No. 25A___

In the
Supreme Court of the United States

CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA, CALIFORNIA CHAMBER OF COMMERCE, AMERICAN FARM BUREAU FEDERATION, LOS ANGELES COUNTY BUSINESS FEDERATION, CENTRAL VALLEY BUSINESS FEDERATION, and WESTERN GROWERS ASSOCIATION,

Applicants,

v.

LAUREN SANCHEZ, in her official capacity as Chair of the California Air Resources Board, STEVEN S. CLIFF, in his official capacity as the Executive Officer of the California Air Resources Board, and ROBERT A. BONTA, in his official capacity as Attorney General of California,

Respondents.

APPENDIX TO EMERGENCY APPLICATION FOR INJUNCTION PENDING APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT

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United States District Court
Central District of California

CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA et al.,

Plaintiffs,

v.

CALIFORNIA AIR RESOURCES BOARD et al.,

Defendants.

Case № 2:24-cv-00801-ODW (PVCx)

ORDER DENYING PLAINTIFFS' MOTION FOR INJUNCTION PENDING APPEAL [116]

I. INTRODUCTION

Plaintiffs bring this action challenging California Senate Bills ("SB" or "SBs") 253 and 261 for violations of the First Amendment. (*See* First Am. Compl. ("FAC") ¶¶ 92–112, ECF No. 28.) Plaintiffs moved for a preliminary injunction seeking to enjoin both laws, (Mot. Prelim Inj., ECF No. 78), and the Court denied the motion, (Order Den. Prelim. Inj. ("Order PI"), ECF No. 112). Plaintiffs now move for an injunction pending appeal. (Mot. Inj. Pending Appeal ("Motion" or "Mot."), ECF No. 116.) For the reasons below, the Court **DENIES** Plaintiffs' Motion.[1]

[1] Having carefully considering the papers filed in support of the Motion, the Court deems the matter appropriate for decision without oral argument. Fed. R. Civ. P. 78; C.D. Cal. L.R. 7-15. Accordingly, the Court **VACATES** the September 15, 2025 hearing.

II. BACKGROUND

The Court incorporates by reference the background in the Court's Order denying Plaintiffs' motion for preliminary injunction. (Order PI 2–6.)

On February 25, 2025, Plaintiffs moved for a preliminary injunction, asking the Court to enjoin SBs 253 and 261 on First Amendment grounds. (*See generally* Mot. Prelim. Inj.) The Court denied Plaintiffs' motion. (Order PI). Plaintiffs appealed the Court's Order to the Ninth Circuit. (Notice Appeal, ECF. No. 114.) Plaintiffs now ask the Court to enjoin the enforcement of SBs 253 and 261 during the pendency of the appeal. (Mot. 1.) The Motion is fully briefed. (Opp'n, ECF No. 120; Reply, ECF No. 122.)[2]

III. LEGAL STANDARD

The standard for issuing an injunction pending appeal is similar to that governing a motion for a preliminary injunction. *Hilton v. Braunskill*, 481 U.S. 770, 776 (1987); *Feldman v. Ariz. Sec'y of State's Off.*, 843 F.3d 366, 367 (9th Cir. 2016). "A preliminary injunction is an extraordinary remedy never awarded as of right." *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 24 (2008). It "may only be awarded upon a clear showing that the plaintiff is entitled to such relief." *Id.* at 22. "A plaintiff seeking a preliminary injunction must establish that he is likely to succeed on the merits, that he is likely to suffer irreparable harm in the absence of preliminary relief, that the balance of equities tips in his favor, and that an injunction is in the public interest." *Id.* at 20; *NetChoice, LLC v. Bonta*, 113 F.4th 1101, 1115 (9th Cir. 2024). The first two factors are "the most critical." *Nken v. Holder*, 556 U.S. 418, 434 (2009). Where, as here, the party opposing injunctive relief is a government entity, "the third and fourth factors 'merge.'" *X Corp. v. Bonta*, 116 F.4th 888, 898

[2] The Court declines to consider Plaintiffs' arguments and accompanying evidence submitted for the first time in their reply brief pertaining to the burden of compliance with SBs 253 and 261. *See Zamani v. Carnes*, 491 F.3d 990, 997 (9th Cir. 2007) ("The district court need not consider arguments raised for the first time in a reply brief."); *see also Provenz v. Miller*, 102 F.3d 1478, 1483 (9th Cir. 1996) (noting that courts will not consider new evidence first submitted in a reply brief because the opposing party has no opportunity to respond to it).

(9th Cir. 2024) (quoting *Fellowship of Christian Athletes v. San Jose Unified Sch. Dist. Bd. of Educ.*, 82 F.4th 664, 695 (9th Cir. 2023)).

In the Ninth Circuit, the *Winter* factors may be evaluated on a sliding scale: "serious questions going to the merits and a balance of hardships that tips sharply towards the plaintiff can support issuance of a preliminary injunction, so long as the plaintiff also shows that there is a likelihood of irreparable injury and that the injunction is in the public interest." *All. for the Wild Rockies v. Cottrell*, 632 F.3d 1127, 1135 (9th Cir. 2011) (internal quotation marks omitted).

Plaintiffs seeking a preliminary injunction bear a "heavy burden." *Earth Island Inst. v. Carlton*, 626 F.3d 462, 469 (9th Cir. 2010) (discussing that plaintiffs "face a difficult task in proving that they are entitled to this 'extraordinary remedy'").

IV. DISCUSSION

Plaintiffs argue that they are entitled to injunctive relief under the "sliding scale" approach to the *Winter* standard. (Mot. 2.) Accordingly, the Court first determines if there are "serious questions going to the merits," before examining whether the "balance of hardships tips sharply in the plaintiff's favor." *All. for the Wild Rockies v. Pena*, 865 F.3d 1211, 1217 (9th Cir. 2017).

A. Serious Questions Going to the Merits

Plaintiffs have not shown that they raise "serious questions going to the merits." *Id.* As an initial matter, the "serious questions" approach does not require a "separate and independent analysis from the court's assessment of [a plaintiff's] likelihood of success on the merits." *Lopez v. Brewer*, 680 F.3d 1068, 1073 (9th Cir. 2012). When a plaintiff fails to demonstrate a likelihood of success on the merits, the plaintiff necessarily cannot establish that there are serious questions going to the merits. *Id.*; *see Cottrell*, 632 F.3d at 1135–36 (assessing the plaintiffs' likelihood of success on the merits under the "serious questions" approach).

The Court previously considered—and rejected—Plaintiffs' argument that they show a likelihood of success on the merits. (Order PI 26–40.) It held that "Plaintiffs

have not shown a likelihood of success on the merits with respect to either of its facial First Amendment challenges to SBs 253 and 261." (*Id.* at 40.) Plaintiffs now ask the Court to revisit its conclusion but fail to show any material changes warranting the Court's reconsideration. (*Id.* at 26–40; *see* Mot. 5–14.) It follows that Plaintiffs also fail to show that they raise serious questions going to the merits. *See Lopez*, 680 F.3d at 1073 ("Because the district court did not err in determining that [the plaintiff] failed to demonstrate a likelihood of success on the merits, it follows that [the plaintiff] also failed to raise serious questions going to the merits.").

Accordingly, Plaintiffs' Motion is denied on this basis alone. *See Ravalli Cnty. Republican Cent. Comm. v. McCulloch*, No. 15-35967, 2016 WL 1161301, at *1 (9th Cir. Mar. 3, 2016) ("Because appellants have made an insufficient showing of either likelihood of success on the merits or the likelihood of irreparable harm, the motion [for injunction pending appeal] is denied." (citation omitted)).

B. Balance of Hardships

For the same reasons, Plaintiffs also fail to demonstrate that the balance of hardships tips sharply in their favor. The Court previously held that because Plaintiffs "have not demonstrated that the laws violate the First Amendment, they have also not shown irreparable harm." (Order PI 40.) As above, Plaintiffs offer nothing to disturb this conclusion. Thus, Plaintiffs fail to show that the balance of hardships tips sharply in their favor. *CTIA – The Wireless Ass'n v. City of Berkeley*, 928 F.3d 832, 852 (9th Cir. 2019) (finding challengers failed to demonstrate any hardship tipping the balance in their favor where their "First Amendment claim is unlikely to succeed").

As Plaintiffs have not satisfied the first two, and most critical, factors under the "sliding scale" approach to the *Winter* test, the Court need not address the remaining factors. Accordingly, the Court finds that Plaintiffs have failed to meet their burden required to obtain injunctive relief and declines to issue the injunction pending appeal.

V. CONCLUSION

For the reasons discussed above, the Court **DENIES** Plaintiffs' Motion for Injunction Pending Appeal. (ECF No. 116.)

IT IS SO ORDERED.

September 11, 2025

OTIS D. WRIGHT, II
UNITED STATES DISTRICT JUDGE

O

United States District Court
Central District of California

CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA et al.,

Plaintiffs,

v.

CALIFORNIA AIR RESOURCES BOARD et al.,

Defendants.

Case № 2:24-cv-00801-ODW (PVCx)

ORDER DENYING PLAINTIFFS' MOTION FOR PRELIMINARY INJUNCTION [78]

I. INTRODUCTION

Plaintiffs Chamber of Commerce of the United States of America ("U.S. Chamber"), California Chamber of Commerce, American Farm Bureau Federation, Los Angeles County Business Federation, Central Valley Business Federation, and Western Growers Association bring this action challenging California Senate Bills ("SB" or "SBs") 253 and 261 for violation of the First Amendment. (*See* First Am. Compl. ("FAC") ¶¶ 92–112, ECF No. 28.) Plaintiffs move for a preliminary injunction to enjoin both laws. (Mot. Prelim Inj., ECF No. 78; Mem. P. & A. ISO Mot. Prelim. Inj. ("Motion" or "Mot."), ECF No. 78-1). For the reasons below, the Court **DENIES** Plaintiffs' Motion.

II. BACKGROUND

A. Factual Background

On October 7, 2023, Governor Gavin Newsom signed SBs 253 and 261 into law. (FAC ¶ 3.) A brief description of each law follows.

1. Senate Bill 253

SB 253 applies to any entity with total annual revenues over $1 billion "that does business in California." Cal. Health & Safety Code §§ 38532(b)(2), (c)(1). SB 253 originally directed that, by January 1, 2025, the California Air Resources Board ("CARB") "shall develop and adopt regulations" for these entities. Cal. Health & Safety Code §§ 38532(b)(2), (c)(1). After the FAC was filed, California delayed this deadline to July 1, 2025. (Notice Amends. SBs 253 & 261 ("Not. Amends."), ECF No. 72.) A recent report estimated that SB 253 would apply to 1,971 companies. (Decl. Caitlan McLoon ISO Opp'n ("McLoon Decl.") Ex. 2 ("Ceres Report") at 11, ECF Nos. 89-3, 89-5.)[1]

SB 253 requires CARB to develop regulations that require reporting entities to annually disclose their "Scope 1," "Scope 2," and "Scope 3" emissions. (FAC ¶ 47); Cal. Health & Safety Code § 38532(c)(1).

- Scope 1 emissions are "all direct greenhouse gas emissions that stem from sources that a reporting entity owns or directly controls, regardless of location, including, but not limited to, fuel combustion activities." (FAC ¶ 47a); Cal. Health & Safety Code § 38532(b)(3).
- Scope 2 emissions are "indirect greenhouse gas emissions from consumed electricity, steam, heating, or cooling purchased or acquired by a reporting entity, regardless of location." (FAC ¶ 47b); Cal. Health & Safety Code § 38532(b)(4).
- Scope 3 emissions are "indirect upstream and downstream greenhouse gas emissions, other than scope 2 emissions, from sources that the reporting entity does not own or directly control and may include, but are not limited to, purchased goods and services, business travel, employee

[1] This report reduced the prior estimate of 5,300 companies. (*See* Ceres Report 3; FAC ¶ 44.)

> commutes, and processing and use of sold products." (FAC ¶ 47c); Cal. Health & Safety Code § 38532(b)(5).

SB 253 does not mandate entities to report avoided emissions, or so-called "Scope 4 emissions." (FAC ¶¶ 50–51, 69.)

SB 253 requires CARB to ensure that its regulations mandate entities to measure and report Scope 1, Scope 2, and Scope 3 emissions "in conformance with the Greenhouse Gas protocol standards and guidance." (*Id.* ¶ 48); Cal. Health & Safety Code § 38532(c)(2)(A)(ii); (*see* Decl. Bradley J. Hamburger ISO Mot. Summ. J. ("Hamburger SJ Decl.") Ex. 18 ("Greenhouse Gas Protocol"), ECF Nos. 48-3, 48-21.) The law further directs CARB to develop and adopt regulations to "minimize[] duplication of effort" by allowing entities "to submit to the emissions reporting organization . . . reports prepared to meet other national and international reporting requirements." Cal. Health & Safety Code § 38532(c)(2)(D)(i). CARB must also develop and adopt regulations that ensure reporting entities obtain third-party assurances as to the quality and accuracy of the reported emissions. *Id.* § 38532(c)(2)(F). These emissions data will be publicly available, and CARB will ensure the creation of a public report on the disclosures. (FAC ¶ 61); Cal. Health & Safety Code §§ 38532(d)(1), (e).

While CARB has yet to issue the specified regulations, it has sent an enforcement notice stating that it "has decided to exercise its enforcement discretion" under SB 253. (Decl. Bradley J. Hamburger ISO Mot. Ex. A ("Enforcement Notice") 5, ECF No. 78-6.) For the first reporting period in 2026, CARB will require reporting entities to "submit scope 1 and scope 2 emissions from the reporting entity's prior fiscal year that can be determined from information the reporting entity already possesses or is already collecting at the time" of the Enforcement Notice. (*Id.* (internal quotation marks omitted).) During the first reporting cycle, CARB "will not take enforcement action for incomplete reporting against entities, as long as the companies make a good faith effort to retain all data relevant to emissions reporting

for the entity's prior fiscal year." (*Id.* at 5–6.) Reporting Scope 3 emissions will come later, as SB 253 requires CARB to issue regulations regarding disclosure of these emissions for the 2027 reporting year. Cal. Health & Safety Code § 38532(c)(2)(A)(i)(II).

2. Senate Bill 261

SB 261 applies to any entity with total annual revenues over $500 million "that does business in California." (FAC ¶ 34); Cal. Health & Safety Code § 38533(a)(4). A recent report estimated that SB 261 would apply to 2,675 companies.[2] (Ceres Report.)

Starting on January 1, 2026, SB 261 will mandate each applicable entity to biennially disclose on its website two categories of "climate-related financial risk information." "Climate-related financial risk information" is defined as information related to "material risk of harm to . . . financial outcomes due to physical and transition risks" to the business. (*Id.* ¶¶ 36, 39); Cal. Health & Safety Code § 38533(a)(2).[3] These two categories are:

- The entity's climate-related financial risk, in accordance with the recommended framework and disclosures contained in the Final Report of Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017), (Hamburger SJ Decl. Ex. 20 ("TCFD Framework"), ECF No. 48-23; FAC ¶ 36), Cal. Health & Safety Code § 38533(b)(1)(A)(i); and
- The entity's measures adopted to reduce and adapt to climate-related financial risk disclosed in its biennial report, (FAC ¶ 37), Cal. Health & Safety Code § 38533(b)(1)(A)(ii).

[2] This report reduced the prior estimate of over 10,000 companies. (*See* Ceres Report 3; FAC ¶ 34.)

[3] The legislation's full definition of "climate-related financial risk" is as follows: "material risk of harm to immediate and long-term financial outcomes due to physical and transition risks, including, but not limited to, risks to corporate operations, provision of goods and services, supply chains, employee health and safety, capital and financial investments, institutional investments, financial standing of loan recipients and borrowers, shareholder value, consumer demand, and financial markets and economic health." Cal. Health & Safety Code § 38533(a)(2).

The TCFD Framework is structured around four areas of disclosure—governance, strategy, risk management, and metrics and targets. (TCFD Framework 14; *see also* Decl. James P. Burton Opp'n Mot. Summ J. ("Burton SJ Decl.") Ex. 5 ("Implementing the TCFD Framework"), ECF Nos. 53, 53-5.) For governance, the TCFD Framework asks each company to disclose its "governance around climate-related risks and opportunities." (TCFD Framework 14 fig. 4.) For strategy, the TCFD Framework asks each company to disclose "the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material." (*Id.*) For risk management, the TCFD Framework asks each company to disclose how it "identifies, assesses, and manages climate-related risk." (*Id.*) And, for metrics and targets, the TCFD Framework asks each company to disclose the metrics and targets it uses "to assess and manage relevant climate-related risks and opportunities where such information is material." (*Id.*)

B. Procedural Background

Plaintiffs initiated this action against Defendants CARB Chair Liane M. Randolph, CARB Executive Officer Steven S. Cliff, and California Attorney General Robert A. Bonta (the "State"). (FAC ¶¶ 15–17.) Plaintiffs bring a facial challenge to both laws on First Amendment grounds. (*Id.* ¶¶ 92–99).

In its FAC, Plaintiffs assert four causes of action under 42 U.S.C. § 1983. In Count I, Plaintiffs allege that SBs 253 and 261 violate the First Amendment. (FAC ¶¶ 92–99.) In Count II, Plaintiffs assert that the Constitution and federal law preempt SBs 253 and 261. (*Id.* ¶¶ 100–06.) In Count III, Plaintiffs claim that the laws violate the Constitution's limits on extraterritorial regulation, including the dormant Commerce Clause. (*Id.* ¶¶ 107–12.) Lastly, in Count IV, Plaintiffs seek payment of attorneys' and expert fees. (*Id.* ¶¶ 113–15.) As relief, Plaintiffs seek judicial declarations that SBs 253 and 261 are "null, void, and with no force or effect," and an

injunction enjoining the State from "implementing, applying, or taking any action whatsoever to enforce" SBs 253 and 261. (*Id.*, Prayer for Relief ¶ 116.)

Before discovery began, Plaintiffs moved for summary judgment on their First Amendment claim, (Mot. Summ. J., ECF No. 48), and the State moved to deny or defer the motion under Federal Rule of Civil Procedure ("Rule" or "Rules") 56(d), (Mot. Den. Defer Mot. Summ. J., ECF No. 57). The Court granted the State's motion to defer Plaintiff's motion for summary judgment and provided Plaintiffs leave to re-file their motion after the close of discovery. (*See* Order Summ. J., ECF No. 73.)

The State separately moved to dismiss Plaintiffs' Supremacy Clause and extraterritoriality claims under Rules 12(b)(1) and 12(b)(6). (Mot. Dismiss, ECF No. 38.) The Court granted the motion and dismissed those claims as to SB 253 under Rule 12(b)(1) and as to SB 261 under Rule 12(b)(6). (Order Mot. Dismiss, ECF No. 77.) Although given the opportunity to amend some of these claims, (*id.* at 23–24), Plaintiffs declined to do so. On March 17, 2025, the State filed an Answer. (Answer, ECF No. 85.)

On April 8, 2025, the Court issued a scheduling order setting the deadline to file renewed motions for summary judgment for March 23, 2026, the pretrial conference for September 21, 2026, and trial for October 20, 2026. (Scheduling & Case Mgmt. Order 2, ECF No. 93.)

Plaintiffs now bring a Motion for Preliminary Injunction, asking the Court to preliminary enjoin SBs 253 and 261 on First Amendment grounds. (Mot.) The Motion is fully briefed. (Opp'n Mot., ECF No. 89; Reply, ECF No. 97.) On July 1, 2025, the Court held a hearing on the Motion. (Hr'g Mins., ECF No. 102; Hr'g Tr., ECF No. 106.)

III. LEGAL STANDARD

"A preliminary injunction is an extraordinary remedy never awarded as of right." *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 24 (2008). To obtain a preliminary injunction, a movant must establish that they are likely to succeed on the

merits, they are likely to suffer irreparable harm absent an injunction, the balance of equities tips in their favor, and an injunction is in the public interest. *NetChoice, LLC v. Bonta*, 113 F.4th 1101, 1115 (9th Cir. 2024) (citing *Winter*, 555 U.S. at 20). "Because 'the party opposing injunctive relief is a government entity' here, the third and fourth factors 'merge.'" *X Corp. v. Bonta*, 116 F.4th 888, 898 (9th Cir. 2024) (quoting *Fellowship of Christian Athletes v. San Jose Unified Sch. Dist. Bd. of Educ.*, 82 F.4th 664, 695 (9th Cir. 2023)). "[I]n the First Amendment context, the moving party bears the initial burden of making a colorable claim that its First Amendment rights have been infringed, or are threatened with infringement, at which point the burden shifts to the government to justify the restriction on speech." *Cal. Chamber of Com. v. Council for Educ. & Rsch. on Toxics*, 29 F.4th 468, 478 (9th Cir. 2022) (internal quotation marks omitted).

IV. DISCUSSION

A. Whether Plaintiffs' SB 253 Challenge Is Ripe

As a threshold matter, the State argues that Plaintiffs' challenge to SB 253 is prudentially unripe because SB 253, without CARB regulations, does not impose any requirements on Plaintiffs' members. (Opp'n 8–9.) The State contends that further factual development, including CARB's implementing regulations, are needed for the Court to rule on the constitutionality of SB 253. (*Id.*; *see* McLoon Decl. Ex. 1 ("CARB Letter"), ECF No. 89-4 (listing topics of potential regulation).) Additionally, the State argues that Plaintiffs cannot show their members will face hardship, as covered companies will not be required to report Scope 1 and Scope 2 emissions until 2026 and Scope 3 emissions until 2027. (Opp'n 8–9); *see* Cal. Health & Safety Code § 38532(c)(1), (2)(A)(i).

In analyzing the prudential components of ripeness, courts consider "the fitness of the issues for judicial decision and the hardship to the parties of withholding court consideration." *Thomas v. Anchorage Equal Rts. Comm'n*, 220 F.3d 1134, 1141 (9th Cir. 2000).

Earlier in this case, when considering the State's motion to dismiss Plaintiffs' Supremacy Clause and extraterritoriality claims, the Court found those challenges to SB 253 were not justiciable. (Order Mot. Dismiss 13.) However, the Court's reasoning there does not apply to Plaintiffs' First Amendment claim. First, courts apply "the requirements of ripeness and standing less stringently in the context of First Amendment claims." *Wolfson v. Brammer*, 616 F.3d 1045, 1058 (9th Cir. 2010). Second, since the Court's prior ruling, the parties have offered CARB's Enforcement Notice, stating that CARB "has decided to exercise its enforcement discretion" under SB 253, including that CARB will require covered companies to submit Scope 1 and 2 emissions in 2026. (Enforcement Notice 5.)

Here, Plaintiffs' First Amendment challenge is fit for judicial decision. Courts find an issue is fit for review when "the issues raised are primarily legal, do not require further factual development, and the challenged action is final." *Tingley v. Ferguson*, 47 F.4th 1055, 1070 (9th Cir. 2022). While CARB has yet to issue implementing regulations for SB 253, the Court finds that SB 253 is clear that covered companies will be required to report Scope 1, 2, and 3 emissions. This positions the Court to rule on the Motion without further factual development by the State. *See* Cal. Health & Safety Code § 38532(c)(2)(A)(i)(I)–(II). To the extent further factual development is needed in this case, (*see* Order Mot. Summ. J. 11–12), it is the type of development accomplished through typical discovery, not through CARB's issuance of regulations.

Additionally, Plaintiffs have demonstrated hardship to their members if the Court declines to review their First Amendment challenge now. It appears that U-Haul Co. of California ("UHCA"), a subsidiary of U-Haul Holding Company ("UHHC") and member of Plaintiff U.S. Chamber, will be subject to SB 253's requirements. (*See* Decl. Edward J. Shoen ISO Mot. ("Shoen Decl.") ¶ 3, ECF

No. 78-3 (declaring that UHHC has an annual total revenue exceeding $1 billion).)[4] UHHC's president and chairman has declared that it will take years for it to build systems to comply with SB 253, for example, by developing systems and processes to collect, store, and analyze climate-related information. (*Id.* ¶ 11.) He estimates that it will cost at least $3 million per year to comply with SBs 253 and 261, demonstrating that UHCA would suffer hardship if the Court does not consider the Motion. (*Id.* ¶ 12; *see id.* ¶¶ 13–29 (detailing cost and burdens of complying with SB 253).)

Accordingly, Court finds that Plaintiffs' challenge to SB 253 is ripe for review and declines to dismiss it on prudential ripeness ground. *See Anchorage Equal Rts. Comm'n*, 220 F.3d at 1142 ("Prudential considerations of ripeness are discretionary . . . .").

B. Application of the First Amendment

Before analyzing whether SBs 253 and 261 violate the First Amendment, the Court must first decide whether the First Amendment even applies.

In its summary judgment order, the Court considered—and rejected—the State's argument "that the laws escape First Amendment scrutiny because they are 'part of a broader regulatory apparatus.'" (Order Summ. J. 7–8.) In ruling that the First Amendment applies to the laws, the Court concluded that the laws' primary effect and purpose is to compel speech. (*Id.*) In opposing the instant Motion, the State asks the court to revisit this conclusion. (Opp'n 10–11.)

The State argues that the Court erred because the laws here "require a type of speech—disclosure of commercial data and financial risks—that has not traditionally garnered constitutional concern." (Opp'n 10.) The State notes that securities filings

[4] The State objects to Shoen's declaration that "[i]f UHCA's activities in California are attributable to UHHC such that UHHC 'does business' in California as a 'Reporting Entity' under S.B. 253 . . , then UHHC would be subject to the requirements of S.B. 253." (Def's Obj. Pls.' Evid ¶ 3, ECF No. 89-1.) The State contends that this statement is a legal conclusion. (*Id.*) Even if it is, and even if it cannot be confirmed whether UHCA will be subject to SB 253's requirements until CARB issues implementing regulations, CARB has stated that it will begin enforcing SB 253 in 2026 and UHCA has demonstrated that it will need to begin preparing to comply with the law before CARB issues any clarification as to its applicability to UHCA.

requiring disclosure of investment-related risks "ha[ve] historically fallen outside the boundaries of First Amendment coverage entirely, or ha[ve] merited minimal judicial scrutiny." (*Id.*) Relatedly, the State again argues that because the laws are directed at a "broader regulatory apparatus" governing disclosure of commercial data, the laws regulate conduct, not speech. (*Id.*)

The Supreme Court has identified "[n]umerous examples" of types of "communications that are regulated without offending the First Amendment," including "the exchange of information about securities" and "corporate proxy statements." *Ohralik v. Ohio St. Bar Ass'n*, 436 U.S. 447, 456 (1978). But to the extent this means that such communications are not subject to First Amendment review, this principle does not extend to SBs 253 and 261. The State's mere assertion that a regulation is like a securities filing or directed at a "broader regulatory apparatus" does not automatically end a court's First Amendment inquiry. To read these exceptions "broadly would allow [the government] to easily regulate otherwise protected speech using the guise of securities laws." *Nat'l Ass'n of Mfrs. v. S.E.C. (NAMF I)*, 748 F.3d 359, 372 (D.C. Cir. 2014), *subsequent opinion after reh'g*, 800 F.3d 518 (D.C. Cir. 2015); *cf. Nat'l Ass'n of Mfrs. v. S.E.C. (NAMF II)*, 800 F.3d 518, 521 (D.C. Cir. 2015) (rejecting argument that an SEC rule requiring companies to disclose whether its products are "conflict-free" "is valid because the United States is thick with laws forcing '[i]ssuers of securities' to 'make all sorts of disclosures about their products'").

Here, the State asserts that the legislature enacted SBs 253 and 261 "to, among other things, respond to concerns that California investors and consumers lacked accurate, verifiable data about [greenhouse gas] emissions and climate-risk assessment . . . from the largest companies doing business in the state." (Opp'n 4.) The State also offers that CalPERS, California's largest public-defined-benefit pension fund, believes "[c]limate risk is investment risk" and finds the information the laws' require companies to disclose to be valuable to its investment decisions. (Decl.

Peter Cashion ISO Opp'n Mot. Summ. J. ("Cashion Decl.") ¶¶ 13–16, 22, ECF No. 52-5; Opp'n 4.) Therefore, per the State, these laws are like typical securities disclosure regimes geared toward consumer protection that escape First Amendment review. (*See* Opp'n 4.)

The problem with the State's comparison is twofold. First, at the same time it argues the purpose of these laws are to correct misleading data and provide investors with accurate information to evaluate climate risks, (*id.*), the State also proffers that the laws further its interest for "companies doing business in California to reduce their emissions" so that California can "meet[] certain emissions reduction goals over time," (*id.* at 18). While certainly a compelling state interest, this is more akin to the conflict-mineral disclosures in *NAMF* than traditional securities disclosures.

Second, and more fundamentally, the scope of SBs 253 and 261 is broader than typical securities disclosures. The laws apply to any company that hits certain annual revenue thresholds and "does business in California." Cal. Health & Safety Code §§ 38532(b)(2), 38533(a)(4). The laws do not differentiate between private and public companies or from those offering the sale of securities and those that do not. (*See* Ceres Report 11 (estimating that of the companies covered by SBs 253 and 261, 23% and 27% are private companies, respectively).) This is not to say that the State's proffered interests in SBs 253 and 261 are ingenuine or not compelling, or that they violate the First Amendment. Rather, the laws' application to public and private companies and those with and without investors, not just those typically subject to securities-based rules, invites First Amendment review. Otherwise, the State would be permitted to "to easily regulate otherwise protected speech using the guise of securities laws," *NAMF I*, 748 F.3d at 372, even if the law's purpose goes beyond the reasons for traditional securities disclosure requirements and the types of companies to which such requirements usually apply.

At bottom, "the forced disclosure of information, even purely commercial information, triggers First Amendment scrutiny." *NetChoice*, 113 F.4th at 1117.

While there may be exceptions for certain types of disclosures, *see Ohralik*, 436 U.S. at 456, none of those exceptions apply to the laws at issue here in their current form. Therefore, the Court declines to alter its prior conclusion that SBs 253 and 261 are subject to First Amendment review. (*See* Order Summ. J. 7–8.)

C. Plaintiffs' Facial Challenge

Plaintiffs assert a First Amendment facial challenge to SBs 253 and 261. "[C]ourts usually handle constitutional claims case by case, not en masse." *X Corp.*, 116 F.4th at 898 (quoting *Moody v. NetChoice, LLC*, 603 U.S. 707, 723 (2024)). Because facial challenges "often rest on speculation about the law's coverage and its future enforcement" and "threaten to short circuit the democratic process," the Supreme Court "has therefore made facial challenges hard to win." *Moody*, 603 U.S. at 723 (internal quotation marks omitted).

However, in First Amendment cases, the Supreme Court has "lowered th[e] very high bar" of a typical facial challenge. *X Corp.*, 116 F.4th at 898 (quoting *Moody*, 603 U.S. at 723). "'[I]f the law's unconstitutional applications substantially outweigh its constitutional ones,' then a court may sustain a facial challenge to the law and strike it down." *Id.* at 898–99 (alteration in original) (quoting *Moody*, 603 U.S. at 724). As such, "a First Amendment facial challenge has two parts: first, the courts must 'assess the state laws' scope'; and second, the courts must 'decide which of the laws' applications violate the First Amendment, and . . . measure them against the rest." *Id.* at 899 (alteration in original) (quoting *Moody*, 603 U.S. at 725). The Supreme Court recently admonished that courts cannot treat facial challenges "more like as-applied claims than like facial ones." *Moody*, 603 U.S. at 724.

The scope of SBs 253 and 261 appears straightforward for purposes of the Motion. SB 253 requires CARB to adopt regulations that will require all domestic companies with total annual revenues more than $1 billion and that "do[] business in California" to annually report the company's Scope 1, Scope 2, and Scope 3 emissions, in conformance with the Greenhouse Gas Protocol and guidance. Cal.

Health & Safety Code § 38532(a)(2), (c). CARB must require covered entities to "publicly disclose" these figures to CARB or a contracted third party. *Id.* § 38532(c). Meanwhile, SB 261 requires all domestic companies with total annual revenues more than $500 million and that "do[] business in California" to "prepare a climate-related financial risk report disclosing" the company's "climate-related financial risk," in accordance with the TCFD Framework and "[i]ts measures adopted to reduce and adapt to [this] climate-related financial risk." *Id.* § 38533(a)(4), (b). Covered companies must make the biennial report available on its website. *Id.* § 38533(c)(1). In short, all covered companies—those with total annual revenues over a certain threshold and that do business in California—must report the same information. *See NetChoice*, 113 F.4th at 1116 (finding that "all" covered companies "are under the same statutory obligation"); *X Corp.*, 116 F.4th at 899 (finding that the relevant provisions "compel every covered social media company to reveal" the same information).

"The next order of business is to decide which of the laws' applications violate the First Amendment, and to measure them against the rest." *Project Veritas v. Schmidt*, 125 F.4th 929, 961 (9th Cir. 2025) (quoting *Moody*, 603 U.S. at 725). This analysis is less complicated where the legislation "raise[s] the same First Amendment issues" as to every covered company. *X Corp.*, 116 F.4th at 899. That is not the case here. While the laws apply equally to all covered companies, the parties reveal differences among the covered companies that may impact the First Amendment analysis.

The State asserts "an interest in protecting its investors, consumers, and other stakeholders from fraud or misrepresentation." (Opp'n 16.) At the same time, the State's evidence suggests that neither SB 253 nor SB 261 applies only to companies engaged in green advertising or accepting investment. (*See* Decl. Angel Hsu ISO Opp'n ("Hsu Decl.") ¶¶ 8–9, ECF No. 89-18 (finding that 82% of North American companies in a dataset have made "green pledges" to reduce emissions); Ceres Report

at 11 (estimating that of the companies covered by SBs 253 and 261, 23% and 27% are private companies, respectively).) Plaintiffs attack the laws on this very basis, arguing that because the laws are not limited to covered companies that engage in green advertisement or are open for investment, they are not sufficiently tailored to protect this government interest. (*See* Reply 7.) The distinction between covered companies—those who engage in green advertising (and those who do not) and those who have investors (and those who do not)—may result in differing analyses to determine whether specific applications of SBs 253 and 261 violate the First Amendment.

NetChoice is instructive as to how the difference in covered companies implicates the Court's analysis of Plaintiffs' First Amendment facial challenge. In that case, the Ninth Circuit evaluated whether the California Age-Appropriate Design Code Act ("CAADCA") should be preliminary enjoined on First Amendment grounds. *NetChoice*, 113 F.4th at 1108. Among the provisions the court considered was one that required online businesses to create a "report identifying, for each offered online service, product, or feature likely to be accessed by children, any risk of material detriment to children that arise from the data management practices of the business." *Id.* at 1109 (internal quotation marks omitted). In affirming the district court's enjoinment of this provision based on a facial challenge, the Ninth Circuit held that this "report requirement, in every application to a covered business, raises the same First Amendment issues," namely, whether the State can require covered businesses to "ask whether the new service may lead to children viewing or receiving harmful or potentially harmful materials." *Id.* at 1116. However, in evaluating other of the CAADCA's provisions, the court found it "less certain" whether NetChoice was likely to succeed on its facial challenge. *Id.* at 1122.

For example, as to some provisions, the Ninth Circuit found that the district court erred in its facial analysis because it "focused on possible applications of these provisions to social media companies—a subset of the businesses covered by the

CAADCA—and speculated about how that subset of applications could ultimately have a substantial effect on those companies' editorial discretion or the expression of their third-party users." *Id.* at 1123. And as to a provision requiring online businesses to provide "privacy information, terms of service, policies, and community standards concisely, prominently, and using clear language suited to the age of children," the Ninth Circuit found it "unclear from the record below whether a substantial majority of those applications are likely to fail First Amendment scrutiny," because "all or most of the speech compelled by this provision is likely to be purely factual and non-controversial." *Id.* at 1123–24.

Consistent with *NetChoice*, to entertain Plaintiffs' facial challenge here, the Court must analyze all the laws' applications. Thus, the Court must analyze whether the applications to green-advertising companies survive First Amendment scrutiny, whether applications to non-advertising companies survive First Amendment scrutiny, and then determine whether a substantial majority of the laws' applications likely fail First Amendment scrutiny. *See Moody*, 603 U.S. at 725 (explaining that the court must "ask, . . . as to each thing covered, whether the required disclosures" survive First Amendment scrutiny and "it is not hard to see how the answers might differ as between regulation of Facebook's News Feed (considered in the courts below) and, say, its direct messaging service (not so considered)"); *Ariz. Att'ys for Crim Just. v. Mayes*, 127 F.4th 105, 110–12 (9th Cir. 2025) (rejecting facial challenge where plaintiffs challenged the prohibition on contacting victims in only one of the law's various applications). Similarly, the Court must analyze whether the laws' applications to companies with investors survive First Amendment scrutiny, whether applications to companies without investors survive First Amendment scrutiny, and then determine whether a substantial majority of the laws' applications likely fail First Amendment scrutiny. *See Moody*, 603 U.S. at 725. However, before the Court can consider these questions, it must first determine what level of scrutiny applies.

D. Level of Scrutiny

The parties disagree about which level of scrutiny applies to SBs 253 and 261. Plaintiffs argue that the laws must survive strict scrutiny to survive their First Amendment challenge. (Mot. 10–13.) Conversely, the State argues that, if the laws compel speech, they are subject to the lowest standard of review. (Opp'n 11–12.)

When the First Amendment applies, compelled speech must typically be reviewed under strict scrutiny. However, "[l]aws regulating commercial speech are generally subject to a lesser standard than strict scrutiny." *NetChoice*, 113 F.4th at 1119. "Commercial speech is generally subject to intermediate scrutiny." *X Corp.*, 116 F.4th at 900; *see also Cent. Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n of N.Y.*, 447 U.S. 557, 561 (1980) (articulating standard). However, if commercial speech requires disclosure of "purely factual and uncontroversial information," then it is subject to the lowest standard of review as set forth in *Zauderer v. Office of Disciplinary Counsel of Supreme Court of Ohio*, 471 U.S. 626 (1985). *Nat'l Inst. of Fam. & Life Advocs. v. Becerra (NIFLA)*, 585 U.S. 755, 768 (2018).

Accordingly, to determine which level of review applies to SBs 253 and 261, the Court must decide whether the laws compel commercial speech of purely factual and uncontroversial information.

1. Commercial Speech

"Commercial speech is 'usually defined as speech that does no more than propose a commercial transaction.'" *X Corp.*, 116 F.4th at 900 (quoting *United States v. United Foods, Inc.*, 533 U.S. 405, 409 (2001)). But this is "just a starting point." *Id.* Indeed, "speech that does not propose a commercial transaction on its face can still be commercial speech." *Ariix, LLC v. NutriSearch Corp.*, 985 F.3d 1107, 1115 (9th Cir. 2021). Courts "try to give effect to a common-sense distinction between commercial speech and other varieties of speech." *X Corp.*, 116 F.4th at 900 (internal quotation marks omitted). This is a "fact-driven" analysis, "due to the inherent

difficulty of drawing bright lines that will clearly cabin commercial speech in a distinct category." *Id.*

Given this difficulty, "in close cases," courts consider three factors outlined by the Supreme Court in *Bolger v. Youngs Drug Products Corporation*, 463 U.S. 60 (1983). *NetChoice, LLC*, 113 F.4th at 1119. The *Bolger* factors consider whether (1) "the speech is an advertisement," (2) "the speech refers to a particular product," and (3) "the speaker has an economic motivation." *Hunt v. City of Los Angeles*, 638 F.3d 703, 715 (9th Cir. 2011). Courts have found that, if the speech meets two of the three *Bolger* factors, then it "weighs in favor of finding" the "speech is commercial." *Stutzman v. Armstrong*, No. 2:13-cv-00116-MCE-KJN, 2013 WL 4853333, at *18 (E.D. Cal. Sept. 10, 2013); *cf. Dex Media W., Inc. v. City of Seattle*, 696 F.3d 952, 959 (9th Cir. 2012) (not commercial speech where "does not fulfill two of the three *Bolger* factors"); *X Corp.*, 116 F.4th at 901 (same). However, while these factors are "important guideposts, . . . they are not necessarily dispositive." *X Corp.*, 116 F.4th at 900; *see Ariix,* 985 F.3d at 1116 (concluding that two of the factors "do[] not shed much light" on whether the publication in question was commercial speech).

The State argues that the required disclosures are commercial speech. (Opp'n 11–12.) While the State does not contend that the disclosures refer to a particular product, it does argue that the compelled disclosures satisfy the remaining *Bolger* factors. (*Id.* at 12.) In support, the State offers expert declarations. (*Id.*; Decl. Thomas P. Lyon ISO Opp'n ("Lyon PI Decl."), ECF No. 90; Hsu Decl.) First, Angel Hsu, a professor of environmental policy, reports that 82% of North American companies in her dataset, which includes the Forbes 200 publicly listed companies and the one hundred largest privately-owned companies, have made "green pledges," meaning a pledge to reduce emissions with a report of at least one emissions target. (Hsu Decl. ¶¶ 8–9.) Next, Thomas Lyon, a professor of engineering-economic systems, opines "that companies have incentives to communicate information about their carbon emissions to investors because investors are concerned about climate risk

and demand a premium from firms that are saddled with climate risk." (Lyon PI Decl. ¶¶ 2, 22.) He further declares that companies make climate pledges to "influence consumer behavior." (*Id.* ¶ 23.) Based on this, the State contends that the speech the laws compel—even if referring to a company as a whole—is advertising. (Opp'n 12.) Also, the State asserts that the advertising has an economic motive, as companies engage in this speech to appear more attractive to consumers and investors. (*Id.*)

Plaintiffs see the speech differently. First, they argue that the Court should not even look to the *Bolger* factors because the "usual definition of commercial speech is speech that does no more than propose a commercial transaction," (Reply 4 (quoting *X Corp.*, 116 F.4th at 901) (cleaned up)), and the State does not argue that the speech here meets that definition, (*id.*). Second, Plaintiffs argue that, even considering the *Bolger* factors, they are not met: the compelled disclosures are not themselves advertisements, do not refer to a particular product, and the companies have no economic motivation to provide these compelled disclosures. (*Id.*)

The Court rejects these arguments and finds that SBs 253 and 261 regulate commercial speech. First, the Ninth Circuit has held that "speech that does not propose a commercial transaction on its face can still be commercial speech." *Ariix*, 985 F.3d at 1115. Accordingly, in this case, the State is not conceding that the speech here is non-commercial simply because it does not explicitly state that the speech "does no more than propose a commercial transaction." *See, e.g.*, *Zauderer*, 471 U.S. at 637 (acknowledging that "the precise bounds of . . . commercial speech" are "subject to doubt"); *Cent. Hudson*, 447 U.S. at 561 (defining "commercial speech" as "expression related solely to the economic interests of the speaker and its audience"); *cf. X Corp.*, 116 F.4th at 901 (recognizing exceptions to the "usual definition" of commercial speech (alterations omitted)).

Second, the *Bolger* factors weigh in favor of finding the speech here commercial. This is so even though the State does not argue the disclosures refer to a particular product. (*See* Opp'n 12.) Plaintiffs are also correct that SBs 253 and 261

do not compel speech in the form of advertisements, in the sense that the required disclosures will not be included in targeted advertisements. However, these disclosures regarding a company's emissions and climate-related risk function as advertisements in the sense that SBs 253 and 261 compel disclosure of the same type of information that a substantial number of companies use to advertise their brands, which they have an economic motive to provide. (*See* Lyon PI Decl. ¶¶ 11–26.)

For example, some "[f]irms communicate their planned emissions reductions because investors penalize firms for carbon risk." (*Id.* ¶ 13.) Of the S&P 500, more than 400 companies have set emissions reduction targets. (*Id.* ¶ 17.) Thousands of other companies, including a substantial number of the Forbes 2000 publicly listed companies, have done the same. (*See* Hsu Decl. ¶ 8.) Firms are increasingly discussing climate-related information with investors. (Lyon PI Decl. ¶ 21.) Also, from 2018 to 2023, nearly 16,000 companies disclosed environmental data, including emissions data and climate-related risks, to CDP (formerly, the Carbon Disclosure Project), an investor-driven disclosure project. (*Id.* ¶¶ 36–37.) Of those companies, 49% disclosed Scope 3 emissions. (*Id.*) In 2022, more than 71% of companies surveyed by the American Institute of Certified Public Accountants used the TCFD Framework for climate-related reporting, and 58% of public companies surveyed by the Financial Stability Board disclosed at least five of the TCFD's recommended climate-risk disclosures. (*See* Burton SJ Decl. ¶ 14.) Indeed, in the "Sustainability" section of its website, UHHC—the only member company offering a declaration in support of the Motion—lists as one of its goals to "[d]evelop and implement comprehensive climate-change strategies to manage and mitigate our greenhouse gas (GHG) emissions." (Decl. James P. Burton ISO Opp'n ("Burton PI Decl.") Ex. 6 ("UHHC Website") at 381, ECF Nos. 89-6, 89-12.) UHHC continues that "[s]hort-term gains may result in long-term losses, both in terms of profitability and in terms of future generations being able to meet their needs." (*Id.*)

While it is true that, on their face, SBs 253 and 261 are not limited to only those companies that advertise greenhouse gas emissions and low climate-related risk, this is more appropriately addressed when applying the appropriate standard of review—e.g., whether the legislation is appropriately tailored to the state's interest—not when determining what standard to apply—e.g., whether the regulated speech is commercial.

Ultimately, in this "fact-driven" analysis considering SBs 253 and 261 and the *Bolger* factors, the "'common-sense distinction' between commercial speech and other varieties of speech," *X Corp.*, 116 F.4th at 900, supports a finding that SBs 253 and 261 compel disclosure of commercial speech. Specifically, SB 253 mandates disclosure of commercial data—a company's direct and indirect greenhouse gas emissions—that many companies routinely disclose and stakeholders consider relevant to the long-term success of the business. And SB 261 requires companies to disclose information related to climate-related risks to a company's own business. Even if companies are not already required to report these precise risks, many companies already report certain risks to their business through SEC disclosures and other requirements. With respect to the type of information many companies already report, SB 261's requirements, while perhaps different in degree, are not different in kind.

For these reasons, the Court finds that SBs 253 and 261 regulate commercial speech.[5]

[5] Plaintiffs' reliance on *X Corp.* is misplaced. (*See* Mot. 12–13.) That opinion focused extensively on the Ninth Circuit's conclusion that the legislation at issue required "a company to recast its content-moderation practices in language prescribed by the State." *X Corp.*, 116 F.4th at 901. For example, the court held that a company's "opinions about and reasons for" its content moderations policies "would require a social media company to convey the company's policy views on intensely debated and politically fraught topics, including hate speech, racism, misinformation, and radicalization, and also convey how the company has applied its policies." *Id.* at 901–02 (footnote omitted). At the same time, the court distinguished compelled disclosures in the case from a "platform's existing [Terms of Service] and content moderation policies" and laws that require platforms to disclose "how they moderate and promote content" and content-moderation "standards"

Having found the laws regulate commercial speech, the Court must determine whether SBs 253 and 261 are subject to intermediate scrutiny or the less searching standard of review under *Zauderer*. "Commercial speech is generally subject to intermediate scrutiny." *X Corp.*, 116 F.4th at 900. However, such speech can qualify for the lower-level *Zauderer* review if the compelled commercial speech at issue discloses "purely factual and uncontroversial information." *NIFLA*, 585 U.S. at 768.

2. Factual Information

As a first step, courts consider whether information is "factually accurate." *Nat'l Ass'n of Wheat Growers v. Bonta*, 85 F.4th 1263, 1276 (9th Cir. 2023). "[B]ut that alone is not enough to qualify for the *Zauderer* exception." *Id.* A statement that is "literally true but nonetheless misleading" is not factual. *Id.* In *National Association of Wheat Growers*, the Ninth Circuit considered a requirement that a business must provide a warning before it "knowingly and intentionally exposes any individual in California to a chemical known to the state to cause cancer." *Id.* at 1268 (cleaned up). While glyphosate was "known" to the state to cause cancer according to the statutory definition, there was substantial scientific debate on whether it actually caused cancer. *Id.* at 1278. Accordingly, the Ninth Circuit concluded that the glyphosate warning was not purely factual because "the technical meaning of the word 'known' in the warning is different from the meaning an average consumer would give the word 'known.'" *Id.* at 1279.

a. SB 253—Factual Information

As to SB 253, Plaintiffs argue that the disclosures required are not factual, but are in fact misleading, for two reasons. First, companies must report "their" greenhouse-gas emissions, SB 253 §§ 1(e), (f), but Scope 2 emissions are emissions of electricity providers and Scope 3 emissions are emissions of upstream and downstream sources that the reporting entity does not directly control. (Mot. 11).

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and "rule changes," without mention of controversial topics. *Id.* at 901, 903. Here, SBs 253 and 261 do not require companies to recast their practices in language prescribed by the State.

Second, SB 253 does not factor in a company's Scope 4 (avoided) emissions, so any reported emissions will provide a misleading picture of a company's total emissions. (*Id.* at 11–12.)

SB 253's Scope 1 emissions disclosure requirement is undisputedly factual and not misleading; Plaintiffs do not challenge this conclusion. (*See* Mot.; Reply.) The Scope 2 and Scope 3 emissions disclosures are also factual in nature, in that they are both are defined and have recognized methods of computation. *See* Cal. Health & Safety Code § 38532(c)(1)(A)(ii) (adopting Greenhouse Gas Protocol standards); (Lyon PI Decl. ¶ 37 & fig.5 (reporting that more than 5,500 entities disclose Scope 3 emissions using these standards)). The question then is whether it is misleading to require companies to report Scope 2 and Scope 3 emissions when the emissions being reported are not the company's own direct omissions and do not include Scope 4 avoided emissions. (*See* Mot. 11.)

The Court concludes that these requirements are not misleading. SB 253 simply mandates that covered entities report Scope 1, Scope 2, and Scope 3 emissions using recognized methodology. SB 253 does not require companies to take responsibility, as Plaintiffs argue, for Scope 2 and Scope 3 emissions. Nor does it prohibit covered entities from separately calculating and publicizing its Scope 4 avoided emissions, or from taking the position that their Scope 4 emissions can offset their Scope 1, Scope 2, and Scope 3 emissions. *See* Cal. Health & Safety Code § 38532; (Burton PI Decl. ¶ 20 (identifying one company that already publicizes its Scope 4 avoided emissions).) This is not like *National Association of Wheat Growers*; SB 253 does not require companies to state that they are causing the emissions, and there is no evidence that the definitions of Scope 2 and Scope 3 emissions include misleading language like the word "known," where the technical meaning of the word is different from the meaning the average consumer would give the word. *See* 85 F.4th at 1278–79. SB 253 does not even require companies to report a "total" number of emissions.

Accordingly, the Court finds that SB 253 requires reporting of only factual—and not misleading—information. As discussed further below, because SB 253's disclosures are factual, the Court must analyze whether they are also uncontroversial to determine whether SB 253 qualifies for review under *Zauderer*.

b. SB 261—Factual Information

As to SB 261, Plaintiffs argue that company's climate-related financial risk is not factual, because it comprises a company's assessment of the risk of harm to immediate and long-term financial outcomes, which requires companies to speculate as to future technological and policy developments. (Mot. 11.) The State counters that companies that "do[] not currently evaluate climate-related risks . . . can simply state that." (Opp'n 15.) The State describes the required disclosures under SB 261 as "not meaningfully distinct from other financial risks routinely disclosed by large companies." (*Id.*)

The Court finds that SB 261's compelled disclosures are not factual. Although the State refers to the disclosure as a company's "assessment[]," (Opp'n 15), by definition, an assessment about the effect of current *and future* events on a company cannot be factual. *See Assessment*, Black's Law Dictionary (12th ed. 2024) ("The process by which, after careful thought, one makes a judgment about a person or situation."). The State argues that SB 261's disclosures are not like the disclosures in *NetChoice*, which required companies to "weigh in on [a] highly divisive national debate about what type of speech is harmful to children" and thus did not qualify for *Zauderer* review. (Opp'n 15 (emphasis omitted).) But that distinction relates to the analysis of the controversial nature of the compelled *NetChoice* speech, not its *factual* character. *See NetChoice*, 113 F.4th at 1120 ("[A] business's opinion about how its services might expose children to harmful content online is not 'purely factual and uncontroversial.'"). The State argues that SB 261 only requires companies that evaluate climate-related risks to speak and does not require companies that do not evaluate those risks to begin to do so. (Opp'n 15.) But this does not transform the

otherwise subjective and predictive opinion into a factual disclosure. *See X Corp.*, 116 F.4th at 902 (rejecting California's argument that a "transparency measure" warrants lower scrutiny).

Accordingly, the Court finds that SB 261 compels disclosure of more than factual information, and thus is not subject to *Zauderer* review.

3. Uncontroversial Information

As the Court finds that SB 253 compels disclosure of factual information, it is subject to *Zauderer* review so long as SB 253 also compels disclosure of "uncontroversial information." *NIFLA*, 585 U.S. at 768.[6] To qualify for *Zauderer* review, the compelled disclosure must be "uncontroversial information." *Nat'l Ass'n of Wheat Growers*, 85 F.4th at 1275. If the required disclosure is of controversial information, intermediate scrutiny applies. *See id.*

Plaintiffs contend that SBs 253's compelled disclosures are controversial because "a company's climate-related risks and emissions 'are anything but an "uncontroversial" topic.'" (Mot. 12 (quoting *NIFLA*, 585 U.S. at 769).) In support, they cite the State's prior acknowledgement that "policy responses to climate change are the subject of vigorous political debate." (*Id.* (quoting Opp'n Mot. Summ. J. 21).) Plaintiffs also argue that the laws' compelled disclosures are like the conflict-mineral disclosures—which required companies to report whether their products are "conflict-free"—that the D.C. Circuit struck down in *NAMF*, because both would be used to "stigmatize companies" and "shape their behavior." (*Id.* (cleaned up).)

In response, the State contends that merely because a disclosure concerns a controversial issue or may lead consumers to form an opinion about a company does not make a factual statement controversial. (Opp'n 13.) The State also distinguishes the conflict-mineral disclosures, highlighting that those disclosures required companies to categorize their diamonds as "conflict free" or "not conflict free," which

[6] As SB 261's disclosures are not factual, and thus not subject to *Zauderer* review, the Court need not consider whether those compelled disclosures are controversial.

is an ideological and moral statement, regardless of the companies' views about their own moral responsibility. (*Id.* at 14.) Conversely, the State asserts, SBs 253 and 261 require companies to report data and climate-related risks without labeling themselves, the companies, as "good" or "bad" for the climate. (*Id.*)

In *NIFLA*, upon which Plaintiffs rely, (*see* Mot. 12), the Supreme Court found that a law requiring clinics that oppose abortion to provide information about state-sponsored services, including abortion, compelled controversial speech for purposes of First Amendment review. 585 U.S. at 769. However, as the Ninth Circuit has commented, the Supreme Court did not "broadly [say] that any purely factual statement that can be tied in some way to a controversial issue is, for that reason alone, controversial." *CTIA – The Wireless Ass'n v. City of Berkeley*, 928 F.3d 832, 845 (9th Cir. 2019). Rather, the Ninth Circuit characterized *NIFLA* as concerning "compelled speech [that] took sides in a heated political controversy, forcing the clinic to convey a message fundamentally at odds with its mission." *Id.*

Here, companies subject to SB 253 are not required "to take sides in a heated political controversy," *id.* at 848, no matter the amount of debate surrounding the existence of and policy responses to climate change. SB 253 merely requires companies to report data on emissions. It does not require companies to say whether they are "responsible" for those emissions or advocate for any (or no) policy response to climate change. This distinguishes SB 253 from the conflict-minerals disclosures, where companies were required to characterize their products as "conflict free" or otherwise. *See NAMF II*, 800 F.3d at 529–30. While the State may take the position that companies are "responsible" for Scope 1, Scope 2, and Scope 3 emissions, (*see* Lyon PI Decl. ¶ 40; SB 253 § 1(g)), companies are not required to agree or even comment on that debate. And SB 253 does not require companies to label themselves or their products as "environmentally sustainable." *NAMF II*, 800 F.3d at 530 (indicating that such compelled disclosure would be impermissible).

That some may look favorably or unfavorably on a company based on its emissions report does not transform an otherwise non-controversial disclosure into a controversial one. Indeed, courts have upheld regulations that were intended to shape consumer behavior. *See Am. Meat Inst. v. U.S. Dep't of Agriculture (AMI)*, 760 F.3d 18, 27 (D.C. Cir. 2014) (requiring country-of-origin labels "to enable consumers to choose American-made products"). If disclosures that provide consumers with information that makes a product undesirable to them qualified a disclosure requirement as controversial, then an untold number of disclosure requirements would be subject to a higher standard of review. *See, e.g.*, *CTIA*, 928 F.3d at 845 ("requiring cell phone retailers to disclose information to prospective cell phone purchasers about the federal government's radio-frequency radiation exposure guidelines relevant to cell phone use"); *Am. Beverage Ass'n v. City & County of San Francisco*, 916 F.3d 749, 753 (9th Cir. 2019) (requiring that certain sugar-sweetened beverages contain a disclosure about potential health risks). Therefore, the Court finds that SB 253 does not mandate disclosure of controversial information.

Accordingly, SB 253's requirement that companies disclose data about Scope 1, Scope 2, and Scope 3 emissions is "factual and uncontroversial," and therefore subject to *Zauderer* review. Conversely, because SB 261 concerns non-factual disclosures, that law is subject to intermediate scrutiny.

E. Application of Scrutiny

Having determined that SB 253 is subject to *Zauderer* review, and SB 261 is subject to intermediate scrutiny, the Court must consider whether the laws survive the applicable review. This is where the implications of Plaintiffs' decision to raise a facial challenge become material. As discussed, to determine whether Plaintiffs' facial challenge against each law succeeds, the Court must evaluate SB 253's and SB 261's applications separately, considering the State's asserted purposes concerning both companies with green-advertising and companies with investors.

First, the Court must analyze whether each law's applications to green-advertising companies survive First Amendment scrutiny, then analyze whether the laws' applications to non-advertising companies survive First Amendment scrutiny, and finally determine whether a substantial majority of those applications likely fail First Amendment scrutiny. *See Moody*, 603 U.S. at 725. Second, the Court must similarly analyze whether the laws' applications to companies with investors survive First Amendment scrutiny, whether the laws' applications to companies without investors survive First Amendment scrutiny, and finally determine whether a substantial majority of those applications likely fail First Amendment scrutiny. *See id.*

1. SB 253

As SB 253 is subject to *Zauderer* review, the required disclosures "compl[y] with the First Amendment if the information in the disclosure is reasonably related to a substantial government interest." *CTIA*, 928 F.3d at 845. The "disclosure requirement cannot be 'unjustified or unduly burdensome.'" *NIFLA*, 585 U.S. at 776 (quoting *Zauderer*, 471 U.S. at 651). The disclosures also must "remedy a harm that is 'potentially real, not purely hypothetical'" and "extend 'no broader than reasonably necessary.'" *Id.* (first quoting *Ibanez v. Fl. Dept. of Bus. & Prof. Regul., Bd. of Accountancy*, 512 U.S. 136, 146 (1994); and then quoting *In re R.M. J.*, 455 U.S. 191, 203 (1982)).

The State offers three interests to support SB 253's compelled disclosure of Scope 1, Scope 2, and Scope 3 emissions.

a. Reliable Information

The State asserts an interest "in reliable information that enables investors and consumers to make informed judgments about the impact of climate-related risks on their economic choices." (Opp'n 17.) This interest implicates both investors and consumers and thus warrants discussing both.

As to consumers, the State asserts that "[s]tudies confirm consumers' interest in this information." (*Id.*) The State offers that "to signal their performance to customers," a "growing number of firms" obtain third-party certifications that show their products are carbon neutral and market their products as carbon neutral. (Lyon PI Decl. ¶ 23–24 (providing examples, including "Lime scooters, Bulldog Skincare, Microsoft Xbox consoles, and Logitech products").) The State also cites studies to support that consumers are willing to pay more for low-carbon products. (*Id.* ¶ 25.) Plaintiffs counter that investors and consumers' mere desire for information does not support a substantial government interest. (Reply 8.)

As the State demonstrates, courts have found that consumers' desire for information can support a substantial government interest. (Opp'n 17 (citing cases).) In *National Electrical Manufacturers Association v. Sorrell*, the Second Circuit held that Vermont had a substantial interest in requiring manufacturers to label certain products as containing mercury that, "on disposal, should be recycled or disposed of as hazardous waste." 272 F.3d 104, 107, 115 (2d Cir. 2001). This is because Vermont had an interest in "increasing consumer awareness of the presence of mercury in a variety of products" "to reduce the amount of mercury released into the environment." *Id.* at 115. The court found it "probable that some" purchasers "will properly dispose of [the products] and thereby reduce mercury pollution." *Id.* Similarly, in *AMI*, the D.C. Circuit found a substantial government interest in requiring county-of-origin disclosures because of "the demonstrated consumer interest in extending country-of-origin labeling to food products." 760 F.3d at 23. And in *American Hospital Association v. Azar*, the D.C. Circuit found the government had a substantial interest in requiring hospitals to make public a list of "standard charges" to "promot[e] price transparency and lower[] healthcare costs. 983 F.3d 528, 530, 540 (D.C. Cir. 2020).

Like in those cases, investors and consumers' purported interest in emissions is not simply for the sake of gaining information, but so that they can "make informed judgments about the impact of climate-related risks on their economic choices."

(Opp'n 17); *see Sorrell*, 272 F.3d at 115 (consumer interest tied to goal of reducing amount of mercury in environment); *AMI*, 760 F.3d at 23 (consumer interest considered in "the context and long history of country-of-original disclosures to enable consumers to choose American-made products" and "the individual health concerns and market impacts that can arise in the event of a food-borne illness outbreak"); *Am. Hosp. Assoc.*, 983 F.3d at 540 (consumer interest in promoting price transparency to lower healthcare costs).

Nevertheless, the State has not met its burden to show that SB 253 is reasonably related to consumers' interest in this information. The State's evidence of consumer interest in company-wide emissions for purposes of determining whether to purchase products or services is based on companies marketing products as green and studies describing consumer behavior in Germany and China. (*See* Lyon PI Decl. ¶¶ 23–26.) Even assuming this shows a consumer interest, the State has not demonstrated that SB 253 is rationally related to this interest. The State's evidence relates to product carbon labels, not a company's total emissions. (*See id.*) SB 253 does not require companies to label products, nor does it provide consumers with information to determine their purchasing impact on the environment. For example, a company may have large total emissions, but smaller emissions on a product-by-product basis.

However, a different conclusion results with respect to the State's interest "in reliable information that enables investors . . . to make informed judgments about the impact of climate-related risks on their economic choices." (Opp'n 17.) The State has provided sufficient evidence that investors have this interest. For example, CalPERS "has long been a proponent" of "Scope 1 and Scope 2 emissions, because it is crucial in making investment[]" decisions. (Cashion Decl. ¶ 13.) "CalPERS also supports requiring disclosure of Scope 3 emissions because it is material in all companies," as "[o]mitting Scope 3 emissions . . . would not allow an investor like CalPERS to assess the total emissions profile" of companies. (*Id.* ¶ 14.) As one of the State's experts explains, "[h]igher carbon emissions expose firms to greater levels of risk, because,

among other things, governments may regulate emissions, impose carbon taxes on emissions, create a system of marketable emissions permits, or take other actions to reduce global warming." (Lyon PI Decl. ¶ 13.) The State's authorities also demonstrate that investors demand a premium from stocks with carbon risks. (*Id.* at 14–15 (citing studies).)

Plaintiffs argue that SB 253 is not appropriately tailored to this "investor" interest because "the laws are not limited to companies seeking investments." (Reply 7.) If the legislation was tailored to providing investors with information about climate-related financial risk, Plaintiffs argue, then California "might have applied the laws only to companies seeking investors or to those engaging in transactions for which consumers need the information the laws require." (*Id.*) The State contends that SB 253 is appropriately tailored because conditioning the law on public company status would be "both underbroad (failing to capture certain economically-significant entities) and overbroad (imposing compliance obligations on entities that are not economically significant)." (Decl. George S. Georgiev ISO Mot. Summ. J. ("Georgiev Decl.") ¶ 39, ECF No. 54 (emphasis omitted).)

SB 253 is not tailored to the State's interest in providing investors with climate-related risk information *to the extent the law compels disclosure from companies that have no California investors*. (*Cf.* Reply 7 (complaining that "the laws are not limited to companies seeking investments").) Therefore, the State's interest in providing investors with reliable information may not support SB 253 surviving a First Amendment challenge to the extent a company has no investors. If Plaintiffs were companies with no California investors and brought an as-applied challenge, then the fact that the law does not apply only to companies with investors may have proved fatal to SB 253. But Plaintiffs "chose to litigate th[is] case[] as [a] facial challenge[], and that decision comes at a cost." *Moody*, 603 U.S. at 723. As explained, "'[I]f the law's unconstitutional applications substantially outweigh its constitutional ones,' then a court may sustain a facial challenge to the law and strike it

down." *X Corp.*, 116 F.4th at 898–99 (alteration in original) (quoting *Moody*, 603 U.S. at 724). This means that the Court must weigh the constitutional applications of SB 253 (as applied to companies with California investors) against the potentially unconstitutional applications (as applied to companies without California investors) and determine whether the unconstitutional applications substantially outweigh its constitutional ones.

As a starting point, over 75% of companies covered by SB 253 are estimated to be public companies. (*See* Ceres Report 11.) The State offers an expert declaration that any private company covered by SB 253 "can be expected to have multiple outside investors (likely both shareholders and bondholders)" because "[t]he competitive business environment in the United States makes it unlikely that entrepreneurs can attain scale without capital outlays that are beyond the self-financing capabilities of the average entrepreneur." (Georgiev Decl. ¶ 47; *see* Cashion Decl. ¶ 16 (declaring that CalPERS has more than $150 billion exposure to private companies).) Additionally, "[e]ven if it were possible to self-finance, it would be imprudent because raising capital from outside investors provides a desirable mechanism for risk-sharing and attracting additional expertise to the enterprise." (Georgiev Decl. ¶ 47.) Given that a large percentage of SB 253's covered companies are public and the likelihood that most, if not all, of the private companies have California investors, the Court concludes, "on this record, that a substantial majority of its applications" are not likely to "fail First Amendment scrutiny." *NetChoice*, 113 F.4th at 1123 (reversing preliminary injunction as to facial attack where district court "focused on possible applications" of provisions to only "a subset of the businesses covered by the" legislation "and speculated about how that subset of applications could" violate the First Amendment).

Accordingly, on this basis, the Court finds that Plaintiffs are unlikely to succeed in their facial challenge to SB 253 and the State's "investor" interest.

b. Emissions Reductions

Separately, the State asserts a second substantial interest in the disclosures: in companies "reduc[ing] their emissions and thereby mitigat[ing] the risks California and its residents face from climate change . . . . because California has committed to meeting certain emissions reduction goals over time and because of the severity of the climate risks the state faces." (Opp'n 17.) Plaintiffs do not contest that this interest is substantial. (Mot. 14–16; Reply); *see CTIA*, 928 F.3d at 844 (holding that *Zauderer* review is not limited to "the prevention of consumer deception," but that "the governmental interest in furthering public health and safety is sufficient under *Zauderer* so long as it is substantial"). Instead, Plaintiffs argue that "[t]he State here has cited *no* evidence . . . that consumers would change their purchasing habits based on a company's emissions or climate-change risks, that any such consumer sentiment would result in material changes in companies' emissions, or . . . that any such changes would have a material impact on climate change." (Mot.15.)

For the reasons discussed, the State has not shown that SB 253's required disclosures would alter consumer behavior such that it would lead to a material decrease in covered companies' emissions. However, companies lower emissions for reasons other than altering consumer behavior. The State cites four studies to support its claim that SB 253's mandatory disclosures may lead to a reduction in emissions.

In one study, the authors found a statistically significant relationship between voluntary disclosure of climate-related information—including disclosure of Scope 1, Scope 2, and Scope 3 emissions—and decrease in corporate CO_2 emissions. (Decl. Thomas Lyon ISO Opp'n Mot. Summ. J. ("Lyon SJ Decl.") Ex. 53 at 1347, 1355–56, ECF Nos. 56, 56-53.) For example, the study found a drop of between 7% and 10% of a company's Scope 1 emissions within three years of disclosure, and a drop in Scope 2 and 3 emissions by year 3 of 4% and 2%, respectively. (*Id.* at 1355–57, tbl. 5, 1373, tbl. OD.9.) While this study only concerns voluntary disclosures, (*id.* at 1348), the State cites three other studies regarding mandatory reporting requirements.

In two studies, authors investigated the effect of disclosures required by the U.S. Greenhouse Gas Reporting Program ("GHGRP") on emissions. (*See* Lyon SJ Decl. Ex. 55 at 1422–24, ECF No. 56-55; Lyon SJ Decl. Ex. 56 at 1466–68, ECF No. 56-56.) The GHGRP requires certain facilities in the United States that emit more than 25,000 tons of CO_2 per year to report emissions, including Scope 1 and Scope 2 emissions, to the Environmental Protection Agency. *See, e.g.*, 40 C.F.R. §§ 98.2, 98.3, 98.6, 98.33 (2009). The studies found that power plants subject to the GHGRP decreased emissions between 7% and 7.9% after reporting. (*See* Lyon SJ Ex. 55 at 1438, 1448; Lyon SJ Ex. 56 at 1482.) In one final study, the authors examined the effects of a United Kingdom requirement that public companies report Scope 1 and Scope 2 emissions. (*See* Lyon SJ Decl. Ex. 54 at 1382, ECF No. 56-54.) The authors found that companies subject to the mandatory disclosures reduced Scope 1 emissions by about 8% compared to companies not subject to the reporting requirement. (*Id.* at 1390, 1399.)

These studies do not support that SB 253's disclosure requirement will definitively lead to a reduction in emissions. But the State need not provide definitive results to survive *Zauderer* review. Even under a more searching review, the Supreme Court has accepted "reference to studies and anecdotes" and justifications "based solely on history, consensus, and simple common sense." *Lorillard Tobacco Co. v. Reilly*, 533 U.S. 525 (2001) (internal quotation marks omitted); *cf. Edenfield v. Fane*, 507 U.S. 761, 771 (1993) (holding that government did not demonstrate that a ban on solicitations advanced government's asserted interests of preventing fraud where it "present[ed] no studies" and did not "disclose any anecdotal evidence" demonstrating such dangers existed). Thus, the State provides sufficient evidence to support a finding that SB 253's disclosure requirements are reasonably related to the State's substantial government interest in reducing emissions and that Plaintiffs have not shown a likelihood that they will succeed on their First Amendment challenge.

c. Misleading Speech

The State raises a third interest: that "California has an interest in protecting its investors, consumers, and other stakeholders from fraud or misrepresentation." (Opp'n 16.) Plaintiffs do not dispute that this is a substantial state interest. (*See* Mot.; Reply); *Zauderer*, 471 U.S. at 638 (explaining that the government may "prevent the dissemination of commercial speech that is false, deceptive, or misleading"). Instead, Plaintiffs challenge whether the disclosures required by SB 253 are reasonably related to this interest and argue that these requirements are unduly burdensome. (Mot. 13–17; Reply 7.)

The State contends that the required disclosures are reasonably related to the interest because they will help correct companies' misleading speech. (Opp'n 16–17.) In support, the States cites to the declaration of one of its experts, Hsu, who presents evidence that "96% of companies with emissions targets exhibit at least one indicator of greenwashing." (Hsu Decl. ¶ 10.) Hsu defines "greenwashing" as a company's emissions reduction pledge or statement that "mislead[s] stakeholders about the environmental integrity of their actions." (*Id.* ¶¶ 7, 10; *see* Lyon PI Decl. ¶ 29 fig. 4 (listing ten indicators of greenwashing).) She identifies seven indicators of greenwashing, including when a company reports no near or short-term emissions targets "that would indicate near-term action" or fails to make meaningful progress toward their stated emissions reduction target. (Hsu Decl. ¶ 11.)[7]

Plaintiffs argue that Hsu's indicators of "greenwashing" do not equate to false or misleading speech. (Opp'n 8.) For example, Plaintiffs argue that whether a company engaged in lobbying activity does not affect whether their emissions targets

[7] The seven indicators are: a company that (1) reports no near or short-term emissions targets "that would indicate near-term action"; (2) excludes Scope 3 emissions from reduction targets; (3) does not provide a publicly available plan detailing the steps the company will take to meet its stated emissions reduction goals; (4) relies on offsets to achieve its pledge without specifying conditions or that fails to disclose whether offsets will be used; (5) pledges "net zero" or "GHG neutrality," but limits its target to only carbon dioxide emissions; (6) actively engages in lobbying activity that undermines climate action; and (7) fails to make meaningful progress toward their stated emissions reduction target. (Hsu Decl. ¶ 11.)

are misleading. (*Id.* at 8–9.) Further, Plaintiffs contend the laws are broader than reasonably necessary because they apply to all companies over the revenue threshold that do business in California, not to those making climate pledges or engaging in misleading speech. (*Id.* at 7.)

Plaintiffs are correct. In its summary judgment order, the Court explained that it "needs a record on whether SBs 253 and 261 regulate a substantial number of companies that do not make potentially misleading environmental claims." (Order Mot. Summ. J. 11.) By way of example, the Court stated that "if ninety-nine percent of the regulated companies have made advertisements relevant to SBs 253's and 261's required disclosures, that may support a finding that SBs 253 and 261 are appropriately tailored to the State's aims under at least rational basis review." (*Id.* at 11–12.) The State has not come close to this mark.

On the record before the Court, it is likely that a substantial majority of covered companies do not make potentially misleading environmental claims. (*See* Ceres Report 11 (estimating SB 253 would apply to 1,971 companies and SB 261 would apply to 2,675 companies).)

The State estimates that "around 82% of North American companies in [its] sample have made green pledges." (Hsu Decl. ¶ 8; *see* Lyon PI Decl. ¶ 20 (citing study that around 73% of companies in a sample had an emissions target).) Beyond that, as Plaintiffs correctly note, the State has failed to show how Hsu's definition of greenwashing equates to misleading speech that it has an interest in correcting. Some of her indicators may represent potentially misleading speech that the State has a substantial interest in correcting. For example, if a company says it will be "net zero," but then does not disclose that this pledge relates only to carbon dioxide emissions, the company's pledge could mislead consumers into thinking the company is doing more than it has said. (*See* Hsu Decl. ¶ 10; Lyon PI Decl. ¶ 30 (providing example of company that discloses it reduced emissions but does not define its measure of emissions).) Or a company that fails to make meaningful progress towards a stated

emissions reduction target and does not retract the target when it knows it will not reach that target may mislead consumers and investors into thinking the company is doing what it said it would do. (*See* Hsu Decl. ¶ 10.) But other of Hsu's indicators have little to do with whether a company's announced emissions target is misleading. Failing to provide a publicly available plan, (*see id.*), is not necessarily misleading, if the company has a private plan to reach its emissions targets. Most concerning is the labelling of speech as misleading if a company engages in lobbying that undermines climate action. (*See* Hsu Decl. ¶ 10; *see also* Lyon PI Decl. ¶ 29 fig. 4 (considering "[b]oasting green commitments while lobbying against environmental laws" as greenwashing).) Ignoring the subjectivity of this measure, Hsu does not show how such activities even correlate to whether a company is meeting its target pledge.

Also, it is unclear how some of the real-world examples the State provides as misleading speech are actually misleading. In arguing that "[v]oluntary disclosures do not prevent the use of misleading language and greenwashing," the State provides an example of a company that "aim[s] to achieve net-zero Scope 1 and 2 greenhouse gas emissions in our operated assets by 2050." (Lyon PI Decl. ¶ 31.) The State characterizes this commitment as misleading because the company "ignores the fact that Scope 3 emissions are far and away the most important climate impact of oil and gas production." (*Id.* ¶ 31.) Perhaps, if the company only committed to net-zero emissions, the speech would be misleading. But it strains credulity to call a claim misleading when the company explicitly identifies the very metric it is using, even if it is not the State's preferred metric.

In sum, based on the record before the Court, SB 253 requires a substantial number of companies that have decided not to speak about climate impact to do so. Even of those companies that have chosen to speak, the State's evidence does not show the prevalence of those companies engaging in misleading speech. Taken together, with respect to the State's interest in correcting misleading information, SBs 253 is overbroad, unduly burdensome, and not reasonably related to this interest.

The State "may reasonably decide to require disclosure for a class of solicitations that it determines pose a risk of deception." *Nationwide Biweekly Admin., Inc. v. Owen*, 873 F.3d 716, 735 (9th Cir. 2017). But SB 253 mandates disclosures from companies outside this "class" of speech. It does not, for example, require only companies that pledge to reduce emissions to define their metrics and report emissions according to those metrics. On this record, the laws extend broader than reasonably necessary to correct potentially misleading speech. *NIFLA*, 585 U.S. at 777 (finding notice requirement fails rational basis review where California required disclosures "wholly disconnected from California's informational interest" by requiring "covered facilities to post California's precise notice, no matter what the facilities say on site or in their advertisements").

As to whether a facial challenge succeeds, if the asserted interest of addressing misleading speech was the State's sole interest supporting SB 253, the Court would conclude "that a substantial majority of its applications are likely to fail First Amendment scrutiny." *NetChoice*, 113 F.4th at 1123. But, as discussed, the State's other proffered other interests support denial of the Motion. Accordingly, based on the above analysis, the Court finds that Plaintiffs do not show a likelihood of success on the merits as to their facial challenge to SB 253 based on the State's dual interests in providing investors with reliable information on which to make investment decisions and in reducing emissions.

2. SB 261

SB 261 is subject to intermediate scrutiny, so "the government may compel a disclosure of commercial speech only if (1) it directly advances a substantial governmental interest, and (2) the restriction is not more extensive than necessary to serve that interest." *Nat'l Ass'n of Wheat Growers*, 85 F.4th at 1282–83. The State asserts the same three interests in SB 261's disclosures as it raises for SB 253's disclosures. (*See* Opp'n 16–19.)

As with SB 253, the State asserts "a compelling interest in reliable information that enables investors and consumers to make informed judgments about the impact of climate-related risks on their economic choices." (Opp'n 17.) Peter Cashion is Managing Investment Director for Sustainable Investments of CalPERS, California's public defined pensions benefit fund with roughly $500 billion in assets. (Cashion Decl. ¶¶ 1, 5.) In a declaration, he expresses the importance of SB 261's disclosure requirements to CalPERS's investments. (*Id.*) Cashion declares that "physical impacts and . . . transition risks have the power to affect our fixed assets, disrupt supply chains and increase volatility in the financial markets." (*Id.* ¶ 11.) He further explains that "consideration of climate-related financial risk and other factors is a necessary component of being an informed and responsible investor." (*Id.* ¶ 12.) Ultimately, SB 261 will enable CalPERS and other investors to "better understand the financial implications" of its investments. (*Id.* ¶ 15; *see* Lyon PI Decl. ¶ 9 (describing types of investors who benefit from disclosure of climate-related financial risks).)

Plaintiffs make the same argument to challenge SB 261 on this interest as they do with SB 253—that the law is not tailored to this interest because "the laws are not limited to companies seeking investments." (Reply 7.) While the State's burden under intermediate review is higher than the rational basis review applied to SB 253, the reasons for denying Plaintiffs' Motion to enjoin SB 253 equally apply to their challenge to SB 263. Ultimately, under intermediate review, "[t]he fit" between the legislature's ends and its means "need not be perfect nor the single best to achieve those ends, but one whose scope is narrowly tailored to achieve the legislative objective." *Am. Acad. of Pain Mgmt. v. Joseph*, 353 F.3d 1099, 1111 (9th Cir. 2004). At this stage, the State has made a sufficient showing as to the benefits of investors' desire for the specific disclosures required by SB 261 to achieve the legislature's objective in reliable information that enables investors to make informed judgments about the impact of climate-related risks on their economic choices. Therefore, as with SB 253, Court concludes that SB 261's potentially unconstitutional applications

(as applied to companies without California investors) do not "substantially outweigh" the constitutional applications (as applied to companies with California investors). *X Corp.*, 116 F.4th at 898; (*see* Ceres Report 11 (estimating 73% of covered companies are public).) Accordingly, Plaintiffs have not shown a likelihood of success on the merits as to their facial challenge to enjoin SB 261.

For completeness, the Court addresses the State's remaining articulated interests and finds that Plaintiffs have shown a likelihood of success of the merits that State's two other asserted interests do not survive First Amendment scrutiny. First, as discussed with respect to SB 253, Plaintiffs are likely to succeed in showing that SB 261's required disclosures do not directly advance the State's stated interest "in protecting its investors, consumers, and other stakeholders from fraud or misrepresentation." (Opp'n 16.)

Second, unlike with SB 253, the State's interest in reducing emissions does not support SB 261 surviving First Amendment review. As with SB 253, Plaintiffs do not dispute that this a substantial state interest but argue that the State has offered "no evidence" that SB 261 will result in fewer emissions. (Mot. 14–15 (emphasis omitted).) In response, the State contends it has "presented evidence demonstrating that disclosures of this type lead to a reduction in emissions of 7 to 10%." (Opp'n 18 (citing Lyon SJ Decl. ¶ 50).) The State cites the same four studies previously discussed for this proposition; however, none of them have studied whether the disclosures required by SB 261—climate-related risks—lead to a reduction in emissions. In three studies, the authors only considered the effect of reporting of greenhouse gas emissions, not climate-related risks, on future emissions. (*See* Lyon SJ Decl. Ex. 54 at 1382; Lyon SJ Decl. Ex. 55 at 1422–24; Lyon SJ Decl. Ex. 56 at 1466–68.) Without considering the effect of climate-related disclosures like those required by SB 261, these studies cannot show that SB 261's disclosures would reduce emissions. The final study—while considering some climate risk disclosures—only concerned voluntary disclosure, and the State provided no evidence to suggest that the

studied disclosures are like the ones required by SB 261. Therefore, Plaintiffs show a likelihood that the State's interest in reducing emissions does not support SB 261 surviving First Amendment review.

However, as discussed, Plaintiffs do not show a likelihood that the State's interest in providing reliable information to investors fails intermediate scrutiny in a substantial majority of SB 261's applications. Accordingly, the Court find that Plaintiffs have not shown a likelihood that SB 261's compelled disclosures violate the First Amendment.[8]

In sum, the Court concludes that Plaintiffs have not shown a likelihood of success on the merits with respect to either of its facial First Amendment challenges to SBs 253 and 261.

F. The Remaining *Winter* Factors

Plaintiffs argue they will be irreparably harmed by SBs 253 and 261 because the laws compel speech in violation of the First Amendment. (Mot. 18–20; Reply 9–10.) As Plaintiffs have not demonstrated that the laws violate the First Amendment, they have also not shown irreparable harm. *See CTIA*, 928 F.3d at 851 (concluding challengers did not show irreparable harm where the court concluded that the city's "ordinance complies with the First Amendment").

Moreover, the balance of equities favors denial of Plaintiffs' Motion. *See id.* at 852 (finding challengers failed to demonstrate any hardship tipping the balance in their favor where their "First Amendment claim is unlikely to succeed"). This is especially true because enjoining SBs 253 and 261 would delay the State from advancing the public interests for which it adopted the laws. *See id.* (finding "that an

[8] Plaintiffs also argue that SB 261 violates the First Amendment because "the definition of 'climate-related financial risk' is so broad and vague that California could almost certainly find fault in the disclosure (or lack of disclosure) of *any* company the State disfavors." (Mot. 16.) In defining "climate-related financial risk," SB 261 references a reporting framework that provides sufficiently clear guidance to covered entities how to comply with the law. *See* Cal. Health & Safety Code § 38533(b)(1)(A)(i); (*see* Lyon SJ Decl. ¶ 14 (reporting that a large number of companies make disclosures using the TCFD Framework).)

injunction would injure the public interest in having a free flow of accurate information").

V. CONCLUSION

For the reasons discussed above, the Court **DENIES** Plaintiffs' Motion for Preliminary Injunction. (ECF No. 78.)

IT IS SO ORDERED.

August 13, 2025

OTIS D. WRIGHT, II
UNITED STATES DISTRICT JUDGE

Exhibit 20

June 2017 Recommendations of the Task Force on Climate-Related Financial Disclosures

Declaration of Bradley J. Hamburger In Support Of
Plaintiffs' Motion for Summary Judgment on Claim I
May 24, 2024

Chamber of Commerce of the United States of America, et al. v. Randolph, et al.,
Case No. 2:24-cv-00801-ODW-PVC (C.D. Cal.)

Final Report

Recommendations of the Task Force on Climate-related Financial Disclosures

TCFD | TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

June 2017

June 15, 2017

Mr. Mark Carney
Chairman
Financial Stability Board
Bank for International Settlements
Centralbahnplatz 2
CH-4002 Basel
Switzerland

Dear Chairman Carney,

On behalf of the Task Force on Climate-related Financial Disclosures, I am pleased to present this final report setting out our recommendations for helping businesses disclose climate-related financial information.

As you know, warming of the planet caused by greenhouse gas emissions poses serious risks to the global economy and will have an impact across many economic sectors. It is difficult for investors to know which companies are most at risk from climate change, which are best prepared, and which are taking action.

The Task Force's report establishes recommendations for disclosing clear, comparable and consistent information about the risks and opportunities presented by climate change. Their widespread adoption will ensure that the effects of climate change become routinely considered in business and investment decisions. Adoption of these recommendations will also help companies better demonstrate responsibility and foresight in their consideration of climate issues. That will lead to smarter, more efficient allocation of capital, and help smooth the transition to a more sustainable, low-carbon economy.

The industry Task Force spent 18 months consulting with a wide range of business and financial leaders to hone its recommendations and consider how to help companies better communicate key climate-related information. The feedback we received in response to the Task Force's draft report confirmed broad support from industry and others, and involved productive dialogue among companies and banks, insurers, and investors. This was and remains a collaborative process, and as these recommendations are implemented, we hope that this dialogue and feedback continues.

Since the Task Force began its work, we have also seen a significant increase in demand from investors for improved climate-related financial disclosures. This comes amid unprecedented support among companies for action to tackle climate change.

I want to thank the Financial Stability Board for its leadership in promoting better disclosure of climate-related financial risks, and for its support of the Task Force's work. I am also grateful to the Task Force members and Secretariat for their extensive contributions and dedication to this effort.

The risk climate change poses to businesses and financial markets is real and already present. It is more important than ever that businesses lead in understanding and responding to these risks—and seizing the opportunities—to build a stronger, more resilient, and sustainable global economy.

Sincerely,



Michael R. Bloomberg

Executive Summary

Financial Markets and Transparency

One of the essential functions of financial markets is to price risk to support informed, efficient capital-allocation decisions. Accurate and timely disclosure of current and past operating and financial results is fundamental to this function, but it is increasingly important to understand the governance and risk management context in which financial results are achieved. The financial crisis of 2007-2008 was an important reminder of the repercussions that weak corporate governance and risk management practices can have on asset values. This has resulted in increased demand for transparency from organizations on their governance structures, strategies, and risk management practices. Without the right information, investors and others may incorrectly price or value assets, leading to a misallocation of capital.

> Increasing transparency makes markets more efficient and economies more stable and resilient.
> —Michael R. Bloomberg

Financial Implications of Climate Change

One of the most significant, and perhaps most misunderstood, risks that organizations face today relates to climate change. While it is widely recognized that continued emission of greenhouse gases will cause further warming of the planet and this warming could lead to damaging economic and social consequences, the exact timing and severity of physical effects are difficult to estimate. The large-scale and long-term nature of the problem makes it uniquely challenging, especially in the context of economic decision making. Accordingly, many organizations incorrectly perceive the implications of climate change to be long term and, therefore, not necessarily relevant to decisions made today.

The potential impacts of climate change on organizations, however, are not only physical and do not manifest only in the long term. To stem the disastrous effects of climate change within this century, nearly 200 countries agreed in December 2015 to reduce greenhouse gas emissions and accelerate the transition to a lower-carbon economy. The reduction in greenhouse gas emissions implies movement away from fossil fuel energy and related physical assets. This coupled with rapidly declining costs and increased deployment of clean and energy-efficient technologies could have significant, near-term financial implications for organizations dependent on extracting, producing, and using coal, oil, and natural gas. While such organizations may face significant climate-related risks, they are not alone. In fact, climate-related risks and the expected transition to a lower-carbon economy affect most economic sectors and industries. While changes associated with a transition to a lower-carbon economy present significant risk, they also create significant opportunities for organizations focused on climate change mitigation and adaptation solutions.

For many investors, climate change poses significant financial challenges and opportunities, now and in the future. The expected transition to a lower-carbon economy is estimated to require around $1 trillion of investments a year for the foreseeable future, generating new investment opportunities.[1] At the same time, the risk-return profile of organizations exposed to climate-related risks may change significantly as such organizations may be more affected by physical impacts of climate change, climate policy, and new technologies. In fact, a 2015 study estimated the value at risk, as a result of climate change, to the total global stock of manageable assets as

[1] International Energy Agency, *World Energy Outlook Special Briefing for COP21*, 2015.

ranging from $4.2 trillion to $43 trillion between now and the end of the century.[2] The study highlights that "much of the impact on future assets will come through weaker growth and lower asset returns across the board." This suggests investors may not be able to avoid climate-related risks by moving out of certain asset classes as a wide range of asset types could be affected. Both investors and the organizations in which they invest, therefore, should consider their longer-term strategies and most efficient allocation of capital. Organizations that invest in activities that may not be viable in the longer term may be less resilient to the transition to a lower-carbon economy; and their investors will likely experience lower returns. Compounding the effect on longer-term returns is the risk that present valuations do not adequately factor in climate-related risks because of insufficient information. As such, long-term investors need adequate information on how organizations are preparing for a lower-carbon economy.

Furthermore, because the transition to a lower-carbon economy requires significant and, in some cases, disruptive changes across economic sectors and industries in the near term, financial policymakers are interested in the implications for the global financial system, especially in terms of avoiding financial dislocations and sudden losses in asset values. Given such concerns and the potential impact on financial intermediaries and investors, the G20 Finance Ministers and Central Bank Governors asked the Financial Stability Board to review how the financial sector can take account of climate-related issues. As part of its review, the Financial Stability Board identified the need for better information to support informed investment, lending, and insurance underwriting decisions and improve understanding and analysis of climate-related risks and opportunities. Better information will also help investors engage with companies on the resilience of their strategies and capital spending, which should help promote a smooth rather than an abrupt transition to a lower-carbon economy.

Task Force on Climate-related Financial Disclosures

To help identify the information needed by investors, lenders, and insurance underwriters to appropriately assess and price climate-related risks and opportunities, the Financial Stability Board established an industry-led task force: the Task Force on Climate-related Financial Disclosures (Task Force). The Task Force was asked to develop voluntary, consistent climate-related financial disclosures that would be useful to investors, lenders, and insurance underwriters in understanding material risks. The 32-member Task Force is global; its members were selected by the Financial Stability Board and come from various organizations, including large banks, insurance companies, asset managers, pension funds, large non-financial companies, accounting and consulting firms, and credit rating agencies. In its work, the Task Force drew on member expertise, stakeholder engagement, and existing climate-related disclosure regimes to develop a singular, accessible framework for climate-related financial disclosure.

The Task Force developed four widely adoptable recommendations on climate-related financial disclosures that are applicable to organizations across sectors and jurisdictions (Figure 1). Importantly, the Task Force's recommendations apply to financial-sector organizations, including banks, insurance companies, asset managers, and asset owners. Large asset owners and asset managers sit at the top of the investment chain and, therefore, have an

Figure 1

Key Features of Recommendations

- Adoptable by all organizations
- Included in financial filings
- Designed to solicit decision-useful, forward-looking information on financial impacts
- Strong focus on risks and opportunities related to transition to lower-carbon economy

[2] The Economist Intelligence Unit, "The Cost of Inaction: Recognising the Value at Risk from Climate Change," 2015. Value at risk measures the loss a portfolio may experience, within a given time horizon, at a particular probability, and the stock of manageable assets is defined as the total stock of assets held by non-bank financial institutions. Bank assets were excluded as they are largely managed by banks themselves.

important role to play in influencing the organizations in which they invest to provide better climate-related financial disclosures.

In developing and finalizing its recommendations, the Task Force solicited input throughout the process.[3] First, in April 2016, the Task Force sought public comment on the scope and high-level objectives of its work. As the Task Force developed its disclosure recommendations, it continued to solicit feedback through hundreds of industry interviews, meetings, and other touchpoints. Then, in December 2016, the Task Force issued its draft recommendations and sought public comment on the recommendations as well as certain key issues, receiving over 300 responses. This final report reflects the Task Force's consideration of industry and other public feedback received throughout 2016 and 2017. Section E contains a summary of key issues raised by the industry as well as substantive changes to the report since December.

Disclosure in Mainstream Financial Filings

The Task Force recommends that preparers of climate-related financial disclosures provide such disclosures in their mainstream (i.e., public) annual financial filings. In most G20 jurisdictions, companies with public debt or equity have a legal obligation to disclose material information in their financial filings—including material climate-related information. The Task Force believes climate-related issues are or could be material for many organizations, and its recommendations should be useful to organizations in complying more effectively with existing disclosure obligations.[4] In addition, disclosure in mainstream financial filings should foster shareholder engagement and broader use of climate-related financial disclosures, thus promoting a more informed understanding of climate-related risks and opportunities by investors and others. The Task Force also believes that publication of climate-related financial information in mainstream annual financial filings will help ensure that appropriate controls govern the production and disclosure of the required information. More specifically, the Task Force expects the governance processes for these disclosures would be similar to those used for existing public financial disclosures and would likely involve review by the chief financial officer and audit committee, as appropriate.

Importantly, organizations should make financial disclosures in accordance with their national disclosure requirements. If certain elements of the recommendations are incompatible with national disclosure requirements for financial filings, the Task Force encourages organizations to disclose those elements in other official company reports that are issued at least annually, widely distributed and available to investors and others, and subject to internal governance processes that are the same or substantially similar to those used for financial reporting.

Core Elements of Climate-Related Financial Disclosures

The Task Force structured its recommendations around four thematic areas that represent core elements of how organizations operate: governance, strategy, risk management, and metrics and targets (Figure 2, p. v). The four overarching recommendations are supported by recommended disclosures that build out the framework with information that will help investors and others understand how reporting organizations assess climate-related risks and opportunities.[5] In addition, there is guidance to support all organizations in developing climate-related financial disclosures consistent with the recommendations and recommended disclosures. The guidance assists preparers by providing context and suggestions for implementing the recommended disclosures. For the financial sector and certain non-financial sectors, *supplemental* guidance was developed to highlight important sector-specific considerations and provide a fuller picture of potential climate-related financial impacts in those sectors.

[3] See Appendix 2: Task Force Objectives and Approach for more information.

[4] The Task Force encourages organizations where climate-related issues could be material in the future to begin disclosing climate-related financial information outside financial filings to facilitate the incorporation of such information into financial filings once climate-related issues are determined to be material.

[5] See Figure 4 on p. 14 for the Task Force's recommendations and recommended disclosures.

Figure 2

Core Elements of Recommended Climate-Related Financial Disclosures



Governance
The organization's governance around climate-related risks and opportunities

Strategy
The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Risk Management
The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

Climate-Related Scenarios

One of the Task Force's key recommended disclosures focuses on the resilience of an organization's strategy, taking into consideration different climate-related scenarios, including a 2° Celsius or lower scenario.[6] An organization's disclosure of how its strategies might change to address potential climate-related risks and opportunities is a key step to better understanding the potential implications of climate change on the organization. The Task Force recognizes the use of scenarios in assessing climate-related issues and their potential financial implications is relatively recent and practices will evolve over time, but believes such analysis is important for improving the disclosure of decision-useful, climate-related financial information.

Conclusion

Recognizing that climate-related financial reporting is still evolving, the Task Force's recommendations provide a foundation to improve investors' and others' ability to appropriately assess and price climate-related risk and opportunities. The Task Force's recommendations aim to be ambitious, but also practical for near-term adoption. The Task Force expects to advance the quality of mainstream financial disclosures related to the potential effects of climate change on organizations today and in the future and to increase investor engagement with boards and senior management on climate-related issues.

Improving the quality of climate-related financial disclosures begins with organizations' willingness to adopt the Task Force's recommendations. Organizations already reporting climate-related information under other frameworks may be able to disclose under this framework immediately and are strongly encouraged to do so. Those organizations in early stages of evaluating the impact of climate change on their businesses and strategies can begin by disclosing climate-related issues as they relate to governance, strategy, and risk management practices. The Task Force recognizes the challenges associated with measuring the impact of climate change, but believes that by moving climate-related issues into mainstream annual financial filings, practices and techniques will evolve more rapidly. Improved practices and techniques, including data analytics, should further improve the quality of climate-related financial disclosures and, ultimately, support more appropriate pricing of risks and allocation of capital in the global economy.

[6] A 2° Celsius (2°C) scenario lays out an energy system deployment pathway and an emissions trajectory consistent with limiting the global average temperature increase to 2°C above the pre-industrial average. The Task Force is not recommending organizations use a specific 2°C scenario.

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A Introduction

A Introduction

1. Background

It is widely recognized that continued emission of greenhouse gases will cause further warming of the Earth and that warming above 2° Celsius (2°C), relative to the pre-industrial period, could lead to catastrophic economic and social consequences.[7] As evidence of the growing recognition of the risks posed by climate change, in December 2015, nearly 200 governments agreed to strengthen the global response to the threat of climate change by "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels," referred to as the Paris Agreement.[8] The large-scale and long-term nature of the problem makes it uniquely challenging, especially in the context of economic decision making. Moreover, the current understanding of the potential financial risks posed by climate change—to companies, investors, and the financial system as a whole—is still at an early stage.

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There is a growing demand for decision-useful, climate-related information by a range of participants in the financial markets.[9] Creditors and investors are increasingly demanding access to risk information that is consistent, comparable, reliable, and clear. There has also been increased focus, especially since the financial crisis of 2007-2008, on the negative impact that weak corporate governance can have on shareholder value, resulting in increased demand for transparency from organizations on their risks and risk management practices, including those related to climate change.

The growing demand for decision-useful, climate-related information has resulted in the development of several climate-related disclosure standards. Many of the existing standards, however, focus on disclosure of climate-related information, such as greenhouse gas (GHG) emissions and other sustainability metrics. Users of such climate-related disclosures commonly cite the lack of information on the financial implications around the climate-related aspects of an organization's business as a key gap. Users also cite inconsistencies in disclosure practices, a lack of context for information, use of boilerplate, and non-comparable reporting as major obstacles to incorporating climate-related risks and opportunities (collectively referred to as climate-related issues) as considerations in their investment, lending, and insurance underwriting decisions over the medium and long term.[10] In addition, evidence suggests that the lack of consistent information hinders investors and others from considering climate-related issues in their asset valuation and allocation processes.[11]

In general, inadequate information about risks can lead to a mispricing of assets and misallocation of capital and can potentially give rise to concerns about financial stability since markets can be vulnerable to abrupt corrections.[12] Recognizing these concerns, the G20 (Group of 20) Finance Ministers and Central Bank Governors requested that the Financial Stability Board (FSB) "convene public- and private-sector participants to review how the financial sector can take account of climate-related issues."[13] In response to the G20's request, the FSB held a meeting of public- and private-sector representatives in September 2015 to consider the implications of climate-related issues for the financial sector. "Participants exchanged views on the existing work of the financial sector, authorities, and standard setters in this area and the challenges they face,

[7] Intergovernmental Panel on Climate Change, *Fifth Assessment Report,* Cambridge University Press, 2014.
[8] United Nations Framework Convention on Climate Change, "The Paris Agreement," December 2015.
[9] Avery Fellow, "Investors Demand Climate Risk Disclosure," Bloomberg, February 2013.
[10] Sustainability Accounting Standards Board (SASB), *SASB Climate Risk Technical Bulletin#: TB001-10182016*, October 2016.
[11] Mercer LLC, *Investing in a Time of Climate Change,* 2015.
[12] Mark Carney, "Breaking the tragedy of the horizon—climate change and financial stability," September 29, 2015.
[13] "Communiqué from the G20 Finance Ministers and Central Bank Governors Meeting in Washington, D.C. April 16-17, 2015," April 2015.

areas for possible further work, and the possible roles the FSB and others could play in taking that work forward. The discussions continually returned to a common theme: the need for better information."[14]

In most G20 jurisdictions, companies with public debt or equity have a legal obligation to disclose material risks in their financial reports—including material climate-related risks. However, the absence of a standardized framework for disclosing climate-related financial risks makes it difficult for organizations to determine what information should be included in their filings and how it should be presented. Even when reporting similar climate-related information, disclosures are often difficult to compare due to variances in mandatory and voluntary frameworks. The resulting fragmentation in reporting practices and lack of focus on financial impacts have prevented investors, lenders, insurance underwriters, and other users of disclosures from accessing complete information that can inform their economic decisions. Furthermore, because financial-sector organizations' disclosures depend, in part, on those from the companies in which they invest or lend, regulators face challenges in using financial-sector organizations' existing disclosures to determine system-wide exposures to climate-related risks.

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In response, the FSB established the industry-led Task Force on Climate-related Financial Disclosures (TCFD or Task Force) in December 2015 to design a set of recommendations for consistent "disclosures that will help financial market participants understand their climate-related risks."[15] See Box 1 (p. 3) for more information on the Task Force.

2. The Task Force's Remit

The FSB called on the Task Force to develop climate-related disclosures that "could promote more informed investment, credit [or lending], and insurance underwriting decisions" and, in turn, "would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks."[16,17] The FSB noted that disclosures by the financial sector in particular would "foster an early assessment of these risks" and "facilitate market discipline." Such disclosures would also "provide a source of data that can be analyzed at a systemic level, to facilitate authorities' assessments of the materiality of any risks posed by climate change to the financial sector, and the channels through which this is most likely to be transmitted."[18]

The FSB also emphasized that "any disclosure recommendations by the Task Force would be voluntary, would need to incorporate the principle of materiality and would need to weigh the balance of costs and benefits."[19] As a result, in devising a principle-based framework for voluntary disclosure, the Task Force sought to balance the needs of the users of disclosures with the challenges faced by the preparers. The FSB further stated that the Task Force's climate-related financial disclosure recommendations should not "add to the already well developed body of existing disclosure schemes."[20] In response, the Task Force drew from existing disclosure frameworks where possible and appropriate.

The FSB also noted the Task Force should determine whether the target audience of users of climate-related financial disclosures should extend beyond investors, lenders, and insurance underwriters. Investors, lenders, and insurance underwriters ("primary users") are the appropriate target audience. These primary users assume the financial risk and reward of the

[14] FSB, "FSB to establish Task Force on Climate-related Financial Disclosures," December 4, 2015.
[15] Ibid.
[16] FSB, "Proposal for a Disclosure Task Force on Climate-Related Risks," November 9, 2015.
[17] The term carbon-related assets is not well defined, but is generally considered to refer to assets or organizations with relatively high direct or indirect GHG emissions. The Task Force believes further work is needed on defining carbon-related assets and potential financial impacts.
[18] FSB, "Proposal for a Disclosure Task Force on Climate-Related Risks," November 9, 2015.
[19] Ibid.
[20] Ibid.

decisions they make. The Task Force recognizes that many other organizations, including credit rating agencies, equity analysts, stock exchanges, investment consultants, and proxy advisors also use climate-related financial disclosures, allowing them to push information through the credit and investment chain and contribute to the better pricing of risks by investors, lenders, and insurance underwriters. These organizations, in principle, depend on the same types of information as primary users.

This report presents the Task Force's recommendations for climate-related financial disclosures and includes supporting information on climate-related risks and opportunities, scenario analysis, and industry feedback that the Task Force considered in developing and then finalizing its recommendations. In addition, the Task Force developed a "stand-alone" document—Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures (Annex)—for organizations to use when preparing disclosures consistent with the recommendations. The Annex provides supplemental guidance for the financial sector as well as for non-financial groups potentially most affected by climate change and the transition to a lower-carbon economy. The supplemental guidance assists preparers by providing additional context and suggestions for implementing the recommended disclosures.

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The Task Force's recommendations provide a foundation for climate-related financial disclosures and aim to be ambitious, but also practical for near-term adoption. The Task Force expects that reporting of climate-related risks and opportunities will evolve over time as organizations, investors, and others contribute to the quality and consistency of the information disclosed.

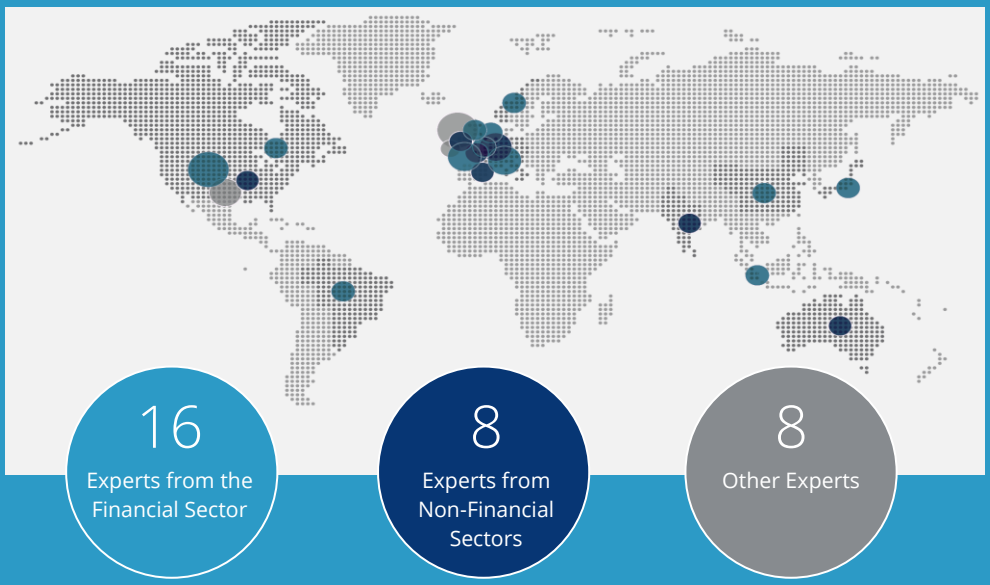
Box 1

Task Force on Climate-related Financial Disclosures

The Task Force membership, first announced on January 21, 2016, has international representation and spans various types of organizations, including banks, insurance companies, asset managers, pension funds, large non-financial companies, accounting and consulting firms, and credit rating agencies—a unique collaborative partnership between the users and preparers of financial reports.

In its work, the Task Force drew on its members' expertise, stakeholder engagement, and existing climate-related disclosure regimes to develop a singular, accessible framework for climate-related financial disclosure. See Appendix 1 for a list of the Task Force members and Appendix 2 for more information on the Task Force's approach.

The Task Force is comprised of 32 global members representing a broad range of economic sectors and financial markets and a careful balance of users and preparers of climate-related financial disclosures.



B Climate-Related Risks, Opportunities, and Financial Impacts

B Climate-Related Risks, Opportunities, and Financial Impacts

Through its work, the Task Force identified a growing demand by investors, lenders, insurance underwriters, and other stakeholders for decision-useful, climate-related financial information. Improved disclosure of climate-related risks and opportunities will provide investors, lenders, insurance underwriters, and other stakeholders with the metrics and information needed to undertake robust and consistent analyses of the potential financial impacts of climate change.

The Task Force found that while several climate-related disclosure frameworks have emerged across different jurisdictions in an effort to meet the growing demand for such information, there is a need for a standardized framework to promote alignment across existing regimes and G20 jurisdictions and to provide a common framework for climate-related financial disclosures. An important element of such a framework is the consistent categorization of climate-related risks and opportunities. As a result, the Task Force defined categories for climate-related risks and climate-related opportunities. The Task Force's recommendations serve to encourage organizations to evaluate and disclose, as part of their annual financial filing preparation and reporting processes, the climate-related risks and opportunities that are most pertinent to their business activities. The main climate-related risks and opportunities that organizations should consider are described below and in Tables 1 and 2 (pp. 10-11).

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1. Climate-Related Risks

The Task Force divided climate-related risks into two major categories: (1) risks related to the *transition* to a lower-carbon economy and (2) risks related to the *physical* impacts of climate change.

a. Transition Risks

Transitioning to a lower-carbon economy may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to organizations.

Policy and Legal Risks

Policy actions around climate change continue to evolve. Their objectives generally fall into two categories—policy actions that attempt to constrain actions that contribute to the adverse effects of climate change or policy actions that seek to promote adaptation to climate change. Some examples include implementing carbon-pricing mechanisms to reduce GHG emissions, shifting energy use toward lower emission sources, adopting energy-efficiency solutions, encouraging greater water efficiency measures, and promoting more sustainable land-use practices. The risk associated with and financial impact of policy changes depend on the nature and timing of the policy change.[21]

Another important risk is litigation or legal risk. Recent years have seen an increase in climate-related litigation claims being brought before the courts by property owners, municipalities, states, insurers, shareholders, and public interest organizations.[22] Reasons for such litigation include the failure of organizations to mitigate impacts of climate change, failure to adapt to climate change, and the insufficiency of disclosure around material financial risks. As the value of loss and damage arising from climate change grows, litigation risk is also likely to increase.

[21] Organizations should assess not only the potential direct effects of policy actions on their operations, but also the potential second and third order effects on their supply and distribution chains.

[22] Peter Seley, "Emerging Trends in Climate Change Litigation," *Law 360,* March 7, 2016.

Technology Risk

Technological improvements or innovations that support the transition to a lower-carbon, energy-efficient economic system can have a significant impact on organizations. For example, the development and use of emerging technologies such as renewable energy, battery storage, energy efficiency, and carbon capture and storage will affect the competitiveness of certain organizations, their production and distribution costs, and ultimately the demand for their products and services from end users. To the extent that new technology displaces old systems and disrupts some parts of the existing economic system, winners and losers will emerge from this "creative destruction" process. The timing of technology development and deployment, however, is a key uncertainty in assessing technology risk.

Market Risk

While the ways in which markets could be affected by climate change are varied and complex, one of the major ways is through shifts in supply and demand for certain commodities, products, and services as climate-related risks and opportunities are increasingly taken into account.

Reputation Risk

Climate change has been identified as a potential source of reputational risk tied to changing customer or community perceptions of an organization's contribution to or detraction from the transition to a lower-carbon economy.

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b. Physical Risks

Physical risks resulting from climate change can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for organizations, such as direct damage to assets and indirect impacts from supply chain disruption. Organizations' financial performance may also be affected by changes in water availability, sourcing, and quality; food security; and extreme temperature changes affecting organizations' premises, operations, supply chain, transport needs, and employee safety.

Acute Risk

Acute physical risks refer to those that are event-driven, including increased severity of extreme weather events, such as cyclones, hurricanes, or floods.

Chronic Risk

Chronic physical risks refer to longer-term shifts in climate patterns (e.g., sustained higher temperatures) that may cause sea level rise or chronic heat waves.

2. Climate-Related Opportunities

Efforts to mitigate and adapt to climate change also produce opportunities for organizations, for example, through resource efficiency and cost savings, the adoption of low-emission energy sources, the development of new products and services, access to new markets, and building resilience along the supply chain. Climate-related opportunities will vary depending on the region, market, and industry in which an organization operates. The Task Force identified several areas of opportunity as described below.

a. Resource Efficiency

There is growing evidence and examples of organizations that have successfully reduced operating costs by improving efficiency across their production and distribution processes, buildings, machinery/appliances, and transport/mobility—in particular in relation to energy efficiency but also including broader materials, water, and waste management.[23] Such actions can

[23] UNEP and Copenhagen Centre for Energy Efficiency, *Best Practices and Case Studies for Industrial Energy Efficiency Improvement*, February 16, 2016.

result in direct cost savings to organizations' operations over the medium to long term and contribute to the global efforts to curb emissions.[24] Innovation in technology is assisting this transition; such innovation includes developing efficient heating solutions and circular economy solutions, making advances in LED lighting technology and industrial motor technology, retrofitting buildings, employing geothermal power, offering water usage and treatment solutions, and developing electric vehicles.[25]

b. Energy Source

According to the International Energy Agency (IEA), to meet global emission-reduction goals, countries will need to transition a major percentage of their energy generation to low emission alternatives such as wind, solar, wave, tidal, hydro, geothermal, nuclear, biofuels, and carbon capture and storage.[26] For the fifth year in a row, investments in renewable energy capacity have exceeded investments in fossil fuel generation.[27] The trend toward decentralized clean energy sources, rapidly declining costs, improved storage capabilities, and subsequent global adoption of these technologies are significant. Organizations that shift their energy usage toward low emission energy sources could potentially save on annual energy costs.[28]

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c. Products and Services

Organizations that innovate and develop new low-emission products and services may improve their competitive position and capitalize on shifting consumer and producer preferences. Some examples include consumer goods and services that place greater emphasis on a product's carbon footprint in its marketing and labeling (e.g., travel, food, beverage and consumer staples, mobility, printing, fashion, and recycling services) and producer goods that place emphasis on reducing emissions (e.g., adoption of energy-efficiency measures along the supply chain).

d. Markets

Organizations that pro-actively seek opportunities in new markets or types of assets may be able to diversify their activities and better position themselves for the transition to a lower-carbon economy. In particular, opportunities exist for organizations to access new markets through collaborating with governments, development banks, small-scale local entrepreneurs, and community groups in developed and developing countries as they work to shift to a lower-carbon economy.[29] New opportunities can also be captured through underwriting or financing green bonds and infrastructure (e.g., low-emission energy production, energy efficiency, grid connectivity, or transport networks).

e. Resilience

The concept of climate resilience involves organizations developing adaptive capacity to respond to climate change to better manage the associated risks and seize opportunities, including the ability to respond to transition risks and physical risks. Opportunities include improving efficiency, designing new production processes, and developing new products. Opportunities related to resilience may be especially relevant for organizations with long-lived fixed assets or extensive supply or distribution networks; those that depend critically on utility and infrastructure networks or natural resources in their value chain; and those that may require longer-term financing and investment.

[24] Environmental Protection Agency Victoria (EPA Victoria), "Resource Efficiency Case Studies: Lower your Impact."

[25] As described by Pearce and Turner, circular economy refers to a system in which resource input and waste, emission, and energy leakage are minimized. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling. This is in contrast to a linear economy which is a "take, make, dispose" model of production.

[26] IEA, "Global energy investment down 8% in 2015 with flows signaling move towards cleaner energy," September 14, 2016.

[27] Frankfurt School-United Nations Environmental Programme Centre and Bloomberg New Energy Finance, "Global Trends in Renewable Energy Investment 2017," 2017.

[28] Ceres, "Power Forward 3.0: How the largest US companies are capturing business value while addressing climate change," 2017.

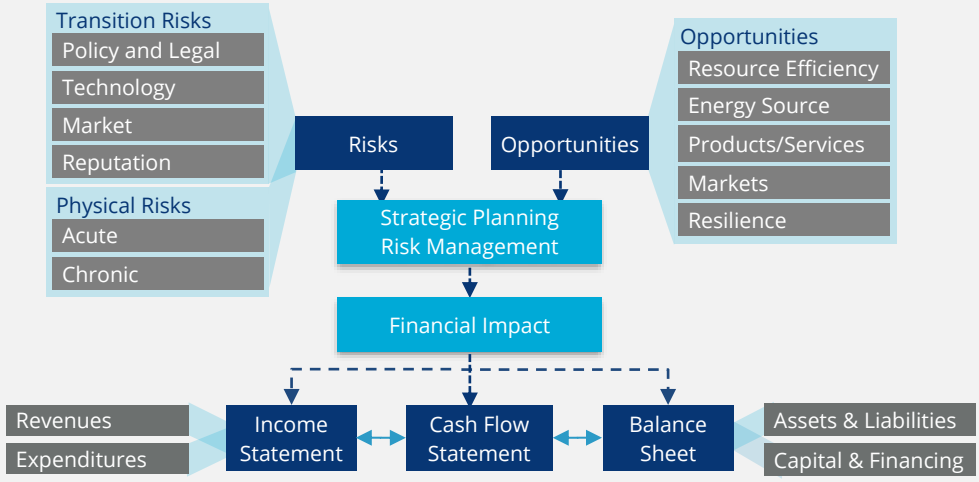
[29] G20 Green Finance Study Group. *G20 Green Finance Synthesis Report*. 2016. The proposal to launch the Green Finance Study Group was adopted by the G20 Finance Ministers and Central Bank Deputies in December 2015.

3. Financial Impacts

Better disclosure of the financial impacts of climate-related risks and opportunities on an organization is a key goal of the Task Force's work. In order to make more informed financial decisions, investors, lenders, and insurance underwriters need to understand how climate-related risks and opportunities are likely to impact an organization's future financial position as reflected in its income statement, cash flow statement, and balance sheet as outlined in Figure 1. While climate change affects nearly all economic sectors, the level and type of exposure and the impact of climate-related risks differs by sector, industry, geography, and organization.[30]

Figure 1

Climate-Related Risks, Opportunities, and Financial Impact



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Fundamentally, the financial impacts of climate-related issues on an organization are driven by the specific climate-related risks and opportunities to which the organization is exposed and its strategic and risk management decisions on managing those risks (i.e., mitigate, transfer, accept, or control) and seizing those opportunities. The Task Force has identified four major categories, described in Figure 2 (p. 9), through which climate-related risks and opportunities may affect an organization's current and future financial positions.

The financial impacts of climate-related issues on organizations are not always clear or direct, and, for many organizations, identifying the issues, assessing potential impacts, and ensuring material issues are reflected in financial filings may be challenging. Key reasons for this are likely because of (1) limited knowledge of climate-related issues within organizations; (2) the tendency to focus mainly on near-term risks without paying adequate attention to risks that may arise in the longer term; and (3) the difficulty in quantifying the financial effects of climate-related issues.[31] To assist organizations in identifying climate-related issues and their impacts, the Task Force developed Table 1 (p. 10), which provides examples of climate-related risks and their potential financial impacts, and Table 2 (p. 11), which provides examples of climate-related opportunities and their potential financial impacts. In addition, Section A.4 in the Annex provides more information on the major categories of financial impacts—revenues, expenditures, assets and liabilities, and capital and financing—that are likely to be most relevant for specific industries.

[30] SASB research demonstrates that 72 out of 79 Sustainable Industry Classification System (SICS™) industries are significantly affected in some way by climate-related risk.

[31] World Business Council for Sustainable Development, "Sustainability and enterprise risk management: The first step towards integration." January 18, 2017.

Figure 2

Major Categories of Financial Impact

Income Statement	Balance Sheet
Revenues. Transition and physical risks may affect demand for products and services. Organizations should consider the potential impact on revenues and identify potential opportunities for enhancing or developing new revenues. In particular, given the emergence and likely growth of carbon pricing as a mechanism to regulate emissions, it is important for affected industries to consider the potential impacts of such pricing on business revenues. **Expenditures.** An organization's response to climate-related risks and opportunities may depend, in part, on the organization's cost structure. Lower-cost suppliers may be more resilient to changes in cost resulting from climate-related issues and more flexible in their ability to address such issues. By providing an indication of their cost structure and flexibility to adapt, organizations can better inform investors about their investment potential. It is also helpful for investors to understand capital expenditure plans and the level of debt or equity needed to fund these plans. The resilience of such plans should be considered bearing in mind organizations' flexibility to shift capital and the willingness of capital markets to fund organizations exposed to significant levels of climate-related risks. Transparency of these plans may provide greater access to capital markets or improved financing terms.	**Assets and Liabilities.** Supply and demand changes from changes in policies, technology, and market dynamics related to climate change could affect the valuation of organizations' assets and liabilities. Use of long-lived assets and, where relevant, reserves may be particularly affected by climate-related issues. It is important for organizations to provide an indication of the potential climate-related impact on their assets and liabilities, particularly long-lived assets. This should focus on existing and committed future activities and decisions requiring new investment, restructuring, write-downs, or impairment. **Capital and Financing.** Climate-related risks and opportunities may change the profile of an organization's debt and equity structure, either by increasing debt levels to compensate for reduced operating cash flows or for new capital expenditures or R&D. It may also affect the ability to raise new debt or refinance existing debt, or reduce the tenor of borrowing available to the organization. There could also be changes to capital and reserves from operating losses, asset write-downs, or the need to raise new equity to meet investment.

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The Task Force encourages organizations to undertake both historical and forward-looking analyses when considering the potential financial impacts of climate change, with greater focus on forward-looking analyses as the efforts to mitigate and adapt to climate change are without historical precedent. This is one of the reasons the Task Force believes scenario analysis is important for organizations to consider incorporating into their strategic planning or risk management practices.

Table 1

Examples of Climate-Related Risks and Potential Financial Impacts

Type	Climate-Related Risks[32]	Potential Financial Impacts
Transition Risks	**Policy and Legal**	
	– Increased pricing of GHG emissions – Enhanced emissions-reporting obligations – Mandates on and regulation of existing products and services – Exposure to litigation	– Increased operating costs (e.g., higher compliance costs, increased insurance premiums) – Write-offs, asset impairment, and early retirement of existing assets due to policy changes – Increased costs and/or reduced demand for products and services resulting from fines and judgments
	Technology	
	– Substitution of existing products and services with lower emissions options – Unsuccessful investment in new technologies – Costs to transition to lower emissions technology	– Write-offs and early retirement of existing assets – Reduced demand for products and services – Research and development (R&D) expenditures in new and alternative technologies – Capital investments in technology development – Costs to adopt/deploy new practices and processes
	Market	
	– Changing customer behavior – Uncertainty in market signals – Increased cost of raw materials	– Reduced demand for goods and services due to shift in consumer preferences – Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment) – Abrupt and unexpected shifts in energy costs – Change in revenue mix and sources, resulting in decreased revenues – Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations)
	Reputation	
	– Shifts in consumer preferences – Stigmatization of sector – Increased stakeholder concern or negative stakeholder feedback	– Reduced revenue from decreased demand for goods/services – Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions) – Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention) – Reduction in capital availability
Physical Risks	**Acute**	– Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions) – Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism) – Write-offs and early retirement of existing assets (e.g., damage to property and assets in "high-risk" locations) – Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants) – Increased capital costs (e.g., damage to facilities) – Reduced revenues from lower sales/output – Increased insurance premiums and potential for reduced availability of insurance on assets in "high-risk" locations
	– Increased severity of extreme weather events such as cyclones and floods	
	Chronic	
	– Changes in precipitation patterns and extreme variability in weather patterns – Rising mean temperatures – Rising sea levels	

[32] The sub-category risks described under each major category are not mutually exclusive, and some overlap exists.

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Table 2

Examples of Climate-Related Opportunities and Potential Financial Impacts

Type	Climate-Related Opportunities[33]	Potential Financial Impacts
Resource Efficiency	– Use of more efficient modes of transport – Use of more efficient production and distribution processes – Use of recycling – Move to more efficient buildings – Reduced water usage and consumption	– Reduced operating costs (e.g., through efficiency gains and cost reductions) – Increased production capacity, resulting in increased revenues – Increased value of fixed assets (e.g., highly rated energy-efficient buildings) – Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
Energy Source	– Use of lower-emission sources of energy – Use of supportive policy incentives – Use of new technologies – Participation in carbon market – Shift toward decentralized energy generation	– Reduced operational costs (e.g., through use of lowest cost abatement) – Reduced exposure to future fossil fuel price increases – Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon – Returns on investment in low-emission technology – Increased capital availability (e.g., as more investors favor lower-emissions producers) – Reputational benefits resulting in increased demand for goods/services
Products and Services	– Development and/or expansion of low emission goods and services – Development of climate adaptation and insurance risk solutions – Development of new products or services through R&D and innovation – Ability to diversify business activities – Shift in consumer preferences	– Increased revenue through demand for lower emissions products and services – Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services) – Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
Markets	– Access to new markets – Use of public-sector incentives – Access to new assets and locations needing insurance coverage	– Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) – Increased diversification of financial assets (e.g., green bonds and infrastructure)
Resilience	– Participation in renewable energy programs and adoption of energy-efficiency measures – Resource substitutes/diversification	– Increased market valuation through resilience planning (e.g., infrastructure, land, buildings) – Increased reliability of supply chain and ability to operate under various conditions – Increased revenue through new products and services related to ensuring resiliency

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[33] The opportunity categories are not mutually exclusive, and some overlap exists.

C Recommendations and Guidance

C Recommendations and Guidance

1. Overview of Recommendations and Guidance

To fulfill its remit, the Task Force developed four widely adoptable recommendations on climate-related financial disclosures applicable to organizations across sectors and jurisdictions. In developing its recommendations, the Task Force considered the challenges for preparers of disclosures as well as the benefits of such disclosures to investors, lenders, and insurance underwriters. To achieve this balance, the Task Force engaged in significant outreach and consultation with users and preparers of disclosures and drew upon existing climate-related disclosure regimes. The insights gained from the outreach and consultations directly informed the development of the recommendations.

The Task Force structured its recommendations around four thematic areas that represent core elements of how organizations operate—governance, strategy, risk management, and metrics and targets. The four overarching recommendations are supported by key climate-related financial disclosures—referred to as recommended disclosures—that build out the framework with information that will help investors and others understand how reporting organizations think about and assess climate-related risks and opportunities. In addition, there is guidance to support all organizations in developing climate-related financial disclosures consistent with the recommendations and recommended disclosures as well as *supplemental* guidance for specific sectors. The structure is depicted in Figure 3 below, and the Task Force's recommendations and supporting recommended disclosures are presented in Figure 4 (p. 14).

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Figure 3

Recommendations and Guidance



Recommendations
Four widely adoptable recommendations tied to: governance, strategy, risk management, and metrics and targets

Recommended Disclosures
Specific recommended disclosures organizations should include in their financial filings to provide decision-useful information

Guidance for All Sectors
Guidance providing context and suggestions for implementing the recommended disclosures for all organizations

Supplemental Guidance for Certain Sectors
Guidance that highlights important considerations for certain sectors and provides a fuller picture of potential climate-related financial impacts in those sectors

Supplemental guidance is provided for the financial sector and for non-financial sectors potentially most affected by climate change

The Task Force's supplemental guidance is included in the Annex and covers the financial sector as well as non-financial industries potentially most affected by climate change and the transition to a lower-carbon economy (referred to as non-financial groups). The supplemental guidance provides these preparers with additional context and suggestions for implementing the recommended disclosures and should be used in conjunction with the guidance for all sectors.

Figure 4

Recommendations and Supporting Recommended Disclosures

Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate-related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
Recommended Disclosures	**Recommended Disclosures**	**Recommended Disclosures**	**Recommended Disclosures**
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	a) Describe the organization's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	b) Describe the organization's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

Figure 5 provides a mapping of the recommendations (governance, strategy, risk management, and metrics and targets) and recommended disclosures (a, b, c) for which supplemental guidance was developed for the financial sector and non-financial groups.

- **Financial Sector.** The Task Force developed supplemental guidance for the financial sector, which it organized into four major industries largely based on activities performed. The four industries are banks (lending), insurance companies (underwriting), asset managers (asset management), and asset owners, which include public- and private-sector pension plans, endowments, and foundations (investing).[34] The Task Force believes that disclosures by the financial sector could foster an early assessment of climate-related risks and opportunities, improve pricing of climate-related risks, and lead to more informed capital allocation decisions.
- **Non-Financial Groups.** The Task Force developed supplemental guidance for non-financial industries that account for the largest proportion of GHG emissions, energy usage, and water usage. These industries were organized into four groups (i.e., non-financial groups)—Energy; Materials and Buildings; Transportation; and Agriculture, Food, and Forest Products—based on similarities in climate-related risks as shown in Box 2 (p. 16). While this supplemental guidance focuses on a subset of non-financial industries, organizations in other industries with similar business activities may wish to review and consider the issues and topics contained in the supplemental guidance.

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Figure 5

Supplemental Guidance for Financial Sector and Non-Financial Groups

	Industries and Groups	Governance		Strategy			Risk Management			Metrics and Targets		
		a)	b)	a)	b)	c)	a)	b)	c)	a)	b)	c)
Financial	Banks			■			■			■		
	Insurance Companies				■	■	■	■		■		
	Asset Owners				■	■	■	■		■	■	
	Asset Managers				■		■	■		■	■	
Non-Financial	Energy				■	■				■		
	Transportation				■	■				■		
	Materials and Buildings				■	■				■		
	Agriculture, Food, and Forest Products				■	■				■		

[34] The use of the term "insurance companies" in this report includes re-insurers.

Box 2

Determination of Non-Financial Groups

In an effort to focus supplemental guidance on those non-financial sectors and industries with the highest likelihood of climate-related financial impacts, the Task Force assessed three factors most likely to be affected by both transition risk (policy and legal, technology, market, and reputation) and physical risk (acute and chronic)—GHG emissions, energy usage, and water usage.

The underlying premise in using these three factors is that climate-related physical and transition risks will likely manifest themselves primarily and broadly in the form of constraints on GHG emissions, effects on energy production and usage, and effects on water availability, usage, and quality. Other factors, such as waste management and land use, are also important, but may not be as determinative across a wide range of industries or may be captured in one of the primary categories.

In taking this approach, the Task Force consulted a number of sources regarding the ranking of various sectors and industries according to these three factors. The various rankings were used to determine an overall set of sectors and industries that have significant exposure to transition or physical risks related to GHG emissions, energy, or water. The sectors and industries were grouped into four categories of industries that have similar economic activities and climate-related exposures.

These four groups and their associated industries are intended to be indicative of the economic activities associated with these industries rather than definitive industry categories. Other industries with similar activities and climate-related exposures should consider the supplemental guidance as well.

The Task Force validated its approach using a variety of sources, including:

1. The TCFD Phase I report public consultation, soliciting more than 200 responses which ranked Energy, Utilities, Materials, Industrials and Consumer Staples/Discretionary, in that order, as the Global Industry Classification Standard (GICS) sectors most important for disclosure guidelines to cover.
2. Numerous sector-specific disclosure guidance documents to understand various breakdowns by economic activity, sector, and industries, including from the following sources: CDP, GHG Protocol, Global Real Estate Sustainability Benchmark (GRESB), Global Reporting Initiative (GRI), Institutional Investors Group on Climate Change (IIGCC), IPIECA (the global oil and gas industry association for environmental and social issues), and the Sustainability Accounting Standards Board (SASB).
3. The Intergovernmental Panel on Climate Change (IPCC) report "Climate Change 2014 – Mitigation of Climate Change" that provides an analysis of global direct and indirect emissions by economic sector. The IPCC analysis highlights the dominant emissions-producing sectors as Energy; Industry; Agriculture, Forestry, and Other Land Use; and Transportation and Buildings (Commercial and Residential).
4. Research and documentation from non-governmental organizations (NGOs) and industry organizations that provide information on which industries have the highest exposures to climate change, including those from Cambridge Institute of Sustainability Leadership, China's National Development and Reform Commission (NDRC), Environmental Resources Management (ERM), IEA, Moody's, S&P Global Ratings, and WRI/UNEPFI.

Based on its assessment, the Task Force identified the four groups and their associated industries, listed in the table below, as those that would most benefit from supplemental guidance.

Energy	Transportation	Materials and Buildings	Agriculture, Food, and Forest Products
– Oil and Gas – Coal – Electric Utilities	– Air Freight – Passenger Air Transportation – Maritime Transportation – Rail Transportation – Trucking Services – Automobiles and Components	– Metals and Mining – Chemicals – Construction Materials – Capital Goods – Real Estate Management and Development	– Beverages – Agriculture – Packaged Foods and Meats – Paper and Forest Products

2. Implementing the Recommendations

a. Scope of Coverage

To promote more informed investing, lending, and insurance underwriting decisions, the Task Force recommends all organizations with public debt or equity implement its recommendations. Because climate-related issues are relevant for other types of organizations as well, the Task Force encourages all organizations to implement these recommendations. In particular, the Task Force believes that asset managers and asset owners, including public- and private-sector pension plans, endowments, and foundations, should implement its recommendations so that their clients and beneficiaries may better understand the performance of their assets, consider the risks of their investments, and make more informed investment choices.

b. Location of Disclosures and Materiality

The Task Force recommends that organizations provide climate-related financial disclosures in their mainstream (i.e., public) annual financial filings.[35] In most G20 jurisdictions, public companies have a legal obligation to disclose material information in their financial filings—including material climate-related information; and the Task Force's recommendations are intended to help organizations meet existing disclosure obligations more effectively.[36] The Task Force's recommendations were developed to apply broadly across sectors and jurisdictions and should not be seen as superseding national disclosure requirements. Importantly, organizations should make financial disclosures in accordance with their national disclosure requirements. If certain elements of the recommendations are incompatible with national disclosure requirements for financial filings, the Task Force encourages organizations to disclose those elements in other official company reports that are issued at least annually, widely distributed and available to investors and others, and subject to internal governance processes that are the same or substantially similar to those used for financial reporting.

The Task Force recognizes that most information included in financial filings is subject to a materiality assessment. However, because climate-related risk is a non-diversifiable risk that affects nearly all industries, many investors believe it requires special attention. For example, in assessing organizations' financial and operating results, many investors want insight into the governance and risk management context in which such results are achieved. The Task Force believes disclosures related to its Governance and Risk Management recommendations directly address this need for context and should be included in annual financial filings.

For disclosures related to the Strategy and Metrics and Targets recommendations, the Task Force believes organizations should provide such information in annual financial filings when the information is deemed material. Certain organizations—those in the four non-financial groups that have more than one billion U.S. dollar equivalent (USDE) in annual revenue—should consider disclosing such information in other reports when the information is not deemed material and not included in financial filings.[37] Because these organizations are more likely than others to be financially impacted over time, investors are interested in monitoring how these organizations' strategies evolve.

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[35] Financial filings refer to the annual reporting packages in which organizations are required to deliver their audited financial results under the corporate, compliance, or securities laws of the jurisdictions in which they operate. While reporting requirements differ internationally, financial filings generally contain financial statements and other information such as governance statements and management commentary.

[36] The Task Force encourages organizations where climate-related issues could be material in the future to begin disclosing climate-related financial information outside financial filings to facilitate the incorporation of such information into financial filings once climate-related issues are determined to be material.

[37] The Task Force chose a one billion USDE annual revenue threshold because it captures organizations responsible for over 90 percent of Scope 1 and 2 GHG emissions in the industries represented by the four non-financial groups (about 2,250 organizations out of roughly 15,000).

The Task Force recognizes reporting by asset managers and asset owners is intended to satisfy the needs of clients, beneficiaries, regulators, and oversight bodies and follows a format that is generally different from corporate financial reporting. For purposes of adopting the Task Force's recommendations, asset managers and asset owners should use their existing means of financial reporting to their clients and beneficiaries where relevant and where feasible. Likewise, asset managers and asset owners should consider materiality in the context of their respective mandates and investment performance for clients and beneficiaries.[38]

The Task Force believes that climate-related financial disclosures should be subject to appropriate internal governance processes. Since these disclosures should be included in annual financial filings, the governance processes should be similar to those used for existing financial reporting and would likely involve review by the chief financial officer and audit committee, as appropriate. The Task Force recognizes that some organizations may provide some or all of their climate-related financial disclosures in reports other than financial filings. This may occur because the organizations are not required to issue public financial reports (e.g., some asset managers and asset owners). In such situations, organizations should follow internal governance processes that are the same or substantially similar to those used for financial reporting.

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c. Principles for Effective Disclosures

To underpin its recommendations and help guide current and future developments in climate-related financial reporting, the Task Force developed seven principles for effective disclosure (Figure 6), which are described more fully in Appendix 3. When used by organizations in preparing their climate-related financial disclosures, these principles can help achieve high-quality and decision-useful disclosures that enable users to understand the impact of climate change on organizations. The Task Force encourages organizations to consider these principles as they develop climate-related financial disclosures.

Figure 6

Principles for Effective Disclosures

1. Disclosures should represent relevant information
2. Disclosures should be specific and complete
3. Disclosures should be clear, balanced, and understandable
4. Disclosures should be consistent over time
5. Disclosures should be comparable among companies within a sector, industry, or portfolio
6. Disclosures should be reliable, verifiable, and objective
7. Disclosures should be provided on a timely basis

The Task Force's disclosure principles are largely consistent with internationally accepted frameworks for financial reporting and are generally applicable to most providers of financial disclosures. The principles are designed to assist organizations in making clear the linkages between climate-related issues and their governance, strategy, risk management, and metrics and targets.

[38] The Task Force recommends asset managers and asset owners include carbon footprinting information in their reporting to clients and beneficiaries, as described in Section D of the Annex, to support the assessment and management of climate-related risks.

3. Guidance for All Sectors

The Task Force has developed guidance to support all organizations in developing climate-related financial disclosures consistent with its recommendations and recommended disclosures. The guidance assists preparers by providing context and suggestions for implementing the recommended disclosures. Recognizing organizations have differing levels of capacity to disclose under the recommendations, the guidance provides descriptions of the types of information that should be disclosed or considered.

a. Governance

Investors, lenders, insurance underwriters, and other users of climate-related financial disclosures (collectively referred to as "investors and other stakeholders") are interested in understanding the role an organization's board plays in overseeing climate-related issues as well as management's role in assessing and managing those issues. Such information supports evaluations of whether climate-related issues receive appropriate board and management attention.

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Governance Disclose the organization's governance around climate-related risks and opportunities.	
Recommended Disclosure a) Describe the board's oversight of climate-related risks and opportunities.	**Guidance for All Sectors** In describing the board's oversight of climate-related issues, organizations should consider including a discussion of the following: – processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues, – whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures, and – how the board monitors and oversees progress against goals and targets for addressing climate-related issues.
Recommended Disclosure b) Describe management's role in assessing and managing climate-related risks and opportunities.	**Guidance for All Sectors** In describing management's role related to the assessment and management of climate-related issues, organizations should consider including the following information: – whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues, – a description of the associated organizational structure(s), – processes by which management is informed about climate-related issues, and – how management (through specific positions and/or management committees) monitors climate-related issues.

b. Strategy

Investors and other stakeholders need to understand how climate-related issues may affect an organization's businesses, strategy, and financial planning over the short, medium, and long term. Such information is used to inform expectations about the future performance of an organization.

Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Recommended Disclosure a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	**Guidance for All Sectors** Organizations should provide the following information: – a description of what they consider to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms, – a description of the specific climate-related issues for each time horizon (short, medium, and long term) that could have a material financial impact on the organization, and – a description of the process(es) used to determine which risks and opportunities could have a material financial impact on the organization. Organizations should consider providing a description of their risks and opportunities by sector and/or geography, as appropriate. In describing climate-related issues, organizations should refer to Tables 1 and 2 (pp. 10-11).
Recommended Disclosure b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	**Guidance for All Sectors** Building on recommended disclosure (a), organizations should discuss how identified climate-related issues have affected their businesses, strategy, and financial planning. Organizations should consider including the impact on their businesses and strategy in the following areas: – Products and services – Supply chain and/or value chain – Adaptation and mitigation activities – Investment in research and development – Operations (including types of operations and location of facilities) Organizations should describe how climate-related issues serve as an input to their financial planning process, the time period(s) used, and how these risks and opportunities are prioritized. Organizations' disclosures should reflect a holistic picture of the interdependencies among the factors that affect their ability to create value over time. Organizations should also consider including in their disclosures the impact on financial planning in the following areas: – Operating costs and revenues – Capital expenditures and capital allocation – Acquisitions or divestments – Access to capital If climate-related scenarios were used to inform the organization's strategy and financial planning, such scenarios should be described.

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The Task Force updated its guidance for all sectors for its Strategy and Metrics and Targets recommendations in October 2021. Please refer to the Task Force's 2021 Annex for the latest guidance.

Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Recommended Disclosure c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	**Guidance for All Sectors** Organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks. Organizations should consider discussing: – where they believe their strategies may be affected by climate-related risks and opportunities, – how their strategies might change to address such potential risks and opportunities, and – the climate-related scenarios and associated time horizon(s) considered. Refer to Section D for information on applying scenarios to forward-looking analysis.

The Task Force updated its guidance for all sectors for its Strategy and Metrics and Targets recommendations in October 2021. Please refer to the Task Force's 2021 Annex for the latest guidance.

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c. Risk Management

Investors and other stakeholders need to understand how an organization's climate-related risks are identified, assessed, and managed and whether those processes are integrated into existing risk management processes. Such information supports users of climate-related financial disclosures in evaluating the organization's overall risk profile and risk management activities.

Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

Recommended Disclosure a) Describe the organization's processes for identifying and assessing climate-related risks.	**Guidance for All Sectors** Organizations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organizations determine the relative significance of climate-related risks in relation to other risks. Organizations should describe whether they consider existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered. Organizations should also consider disclosing the following: – processes for assessing the potential size and scope of identified climate-related risks and – definitions of risk terminology used or references to existing risk classification frameworks used.
Recommended Disclosure b) Describe the organization's processes for managing climate-related risks.	**Guidance for All Sectors** Organizations should describe their processes for managing climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks. In addition, organizations should describe their processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations. In describing their processes for managing climate-related risks, organizations should address the risks included in Tables 1 and 2 (pp. 10-11), as appropriate.

Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

Recommended Disclosure c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	**Guidance for All Sectors** Organizations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.

d. Metrics and Targets

Investors and other stakeholders need to understand how an organization measures and monitors its climate-related risks and opportunities. Access to the metrics and targets used by an organization allows investors and other stakeholders to better assess the organization's potential risk-adjusted returns, ability to meet financial obligations, general exposure to climate-related issues, and progress in managing or adapting to those issues. They also provide a basis upon which investors and other stakeholders can compare organizations within a sector or industry.

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Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

Recommended Disclosure a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	**Guidance for All Sectors** Organizations should provide the key metrics used to measure and manage climate-related risks and opportunities, as described in Tables 1 and 2 (pp. 10-11). Organizations should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable. Where climate-related issues are material, organizations should consider describing whether and how related performance metrics are incorporated into remuneration policies. Where relevant, organizations should provide their internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy. Metrics should be provided for historical periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate climate-related metrics.
Recommended Disclosure b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	**Guidance for All Sectors** Organizations should provide their Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks.[39] GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organizations and jurisdictions.[40] As appropriate, organizations should consider providing related, generally accepted industry-specific GHG efficiency ratios.[41] GHG emissions and associated metrics should be provided for historical

The Task Force updated its guidance for all sectors for its Strategy and Metrics and Targets recommendations in October 2021. Please refer to the Task Force's 2021 Annex for the latest guidance.

[39] Emissions are a prime driver of rising global temperatures and, as such, are a key focal point of policy, regulatory, market, and technology responses to limit climate change. As a result, organizations with significant emissions are likely to be impacted more significantly by transition risk than other organizations. In addition, current or future constraints on emissions, either directly by emission restrictions or indirectly through carbon budgets, may impact organizations financially.

[40] While challenges remain, the GHG Protocol methodology is the most widely recognized and used international standard for calculating GHG emissions. Organizations may use national reporting methodologies if they are consistent with the GHG Protocol methodology.

[41] For industries with high energy consumption, metrics related to emission intensity are important to provide. For example, emissions per unit of economic output (e.g., unit of production, number of employees, or value-added) is widely used. See the Annex for examples of metrics.

Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

	periods to allow for trend analysis. In addition, where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.
Recommended Disclosure c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	**Guidance for All Sectors** Organizations should describe their key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a lower-carbon economy. In describing their targets, organizations should consider including the following: – whether the target is absolute or intensity based, – time frames over which the target applies, – base year from which progress is measured, and – key performance indicators used to assess progress against targets. Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

The Task Force updated its guidance for all sectors for its Strategy and Metrics and Targets recommendations in October 2021. Please refer to the Task Force's 2021 Annex for the latest guidance.

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Some organizations are affected by risks associated with climate change today. However, for many organizations, the most significant effects of climate change are likely to emerge over the medium to longer term and their timing and magnitude are uncertain. This uncertainty presents challenges for individual organizations in understanding the potential effects of climate change on their businesses, strategies, and financial performance. To appropriately incorporate the potential effects in their planning processes, organizations need to consider how their climate-related risks and opportunities may evolve and the potential implications under different conditions. One way to do this is through scenario analysis.

Scenario analysis is a well-established method for developing strategic plans that are more flexible or robust to a range of plausible future states. The use of scenario analysis for assessing the potential business implications of climate-related risks and opportunities, however, is relatively recent. While several organizations use scenario analysis to assess the potential impact of climate change on their businesses, only a subset have disclosed their assessment of forward-looking implications publicly, either in sustainability reports or financial filings.[42]

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The disclosure of organizations' forward-looking assessments of climate-related issues is important for investors and other stakeholders in understanding how vulnerable individual organizations are to transition and physical risks and how such vulnerabilities are or would be addressed. As a result, the Task Force believes that organizations should use scenario analysis to assess potential business, strategic, and financial implications of climate-related risks and opportunities and disclose those, as appropriate, in their annual financial filings.

> Scenario analysis is an important and useful tool for understanding the strategic implications of climate-related risks and opportunities.

This section provides additional information on using scenario analysis as a tool to assess potential implications of climate-related risks and opportunities. In addition, a technical supplement, The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities, on the Task Force's website provides further information on the types of climate-related scenarios, the application of scenario analysis, and the key challenges in implementing scenario analysis.

1. Overview of Scenario Analysis

Scenario analysis is a process for identifying and assessing the potential implications of a range of plausible future states under conditions of uncertainty. Scenarios are hypothetical constructs and not designed to deliver precise outcomes or forecasts. Instead, scenarios provide a way for organizations to consider how the future might look if certain trends continue or certain conditions are met. In the case of climate change, for example, scenarios allow an organization to explore and develop an understanding of how various combinations of climate-related risks, both transition and physical risks, may affect its businesses, strategies, and financial performance over time.

Scenario analysis can be qualitative, relying on descriptive, written narratives, or quantitative, relying on numerical data and models, or some combination of both. Qualitative scenario analysis

[42] Some organizations in the energy sector and some large investors have made public disclosures describing the results of their climate-related scenario analysis, including discussing how the transition might affect their current portfolios. In some instances, this information was published in financial filings.

explores relationships and trends for which little or no numerical data is available, while quantitative scenario analysis can be used to assess measurable trends and relationships using models and other analytical techniques.[43] Both rely on scenarios that are internally consistent, logical, and based on explicit assumptions and constraints that result in plausible future development paths.

As summarized in Figure 7, there are several reasons why scenario analysis is a useful tool for organizations in assessing the potential implications of climate-related risks and opportunities.

Figure 7

Reasons to Consider Using Scenario Analysis for Climate Change

1. Scenario analysis can help organizations consider issues, like climate change, that have the following characteristics:
   - Possible outcomes that are highly uncertain (e.g., the **physical** response of the climate and ecosystems to higher levels of GHG emissions in the atmosphere)
   - Outcomes that will play out over the medium to longer term (e.g., timing, distribution, and mechanisms of the **transition** to a lower-carbon economy)
   - Potential disruptive effects that, due to uncertainty and complexity, are substantial
2. Scenario analysis can enhance organizations' strategic conversations about the future by considering, in a more structured manner, what may unfold that is different from business-as-usual. Importantly, it broadens decision makers' thinking across a range of plausible scenarios, including scenarios where climate-related impacts can be significant.
3. Scenario analysis can help organizations frame and assess the potential range of plausible business, strategic, and financial impacts from climate change and the associated management actions that may need to be considered in strategic and financial plans. This may lead to more robust strategies under a wider range of uncertain future conditions.
4. Scenario analysis can help organizations identify indicators to monitor the external environment and better recognize when the environment is moving toward a different scenario state (or to a different stage along a scenario path). This allows organizations the opportunity to reassess and adjust their strategies and financial plans accordingly.[44]
5. Scenario analysis can assist investors in understanding the robustness of organizations' strategies and financial plans and in comparing risks and opportunities across organizations.

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2. Exposure to Climate-Related Risks

The effects of climate change on specific sectors, industries, and individual organizations are highly variable. It is important, therefore, that all organizations consider applying a basic level of scenario analysis in their strategic planning and risk management processes. Organizations more significantly affected by transition risk (e.g., fossil fuel-based industries, energy-intensive manufacturers, and transportation activities) and/or physical risk (e.g., agriculture, transportation

[43] For example, see Mark D. A. Rounsevell, Marc J. Metzger, *Developing qualitative scenario storylines for environmental change assessment,* WIREs Climate Change 2010, 1: 606-619. doi: 10.1002/wcc.63, 2010 and Oliver Fricko, et. al., *Energy sector water use implications of a 2º C climate policy,* Environmental Research Letters, 11: 1-10, 2016.

[44] J.N. Maack, *Scenario analysis: a tool for task managers,* Social Analysis: selected tools and techniques, Social Development Papers, Number 36, the World Bank, June 2001, Washington, DC.

and building infrastructure, insurance, and tourism) should consider a more in-depth application of scenario analysis.

a. Exposure to Transition Risks

Transition risk scenarios are particularly relevant for resource-intensive organizations with high GHG emissions within their value chains, where policy actions, technology, or market changes aimed at emissions reductions, energy efficiency, subsidies or taxes, or other constraints or incentives may have a particularly direct effect.

A key type of transition risk scenario is a so-called 2°C scenario, which lays out a pathway and an emissions trajectory consistent with holding the increase in the global average temperature to 2°C above pre-industrial levels. In December 2015, nearly 200 governments agreed to strengthen the global response to the threat of climate change by "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels," referred to as the Paris Agreement.[45] As a result, a 2°C scenario provides a common reference point that is generally aligned with the objectives of the Paris Agreement and will support investors' evaluation of the potential magnitude and timing of transition-related implications for individual organizations; across different organizations within a sector; and across different sectors.

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b. Exposure to Physical Risks

A wide range of organizations are exposed to climate-related physical risks. Physical climate-related scenarios are particularly relevant for organizations exposed to acute or chronic climate change, such as those with:

- long-lived, fixed assets;
- locations or operations in climate-sensitive regions (e.g., coastal and flood zones);
- reliance on availability of water; and
- value chains exposed to the above.

Physical risk scenarios generally identify extreme weather threats of moderate or higher risk before 2030 and a larger number and range of physical threats between 2030 and 2050. Although most climate models deliver scenario results for physical impacts beyond 2050, organizations typically focus on the consequences of physical risk scenarios over shorter time frames that reflect the lifetimes of their respective assets or liabilities, which vary across sectors and organizations.

3. Recommended Approach to Scenario Analysis

The Task Force believes that all organizations exposed to climate-related risks should consider (1) using scenario analysis to help inform their strategic and financial planning processes and (2) disclosing how resilient their strategies are to a range of plausible climate-related scenarios. The Task Force recognizes that, for many organizations, scenario analysis is or would be a largely qualitative exercise. However, organizations with more significant exposure to transition risk and/or physical risk should undertake more rigorous qualitative and, if relevant, quantitative scenario analysis with respect to key drivers and trends that affect their operations.

A critical aspect of scenario analysis is the selection of a set of scenarios (not just one) that covers a reasonable variety of future outcomes, both favorable and unfavorable. In this regard, the Task Force recommends organizations use a 2°C or lower scenario in addition to two or three other

[45] United Nations Framework Convention on Climate Change. "The Paris Agreement," December 2015.

scenarios most relevant to their circumstances, such as scenarios related to Nationally Determined Contributions (NDCs), physical climate-related scenarios, or other challenging scenarios.[46] In jurisdictions where NDCs are a commonly accepted guide for an energy and/or emissions pathway, NDCs may constitute particularly useful scenarios to include in an organization's suite of scenarios for conducting climate-related scenario analysis.

For an organization in the initial stages of implementing scenario analysis or with limited exposure to climate-related issues, the Task Force recommends disclosing how resilient, qualitatively or directionally, the organization's strategy and financial plans may be to a range of relevant climate change scenarios. This information helps investors, lenders, insurance underwriters, and other stakeholders understand the robustness of an organization's forward-looking strategy and financial plans across a range of possible future states.

Organizations with more significant exposure to climate-related issues should consider disclosing key assumptions and pathways related to the scenarios they use to allow users to understand the analytical process and its limitations. In particular, it is important to understand the critical parameters and assumptions that materially affect the conclusions drawn. As a result, the Task Force believes that organizations with significant climate-related exposures should *strive* to disclose the elements described in Figure 8.

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Figure 8

Disclosure Considerations for Non-Financial Organizations

Organizations with more significant exposure to climate-related issues should consider disclosing key aspects of their scenario analysis, such as the ones described below.

1. The scenarios used, including the 2°C or lower scenario[47]
2. Critical input parameters, assumptions, and analytical choices for the scenarios used, including such factors as:
   - Assumptions about possible technology responses and timing (e.g., evolution of products/services, the technology used to produce them, and costs to implement)
   - Assumptions made around potential differences in input parameters across regions, countries, asset locations, and/or markets
   - Approximate sensitivities to key assumptions
3. Time frames used for scenarios, including short-, medium-, and long-term milestones (e.g., how organizations consider timing of potential future implications under the scenarios used)
4. Information about the resiliency of the organization's strategy, including strategic performance implications under the various scenarios considered, potential qualitative or directional implications for the organization's value chain, capital allocation decisions, research and development focus, and potential material financial implications for the organization's operating results and/or financial position

[46] The Task Force's technical supplement, The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities provides more information on scenario inputs, analytical assumptions and choices, and assessment and presentation of potential impacts.

[47] The objective of the Paris Agreement is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. The IEA is developing a 1.5°C scenario that organizations may find useful.

4. Applying Scenario Analysis

While the Task Force recognizes the complexities of scenario analysis and the potential resources needed to conduct it, organizations are encouraged to use scenario analysis to assess climate-related risks and opportunities. For organizations just beginning to use scenario analysis, a qualitative approach that progresses and deepens over time may be appropriate.[48] Greater rigor and sophistication in the use of data and quantitative models and analysis may be warranted for organizations with more extensive experience in conducting scenario analysis. Organizations may decide to use existing external scenarios and models (e.g., those provided by third-party vendors) or develop their own, in-house modeling capabilities. The choice of approach will depend on an organization's needs, resources, and capabilities.

In conducting scenario analysis, organizations should *strive* to achieve:

- transparency around parameters, assumptions, analytical approaches, and time frames;
- comparability of results across different scenarios and analytical approaches;
- adequate documentation for the methodology, assumptions, data sources, and analytics;
- consistency of methodology year over year;
- sound governance over scenario analysis conduct, validation, approval, and application; and
- effective disclosure of scenario analysis that will inform and promote a constructive dialogue between investors and organizations on the range of potential impacts and resilience of the organization's strategy under various plausible climate-related scenarios.

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In applying scenario analysis, organizations should consider general implications for their strategies, capital allocation, and costs and revenues, both at an enterprise-wide level and at the level of specific regions and markets where specific implications of climate change for the organization are likely to arise. Financial-sector organizations should consider using scenario analysis to evaluate the potential impact of climate-related scenarios on individual assets or investments, investments or assets in a particular sector or region, or underwriting activities.

The Task Force's supplemental guidance recognizes that organizations will be at different levels of experience in using scenario analysis. However, it is important for organizations to use scenario analysis and develop the necessary organizational skills and capabilities to assess climate-related risks and opportunities, with the expectation that organizations will evolve and deepen their use of scenario analysis over time. The objective is to assist investors and other stakeholders in better understanding:

- the degree of robustness of the organization's strategy and financial plans under different plausible future states of the world;
- how the organization may be positioning itself to take advantage of opportunities and plans to mitigate or adapt to climate-related risks; and
- how the organization is challenging itself to think strategically about longer-term climate-related risks and opportunities.

[48] Organizations considering undertaking scenario analysis may wish to conduct various sensitivity analyses around key climate factors as a precursor to scenario analysis, recognizing that sensitivity analysis and scenario analysis are different, but complementary, processes.

5. Challenges and Benefits of Conducting Scenario Analysis

Scenario analysis is a well-established method for developing strategic plans that are more flexible and robust to a range of plausible future states. As previously discussed (Figure 7, p. 26) it is particularly useful for assessing issues with possible outcomes that are highly uncertain, that play out over the medium to longer term, and that are potentially disruptive. Scenario analysis can help to better frame strategic issues, assess the range of potential management actions that may be needed, engage more productively in strategic conversations, and identify indicators to monitor the external environment. Importantly, climate-related scenario analysis can provide the foundation for more effective engagement with investors on an organization's strategic and business resiliency.

Conducting climate-related scenario analysis, however, is not without challenges. First, most scenarios have been developed for global and macro assessments of potential climate-related impacts that can inform policy makers. These climate-related scenarios do not always provide the ideal level of transparency, range of data outputs, and functionality of tools that would facilitate their use in a business or investment context.

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Second, the availability and granularity of data can be a challenge for organizations attempting to assess various energy and technology pathways or carbon constraints in different jurisdictions and geographic locations.

Third, the use of climate-related scenario analysis to assess potential business implications is still at an early stage. Although a handful of the largest organizations and investors are using climate-related scenario analysis as part of their strategic planning and risk management processes, many organizations are just beginning to explore its use. Sharing experiences and approaches to climate-related scenario analysis across organizations, therefore, is critical to advancing the use of climate-related scenario analysis. Organizations may be able to play an important role in this regard by facilitating information and experience exchanges among themselves; collectively developing tools, data sets, and methodologies; and working to set standards. Organizations across many different sectors will inevitably need to learn by doing. Some may seek guidance from other industry participants and experts on how to apply climate-related scenarios to make forward-looking analyses of climate-related risks and opportunities.

Addressing these challenges and advancing the use of climate-related scenario analysis will require further work. These challenges, however, are not insurmountable and can be addressed. Organizations should undertake scenario analysis in the near term to capture the important benefits for assessing climate-related risks and opportunities and improve their capabilities as tools and data progress over time.

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The diverse perspectives of Task Force members as well as outreach efforts, including two public consultations, resulting in over 500 responses, hundreds of industry interviews, several focus groups, and multiple webinars, provided valuable insight into the challenges that different organizations—both financial and non-financial—may encounter in preparing disclosures consistent with the Task Force's recommendations. The Task Force considered these issues and others in developing and then finalizing its recommendations and sought to balance the burden of disclosure on preparers with the need for consistent and decision-useful information for users (i.e., investors, lenders, and insurance underwriters). This section describes the key issues considered by the Task Force, significant public feedback received by the Task Force related to those issues, the ultimate disposition of the issues, and, in some cases, areas where further work may be warranted. Figure 9 summarizes areas the Task Force identified, through its own analysis as well as through public feedback, as warranting further research and analysis or the development of methodologies and standards.

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Figure 9

Key Areas for Further Work

Relationship to Other Reporting Initiatives	Encourage standard setting organizations and others to actively work toward greater alignment of frameworks and to support adoption
Scenario Analysis	Further develop applicable 2°C or lower transition scenarios and supporting outputs, tools, and user interfaces Develop broadly accepted methodologies, datasets, and tools for scenario-based evaluation of physical risk by organizations Make datasets and tools publicly available and provide commonly available platforms for scenario analysis
Data Availability and Quality and Financial Impact	Undertake further research and analysis to better understand and measure how climate-related issues translate into potential financial impacts for organizations in financial and non-financial sectors Improve data quality and further develop standardized metrics for the financial sector, including better defining carbon-related assets and developing metrics that address a broader range of climate-related risks and opportunities Increase organizations' understanding of climate-related risks and opportunities
Example Disclosures[49]	Provide example disclosures to assist preparers in developing disclosures consistent with the Task Force's recommendations

[49] In response to the second consultation, organizations asked for example disclosures to gain a better understanding of how the recommended information may be disclosed. The Task Force acknowledges the development of these examples as an area of further work.

1. Relationship to Other Reporting Initiatives

Through the Task Force's outreach efforts, some organizations expressed concern that multiple disclosure frameworks and mandatory reporting requirements increase the administrative burden of disclosure efforts. Specifically, the additional time, cost, and effort required to analyze and disclose new climate-related information could penalize those with less capacity to respond.

The Task Force considered existing voluntary and mandatory climate-related reporting frameworks in developing its recommendations and provides information in the Annex on the alignment of existing frameworks, including those developed by the CDP (formerly the Carbon Disclosure Project), Climate Disclosure Standards Board (CDSB), the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), and the Sustainability Accounting Standards Board (SASB), with the Task Force's recommended disclosures. The Task Force expects preparers disclosing climate-related information under other regimes will be able to use existing processes and content when developing disclosures based on the Task Force's recommendations.

The Task Force's recommendations provide a common set of principles that should help existing disclosure regimes come into closer alignment over time. Preparers, users, and other stakeholders share a common interest in encouraging such alignment as it relieves a burden for reporting entities, reduces fragmented disclosure, and provides greater comparability for users. The Task Force also encourages standard setting bodies to support adoption of the recommendations and alignment with the recommended disclosures.

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2. Location of Disclosures and Materiality

In considering possible reporting venues, the Task Force reviewed existing regimes for climate-related disclosures across G20 countries. While many G20 countries have rules or regulatory guidance that require climate-related disclosure for organizations, most are *not* explicitly focused on climate-related *financial* information.[50] In addition, the locations of these disclosures vary significantly and range from surveys sent to regulators to sustainability reports to annual financial filings (see Appendix 4).

The Task Force also reviewed financial filing requirements applicable to public companies across G20 countries and found that in most G20 countries, issuers have a legal obligation to disclose material information in their financial reports—which includes material, climate-related information. Such reporting may take the form of a general disclosure of material information, but many jurisdictions require disclosure of material information in specific sections of the financial filing (e.g., in a discussion on risk factors).[51]

Based on its review, the Task Force determined that preparers of climate-related financial disclosures should provide such disclosures in their mainstream (i.e., public) annual financial filings.[52] The Task Force believes publication of climate-related financial information in mainstream financial filings will foster broader utilization of such disclosures, promoting an informed understanding of climate-related issues by investors and others, and support shareholder engagement. Importantly, in determining whether information is material, the Task Force believes organizations should determine materiality for climate-related issues consistent with how they determine the materiality of other information included in their financial filings. In addition, the Task Force cautions organizations against prematurely concluding that climate-

[50] Organization for Economic Co-operation and Development (OECD) and CDSB, *Climate Change Disclosure in G20 Countries: Stocktaking of Corporate Reporting Schemes,* November 18, 2015.

[51] N. Ganci, S. Hammer, T. Reilly, and P. Rodel, *Environmental and Climate Change Disclosure under the Securities Laws: A Multijurisdictional Survey,* Debevoise & Plimpton, March 2016.

[52] To the extent climate-related disclosures are provided outside of financial filings, organizations are encouraged to align the release of such reports with their financial filings.

related risks and opportunities are not material based on perceptions of the longer-term nature of some climate-related risks.

As part of the Task Force's second public consultation, some organizations expressed concern about disclosing information in financial filings that is not clearly tied to an assessment of materiality. The Task Force recognizes organizations' concerns about disclosing information in annual financial filings that is not clearly tied to an assessment of materiality. However, the Task Force believes disclosures related to the Governance and Risk Management recommendations should be provided in annual financial filings. Because climate-related risk is a non-diversifiable risk that affects nearly all sectors, many investors believe it requires special attention. For example, in assessing organizations' financial and operating results, many investors want insight into the governance and risk management context in which such results are achieved. The Task Force believes disclosures related to its Governance and Risk Management recommendations directly address this need for context and should be included in annual financial filings.

For disclosures related to the Strategy and Metrics and Targets recommendations, the Task Force believes organizations should provide such information in annual financial filings when the information is deemed material. Certain organizations—those in the four non-financial groups that have more than one billion USDE in annual revenue—should consider disclosing information related to these recommendations in other reports when the information is not deemed material and not included in financial filings.[53,54] Because these organizations are more likely than others to be affected financially over time due to their significant GHG emissions or energy or water dependencies, investors are interested in monitoring how the organizations' strategies evolve.

In addition, the Task Force recognizes reporting by asset managers and asset owners to their clients and beneficiaries, respectively, generally occurs outside mainstream financial filings (Figure 10). For purposes of adopting the Task Force's recommendations, asset managers and asset owners should use their existing channels of financial reporting to their clients and beneficiaries where relevant and feasible. Likewise, asset managers and asset owners should consider materiality in the context of their respective mandates and investment performance for clients and beneficiaries.

Figure 10

Reporting by Asset Owners

The financial reporting requirements and practices of asset owners vary widely and differ from what is required of organizations with public debt or equity. Some asset owners have no public reporting, while others provide extensive public reporting. For purposes of adopting the Task Force's recommendations, asset owners should use their existing channels of financial reporting to their beneficiaries and others where relevant and feasible.

Reporting by Asset Managers

Reporting to clients by asset managers also takes different forms, depending on the requirements of the client and the types of investments made. For example, an investor in a mutual fund might receive quarterly, or download from the asset manager's website, a "fund fact sheet" that reports, among other information, the top holdings by value, the top performers by returns, and the carbon footprint of the portfolio against a stated benchmark. An investor in a segregated account might receive more detailed reporting, including items such as the aggregate carbon intensity of the portfolio compared with a benchmark, the portfolio's exposure to green revenue (and how this changes over time), or insight into portfolio positioning under different climate scenarios. The Task Force appreciates that climate-related risk reporting by asset managers is in the very early stages and encourages progress and innovation by the industry.

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[53] The Task Force chose a one billion USDE annual revenue threshold because it captures organizations responsible for over 90% of Scope 1 and 2 GHG emissions in the industries represented by the four non-financial groups (about 2,250 organizations out of roughly 15,000).

[54] "Other reports" should be official company reports that are issued at least annually, widely distributed and available to investors and others, and subject to internal governance processes that are substantially similar to those used for financial reporting.

3. Scenario Analysis

As part of the Task Force's second public consultation, many organizations said scenario analysis is a useful tool to help assess risks and understand potential implications of climate change; however, they also identified areas where the Task Force's recommendations and guidance could be improved. In particular, organizations asked the Task Force to identify standardized climate-related scenarios for organizations to use and clarify the information related to scenarios that should be disclosed. They also noted expectations around disclosures and climate-related scenario analysis should be proportionate to the size of the reporting entity and not onerous for smaller organizations. In addition, some organizations noted that the disclosures related to strategy could put organizations at greater risk of litigation given the high degree of uncertainty around the future timing and magnitude of climate-related impacts.

In finalizing its recommendations and guidance, the Task Force clarified organizations should describe how resilient their strategies are to climate-related risks and opportunities, taking into consideration a transition to a lower-carbon economy consistent with a 2°C or lower scenario and, where relevant, scenarios consistent with more extreme physical risks. To address concerns about proportionality, the Task Force established a threshold for organizations in the four non-financial groups that should perform more robust scenario analysis and disclose additional information on the resiliency of their strategies.

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On the issue of recommending specific standardized or reference climate-related scenarios for organizations to use, Task Force members agreed that while such an approach is intuitively appealing, it is not a practical solution at this time. Existing, publicly available climate-related scenarios are not structured or defined in such a way that they can be easily applied consistently across different industries or across organizations within an industry.

The Task Force recognizes that incorporating scenario analysis into strategic planning processes will improve over time as organizations "learn by doing." To facilitate progress in this area, the Task Force encourages further work as follows:

- further developing 2°C or lower transition scenarios that can be applied to specific industries and geographies along with supporting outputs, tools, and user interfaces;
- developing broadly accepted methodologies, data sets, and tools for scenario-based evaluation of physical risk by organizations;
- making these data sets and tools publicly available to facilitate use by organizations, reduce organizational transaction costs, minimize gaps between jurisdictions in terms of technical expertise, enhance comparability of climate-related risk assessments by organizations, and help ensure comparability for investors; and
- creating more industry specific (financial and non-financial) guidance for preparers and users of climate-related scenarios.

4. Data Availability and Quality and Financial Impact

The Task Force developed supplemental guidance for the four non-financial groups that account for the largest proportion of GHG emissions, energy usage, and water usage; and, as part of that supplemental guidance, the Task Force included several illustrative metrics around factors that may be indicative of potential financial implications for climate-related risks and opportunities. As part of the second public consultation, several organizations provided feedback on the illustrative metrics, and common themes included (1) improving the comparability and consistency of the metrics, (2) clarifying the links among the metrics, climate-related risks and opportunities, and potential financial implications, (3) simplifying the metrics, and (4) providing additional guidance on the metrics, including how to calculate key metrics. Organizations also raised concerns about

the lack of standardized data and metrics in the financial sector, which complicates preparers' ability to develop decision-useful metrics and users' ability to compare metrics across organizations.

The Task Force recognizes these concerns as well as broader challenges related to data availability and quality, as described below.

- The gaps in emissions measurement methodologies, including Scope 3 emissions and product life-cycle emissions methodologies, make reliable and accurate estimates difficult.[55,56]
- The lack of robust and cost-effective tools to quantify the potential impact of climate-related risks and opportunities at the asset and project level makes aggregation across an organization's activities or investment portfolios problematic and costly.
- The need to consider the variability of climate-related impacts across and within different sectors and markets further complicates the process (and magnifies the cost) of assessing potential climate-related financial impacts.
- The high degree of uncertainty around the timing and magnitude of climate-related risks makes it difficult to determine and disclose the potential impacts with precision.

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In finalizing its supplemental guidance, the Task Force addressed the redundancy of the metrics; simplified the non-financial illustrative metrics tables; ensured consistent terminology was used; and clarified the links between the metrics, climate-related risks and opportunities, and potential financial implications. In addition, the Task Force encourages further research and analysis by sector and industry experts to (1) better understand and measure how climate-related issues translate into potential financial impacts; (2) develop standardized metrics for the financial sector, including better defining carbon-related assets; and (3) increase organizations' understanding of climate-related risks and opportunities. As it relates to the broader challenges with data quality and availability, the Task Force encourages preparers to include in their disclosures a description of gaps, limitations, and assumptions made as part of their assessment of climate-related issues.

5. GHG Emissions Associated with Investments

In its supplemental guidance for asset owners and asset managers issued on December 14, 2016, the Task Force asked such organizations to provide GHG emissions associated with each fund, product, or investment strategy normalized for every million of the reporting currency invested. As part of the Task Force's public consultation as well as in discussions with preparers, some asset owners and asset managers expressed concern about reporting on GHG emissions related to their own or their clients' investments given the current data challenges and existing accounting guidance on how to measure and report GHG emissions associated with investments. In particular, they voiced concerns about the accuracy and completeness of the reported data and limited application of the metric to asset classes beyond public equities. Organizations also highlighted that GHG emissions associated with investments cannot be used as a sole indicator for investment decisions (i.e., additional metrics are needed) and that the metric can fluctuate with share price movements since it uses investors' proportional share of total equity.[57]

In consideration of the feedback received, the Task Force has replaced the GHG emissions associated with investments metric in the supplemental guidance for asset owners and asset managers with a weighted average carbon intensity metric. The Task Force believes the weighted

[55] Scope 3 emissions are all indirect emissions that occur in the value chain of the reporting company, including both upstream and downstream emissions. See Greenhouse Gas Protocol, "Calculation Tools, FAQ."

[56] Product life cycle emissions are all the emissions associated with the production and use of a specific product, including emissions from raw materials, manufacture, transport, storage, sale, use, and disposal. See Greenhouse Gas Protocol, "Calculation Tools, FAQ."

[57] Because the metric uses investors' proportional share of total equity, increases in the underlying companies' share prices, *all else equal*, will result in a decrease in the carbon footprinting number even though GHG emissions are unchanged.

average carbon intensity metric, which measures exposure to carbon-intensive companies, addresses many of the concerns raised. For example, the metric can be applied across asset classes, is fairly simple to calculate, and does not use investors' proportional share of total equity and, therefore, is not sensitive to share price movements.

The Task Force acknowledges the challenges and limitations of current carbon footprinting metrics, including that such metrics should not necessarily be interpreted as risk metrics. Nevertheless, the Task Force views the reporting of weighted average carbon intensity as a first step and expects disclosure of this information to prompt important advancements in the development of decision-useful, climate-related risk metrics. In this regard, the Task Force encourages asset owners and asset managers to provide other metrics they believe are useful for decision making along with a description of the methodology used. The Task Force recognizes that some asset owners and asset managers may be able to report the weighted average carbon intensity and other metrics on only a portion of their investments given data availability and methodological issues. Nonetheless, increasing the number of organizations reporting this type of information should help speed the development of better climate-related risk metrics.

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6. Remuneration

In the supplemental guidance for the Energy Group, the Task Force asked such organizations to consider disclosing whether and how performance metrics, including links to remuneration policies, take into consideration climate-related risks and opportunities. As part of its second public consultation, the Task Force asked whether the guidance should extend to organizations beyond those in the Energy group and, if so, to which types of organizations. The majority of organizations that commented on this issue responded that the guidance should be extended to other organizations; and many suggested that the guidance should apply to organizations more likely to be affected by climate-related risks. In consideration of the feedback received, the Task Force revised its guidance to ask organizations, where climate-related risks are material, to consider describing whether and how related performance metrics are incorporated into remuneration policies.

7. Accounting Considerations

As part of its work, the Task Force considered the interconnectivity of its recommendations with existing financial statement and disclosure requirements. The Task Force determined that the two primary accounting standard setting bodies, the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), have issued standards to address risks and uncertainties affecting companies. Both International Accounting Standard (IAS) 37 "Provisions, Contingent Liabilities and Contingent Assets" and Accounting Standards Codification (ASC) 450 "Contingencies" provide guidance on how to account for and disclose contingencies. Additionally, IAS 36 "Impairment of Assets" and ASC 360 "Long-lived Asset Impairment" provide guidance on assessing the impairment of long-lived assets. The disclosures of both contingencies and management's assessment and evaluation of long-lived assets for potential impairment are critically important in assisting stakeholders in understanding an organization's ability to meet future reported earnings and cash flow goals.

In most G20 countries, financial executives will likely recognize that the Task Force's disclosure recommendations should result in more quantitative financial disclosures, particularly disclosure of metrics, about the financial impact that climate-related risks have or could have on an organization. Specifically, asset impairments may result from assets adversely impacted by the effects of climate change and/or additional liabilities may need to be recorded to account for regulatory fines and penalties resulting from enhanced regulatory standards. Additionally, cash flows from operations, net income, and access to capital could all be impacted by the effects of

climate-related risks (and opportunities). Therefore, financial executives (e.g., chief financial officers, chief accounting officers, and controllers) should be involved in the organization's evaluation of climate-related risks and opportunities and the efforts undertaken to manage the risks and maximize the opportunities. Finally, careful consideration should be given to the linkage between scenario analyses performed to assess the resilience of an organization's strategy to climate-related risks and opportunities (as suggested in the Task Force's recommendations) and assumptions underlying cash flow analyses used to assess asset (e.g., goodwill, intangibles, and fixed assets) impairments.

8. Time Frames for Short, Medium, and Long Term

As part of the Task Force's second public consultation, some organizations asked the Task Force to define specific ranges for short, medium, and long term. Because the timing of climate-related impacts on organizations will vary, the Task Force believes specifying time frames across sectors for short, medium, and long term could hinder organizations' consideration of climate-related risks and opportunities specific to their businesses. The Task Force is, therefore, not defining time frames and encourages preparers to decide how to define their own time frames according to the life of their assets, the profile of the climate-related risks they face, and the sectors and geographies in which they operate.

In assessing climate-related issues, organizations should be sensitive to the time frames used to conduct their assessments. While many organizations conduct operational and financial planning over a 1-2 year time frame and strategic and capital planning over a 2-5 year time frame, climate-related risks may have implications for an organization over a longer period. It is, therefore, important for organizations to consider the appropriate time frames when assessing climate-related risks.

9. Scope of Coverage

To promote more informed investing, lending, and insurance underwriting decisions, the Task Force recommends all financial and non-financial organizations with public debt and/or equity adopt its recommendations.[58] Because climate-related risks and opportunities are relevant for organizations across all sectors, the Task Force encourages all organizations to adopt these recommendations. In addition, the Task Force believes that asset managers and asset owners, including public- and private-sector pension plans, endowments, and foundations, should implement its recommendations. The Task Force believes climate-related financial information should be provided to asset managers' clients and asset owners' beneficiaries so that they may better understand the performance of their assets, consider the risks of their investments, and make more informed investment choices.

Consistent with existing global stewardship frameworks, asset owners should engage with the organizations in which they invest to encourage adoption of these recommendations. They should also ask their asset managers to adopt these recommendations. Asset owners' expectations in relation to climate-related risk reporting from organizations and asset managers are likely to evolve as data availability and quality improves, understanding of climate-related risk increases, and risk measurement methodologies are further developed.

The Task Force recognizes that several asset owners expressed concern about being identified as the potential "policing body" charged with ensuring adoption of the Task Force's recommendations by asset managers and underlying organizations. The Task Force appreciates that expectations must be reasonable and that asset owners have many competing priorities, but

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[58] Thresholds for climate-related financial disclosures should be aligned to the financial disclosure requirements more broadly in the jurisdictions where a preparer is incorporated and/or operates and is required to make financial disclosures.

encourages them to help drive adoption of the recommendations. Because asset owners and asset managers sit at the top of the investment chain, they have an important role to play in influencing the organizations in which they invest to provide better climate-related financial disclosures.

10. Organizational Ownership

Some organizations have not formalized responsibility for climate-related risk assessment and management. Even for organizations with clearly assigned responsibilities for climate-related issues, the relationship between those responsible for climate-related risk (e.g., "environmental, social and governance" experts, chief investment officers) and those in the finance function can range from regularly scheduled interactions and exchanges of information to minimal or no interaction. According to some preparers, lack of clarity around responsibility for climate-related risk assessments and management, compounded by a lack of integration into organizations' financial reporting processes, could adversely affect implementation of the recommendations.

The Task Force believes that by encouraging disclosure of climate-related financial information in public financial filings, coordination between organizations' climate-related risk experts and the finance function will improve. Similar to the way organizations are evolving to include cyber security issues in their strategic and financial planning efforts, so too should they evolve for climate-related issues.

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The Task Force's recommendations are a foundation for improved reporting of climate-related issues in mainstream financial filings with several resulting benefits (outlined in Figure 11). The recommendations aim to be ambitious, but also practical for near-term adoption. The Task Force expects that reporting of climate-related risks and opportunities will evolve over time as organizations, investors, and others contribute to the quality and consistency of the information disclosed.

Figure 11

Benefits of Recommendations

- Foundation for immediate adoption and flexible enough to accommodate evolving practices
- Promote board and senior management engagement on climate-related issues
- Bring the "future" nature of issues into the present through scenario analysis
- Support understanding of financial sector's exposure to climate-related risks
- Designed to solicit decision-useful, forward-looking information on financial impacts

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1. Evolution of Climate-Related Financial Disclosures

The Task Force recognizes that challenges exist, but all types of organizations can develop disclosures consistent with its recommendations. The recommendations provide a foundation for immediate adoption and are flexible enough to accommodate evolving practices. As understanding, data analytics, and modeling of climate-related issues become more widespread, disclosures can mature accordingly.

Organizations already reporting climate-related financial information under other frameworks may be well positioned to disclose under this framework immediately and are encouraged to do so. For such organizations, significant effort has gone into developing processes and collecting information needed for disclosing under these regimes. The Task Force expects these organizations will be able to use existing processes when providing disclosures in annual financial filings based on the Task Force's recommendations.[59,60] Those with less experience can begin by considering and disclosing how climate-related issues may be relevant in their current governance, strategy, and risk management practices. This initial level of disclosure will allow investors to review, recognize, and understand how organizations consider climate-related issues and their potential financial impact.

Importantly, the Task Force recognizes organizations need to make financial disclosures in accordance with their national disclosure requirements. To the extent certain elements of the recommendations are incompatible with national disclosure requirements for financial filings, the Task Force encourages organizations to disclose those elements through other reports. Such other reports should be official company reports that are issued at least annually, widely distributed and available to investors and others, and subject to internal governance processes that are the same or substantially similar to those used for financial reporting.

2. Widespread Adoption Critical

In the Task Force's view, the success of its recommendations depends on near-term, widespread adoption by organizations in the financial and non-financial sectors. Through widespread adoption, financial risks and opportunities related to climate change will become a natural part of

[59] The Task Force recognizes the structure and content of financial filings differs across jurisdictions and, therefore, believes organizations are in the best position to determine where and how the recommended disclosures should be incorporated in financial filings.

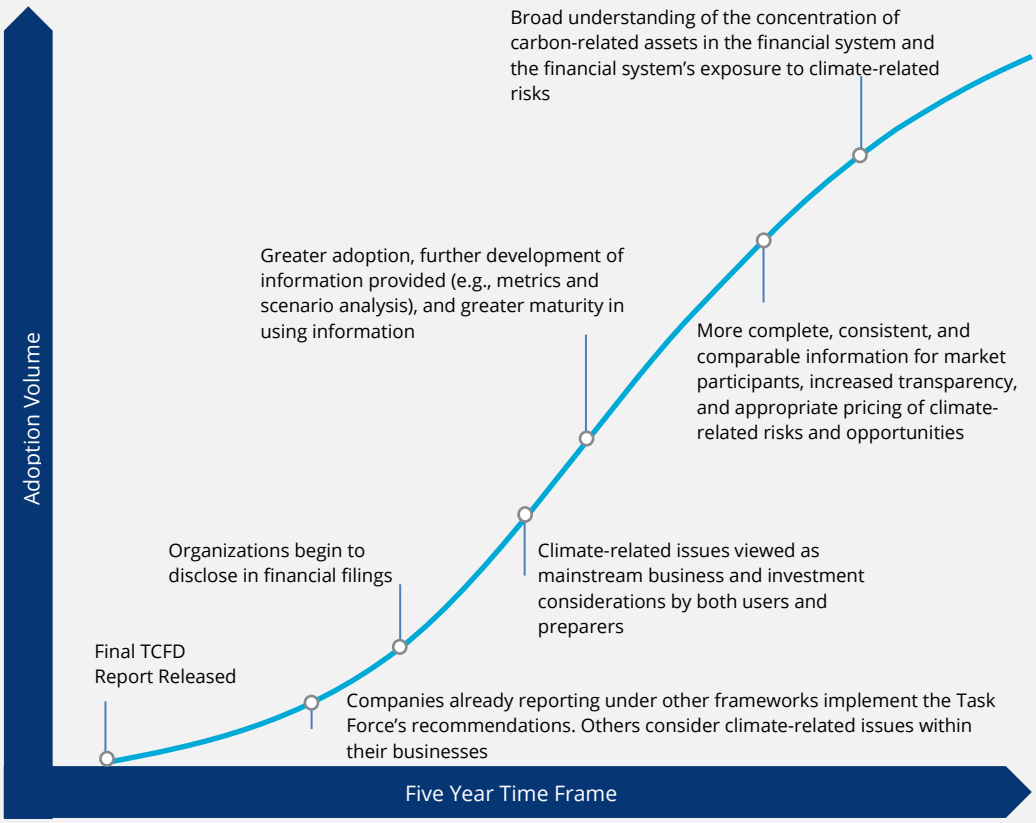
[60] The Task Force encourages organizations where climate-related issues could be material in the future to begin disclosing climate-related financial information outside financial filings to facilitate the incorporation of such information into financial filings once climate-related issues are determined to be material.

organizations' risk management and strategic planning processes. As this occurs, organizations' and investors' understanding of the potential financial implications associated with transitioning to a lower-carbon economy and physical risks will grow, information will become more decision-useful, and risks and opportunities will be more accurately priced, allowing for the more efficient allocation of capital. Figure 12 outlines a possible path for implementation.

Widespread adoption of the recommendations will require ongoing leadership by the G20 and its member countries. Such leadership is essential to continue to make the link between these recommendations and the achievements of global climate objectives. Leadership from the FSB is also critical to underscore the importance of better climate-related financial disclosures for the functioning of the financial system.

Figure 12

Implementation Path *(Illustrative)*



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The Task Force is not alone in its work. A variety of stakeholders, including stock exchanges, investment consultants, credit rating agencies, and others can provide valuable contributions toward adoption of the recommendations. The Task Force believes that advocacy for these standards will be necessary for widespread adoption, including educating organizations that will disclose climate-related financial information and those that will use those disclosures to make financial decisions. To this end, the Task Force notes that strong support by the FSB and G20 authorities would have a positive impact on implementation. With the FSB's extension of the Task Force through September 2018, the Task Force will work to encourage adoption of the recommendations and support the FSB and G20 authorities in promoting the advancement of climate-related financial disclosures.

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Appendix 1: Task Force Members

Chairman and Vice Chairs

Michael Bloomberg
Chair
Founder
Bloomberg LP and Bloomberg Philanthropies

Denise Pavarina
Vice Chair
Executive Director
Banco Bradesco

Graeme Pitkethly
Vice Chair
Chief Financial Officer
Unilever

Christian Thimann
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Group Head of Regulation, Sustainability, and Insurance Foresight
AXA

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Jane Ambachtsheer
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Wim Bartels
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Bruno Bertocci
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Tata Group

Eric Dugelay
Global Leader, Sustainability Services
Deloitte

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Air Liquide Group

Udo Hartmann
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Daimler

Neil Hawkins
Corporate Vice President and Chief Sustainability Officer
The Dow Chemical Company

Thomas Kusterer
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Mark Lewis
Managing Director, Head of European Utilities Equity Research
Barclays

Eloy Lindeijer
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Vice President, Sustainability and Climate Change
BHP Billiton

Jon Williams
Partner, Sustainability and Climate Change
PwC

Masaaki Nagamura
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Tokio Marine Holdings

Martin Skancke
Chair, Risk Committee
Storebrand

Steve Waygood
Chief Responsible Investment Officer
Aviva Investors

Michael Wilkins
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Chair, Audit and Risk Committee, LifeSight
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Former Group Chief Accounting Officer, HSBC

Secretariat

Mary Schapiro
Special Advisor to the Chair
Former Chair, U.S. Securities and Exchange Commission

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Appendix 2: Task Force Objectives and Approach

1. Objectives

The Task Force engaged with key stakeholders throughout the development of its recommendations to ensure that its work would (1) promote alignment across existing disclosure regimes, (2) consider the perspectives of users and the concerns of preparers of climate-related financial disclosures, and (3) be efficiently implemented by organizations in their financial reporting.

2. Approach

In addition to the expertise of its members, a broad range of external resources informed the Task Force's recommendations, including existing voluntary and mandatory climate-related reporting frameworks, governance and risk management standards, government reports and research, expert resources, and various other stakeholders such as industry participants, trade associations, and non-governmental organizations (NGOs).

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a. Leveraging Expertise

Task Force members come from a range of companies, including large financial companies, large non-financial companies, accounting and consulting firms, and credit rating agencies, and brought a range of practical experience, expertise, and global perspectives on preparing and using climate-related financial disclosures. Through eight plenary meetings, Task Force members contributed significantly to developing a consensus-based, industry-led approach to climate-related financial disclosure.

Due to the technically challenging and broad focus of its work, the Task Force also sought input from experts in the field of climate change, particularly in relation to scenario analysis. The Task Force engaged Environmental Resources Management (ERM) to inform its work by developing a technical paper on scenario analysis—The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities. Several members of the Task Force, joined by representatives from 2° Investing Initiative (2°ii), Bloomberg New Energy Finance (BNEF), Bloomberg Quantitative Risk Experts, Carbon Tracker, CDP, and the London School of Economics and Political Science led a working group to oversee ERM's technical considerations. A workshop was also held with experts from Oxford Martin School. Additionally, the International Energy Agency (IEA) provided input regarding how scenario analysis can be conducted and used.

b. Research and Information Gathering

The Task Force's work drew on publications and research conducted by governments, NGOs, industry participants, as well as disclosure regimes with a focus on climate-related issues. The Task Force reviewed existing mandatory and voluntary reporting regimes for climate-related disclosure to identify commonalities and gaps across existing regimes and to determine areas meriting further research and analysis by the Task Force. The work of organizations regarded as standard setters, as well as several organizations active in developing reporting mechanisms for climate-related issues, served as the primary references for the Task Force in developing its recommendations and supporting guidance. The Task Force also considered resources related to sector-specific climate issues in the development of the supplemental guidance.

c. Outreach and Engagement

Engagement with users, preparers, and other stakeholders in relevant industries and sectors across G20 countries and other countries was important in developing the Task Force's recommendations. The Task Force conducted five types of engagement to support this effort: public consultation, industry interviews, focus groups, outreach events, and webinars.

Such engagement served two primary purposes: (1) to raise the level of awareness and educate stakeholders on the Task Force's work and (2) to solicit feedback from stakeholders on the Task Force's proposed recommended disclosures and supplemental guidance for specific sectors. In total, more than 2,700 individuals in 43 countries were included in the Task Force's outreach and engagement (Figure A2.1).

Public Consultations

The Task Force conducted two public consultations. The first followed the April 1, 2016 publication of the Task Force's Phase I Report, which set out the scope and high-level objectives for the Task Force's work. The Task Force solicited input to guide the development of its recommendations for voluntary climate-related financial disclosures. In total, 203 participants from 24 countries responded to the first public consultation. Respondents represented the financial sector, non-financial sectors, NGOs, and other organizations. Public consultation comments indicated support for disclosures on scenario analysis as well as disclosures tailored for specific sectors. Key themes from the first public consultation, which informed the Task Force's recommendations and guidance, are included in Table A2.1 (p. 48).

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Figure A2.1

Outreach and Engagement



Table A2.1

Key Themes of First Public Consultation (Scope of Work)

Key Themes	Survey Response	
Components of Disclosures	The majority of respondents were in agreement that disclosures should: – be forward-looking, – address the ability to achieve targets, with strategies for achievement, and – align with material risks.	
Sector-Specific Disclosures	Respondents were in favor of disclosures for specific sectors	62%
Scenario Analysis	Respondents see scenario analysis as a key component of disclosure	96%

A second public consultation followed the release of the Task Force's report in December 2016. The Task Force conducted the second consultation through an online questionnaire designed to gather feedback on the recommendations, guidance, and key issues identified by the Task Force. The Task Force received 306 responses to its online questionnaire and 59 comment letters on the recommendations and guidance from a variety of organizations in 30 countries.[61] The majority of responses came from Europe (57 percent), followed by North America (20 percent), Asia Pacific (19 percent), South America (four percent), and the Middle East/Africa (less than one percent). Fourty-five percent of respondents provided perspective as users of disclosure, 44 percent as preparers of disclosure, and 11 percent as "other." Respondents came from the financial sector (43 percent), non-financial sectors (18 percent), or other types of organizations (39 percent).[62]

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Table A2.2

Responses to Second Public Consultation Questions

Questions	Respondent	Percent Responding "Useful"
How useful are the recommendations and guidance for all sectors in preparing disclosures?	Preparers	75%
How useful is the supplemental guidance in preparing disclosures?	Preparers	66%
If organizations disclose the recommended information, how useful would it be for decision making?	Users	77%
How useful is a description of potential performance across a range of scenarios to understanding climate-related impacts on an organization's businesses, strategy, and financial planning?	Financial	74%
	Non-Financial	17%
	Other	86%
How useful are the illustrative examples of metrics and targets?	Financial	74%
	Non-Financial	33%
	Other	72%
How useful would the disclosure of GHG emissions associated with investments be for economic decision-making?	Financial	68%
	Other	74%

[61] Of the 59 respondents that submitted comment letters, 45 also completed the online questionnaire, resulting in a total of 320 unique responses.

[62] The other types of organizations included research and advocacy NGOs; standard setting NGOs; data analytics, consulting, and research organizations; academia; and accounting associations.

Overall, respondents were generally supportive of the Task Force's recommendations as shown in Table A2.2 (p. 48); however, several provided specific and constructive feedback on the report. The key themes from this feedback are included in Table A2.3. For additional information regarding the results of the second public consultation, please view the TCFD Public Consultation Summary 2017 on the Task Force's website.

Table A2.3

Key Themes of Second Public Consultation (Recommendations)

Key Themes	
Materiality and Location of Disclosures	Clarifying which recommended disclosures depend on materiality assessment and providing flexibility for organizations to provide some or all disclosures in reports other than financial filings.
Scenario Analysis	Improving ease of implementation, and comparability of scenario analysis by specifying standard scenario(s) and providing additional guidance and tools.
Metrics for the Financial Sector	Encouraging further development and standardization of metrics for the financial sector.
Metrics for Non-Financial Sectors	Improving comparability and consistency of the illustrative metrics for non-financial sectors, clarifying the links to financial impact and climate-related risks and opportunities.
Implementation	Providing disclosure examples to support preparers in developing relevant climate-related financial disclosures.

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Industry Interviews and Focus Groups

Prior to the December 2016 release of the Task Force's report for public consultation, the Task Force conducted 128 industry interviews with users and preparers of financial statements to gather feedback regarding the Task Force's draft recommendations, supplemental guidance for certain sectors, and other considerations. Industry interview participants included chief financial officers, investment officers, other finance and accounting officers, risk officers, sustainability officers, and others. Forty-three percent of the participants held finance, legal, or risk positions and 39 percent held environmental or sustainability roles.

Task Force representatives conducted two rounds of industry interviews. The initial round of interviews focused on the recommendations and guidance; the second round emphasized specific recommendations and sector-specific guidance. Organizations invited to participate in the interviews met two primary criteria: (1) represented industry and sector leaders likely to be impacted by climate-related risks and opportunities and (2) provided geographic diversity to ensure coverage from each G20 and Financial Stability Board (FSB) represented country.

The interviews provided valuable information that informed the Task Force's recommendations and guidance as reflected in the report issued for public consultation in December 2016. Industry interview themes were consistent with those identified in the second public consultation. Preparers raised concerns about the relationship of the Task Force's recommendations to other reporting initiatives and the accuracy and reliability of information requested. Users commented that establishing consistency in metrics would be beneficial, acknowledged data quality challenges, and provided thoughts on scenario analysis (e.g., would like preparers to use of a range of scenarios, interested in knowing how scenario analysis is used in the organization).

Subsequent to the December 2016 release of the Task Force's report for public consultation, the Task Force conducted five focus groups with 32 individuals from six countries representing organizations in specific sectors and industries to solicit feedback on scenario analysis and carbon footprinting metrics. In the two focus groups for the financial sector, participants expressed support for the Task Force's work, noting current challenges related to quality and consistency in

reported climate-related information. Asset owners and asset managers also provided feedback on the benefits and limitations of different carbon footprinting metrics. In the three focus groups for non-financial sectors, participants in oil and gas and utilities industries provided specific feedback on their use of scenario analysis and challenges related to disclosing certain information in financial filings.

Outreach Events

The Task Force sponsored 18 public outreach events in 13 countries, and Task Force members presented the recommendations at 91 other events including conferences, forums, and meetings sponsored by industry associations, NGOs, government agencies, corporations, and other organizations. The 18 Task Force-sponsored events informed stakeholders of the Task Force's work and recommendations and included panel discussions and keynote speeches by prominent climate-risk and financial experts. Attendees included representatives of financial and non-financial organizations who spanned a variety of corporate functions, including strategy, risk, accounting, portfolio and investment management, corporate sustainability, as well as representatives from industry associations, NGOs, government agencies, research providers, academia, accounting and consulting firms, and media.

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Webinars

Prior to the release of the report in December 2016 for public consultation, the Task Force offered seven webinars to educate and increase awareness of the Task Force's efforts as well as to collect additional feedback. Of the seven webinars, the Task Force hosted four webinars and participated in three additional webinars by partnering with the following organizations: Business for Social Responsibility, Global Financial Markets Association, and the National Association of Corporate Directors. These webinars served to supplement the in-person outreach events and offered global stakeholders, regardless of location, an opportunity to engage with the Task Force. The webinars included 538 attendees representing 365 organizations across 23 countries. After the release of the report, the Task Force held three webinars to present its recommendations and to solicit additional feedback. The three webinars included 255 attendees representing 209 organizations across 25 countries. In total, the Task Force offered ten webinars, reaching 793 attendees across 30 countries.

Appendix 3: Fundamental Principles for Effective Disclosure

To underpin its recommendations and help guide current and future developments in climate-related financial reporting, the Task Force developed a set of principles for effective disclosure.[63] As understanding of, and approaches to, climate-related issues evolve over time, so too will climate-related financial reporting. These principles can help achieve high-quality and decision-useful disclosures that enable users to understand the impact of climate change on organizations. The Task Force encourages organizations adopting its recommendations to consider these principles as they develop climate-related financial disclosures.

The Task Force's disclosure principles are largely consistent with other mainstream, internationally accepted frameworks for financial reporting and are generally applicable to most providers of financial disclosures. They are informed by the qualitative and quantitative characteristics of financial information and further the overall goals of producing disclosures that are consistent, comparable, reliable, clear, and efficient, as highlighted by the FSB in establishing the Task Force. The principles, taken together, are designed to assist organizations in making clear the linkages and connections between climate-related issues and their governance, strategy, risk management, and metrics and targets.

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Principle 1: Disclosures should present relevant information

The organization should provide information specific to the potential impact of climate-related risks and opportunities on its markets, businesses, corporate or investment strategy, financial statements, and future cash flows.

- Disclosures should be eliminated if they are immaterial or redundant to avoid obscuring relevant information. However, when a particular risk or issue attracts investor and market interest or attention, it may be helpful for the organization to include a statement that the risk or issue is not significant. This shows that the risk or issue has been considered and has not been overlooked.
- Disclosures should be presented in sufficient detail to enable users to assess the organization's exposure and approach to addressing climate-related issues, while understanding that the type of information, the way in which it is presented, and the accompanying notes will differ between organizations and will be subject to change over time.
- Climate-related impacts can occur over the short, medium, and long term. Organizations can experience chronic, gradual impacts (such as impacts due to shifting temperature patterns), as well as acute, abrupt disruptive impacts (such as impacts from flooding, drought, or sudden regulatory actions). An organization should provide information from the perspective of the potential impact of climate-related issues on value creation, taking into account and addressing the different time frames and types of impacts.
- Organizations should avoid generic or boilerplate disclosures that do not add value to users' understanding of issues. Furthermore, any proposed metrics should adequately describe or serve as a proxy for risk or performance and reflect how an organization manages the risk and opportunities.

[63] These principles are adapted from those included in the Enhanced Disclosure Task Force's "Enhancing the Risk Disclosures of Banks."

Principle 2: Disclosures should be specific and complete

- An organization's reporting should provide a thorough overview of its exposure to potential climate-related impacts; the potential nature and size of such impacts; the organization's governance, strategy, processes for managing climate-related risks, and performance with respect to managing climate-related risks and opportunities.
- To be sufficiently comprehensive, disclosures should contain historical and future-oriented information in order to allow users to evaluate their previous expectations relative to actual performance and assess possible future financial implications.
- For quantitative information, the disclosure should include an explanation of the definition and scope applied. For future-oriented data, this includes clarification of the key assumptions used. Forward-looking quantitative disclosure should align with data used by the organization for investment decision making and risk management.
- Any scenario analyses should be based on data or other information used by the organization for investment decision making and risk management. Where appropriate, the organization should also demonstrate the effect on selected risk metrics or exposures to changes in the key underlying methodologies and assumptions, both in qualitative and quantitative terms.

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Principle 3: Disclosures should be clear, balanced, and understandable

- Disclosures should be written with the objective of communicating financial information that serves the needs of a range of financial sector users (e.g., investors, lenders, insurers, and others). This requires reporting at a level beyond compliance with minimum requirements. The disclosures should be sufficiently granular to inform sophisticated users, but should also provide concise information for those who are less specialized. Clear communication will allow users to identify key information efficiently.
- Disclosures should show an appropriate balance between qualitative and quantitative information and use text, numbers, and graphical presentations as appropriate.
- Fair and balanced narrative explanations should provide insight into the meaning of quantitative disclosures, including the changes or developments they portray over time. Furthermore, balanced narrative explanations require that risks as well as opportunities be portrayed in a manner that is free from bias.
- Disclosures should provide straightforward explanations of issues. Terms used in the disclosures should be explained or defined for a proper understanding by the users.

Principle 4: Disclosures should be consistent over time

- Disclosures should be consistent over time to enable users to understand the development and/or evolution of the impact of climate-related issues on the organization's business. Disclosures should be presented using consistent formats, language, and metrics from period to period to allow for inter-period comparisons. Presenting comparative information is preferred; however, in some situations it may be preferable to include a new disclosure even if comparative information cannot be prepared or restated.
- Changes in disclosures and related approaches or formats (e.g., due to shifting climate-related issues and evolution of risk practices, governance, measurement methodologies, or accounting practices) can be expected due to the relative immaturity of climate-related disclosures. Any such changes should be explained.

Principle 5: Disclosures should be comparable among organizations within a sector, industry, or portfolio

- Disclosures should allow for meaningful comparisons of strategy, business activities, risks, and performance across organizations and within sectors and jurisdictions.
- The level of detail provided in disclosures should enable comparison and benchmarking of risks across sectors and at the portfolio level, where appropriate.
- The placement of reporting would ideally be consistent across organizations—i.e., in financial filings—in order to facilitate easy access to the relevant information.

Principle 6: Disclosures should be reliable, verifiable, and objective

- Disclosures should provide high-quality reliable information. They should be accurate and neutral—i.e., free from bias.
- Future-oriented disclosures will inherently involve the organization's judgment (which should be adequately explained). To the extent possible, disclosures should be based on objective data and use best-in-class measurement methodologies, which would include common industry practice as it evolves.
- Disclosures should be defined, collected, recorded, and analyzed in such a way that the information reported is verifiable to ensure it is high quality. For future-oriented information, this means assumptions used can be traced back to their sources. This does not imply a requirement for independent external assurance; however, disclosures should be subject to internal governance processes that are the same or substantially similar to those used for financial reporting.

Principle 7: Disclosures should be provided on a timely basis

- Information should be delivered to users or updated in a timely manner using appropriate media on, at least, an annual basis within the mainstream financial report.
- Climate-related risks can result in disruptive events. In case of such events with a material financial impact, the organization should provide a timely update of climate-related disclosures as appropriate.

Reporters may encounter tension in the application of the fundamental principles set out above. For example, an organization may update a methodology to meet the comparability principle, which could then result in a conflict with the principle of consistency. Tension can also arise within a single principle. For example, Principle 6 states that disclosures should be verifiable, but assumptions made about future-oriented disclosures often require significant judgment by management that is difficult to verify. Such tensions are inevitable given the wide-ranging and sometimes competing needs of users and preparers of disclosures. Organizations should aim to find an appropriate balance of disclosures that reasonably satisfy the recommendations and principles while avoiding overwhelming users with unnecessary information.

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Appendix 4: Select Disclosure Frameworks

To the extent there is corporate reporting of climate-related issues, it happens through a multitude of mandatory and voluntary schemes. Although a complete and comprehensive survey of existing schemes is beyond the scope of this report, the Task Force on Climate-related Financial Disclosures (TCFD or Task Force) considered a broad range of existing frameworks, both voluntary and mandatory. The tables in Appendix 4 outline select disclosure frameworks considered by the Task Force and describe a few key characteristics of each framework, including whether disclosures are mandatory or voluntary, what type of information is reported, who the target reporters and target audiences are, where the disclosed information is placed, and whether there are specified materiality standards.[64] These disclosure frameworks were chosen to illustrate the broad range of disclosure regimes around the world; the tables are broken out into disclosure frameworks sponsored by governments, stock exchanges, and non-governmental organizations (NGOs).

The information presented in the tables below (A4.1, A4.2, and A4.3) is based on information released by governments, stock exchanges, and standard setters and is supplemented by the United Nations Environment Programme (UNEP), "The Financial System We Need: Aligning the Financial System with Sustainable Development," October 2015, and the Organization for Economic Co-operation and Development (OECD), "Report to G20 Finance Ministers and Central Bank Governors," September 2015.

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[64] These tables were originally included in the Task Force's Phase I Report and have been updated where appropriate.

Table A4.1

Select Disclosure Frameworks: Governments

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Climate-Related Information	Disclosure Location	External Assurance Required
Australia: National Greenhouse and Energy Reporting Act (2007)	Financial and non-financial firms that meet emissions or energy production or consumption thresholds	General public	Mandatory if thresholds are met	Based on emissions above a certain threshold	GHG emissions, energy consumption, and energy production	Report to government	Regulator may, by written notice to corporation, require an audit of its disclosures
European Union (EU): EU Directive 2014/95 regarding disclosure of non-financial and diversity information (2014)	Financial and non-financial firms that meet size criteria (i.e., have more than 500 employees)	Investors, consumers, and other stakeholders	Mandatory; applicable for the financial year starting on Jan. 1, 2017 or during the 2017 calendar year	None specified	Land use, water use, GHG emissions, use of materials, and energy use	Corporate financial report or separate report (published with financial report or on website six months after the balance sheet date and referenced in financial report)	Member States must require that statutory auditor checks whether the non-financial statement has been provided Member States may require independent assurance for information in non-financial statement
France: Article 173, Energy Transition Law (2015)	Listed financial and non-financial firms Additional requirements for institutional investors	Investors, general public	Mandatory	None specified	Risks related to climate change, consequences of climate change on the company's activities and use of goods and services it produces. Institutional investors: GHG emissions and contribution to goal of limiting global warming	Annual report and website	Mandatory review on the consistency of the disclosure by an independent third party, such as a statutory auditor
India: National Voluntary Guidelines on Social, Environmental, and Economic Responsibilities of Business (2011)	Financial and non-financial firms	Investors, general public	Voluntary	None specified	Significant risk, goals and targets for improving performance, materials, energy consumption, water, discharge of effluents, GHG emissions, and biodiversity	Not specified; companies may furnish a report or letter from owner/chief executive officer	Guidelines include third-party assurance as a "leadership indicator" of company's progress in implementing the principles

Table A4.1

Select Disclosure Frameworks: Governments *(continued)*

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Climate-Related Information	Disclosure Location	External Assurance Required
United Kingdom: Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013	Financial and non-financial firms that are "Quoted Companies," as defined by the Companies Act 2006	Investors / shareholders ("members of the company")	Mandatory	Information is material if its omission or misrepresentation could influence the economic decisions shareholders take on the basis of the annual report as a whole (section 5 of the UK FRC June 2014 Guidance on the Strategic Report)	The main trends and factors likely to affect the future development, performance, and position of the company's business, environmental matters (including the impact of the company's business on the environment), and GHG emissions	Strategic Report and Directors' Report	Not required, but statutory auditor must state in report on the company's annual accounts whether in the auditor's opinion the information given in the Strategic Report and the Directors' Report for the financial year for which the accounts are prepared is consistent with those accounts
United States: NAICs, 2010 Insurer Climate Risk Disclosure Survey	Insurers meeting certain premium thresholds - $100M in 2015	Regulators	Mandatory if thresholds are met	None specified	General disclosures about climate change-related risk management and investment management	Survey sent to state regulators	Not specified
United States: SEC Guidance Regarding Disclosure Related to Climate Change	Financial and non-financial firms subject to Securities and Exchange Commission (SEC) reporting requirements	Investors	Mandatory	US securities law definition	Climate-related material risks and factors that can affect or have affected the company's financial condition, such as regulations, treaties and agreements, business trends, and physical impacts	Annual and other reports required to be filed with SEC	Depends on assurance requirements for information disclosed

Table A4.2

Select Disclosure Frameworks: Exchange Listing Requirements and Indices

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Climate-Related Information	Disclosure Location	External Assurance Required
Australia: Australia Securities Exchange Listing Requirement 4.10.3; Corporate Governance Principles and Recommendations (2014)	Listed financial and non-financial firms	Investors	Mandatory (comply or explain)	A real possibility that the risk in question could substantively impact the listed entity's ability to create or preserve value for security holders over the short, medium or long term	General disclosure of material environmental risks	Annual report must include either the corporate governance statement or company website link to the corporate governance statement on company's website	Not specified, may depend on assurance requirements for annual report
Brazil: Stock Exchange (BM&FBovespa) Recommendation of report or explain (2012)	Listed financial and non-financial firms	Investors, regulator	Voluntary (comply or explain)	Criteria explained in Reference Form (Annex 24) of the Instruction CVM nº 480/09	Social and environmental information including methodology used, if audited/reviewed by an independent entity, and link to information (i.e., webpage)	Discretion of company	Not specified
China: Shenzhen Stock Exchange Social Responsibility Instructions to Listed Companies (2006)	Listed financial and non-financial firms	Investors	Voluntary: social responsibilities Mandatory: pollutant discharge	None specified	Waste generation, resource consumption, and pollutants	Not specified	Not specified; companies shall allocate dedicated human resources for regular inspection of implementation of environmental protection policies
Singapore: Singapore Exchange Listing Rules 711A & 711B and Sustainability Reporting Guide (2016) ("Guide")	Listed financial and non-financial firms	Investors	Mandatory (comply or explain)	Guidance provided in the Guide, paragraphs 4.7-4.11	Material environmental, social, and governance factors, performance, targets, and related information specified in the Guide	Annual report or standalone report, disclosed through SGXNet reporting platform and company website	Not required

Table A4.2

Select Disclosure Frameworks: Exchange Listing Requirements and Indices *(continued)*

Region: Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Climate-Related Information	Disclosure Location	External Assurance Required
South Africa: Johannesburg Stock Exchange Listing Requirement Paragraph 8.63; King Code of Governance Principles (2009)	Listed financial and non-financial firms	Investors	Mandatory; (comply or explain)	None specified	General disclosure regarding sustainability performance	Annual report	Required
World, regional, and country-specific indices: S&P Dow Jones Indices Sustainability Index, Sample Questionnaires	Financial and non-financial firms	Investors	Voluntary	None specified	GHG emissions, SOx emissions, energy consumption, water, waste generation, environmental violations, electricity purchased, biodiversity, and mineral waste management	Nonpublic	Disclose whether external assurance was provided and whether it was pursuant to a recognized standard

Table A4.3

Select Disclosure Frameworks: Non-Governmental Organizations

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Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Climate-Related Information	Disclosure Location	External Assurance Required
Global: Asset Owners Disclosure Project 2017 Global Climate Risk Survey	Pension funds, insurers, sovereign wealth funds ≥$2bn AUM	Asset managers, investment industry, government	Voluntary	None specified	Information on whether climate change issues are integrated in investment policies, engagement efforts, portfolio emissions intensity for scope 1 emissions, climate change-related portfolio risk mitigation actions	Survey responses; respondents are asked whether responses may be made public	Disclose whether external assurance was provided
Global: CDP Annual Questionnaire (2016)	Financial and non-financial firms	Investors	Voluntary	None specified	Information on risk management procedures related to climate change risks and opportunities, energy use, and GHG emissions (Scope 1-3)	CDP database	Encouraged; information requested about verification and third party certification
Global: CDSB CDSB Framework for Reporting Environmental Information & Natural Capital	Financial and non-financial firms	Investors	Voluntary	Environmental information is material if (1) the environmental impacts or results it describes are, due to their size and nature, expected to have a significant positive or negative effect on the organization's current, past or future financial condition and operational results and its ability to execute its strategy or (2) omitting, misstating, or mis-interpreting it could influence decisions that users of mainstream reports make about the organization	Environmental policies, strategy, and targets, including the indicators, plans, and timelines used to assess performance; material environmental risks and opportunities affecting the organization; governance of environmental policies, strategy, and information; and quantitative and qualitative results on material sources of environmental impact	Annual reporting packages in which organizations are required to deliver their audited financial results under the corporate, compliance or securities laws of the country in which they operate	Not required, but disclose if assurance has been provided over whether reported environmental information is in conformance with the CDSB Framework

Table A4.3

Select Disclosure Frameworks: Non-Governmental Organizations *(continued)*

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Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Climate-Related Information	Disclosure Location	External Assurance Required
Global: CDSB Climate Change Reporting Framework, Ed. 1.1 (2012)	Financial and non-financial firms	Investors	Voluntary	Allow "investors to see major trends and significant events related to climate change that affect or have the potential to affect the company's financial condition and/or its ability to achieve its strategy"	The extent to which performance is affected by climate-related risks and opportunities; governance processes for addressing those effects; exposure to significant climate-related issues; strategy or plan to address the issues; and GHG emissions	Annual reporting packages in which organizations are required to deliver their audited financial results under the corporate, compliance or securities laws of the territory or territories in which they operate	Not required unless International Standards on Auditing 720 requires the auditor of financial statements to read information accompanying them to identify material inconsistencies between the audited financial statements and accompanying information
Global: GRESB Infrastructure Asset Assessment & Real Estate Assessment	Real estate asset/portfolio owners	Investors and industry stakeholders	Voluntary	None specified	Real estate sector-specific requirements related to fuel, energy, and water consumption and efficiencies as well as low-carbon products	Data collected through the GRESB Real Estate Assessment disclosed to participants themselves and: • for non-listed property funds and companies, to those of that company or fund's investors that are GRESB Investor Members; • for listed real estate companies, to all GRESB Investor Members that invest in listed real estate securities.	Not required, but disclose whether external assurance was provided
Global: GRI Sustainability Reporting Standards (2016)	Organizations of any size, type, sector, or geographic location	All stakeholders	Voluntary	Topics that reflect the reporting organization's significant economic, environmental, and social impacts or substantively influence the decisions of stakeholders	Materials, energy, water, biodiversity, emissions, effluents and waste, environmental compliance, and supplier environmental assessment	Stand-alone sustainability reports or annual reports or other published materials that include sustainability information	Not required, but advised

Table A4.3

Select Disclosure Frameworks: Non-Governmental Organizations *(continued)*

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Framework	Target Reporter	Target Audience	Mandatory or Voluntary	Materiality Standard	Types of Climate-Related Information	Disclosure Location	External Assurance Required
Global: IIGCC Oil & Gas (2010) Automotive (2009) Electric Utilities (2008)	Oil and gas industries	Investors	Voluntary	None specified	GHG emissions and clean technologies data	Not specified	Not specified
	Automotive industry	Investors	Voluntary	None specified	GHG emissions and clean technologies data	Company's discretion	Not specified
	Electrical utilities	Investors	Voluntary	None specified	GHG emissions and electricity production	Company's discretion	Disclose how GHG emissions information was verified
Global: IIRC International Integrated Reporting Framework (2013)	Public companies traded on international exchanges	Investors	Voluntary	Substantively affect the company's ability to create value over the short, medium, and long term	General challenges related to climate change, loss of ecosystems, and resource shortages	Standalone sustainability or integrated report	Not specified; discussion paper released on issues relating to assurance
Global: IPIECA Oil and gas industry guidance on voluntary sustainability reporting	Oil and gas industries	All stakeholders	Voluntary	Material sustainability issues are those that, in the view of company management and its external stakeholders, affect the company's performance or strategy and/or assessments or decisions about the company	Energy consumption	Sustainability reporting	Not required, but encouraged
Global: PRI Reporting Framework (2016)	Investors	Investors	Voluntary	None specified	Investor practices	Transparency report	Not specified
United States: SASB Conceptual Framework (2013) and SASB Standards (Various)	Public companies traded on US exchanges	Investors	Voluntary	A substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the "total mix" of the information made available	Information on sustainability topics that are deemed material, standardized metrics tailored by industry	SEC filings	Depends on assurance requirements for information disclosed

Appendix 5: Glossary and Abbreviations

Glossary

BOARD OF DIRECTORS (or BOARD) refers to a body of elected or appointed members who jointly oversee the activities of a company or organization. Some countries use a two-tiered system where "board" refers to the "supervisory board" while "key executives" refers to the "management board."[65]

CLIMATE-RELATED OPPORTUNITY refers to the potential positive impacts related to climate change on an organization. Efforts to mitigate and adapt to climate change can produce opportunities for organizations, such as through resource efficiency and cost savings, the adoption and utilization of low-emission energy sources, the development of new products and services, and building resilience along the supply chain. Climate-related opportunities will vary depending on the region, market, and industry in which an organization operates.

CLIMATE-RELATED RISK refers to the potential negative impacts of climate change on an organization. Physical risks emanating from climate change can be event-driven (acute) such as increased severity of extreme weather events (e.g., cyclones, droughts, floods, and fires). They can also relate to longer-term shifts (chronic) in precipitation and temperature and increased variability in weather patterns (e.g., sea level rise). Climate-related risks can also be associated with the transition to a lower-carbon global economy, the most common of which relate to policy and legal actions, technology changes, market responses, and reputational considerations.

FINANCIAL FILINGS refer to the annual reporting packages in which organizations are required to deliver their audited financial results under the corporate, compliance, or securities laws of the jurisdictions in which they operate. While reporting requirements differ internationally, financial filings generally contain financial statements and other information such as governance statements and management commentary.[66]

FINANCIAL PLANNING refers to an organization's consideration of how it will achieve and fund its objectives and strategic goals. The process of financial planning allows organizations to assess future financial positions and determine how resources can be utilized in pursuit of short- and long-term objectives. As part of financial planning, organizations often create "financial plans" that outline the specific actions, assets, and resources (including capital) necessary to achieve these objectives over a 1-5 year period. However, financial planning is broader than the development of a financial plan as it includes long-term capital allocation and other considerations that may extend beyond the typical 3-5 year financial plan (e.g., investment, research and development, manufacturing, and markets).

GOVERNANCE refers to "the system by which an organization is directed and controlled in the interests of shareholders and other stakeholders."[67] "Governance involves a set of relationships between an organization's management, its board, its shareholders, and other stakeholders. Governance provides the structure and processes through which the objectives of the organization are set, progress against performance is monitored, and results are evaluated."[68]

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[65] OECD, *G20/OECD Principles of Corporate Governance,* OECD Publishing, Paris, 2015.
[66] Based on Climate Disclosure Standards Board, "CDSB Framework for Reporting Environmental Information and Natural Capital," June 2015.
[67] A. Cadbury, *Report of the Committee on the Financial Aspects of Corporate Governance*, London, 1992.
[68] OECD, *G20/OECD Principles of Corporate Governance*, OECD Publishing, Paris, 2015.

GREENHOUSE GAS (GHG) EMISSIONS SCOPE LEVELS[69]

- **Scope 1** refers to all direct GHG emissions.
- **Scope 2** refers to indirect GHG emissions from consumption of purchased electricity, heat, or steam.
- **Scope 3** refers to other indirect emissions not covered in Scope 2 that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 emissions could include: the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses), outsourced activities, and waste disposal.[70]

INTERNAL CARBON PRICE is an internally developed estimated cost of carbon emissions. Internal carbon pricing can be used as a planning tool to help identify revenue opportunities and risks, as an incentive to drive energy efficiencies to reduce costs, and to guide capital investment decisions.

MANAGEMENT refers to those positions an organization views as executive or senior management positions and that are generally separate from the board.

NATIONALLY DETERMINED CONTRIBUTION (NDC) refers to the post-2020 actions that a country intends to take under the international climate agreement adopted in Paris.

ORGANIZATION refers to the group, company, or companies, and other entities for which consolidated financial statements are prepared, including subsidiaries and jointly controlled entities.

PUBLICLY AVAILABLE 2°C SCENARIO refers to a 2°C scenario that is (1) used/referenced and issued by an independent body; (2) wherever possible, supported by publicly available datasets; (3) updated on a regular basis; and (4) linked to functional tools (e.g., visualizers, calculators, and mapping tools) that can be applied by organizations. 2°C scenarios that presently meet these criteria include: IEA 2DS, IEA 450, Deep Decarbonization Pathways Project, and International Renewable Energy Agency.

RISK MANAGEMENT refers to a set of processes that are carried out by an organization's board and management to support the achievement of the organization's objectives by addressing its risks and managing the combined potential impact of those risks.

SCENARIO ANALYSIS is a process for identifying and assessing a potential range of outcomes of future events under conditions of uncertainty. In the case of climate change, for example, scenarios allow an organization to explore and develop an understanding of how the physical and transition risks of climate change may impact its businesses, strategies, and financial performance over time.

SECTOR refers to a segment of organizations performing similar business activities in an economy. A sector generally refers to a large segment of the economy or grouping of business types, while "industry" is used to describe more specific groupings of organizations within a sector.

STRATEGY refers to an organization's desired future state. An organization's strategy establishes a foundation against which it can monitor and measure its progress in reaching that desired state. Strategy formulation generally involves establishing the purpose and scope of the

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[69] World Resources Institute and World Business Council for Sustainable Development, *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition),* March 2004.
[70] IPCC, *Climate Change 2014 Mitigation of Climate Change,* Cambridge University Press, 2014.

organization's activities and the nature of its businesses, taking into account the risks and opportunities it faces and the environment in which it operates.

SUSTAINABILITY REPORT is an organizational report that gives information about economic, environmental, social, and governance performance and impacts. For companies and organizations, sustainability —the ability to be long-lasting or permanent—is based on performance and impacts in these four key areas.

VALUE CHAIN refers to the upstream and downstream life cycle of a product, process, or service, including material sourcing, production, consumption, and disposal/recycling. Upstream activities include operations that relate to the initial stages of producing a good or service (e.g., material sourcing, material processing, supplier activities). Downstream activities include operations that relate to processing the materials into a finished product and delivering it to the end user (e.g., transportation, distribution, and consumption).

Abbreviations

2°C —2° Celsius

ASC—Accounting Standards Codification

BNEF—Bloomberg New Energy Finance

CDSB—Climate Disclosure Standards Board

ERM—Environmental Resources Management

EU—European Union

FASB—Financial Accounting Standards Board

FSB—Financial Stability Board

G20—Group of 20

GHG—Greenhouse gas

GICS—Global Industry Classification Standard

GRI—Global Reporting Initiative

IAS—International Accounting Standard

IASB—International Accounting Standards Board

IEA—International Energy Agency

IIGCC—Institutional Investors Group on Climate Change

IIRC—International Integrated Reporting Council

IPCC—Intergovernmental Panel on Climate Change

NGO—Non-governmental organization

OECD—Organization for Economic Co-operation and Development

R&D—Research and development

SASB—Sustainability Accounting Standards Board

TCFD—Task Force on Climate-related Financial Disclosures

UN—United Nations

UNEP—United Nations Environment Programme

USDE—U.S. Dollar Equivalent

WRI—World Resources Institute

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"Communiqué from the G20 Finance Ministers and Central Bank Governors Meeting in Washington, D.C. April 16-17, 2015." April 2015. www.g20.org.tr/wp-content/uploads/2015/04/April-G20-FMCBG-Communique-Final.pdf.

Cadbury, A. *Report of the Committee on the Financial Aspects of Corporate Governance.* London, 1992. www.ecgi.org/codes/documents/cadbury.pdf.

Carney, Mark. "Breaking the tragedy of the horizon—climate change and financial stability." September 29, 2015. www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx.

Ceres. "Power Forward 3.0: How the largest US companies are capturing business value while addressing climate change." 2017. https://www.worldwildlife.org/publications/power-forward-3-0-how-the-largest-us-companies-are-capturing-business-value-while-addressing-climate-change.

Climate Disclosure Standards Board (CDSB). "CDSB Framework for Reporting Environmental Information and Natural Capital." June 2015. www.cdsb.net/sites/cdsbnet/files/cdsb_framework_for_reporting_environmental_information_natural_capital.pdf.

Economist Intelligence Unit. "The Cost of Inaction: Recognising the Value at Risk from Climate Change." 2015. https://www.eiuperspectives.economist.com/sustainability/cost-inaction.

Enhanced Disclosure Task Force. *Enhancing the Risk Disclosures of Banks.* October 2012. www.fsb.org/wp-content/uploads/r_121029.pdf.

Environmental Protection Agency Victoria (EPA Victoria). "Resource Efficiency Case Studies, Lower your impact." www.epa.vic.gov.au/business-and-industry/lower-your-impact/resource-efficiency/case-studies.

Fellow, Avery. "Investors Demand Climate Risk Disclosure." *Bloomberg,* February 2013. www.bloomberg.com/news/2013-02-25/investors-demand-climate-risk-disclosure-in-2013-proxies.html.

Frankfurt School-United Nations Environmental Programme Centre and Bloomberg New Energy Finance. "Global Trends in Renewable Energy Investment 2017." 2017. fs-unep-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2017.pdf.

Fricko, Oliver et. al. *Energy sector water use implications of a 2° C climate policy.* Environmental Research Letters, 11: 1-10, 2016. www.cd-links.org/wp-content/uploads/2016/06/Fricko-et-al-2016.pdf.

FSB. "FSB to establish Task Force on Climate-related Financial Disclosures." December 4, 2015. www.fsb-tcfd.org/wp-content/uploads/2016/01/12-4-2015-Climate-change-task-force-press-release.pdf.

FSB. "Proposal for a Disclosure Task Force on Climate-Related Risks." November 9, 2015. www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf.

G20 Green Finance Study Group. *G20 Green Finance Synthesis Report.* 2016. unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf.

Ganci, N., S. Hammer, T. Reilly, and P. Rodel. *Environmental and Climate Change Disclosure under the Securities Laws: A Multijurisdictional Survey.* Debevoise & Plimpton, March 2016. www.debevoise.com/insights/publications/2016/03/environmental-and-climate-change-disclosure.

Greenhouse Gas Protocol. "Calculation Tools, FAQ." ghgprotocol.org/calculationg-tools-faq.

Intergovernmental Panel on Climate Change (IPCC). *Fifth Assessment Report (AR5),* Cambridge University Press, 2014. http://www.ipcc.ch/report/ar5/.

IPCC. *Climate Change 2014 Mitigation of Climate Change.* Cambridge University Press, 2014.

International Energy Agency (IEA). "Global energy investment down 8% in 2015 with flows signaling move towards cleaner energy." September 14, 2016. www.iea.org/newsroom/news/2016/september/global-energy-investment-down-8-in-2015-with-flows-signalling-move-towards-clean.html.

IEA. *World Energy Outlook Special Briefing for COP21*. 2015. www.iea.org/media/news/WEO_INDC_Paper_Final_WEB.PDF.

Maack, J. *Scenario Analysis: A Tool for Task Managers.* Social Analysis: selected tools and techniques, Social Development Papers, Number 36, the World Bank, June 2001, Washington, DC. siteresources.worldbank.org/INTPSIA/Resources/ 490023-1121114603600/13053_scenarioanalysis.pdf.

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C Recommendations and Guidance

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Mercer LLC. *Investing in a Time of Climate Change.* 2015. www.mercer.com/our-thinking/investing-in-a-time-of-climate-change.html.

Organization for Economic Co-operation and Development (OECD) and Climate Disclosure Standards Board (CDSB). *Climate Change Disclosure in G20 Countries: Stocktaking of Corporate Reporting Schemes.* November 18, 2015. www.oecd.org/investment/corporate-climate-change-disclosure-report.htm.

OECD. *G20/OECD Principles of Corporate Governance*. OECD Publishing, Paris, 2015. dx.doi.org/10.1787/9789264236882-en.

Pearce, David W. and R. Kerry Turner. "Economics of Natural Resources and the Environment." Johns Hopkins University Press. 1989. ISBN 978-0801839870.

Rounsevell, Mark D. A. and Marc J Metzger. *Developing qualitative scenario storylines for environmental change assessment.* WIREs Climate Change 2010, 1: 606-619. doi: 10.1002/wcc.63, 2010. wires.wiley.com/WileyCDA/WiresArticle/wisId-WCC63.html.

Seley, Peter. "Emerging Trends in Climate Change Litigation." *Law 360.* March 7, 2016. www.law360.com/articles/766214/emerging-trends-in-climate-change-litigation.

Sustainability Accounting Standards Board (SASB). *SASB Climate Risk Technical Bulletin#: TB001-10182016.* October, 2016. library.sasb.org/climate-risk-technical-bulletin.

Task Force on Climate-related Financial Disclosures. *Phase I Report of the Task Force on Climate-related Financial Disclosures.* March 31, 2016. www.fsb-tcfd.org/wp-content/uploads/2016/03/Phase_I_Report_v15.pdf.

United Nations Environment Programme (UNEP). *The Financial System We Need: Aligning the Financial System with Sustainable Development.* 2015. http://unepinquiry.org/wp-content/uploads/2015/11/The_Financial_System_We_Need_EN.pdf.

UNEP and Copenhagen Centre for Energy Efficiency. *Best Practices and Case Studies for Industrial Energy Efficiency Improvement.* February 16, 2016. www.energyefficiencycentre.org/Nyheder/Nyhed?id=b2bedb2b-05a3-444f-ae5e-55ee3c8f1a68.

United Nations Framework Convention on Climate Change. "The Paris Agreement," December 2015. unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.

World Business Council for Sustainable Development. "Sustainability and enterprise risk management: The first step towards integration." January 18, 2017. www.wbcsd.org/contentwbc/download/2548/31131.

World Resources Institute and World Business Council for Sustainable Development. *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard,* (Revised Edition). March 2004. www.ghgprotocol.org/standards/corporate-standard.

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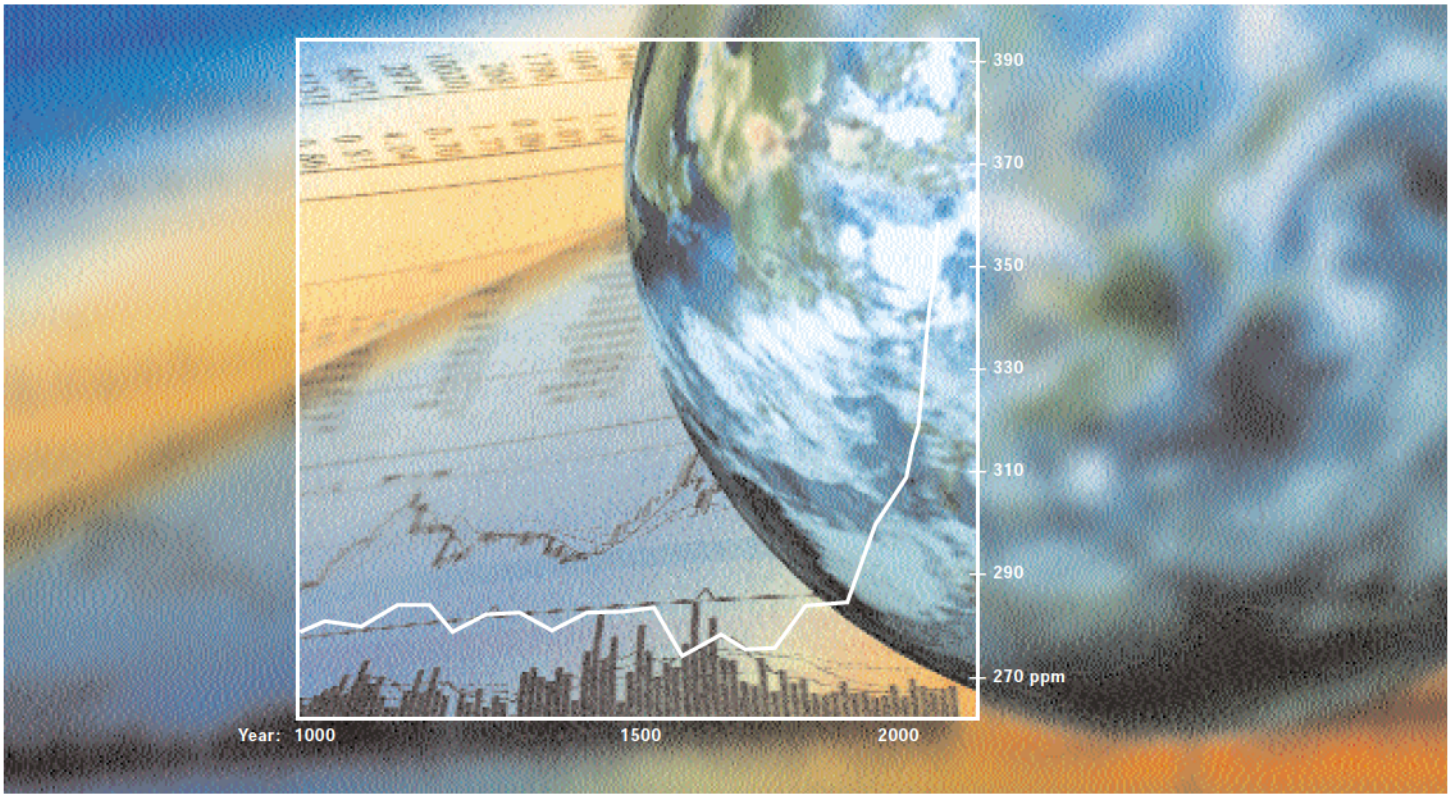
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World Resources Institute & World Business Council for Sustainable Development, *The GHG Protocol Corporate Accounting and Reporting Standard* (2004),

https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

The Greenhouse Gas Protocol



A Corporate Accounting and Reporting Standard

REVISED EDITION

World Business Council for Sustainable Development

WORLD RESOURCES INSTITUTE

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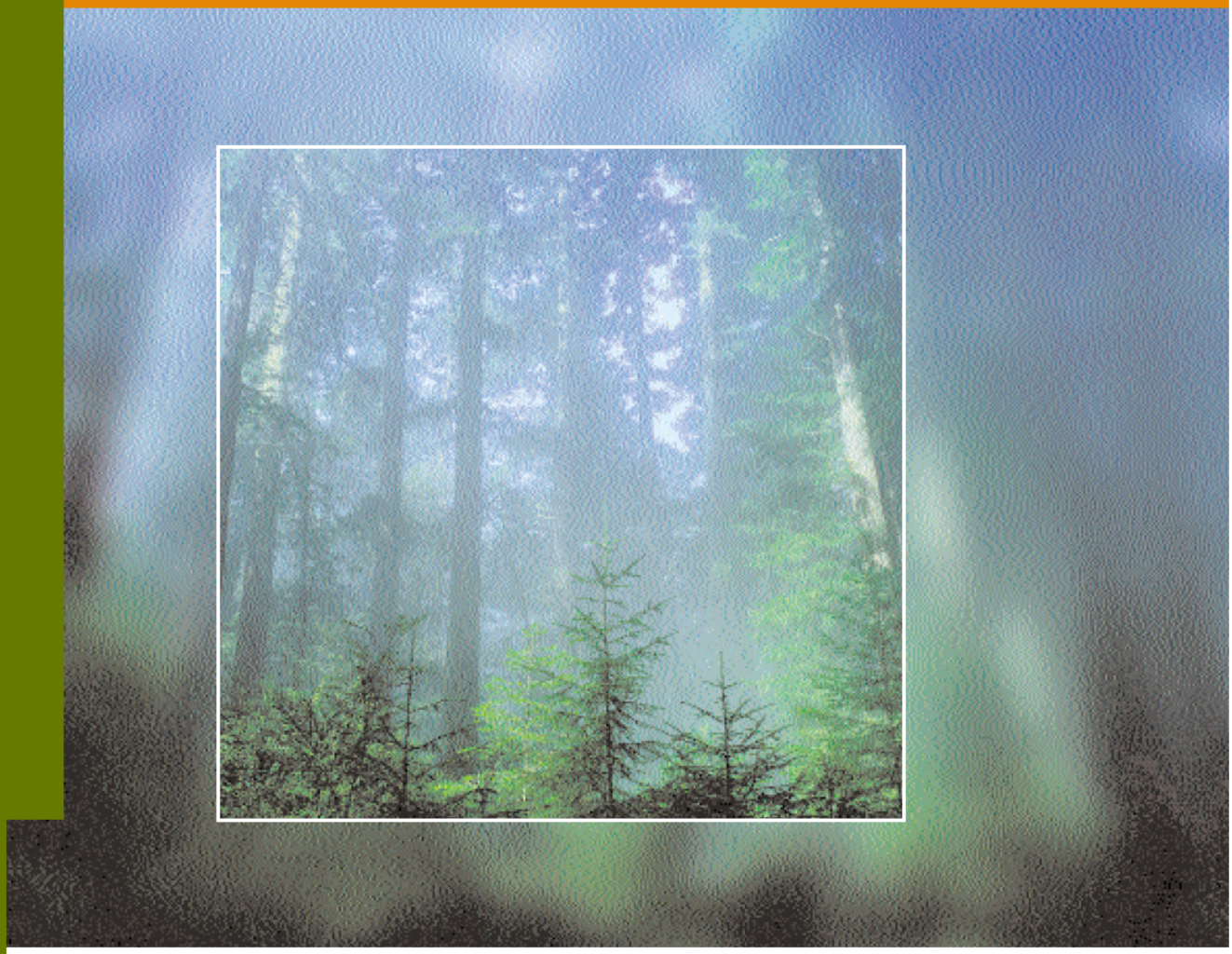
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Introduction



The Greenhouse Gas Protocol Initiative is a multi-stakeholder partnership of businesses, non-governmental organizations (NGOs), governments, and others convened by the World Resources Institute (WRI), a U.S.-based environmental NGO, and the World Business Council for Sustainable Development (WBCSD), a Geneva-based coalition of 170 international companies. Launched in 1998, the Initiative's mission is to develop internationally accepted greenhouse gas (GHG) accounting and reporting standards for business and to promote their broad adoption.

The GHG Protocol Initiative comprises two separate but linked standards:

- *GHG Protocol Corporate Accounting and Reporting Standard* (this document, which provides a step-by-step guide for companies to use in quantifying and reporting their GHG emissions)
- *GHG Protocol Project Quantification Standard* (forthcoming; a guide for quantifying reductions from GHG mitigation projects)

The first edition of the *GHG Protocol Corporate Accounting and Reporting Standard (GHG Protocol Corporate Standard),* published in September 2001, enjoyed broad adoption and acceptance around the globe by businesses, NGOs, and governments. Many industry, NGO, and government GHG programs[1] used the standard as a basis for their accounting and reporting systems. Industry groups, such as the International Aluminum Institute, the International Council of Forest and Paper Associations, and the WBCSD Cement Sustainability Initiative, partnered with the GHG Protocol Initiative to develop complementary industry-specific calculation tools. Widespread adoption of the standard can be attributed to the inclusion of many stakeholders in its development and to the fact that it is robust, practical, and builds on the experience and expertise of numerous experts and practitioners.

This revised edition of the *GHG Protocol Corporate Standard* is the culmination of a two-year multi-stakeholder dialogue, designed to build on experience gained from using the first edition. It includes additional guidance, case studies, appendices, and a new chapter on setting a GHG target. For the most part, however, the first edition of the Corporate Standard has stood the test of time, and the changes in this revised edition will not affect the results of most GHG inventories.

This *GHG Protocol Corporate Standard* provides standards and guidance for companies and other types of organizations[2] preparing a GHG emissions inventory. It covers the accounting and reporting of the six greenhouse gases covered by the Kyoto Protocol — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). The standard and guidance were designed with the following objectives in mind:

- To help companies prepare a GHG inventory that represents a true and fair account of their emissions, through the use of standardized approaches and principles
- To simplify and reduce the costs of compiling a GHG inventory
- To provide business with information that can be used to build an effective strategy to manage and reduce GHG emissions
- To provide information that facilitates participation in voluntary and mandatory GHG programs
- To increase consistency and transparency in GHG accounting and reporting among various companies and GHG programs.

Both business and other stakeholders benefit from converging on a common standard. For business, it reduces costs if their GHG inventory is capable of meeting different internal and external information requirements. For others, it improves the consistency, transparency, and understandability of reported information, making it easier to track and compare progress over time.

The business value of a GHG inventory

Global warming and climate change have come to the fore as a key sustainable development issue. Many governments are taking steps to reduce GHG emissions through national policies that include the introduction of emissions trading programs, voluntary programs, carbon or energy taxes, and regulations and standards on energy efficiency and emissions. As a result, companies must be able to understand and manage their GHG risks if they are to ensure long-term success in a competitive business environment, and to be prepared for future national or regional climate policies.

A well-designed and maintained corporate GHG inventory can serve several business goals, including:

- Managing GHG risks and identifying reduction opportunities
- Public reporting and participation in voluntary GHG programs
- Participating in mandatory reporting programs
- Participating in GHG markets
- Recognition for early voluntary action.

Who should use this standard?

This standard is written primarily from the perspective of a business developing a GHG inventory. However, it applies equally to other types of organizations with operations that give rise to GHG emissions, e.g., NGOs, government agencies, and universities.[3] It should not be used to quantify the reductions associated with GHG mitigation projects for use as offsets or credits—the forthcoming *GHG Protocol Project Quantification Standard* will provide standards and guidance for this purpose.

Policy makers and architects of GHG programs can also use relevant parts of this standard as a basis for their own accounting and reporting requirements.



Introduction

Relationship to other GHG programs

It is important to distinguish between the GHG Protocol Initiative and other GHG programs. The *GHG Protocol Corporate Standard* focuses only on the accounting and reporting of emissions. It does not require emissions information to be reported to WRI or WBCSD. In addition, while this standard is designed to develop a verifiable inventory, it does not provide a standard for how the verification process should be conducted.

The *GHG Protocol Corporate Standard* has been designed to be program or policy neutral. However, many existing GHG programs use it for their own accounting and reporting requirements and it is compatible with most of them, including:

- Voluntary GHG reduction programs, e.g., the World Wildlife Fund (WWF) Climate Savers, the U.S. Environmental Protection Agency (EPA) Climate Leaders, the Climate Neutral Network, and the Business Leaders Initiative on Climate Change (BLICC)
- GHG registries, e.g., California Climate Action Registry (CCAR), World Economic Forum Global GHG Registry
- National and regional industry initiatives, e.g., New Zealand Business Council for Sustainable Development, Taiwan Business Council for Sustainable Development, Association des entreprises pour la réduction des gaz à effet de serre (AERES)
- GHG trading programs,[4] e.g., UK Emissions Trading Scheme (UK ETS), Chicago Climate Exchange (CCX), and the European Union Greenhouse Gas Emissions Allowance Trading Scheme (EU ETS)
- Sector-specific protocols developed by a number of industry associations, e.g., International Aluminum Institute, International Council of Forest and Paper Associations, International Iron and Steel Institute, the WBCSD Cement Sustainability Initiative, and the International Petroleum Industry Environmental Conservation Association (IPIECA).

Since GHG programs often have specific accounting and reporting requirements, companies should always check with any relevant programs for any additional requirements before developing their inventory.

GHG calculation tools

To complement the standard and guidance provided here, a number of cross-sector and sector-specific calculation tools are available on the GHG Protocol Initiative website (www.ghgprotocol.org), including a guide for small office-based organizations (see chapter 6 for full list). These tools provide step-by-step guidance and electronic worksheets to help users calculate GHG emissions from specific sources or industries. The tools are consistent with those proposed by the Intergovernmental Panel on Climate Change (IPCC) for compilation of emissions at the national level (IPCC, 1996). They have been refined to be user-friendly for non-technical company staff and to increase the accuracy of emissions data at a company level. Thanks to help from many companies, organizations, and individual experts through an intensive review of the tools, they are believed to represent current "best practice."

Reporting in accordance with the *GHG Protocol Corporate Standard*

The GHG Protocol Initiative encourages the use of the *GHG Protocol Corporate Standard* by all companies regardless of their experience in preparing a GHG inventory. The term "shall" is used in the chapters containing standards to clarify what is required to prepare and report a GHG inventory in accordance with the *GHG Protocol Corporate Standard*. This is intended to improve the consistency with which the standard is applied and the resulting information that is publicly reported, without departing from the initial intent of the first edition. It also has the advantage of providing a verifiable standard for companies interested in taking this additional step.

Overview of main changes to the first edition

This revised edition contains additional guidance, case studies, and annexes. A new guidance chapter on setting GHG targets has been added in response to many requests from companies that, having developed an inventory, wanted to take the next step of setting a target. Appendices have been added on accounting for indirect emissions from electricity and on accounting for sequestered atmospheric carbon.

Changes to specific chapters include:

- **CHAPTER 1:** Minor rewording of principles.
- **CHAPTER 2:** Goal-related information on operational boundaries has been updated and consolidated.
- **CHAPTER 3:** Although still encouraged to account for emissions using both the equity and control approaches, companies may now report using one approach. This change reflects the fact that not all companies need both types of information to achieve their business goals. New guidance has been provided on establishing control. The minimum equity threshold for reporting purposes has been removed to enable emissions to be reported when significant.
- **CHAPTER 4:** The definition of scope 2 has been revised to exclude emissions from electricity purchased for resale—these are now included in scope 3. This prevents two or more companies from double counting the same emissions in the same scope. New guidance has been added on accounting for GHG emissions associated with electricity transmission and distribution losses. Additional guidance provided on Scope 3 categories and leasing.
- **CHAPTER 5:** The recommendation of pro-rata adjustments was deleted to avoid the need for two adjustments. More guidance has been added on adjusting base year emissions for changes in calculation methodologies.
- **CHAPTER 6:** The guidance on choosing emission factors has been improved.
- **CHAPTER 7:** The guidance on establishing an inventory quality management system and on the applications and limitations of uncertainty assessment has been expanded.
- **CHAPTER 8:** Guidance has been added on accounting for and reporting project reductions and offsets in order to clarify the relationship between the *GHG Protocol Corporate* and *Project Standards*.
- **CHAPTER 9:** The required and optional reporting categories have been clarified.
- **CHAPTER 10:** Guidance on the concepts of materiality and material discrepancy has been expanded.
- **CHAPTER 11:** New chapter added on steps in setting a target and tracking and reporting progress.

Frequently asked questions.

Below is a list of frequently asked questions, with directions to the relevant chapters.

- What should I consider when setting out to account for and report emissions? **CHAPTER 2**
- How do I deal with complex company structures and shared ownership? **CHAPTER 3**
- What is the difference between direct and indirect emissions and what is their relevance? **CHAPTER 4**
- Which indirect emissions should I report? **CHAPTER 4**
- How do I account for and report outsourced and leased operations? **CHAPTER 4**
- What is a base year and why do I need one? **CHAPTER 5**
- My emissions change with acquisitions and divestitures. How do I account for these? **CHAPTER 5**
- How do I identify my company's emission sources? **CHAPTER 6**
- What kinds of tools are there to help me calculate emissions? **CHAPTER 6**
- What data collection activities and data management issues do my facilities have to deal with? **CHAPTER 6**
- What determines the quality and credibility of my emissions information? **CHAPTER 7**
- How should I account for and report GHG offsets that I sell or purchase? **CHAPTER 8**
- What information should be included in a GHG public emissions report? **CHAPTER 9**
- What data must be available to obtain external verification of the inventory data? **CHAPTER 10**
- What is involved in setting an emissions target and how do I report performance in relation to my target? **CHAPTER 11**

NOTES

[1] GHG program is a generic term used to refer to any voluntary or mandatory international, national, sub-national government or non-governmental authority that registers, certifies, or regulates GHG emissions or removals.

[2] Throughout the rest of this document, the term "company" or "business" is used as shorthand for companies, businesses and other types of organizations.

[3] For example, WRI uses the *GHG Protocol Corporate Standard* to publicly report its own emissions on an annual basis and to participate in the Chicago Climate Exchange.

[4] Trading programs that operate at the level of facilities primarily use the GHG Protocol Initiative calculation tools.

STANDARD

1 GHG Accounting and Reporting Principles



As with financial accounting and reporting, generally accepted GHG accounting principles are intended to underpin and guide GHG accounting and reporting to ensure that the reported information represents a faithful, true, and fair account of a company's GHG emissions.

STANDARD
GUIDANCE

GHG accounting and reporting practices are evolving and are new to many businesses; however, the principles listed below are derived in part from generally accepted financial accounting and reporting principles. They also reflect the outcome of a collaborative process involving stakeholders from a wide range of technical, environmental, and accounting disciplines.

GHG accounting and reporting shall be based on the following principles:

RELEVANCE Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.

COMPLETENESS Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.

CONSISTENCY Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.

TRANSPARENCY Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.

ACCURACY Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.



GHG Accounting and Reporting Principles

These principles are intended to underpin all aspects of GHG accounting and reporting. Their application will ensure that the GHG inventory constitutes a true and fair representation of the company's GHG emissions. Their primary function is to guide the implementation of the GHG Protocol Corporate Standard, particularly when the application of the standards to specific issues or situations is ambiguous.

Relevance

For an organization's GHG report to be relevant means that it contains the information that users—both internal and external to the company—need for their decision making. An important aspect of relevance is the selection of an appropriate inventory boundary that reflects the substance and economic reality of the company's business relationships, not merely its legal form. The choice of the inventory boundary is dependent on the characteristics of the company, the intended purpose of information, and the needs of the users. When choosing the inventory boundary, a number of factors should be considered, such as:

- Organizational structures: control (operational and financial), ownership, legal agreements, joint ventures, etc.
- Operational boundaries: on-site and off-site activities, processes, services, and impacts
- Business context: nature of activities, geographic locations, industry sector(s), purposes of information, and users of information

More information on defining an appropriate inventory boundary is provided in chapters 2, 3, and 4.

Completeness

All relevant emissions sources within the chosen inventory boundary need to be accounted for so that a comprehensive and meaningful inventory is compiled. In practice, a lack of data or the cost of gathering data may be a limiting factor. Sometimes it is tempting to define a minimum emissions accounting threshold (often referred to as a materiality threshold) stating that a source not exceeding a certain size can be omitted from the inventory. Technically, such a threshold is simply a predefined and accepted negative bias in estimates (i.e., an underestimate). Although it appears useful in theory, the practical implementation of such a threshold is not compatible with the completeness principle of the GHG Protocol Corporate Standard. In order to utilize a materiality specification, the emissions from a particular source or activity would have to be quantified to ensure they were under the threshold. However, once emissions are quantified, most of the benefit of having a threshold is lost.

A threshold is often used to determine whether an error or omission is a material discrepancy or not. This is not the same as a de minimis for defining a complete inventory. Instead companies need to make a good faith effort to provide a complete, accurate, and consistent accounting of their GHG emissions. For cases where emissions have not been estimated, or estimated at an insufficient level of quality, it is important that this is transparently documented and justified. Verifiers can determine the potential impact and relevance of the exclusion, or lack of quality, on the overall inventory report.

More information on completeness is provided in chapters 7 and 10.

Consistency

Users of GHG information will want to track and compare GHG emissions information over time in order to identify trends and to assess the performance of the reporting company. The consistent application of accounting approaches, inventory boundary, and calculation methodologies is essential to producing comparable GHG emissions data over time. The GHG information for all operations within an organization's inventory boundary needs to be compiled in a manner that ensures that the aggregate information is internally consistent and comparable over time. If there are changes in the inventory boundary, methods, data or any other factors affecting emission estimates, they need to be transparently documented and justified.

More information on consistency is provided in chapters 5 and 9.

Volkswagen: Maintaining completeness over time

Volkswagen is a global auto manufacturer and the largest automaker in Europe. While working on its GHG inventory, Volkswagen realized that the structure of its emission sources had undergone considerable changes over the last seven years. Emissions from production processes, which were considered to be irrelevant at a corporate level in 1996, today constitute almost 20 percent of aggregated GHG emissions at the relevant plant sites. Examples of growing emissions sources are new sites for engine testing or the investment into magnesium die-casting equipment at certain production sites. This example shows that emissions sources have to be regularly re-assessed to maintain a complete inventory over time.

Accuracy

Data should be sufficiently precise to enable intended users to make decisions with reasonable assurance that the reported information is credible. GHG measurements, estimates, or calculations should be systemically neither over nor under the actual emissions value, as far as can be judged, and that uncertainties are reduced as far as practicable. The quantification process should be conducted in a manner that minimizes uncertainty. Reporting on measures taken to ensure accuracy in the accounting of emissions can help promote credibility while enhancing transparency.

More information on accuracy is provided in chapter 7.

Transparency

Transparency relates to the degree to which information on the processes, procedures, assumptions, and limitations of the GHG inventory are disclosed in a clear, factual, neutral, and understandable manner based on clear documentation and archives (i.e., an audit trail). Information needs to be recorded, compiled, and analyzed in a way that enables internal reviewers and external verifiers to attest to its credibility. Specific exclusions or inclusions need to be clearly identified and justified, assumptions disclosed, and appropriate references provided for the methodologies applied and the data sources used. The information should be sufficient to enable a third party to derive the same results if provided with the same source data. A "transparent" report will provide a clear understanding of the issues in the context of the reporting company and a meaningful assessment of performance. An independent external verification is a good way of ensuring transparency and determining that an appropriate audit trail has been established and documentation provided.

More information on transparency is provided in chapters 9 and 10.

The Body Shop: Solving the trade-off between accuracy and completeness

As an international, values-driven retailer of skin, hair, body care, and make-up products, the Body Shop operates nearly 2,000 locations, serving 51 countries in 29 languages. Achieving both accuracy and completeness in the GHG inventory process for such a large, disaggregated organization, is a challenge. Unavailable data and costly measurement processes present significant obstacles to improving emission data accuracy. For example, it is difficult to disaggregate energy consumption information for shops located within shopping centers. Estimates for these shops are often inaccurate, but excluding sources due to inaccuracy creates an incomplete inventory.

The Body Shop, with help from the Business Leaders Initiative on Climate Change (BLICC) program, approached this problem with a two-tiered solution. First, stores were encouraged to actively pursue direct consumption data through disaggregated data or direct monitoring. Second, if unable to obtain direct consumption data, stores were given standardized guidelines for estimating emissions based on factors such as square footage, equipment type, and usage hours. This system replaced the prior fragmentary approach, provided greater accuracy, and provided a more complete account of emissions by including facilities that previously were unable to calculate emissions. If such limitations in the measurement processes are made transparent, users of the information will understand the basis of the data and the trade-off that has taken place.

2 Business Goals and Inventory Design



Improving your understanding of your company's GHG emissions by compiling a GHG inventory makes good business sense. Companies frequently cite the following five business goals as reasons for compiling a GHG inventory:

- Managing GHG risks and identifying reduction opportunities
- Public reporting and participation in voluntary GHG programs
- Participating in mandatory reporting programs
- Participating in GHG markets
- Recognition for early voluntary action

Companies generally want their GHG inventory to be capable of serving multiple goals. It therefore makes sense to design the process from the outset to provide information for a variety of different users and uses—both current and future. The GHG Protocol Corporate Standard has been designed as a comprehensive GHG accounting and reporting framework to provide the information building blocks capable of serving most business goals (see Box 1). Thus the inventory data collected according to the GHG Protocol Corporate Standard can be aggregated and disaggregated for various organizational and operational boundaries and for different business geographic scales (state, country, Annex 1 countries, non-Annex 1 countries, facility, business unit, company, etc.).

BOX 1. Business goals served by GHG inventories

Managing GHG risks and identifying reduction opportunities
- Identifying risks associated with GHG constraints in the future
- Identifying cost effective reduction opportunities
- Setting GHG targets, measuring and reporting progress

Public reporting and participation in voluntary GHG programs
- Voluntary stakeholder reporting of GHG emissions and progress towards GHG targets
- Reporting to government and NGO reporting programs, including GHG registries
- Eco-labelling and GHG certification

Participating in mandatory reporting programs
- Participating in government reporting programs at the national, regional, or local level

Participating in GHG markets
- Supporting internal GHG trading programs
- Participating in external cap and trade allowance trading programs
- Calculating carbon/GHG taxes

Recognition for early voluntary action
- Providing information to support "baseline protection" and/or credit for early action

Appendix C provides an overview of various GHG programs—many of which are based on the GHG Protocol Corporate Standard. The guidance sections of chapters 3 and 4 provide additional information on how to design an inventory for different goals and uses.

Managing GHG risks and identifying reduction opportunities

Compiling a comprehensive GHG inventory improves a company's understanding of its emissions profile and any potential GHG liability or "exposure." A company's GHG exposure is increasingly becoming a management issue in light of heightened scrutiny by the insurance industry, shareholders, and the emergence of environmental regulations/policies designed to reduce GHG emissions.

In the context of future GHG regulations, significant GHG emissions in a company's value chain may result in increased costs (upstream) or reduced sales (downstream), even if the company itself is not directly subject to regulations. Thus investors may view significant indirect emissions upstream or downstream of a company's operations as potential liabilities that need to be managed and reduced. A limited focus on direct emissions from a company's own operations may miss major GHG risks and opportunities, while leading to a misinterpretation of the company's actual GHG exposure.

On a more positive note, what gets measured gets managed. Accounting for emissions can help identify the most effective reduction opportunities. This can drive increased materials and energy efficiency as well as the development of new products and services that reduce the GHG impacts of customers or suppliers. This in turn can reduce production costs and help differentiate the company in an increasingly environmentally conscious marketplace. Conducting a rigorous GHG inventory is also a prerequisite for setting an internal or public GHG target and for subsequently measuring and reporting progress.

IBM: The role of renewable energy in reducing GHG emissions

Indirect emissions associated with the consumption of purchased electricity are a required element of any company's accounting and reporting under the *GHG Protocol Corporate Standard*. Because purchased electricity is a major source of GHG emissions for companies, it presents a significant reduction opportunity. IBM, a major information technology company and a member of the WRI's Green Power Market Development Group, has systematically accounted for these indirect emissions and thus identified the significant potential to reduce them. The company has implemented a variety of strategies that would reduce either their demand for purchased energy or the GHG intensity of that purchased energy. One strategy has been to pursue the renewable energy market to reduce the GHG intensity of its purchased electricity.

IBM succeeded in reducing its GHG emissions at its facility in Austin, Texas, even as energy use stayed relatively constant, through a contract for renewable electricity with the local utility company, Austin Energy. Starting in 2001, this five-year contract is for 5.25 million kWhs of wind-power per year. This zero emission power lowered the facility's inventory by more than 4,100 tonnes of CO_2 compared to the previous year and represents nearly 5% of the facility's total electricity consumption. Company-wide, IBM's 2002 total renewable energy procurement was 66.2 million kWh, which represented 1.3% of its electricity consumption worldwide and 31,550 tonnes of CO_2 compared to the previous year. Worldwide, IBM purchased a variety of sources of renewable energy including wind, biomass and solar.

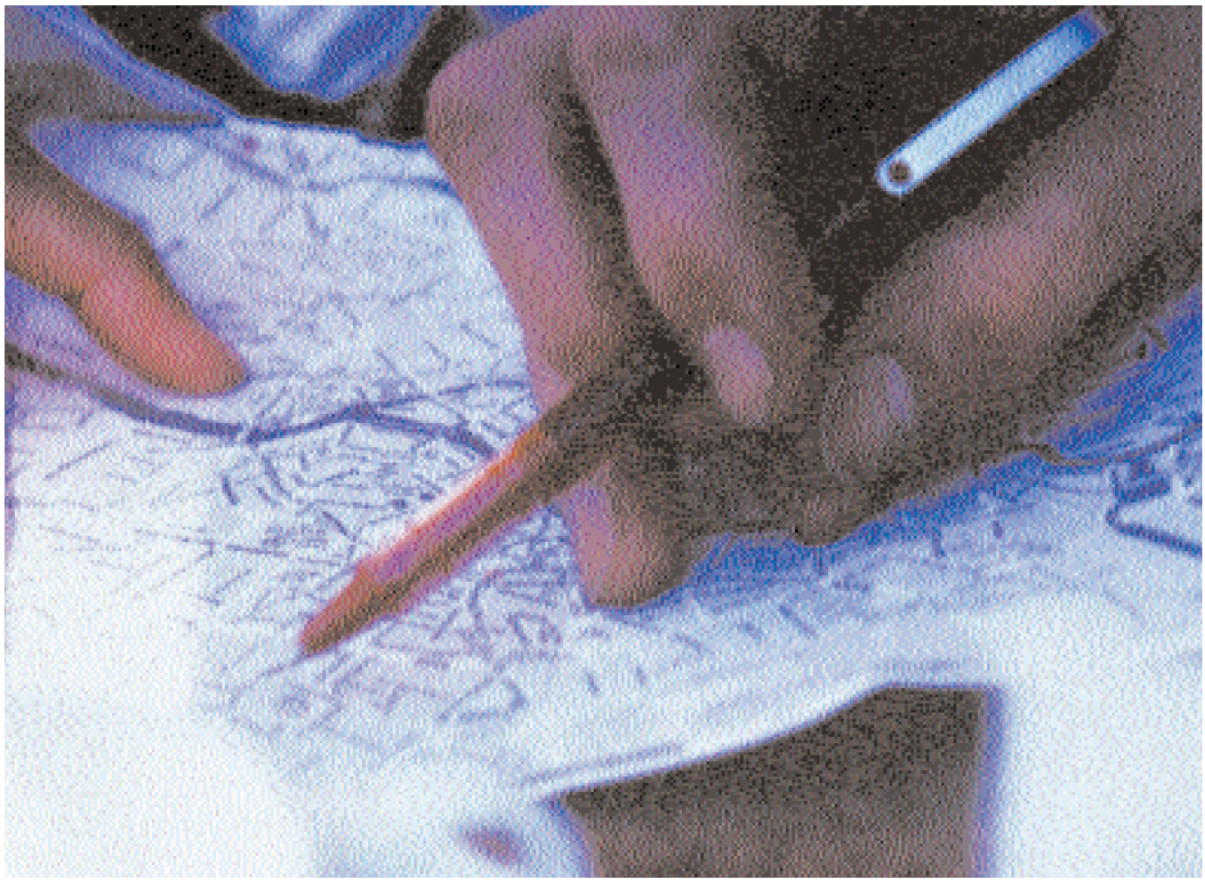
By accounting for these indirect emissions and looking for associated reduction opportunities, IBM has successfully reduced an important source of its overall GHG emissions.

Public reporting and participation in voluntary GHG programs

As concerns over climate change grow, NGOs, investors, and other stakeholders are increasingly calling for greater corporate disclosure of GHG information. They are interested in the actions companies are taking and in how the companies are positioned relative to their competitors in the face of emerging regulations. In response, a growing number of companies are preparing stakeholder reports containing information on GHG emissions. These may be stand-alone reports on GHG emissions or broader environmental or sustainability reports. For example, companies preparing sustainability reports using the Global Reporting Initiative guidelines should include information on GHG emissions in accordance with the GHG Protocol Corporate Standard (GRI, 2002). Public reporting can also strengthen relationships with other stakeholders. For instance, companies can improve their standing with customers and with the public by being recognized for participating in voluntary GHG programs.

Some countries and states have established GHG registries where companies can report GHG emissions in a public database. Registries may be administered by governments (e.g., U.S. Department of Energy 1605b Voluntary Reporting Program), NGOs (e.g., California Climate Action Registry), or industry groups (e.g., World Economic Forum Global GHG Registry). Many GHG programs also provide help to companies setting voluntary GHG targets.

Most voluntary GHG programs permit or require the reporting of direct emissions from operations (including all six GHGs), as well as indirect GHG emissions from purchased electricity. A GHG inventory prepared in accordance with the GHG Protocol Corporate Standard will usually be compatible with most requirements (Appendix C provides an overview of the reporting requirements of some GHG programs). However, since the accounting guidelines of many voluntary programs are periodically updated, companies planning to participate are advised to contact the program administrator to check the current requirements.



Participating in mandatory reporting programs

Some governments require GHG emitters to report their emissions annually. These typically focus on direct emissions from operations at operated or controlled facilities in specific geographic jurisdictions. In Europe, facilities falling under the requirements of the Integrated Pollution Prevention and Control (IPPC) Directive must report emissions exceeding a specified threshold for each of the six GHGs. The reported emissions are included in a European Pollutant Emissions Register (EPER), a publicly accessible internet-based database that permits comparisons of emissions from individual facilities or industrial sectors in different countries (EC-DGE, 2000). In Ontario, Ontario Regulation 127 requires the reporting of GHG emissions (Ontario MOE, 2001).

Participating in GHG markets

Market-based approaches to reducing GHG emissions are emerging in some parts of the world. In most places, they take the form of emissions trading programs, although there are a number of other approaches adopted by countries, such as the taxation approach used in Norway. Trading programs can be implemented on a mandatory (e.g., the forthcoming EU ETS) or voluntary basis (e.g., CCX).

Although trading programs, which determine compliance by comparing emissions with an emissions reduction target or cap, typically require accounting only for direct emissions, there are exceptions. The UK ETS, for example, requires direct entry participants to account for GHG emissions from the generation of purchased electricity (DEFRA, 2003). The CCX allows its members the option of counting indirect emissions associated with electricity purchases as a supplemental reduction commitment. Other types of indirect emissions can be more difficult to verify and may present challenges in terms of avoiding double counting. To facilitate independent verification, emissions trading

may require participating companies to establish an audit trail for GHG information (see chapter 10).

GHG trading programs are likely to impose additional layers of accounting specificity relating to which approach is used for setting organizational boundaries; which GHGs and sources are addressed; how base years are established; the type of calculation methodology used; the choice of emission factors; and the monitoring and verification approaches employed. The broad participation and best practices incorporated into the GHG Protocol Corporate Standard are likely to inform the accounting requirements of emerging programs, and have indeed done so in the past.

Recognition for early voluntary action

A credible inventory may help ensure that a corporation's early, voluntary emissions reductions are recognized in future regulatory programs. To illustrate, suppose that in 2000 a company started reducing its GHG emissions by shifting its on-site powerhouse boiler fuel from coal to landfill gas. If a mandatory GHG reduction program is later established in 2005 and it sets 2003 as the base against which reductions are to be measured, the program might not allow the emissions reductions achieved by the green power project prior to 2003 to count toward its target.

However, if a company's voluntary emissions reductions have been accounted for and registered, they are more likely to be recognized and taken into account when regulations requiring reductions go into effect. For instance, the state of California has stated that it will use its best efforts to ensure that organizations that register certified emission results with the California Climate Action Registry receive appropriate consideration under any future international, federal, or state regulatory program relating to GHG emissions.

Tata Steel: Development of institutional capacity in GHG accounting and reporting

For Tata Steel, Asia's first and India's largest integrated private sector steel company, reducing its GHG emissions through energy efficiency is a key element of its primary business goal: the acceptability of its product in international markets. Each year, in pursuit of this goal, the company launches several energy efficiency projects and introduces less-GHG-intensive processes. The company is also actively pursuing GHG trading markets as a means of further improving its GHG performance. To succeed in these efforts and be eligible for emerging trading schemes, Tata Steel must have an accurate GHG inventory that includes all processes and activities, allows for meaningful benchmarking, measures improvements, and promotes credible reporting.

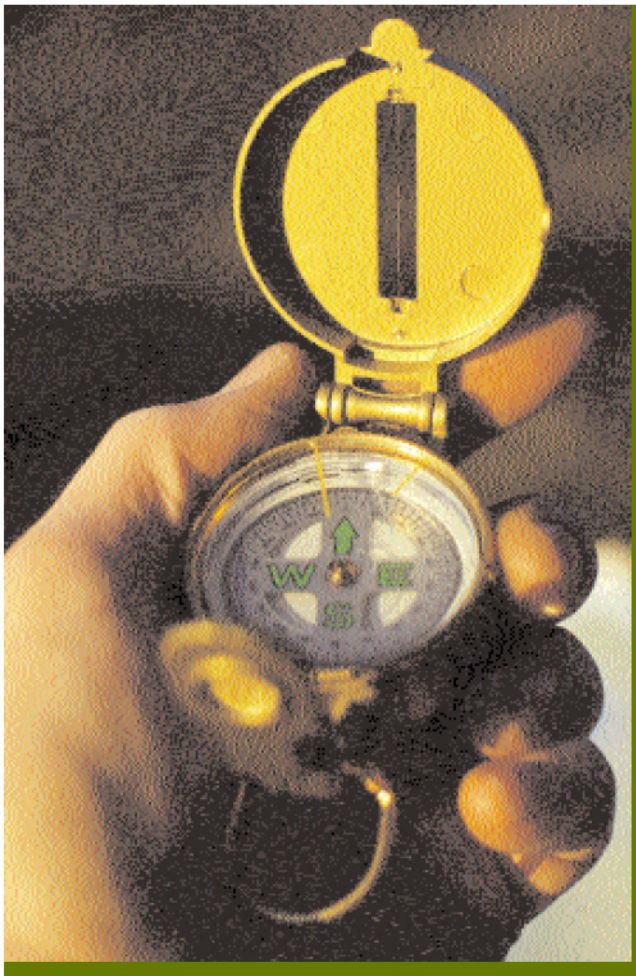
Tata Steel has developed the capacity to measure its progress in reducing GHG emissions. Tata Steel's managers have access to on-line information on energy usage, material usage, waste and byproduct generation, and other material streams. Using this data and the GHG Protocol calculation tools, Tata Steel generates two key long-term, strategic performance indicators: specific energy consumption (Giga calorie/tonne of crude steel) and GHG intensity (tonne of CO_2equivalent/tonne of crude steel). These indicators are key sustainability metrics in the steel sector worldwide, and help ensure market acceptability and competitiveness. Since the company adopted the *GHG Protocol Corporate Standard*, tracking performance has become more structured and streamlined. This system allows Tata Steel quick and easy access to its GHG inventory and helps the company maximize process and material flow efficiencies.

Ford Motor Company: Experiences using the *GHG Protocol Corporate Standard*

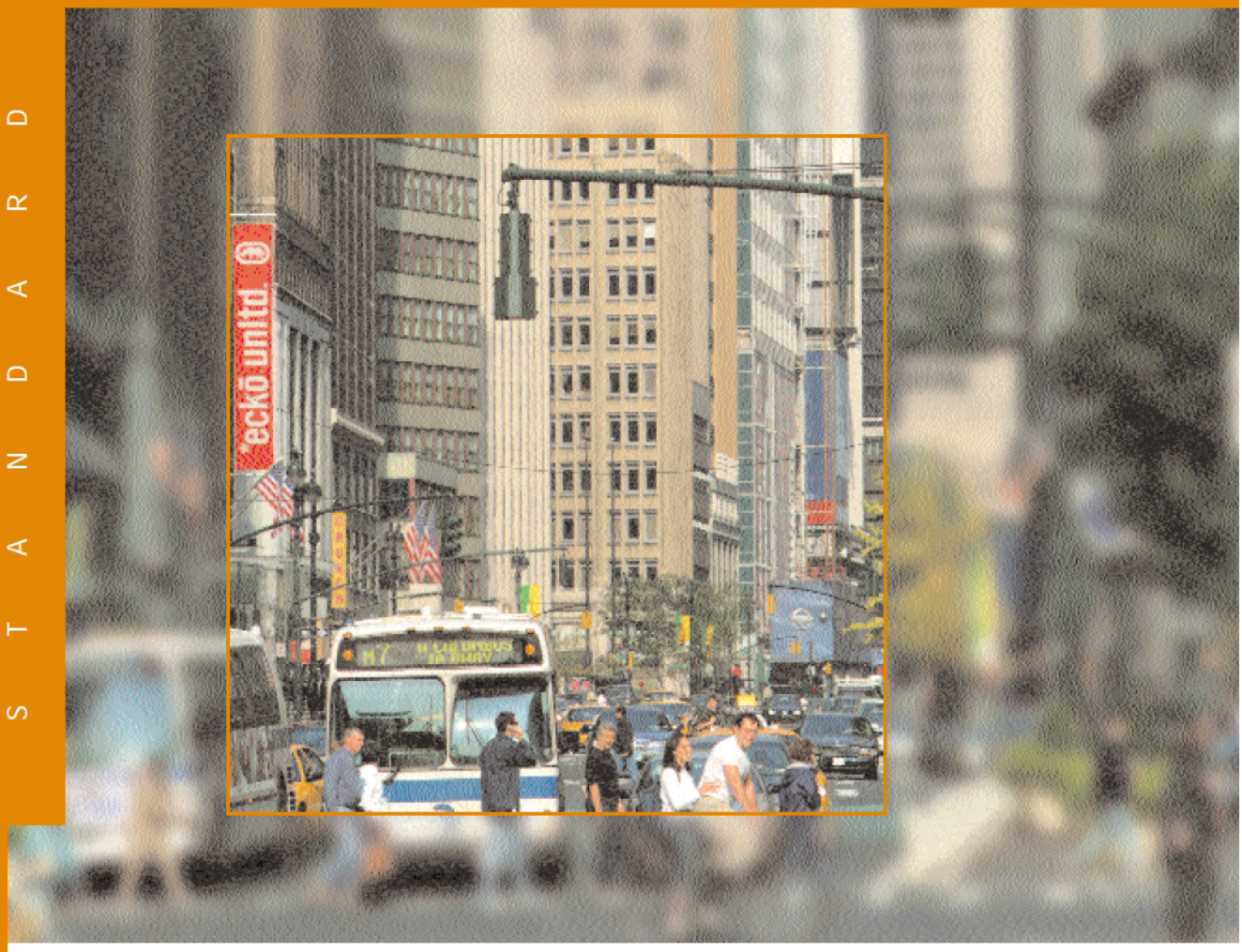
When Ford Motor Company, a global automaker, embarked on an effort to understand and reduce its GHG impacts, it wanted to track emissions with enough accuracy and detail to manage them effectively. An internal cross-functional GHG inventory team was formed to accomplish this goal. Although the company was already reporting basic energy and carbon dioxide data at the corporate level, a more detailed understanding of these emissions was essential to set and measure progress against performance targets and evaluate potential participation in external trading schemes.

For several weeks, the team worked on creating a more comprehensive inventory for stationary combustion sources, and quickly found a pattern emerging. All too often team members left meetings with as many questions as answers, and the same questions kept coming up from one week to the next. How should they draw boundaries? How do they account for acquisitions and divestitures? What emission factors should be used? And perhaps most importantly, how could their methodology be deemed credible with stakeholders? Although the team had no shortage of opinions, there also seemed to be no clearly right or wrong answers.

The *GHG Protocol Corporate Standard* helped answer many of these questions and the Ford Motor Company now has a more robust GHG inventory that can be continually improved to fulfill its rapidly emerging GHG management needs. Since adopting the *GHG Protocol Corporate Standard*, Ford has expanded the coverage of its public reporting to all of its brands globally; it now includes direct emissions from sources it owns or controls and indirect emissions resulting from the generation of purchased electricity, heat, or steam. In addition, Ford is a founding member of the Chicago Climate Exchange, which uses some of the *GHG Protocol* calculation tools for emissions reporting purposes.



3 Setting Organizational Boundaries



Business operations vary in their legal and organizational structures; they include wholly owned operations, incorporated and non-incorporated joint ventures, subsidiaries, and others. For the purposes of financial accounting, they are treated according to established rules that depend on the structure of the organization and the relationships among the parties involved. In setting organizational boundaries, a company selects an approach for consolidating GHG emissions and then consistently applies the selected approach to define those businesses and operations that constitute the company for the purpose of accounting and reporting GHG emissions.

For corporate reporting, two distinct approaches can be used to consolidate GHG emissions: the equity share and the control approaches. Companies shall account for and report their consolidated GHG data according to either the equity share or control approach as presented below. If the reporting company wholly owns all its operations, its organizational boundary will be the same whichever approach is used.[1] For companies with joint operations, the organizational boundary and the resulting emissions may differ depending on the approach used. In both wholly owned and joint operations, the choice of approach may change how emissions are categorized when operational boundaries are set (see chapter 4).

Equity share approach

Under the equity share approach, a company accounts for GHG emissions from operations according to its share of equity in the operation. The equity share reflects economic interest, which is the extent of rights a company has to the risks and rewards flowing from an operation. Typically, the share of economic risks and rewards in an operation is aligned with the company's percentage ownership of that operation, and equity share will normally be the same as the ownership percentage. Where this is not the case, the economic substance of the relationship the company has with the operation always overrides the legal ownership form to ensure that equity share reflects the percentage of economic interest. The principle of economic substance taking precedent over legal form is consistent with international financial reporting standards. The staff preparing the inventory may therefore need to consult with the company's accounting or legal staff to ensure that the appropriate equity share percentage is applied for each joint operation (see Table 1 for definitions of financial accounting categories).



Control approach

Under the control approach, a company accounts for 100 percent of the GHG emissions from operations over which it has control. It does not account for GHG emissions from operations in which it owns an interest but has no control. Control can be defined in either financial or operational terms. When using the control approach to consolidate GHG emissions, companies shall choose between either the operational control or financial control criteria.

In most cases, whether an operation is controlled by the company or not does not vary based on whether the financial control or operational control criterion is used. A notable exception is the oil and gas industry, which often has complex ownership / operatorship structures. Thus, the choice of control criterion in the oil and gas industry can have substantial consequences for a company's GHG inventory. In making this choice, companies should take into account how GHG emissions accounting and reporting can best be geared to the requirements of emissions reporting and trading schemes, how it can be aligned with financial and environmental reporting, and which criterion best reflects the company's actual power of control.

- Financial Control. The company has financial control over the operation if the former has the ability to direct the financial and operating policies of the latter with a view to gaining economic benefits from its activities.[2] For example, financial control usually exists if the company has the right to the majority of benefits of the operation, however these rights are conveyed. Similarly, a company is considered to financially control an operation if it retains the majority risks and rewards of ownership of the operation's assets.

  Under this criterion, the economic substance of the relationship between the company and the operation takes precedence over the legal ownership status, so that the company may have financial control over the operation even if it has less than a 50 percent interest in that operation. In assessing the economic substance of the relationship, the impact of potential voting rights, including both those held by the company and those held by other parties, is also taken into account. This criterion is consistent with international financial accounting standards; therefore, a company has financial control over an operation for GHG accounting purposes if the operation is considered as a group company or subsidiary for the purpose of financial

consolidation, i.e., if the operation is fully consolidated in financial accounts. If this criterion is chosen to determine control, emissions from joint ventures where partners have joint financial control are accounted for based on the equity share approach (see Table 1 for definitions of financial accounting categories).

- Operational Control. A company has operational control over an operation if the former or one of its subsidiaries (see Table 1 for definitions of financial accounting categories) has the full authority to introduce and implement its operating policies at the operation. This criterion is consistent with the current accounting and reporting practice of many companies that report on emissions from facilities, which they operate (i.e., for which they hold the operating license). It is expected that except in very rare circumstances, if the company or one of its subsidiaries is the operator of a facility, it will have the full authority to introduce and implement its operating policies and thus has operational control.

  Under the operational control approach, a company accounts for 100% of emissions from operations over which it or one of its subsidiaries has operational control.

  It should be emphasized that having operational control does not mean that a company necessarily has authority to make all decisions concerning an operation. For example, big capital investments will likely require the approval of all the partners that have joint financial control. Operational control does mean that a company has the authority to introduce and implement its operating policies.

  More information on the relevance and application of the operational control criterion is provided in petroleum industry guidelines for reporting GHG emissions (IPIECA, 2003).

Sometimes a company can have joint financial control over an operation, but not operational control. In such cases, the company would need to look at the contractual arrangements to determine whether any one of the partners has the authority to introduce and implement its operating policies at the operation and thus has the responsibility to report emissions under operational control. If the operation itself will introduce and implement its own operating policies, the partners with joint financial control over the operation will not report any emissions under operational control.

Table 2 in the guidance section of this chapter illustrates the selection of a consolidation approach at the corporate level and the identification of which joint operations will be in the organizational boundary depending on the choice of the consolidation approach.

Consolidation at multiple levels

The consolidation of GHG emissions data will only result in consistent data if all levels of the organization follow the same consolidation policy. In the first step, the management of the parent company has to decide on a consolidation approach (i.e., either the equity share or the financial or operational control approach). Once a corporate consolidation policy has been selected, it shall be applied to all levels of the organization.

State-ownership

The rules provided in this chapter shall also be applied to account for GHG emissions from industry joint operations that involve state ownership or a mix of private/state ownership.

BP: Reporting on the basis of equity share

BP reports GHG emissions on an equity share basis, including those operations where BP has an interest, but where BP is not the operator. In determining the extent of the equity share reporting boundary BP seeks to achieve close alignment with financial accounting procedures. BP's equity share boundary includes all operations undertaken by BP and its subsidiaries, joint ventures and associated undertakings as determined by their treatment in the financial accounts. Fixed asset investments, i.e., where BP has limited influence, are not included.

GHG emissions from facilities in which BP has an equity share are estimated according to the requirements of the BP Group Reporting Guidelines for Environmental Performance (BP 2000). In those facilities where BP has an equity share but is not the operator, GHG emissions data may be obtained directly from the operating company using a methodology consistent with the BP Guidelines, or is calculated by BP using activity data provided by the operator.

BP reports its equity share GHG emissions every year. Since 2000, independent external auditors have expressed the opinion that the reported total has been found to be free from material misstatement when audited against the BP Guidelines.

TABLE 1. **Financial accounting categories**

ACCOUNTING CATEGORY	FINANCIAL ACCOUNTING DEFINITION	ACCOUNTING FOR GHG EMISSIONS ACCORDING TO *GHG PROTOCOL CORPORATE STANDARD*	
		BASED ON EQUITY SHARE	BASED ON FINANCIAL CONTROL
Group companies / subsidiaries	The parent company has the ability to direct the financial and operating policies of the company with a view to gaining economic benefits from its activities. Normally, this category also includes incorporated and non-incorporated joint ventures and partnerships over which the parent company has financial control. Group companies/subsidiaries are fully consolidated, which implies that 100 percent of the subsidiary's income, expenses, assets, and liabilities are taken into the parent company's profit and loss account and balance sheet, respectively. Where the parent's interest does not equal 100 percent, the consolidated profit and loss account and balance sheet shows a deduction for the profits and net assets belonging to minority owners.	Equity share of GHG emissions	100% of GHG emissions
Associated / affiliated companies	The parent company has significant influence over the operating and financial policies of the company, but does not have financial control. Normally, this category also includes incorporated and non-incorporated joint ventures and partnerships over which the parent company has significant influence, but not financial control. Financial accounting applies the equity share method to associated/affiliated companies, which recognizes the parent company's share of the associate's profits and net assets.	Equity share of GHG emissions	0% of GHG emissions
Non-incorporated joint ventures / partnerships / operations where partners have joint financial control	Joint ventures/partnerships/operations are proportionally consolidated, i.e., each partner accounts for their proportionate interest of the joint venture's income, expenses, assets, and liabilities.	Equity share of GHG emissions	Equity share of GHG emissions
Fixed asset investments	The parent company has neither significant influence nor financial control. This category also includes incorporated and non-incorporated joint ventures and partnerships over which the parent company has neither significant influence nor financial control. Financial accounting applies the cost/dividend method to fixed asset investments. This implies that only dividends received are recognized as income and the investment is carried at cost.	0%	0%
Franchises	Franchises are separate legal entities. In most cases, the franchiser will not have equity rights or control over the franchise. Therefore, franchises should not be included in consolidation of GHG emissions data. However, if the franchiser does have equity rights or operational/financial control, then the same rules for consolidation under the equity or control approaches apply.	Equity share of GHG emissions	100% of GHG emissions

NOTE: Table 1 is based on a comparison of UK, US, Netherlands and International Financial Reporting Standards (KPMG, 2000).

Setting Organizational Boundaries

When planning the consolidation of GHG data, it is important to distinguish between GHG accounting and GHG reporting. GHG accounting concerns the recognition and consolidation of GHG emissions from operations in which a parent company holds an interest (either control or equity) and linking the data to specific operations, sites, geographic locations, business processes, and owners. GHG reporting, on the other hand, concerns the presentation of GHG data in formats tailored to the needs of various reporting uses and users.

Most companies have several goals for GHG reporting, e.g., official government reporting requirements, emissions trading programs, or public reporting (see chapter 2). In developing a GHG accounting system, a fundamental consideration is to ensure that the system is capable of meeting a range of reporting requirements. Ensuring that data are collected and recorded at a sufficiently disaggregated level, and capable of being consolidated in various forms, will provide companies with maximum flexibility to meet a range of reporting requirements.

Double counting

When two or more companies hold interests in the same joint operation and use different consolidation approaches (e.g., Company A follows the equity share approach while Company B uses the financial control approach), emissions from that joint operation could be double counted. This may not matter for voluntary corporate public reporting as long as there is adequate disclosure from the company on its consolidation approach. However, double counting of emissions needs to be avoided in trading schemes and certain mandatory government reporting programs.

Reporting goals and level of consolidation

Reporting requirements for GHG data exist at various levels, from a specific local facility level to a more aggregated corporate level. Examples of drivers for various levels of reporting include:

- Official government reporting programs or certain emissions trading programs may require GHG data to be reported at a facility level. In these cases, consolidation of GHG data at a corporate level is not relevant
- Government reporting and trading programs may require that data be consolidated within certain geographic and operational boundaries (e.g., the U.K. Emissions Trading Scheme)
- To demonstrate the company's account to wider stakeholders, companies may engage in voluntary public reporting, consolidating GHG data at a corporate level in order to show the GHG emissions of their entire business activities.

Contracts that cover GHG emissions

To clarify ownership (rights) and responsibility (obligations) issues, companies involved in joint operations may draw up contracts that specify how the ownership of emissions or the responsibility for managing emissions and associated risk is distributed between the parties. Where such arrangements exist, companies may optionally provide a description of the contractual arrangement and include information on allocation of CO_2 related risks and obligations (see Chapter 9).

Using the equity share or control approach

Different inventory reporting goals may require different data sets. Thus companies may need to account for their GHG emissions using both the equity share and the control approaches. The GHG Protocol Corporate Standard makes no recommendation as to whether voluntary public GHG emissions reporting should be based on the equity share or any of the two control approaches, but encourages companies to account for their emissions applying the equity share and a control approach separately. Companies need to decide on the approach best suited to their business activities and GHG accounting and reporting requirements. Examples of how these may drive the choice of approach include the following:

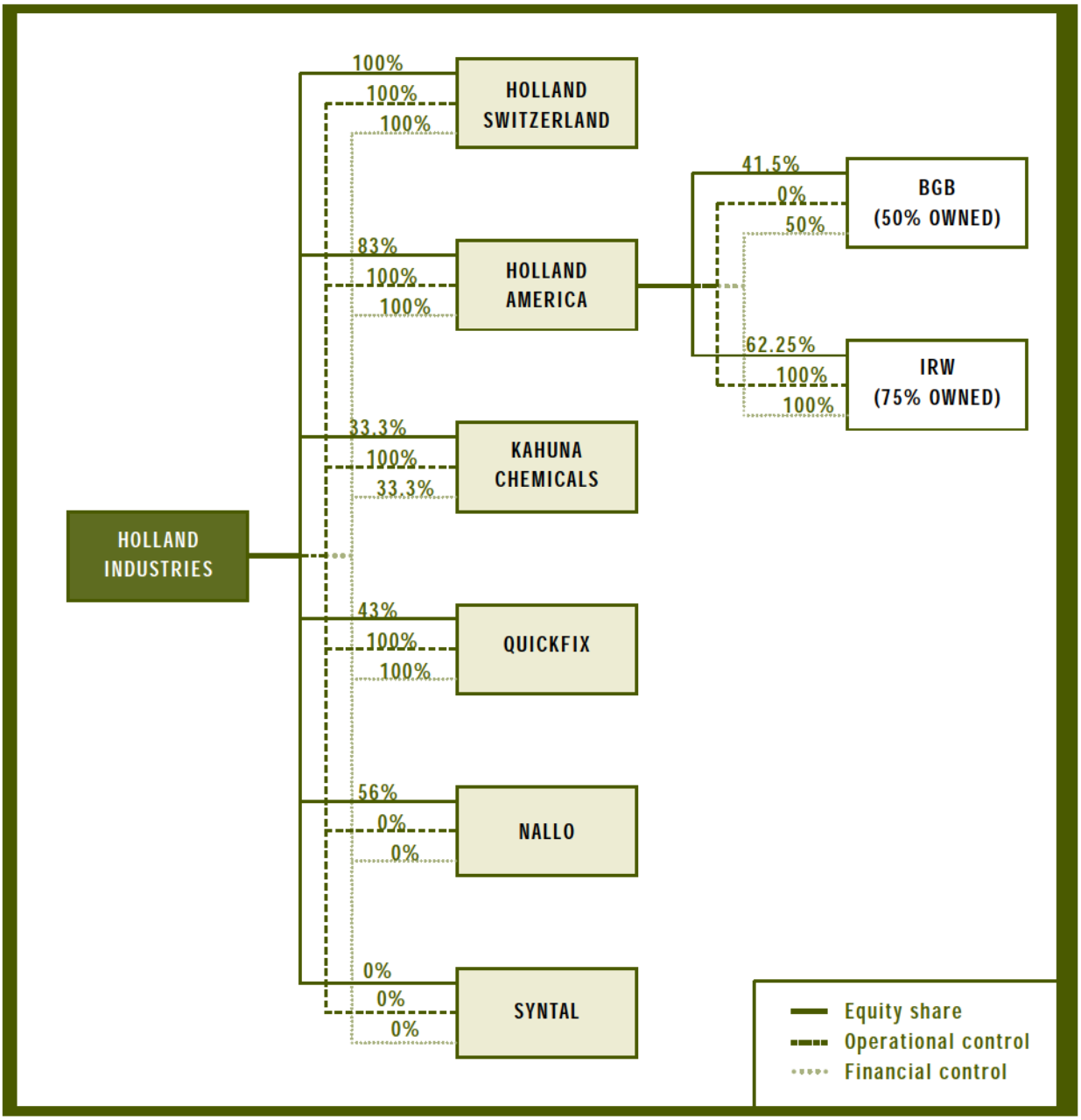
- Reflection of commercial reality. It can be argued that a company that derives an economic profit from a certain activity should take ownership for any GHG emissions generated by the activity. This is achieved by using the equity share approach, since this approach assigns ownership for GHG emissions on the basis of economic interest in a business activity. The control approaches do not always reflect the full GHG emissions portfolio of a company's business activities, but have the advantage that a company takes full ownership of all GHG emissions that it can directly influence and reduce.

- Government reporting and emissions trading programs. Government regulatory programs will always need to monitor and enforce compliance. Since compliance responsibility generally falls to the operator (not equity holders or the group company that has financial control), governments will usually require reporting on the basis of operational control, either through a facility level-based system or involving the consolidation of data within certain geographical boundaries (e.g. the EU ETS will allocate emission permits to the operators of certain installations).
- Liability and risk management. While reporting and compliance with regulations will most likely continue to be based directly on operational control, the ultimate financial liability will often rest with the group company that holds an equity share in the operation or has financial control over it. Hence, for assessing risk, GHG reporting on the basis of the equity share and financial control approaches provides a more complete picture. The equity share approach is likely to result in the most comprehensive coverage of liability and risks. In the future, companies might incur liabilities for GHG emissions produced by joint operations in which they have an interest, but over which they do not have financial control. For example, a company that is an equity shareholder in an operation but has no financial control over it might face demands by the companies with a controlling share to cover its requisite share of GHG compliance costs.
- Alignment with financial accounting. Future financial accounting standards may treat GHG emissions as liabilities and emissions allowances/credits as assets. To assess the assets and liabilities a company creates by its joint operations, the same consolidation rules that are used in financial accounting should be applied in GHG accounting. The equity share and financial control approaches result in closer alignment between GHG accounting and financial accounting.
- Management information and performance tracking. For the purpose of performance tracking, the control approaches seem to be more appropriate since managers can only be held accountable for activities under their control.
- Cost of administration and data access. The equity share approach can result in higher administrative costs than the control approach, since it can be difficult and time consuming to collect GHG emissions data from joint operations not under the control of the reporting company. Companies are likely to have better access to operational data and therefore greater ability to ensure that it meets minimum quality standards when reporting on the basis of control.
- Completeness of reporting. Companies might find it difficult to demonstrate completeness of reporting when the operational control criterion is adopted, since there are unlikely to be any matching records or lists of financial assets to verify the operations that are included in the organizational boundary.

Royal Dutch/Shell: Reporting on the basis of operational control

In the oil and gas industry, ownership and control structures are often complex. A group may own less than 50 percent of a venture's equity capital but have operational control over the venture. On the other hand, in some situations, a group may hold a majority interest in a venture without being able to exert operational control, for example, when a minority partner has a veto vote at the board level. Because of these complex ownership and control structures, Royal Dutch/Shell, a global group of energy and petrochemical companies, has chosen to report its GHG emissions on the basis of operational control. By reporting 100 percent of GHG emissions from all ventures under its operational control, irrespective of its share in the ventures' equity capital, Royal Dutch/Shell can ensure that GHG emissions reporting is in line with its operational policy including its Health, Safety and Environmental Performance Monitoring and Reporting Guidelines. Using the operational control approach, the group generates data that is consistent, reliable, and meets its quality standards.

FIGURE 1. **Defining the organizational boundary of Holland Industries**



AN ILLUSTRATION: THE EQUITY SHARE AND CONTROL APPROACHES

Holland Industries is a chemicals group comprising a number of companies/joint ventures active in the production and marketing of chemicals. Table 2 outlines the organizational structure of Holland Industries and shows how GHG emissions from the various wholly owned and joint operations are accounted for under both the equity share and control approaches.

In setting its organizational boundary, Holland Industries first decides whether to use the equity or control approach for consolidating GHG data at the corporate level. It then determines which operations at the corporate level meet its selected consolidation approach. Based on the selected consolidation approach, the consolidation process is repeated for each lower operational level. In this process, GHG emissions are first apportioned at the lower operational level (subsidiaries, associate, joint ventures, etc.) before they are consolidated at the corporate level. Figure 1 presents the organizational boundary of Holland Industries based on the equity share and control approaches.

TABLE 2. Holland Industries - organizational structure and GHG emissions accounting

WHOLLY OWNED AND JOINT OPERATIONS OF HOLLAND	LEGAL STRUCTURE AND PARTNERS	ECONOMIC INTEREST HELD BY HOLLAND INDUSTRIES	CONTROL OF OPERATING POLICIES	TREATMENT IN HOLLAND INDUSTRIES' FINANCIAL ACCOUNTS (SEE TABLE 1)	EMISSIONS ACCOUNTED FOR AND REPORTED BY HOLLAND INDUSTRIES	
					EQUITY SHARE APPROACH	CONTROL APPROACH
Holland Switzerland	Incorporated company	100%	Holland Industries	Wholly owned subsidiary	100%	100% for operational control 100% for financial control
Holland America	Incorporated company	83%	Holland Industries	Subsidiary	83%	100% for operational control 100% for financial control
BGB	Joint venture, partners have joint financial control other partner Rearden	50% by Holland America	Rearden	via Holland America	41.5% (83% x 50%)	0% for operational control 50% for financial control (50% x 100%)
IRW	Subsidiary of Holland America	75% by Holland America	Holland America	via Holland America	62.25% (83% x 75%)	100% for operational control 100% for financial control
Kahuna Chemicals	Non-incorporated joint venture; partners have joint financial control; two other partners: ICT and BCSF	33.3%	Holland Industries	Proportionally consolidated joint venture	33.3%	100% for operational control 33.3% for financial control
QuickFix	Incorporated joint venture, other partner Majox	43%	Holland Industries	Subsidiary (Holland Industries has financial control since it treats Quick Fix as a subsidiary in its financial accounts)	43%	100% for operational control 100% for financial control
Nallo	Incorporated joint venture, other partner Nagua Co.	56%	Nallo	Associated company (Holland Industries does not have financial control since it treats Nallo as an Associated company in its financial accounts)	56%	0% for operational control 0% for financial control
Syntal	Incorporated company, subsidiary of Erewhon Co.	1%	Erewhon Co.	Fixed asset investment	0%	0% for operational control 0% for financial control

In this example, Holland America (not Holland Industries) holds a 50 percent interest in BGB and a 75 percent interest in IRW. If the activities of Holland Industries itself produce GHG emissions (e.g., emissions associated with electricity use at the head office), then these emissions should also be included in the consolidation at 100 percent.

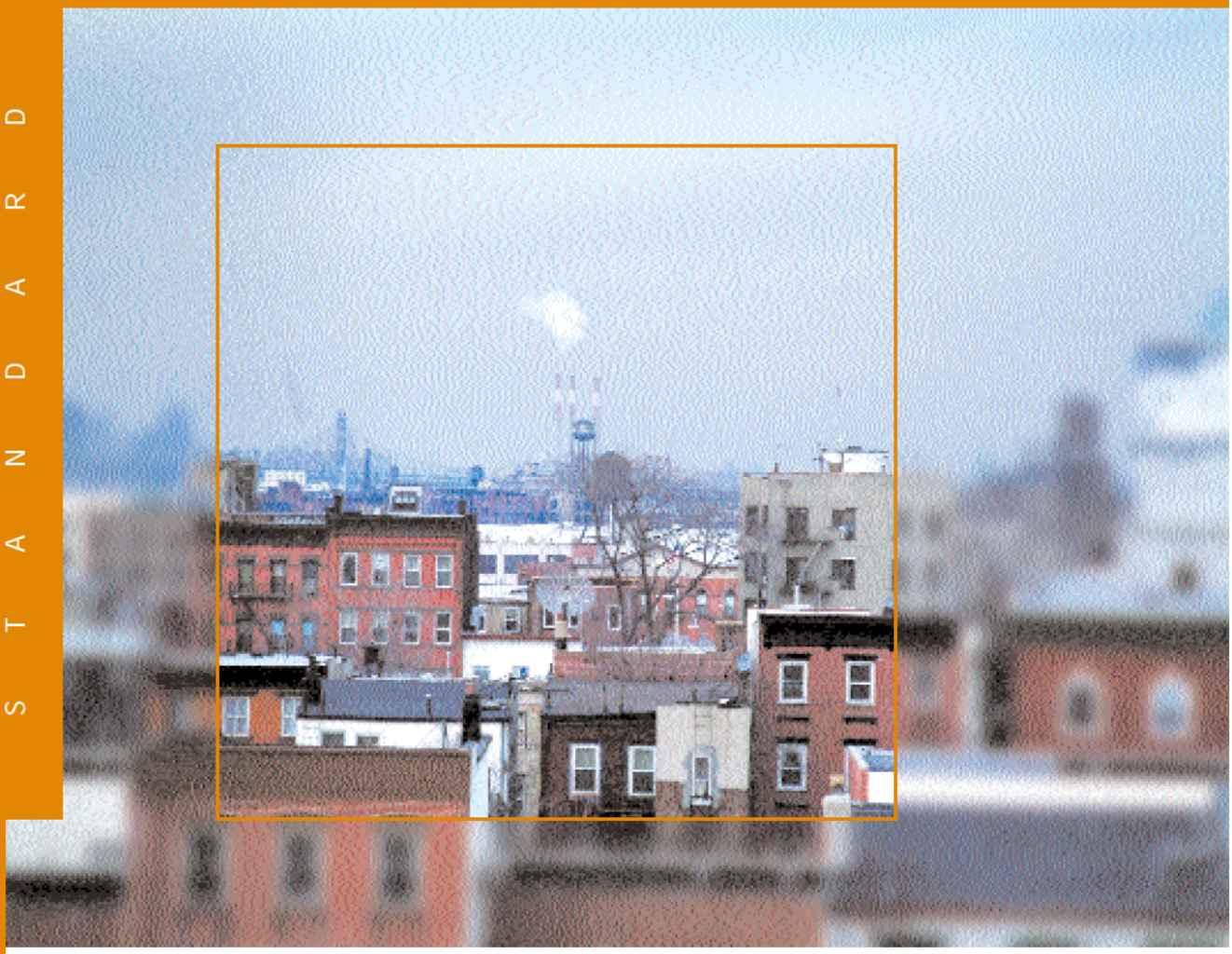
NOTES

[1] The term "operations" is used here as a generic term to denote any kind of business activity, irrespective of its organizational, governance, or legal structures.

[2] Financial accounting standards use the generic term "control" for what is denoted as "financial control" in this chapter.

4 Setting Operational Boundaries

STANDARD



After a company has determined its organizational boundaries in terms of the operations that it owns or controls, it then sets its operational boundaries. This involves identifying emissions associated with its operations, categorizing them as direct and indirect emissions, and choosing the scope of accounting and reporting for indirect emissions.

STANDARD GUIDANCE

For effective and innovative GHG management, setting operational boundaries that are comprehensive with respect to direct and indirect emissions will help a company better manage the full spectrum of GHG risks and opportunities that exist along its value chain.

Direct GHG emissions are emissions from sources that are owned or controlled by the company.[1]

Indirect GHG emissions are emissions that are a consequence of the activities of the company but occur at sources owned or controlled by another company.

What is classified as direct and indirect emissions is dependent on the consolidation approach (equity share or control) selected for setting the organizational boundary (see chapter 3). Figure 2 below shows the relationship between the organizational and operational boundaries of a company.

Introducing the concept of "scope"

To help delineate direct and indirect emission sources, improve transparency, and provide utility for different types of organizations and different types of climate policies and business goals, three "scopes" (scope 1, scope 2, and scope 3) are defined for GHG accounting and reporting purposes. Scopes 1 and 2 are carefully defined in this standard to ensure that two or more companies will not account for emissions in the same scope. This makes the scopes amenable for use in GHG programs where double counting matters.

Companies shall separately account for and report on scopes 1 and 2 at a minimum.

Scope 1: Direct GHG emissions

Direct GHG emissions occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.

Direct CO_2 emissions from the combustion of biomass shall not be included in scope 1 but reported separately (see chapter 9).

GHG emissions not covered by the Kyoto Protocol, e.g. CFCs, NOx, etc. shall not be included in scope 1 but may be reported separately (see chapter 9).

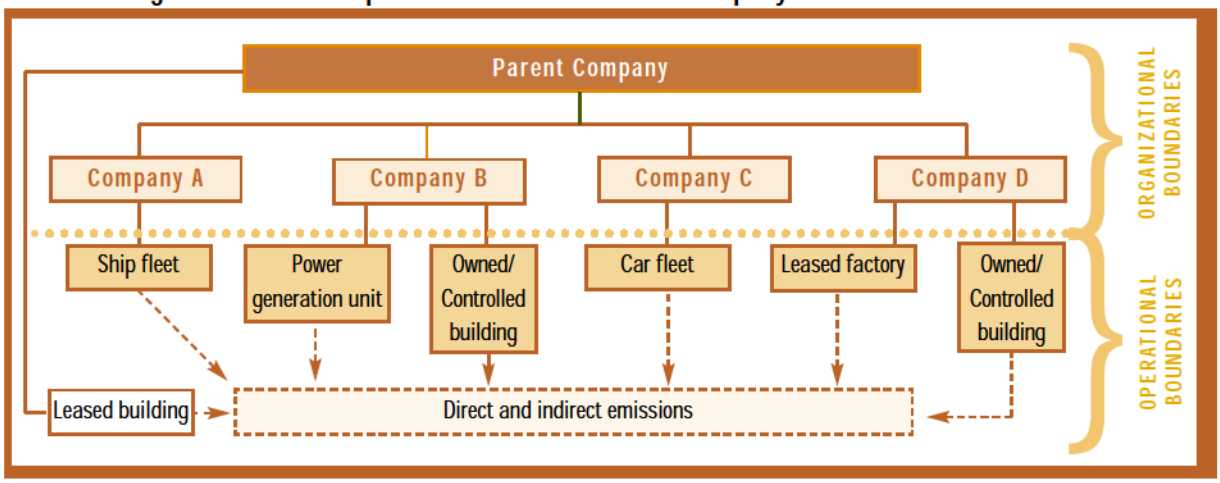
Scope 2: Electricity indirect GHG emissions

Scope 2 accounts for GHG emissions from the generation of purchased electricity[2] consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.

Scope 3: Other indirect GHG emissions

Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.

FIGURE 2. **Organizational and operational boundaries of a company**



STANDARD

Setting Operational Boundaries

An operational boundary defines the scope of direct and indirect emissions for operations that fall within a company's established organizational boundary. The operational boundary (scope 1, scope 2, scope 3) is decided at the corporate level after setting the organizational boundary. The selected operational boundary is then uniformly applied to identify and categorize direct and indirect emissions at each operational level (see Box 2). The established organizational and operational boundaries together constitute a company's inventory boundary.

BOX 2. Organizational and operational boundaries

Organization X is a parent company that has full ownership and financial control of operations A and B, but only a 30% non-operated interest and no financial control in operation C.

Setting Organizational Boundary: X would decide whether to account for GHG emissions by equity share or financial control. If the choice is equity share, X would include A and B, as well as 30% of C's emissions. If the approach chosen is financial control, X would count only A and B's emissions as relevant and subject to consolidation. Once this has been decided, the organizational boundary has been defined.

Setting Operational Boundary: Once the organizational boundary is set, X then needs to decide, on the basis of its business goals, whether to account only for scope 1 and scope 2, or whether to include relevant scope 3 categories for its operations.

Operations A, B and C (if the equity approach is selected) account for the GHG emissions in the scopes chosen by X, i.e., they apply the corporate policy in drawing up their operational boundaries.

Accounting and reporting on scopes

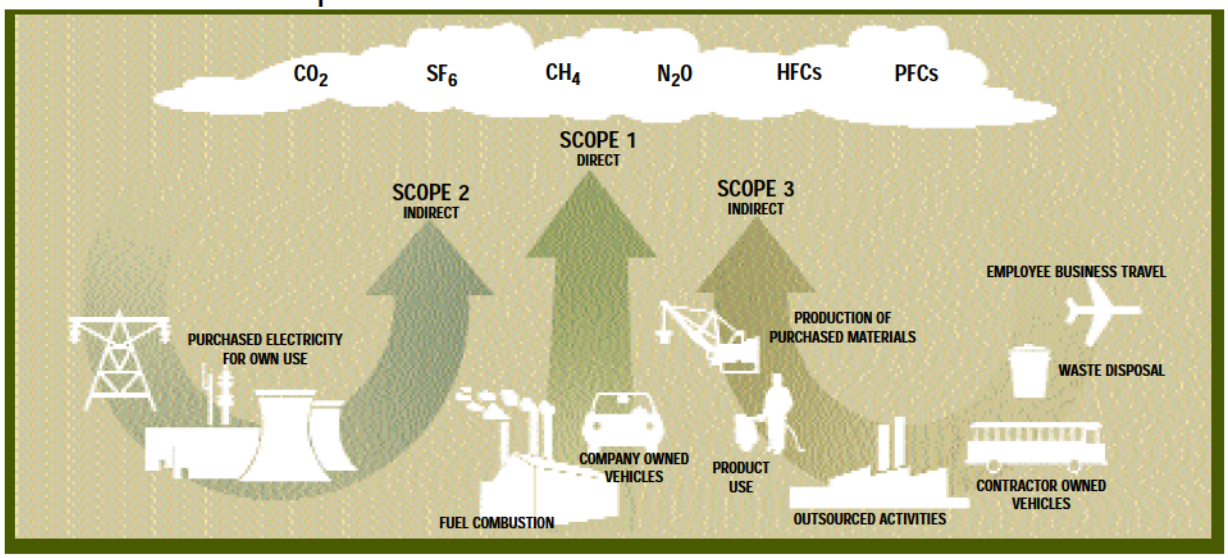
Companies account for and report emissions from scope 1 and 2 separately. Companies may further subdivide emissions data within scopes where this aids transparency or facilitates comparability over time. For example, they may subdivide data by business unit/facility, country, source type (stationary combustion, process, fugitive, etc.), and activity type (production of electricity, consumption of electricity, generation or purchased electricity that is sold to end users, etc.).

In addition to the six Kyoto gases, companies may also provide emissions data for other GHGs (e.g., Montreal Protocol gases) to give context to changes in emission levels of Kyoto Protocol gases. Switching from a CFC to HFC, for example, will increase emissions of Kyoto Protocol gases. Information on emissions of GHGs other than the six Kyoto gases may be reported separately from the scopes in a GHG public report.

Together the three scopes provide a comprehensive accounting framework for managing and reducing direct and indirect emissions. Figure 3 provides an overview of the relationship between the scopes and the activities that generate direct and indirect emissions along a company's value chain.

A company can benefit from efficiency gains throughout the value chain. Even without any policy drivers, accounting for GHG emissions along the value chain may reveal potential for greater efficiency and lower costs (e.g., the use of fly ash as a clinker substitute in the manufacture of cement that reduces downstream emissions from processing of waste fly ash, and upstream

FIGURE 3. Overview of scopes and emissions across a value chain



Adopted from NZBCSD, 2002

emissions from producing clinker). Even if such "win-win" options are not available, indirect emissions reductions may still be more cost effective to accomplish than scope 1 reductions. Thus accounting for indirect emissions can help identify where to allocate limited resources in a way that maximizes GHG reduction and return on investment.

Appendix D lists GHG sources and activities along the value chain by scopes for various industry sectors.

Scope 1: Direct GHG emissions

Companies report GHG emissions from sources they own or control as scope 1. Direct GHG emissions are principally the result of the following types of activities undertaken by the company:

- Generation of electricity, heat, or steam. These emissions result from combustion of fuels in stationary sources, e.g., boilers, furnaces, turbines
- Physical or chemical processing.[3] Most of these emissions result from manufacture or processing of chemicals and materials, e.g., cement, aluminum, adipic acid, ammonia manufacture, and waste processing
- Transportation of materials, products, waste, and employees. These emissions result from the combustion of fuels in company owned/controlled mobile combustion sources (e.g., trucks, trains, ships, airplanes, buses, and cars)
- Fugitive emissions. These emissions result from intentional or unintentional releases, e.g., equipment leaks from joints, seals, packing, and gaskets; methane emissions from coal mines and venting; hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport.

SALE OF OWN-GENERATED ELECTRICITY

Emissions associated with the sale of own-generated electricity to another company are not deducted/netted from scope 1. This treatment of sold electricity is consistent with how other sold GHG intensive products are accounted, e.g., emissions from the production of sold clinker by a cement company or the production of scrap steel by an iron and steel company are not subtracted from their scope 1 emissions. Emissions associated with the sale/transfer of own-generated electricity may be reported in optional information (see chapter 9).

Scope 2: Electricity indirect GHG emissions

Companies report the emissions from the generation of purchased electricity that is consumed in its owned or controlled equipment or operations as scope 2. Scope 2 emissions are a special category of indirect emissions. For many companies, purchased electricity represents one of the largest sources of GHG emissions and the most significant opportunity to reduce these emissions. Accounting for scope 2 emissions allows companies to assess the risks and opportunities associated with changing electricity and GHG emissions costs. Another important reason for companies to track these emissions is that the information may be needed for some GHG programs.

Companies can reduce their use of electricity by investing in energy efficient technologies and energy conservation. Additionally, emerging green power markets[4] provide opportunities for some companies to switch to less GHG intensive sources of electricity. Companies can also install an efficient on site co-generation plant, particularly if it replaces the purchase of more GHG intensive electricity from the grid or electricity supplier. Reporting of scope 2 emissions allows transparent accounting of GHG emissions and reductions associated with such opportunities.

INDIRECT EMISSIONS ASSOCIATED WITH TRANSMISSION AND DISTRIBUTION

Electric utility companies often purchase electricity from independent power generators or the grid and resell it to end-consumers through a transmission and distribution (T&D) system.[5] A portion of the electricity purchased by a utility company is consumed (T&D loss) during its transmission and distribution to end-consumers (see Box 3).

Consistent with the scope 2 definition, emissions from the generation of purchased electricity that is consumed during transmission and distribution are reported in scope 2 by the company that owns or controls the T&D operation. End consumers of the purchased electricity do not report indirect emissions associated with T&D losses in scope 2 because they do not own or control the T&D operation where the electricity is consumed (T&D loss).

BOX 3. Electricity balance

GENERATED ELECTRICITY = Purchased electricity consumed by the utility company during T&D + Purchased electricity consumed by end consumers

GUIDANCE

This approach ensures that there is no double counting within scope 2 since only the T&D utility company will account for indirect emissions associated with T&D losses in scope 2. Another advantage of this approach is that it adds simplicity to the reporting of scope 2 emissions by allowing the use of commonly available emission factors that in most cases do not include T&D losses. End consumers may, however, report their indirect emissions associated with T&D losses in scope 3 under the category "generation of electricity consumed in a T&D system." Appendix A provides more guidance on accounting for emissions associated with T&D losses.

OTHER ELECTRICITY-RELATED INDIRECT EMISSIONS

Indirect emissions from activities upstream of a company's electricity provider (e.g., exploration, drilling, flaring, transportation) are reported under scope 3. Emissions from the generation of electricity that has been purchased for resale to end-users are reported in scope 3 under the category "generation of electricity that is purchased and then resold to end users." Emissions from the generation of purchased electricity for resale to non-end-users (e.g., electricity traders) may be reported separately from scope 3 in "optional information."

The following two examples illustrate how GHG emissions are accounted for from the generation, sale, and purchase of electricity.

Example one (Figure 4): Company A is an independent power generator that owns a power generation plant. The power plant produces 100 MWh of electricity and releases 20 tonnes of emissions per year. Company B is an electricity trader and has a supply contract with company A to purchase all its electricity. Company B resells the purchased electricity (100 MWh) to company C, a utility company that owns / controls the T&D system. Company C consumes 5 MWh of electricity in its T&D system and sells the remaining 95 MWh to company D. Company D is an end user who consumes the purchased electricity (95 MWh) in its own operations. Company A reports its direct emissions from power generation under scope 1. Company B reports emissions from the purchased electricity sold to a non-end-user as optional information separately from scope 3. Company C reports the indirect emissions from the generation of the part of the purchased electricity that is sold to the end-user under scope 3 and the part of the purchased electricity that it consumes in its T&D system under scope 2. End-user D reports the indirect emissions associated with its own consumption of purchased electricity under scope 2 and can optionally report emissions associated with upstream T&D losses in scope 3. Figure 4 shows the accounting of emissions associated with these transactions.

Example two: Company D installs a co-generation unit and sells surplus electricity to a neighboring company E for its consumption. Company D reports all direct emissions from the co-generation unit under scope 1. Indirect emissions from the generation of electricity for export to E are reported by D under optional information separately

Seattle City Light: Accounting for the purchase of electricity sold to end users

Seattle City Light (SCL), Seattle's municipal utility company, sells electricity to its end-use customers that is either produced at its own hydropower facilities, purchased through long-term contracts, or purchased on the short-term market. SCL used the first edition of the *GHG Protocol Corporate Standard* to estimate its year 2000 and year 2002 GHG emissions, and emissions associated with generation of net purchased electricity sold to end-users was an important component of that inventory. SCL tracks and reports the amount of electricity sold to end-users on a monthly and annual basis.

SCL calculates net purchases from the market (brokers and other utility companies) by subtracting sales to the market from purchases from the market, measured in MWh. This allows a complete accounting of all emissions impacts from its entire operation, including interactions with the market and end-users. On an annual basis, SCL produces more electricity than there is end-use demand, but the production does not match load in all months. So SCL accounts for both purchases from the market and sales into the market. SCL also includes the scope 3 upstream emissions from natural gas production and delivery, operation of SCL facilities, vehicle fuel use, and airline travel.

SCL believes that sales to end-users are a critical part of the emissions profile for an electric utility company. Utility companies need to provide information on their emissions profile to educate end-users and adequately represent the impact of their business, the providing of electricity. End-use customers need to rely on their utility company to provide electricity, and except in some instances (green power programs), do not have a choice in where their electricity is purchased. SCL meets a customer need by providing emissions information to customers who are doing their own emissions inventory.

from scope 3. Company E reports indirect emissions associated with the consumption of electricity purchased from the company D's co-generation unit under scope 2.

For more guidance, see Appendix A on accounting for indirect emissions from purchased electricity.

Scope 3: Other indirect GHG emissions

Scope 3 is optional, but it provides an opportunity to be innovative in GHG management. Companies may want to focus on accounting for and reporting those activities that are relevant to their business and goals, and for which they have reliable information. Since companies have discretion over which categories they choose to report, scope 3 may not lend itself well to comparisons across companies. This section provides an indicative list of scope 3 categories and includes case studies on some of the categories.

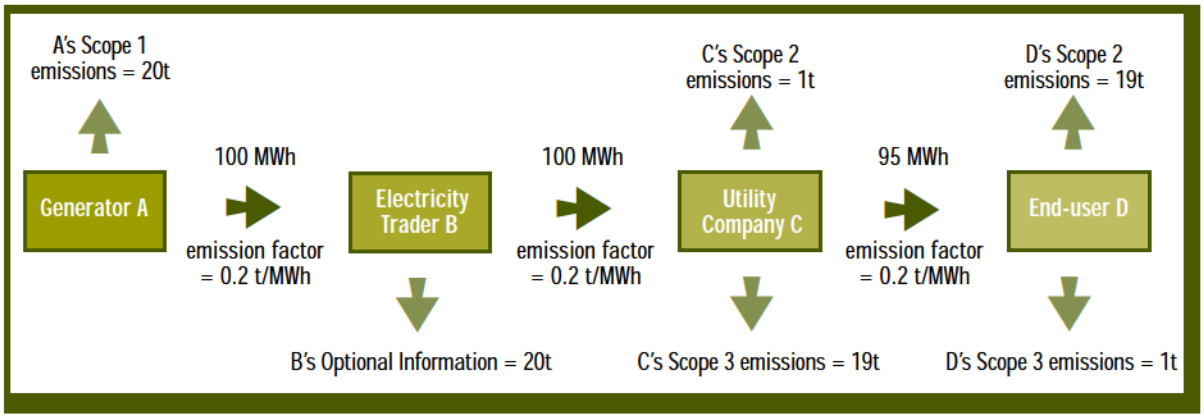
Some of these activities will be included under scope 1 if the pertinent emission sources are owned or controlled by the company (e.g., if the transportation of products is done in vehicles owned or controlled by the company). To determine if an activity falls within scope 1 or scope 3, the company should refer to the selected consolidation approach (equity or control) used in setting its organizational boundaries.

- Extraction and production of purchased materials and fuels[6]
- Transport-related activities
  - Transportation of purchased materials or goods
  - Transportation of purchased fuels
  - Employee business travel
  - Employees commuting to and from work
  - Transportation of sold products
  - Transportation of waste
- Electricity-related activities not included in scope 2 (see Appendix A)
  - Extraction, production, and transportation of fuels consumed in the generation of electricity (either purchased or own generated by the reporting company)
  - Purchase of electricity that is sold to an end user (reported by utility company)
  - Generation of electricity that is consumed in a T&D system (reported by end-user)
- Leased assets, franchises, and outsourced activities—emissions from such contractual arrangements are only classified as scope 3 if the selected consolidation approach (equity or control) does not apply to them. Clarification on the classification of leased assets should be obtained from the company accountant (see section on leases below).
- Use of sold products and services
- Waste disposal
  - Disposal of waste generated in operations
  - Disposal of waste generated in the production of purchased materials and fuels
  - Disposal of sold products at the end of their life

ACCOUNTING FOR SCOPE 3 EMISSIONS

Accounting for scope 3 emissions need not involve a full-blown GHG life cycle analysis of all products and operations. Usually it is valuable to focus on one or two major GHG-generating activities. Although it is difficult to provide generic guidance on which scope 3 emissions to include in an inventory, some general steps can be articulated:

FIGURE 4. GHG accounting from the sale and purchase of electricity



1. Describe the value chain. Because the assessment of scope 3 emissions does not require a full life cycle assessment, it is important, for the sake of transparency, to provide a general description of the value chain and the associated GHG sources. For this step, the scope 3 categories listed can be used as a checklist. Companies usually face choices on how many levels up- and downstream to include in scope 3. Consideration of the company's inventory or business goals and relevance of the various scope 3 categories will guide these choices.

2. Determine which scope 3 categories are relevant. Only some types of upstream or downstream emissions categories might be relevant to the company. They may be relevant for several reasons:

- They are large (or believed to be large) relative to the company's scope 1 and scope 2 emissions
- They contribute to the company's GHG risk exposure
- They are deemed critical by key stakeholders (e.g., feedback from customers, suppliers, investors, or civil society)
- There are potential emissions reductions that could be undertaken or influenced by the company.

The following examples may help decide which scope 3 categories are relevant to the company.

- If fossil fuel or electricity is required to use the company's products, product use phase emissions may be a relevant category to report. This may be especially important if the company can influence product design attributes (e.g., energy efficiency) or customer behavior in ways that reduce GHG emissions during the use of the products.

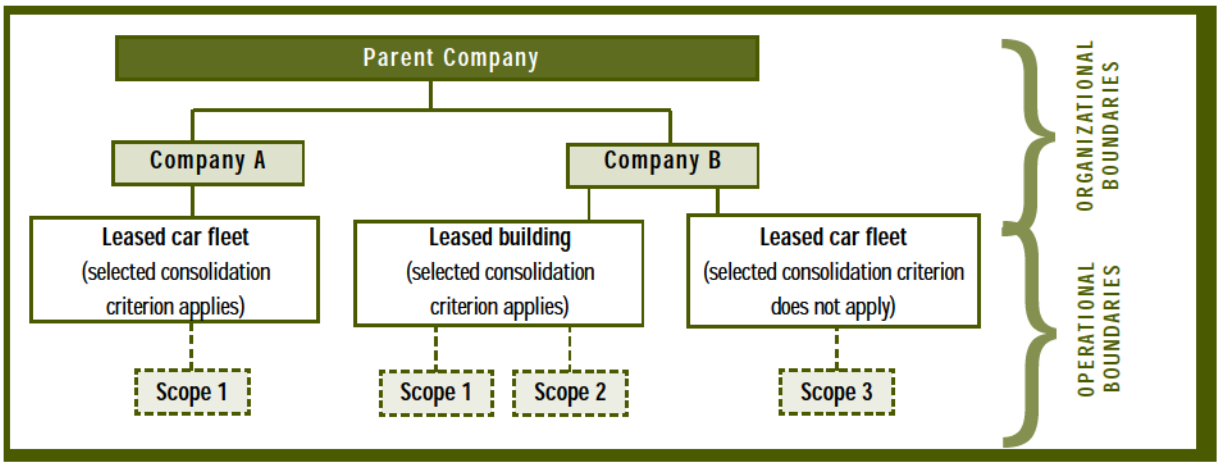
DHL Nordic Express: The business case for accounting for outsourced transportation services

As a major transportation and logistics company in northern Europe, DHL Express Nordic serves large loads and special transport needs as well as world wide express package and document deliveries and offers courier, express, parcel, systemized and specialty business services. Through participation in the Business Leaders Initiative on Climate Change, the company found that 98 percent of its emissions in Sweden originate from the transport of goods via outsourced partner transportation firms. Each partner is required, as an element of the subcontract payment scheme, to enter data on vehicles used, distance traveled, fuel efficiency, and background data. This data is used to calculate total emissions via a tailored calculation tool for outsourced transportation which gives a detailed picture of its scope 3 emissions. Linking data to specific carriers allows the company to screen individual carriers for environmental performance and affect decisions based on each carrier's emissions performance, which is seen through scope 3 as DHL's own performance.

By including scope 3 and promoting GHG reductions throughout the value chain, DHL Express Nordic increased the relevance of its emissions footprint, expanded opportunities for reducing its impacts and improved its ability to recognize cost saving opportunities. Without scope 3, DHL Express Nordic would have lacked much of the information needed to be able to understand and effectively manage its emissions.

SCOPE	EMISSIONS (tCO_2)
Scope 1	7,265
Scope 2	52
Scope 3	327,634
Total	**334,951**

FIGURE 5. Accounting of emissions from leased assets



- Outsourced activities are often candidates for scope 3 emissions assessments. It may be particularly important to include these when a previously outsourced activity contributed significantly to a company's scope 1 or scope 2 emissions.
- If GHG-intensive materials represent a significant fraction of the weight or composition of a product used or manufactured (e.g., cement, aluminum), companies may want to examine whether there are opportunities to reduce their consumption of the product or to substitute less GHG-intensive materials.
- Large manufacturing companies may have significant emissions related to transporting purchased materials to centralized production facilities.
- Commodity and consumer product companies may want to account for GHGs from transporting raw materials, products, and waste.
- Service sector companies may want to report on emissions from employee business travel; this emissions source is not as likely to be significant for other kinds of companies (e.g., manufacturing companies).

3. Identify partners along the value chain. Identify any partners that contribute potentially significant amounts of GHGs along the value chain (e.g., customers/users, product designers/manufacturers, energy providers, etc.). This is important when trying to identify sources, obtain relevant data, and calculate emissions.

4. Quantify scope 3 emissions. While data availability and reliability may influence which scope 3 activities are included in the inventory, it is accepted that data accuracy may be lower. It may be more important to understand the relative magnitude of and possible changes to scope 3 activities. Emission estimates are acceptable as long as there is transparency with regard to the estimation approach, and the data used for the analysis are adequate to support the objectives of the inventory. Verification of scope 3 emissions will often be difficult and may only be considered if data is of reliable quality.

IKEA: Customer transportation to and from its retail stores

IKEA, an international home furniture and furnishings retailer, decided to include scope 3 emissions from customer travel when it became clear, through participation in the Business Leaders Initiative on Climate Change (BLICC) program, that these emissions were large relative its scope 1 and scope 2 emissions. Furthermore, these emissions are particularly relevant to IKEA's store business model. Customer travel to its stores, often from long distances, is directly affected by IKEA's choice of store location and the warehouse shopping concept.

Customer transportation emission calculations were based on customer surveys at selected stores. Customers were asked for the distance they traveled to the store (based on home postal code), the number of customers in their car, the number of other stores they intended to visit at that shopping center that day, and whether they had access to public transportation to the store. Extrapolating this data to all IKEA stores and multiplying distance by average vehicle efficiencies for each country, the company calculated that 66 percent of its emissions inventory was from scope 3 customer travel. Based on this information, IKEA will have significant influence over future scope 3 emissions by considering GHG emissions when developing public transportation options and home delivery services for its existing and new stores.

Leased assets, outsourcing, and franchises

The selected consolidation approach (equity share or one of the control approaches) is also applied to account for and categorize direct and indirect GHG emissions from contractual arrangements such as leased assets, outsourcing, and franchises. If the selected equity or control approach does not apply, then the company may account for emissions from the leased assets, outsourcing, and franchises under scope 3. Specific guidance on leased assets is provided below:

- USING EQUITY SHARE OR FINANCIAL CONTROL: The lessee only accounts for emissions from leased assets that are treated as wholly owned assets in financial accounting and are recorded as such on the balance sheet (i.e., finance or capital leases).

- **USING OPERATIONAL CONTROL:** The lessee only accounts for emissions from leased assets that it operates (i.e., if the operational control criterion applies).

Guidance on which leased assets are operating and which are finance leases should be obtained from the company accountant. In general, in a finance lease, an organization assumes all rewards and risks from the leased asset, and the asset is treated as wholly owned and is recorded as such on the balance sheet. All leased assets that do not meet those criteria are operating leases. Figure 5 illustrates the application of consolidation criteria to account for emissions from leased assets.

Double counting

Concern is often expressed that accounting for indirect emissions will lead to double counting when two different companies include the same emissions in their respective inventories. Whether or not double counting occurs depends on how consistently companies with shared ownership or trading program administrators choose the same approach (equity or control) to set the organizational boundaries. Whether or not double counting matters, depends on how the reported information is used.

Double counting needs to be avoided when compiling national (country) inventories under the Kyoto Protocol, but these are usually compiled via a top-down exercise using national economic data, rather than aggregation of bottom-up company data. Compliance regimes are more likely to focus on the "point of release" of emissions (i.e., direct emissions) and/or indirect emissions from use of electricity. For GHG risk management and voluntary reporting, double counting is less important.

World Resources Institute: Innovations in estimating employee commuting emissions

The World Resources Institute has a long-standing commitment to reduce its annual GHG emissions to net zero through a combination of internal reduction efforts and external offset purchases. WRI's emissions inventory includes scope 2 indirect emissions associated with the consumption of purchased electricity and scope 3 indirect emissions associated with business air travel, employee commuting, and paper use. WRI has no scope 1 direct emissions.

Collecting employee commuting activity data from WRI's 140 staff can be challenging. The method used is to survey employees once each year about their average commuting habits. In the first two years of the initiative, WRI used an Excel spreadsheet accessible to all employees on a shared internal network, but only achieved a 48 percent participation rate. A simplified, web-based survey that downloaded into a spreadsheet improved participation to 65 percent in the third year. Using feedback on the survey design, WRI further simplified and refined survey questions, improved user friendliness, and reduced the time needed to complete the survey to less than a minute. Employee participation rate rose to 88 percent.

Designing a survey that was easily navigable and had clearly articulated questions significantly improved the completeness and accuracy of the employee commuting activity data. An added benefit was that employees felt a certain amount of pride at having contributed to the inventory development process. The experience also provided a positive internal communications opportunity.

WRI has developed a guide consistent with *GHG Protocol Corporate Standard* to help office-based organizations understand how to track and manage their emissions. *Working 9 to 5 on Climate Change: An Office Guide* is accompanied by a suite of calculation tools, including one for using a survey method to estimate employee commuting emissions. The Guide and tools can be downloaded from the GHG Protocol Initiative website (www.ghgprotocol.org).

Transportation-related emissions are the fastest growing GHG emissions category in the United States. This includes commercial, business, and personal travel as well as commuting. By accounting for commuting emissions, companies may find that several practical opportunities exist for reducing them. For example, when WRI moved to new office space, it selected a building located close to public transportation, reducing the need for employees to drive to work. In its lease, WRI also negotiated access to a locked bike room for those employees who cycle to work. Finally, telework programs significantly reduce commuting emissions by avoiding or decreasing the need to travel.

For participating in GHG markets or obtaining GHG credits, it would be unacceptable for two organizations to claim ownership of the same emissions commodity and it is therefore necessary to make sufficient provisions to ensure that this does not occur between participating companies (see chapter 11).

SCOPES AND DOUBLE COUNTING

The GHG Protocol Corporate Standard is designed to prevent double counting of emissions between different companies within scope 1 and 2. For example, the scope 1 emissions of company A (generator of electricity) can be counted as the scope 2 emissions of company B (end-user of electricity) but company A's scope 1 emissions cannot be counted as scope 1 emissions by company C (a partner organization of company A) as long as company A and company C consistently apply the same control or equity share approach when consolidating emissions.

Similarly, the definition of scope 2 does not allow double counting of emissions within scope 2, i.e., two different companies cannot both count scope 2 emissions from the purchase of the same electricity. Avoiding this type of double counting within scope 2 emissions makes it a useful accounting category for GHG trading programs that regulate end users of electricity.

When used in external initiatives such as GHG trading, the robustness of the scope 1 and 2 definitions combined with the consistent application of either the control or equity share approach for defining organizational boundaries allows only one company to exercise ownership of scope 1 or scope 2 emissions.



ABB: Calculating product use phase emissions associated with electrical appliances

ABB, an energy and automation technology company based in Switzerland, produces a variety of appliances and equipment, such as circuit breakers and electrical drives, for industrial applications. ABB has a stated goal to issue Environmental Product Declarations (EPDs) for all its core products based on life cycle assessment. As a part of its committment, ABB reports both manufacturing and product use phase GHG emissions for a variety of its products using a standardized calculation method and set of assumptions. For example, product use phase calculations for ABB's 4 kW DriveIT Low Voltage AC drive are based on a 15-year expected lifetime and an average of 5,000 annual operating hours. This activity data is multiplied by the average electricity emission factor for OECD countries to produce total lifetime product use emissions.

Compared with manufacturing emissions, product use phase emissions account for about 99 percent of total life cycle emissions for this type of drive. The magnitude of these emissions and ABB's control of the design and performance of this equipment clearly give the company significant leverage on its customers' emissions by improving product efficiency or helping customers design better overall systems in which ABB's products are involved. By clearly defining and quantifying significant value chain emissions, ABB has gained insight into and influence over its emissions footprint.

NOTES

[1] The terms "direct" and "indirect" as used in this document should not be confused with their use in national GHG inventories where 'direct' refers to the six Kyoto gases and 'indirect' refers to the precursors NOx, NMVOC, and CO.

[2] The term "electricity" is used in this chapter as shorthand for electricity, steam, and heating/cooling.

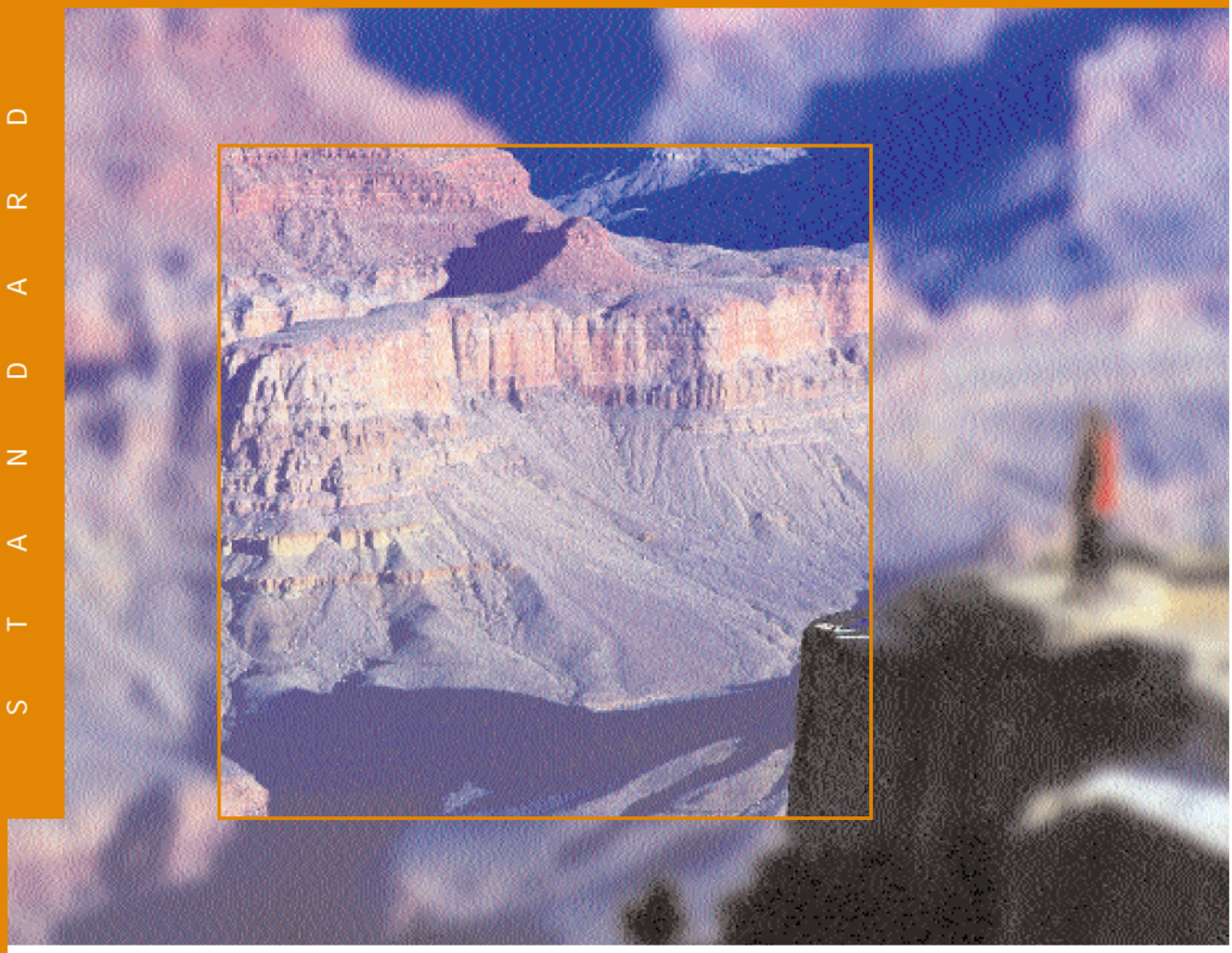
[3] For some integrated manufacturing processes, such as ammonia manufacture, it may not be possible to distinguish between GHG emissions from the process and those from the production of electricity, heat, or steam.

[4] Green power includes renewable energy sources and specific clean energy technologies that reduce GHG emissions relative to other sources of energy that supply the electric grid, e.g., solar photovoltaic panels, geothermal energy, landfill gas, and wind turbines.

[5] A T&D system includes T&D lines and other T&D equipment (e.g., transformers).

[6] "Purchased materials and fuels" is defined as material or fuel that is purchased or otherwise brought into the organizational boundary of the company.

5 Tracking Emissions Over Time



Companies often undergo significant structural changes such as acquisitions, divestments, and mergers. These changes will alter a company's historical emission profile, making meaningful comparisons over time difficult. In order to maintain consistency over time, or in other words, to keep comparing "like with like", historic emission data will have to be recalculated.

Companies may need to track emissions over time in response to a variety of business goals, including:

- Public reporting
- Establishing GHG targets
- Managing risks and opportunities
- Addressing the needs of investors and other stakeholders

A meaningful and consistent comparison of emissions over time requires that companies set a performance datum with which to compare current emissions. This performance datum is referred to as the base year[1] emissions. For consistent tracking of emissions over time, the base year emissions may need to be recalculated as companies undergo significant structural changes such as acquisitions, divestments, and mergers.

The first step in tracking emissions, however, is the selection of a base year.

Choosing a base year

Companies shall choose and report a base year for which verifiable emissions data are available and specify their reasons for choosing that particular year.

Most companies select a single year as their base year. However, it is also possible to choose an average of annual emissions over several consecutive years. For example, the U.K. ETS specifies an average of 1998–2000 emissions as the reference point for tracking reductions. A multi-year average may help smooth out unusual fluctuations in GHG emissions that would make a single year's data unrepresentative of the company's typical emissions profile.

The inventory base year can also be used as a basis for setting and tracking progress towards a GHG target in which case it is referred to as a target base year (see chapter 11).

Recalculating base year emissions

Companies shall develop a base year emissions recalculation policy, and clearly articulate the basis and context for any recalculations. If applicable, the policy shall state any "significance threshold" applied for deciding on historic emissions recalculation. "Significance threshold" is a qualitative and/or quantitative criterion used to define any significant change to the data, inventory boundary, methods, or any other relevant factors. It is the responsibility of the company to determine the "significance threshold" that triggers base year emissions recalculation and to disclose it. It is the responsibility of the verifier to confirm the company's adherence to its threshold policy. The following cases shall trigger recalculation of base year emissions:

- Structural changes in the reporting organization that have a significant impact on the company's base year emissions. A structural change involves the transfer of ownership or control of emissions-generating activities or operations from one company to another. While a single structural change might not have a significant impact on the base year emissions, the cumulative effect of a number of minor structural changes can result in a significant impact. Structural changes include:
  - Mergers, acquisitions, and divestments
  - Outsourcing and insourcing of emitting activities
- Changes in calculation methodology or improvements in the accuracy of emission factors or activity data that result in a significant impact on the base year emissions data
- Discovery of significant errors, or a number of cumulative errors, that are collectively significant.

In summary, base year emissions shall be retroactively recalculated to reflect changes in the company that would otherwise compromise the consistency and relevance of the reported GHG emissions information. Once a company has determined its policy on how it will recalculate base year emissions, it shall apply this policy in a consistent manner. For example, it shall recalculate for both GHG emissions increases and decreases.

Selection and recalculation of a base year should relate to the business goals and the particular context of the company:

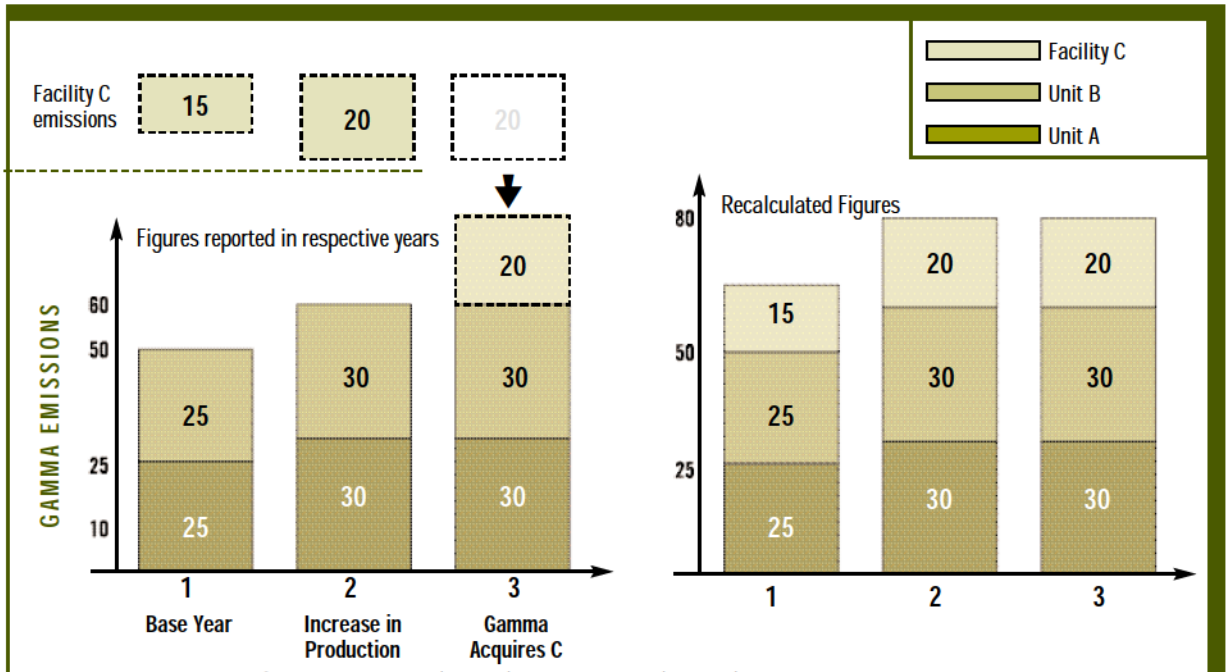
- For the purpose of reporting progress towards voluntary public GHG targets, companies may follow the standards and guidance in this chapter
- A company subject to an external GHG program may face external rules governing the choice and recalculation of base year emissions
- For internal management goals, the company may follow the rules and guidelines recommended in this document, or it may develop its own approach, which should be followed consistently.

Choosing a base year

Companies should choose as a base year the earliest relevant point in time for which they have reliable data. Some organizations have adopted 1990 as a base year in order to be consistent with the Kyoto Protocol. However, obtaining reliable and verifiable data for historical base years such as 1990 can be very challenging.

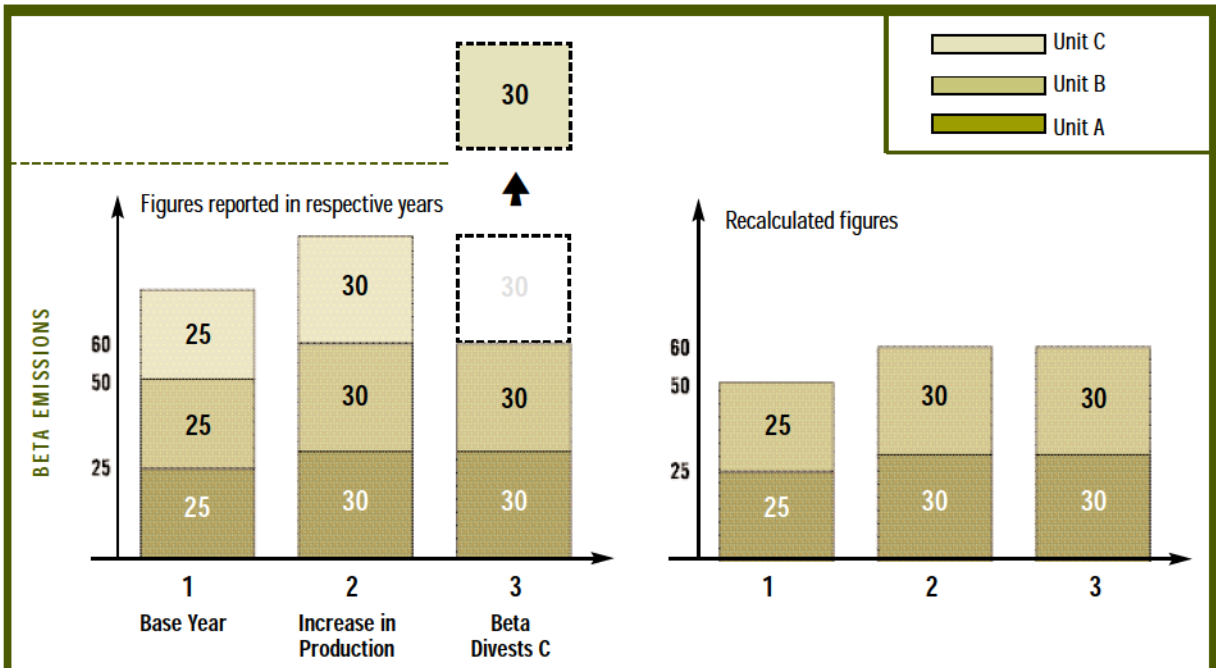
If a company continues to grow through acquisitions, it may adopt a policy that shifts or "rolls" the base year forward by a number of years at regular intervals. Chapter 11 contains a description of such a "rolling base year," including a comparison with the fixed base year approach described in this chapter. A fixed base year has the advantage of allowing emissions data to be compared on a like-with-like basis over a longer time period than a rolling base year approach. Most emissions trading and registry programs require a fixed base year policy to be implemented.

FIGURE 6. **Base year emissions recalculation for an acquisition**



Company Gamma consists of two business units (A and B). In its base year (year one), each business unit emits 25 tonnes CO_2. In year two, the company undergoes "organic growth," leading to an increase in emissions to 30 tonnes CO_2 per business unit, i.e., 60 tonnes CO_2 in total. The base year emissions are not recalculated in this case. At the beginning of year three, the company acquires production facility C from another company. The annual emissions of facility C in year one were 15 tonnes CO_2, and 20 tonnes CO_2 in years two and three. The total emission of company Gamma in year three, including facility C, are therefore 80 tonnes CO_2. To maintain consistency over time, the company recalculates its base year emissions to take into account the acquisition of facility C. The base year emissions increase by 15 tonnes CO_2—the quantity of emissions produced by facility C in Gamma's base year. The recalculated base year emissions are 65 tonnes CO_2. Gamma also (optionally) reports 80 tonnes CO_2 as the recalculated emissions for year two.

FIGURE 7. **Base year emissions recalculation for a divestment**



Company Beta consists of three business units (A, B, and C). Each business unit emits 25 tonnes CO_2 and the total emissions for the company are 75 tonnes CO_2 in the base year (year one). In year two, the output of the company grows, leading to an increase in emissions to 30 tonnes CO_2 per business unit, i.e., 90 tonnes CO_2 in total. At the beginning of year three, Beta divests business unit C and its annual emissions are now 60 tonnes, representing an apparent reduction of 15 tonnes relative to the base year emissions. However, to maintain consistency over time, the company recalculates its base year emissions to take into account the divestment of business unit C. The base year emissions are lowered by 25 tonnes CO_2—the quantity of emissions produced by the business unit C in the base year. The recalculated base year emissions are 50 tonnes CO_2, and the emissions of company Beta are seen to have risen by 10 tonnes CO_2 over the three years. Beta (optionally) reports 60 tonnes CO_2 as the recalculated emissions for year two.

Significance thresholds for recalculations

Whether base year emissions are recalculated depends on the significance of the changes. The determination of a significant change may require taking into account the cumulative effect on base year emissions of a number of small acquisitions or divestments. The GHG Protocol Corporate Standard makes no specific recommendations as to what constitutes "significant." However, some GHG programs do specify numerical significance thresholds, e.g., the California Climate Action Registry, where the change threshold is 10 percent of the base year emissions, determined on a cumulative basis from the time the base year is established.

Base year emissions recalculation for structural changes

Structural changes trigger recalculation because they merely transfer emissions from one company to another without any change of emissions released to the atmosphere, for example, an acquisition or divestment only transfers existing GHG emissions from one company's inventory to another.

Figures 6 and 7 illustrate the effect of structural changes and the application of this standard on recalculation of base year emissions.

Timing of recalculations for structural changes

When significant structural changes occur during the middle of the year, the base year emissions should be recalculated for the entire year, rather than only for the remainder of the reporting period after the structural change occurred. This avoids having to recalculate base year emissions again in the succeeding year. Similarly, current year emissions should be recalculated for the entire year to maintain consistency with the base year recalculation. If it is not possible to make a recalculation in the year of the structural change (e.g., due to

lack of data for an acquired company), the recalculation may be carried out in the following year.[2]

Recalculations for changes in calculation methodology or improvements in data accuracy

A company might report the same sources of GHG emissions as in previous years, but measure or calculate them differently. For example, a company might have used a national electric power generation emissions factor to estimate scope 2 emissions in year one of reporting. In later years, it may obtain more accurate utility-specific emission factors (for the current as well as past years) that better reflect the GHG emissions associated with the electricity that it has purchased. If the differences in emissions resulting from such a change are significant, historic data is recalculated applying the new data and/or methodology.

Sometimes the more accurate data input may not reasonably be applied to all past years or new data points may not be available for past years. The company may then have to backcast these data points, or the change in data source may simply be acknowledged without recalculation. This acknowledgement should be made in the report each year in order to enhance transparency; otherwise, new users of the report in the two or three years after the change may make incorrect assumptions about the performance of the company.

Any changes in emission factor or activity data that reflect real changes in emissions (i.e., changes in fuel type or technology) do not trigger a recalculation.

Optional reporting for recalculations

Optional information that companies may report on recalculations includes:

- The recalculated GHG emissions data for all years between the base year and the reporting year
- All actual emissions as reported in respective years in the past, i.e., the figures that have not been recalculated. Reporting the original figures in addition to the recalculated figures contributes to transparency since it illustrates the evolution of the company's structure over time.

No base year emissions recalculations for facilities that did not exist in the base year

Base year emissions are not recalculated if the company makes an acquisition of (or insources) operations that did not exist in its base year. There may only be a recalculation of historic data back to the year in which the acquired company came into existence. The same applies to cases where the company makes a divestment of (or outsources) operations that did not exist in the base year.

Figure 8 illustrates a situation where no recalculation of base year emissions is required, since the acquired facility came into existence after the base year was set.

No recalculation for " outsourcing/insourcing" if reported under scope 2 and/or scope 3

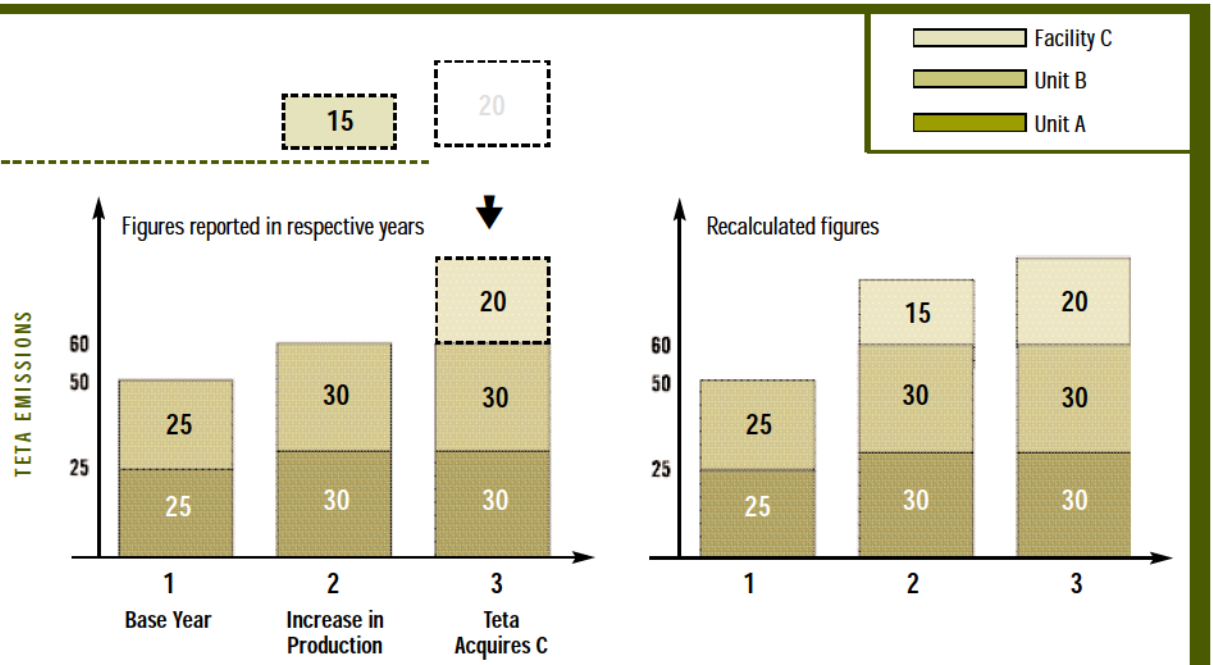
Structural changes due to "outsourcing" or "insourcing" do not trigger base year emissions recalculation if the company is reporting its indirect emissions from relevant outsourced or insourced activities. For example, outsourcing production of electricity, heat, or steam does not trigger base year emissions recalculation, since the GHG Protocol Corporate Standard requires scope 2 reporting. However, outsourcing/insourcing that shifts significant emissions between scope 1 and scope 3 when scope 3 is not reported does trigger a base year emissions recalculation (e.g., when a company outsources the transportation of products).

In case a company decides to track emissions over time separately for different scopes, and has separate base years for each scope, base year emissions recalculation for outsourcing or insourcing is made.

ENDESA: Recalculation of base year emissions because of structural changes

The *GHG Protocol Corporate Standard* requires setting a base year for comparing emissions over time. To be able to compare over time, the base year emissions must be recalculated if any structural changes occur in the company. In a deal completed January 2002, the ENDESA Group, a power generation company based in Spain, sold its 87.5 percent holding in Viesgo, a part of its Spanish power generation business, to ENEL, an Italian power company. To account for this structural change, historical emissions from the six power plants included in the sale were no longer accounted for in the Endesa GHG inventory and therefore removed from its base year emissions. This recalculation provides ENDESA with a complete and comparable picture of its historical emissions.

FIGURE 8. **Acquisition of a facility that came into existence after the base year was set**



Company Teta consists of two business units (A and B). In its base year (year one), the company emits 50 tonnes CO_2. In year two, the company undergoes organic growth, leading to an increase in emissions to 30 tonnes CO_2 per business unit, i.e., 60 tonnes CO_2 in total. The base year emissions are not recalculated in this case. At the beginning of year three, Teta acquires a production facility C from another company. Facility C came into existence in year two, its emissions being 15 tonnes CO_2 in year two and 20 tonnes CO_2 in year three. The total emissions of company Teta in year three, including facility C, are therefore 80 tonnes CO_2. In this acquisition case, the base year emissions of company Teta do not change because the acquired facility C did not exist in year one when the base year of Teta was set. The base year emissions of Teta therefore remain at 50 tonnes CO_2. Teta (optionally) reports 75 tonnes as the recalculated figure for year two emissions.

No recalculation for organic growth or decline

Base year emissions and any historic data are not recalculated for organic growth or decline. Organic growth/decline refers to increases or decreases in production output, changes in product mix, and closures and openings of operating units that are owned or controlled by the company. The rationale for this is that organic growth or decline results in a change of emissions to the atmosphere and therefore needs to be counted as an increase or decrease in the company's emissions profile over time.



NOTES

[1] Terminology on this topic can be confusing. Base year emissions should be differentiated from the term "baseline," which is mostly used in the context of project-based accounting. The term base year focuses on a comparison of emissions over time, while a baseline is a hypothetical scenario for what GHG emissions would have been in the absence of a GHG reduction project or activity.

[2] For more information on the timing of base year emissions recalculations, see the guidance document "Base year recalculation methodologies for structural changes" on the GHG Protocol website (www.ghgprotocol.org).

6 Identifying and Calculating GHG Emissions



Once the inventory boundary has been established, companies generally calculate GHG emissions using the following steps:

1. Identify GHG emissions sources
2. Select a GHG emissions calculation approach
3. Collect activity data and choose emission factors
4. Apply calculation tools
5. Roll-up GHG emissions data to corporate level.

This chapter describes these steps and the calculation tools developed by the GHG Protocol. The calculation tools are available on the GHG Protocol Initiative website at www.ghgprotocol.org.

To create an accurate account of their emissions, companies have found it useful to divide overall emissions into specific categories. This allows a company to use specifically developed methodologies to accurately calculate the emissions from each sector and source category.

Identify GHG emissions sources

The first of the five steps in identifying and calculating a company's emissions as outlined in Figure 9 is to categorize the GHG sources within that company's boundaries. GHG emissions typically occur from the following source categories:

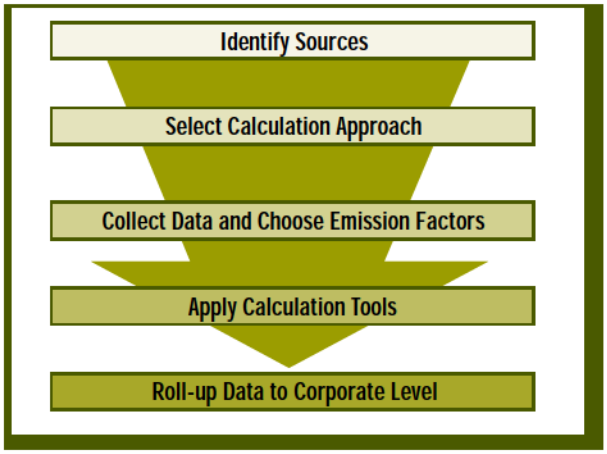
- Stationary combustion: combustion of fuels in stationary equipment such as boilers, furnaces, burners, turbines, heaters, incinerators, engines, flares, etc.
- Mobile combustion: combustion of fuels in transportation devices such as automobiles, trucks, buses, trains, airplanes, boats, ships, barges, vessels, etc.
- Process emissions: emissions from physical or chemical processes such as CO_2 from the calcination step in cement manufacturing, CO_2 from catalytic cracking in petrochemical processing, PFC emissions from aluminum smelting, etc.
- Fugitive emissions: intentional and unintentional releases such as equipment leaks from joints, seals, packing, gaskets, as well as fugitive emissions from coal piles, wastewater treatment, pits, cooling towers, gas processing facilities, etc.

Every business has processes, products, or services that generate direct and/or indirect emissions from one or more of the above broad source categories. The GHG Protocol calculation tools are organized based on these categories. Appendix D provides an overview of direct and indirect GHG emission sources organized by scopes and industry sectors that may be used as an initial guide to identify major GHG emission sources.

IDENTIFY SCOPE 1 EMISSIONS

As a first step, a company should undertake an exercise to identify its direct emission sources in each of the four source categories listed above. Process emissions are usually only relevant to certain industry sectors like oil and gas, aluminum, cement, etc. Manufacturing companies that generate process emissions and own or control a power production facility will likely have direct emissions from all the main source categories. Office-based organizations may not have any direct GHG emissions except in cases where they own or operate a vehicle, combustion device, or refrigeration and air-conditioning equipment. Often companies are surprised to realize that significant emissions come from sources that are not initially obvious (see United Technologies case study).

FIGURE 9.
Steps in identifying and calculating GHG emissions



IDENTIFY SCOPE 2 EMISSIONS

The next step is to identify indirect emission sources from the consumption of purchased electricity, heat, or steam. Almost all businesses generate indirect emissions due to the purchase of electricity for use in their processes or services.

IDENTIFY SCOPE 3 EMISSIONS

This optional step involves identification of other indirect emissions from a company's upstream and downstream activities as well as emissions associated with outsourced/contract manufacturing, leases, or franchises not included in scope 1 or scope 2.

The inclusion of scope 3 emissions allows businesses to expand their inventory boundary along their value chain and to identify all relevant GHG emissions. This provides a broad overview of various business linkages and possible opportunities for significant GHG emission reductions that may exist upstream or downstream of a company's immediate operations (see chapter 4 for an overview of activities that can generate GHG emissions along a company's value chain).

Select a calculation approach

Direct measurement of GHG emissions by monitoring concentration and flow rate is not common. More often, emissions may be calculated based on a mass balance or stoichiometric basis specific to a facility or process. However, the most common approach for calculating GHG emissions is through the application of documented emission factors. These factors are calculated ratios relating GHG emissions to a proxy measure of activity at an emissions source. The IPCC guidelines (IPCC, 1996) refer to a hierarchy of calculation approaches and techniques ranging from the application of generic emission factors to direct monitoring.

In many cases, particularly when direct monitoring is either unavailable or prohibitively expensive, accurate emission data can be calculated from fuel use data. Even small users usually know both the amount of fuel consumed and have access to data on the carbon content of the fuel through default carbon content coefficients or through more accurate periodic fuel sampling. Companies should use the most accurate calculation approach available to them and that is appropriate for their reporting context.

United Technologies Corporation: More than meets the eye

In 1996, United Technologies Corporation (UTC), a global aerospace and building systems technology corporation, appointed a team to set boundaries for the company's new Natural Resource Conservation, Energy and Water Use Reporting Program. The team focused on what sources of energy should be included in the program's annual report of energy consumption. The team decided jet fuel needed to be reported in the annual report; jet fuel was used by a number of UTC divisions for engine and flight hardware testing and for test firing. Although the amount of jet fuel used in any given year was subject to wide variation due to changing test schedules, the total amount consumed in an average year was believed to be large and potentially small enough to be specifically excluded. However, jet fuel consumption reports proved that initial belief incorrect. Jet fuel has accounted for between 9 and 13 percent of the corporation's total annual use of energy since the program commenced. Had UTC not included the use of jet fuel in annual data collection efforts, a significant emissions source would have been overlooked.

Collect activity data and choose emission factors

For most small to medium-sized companies and for many larger companies, scope 1 GHG emissions will be calculated based on the purchased quantities of commercial fuels (such as natural gas and heating oil) using published emission factors. Scope 2 GHG emissions will primarily be calculated from metered electricity consumption and supplier-specific, local grid, or other published emission factors. Scope 3 GHG emissions will primarily be calculated from activity data such as fuel use or passenger miles and published or third-party emission factors. In most cases, if source- or facility-specific emission factors are available, they are preferable to more generic or general emission factors.

Industrial companies may be faced with a wider range of approaches and methodologies. They should seek guidance from the sector-specific guidelines on the GHG Protocol website (if available) or from their industry associations (e.g., International Aluminum Institute, International Iron and Steel Institute, American Petroleum Institute, WBCSD Sustainable Cement Initiative, International Petroleum Industry Environmental Conservation Association).

Apply calculation tools

This section provides an overview of the GHG calculation tools and guidance available on the GHG Protocol Initiative website (www.ghgprotocol.org). Use of these tools is encouraged as they have been peer reviewed by experts and industry leaders, are regularly updated, and are believed to be the best available. The tools, however, are optional. Companies may substitute their own GHG calculation methods, provided they are more accurate than or are at least consistent with the GHG Protocol Corporate Standards approaches.

There are two main categories of calculation tools:

- Cross-sector tools that can be applied to different sectors. These include stationary combustion, mobile combustion, HFC use in refrigeration and air conditioning, and measurement and estimation uncertainty.
- Sector-specific tools that are designed to calculate emissions in specific sectors such as aluminum, iron and steel, cement, oil and gas, pulp and paper, office-based organizations.

Most companies will need to use more than one calculation tool to cover all their GHG emission sources. For example, to calculate GHG emissions from an aluminum production facility, the company would use the calculation tools for aluminum production, stationary combustion (for any consumption of purchased electricity, generation of energy on-site, etc), mobile combustion (for transportation of materials and products by train, vehicles employed on-site, employee business travel, etc), and HFC use (for refrigeration, etc). See Table 3 for the full list of tools.

STRUCTURE OF GHG PROTOCOL CALCULATION TOOLS

Each of the cross-sector and sector-specific calculation tools on the website share a common format and include step-by-step guidance on measuring and calculating emissions data. Each tool consists of a guidance section and automated worksheets with explanations on how to use them.

The guidance for each calculation tool includes the following sections:

- Overview: provides an overview of the purpose and content of the tool, the calculation method used in the tool, and a process description
- Choosing activity data and emission factors: provides sector-specific good practice guidance and references for default emission factors
- Calculation methods: describes different calculation methods depending on the availability of site-specific activity data and emission factors
- Quality control: provides good practice guidance
- Internal reporting and documentation: provides guidance on internal documentation to support emissions calculations.

ChevronTexaco: The SANGEA™ accounting and reporting system

ChevronTexaco, a global energy company, has developed and implemented energy utilization and GHG estimation and reporting software consistent with the *GHG Protocol Corporate Standard*. This software is available free of charge and makes it easier, more accurate, and less costly to institute a corporate-wide GHG accounting and reporting system in the oil and gas sector. Called the SANGEA™ Energy and Greenhouse Gas Emissions Estimating System, it is currently in use at all ChevronTexaco facilities worldwide, comprising more than 70 reporting entities.

The system is an auditable, Excel-and-Visual-Basic-based tool for estimating GHG emissions and energy utilization. It streamlines corporate-level data consolidation by allowing the inventory coordinator at each facility to configure a spreadsheet, enter monthly data, and send quarterly reports to a centralized database.

In practice, the SANGEA™ system employs a variety of strategies to ensure consistent calculation methods and ease company-wide standardization:

- Spreadsheet configuration and material input information for specific facilities can be carried over from year to year. Inventory specialists can easily modify configurations as a facility changes (due to new construction, retirement of units, etc.).
- Updates are efficient. Methodologies for estimating emissions, emission factors, and calculation equations are stored centrally in the software, easing updates when methodologies or default factors change. Updates to this central reference are automatically applied to the existing configuration and input data. Updates will mirror the timing and content of updates to the American Petroleum Institute Compendium of GHG emission estimating methodologies.
- The system is auditable. The software requires detailed audit trail information on data inputs and system users. There is documented accountability of who made any change to the system.
- Using one system saves money. Significant cost savings are achieved by using the same system in all facilities, as compared to conventional, disparate systems.

ChevronTexaco's one-off investment in developing the SANGEA™ system has already shown results: A rough cost estimate for ChevronTexaco's Richmond, California, refinery indicates savings of more than 70 percent over a five-year period compared with the conventional approaches based on locally developed reporting systems. SANGEA™ is expected to reduce the long term expenses of maintaining a legacy system and hiring independent consultants. Employing a combination of the *GHG Protocol Corporate Standards* and SANGEA™ calculation software to replace a diverse and confusing set of accounting and reporting templates yields significant efficiency and accuracy gains, and allows the company to more accurately manage GHG emissions and institute specific emissions improvements.

TABLE 3. Overview of GHG calculation tools available on the GHG Protocol website

	CALCULATION TOOLS	MAIN FEATURES
CROSS-SECTOR TOOLS	Stationary Combustion	• Calculates direct and indirect CO_2 emissions from fuel combustion in stationary equipment • Provides two options for allocating GHG emissions from a co-generation facility • Provides default fuel and national average electricity emission factors
	Mobile Combustion	• Calculates direct and indirect CO_2 emissions from fuel combustion in mobile sources • Provides calculations and emission factors for road, air, water, and rail transport
	HFC from Air Conditioning and Refrigeration Use	• Calculates direct HFC emissions during manufacture, use and disposal of refrigeration and air-conditioning equipment in commercial applications • Provides three calculation methodologies: a sales-based approach, a life cycle stage based approach, and an emission factor based approach
	Measurement and Estimation Uncertainty for GHG Emissions	• Introduces the fundamentals of uncertainty analysis and quantification • Calculates statistical parameter uncertainties due to random errors related to calculation of GHG emissions • Automates the aggregation steps involved in developing a basic uncertainty assessment for GHG inventory data
SECTOR-SPECIFIC TOOLS	Aluminum and other non-Ferrous Metals Production	• Calculates direct GHG emissions from aluminum production (CO_2 from anode oxidation, PFC emissions from the "anode effect," and SF_6 used in non-ferrous metals production as a cover gas)
	Iron and Steel	• Calculates direct GHG emissions (CO_2) from oxidation of the reducing agent, from the calcination of the flux used in steel production, and from the removal of carbon from the iron ore and scrap steel used
	Nitric Acid Manufacture	• Calculates direct GHG emissions (N_2O) from the production of nitric acid
	Ammonia Manufacture	• Calculates direct GHG emissions (CO_2) from ammonia production. This is for the removal of carbon from the feedstock stream only; combustion emissions are calculated with the stationary combustion module
	Adipic Acid Manufacture	• Calculates direct GHG emissions (N_2O) from adipic acid production
	Cement	• Calculates direct CO_2 emissions from the calcination process in cement manufacturing (WBCSD tool also calculates combustion emissions) • Provides two calculation methodologies: the cement-based approach and the clinker-based approach
	Lime	• Calculates direct GHG emissions from lime manufacturing (CO_2 from the calcination process)
	HFC-23 from HCFC-22 Production	• Calculates direct HFC-23 emissions from production of HCFC-22
	Pulp and Paper	• Calculates direct CO_2, CH_4, and N_2O emissions from production of pulp and paper. This includes calculation of direct and indirect CO_2 emissions from combustion of fossil fuels, bio-fuels, and waste products in stationary equipment
	Semi-Conductor Wafer Production	• Calculates PFC emission from the production of semi-conductor wafers
	Guide for Small Office-Based Organizations	• Calculates direct CO_2 emissions from fuel use, indirect CO_2 emissions from electricity consumption, and other indirect CO_2 emissions from business travel and commuting

In the automated worksheet section, it is only necessary to insert activity data into the worksheets and to select an appropriate emission factor or factors. Default emission factors are provided for the sectors covered, but it is also possible to insert customized emission factors that are more representative of the reporting company's operations. The emissions of each GHG (CO_2, CH_4, N_2O, etc.) are calculated separately and then converted to CO_2 equivalents on the basis of their global warming potential.

Some tools, such as the iron and steel sector tool and the HFC cross-sector tool, take a tiered approach, offering a choice between a simple and a more advanced calculation methodology. The more advanced methods are expected to produce more accurate emissions estimates but usually require collection of more detailed data and a more thorough understanding of a company's technologies.

Roll-up GHG emissions data to corporate level

To report a corporation's total GHG emissions, companies will usually need to gather and summarize data from multiple facilities, possibly in different countries and business divisions. It is important to plan this process carefully to minimize the reporting burden, reduce the risk of errors that might occur while compiling data, and ensure that all facilities are collecting information on an approved, consistent basis. Ideally, corporations will integrate GHG reporting with their existing reporting tools and processes, and take advantage of any relevant data already collected and reported by facilities to division or corporate offices, regulators or other stakeholders.

The tools and processes chosen to report data will depend upon the information and communication infrastructure already in place (i.e., how easy is it to include new data categories in corporate databases). It will also depend upon the amount of detail that corporate headquarters wishes to be reported from facilities. Data collection and management tools could include:

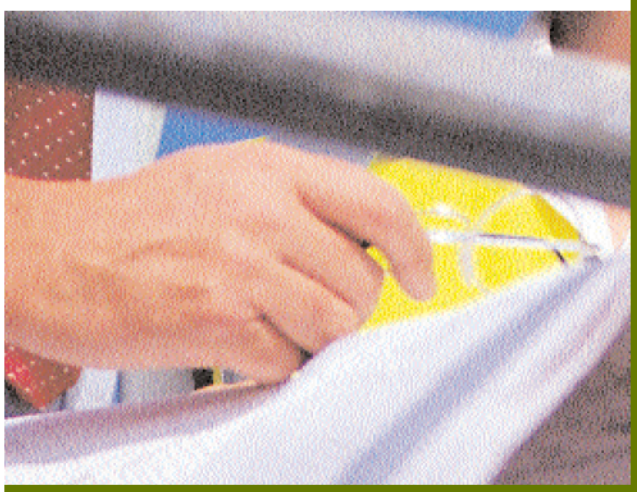
- Secure databases available over the company intranet or internet, for direct data entry by facilities
- Spreadsheet templates filled out and e-mailed to a corporate or division office, where data is processed further
- Paper reporting forms faxed to a corporate or division office where data is re-entered in a corporate database. However, this method may increase the likelihood of errors if there are not sufficient checks in place to ensure the accurate transfer of the data.

BP: A standardized system for internal reporting of GHGs

BP, a global energy company, has been collecting GHG data from the different parts of its operations since 1997 and has consolidated its internal reporting processes into one central database system. The responsibility for reporting environmental emissions lies with about 320 individual BP facilities and business departments, which are termed "reporting units." All reporting units have to complete a standard Excel pro-forma spreadsheet every quarter, stating actual emissions for the preceding three months and updates to forecasts for the current year and the next two years. In addition, reporting units are asked to account for all significant variances, including sustainable reductions. The reporting units all use the same BP GHG Reporting Guidelines "Protocol" (BP, 2000) for quantifying their emissions of carbon dioxide and methane.

All pro-forma spreadsheets are e-mailed automatically by the central database to the reporting units, and the completed e-mail returns are uploaded into the database by a corporate team, who check the quality of the incoming data. The data are then compiled, by the end of the month following each quarter end, to provide the total emission inventory and forecasts for analysis against BP's GHG target. Finally, the inventory is reviewed by a team of independent external auditors to provide assurance on the quality and accuracy of the data.

For internal reporting up to the corporate level, it is recommended that standardized reporting formats be used to ensure that data received from different business units and facilities is comparable, and that internal reporting rules are observed (see BP case study). Standardized formats can significantly reduce the risk of errors.



Approaches for rolling up GHG emissions data to corporate level

There are two basic approaches for gathering data on GHG emissions from a corporation's facilities (Figure 10):

- Centralized: individual facilities report activity/fuel use data (such as quantity of fuel used) to the corporate level, where GHG emissions are calculated.
- Decentralized: individual facilities collect activity/fuel use data, directly calculate their GHG emissions using approved methods, and report this data to the corporate level.

FIGURE 10. **Approaches to gathering data**

	SITE LEVEL	CORPORATE LEVEL
CENTRALIZED	Activity data →	Sites report activity data (GHG emissions calculated at corporate level: activity data x emissions factor = GHG emissions)
DECENTRALIZED	Activity data x emission factor = GHG emissions →	Sites report GHG emissions

The difference between these two approaches is in where the emissions calculations occur (i.e., where activity data is multiplied by the appropriate emission factors) and in what type of quality management procedures must be put in place at each level of the corporation. Facility-level staff is generally responsible for initial data collection under both approaches.

Under both approaches, staff at corporate and lower levels of consolidation should take care to identify and exclude any scope 2 or 3 emissions that are also accounted for as scope 1 emissions by other facilities, business units, or companies included in the emissions inventory consolidation.

CENTRALIZED APPROACH: INDIVIDUAL FACILITIES REPORT ACTIVITY/FUEL USE DATA

This approach may be particularly suitable for office-based organizations. Requesting that facilities report their activity/fuel use data may be the preferred option if:

- The staff at the corporate or division level can calculate emissions data in a straightforward manner on the basis of activity/fuel use data; and
- Emissions calculations are standard across a number of facilities.

DECENTRALIZED APPROACH: INDIVIDUAL FACILITIES CALCULATE GHG EMISSIONS DATA

Asking facilities to calculate GHG emissions themselves will help to increase their awareness and understanding of the issue. However, it may also lead to resistance, increased training needs, an increase in calculation errors, and a greater need for auditing of calculations. Requesting that facilities calculate GHG emissions themselves may be the preferred option if:

- GHG emission calculations require detailed knowledge of the kind of equipment being used at facilities;
- GHG emission calculation methods vary across a number of facilities;
- Process emissions (in contrast to emissions from burning fossil fuels) make up an important share of total GHG emissions;
- Resources are available to train facility staff to conduct these calculations and to audit them;
- A user-friendly tool is available to simplify the calculation and reporting task for facility-level staff; or
- Local regulations require reporting of GHG emissions at a facility level.

The choice of collection approach depends on the needs and characteristics of the reporting company. For example, United Technologies Corporation uses the centralized approach, leaving the choice of emission factors and calculations to corporate staff, while BP uses the decentralized approach and follows up with audits to ensure calculations are correct, documented, and follow approved methods. To maximize accuracy and minimize reporting burdens, some companies use a combination of the two approaches. Complex facilities with process emissions calculate their emissions at the facility level, while facilities with uniform emissions from standard sources only report fuel use, electricity consumption, and travel activity. The corporate database or reporting tool then calculates total GHG emissions for each of these standard activities.

The two approaches are not mutually exclusive and should produce the same result. Thus companies desiring a consistency check on facility-level calculations can follow both approaches and compare the results. Even when facilities calculate their own GHG emissions, corporate staff may still wish to gather activity/fuel use data to double-check calculations and explore opportunities for emissions reductions. These

data should be available and transparent to staff at all corporate levels. Corporate staff should also verify that facility-reported data are based on well defined, consistent, and approved inventory boundaries, reporting periods, calculation methodologies, etc.

Common guidance on reporting to corporate level

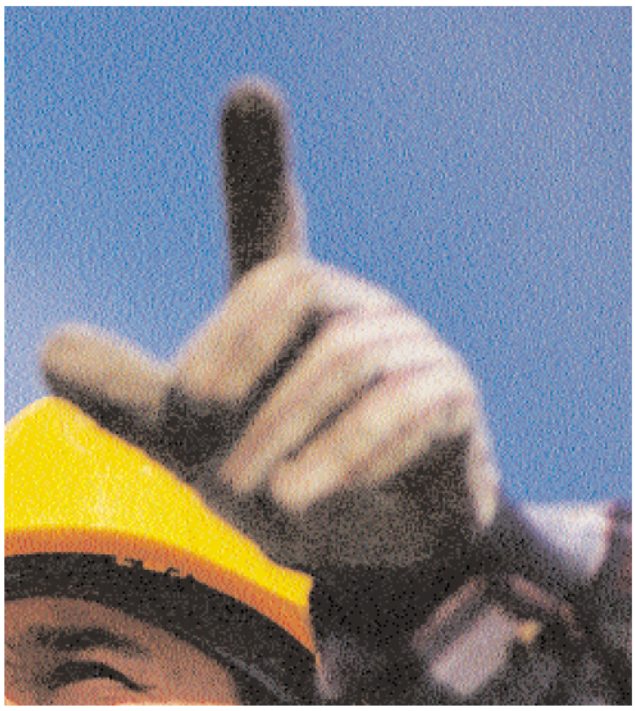
Reports from facility level to corporate or division offices should include all relevant information as specified in chapter 9. Some reporting categories are common to both the centralized and decentralized approaches and should be reported by facilities to their corporate offices. These include:

- A brief description of the emission sources
- A list and justification of specific exclusion or inclusion of sources
- Comparative information from previous years
- The reporting period covered
- Any trends evident in the data
- Progress towards any business targets
- A discussion of uncertainties in activity/fuel use or emissions data reported, their likely cause, and recommendations for how data can be improved
- A description of events and changes that have an impact on reported data (acquisitions, divestitures, closures, technology upgrades, changes of reporting boundaries or calculation methodologies applied, etc.).

REPORTING FOR THE CENTRALIZED APPROACH

In addition to the activity/fuel use data and aforementioned common categories of reporting data, facilities following the centralized approach by reporting activity/fuel use data to the corporate level should also report the following:

- Activity data for freight and passenger transport activities (e.g., freight transport in tonne-kilometers)
- Activity data for process emissions (e.g., tonnes of fertilizer produced, tonnes of waste in landfills)
- Clear records of any calculations undertaken to derive activity/fuel use data
- Local emission factors necessary to translate fuel use and/or electricity consumption into CO_2 emissions.



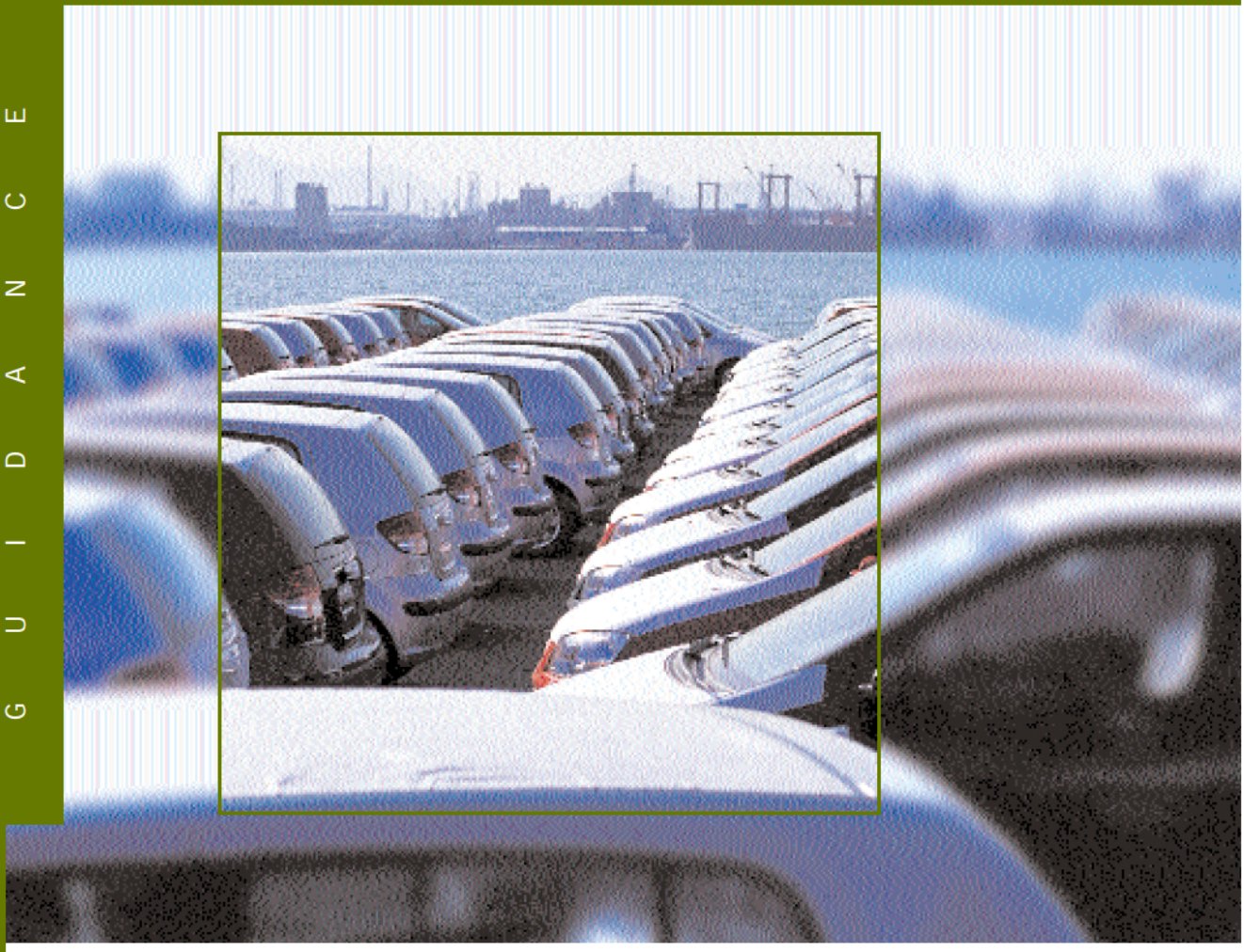
REPORTING FOR THE DECENTRALIZED APPROACH

In addition to the GHG emissions data and aforementioned common categories of reporting data, individual facilities following the decentralized approach by reporting calculated GHG emissions to the corporate level should also report the following:

- A description of GHG calculation methodologies and any changes made to those methodologies relative to previous reporting periods
- Ratio indicators (see chapter 9)
- Details on any data references used for the calculations, in particular information on emission factors used.

Clear records of calculations undertaken to derive emissions data should be kept for any future internal or external verification.

7 Managing Inventory Quality



Companies have different reasons for managing the quality of their GHG emissions inventory, ranging from identifying opportunities for improvement to stakeholder demand to preparation for regulation. The *GHG Protocol Corporate Standard* recognizes that these reasons are a function of a company's goals and its expectations for the future. A company's goals for and vision of the evolution of the GHG emissions issue should guide the design of its corporate inventory, the implementation of a quality management system, and the treatment of uncertainty within its inventory.

A corporate GHG inventory program includes all institutional, managerial, and technical arrangements made for the collection of data, preparation of the inventory, and implementation of steps to manage the quality of the inventory.[1] The guidance in this chapter is intended to help companies develop and implement a quality management system for their inventory.

Given an uncertain future, high quality information will have greater value and more uses, while low quality information may have little or no value or use and may even incur penalties. For example, a company may currently be focusing on a voluntary GHG program but also want its inventory data to meet the anticipated requirements of a future when emissions may have monetary value. A quality management system is essential to ensuring that an inventory continues to meet the principles of the GHG Protocol Corporate Standard and anticipates the requirements of future GHG emissions programs.

Even if a company is not anticipating a future regulatory mechanism, internal and external stakeholders will demand high quality inventory information. Therefore, the implementation of some type of quality management system is important. However, the GHG Protocol Corporate Standard recognizes that companies do not have unlimited resources, and, unlike financial accounting, corporate GHG inventories involve a level of scientific and engineering complexity. Therefore, companies should develop their inventory program and quality management system as a cumulative effort in keeping with their resources, the broader evolution of policy, and their own corporate vision.

A quality management system provides a systematic process for preventing and correcting errors, and identifies areas where investments will likely lead to the greatest improvement in overall inventory quality. However, the primary objective of quality management is ensuring the credibility of a company's GHG inventory information. The first step towards achieving this objective is defining inventory quality.

Defining inventory quality

The GHG Protocol Corporate Standard outlines five accounting principles that set an implicit standard for the faithful representation of a company's GHG emission through its technical, accounting, and reporting efforts (see chapter 1). Putting these principles into practice will result in a credible and unbiased treatment and presentation of issues and data. For a company to follow these principles, quality management needs to be an integral part of its corporate inventory program. The goal of a quality management system is to ensure that these principles are put into practice.

KPMG: The value of integrating GHG management with existing systems

KPMG, a global services company, found that a key factor in the derivation of reliable, verifiable GHG data is the integration of GHG data management and reporting mechanisms with companies' core operational management and assurance processes. This is because:

- It is more efficient to widen the scope of existing embedded management and assurance processes than to develop a separate function responsible for generating and reporting GHG information.
- As GHG information becomes increasingly monetized, it will attract the same attention as other key performance indicators of businesses. Therefore, management will need to ensure adequate procedures are in place to report reliable data. These procedures can most effectively be implemented by functions within the organization that oversee corporate governance, internal audit, IT, and company reporting.

Another factor that is often not given sufficient emphasis is training of personnel and communication of GHG objectives. Data generation and reporting systems are only as reliable as the people who operate them. Many well-designed systems fail because the precise reporting needs of the company are not adequately explained to the people who have to interpret a reporting standard and calculation tools. Given the complexity of accounting boundaries and an element of subjectivity that must accompany source inclusion and equity share, inconsistent interpretation of reporting requirements is a real risk. It is also important that those responsible for supplying input data are aware of its use. The only way to minimize this risk is through clear communication, adequate training and knowledge sharing.

An inventory program framework

A practical framework is needed to help companies conceptualize and design a quality management system and to help plan for future improvements. This framework focuses on the following institutional, managerial, and technical components of an inventory (Figure 11):

METHODS: These are the technical aspects of inventory preparation. Companies should select or develop methodologies for estimating emissions that accurately represent the characteristics of their source categories. The GHG Protocol provides many default methods and calculation tools to help with this effort. The design of an inventory program and quality management system should provide for the selection, application, and updating of inventory methodologies as new research becomes available, changes are made to business operations, or the importance of inventory reporting is elevated.

DATA: This is the basic information on activity levels, emission factors, processes, and operations. Although methodologies need to be appropriately rigorous and detailed, data quality is more important. No methodology can compensate for poor quality input data. The design of a corporate inventory program should facilitate the collection of high quality inventory data and the maintenance and improvement of collection procedures.

INVENTORY PROCESSES AND SYSTEMS: These are the institutional, managerial, and technical procedures for preparing GHG inventories. They include the team and processes charged with the goal of producing a high quality inventory. To streamline GHG inventory quality management, these processes and systems may be integrated, where appropriate, with other corporate processes related to quality.

DOCUMENTATION: This is the record of methods, data, processes, systems, assumptions, and estimates used to prepare an inventory. It includes everything employees need to prepare and improve a company's inventory. Since estimating GHG emissions is inherently technical (involving engineering and science), high quality, transparent documentation is particularly important to credibility. If information is not credible, or fails to be effectively communicated to either internal or external stakeholders, it will not have value.

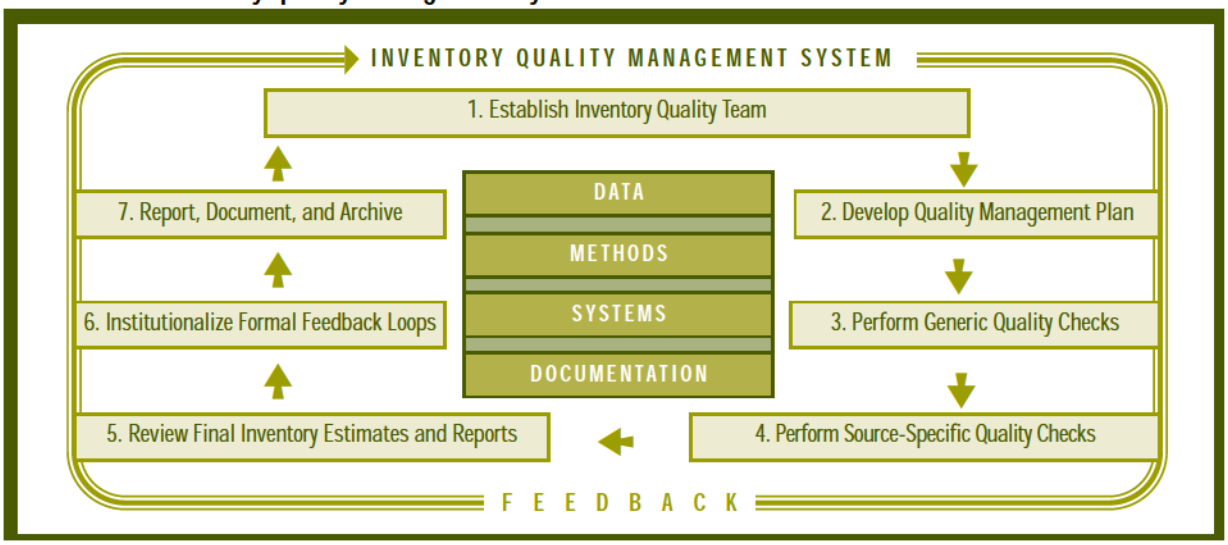
Companies should seek to ensure the quality of these components at every level of their inventory design.

Implementing an inventory quality management system

A quality management system for a company's inventory program should address all four of the inventory components described above. To implement the system, a company should take the following steps:

1. Establish an inventory quality team. This team should be responsible for implementing a quality management system, and continually improving inventory quality. The team or manager should coordinate interactions between relevant business units, facilities and external entities such as government agency programs, research institutions, verifiers, or consulting firms.

FIGURE 11: Inventory quality management system



2. Develop a quality management plan. This plan describes the steps a company is taking to implement its quality management system, which should be incorporated into the design of its inventory program from the beginning, although further rigor and coverage of certain procedures may be phased in over multiple years. The plan should include procedures for all organizational levels and inventory development processes—from initial data collection to final reporting of accounts. For efficiency and comprehensiveness, companies should integrate (and extend as appropriate) existing quality systems to cover GHG management and reporting, such as any ISO procedures. To ensure accuracy, the bulk of the plan should focus on practical measures for implementing the quality management system, as described in steps three and four.
3. Perform generic quality checks. These apply to data and processes across the entire inventory, focusing on appropriately rigorous quality checks on data handling, documentation, and emission calculation activities (e.g., ensuring that correct unit conversions are used). Guidance on quality checking procedures is provided in the section on implementation below (see table 4).

TABLE 4. Generic quality management measures

DATA GATHERING, INPUT, AND HANDLING ACTIVITIES
• Check a sample of input data for transcription errors
• Identify spreadsheet modifications that could provide additional controls or checks on quality
• Ensure that adequate version control procedures for electronic files have been implemented
• Others
DATA DOCUMENTATION
• Confirm that bibliographical data references are included in spreadsheets for all primary data
• Check that copies of cited references have been archived
• Check that assumptions and criteria for selection of boundaries, base years, methods, activity data, emission factors, and other parameters are documented
• Check that changes in data or methodology are documented
• Others
CALCULATING EMISSIONS AND CHECKING CALCULATIONS
• Check whether emission units, parameters, and conversion factors are appropriately labeled
• Check if units are properly labeled and correctly carried through from beginning to end of calculations
• Check that conversion factors are correct
• Check the data processing steps (e.g., equations) in the spreadsheets
• Check that spreadsheet input data and calculated data are clearly differentiated
• Check a representative sample of calculations, by hand or electronically
• Check some calculations with abbreviated calculations (i.e., back of the envelope calculations)
• Check the aggregation of data across source categories, business units, etc.
• Check consistency of time series inputs and calculations
• Others

4. Perform source-category-specific quality checks. This includes more rigorous investigations into the appropriate application of boundaries, recalculation procedures, and adherence to accounting and reporting principles for specific source categories, as well as the quality of the data input used (e.g., whether electricity bills or meter readings are the best source of consumption data) and a qualitative description of the major causes of uncertainty in the data. The information from these investigations can also be used to support a quantitative assessment of uncertainty. Guidance on these investigations is provided in the section on implementation below.

5. Review final inventory estimates and reports. After the inventory is completed, an internal technical review should focus on its engineering, scientific, and other technical aspects. Subsequently, an internal managerial review should focus on securing official corporate approval of and support for the inventory. A third type of review involving experts external to the company's inventory program is addressed in chapter 10.

6. Institutionalize formal feedback loops. The results of the reviews in step five, as well as the results of every other component of a company's quality management system, should be fed back via formal feedback procedures to the person or team identified in step one. Errors should be corrected and improvements implemented based on this feedback.

7. Establish reporting, documentation, and archiving procedures. The system should contain record keeping procedures that specify what information will be documented for internal purposes, how that information should be archived, and what information is to be reported for external stakeholders. Like internal and external reviews, these record keeping procedures include formal feedback mechanisms.

A company's quality management system and overall inventory program should be treated as evolving, in keeping with a company's reasons for preparing an inventory. The plan should address the company's strategy for a multi-year implementation (i.e., recognize that inventories are a long-term effort), including steps to ensure that all quality control findings from previous years are adequately addressed.

Practical measures for implementation

Although principles and broad program design guidelines are important, any guidance on quality management would be incomplete without a discussion of practical inventory quality measures. A company should implement these measures at multiple levels within the company, from the point of primary data collection to the final corporate inventory approval process. It is important to implement these measures at points in the inventory program where errors are mostly likely to occur, such as the initial data collection phase and during calculation and data aggregation. While corporate level inventory quality may initially be emphasized, it is important to ensure quality measures are implemented at all levels of disaggregation (e.g., facility, process, geographical, according to a particular scope, etc) to be better prepared for GHG markets or regulatory rules in the future.

Companies also need to ensure the quality of their historical emission estimates and trend data. They can achieve this by employing inventory quality measures to minimize biases that can arise from changes in the characteristics of the data or methods used to calculate historical emission estimates, and by following the standards and guidance of chapter 5.

The third step of a quality management system, as described above, is to implement generic quality checking measures. These measures apply to all source categories and all levels of inventory preparation. Table 4 provides a sample list of such measures.

The fourth step of a quality management system is source category-specific data quality investigations. The information gathered from these investigations can also be used for the quantitative and qualitative assessment of data uncertainty (see section on uncertainty). Addressed below are the types of source-specific quality measures that can be employed for emission factors, activity data, and emission estimates.



EMISSION FACTORS AND OTHER PARAMETERS

For a particular source category, emissions calculations will generally rely on emission factors and other parameters (e.g., utilization factors, oxidation rates, methane conversion factors).[2] These factors and parameters may be published or default factors, based on company-specific data, site-specific data, or direct emission or other measurements. For fuel consumption, published emission factors based on fuel energy content are generally more accurate than those based on mass or volume, except when mass or volume based factors have been measured at the company- or site-specific level. Quality investigations need to assess the representativeness and applicability of emission factors and other parameters to the specific characteristics of a company. Differences between measured and default values need to be qualitatively explained and justified based upon the company's operational characteristics.

ACTIVITY DATA

The collection of high quality activity data will often be the most significant limitation for corporate GHG inventories. Therefore, establishing robust data collection procedures needs to be a priority in the design of any company's inventory program. The following are useful measures for ensuring the quality of activity data:

- Develop data collection procedures that allow the same data to be efficiently collected in future years.
- Convert fuel consumption data to energy units before applying carbon content emission factors, which may be better correlated to a fuel's energy content than its mass.
- Compare current year data with historical trends. If data do not exhibit relatively consistent changes from year to year then the causes for these patterns should be investigated (e.g., changes of over 10 percent from year to year may warrant further investigation).
- Compare activity data from multiple reference sources (e.g., government survey data or data compiled by trade associations) with corporate data when possible. Such checks can ensure that consistent data is being reported to all parties. Data can also be compared among facilities within a company.

Interface: Integration of emissions and business data systems

Interface, Inc., is the world's largest manufacturer of carpet tiles and upholstery fabrics for commercial interiors. The company has established an environmental data system that mirrors its corporate financial data reporting. The Interface EcoMetrics system is designed to provide activity and material flow data from business units in a number of countries (the United States, Canada, Australia, the United Kingdom, Thailand and throughout Europe) and provides metrics for measuring progress on environmental issues such as GHG emissions. Using company-wide accounting guidelines and standards, energy and material input data are reported to a central database each quarter and made available to sustainability personnel. These data are the foundation of Interface's annual inventory and enable data comparison over time in the pursuit of improved quality.

Basing emissions data systems on financial reporting helps Interface improve its data quality. Just as financial data need to be documented and defensible, Interface's emissions data are held to standards that promote an increasingly transparent, accurate, and high-quality inventory. Integrating its financial and emissions data systems has made Interface's GHG accounting and reporting more useful as it strives to be a "completely sustainable company" by 2020.

- Investigate activity data that is generated for purposes other than preparing a GHG inventory. In doing so, companies will need to check the applicability of this data to inventory purposes, including completeness, consistency with the source category definition, and consistency with the emission factors used. For example, data from different facilities may be examined for inconsistent measurement techniques, operating conditions, or technologies. Quality control measures (e.g., ISO) may have already been conducted during the data's original preparation. These measures can be integrated with the company's inventory quality management system.
- Check that base year recalculation procedures have been followed consistently and correctly (see chapter 5).
- Check that operational and organizational boundary decisions have been applied correctly and consistently to the collection of activity data (see chapters 3 and 4).

- Investigate whether biases or other characteristics that could affect data quality have been previously identified (e.g., by communicating with experts at a particular facility or elsewhere). For example, a bias could be the unintentional exclusion of operations at smaller facilities or data that do not correspond exactly with the company's organizational boundaries.
- Extend quality management measures to cover any additional data (sales, production, etc.) used to estimate emission intensities or other ratios.

EMISSION ESTIMATES

Estimated emissions for a source category can be compared with historical data or other estimates to ensure they fall within a reasonable range. Potentially unreasonable estimates provide cause for checking emission factors or activity data and determining whether changes in methodology, market forces, or other events are sufficient reasons for the change. In situations where actual emission monitoring occurs (e.g., power plant CO_2 emissions), the data from monitors can be compared with calculated emissions using activity data and emission factors.

If any of the above emission factor, activity data, emission estimate, or other parameter checks indicate a problem, more detailed investigations into the accuracy of the data or appropriateness of the methods may be required. These more detailed investigations can also be utilized to better assess the quality of data. One potential measure of data quality is a quantitative and qualitative assessment of their uncertainty.

Vauxhall Motors: The importance of accuracy checks

The experience of the U.K. automotive manufacturer Vauxhal Motors illustrates the importance of attention to detail in setting up GHG information collection systems. The company wished to calculate GHG emissions from staff air travel. However, when determining the impact of flight travel, it is important to make sure that the round trip distance is used when calculating emissions. Fortunately, Vauxhall's review of its assumptions and calculation methodologies revealed this fact and avoided reporting emissions that were 50 percent lower than the actual value.

Inventory quality and inventory uncertainty

Preparing a GHG inventory is inherently both an accounting and a scientific exercise. Most applications for company-level emissions and removal estimates require that these data be reported in a format similar to financial accounting data. In financial accounting, it is standard practice to report individual point estimates (i.e., single value versus a range of possible values). In contrast, the standard practice for most scientific studies of GHG and other emissions is to report quantitative data with estimated error bounds (i.e., uncertainty). Just like financial figures in a profit and loss or bank account statement, point estimates in a corporate emission inventory have obvious uses. However, how would or should the addition of some quantitative measure of uncertainty to an emission inventory be used?

In an ideal situation, in which a company had perfect quantitative information on the uncertainty of its emission estimates at all levels, the primary use of this information would almost certainly be comparative. Such comparisons might be made across companies, across business units, across source categories, or through time. In this situation, inventory estimates could even be rated or discounted based on their quality before they were used, with uncertainty being the objective quantitative metric for quality. Unfortunately, such objective uncertainty estimates rarely exist.

TYPES OF UNCERTAINTIES

Uncertainties associated with GHG inventories can be broadly categorized into scientific uncertainty and estimation uncertainty. Scientific uncertainty arises when the science of the actual emission and/or removal process is not completely understood. For example, many direct and indirect factors associated with global warming potential (GWP) values that are used to combine emission estimates for various GHGs involve significant scientific uncertainty. Analyzing and quantifying such scientific uncertainty is extremely problematic and is likely to be beyond the capacity of most company inventory programs.

Estimation uncertainty arises any time GHG emissions are quantified. Therefore all emissions or removal estimates are associated with estimation uncertainty. Estimation uncertainty can be further classified into two types: model uncertainty and parameter uncertainty.[3]

Model uncertainty refers to the uncertainty associated with the mathematical equations (i.e., models) used to characterize the relationships between various parameters and emission processes. For example, model uncertainty may arise either due to the use of an incorrect mathematical model or inappropriate input into the model. As with scientific uncertainty, estimating model uncertainty is likely to be beyond most company's inventory efforts; however, some companies may wish to utilize their unique scientific and engineering expertise to evaluate the uncertainty in their emission estimation models.

Parameter uncertainty refers to the uncertainty associated with quantifying the parameters used as inputs (e.g., activity data and emission factors) into estimation models. Parameter uncertainties can be evaluated through statistical analysis, measurement equipment precision determinations, and expert judgment. Quantifying parameter uncertainties and then estimating source category uncertainties based on these parameter uncertainties will be the primary focus of companies that choose to investigate the uncertainty in their emission inventories.



LIMITATIONS OF UNCERTAINTY ESTIMATES

Given that only parameter uncertainties are within the feasible scope of most companies, uncertainty estimates for corporate GHG inventories will, of necessity, be imperfect. Complete and robust sample data will not always be available to assess the statistical uncertainty[4] in every parameter. For most parameters (e.g., liters of gasoline purchased or tonnes of limestone consumed), only a single data point may be available. In some cases, companies can utilize instrument precision or calibration information to inform their assessment of statistical uncertainty. However, to quantify some of the systematic uncertainties[5] associated with parameters and to supplement statistical uncertainty estimates, companies will usually have to rely on expert judgment.[6] The problem with expert judgment, though, is that it is difficult to obtain in a comparable (i.e., unbiased) and consistent manner across parameters, source categories, or companies.

For these reasons, almost all comprehensive estimates of uncertainty for GHG inventories will be not only imperfect but also have a subjective component and, despite the most thorough efforts, are themselves considered highly uncertain. In most cases, uncertainty estimates cannot be interpreted as an objective measure of quality. Nor can they be used to compare the quality of emission estimates between source categories or companies.

Exceptions to this include the following cases in which it is assumed that either statistical or instrument precision data are available to objectively estimate each parameter's statistical uncertainty (i.e., expert judgment is not needed):

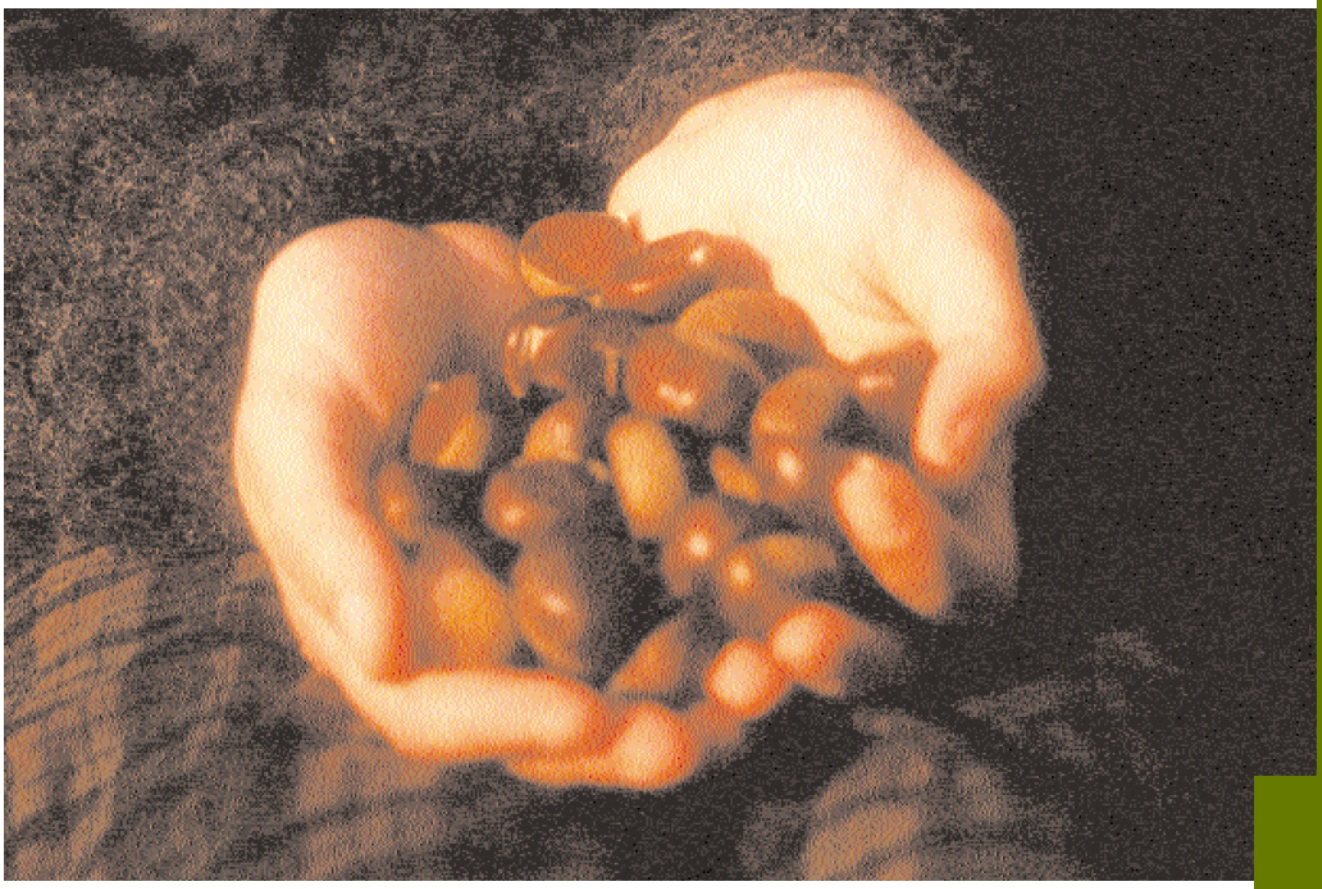
- When two operationally similar facilities use identical emission estimation methodologies, the differences in scientific or model uncertainties can, for the most part, be ignored. Then quantified estimates of statistical uncertainty can be treated as being comparable between facilities. This type of comparability is what is aimed for in some trading programs that prescribe specific monitoring, estimation, and measurement requirements. However, even in this situation, the degree of comparability depends on the flexibility that participants are given for estimating emissions, the homogeneity across facilities, as well as the level of enforcement and review of the methodologies used.
- Similarly, when a single facility uses the same estimation methodology each year, the systematic parameter uncertainties—in addition to scientific and model uncertainties—in a source's emission estimates for two years are, for the most part, identical.[7] Because the systematic parameter uncertainties then cancel out, the uncertainty in an emission trend (e.g., the difference between the estimates for two years) is generally less than the uncertainty in total emissions for a single year. In such a situation, quantified uncertainty estimates can be treated as being comparable over time and used to track relative changes in the quality of a facility's emission estimates for that source category. Such estimates of uncertainty in emission trends can also be used as a guide to setting a facility's emissions reduction target. Trend uncertainty estimates are likely to be less useful for setting broader (e.g., company-wide) targets (see chapter 11) because of the general problems with comparability between uncertainty estimates across gases, sources, and facilities.

Given these limitations, the role of qualitative and quantitative uncertainty assessments in developing GHG inventories include:

- Promoting a broader learning and quality feedback process.
- Supporting efforts to qualitatively understand and document the causes of uncertainty and help identify ways of improving inventory quality. For example, collecting the information needed to determine the statistical properties of activity data and emission factors forces one to ask hard questions and to carefully and systematically investigate data quality.
- Establishing lines of communication and feedback with data suppliers to identify specific opportunities to improve quality of the data and methods used.
- Providing valuable information to reviewers, verifiers, and managers for setting priorities for investments into improving data sources and methodologies.

The GHG Protocol Corporate Standard has developed a supplementary guidance document on uncertainty assessments ("Guidance on uncertainty assessment in GHG inventories and calculating statistical parameter uncertainty") along with an uncertainty calculation tool, both of which are available on the GHG Protocol website. The guidance document describes how to use the calculation tool in aggregating uncertainties. It also discusses in more depth different types of uncertainties, the limitations of quantitative uncertainty assessment, and how uncertainty estimates should be properly interpreted.

Additional guidance and information on assessing uncertainty—including optional approaches to developing quantitative uncertainty estimates and eliciting judgments from experts—can also be found in EPA's Emissions Inventory Improvement Program, Volume VI: Quality Assurance/Quality Control (1999) and in chapter 6 of the IPCC's Good Practice Guidance (2000a).



NOTES

[1] Although the term "emissions inventory" is used throughout this chapter, the guidance equally applies to estimates of removals due to sink categories (e.g., forest carbon sequestration).

[2] Some emission estimates may be derived using mass or energy balances, engineering calculations, or computer simulation models. In addition to investigating the input data to these models, companies should also consider whether the internal assumptions (including assumed parameters in the model) are appropriate to the nature of the company's operations.

[3] Emissions estimated from direct emissions monitoring will generally only involve parameter uncertainty (e.g., equipment measurement error).

[4] Statistical uncertainty results from natural variations (e.g., random human errors in the measurement process and fluctuations in measurement equipment). Statistical uncertainty can be detected through repeated experiments or sampling of data.

[5] Systematic parameter uncertainty occurs if data are systematically biased. In other words, the average of the measured or estimated value is always less or greater than the true value. Biases arise, for example, because emission factors are constructed from non-representative samples, all relevant source activities or categories have not been identified, or incorrect or incomplete estimation methods or faulty measurement equipment have been used. Because the true value is unknown, such systematic biases cannot be detected through repeated experiments and, therefore, cannot be quantified through statistical analysis. However, it is possible to identify biases and, sometimes, to quantify them through data quality investigations and expert judgments.

[6] The role of expert judgment can be twofold: First, it can provide the data necessary to estimate the parameter. Second, it can help (in combination with data quality investigations) identify, explain, and quantify both statistical and systematic uncertainties.

[7] It should be recognized, however, that biases may not be constant from year to year but instead may exhibit a pattern over time (e.g., may be growing or falling). For example, a company that continues to disinvest in collecting high quality data may create a situation in which the biases in its data get worse each year. These types of data quality issues are extremely problematic because of the effect they can have on calculated emission trends. In such cases, systematic parameter uncertainties cannot be ignored.

8 Accounting for GHG Reductions



As voluntary reporting, external GHG programs, and emission trading systems evolve, it is becoming more and more essential for companies to understand the implications of accounting for GHG emissions changes over time on the one hand, and, on the other hand, accounting for offsets or credits that result from GHG reduction projects. This chapter elaborates on the different issues associated with the term "GHG reductions."

The GHG Protocol Corporate Standard focuses on accounting and reporting for GHG emissions at the company or organizational level. Reductions in corporate emissions are calculated by comparing changes in the company's actual emissions inventory over time relative to a base year. Focusing on overall corporate or organizational level emissions has the advantage of helping companies manage their aggregate GHG risks and opportunities more effectively. It also helps focus resources on activities that result in the most cost-effective GHG reductions.

In contrast to corporate accounting, the forthcoming GHG Protocol Project Quantification Standard focuses on the quantification of GHG reductions from GHG mitigation projects that will be used as offsets. Offsets are discrete GHG reductions used to compensate for (i.e., offset) GHG emissions elsewhere, for example to meet a voluntary or mandatory GHG target or cap. Offsets are calculated relative to a baseline that represents a hypothetical scenario for what emissions would have been in the absence of the project.

Corporate GHG reductions at facility or country level

From the perspective of the earth's atmosphere, it does not matter where GHG emissions or reductions occur. From the perspective of national and international policymakers addressing global warming, the location where GHG reductions are achieved is relevant, since policies usually focus on achieving reductions within specific countries or regions, as spelled out, for example, in the Kyoto Protocol. Thus companies with global operations will have to respond to an array of state, national, or regional regulations and requirements that address GHGs from operations or facilities within a specific geographic area.

The GHG Protocol Corporate Standard calculates GHG emissions using a bottom-up approach. This involves calculating emissions at the level of an individual source or facility and then rolling this up to the corporate level. Thus a company's overall emissions may decrease, even if increases occur at specific sources, facilities, or operations and vice-versa. This bottom-up approach enables companies to report GHG emissions information at different scales, e.g., by individual sources or facilities, or by a collection of facilities within a given country. Companies can meet an array of government requirements or voluntary commitments by comparing actual emissions over time for the relevant scale. On a corporate-wide scale, this information can also be used when setting and reporting progress towards a corporate-wide GHG target (see chapter 11).

In order to track and explain changes in GHG emissions over time, companies may find it useful to provide information on the nature of these changes. For example, BP asks each of its reporting units to provide such information in an accounting movement format using the following categories (BP 2000):

- Acquisitions and divestments
- Closure
- Real reductions (e.g., efficiency improvements, material or fuel substitution)
- Change in production level
- Changes in estimation methodology
- Other

This type of information can be summarized at the corporate level to provide an overview of the company's performance over time.

Reductions in indirect emissions

Reductions in indirect emissions (changes in scope 2 or 3 emissions over time) may not always capture the actual emissions reduction accurately. This is because there is not always a direct cause-effect relationship between the activity of the reporting company and the resulting GHG emissions. For example, a reduction in air travel would reduce a company's scope 3 emissions. This reduction is usually quantified based on an average emission factor of fuel use per passenger. However, how this reduction actually translates into a change in GHG emissions to the atmosphere would depend on a number of factors, including whether another person takes the "empty seat" or whether this unused seat contributes to reduced air traffic over the longer term. Similarly, reductions in scope 2 emissions calculated with an average grid emissions factor may over- or underestimate the actual reduction depending on the nature of the grid.

Generally, as long as the accounting of indirect emissions over time recognizes activities that in aggregate change global emissions, any such concerns over accuracy should not inhibit companies from reporting their indirect emissions. In cases where accuracy is more important, it may be appropriate to undertake a more

detailed assessment of the actual reduction using a project quantification methodology.

Project based reductions and offsets/credits

Project reductions that are to be used as offsets should be quantified using a project quantification method, such as the forthcoming GHG Protocol Project Quantification Standard, that addresses the following accounting issues:

- SELECTION OF A BASELINE SCENARIO AND EMISSION. The baseline scenario represents what would have happened in the absence of the project. Baseline emissions are the hypothetical emissions associated with this scenario. The selection of a baseline scenario always involves uncertainty because it represents a hypothetical scenario for what would have happened without the project. The project reduction is calculated as the difference between the baseline and project emissions. This differs from the way corporate or organizational reductions are measured in this document, i.e., in relation to an actual historical base year.
- DEMONSTRATION OF ADDITIONALITY. This relates to whether the project has resulted in emission reductions or removals in addition to what would have happened in the absence of the project. If the project reduction is used as an offset, the quantification procedure should address additionality and demonstrate that the project itself is not the baseline and that project emissions are less than baseline emissions. Additionality ensures the integrity of the fixed cap or target for which the offset is used. Each reduction unit from a project used as an offset allows the organization or facility with a cap or target one additional unit of emissions. If the project were going to happen anyway (i.e., is non-additional), global emissions will be higher by the number of reduction units issued to the project.
- IDENTIFICATION AND QUANTIFICATION OF RELEVANT SECONDARY EFFECTS. These are GHG emissions changes resulting from the project not captured by the primary effect(s).[1] Secondary effects are typically the small, unintended GHG consequences of a project and include leakage (changes in the availability or quantity of a product or service that results in changes in GHG emissions elsewhere) as well as changes in GHG emissions up- and downstream of the project. If relevant, secondary effects should be incorporated into the calculation of the project reduction.
- CONSIDERATION OF REVERSIBILITY. Some projects achieve reductions in atmospheric carbon dioxide levels by capturing, removing and/or storing carbon or GHGs in biological or non-biological sinks (e.g., forestry, land use management, underground reservoirs). These reductions may be temporary in that the removed carbon dioxide may be returned to the atmosphere at some point in the future through intentional activities or accidental occurrences—such as harvesting of forestland or forest fires, etc.[2] The risk of reversibility should be assessed, together with any mitigation or compensation measures included in the project design.
- AVOIDANCE OF DOUBLE COUNTING. To avoid double counting, the reductions giving rise to the offset must occur at sources or sinks not included in the target or cap for which the offset is used. Also, if the reductions occur at sources or sinks owned or controlled by someone other than the parties to the project (i.e., they are indirect), the ownership of the reduction should be clarified to avoid double counting.

Offsets may be converted into credits when used to meet an externally imposed target. Credits are convertible and transferable instruments usually bestowed by an external GHG program. They are typically generated from an activity such as an emissions reduction project and then used to meet a target in an otherwise closed system, such as a group of facilities with an absolute emissions cap placed across them. Although a credit is usually based on the underlying reduction calculation, the conversion of an offset into a credit is usually subject to strict rules, which may differ from program to program. For example, a Certified Emission Reduction (CER) is a credit issued by the Kyoto Protocol Clean Development Mechanism. Once issued, this credit can be traded and ultimately used to meet Kyoto Protocol targets. Experience from the "pre-compliance" market in GHG credits highlights the importance of delineating project reductions that are to be used as offsets with a credible quantification method capable of providing verifiable data.

Reporting project based reductions

It is important for companies to report their physical inventory emissions for their chosen inventory boundaries separately and independently of any GHG trades they undertake. GHG trades[3] should be reported in its public GHG report under optional information—either in relation to a target (see chapter 11) or corporate

inventory (see chapter 9). Appropriate information addressing the credibility of purchased or sold offsets or credits should be included.

When companies implement internal projects that reduce GHGs from their operations, the resulting reductions are usually captured in their inventory's boundaries. These reductions need not be reported separately unless they are sold, traded externally, or otherwise used as an offset or credit. However, some companies may be able to make changes to their own operations that result in GHG emissions changes at sources not included in their own inventory boundary, or not captured by comparing emissions changes over time. For example:

- Substituting fossil fuel with waste-derived fuel that might otherwise be used as landfill or incinerated without energy recovery. Such substitution may have no direct effect on (or may even increase) a company's own GHG emissions. However, it could result in emissions reductions elsewhere by another organization, e.g., through avoiding landfill gas and fossil fuel use.
- Installing an on-site power generation plant (e.g., a combined heat and power, or CHP, plant) that provides surplus electricity to other companies may increase a company's direct emissions, while displacing the consumption of grid electricity by the companies supplied. Any resulting emissions reductions at the plants where this electricity would have otherwise been produced will not be captured in the inventory of the company installing the on-site plant.
- Substituting purchased grid electricity with an on-site power generation plant (e.g., CHP) may increase a company's direct GHG emissions, while reducing the GHG emissions associated with the generation of grid electricity. Depending on the GHG intensity and the supply structure of the electricity grid, this reduction may be over- or underestimated when merely comparing scope 2 emissions over time, if the latter are quantified using an average grid emission factor.



Alcoa: Taking advantage of renewable energy certificates

Alcoa, a global manufacturer of aluminum, is implementing a variety of strategies to reduce its GHG emissions. One approach has been to purchase renewable energy certificates, or RECs, to offset some of the company's GHG emissions. RECs, which represent the environmental benefits of renewable energy unbundled from the actual flow of electrons, are an innovative method of providing renewable energy to individual customers. RECs represent the unbundled environmental benefits, such as avoided CO_2 emissions, generated by producing electricity from renewable rather than fossil sources. RECs can be sold bundled with the electricity (as green power) or separately to customers interested in supporting renewable energy.

Alcoa found that RECs offer a variety of advantages, including direct access to the benefits of renewable energy for facilities that may have limited renewable energy procurement options. In October 2003, Alcoa began purchasing RECs equivalent to 100% of the electricity used annually at four corporate offices in Tennessee, Pennsylvania, and New York. The RECs Alcoa is purchasing effectively mean that the four corporate centers are now operating on electricity generated by projects that produce electricity from landfill gas, avoiding the emission of more than 6.3 million kilograms (13.9 million pounds) of carbon dioxide annually. Alcoa chose RECs in part because the supplier was able to provide RECs to all four facilities through one contract. This flexibility lowered the administrative cost of purchasing renewable energy for multiple facilities that are served by different utilities.

For more information on RECs, see the Green Power Market Development Group's Corporate Guide to Green Power Markets: Installment #5 (WRI, 2003).

These reductions may be separately quantified, for example using the GHG Protocol Project Quantification Standard, and reported in a company's public GHG report under optional information in the same way as GHG trades described above.

NOTES

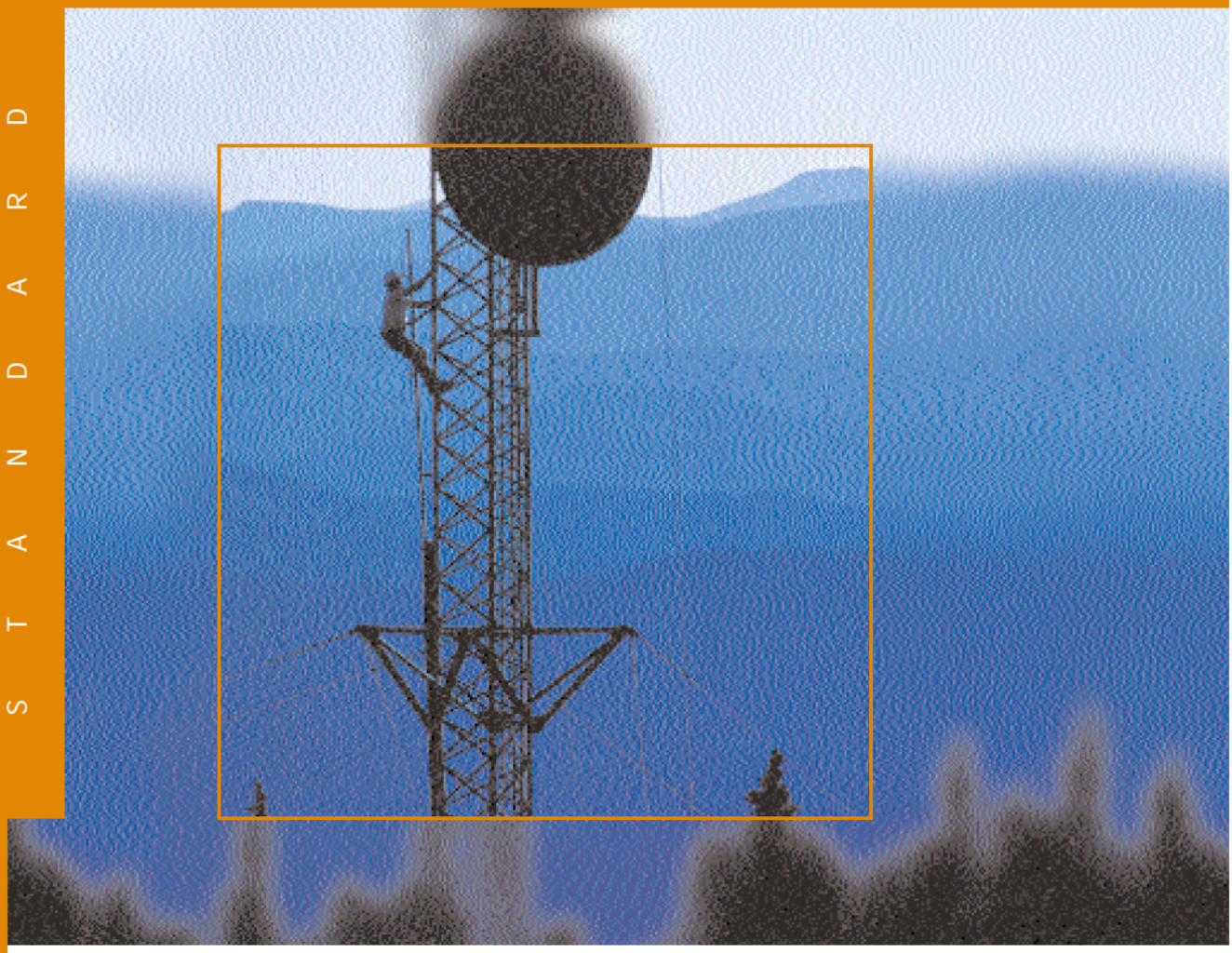
[1] Primary effects are the specific GHG reducing elements or activities (reducing GHG emissions, carbon storage, or enhancing GHG removals) that the project is intended to achieve.

[2] This problem with the temporary nature of GHG reductions is sometimes referred to as the "permanence" issue.

[3] The term "GHG trades" refers to all purchases or sales of allowances, offsets, and credits.

9 Reporting GHG Emissions

STANDARD



A credible GHG emissions report presents relevant information that is complete, consistent, accurate and transparent. While it takes time to develop a rigorous and complete corporate inventory of GHG emissions, knowledge will improve with experience in calculating and reporting data. It is therefore recommended that a public GHG report:

- Be based on the best data available at the time of publication, while being transparent about its limitations
- Communicate any material discrepancies identified in previous years
- Include the company's gross emissions for its chosen inventory boundary separate from and independent of any GHG trades it might engage in.

STANDARD GUIDANCE

Reported information shall be "relevant, complete, consistent, transparent and accurate." The GHG Protocol Corporate Standard requires reporting a minimum of scope 1 and scope 2 emissions.

Required information

A public GHG emissions report that is in accordance with the GHG Protocol Corporate Standard shall include the following information:

DESCRIPTION OF THE COMPANY AND INVENTORY BOUNDARY

- An outline of the organizational boundaries chosen, including the chosen consolidation approach.
- An outline of the operational boundaries chosen, and if scope 3 is included, a list specifying which types of activities are covered.
- The reporting period covered.

INFORMATION ON EMISSIONS

- Total scope 1 and 2 emissions independent of any GHG trades such as sales, purchases, transfers, or banking of allowances.
- Emissions data separately for each scope.
- Emissions data for all six GHGs separately (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) in metric tonnes and in tonnes of CO_2 equivalent.
- Year chosen as base year, and an emissions profile over time that is consistent with and clarifies the chosen policy for making base year emissions recalculations.
- Appropriate context for any significant emissions changes that trigger base year emissions recalculation (acquisitions/divestitures, outsourcing/insourcing, changes in reporting boundaries or calculation methodologies, etc.).
- Emissions data for direct CO_2 emissions from biologically sequestered carbon (e.g., CO_2 from burning biomass/biofuels), reported separately from the scopes.
- Methodologies used to calculate or measure emissions, providing a reference or link to any calculation tools used.
- Any specific exclusions of sources, facilities, and/or operations.

Optional information

A public GHG emissions report should include, when applicable, the following additional information:

INFORMATION ON EMISSIONS AND PERFORMANCE

- Emissions data from relevant scope 3 emissions activities for which reliable data can be obtained.
- Emissions data further subdivided, where this aids transparency, by business units/facilities, country, source types (stationary combustion, process, fugitive, etc.), and activity types (production of electricity, transportation, generation of purchased electricity that is sold to end users, etc.).
- Emissions attributable to own generation of electricity, heat, or steam that is sold or transferred to another organization (see chapter 4).
- Emissions attributable to the generation of electricity, heat or steam that is purchased for re-sale to non-end users (see chapter 4).
- A description of performance measured against internal and external benchmarks.
- Emissions from GHGs not covered by the Kyoto Protocol (e.g., CFCs, NO_x,), reported separately from scopes.
- Relevant ratio performance indicators (e.g. emissions per kilowatt-hour generated, tonne of material production, or sales).
- An outline of any GHG management/reduction programs or strategies.
- Information on any contractual provisions addressing GHG-related risks and obligations.
- An outline of any external assurance provided and a copy of any verification statement, if applicable, of the reported emissions data.

- Information on the causes of emissions changes that did not trigger a base year emissions recalculation (e.g., process changes, efficiency improvements, plant closures).
- GHG emissions data for all years between the base year and the reporting year (including details of and reasons for recalculations, if appropriate)
- Information on the quality of the inventory (e.g., information on the causes and magnitude of uncertainties in emission estimates) and an outline of policies in place to improve inventory quality. (see chapter 7).
- Information on any GHG sequestration.
- A list of facilities included in the inventory.
- A contact person.

INFORMATION ON OFFSETS

- Information on offsets that have been purchased or developed outside the inventory boundary, subdivided by GHG storage/removals and emissions reduction projects. Specify if the offsets are verified/certified (see chapter 8) and/or approved by an external GHG program (e.g., the Clean Development Mechanism, Joint Implementation).
- Information on reductions at sources inside the inventory boundary that have been sold/transferred as offsets to a third party. Specify if the reduction has been verified/certified and/or approved by an external GHG program (see chapter 8).



By following the GHG Protocol Corporate Standard reporting requirements, users adopt a comprehensive standard with the necessary detail and transparency for credible public reporting. The appropriate level of reporting of optional information categories can be determined by the objectives and intended audience for the report. For national or voluntary GHG programs, or for internal management purposes, reporting requirements may vary (Appendix C summarizes the requirements of various GHG programs).

For public reporting, it is important to differentiate between a summary of a public report that is, for example, published on the Internet or in Sustainability/Corporate Social Responsibility reporting (e.g., Global Reporting Initiative) and a full public report that contains all the necessary data as specified by the reporting standard spelled out in this volume. Not every circulated report must contain all information as specified by this standard, but a link or reference needs to be made to a publicly available full report where all information is available.

For some companies, providing emissions data for specific GHGs or facilities/business units, or reporting ratio indicators, may compromise business confidentiality. If this is the case, the data need not be publicly reported, but can be made available to those auditing the GHG emissions data, assuming confidentiality is secured.

Companies should strive to create a report that is as transparent, accurate, consistent and complete as possible. Structurally, this may be achieved by adopting the reporting categories of the standard (e.g., required description of the company and inventory boundary, required information on corporate emissions, optional information on emissions and performance, and optional information on offsets) as a basis of the report. Qualitatively, including a discussion of the reporting company's strategy and goals for GHG accounting, any particular challenges or tradeoffs faced, the context of decisions on boundaries and other accounting parameters, and an analysis of emissions trends may help provide a complete picture of the company's inventory efforts.

Double Counting

Companies should take care to identify and exclude from reporting any scope 2 or scope 3 emissions that are also reported as scope 1 emissions by other facilities, business units, or companies included in the emissions inventory consolidation (see chapter 6).

Use of ratio indicators

Two principal aspects of GHG performance are of interest to management and stakeholders. One concerns the overall GHG impact of a company—that is the absolute quantity of GHG emissions released to the atmosphere. The other concerns the company's GHG emissions normalized by some business metric that results in a ratio indicator. The GHG Protocol Corporate Standard requires reporting of absolute emissions; reporting of ratio indicators is optional.

Ratio indicators provide information on performance relative to a business type and can facilitate comparisons between similar products and processes over time. Companies may choose to report GHG ratio indicators in order to:

- Evaluate performance over time (e.g., relate figures from different years, identify trends in the data, and show performance in relation to targets and base years (see chapter 11).
- Establish a relationship between data from different categories. For example, a company may want to establish a relationship between the value that an action provides (e.g., price of a tonne of product) and its impact on society or on the environment (e.g., emissions from product manufacturing).
- Improve comparability between different sizes of business and operations by normalizing figures (e.g., by assessing the impact of different sized businesses on the same scale).

It is important to recognize that the inherent diversity of businesses and the circumstances of individual companies can result in misleading indicators. Apparently minor differences in process, product, or location can be significant in terms of environmental effect. Therefore, it is necessary to know the business context in order to be able to design and interpret ratio indicators correctly.

Companies may develop ratios that make most sense for their business and are relevant to their decision-making needs. They may select ratios for external reporting that improve the understanding and clarify the interpretation of their performance for their stakeholders. It is important to provide some perspective on issues such as scale and limitations of indicators in a way that users understand the nature of the information provided. Companies should consider what ratio indicators best capture the benefits and impacts of their business, i.e., its operations, its products, and its effects on the marketplace and on the entire economy. Some examples of different ratio indicators are provided here.

PRODUCTIVITY/EFFICIENCY RATIOS.
Productivity/efficiency ratios express the value or achievement of a business divided by its GHG impact. Increasing efficiency ratios reflect a positive performance improvement. Examples of productivity/efficiency ratios include resource productivity (e.g., sales per GHG) and process eco-efficiency (e.g., production volume per amount of GHG).

MidAmerican: Setting ratio indicators for a utility company

MidAmerican Energy Holdings Company, an energy company based in Iowa, wanted a method to track a power plant's GHG intensity, while also being able to roll individual plant results into a corporate "generation portfolio" GHG intensity indicator. MidAmerican also wanted to be able to take into account the GHG benefits from planned renewable generation, as well as measure the impacts of other changes to its generation portfolio over time (e.g., unit retirements or new construction). The company adopted a GHG intensity indicator that specifically measures pounds of direct emissions over total megawatt hours generated (lbs/MWh).

To measure its direct emissions, the company leverages data currently gathered to satisfy existing regulatory requirements and, where gaps might exist, uses fuel calculations. For coal-fired units, that means mainly using continuous emissions monitoring (CEM) data and the U.S. Environmental Protection Agency's emission factors for natural gas- and fuel oil-fired units. Using the *GHG Protocol Corporate Standard*, the company completes an annual emission inventory for each of its fossil-fired plants, gathering together a) fuel volume and heat input data, b) megawatt production data, c) CEMs data, and d) fuel calculations using appropriate emission factors.

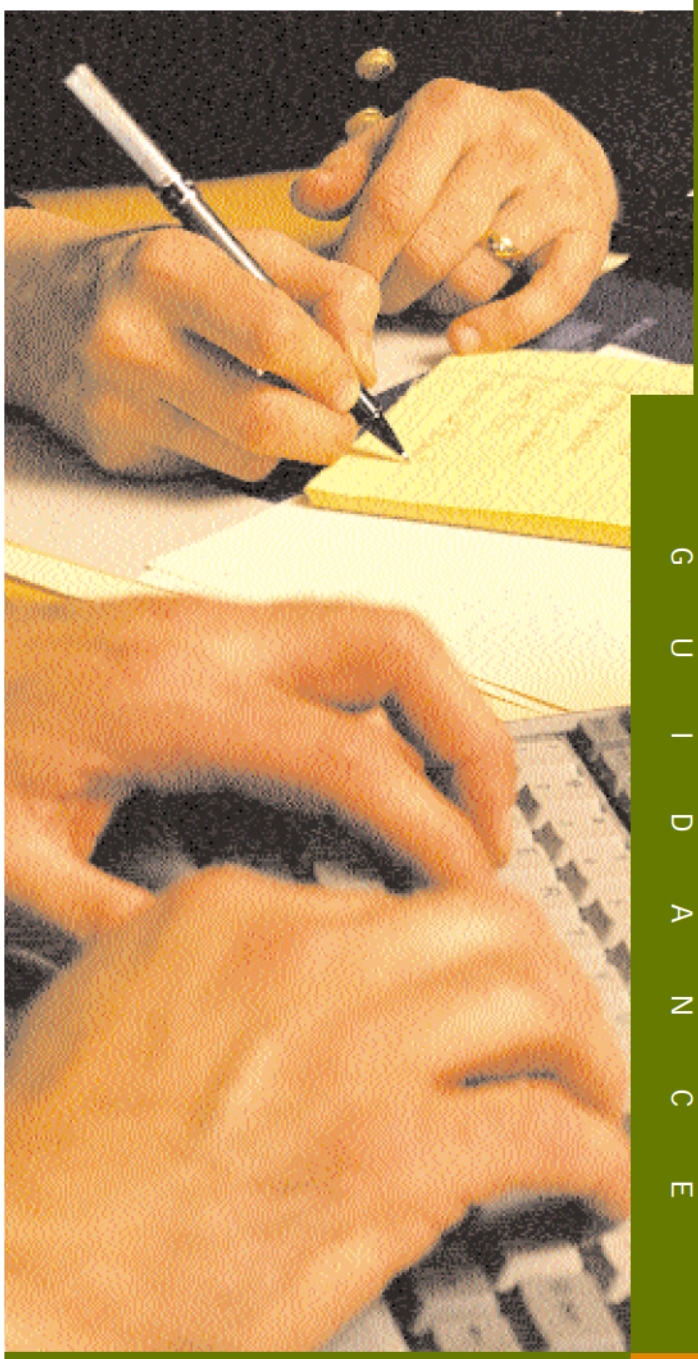
For example, in 2001, using CEM data and fuel calculations, the company's Iowa utility business emitted roughly 23 million tonnes of CO_2, while generating approximately 21 million megawatt hours. Its 2001 GHG intensity indicator calculates to approximately 2,177 lbs/MWh of CO_2, reflecting the Iowa utility company's reliance on traditional coal-fired generation.

By 2008, the Iowa utility company will have constructed a new 790 MW coal-fueled plant, a 540 MW combined-cycle natural gas plant, and a 310 MW wind-turbine farm and added them to its generation portfolio. The utility company's overall CO_2 emissions will increase, but so will its megawatt production. The combined emissions from the new coal- and gas-fired plants will be added to the GHG intensity indicator's numerator, while the megawatt production data from all three facilities will be added to the indicator's denominator. More importantly, and the ratio indicator illustrates this, over time MidAmerican's GHG intensity will decline as more efficient generation is brought online and older power plants are used less or retired altogether.

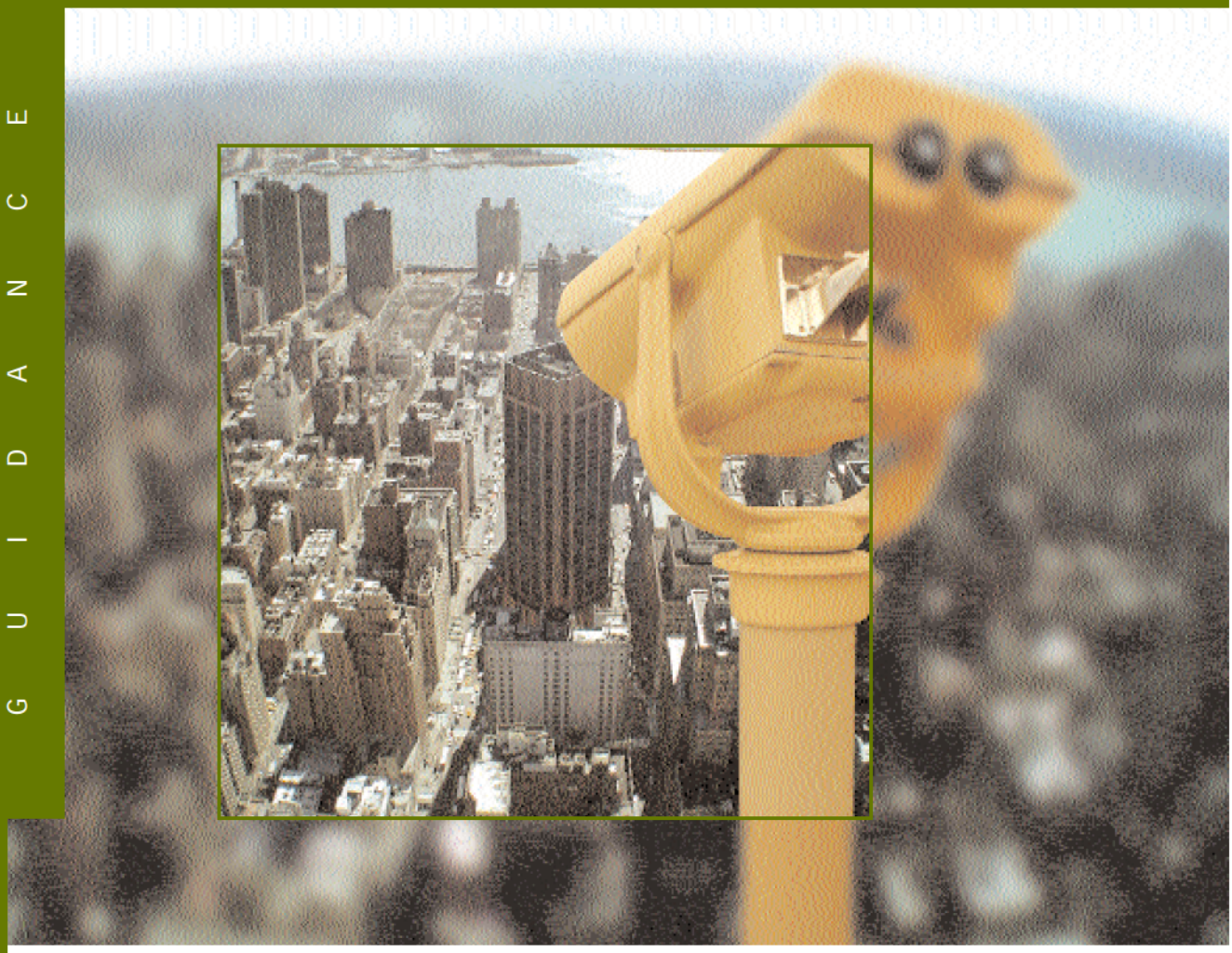
INTENSITY RATIOS. Intensity ratios express GHG impact per unit of physical activity or unit of economic output. A physical intensity ratio is suitable when aggregating or comparing across businesses that have similar products. An economic intensity ratio is suitable when aggregating or comparing across businesses that produce different products. A declining intensity ratio reflects a positive performance improvement. Many companies historically tracked environmental performance with intensity ratios. Intensity ratios are often called "normalized" environmental impact data. Examples of intensity ratios include product emission intensity (e.g., tonnes of CO_2 emissions per electricity generated); service intensity (e.g., GHG emissions per function or per service); and sales intensity (e.g., emissions per sales).

PERCENTAGES. A percentage indicator is a ratio between two similar issues (with the same physical unit in the numerator and the denominator). Examples of percentages that can be meaningful in performance reports include current GHG emissions expressed as a percentage of base year GHG emissions.

For further guidance on ratio indicators refer to CCAR, 2003; GRI, 2002; Verfaillie and Bidwell, 2000.



10 Verification of GHG Emissions



Verification is an objective assessment of the accuracy and completeness of reported GHG information and the conformity of this information to pre-established GHG accounting and reporting principles. Although the practice of verifying corporate GHG inventories is still evolving the emergence of widely accepted standards, such as the *GHG Protocol Corporate Standard* and the forth-coming *GHG Protocol Project Quantification Standard*, should help GHG verification become more uniform, credible, and widely accepted.

This chapter provides an overview of the key elements of a GHG verification process. It is relevant to companies who are developing GHG inventories and have planned for, or are considering, obtaining an independent verification of their results and systems. Furthermore, as the process of developing a verifiable inventory is largely the same as that for obtaining reliable and defensible data, this chapter is also relevant to all companies regardless of any intention to commission a GHG verification.

Verification involves an assessment of the risks of material discrepancies in reported data. Discrepancies relate to differences between reported data and data generated from the proper application of the relevant standards and methodologies. In practice, verification involves the prioritization of effort by the verifier towards the data and associated systems that have the greatest impact on overall data quality.

Relevance of GHG principles

The primary aim of verification is to provide confidence to users that the reported information and associated statements represent a faithful, true, and fair account of a company's GHG emissions. Ensuring transparency and verifiability of the inventory data is crucial for verification. The more transparent, well controlled and well documented a company's emissions data and systems are, the more efficient it will be to verify. As outlined in chapter 1, there are a number of GHG accounting and reporting principles that need to be adhered to when compiling a GHG inventory. Adherence to these principles and the presence of a transparent, well-documented system (sometimes referred to as an audit trail) is the basis of a successful verification.

Goals

Before commissioning an independent verification, a company should clearly define its goals and decide whether they are best met by an external verification. Common reasons for undertaking a verification include:

- Increased credibility of publicly reported emissions information and progress towards GHG targets, leading to enhanced stakeholder trust
- Increased senior management confidence in reported information on which to base investment and target-setting decisions
- Improvement of internal accounting and reporting practices (e.g., calculation, recording and internal reporting systems, and the application of GHG accounting and reporting principles), and facilitating learning and knowledge transfer within the company
- Preparation for mandatory verification requirements of GHG programs.

Internal assurance

While verification is often undertaken by an independent, external third party, this may not always be the case. Many companies interested in improving their GHG inventories may subject their information to internal verification by personnel who are independent of the GHG accounting and reporting process. Both internal and external verification should follow similar procedures and processes. For external stakeholders, external third part verification is likely to significantly increase the credibility of the GHG inventory. However, independent internal verifications can also provide valuable assurance over the reliability of information.

Internal verification can be a worthwhile learning experience for a company prior to commissioning an external verification by a third party. It can also provide external verifiers with useful information to begin their work.

The concept of materiality

The concept of "materiality" is essential to understanding the process of verification. Chapter 1 provides a useful interpretation of the relationship between the principle of completeness and the concept of materiality. Information is considered to be material if, by its inclusion or exclusion, it can be seen to influence any decisions or actions taken by users of it. A material discrepancy is an error (for example, from an oversight, omission or miscalculation) that results in a reported quantity or statement being significantly different to the true value or meaning. In order to express an opinion on data or information, a verifier would need to form a view on the materiality of all identified errors or uncertainties.

While the concept of materiality involves a value judgment, the point at which a discrepancy becomes material (materiality threshold) is usually pre-defined. As a rule of thumb, an error is considered to be materially misleading

if its value exceeds 5% of the total inventory for the part of the organization being verified.

The verifier needs to assess an error or omission in the full context within which information is presented. For example, if a 2% error prevents a company from achieving its corporate target then this would most likely be considered material. Understanding how verifiers apply a materiality threshold will enable companies to more readily establish whether the omissions of an individual source or activity from their inventory is likely to raise questions of materiality.

Materiality thresholds may also be outlined in the requirements of a specific GHG program or determined by a national verification standard, depending on who is requiring the verification and for what reasons. A materiality threshold provides guidance to verifiers on what may be an immaterial discrepancy so that they can concentrate their work on areas that are more likely to lead to materially misleading errors. A materiality threshold is not the same as de minimis emissions, or a permissible quantity of emissions that a company can leave out of its inventory.

Assessing the risk of material discrepancy

Verifiers need to assess the risk of material discrepancy of each component of the GHG information collection and reporting process. This assessment is used to plan and direct the verification process. In assessing this risk, they will consider a number of factors, including:

- The structure of the organization and the approach used to assign responsibility for monitoring and reporting GHG emissions
- The approach and commitment of management to GHG monitoring and reporting
- Development and implementation of policies and processes for monitoring and reporting (including documented methods explaining how data is generated and evaluated)
- Processes used to check and review calculation methodologies
- Complexity and nature of operations
- Complexity of the computer information system used to process the information
- The state of calibration and maintenance of meters used, and the types of meters used
- Reliability and availability of input data
- Assumptions and estimations applied
- Aggregation of data from different sources
- Other assurance processes to which the systems and data are subjected (e.g., internal audit, external reviews and certifications).

Establishing the verification parameters

The scope of an independent verification and the level of assurance it provides will be influenced by the company's goals and/or any specific jurisdictional requirements. It is possible to verify the entire GHG inventory or specific parts of it. Discrete parts may be specified in terms of geographic location, business units, facilities, and type of emissions. The verification process may also examine more general managerial issues, such as quality management procedures, managerial awareness, availability of resources, clearly defined responsibilities, segregation of duties, and internal review procedures.

The company and verifier should reach an agreement upfront on the scope, level and objective of the verification. This agreement (often referred to as the scope of work) will address issues such as which information is to be included in the verification (e.g., head office consolidation only or information from all sites), the level of scrutiny to which selected data will be subjected (e.g., desk top review or on-site review), and the intended use of the results of the verification). The materiality threshold is another item to be considered in the scope of work. It will be of key consideration for both the verifier and the company, and is linked to the objectives of the verification.

The scope of work is influenced by what the verifier actually finds once the verification commences and, as a result, the scope of work must remain sufficiently flexible to enable the verifier to adequately complete the verification.

A clearly defined scope of work is not only important to the company and verifier, but also for external stakeholders to be able to make informed and appropriate decisions. Verifiers will ensure that specific exclusions have not been made solely to improve the company's performance. To enhance transparency and credibility companies should make the scope of work publicly available.

Site visits

Depending on the level of assurance required from verification, verifiers may need to visit a number of sites to enable them to obtain sufficient, appropriate evidence over the completeness, accuracy and reliability of reported information. The sites visited should be representative of the organization as a whole. The selection of sites to be visited will be based on consideration of a number of factors, including:

- Nature of the operations and GHG sources at each site
- Complexity of the emissions data collection and calculation process
- Percentage contribution to total GHG emissions from each site
- The risk that the data from sites will be materially misstated
- Competencies and training of key personnel
- Results of previous reviews, verifications, and uncertainty analyses.

Timing of the verification

The engagement of a verifier can occur at various points during the GHG preparation and reporting process. Some companies may establish a semi-permanent internal verification team to ensure that GHG data standards are being met and improved on an on-going basis.

Verification that occurs during a reporting period allows for any reporting deficiencies or data issues to be addressed before the final report is prepared. This may be particularly useful for companies preparing high profile public reports. However, some GHG programs may require, often on a random selection basis, an independent verification of the GHG inventory following the submission of a report (e.g., World Economic Forum Global GHG Registry, Greenhouse Challenge program in Australia, EU ETS). In both cases the verification cannot be closed out until the final data for the period has been submitted.

PricewaterhouseCoopers: GHG inventory verification- lessons from the field

PricewaterhouseCoopers (PwC), a global services company, has been conducting GHG emissions verifications for the past 10 years in various sectors, including energy, chemicals, metals, semiconductors, and pulp and paper. PwC's verification process involves two key steps:

1. An evaluation of whether the GHG accounting and reporting methodology (e.g., *GHG Protocol Corporate Standard*) has been correctly implemented
2. Identification of any material discrepancies.

The *GHG Protocol Corporate Standard* has been crucial in helping PwC to design an effective GHG verification methodology. Since the publication of the first edition, PwC has witnessed rapid improvements in the quality and verifiability of GHG data reported. In particular the quantification on non-CO_2 GHGs and combustion emissions has dramatically improved. Cement sector emissions verification has been made easier by the release of the WBCSD cement sector tool. GHG emissions from purchased electricity are also easy to verify since most companies have reliable data on MWh consumed and emission factors are publicly available.

However, experience has shown that for most companies, GHG data for 1990 is too unreliable to provide a verifiable base year for the purposes of tracking emissions over time or setting a GHG target. Challenges also remain in auditing GHG emissions embedded in waste fuels, co-generation, passenger travel, and shipping.

Over the past 3 years PwC has noticed a gradual evolution of GHG verification practices from "customized" and "voluntary" to "standardized" and "mandatory." The California Climate Action Registry, World Economic Forum Global GHG Registry and the forthcoming EU ETS (covering 12,000 industrial sites in Europe) require some form of emissions verification. In the EU ETS GHG verifiers will likely have to be accredited by a national body. GHG verifier accreditation processes have already been established in the UK for its domestic trading scheme, and in California for registering emissions in the CCAR.

Selecting a verifier

Some factors to consider when selecting a verifier include their:

- previous experience and competence in undertaking GHG verifications
- understanding of GHG issues including calculation methodologies
- understanding of the company's operations and industry
- objectivity, credibility, and independence.

It is important to recognize that the knowledge and qualifications of the individual(s) conducting the verification can be more important than those of the organization(s) they come from. Companies should select organizations based on the knowledge and qualifications of their actual verifiers and ensure that the lead verifier assigned to them is appropriately experienced. Effective verification of GHG inventories often requires a mix of specialized skills, not only at a technical level (e.g., engineering experience, industry specialists) but also at a business level (e.g., verification and industry specialists).

Preparing for a GHG verification

The internal processes described in chapter 7 are likely to be similar to those followed by an independent verifier. Therefore, the materials that the verifiers need are similar. Information required by an external verifier is likely to include the following:

- Information about the company's main activities and GHG emissions (types of GHG produced, description of activity that causes GHG emissions)
- Information about the company/groups/organization (list of subsidiaries and their geographic location, ownership structure, financial entities within the organization)
- Details of any changes to the company's organizational boundaries or processes during the period, including justification for the effects of these changes on emissions data
- Details of joint venture agreements, outsourcing and contractor agreements, production sharing agreements, emissions rights and other legal or contractual documents that determine the organizational and operational boundaries
- Documented procedures for identifying sources of emissions within the organizational and operational boundaries
- Information on other assurance processes to which the systems and data are subjected (e.g. internal audit, external reviews and certifications)
- Data used for calculating GHG emissions. This might, for example, include:
  - Energy consumption data (invoices, delivery notes, weigh-bridge tickets, meter readings: electricity, gas pipes, steam, and hot water, etc.)
  - Production data (tonnes of material produced, kWh of electricity produced, etc.)
  - Raw material consumption data for mass balance calculations (invoices, delivery notes, weighbridge tickets, etc.)
  - Emission factors (laboratory analysis etc.).
- Description of how GHG emissions data have been calculated:
  - Emission factors and other parameters used and their justification
  - Assumptions on which estimations are based
  - Information on the measurement accuracy of meters and weigh-bridges (e.g., calibration records), and other measurement techniques
  - Equity share allocations and their alignment with financial reporting
  - Documentation on what, if any, GHG sources or activities are excluded due to, for example, technical or cost reasons.
- Information gathering process:
  - Description of the procedures and systems used to collect, document and process GHG emissions data at the facility and corporate level
  - Description of quality control procedures applied (internal audits, comparison with last year's data, recalculation by second person, etc.).

- Other information:
  - Selected consolidation approach as defined in chapter 3
  - list of (and access to) persons responsible for collecting GHG emissions data at each site and at the corporate level (name, title, e-mail, and telephone numbers)
  - information on uncertainties, qualitative and if available, quantitative.

Appropriate documentation needs to be available to support the GHG inventory being subjected to external verification. Statements made by management for which there is no available supporting documentation cannot be verified. Where a reporting company has not yet implemented systems for routinely accounting and recording GHG emissions data, an external verification will be difficult and may result in the verifier being unable to issue an opinion. Under these circumstances, the verifiers may make recommendations on how current data collection and collation process should be improved so that an opinion can be obtained in future years.

Companies are responsible for ensuring the existence, quality and retention of documentation so as to create an audit trail of how the inventory was compiled. If a company issues a specific base year against which it assesses its GHG performance, it should retain all relevant historical records to support the base year data. These issues should be born in mind when designing and implementing GHG data processes and procedures.

Using the verification findings

Before the verifiers will verify that an inventory has met the relevant quality standard, they may require the company to adjust any material errors that they identified during the course of the verification. If the verifiers and the company cannot come to an agreement regarding adjustments, then the verifier may not be able to provide the company with an unqualified opinion. All material errors (individually or in aggregate) need to be amended prior to the final verification sign off.

As well as issuing an opinion on whether the reported information is free from material discrepancy, the verifiers may, depending on the agreed scope of work, also issue a verification report containing a number of recommendations for future improvements. The process of verification should be viewed as a valuable input to the process of continual improvement. Whether verification is undertaken for the purposes of internal review, public reporting or to certify compliance with a particular GHG program, it will likely contain useful information and guidance on how to improve and enhance a company's GHG accounting and reporting system.

Similar to the process of selecting a verifier, those selected to be responsible for assessing and implementing responses to the verification findings should also have the appropriate skills and understanding of GHG accounting and reporting issues.



11 Setting a GHG Target



Setting targets is a routine business practice that helps ensure that an issue is kept on senior management's "radar screen" and factored into relevant decisions about what products and services to provide and what materials and technologies to use. Often, a corporate GHG emission reduction target is the logical follow-up to developing a GHG inventory.

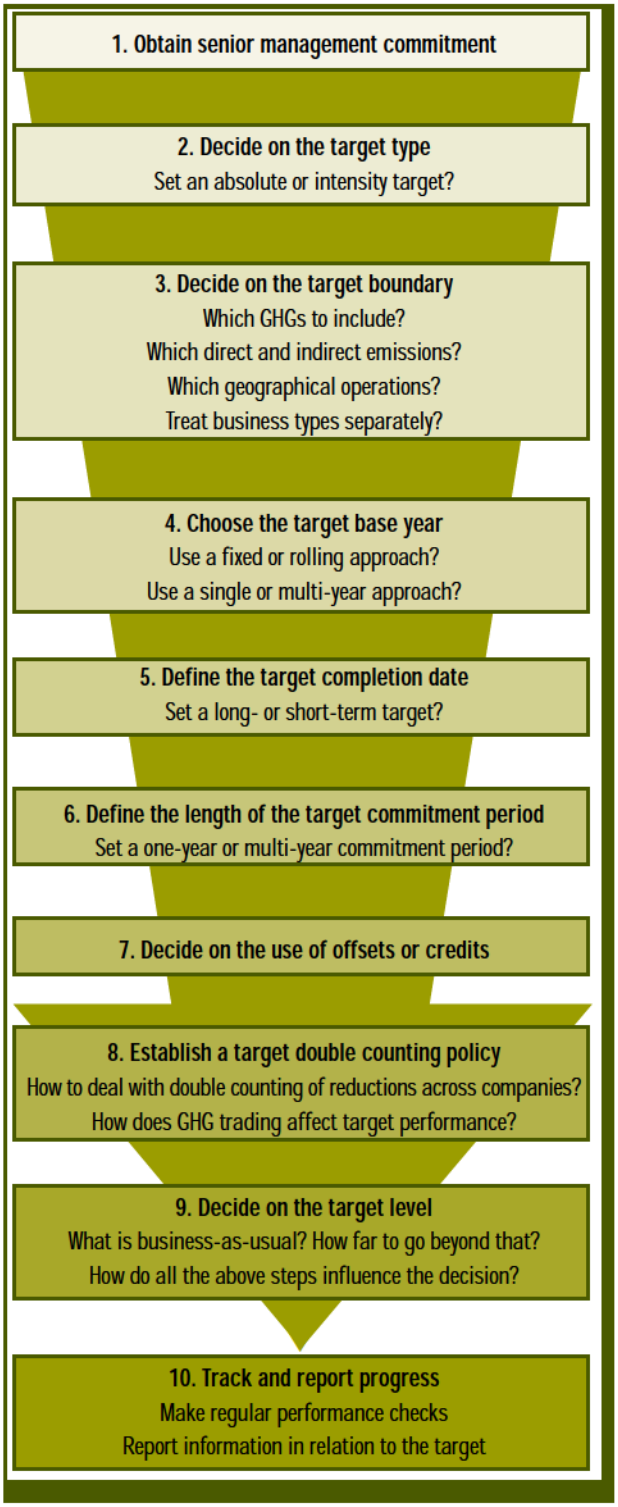
This chapter provides guidance on the process of setting and reporting on a corporate GHG target. Although the chapter focuses on emissions, many of the considerations equally apply to GHG sequestration (see Appendix B). It is not the purpose of this chapter to prescribe what a company's target should be, rather the focus is on the steps involved, the choices to be made, and the implications of those choices.

Why Set a GHG Target?

Any robust business strategy requires setting targets for revenues, sales, and other core business indicators, as well as tracking performance against those targets. Likewise, effective GHG management involves setting a GHG target. As companies develop strategies to reduce the GHG emissions of their products and operations, corporate-wide GHG targets are often key elements of these efforts, even if some parts of the company are or will be subject to mandatory GHG limits. Common drivers for setting a GHG target include:

- **MINIMIZING AND MANAGING GHG RISKS**
  While developing a GHG inventory is an important step towards identifying GHG risks and opportunities, a GHG target is a planning tool that can actually drive GHG reductions. A GHG target will help raise internal awareness about the risks and opportunities presented by climate change and ensure the issue is on the business agenda. This can serve to minimize and more effectively manage the business risks associated with climate change.
- **ACHIEVING COST SAVINGS AND STIMULATING INNOVATION**
  Implementing a GHG target can result in cost savings by driving improvements in process innovation and resource efficiency. Targets that apply to products can drive R&D, which in turn creates products and services that can increase market share and reduce emissions associated with the use of products.
- **PREPARING FOR FUTURE REGULATIONS**
  Internal accountability and incentive mechanisms that are established to support a target's implementation can also equip companies to respond more effectively to future GHG regulations. For example, some companies have found that experimenting with internal GHG trading programs has allowed them to better understand the possible impacts of future trading programs on the company.

FIGURE 12. **Steps in setting a GHG target**



- **DEMONSTRATING LEADERSHIP AND CORPORATE RESPONSIBILITY**
  With the emergence of GHG regulations in many parts of the world, as well as growing concern about the effects of climate change, a commitment such as setting a public corporate GHG target demonstrates leadership and corporate responsibility. This can improve a company's standing with customers, employees, investors, business partners, and the public, and enhance brand reputation.

- **PARTICIPATING IN VOLUNTARY PROGRAMS**
  A growing number of voluntary GHG programs are emerging to encourage and assist companies in setting, implementing, and tracking progress toward GHG targets. Participation in voluntary programs can result in public recognition, may facilitate recognition of early action by future regulations, and enhance a company's GHG accounting and reporting capacity and understanding.

Steps in Setting a Target

Setting a GHG target involves making choices among various strategies for defining and achieving a GHG reduction. The business goals, any relevant policy context, and stakeholder discussions should inform these choices.

The following sections outline the ten steps involved. Although presented sequentially, in practice target setting involves cycling back and forth between the steps. It is assumed that the company has developed a GHG inventory before implementing these steps. Figure 12 summarizes the steps.

1. Obtain senior management commitment

As with any corporate wide target, senior management buy-in and commitment particularly at the board/CEO level is a prerequisite for a successful GHG reduction program. Implementing a reduction target is likely to necessitate changes in behavior and decision-making throughout the organization. It also requires establishing an internal accountability and incentive system and providing adequate resources to achieve the target. This will be difficult, if not impossible, without senior management commitment.

BOX 4. Comparing absolute and intensity targets

ABSOLUTE TARGETS reduce absolute emissions over time (Example: reduce CO_2 by 25 percent below 1994 levels by 2010)

Advantages

- Designed to achieve a reduction in a specified quantity of GHGs emitted to the atmosphere
- Environmentally robust as it entails a commitment to reduce GHGs by a specified amount
- Transparently addresses potential stakeholder concerns about the need to manage absolute emissions

Disadvantages

- Target base year recalculations for significant structural changes to the organization add complexity to tracking progress over time
- Does not allow comparisons of GHG intensity/efficiency
- Recognizes a company for reducing GHGs by decreasing production or output (organic decline, see chapter 5)
- May be difficult to achieve if the company grows unexpectedly and growth is linked to GHG emissions

INTENSITY TARGETS reduce the ratio of emissions relative to a business metric over time (Example: reduce CO_2 by 12 percent per tonne of clinker between 2000 and 2008)

Advantages

- Reflects GHG performance improvements independent of organic growth or decline
- Target base year recalculations for structural changes are usually not required (see step 4)
- May increase the comparability of GHG performance among companies

Disadvantages

- No guarantee that GHG emissions to the atmosphere will be reduced—absolute emissions may rise even if intensity goes down and output increases
- Companies with diverse operations may find it difficult to define a single common business metric
- If a monetary variable is used for the business metric, such as dollar of revenue or sales, it must be recalculated for changes in product prices and product mix, as well as inflation, adding complexity to the tracking process

Royal Dutch/Shell: The target cascade

The Royal Dutch/Shell Group, a global energy corporation, discovered when implementing its voluntary GHG reduction target that one of the biggest challenges was to cascade the target down to the actions of all employees who influence target performance. It was concluded that successful implementation required different targets at different levels of the company. This is because each of the components that underlie absolute GHG emissions is influenced by decision-making at various management levels (from the corporate level down to individual businesses and facilities).

Absolute GHG emissions at a plant (tonnes of CO_2-e.) = Function (MP x BPE x PE)

MP Quantity of product manufactured by a facility. This is fundamental to the need to grow and is therefore controlled at corporate level. GHG emissions are typically not managed by limiting this component.

BPE Best process energy use per tonne. The optimal (or theoretical) energy consumed (translates to emissions) by a particular design of plant. The type of plant built is a business-level decision. Significant capital decisions may be involved in building a new plant incorporating new technology. For existing plants, BPE is improved by significant design change and retrofitting. This could also involve large capital expenditure.

PE Plant efficiency index. An index that indicates how the plant is actually performing relative to BPE. PE is a result of day-to-day decisions taken by plant operators and technicians. It is improved also by the Shell Global Solutions Energise™ programme, which typically requires low capital expenditure to implement.

Royal Dutch/Shell found that while this model is probably an oversimplification when it comes to exploration and production facilities, it is suitable for manufacturing facilities (e.g., refineries and chemical plants). It illustrates that an absolute target could only be set at the corporate level, while lower levels require intensity or efficiency targets.

TYPE OF TARGET			ACTIONS THAT REDUCE EMISSIONS	LEVEL OF DECISION-MAKING (IN GENERAL AND ON TARGET)
Reduce absolute emissions			See below	Corporate
	MP: not normally constrained		--------	All levels depending on scale (e.g. new venture, new plant, operational)
	Reduce GHG intensity		See below	Business in consultation with corporate
		Improve BPE (efficiency)	Building new plants with new technology	Business
			Retrofitting and changing design of plants	Business
		Improve PE (efficiency)	Increase plant operating efficiency	Facility, supported by Shell Global Solutions Energise™

2. Decide on the target type

There are two broad types of GHG targets: absolute and intensity-based. An absolute target is usually expressed in terms of a reduction over time in a specified quantity of GHG emissions to the atmosphere, the unit typically being tonnes of CO_2-e. An intensity target is usually expressed as a reduction in the ratio of GHG emissions relative to another business metric.[1] The comparative metric should be carefully selected. It can be the output of the company (e.g. tonne CO_2-e per tonne product, per kWh, per tonne mileage) or some other metric such as sales, revenues or office space. To facilitate transparency, companies using an intensity target should also report the absolute emissions from sources covered by the target.

Box 4 summarizes the advantages and disadvantages of each type of target. Some companies have both an absolute and an intensity target. Box 5 provides examples of corporate GHG targets. The Royal Dutch/Shell case study illustrates how a corporate wide absolute target can be implemented by formulating a combination of intensity targets at lower levels of decision-making within the company.

3. Decide on the target boundary

The target boundary defines which GHGs, geographic operations, sources, and activities are covered by the target. The target and inventory boundary can be identical, or

the target may address a specified subset of the sources included in the company inventory. The quality of the GHG inventory should be a key factor informing this choice. The questions to be addressed in this step include the following:

- **WHICH GHGS?** Targets usually include one or more of the six major GHGs covered by the Kyoto Protocol. For companies with significant non-CO_2 GHG sources it usually makes sense to include these to increase the range of reduction opportunities. However, practical monitoring limitations may apply to smaller sources.
- **WHICH GEOGRAPHICAL OPERATIONS?** Only country or regional operations with reliable GHG inventory data should be included in the target. For companies with global operations, it makes sense to limit the target's geographical scope until a robust and reliable inventory has been developed for all operations. Companies that participate in GHG programs involving trading[2] will need to decide whether or not to include the emissions sources covered in the trading program in their corporate target. If common sources are included, i.e., if there is overlap in sources covered between the corporate target and the trading program, companies should consider how they will address any double counting resulting from the trading of GHG reductions in the trading program (see step 8).
- **WHICH DIRECT AND INDIRECT EMISSION SOURCES?** Including indirect GHG emissions in a target will facilitate more cost-effective reductions by increasing the reduction opportunities available. However, indirect emissions are generally harder to measure accurately and verify than direct emissions although some categories, such as scope 2 emissions from purchased electricity, may be amenable to accurate measurement and verification. Including indirect emissions can raise issues with regard to ownership and double counting of reductions, as indirect emissions are by definition someone else's direct emissions (see step 8).
- **SEPARATE TARGETS FOR DIFFERENT TYPES OF BUSINESSES?** For companies with diverse operations it may make more sense to define separate GHG targets for different core businesses, especially when using an intensity target, where the most meaningful business metric for defining the target varies across business units (e.g., GHGs per tonne of cement produced or barrel of oil refined).

BOX 5. Selected corporate GHG targets

ABSOLUTE TARGETS

- **ABB** Reduce GHGs by 1 percent each year from 1998 through 2005
- **Alcoa** Reduce GHGs by 25 percent from 1990 levels by 2010, and 50 percent from 1990 levels over same period, if inert anode technology succeeds
- **BP** Hold net GHGs stable at 1990 levels through 2012
- **Dupont** Reduce GHGs by 65 percent from 1990 levels by 2010
- **Entergy** Stabilize CO_2 from U.S. generating facilities at 2000 levels through 2005
- **Ford** Reduce CO_2 by 4 percent over 2003-2006 timeframe based upon average 1998-2001 baseline as part of Chicago Climate Exchange
- **Intel** Reduce PFCs by 10 percent from 1995 levels by 2010
- **Johnson & Johnson** Reduce GHGs by 7 percent from 1990 levels by 2010, with interim goal of 4 percent below 1990 levels by 2005
- **Polaroid** Reduce CO_2 emissions 20 percent below its 1994 emissions by year-end 2005; 25 percent by 2010
- **Royal Dutch/Shell** Manage GHG emissions so that they are still 5 percent or more below the 1990 baseline by 2010, even while growing the business
- **Transalta** Reduce GHGs to 1990 levels by 2000. Achieve zero net GHGs from Canadian operations by 2024

INTENSITY TARGETS

- **Holcim Ltd.** Reduce by the year 2010 the Group average specific[3] net CO_2 emissions by 20 percent from the reference year 1990
- **Kansai Electric Power Company** Reduce CO_2 emissions per kWh sold in fiscal 2010 to approx. 0.34 kg-CO_2/kWh
- **Miller Brewing Company** Reduce GHGs by 18 percent per barrel of production from 2001 to 2006
- **National Renewable Energy Laboratory** Reduce GHGs by 10 percent per square foot from 2000 to 2005

COMBINED ABSOLUTE & INTENSITY TARGETS

- **SC Johnson** GHG emissions intensity reduction of 23 percent by 2005, which represents an absolute or actual GHG reduction of 8 percent
- **Lafarge** Reduce absolute gross CO_2 emissions in Annex I countries 10 percent below 1990 levels by the year 2010. Reduce worldwide average specific net CO_2 emissions 20 percent below 1990 levels by the year 2010[3]

4. Choose the target base year

For a target to be credible, it has to be transparent how target emissions are defined in relation to past emissions. Two general approaches are available: a fixed target base year or a rolling target base year.

- USING A FIXED TARGET BASE YEAR. Most GHG targets are defined as a percentage reduction in emissions below a fixed target base year (e.g., reduce CO_2 emissions 25 percent below 1994 levels by 2010). Chapter 5 describes how companies should track emissions in their inventory over time in reference to a fixed base year. Although it is possible to use different years for the inventory base year and the target base year, to streamline the inventory and target reporting process, it usually makes sense to use the same year for both. As with the inventory base year, it is important to ensure that the emissions data for the target base year are reliable and verifiable. It is possible to use a multi-year average target base year. The same considerations as described for multi-year average base years in chapter 5 apply.

  Chapter 5 provides standards on when and how to recalculate base year emissions in order to ensure like-with-like comparisons over time when structural changes (e.g., acquisitions/divestitures) or changes in measurement and calculation methodologies alter the emissions profile over time. In most cases, this will also be an appropriate approach for recalculating data for a fixed target base year.

- USING A ROLLING TARGET BASE YEAR. Companies may consider using a rolling target base year if obtaining and maintaining reliable and verifiable data for a fixed target base year is likely to be challenging (for example, due to frequent acquisitions). With a rolling target base year, the base year rolls forward at regular time intervals, usually one year, so that emissions are always compared against the previous year.[4] However, emission reductions can still be collectively

TABLE 5. Comparing targets with rolling and fixed base years

	FIXED TARGET BASE YEAR	ROLLING TARGET BASE YEAR
How might the target be stated?	A target might take the form "we will emit X% less in year B than in year A"	A target might take the form of "over the next X years we will reduce emissions every year by Y% compared to the previous year"[5]
What is the target base year?	A fixed reference year in the past	The previous year
How far back is like-with-like comparison possible?	The time series of absolute emissions will compare like with like	If there have been significant structural changes the time series of absolute emissions will not compare like with like over more than two years at a time
What is the basis for comparing emissions between the target base year and completion year? (see also Figure 14)	The comparison over time is based on what is owned/controlled by the company in the target completion year.	The comparison over time is based on what was owned/controlled by the company in the years the information was reported[6]
How far back are recalculations made?	Emissions are recalculated for all years back to the fixed target base year	Emissions are recalculated only for the year prior to the structural change, or ex-post for the year of the structural change which then becomes the base year.
How reliable are the target base year emissions?	If a company with a target acquires a company that did not have reliable GHG data in the target base year; back-casting of emissions becomes necessary, reducing the reliability of the base year	Data from an acquired company's GHG emissions are only necessary for the year before the acquisition (or even only from the acquisition onwards), reducing or eliminating the need for back-casting
When are recalculations made?	The circumstances which trigger recalculations for structural changes etc. (see chapter 5) are the same under both approaches	

stated over several years. An example would be "from 2001 through 2012, emissions will be reduced by one percent every year, compared to the previous year." When structural or methodological changes occur, recalculations only need to be made to the previous year.[7] As a result, like-with-like comparisons of emissions in the "target starting year" (2001 in the example) and "target completion year" (2012) cannot be made because emissions are not recalculated for all years back to the target starting year.

The definition of what triggers a base-year emissions recalculation is the same as under the fixed base year approach. The difference lies in how far back emissions are recalculated. Table 5 compares targets using the rolling and fixed base year approaches while Figure 14 illustrates one of the key differences.

RECALCULATIONS UNDER INTENSITY TARGETS

While the standard in chapter 5 applies to absolute inventory emissions of companies using intensity targets, recalculations for structural changes for the purposes of the target are not usually needed unless the structural change results in a significant change in the GHG intensity. However, if recalculations for structural changes are made for the purposes of the target, they should be made for both the absolute emissions and the business metric. If the target business metric becomes irrelevant through a structural change, a reformulation of the target might be needed (e.g., when a company refocuses on a different industry but had used an industry-specific business metric before).

5. Define the target completion date

The target completion date determines whether the target is relatively short- or long-term. Long-term targets (e.g., with a completion year ten years from the time the target is set) facilitate long-term planning for large capital investments with GHG benefits. However, they might encourage later phase-outs of less efficient equipment. Generally, long-term targets depend on uncertain future developments, which can have opportunities as well as risks, which is illustrated in Figure 13. A five-year target period may be more practical for organizations with shorter planning cycles.

6. Define the length of the commitment period

The target commitment period is the period of time during which emissions performance is actually measured against the target. It ends with the target completion date. Many companies use single-year commitment periods, whereas the Kyoto Protocol, for example, specifies a multi-year "first commitment period" of five years (2008–2012). The length of the target commitment period is an important factor in determining a company's level of commitment. Generally, the longer the target commitment period, the longer the period during which emissions performance counts towards the target.

- EXAMPLE OF A SINGLE YEAR COMMITMENT PERIOD. Company Beta has a target of reducing emissions by 10 percent compared to its target base year 2000, by the commitment year 2010. For Beta to meet its target, it is sufficient for its emissions to be, in the year 2010, no more than 90 percent of year 2000 emissions.
- EXAMPLE OF A MULTI-YEAR COMMITMENT PERIOD. Company Gamma has a target of reducing emissions by 10 percent, compared to its target base year 2000, by the commitment period 2008–2012. For Gamma to meet its target, its sum total emissions from 2008–2012 must not exceed 90 percent of year 2000 emissions times five (number of years in the

FIGURE 13. **Defining the target completion date**

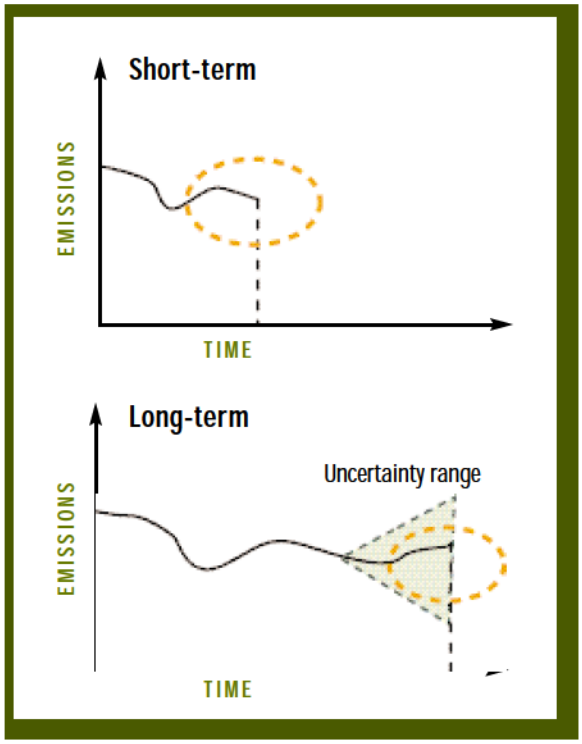
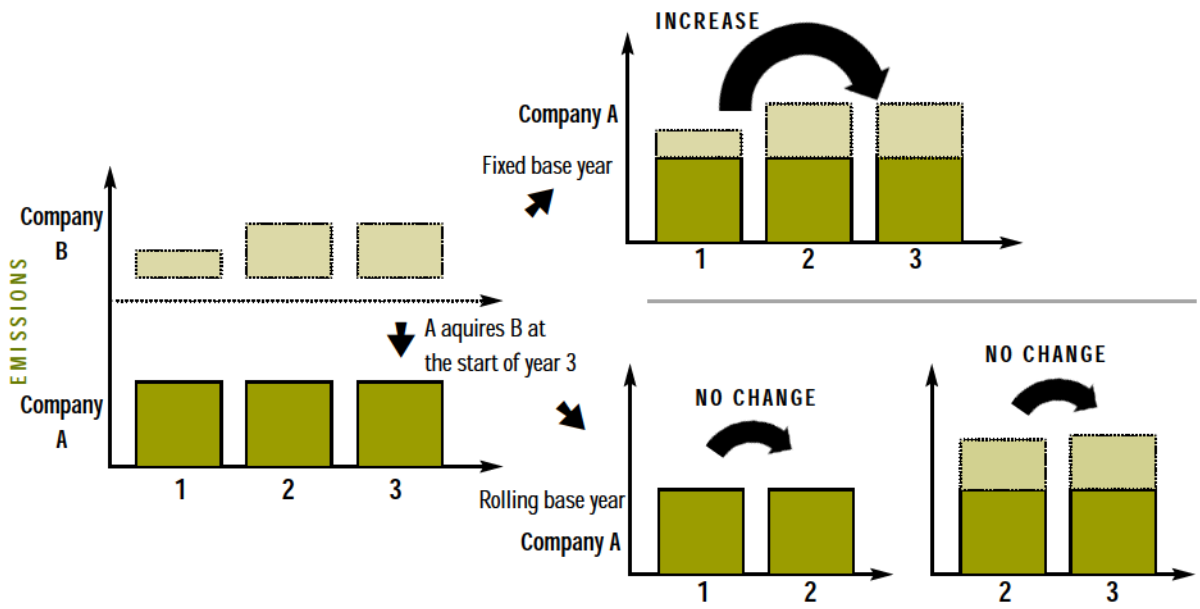


FIGURE 14. **Comparing a stabilization target under the fixed and rolling target base year approach**



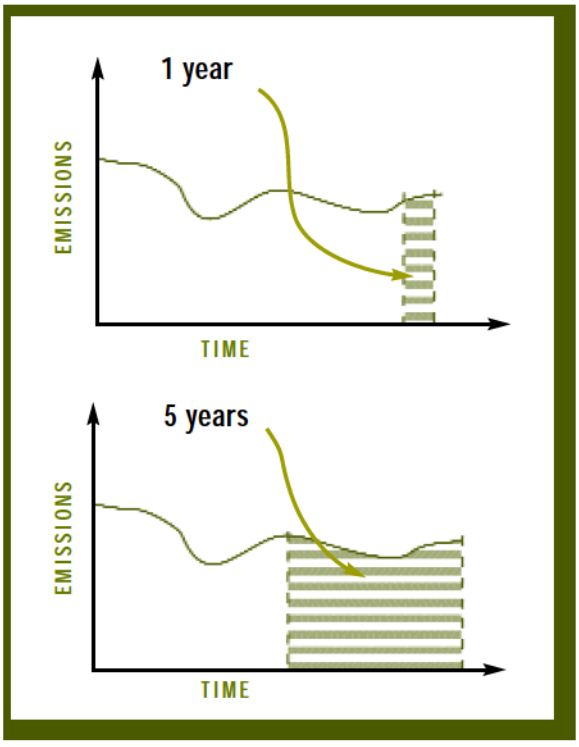
A stabilization target is one that aims to keep emissions constant over time. In this example, company A acquires company B, which has experienced organic GHG growth since the target base year (or "starting" year). Under the rolling approach, emissions growth in the acquired company (B) from year 1 to year 2 does not appear as an emissions increase in relation to the target of the acquiring company (A). Thus company A would meet its stabilization target when using the rolling approach but not when using the fixed approach. In parallel to the example in chapter 5, past GHG growth or decline in divested facilities (GHG changes before the divestment) would affect the target performance under the rolling approach, while it would not be counted under the fixed approach.

commitment period). In other words, its average emissions over those five years must not exceed 90 percent of year 2000 emissions.

Target commitment periods longer than one year can be used to mitigate the risk of unpredictable events in one particular year influencing performance against the target. Figure 15 shows that the length of the target commitment period determines how many emissions are actually relevant for target performance.

For a target using a rolling base year, the commitment period applies throughout: emission performance is continuously being measured against the target every year from when the target is set until the target completion date.

FIGURE 15. **Short vs. long commitment periods**



7. Decide on the use of GHG offsets or credits[8]

A GHG target can be met entirely from internal reductions at sources included in the target boundary or through additionally using offsets that are generated from GHG reduction projects that reduce emissions at sources (or enhance sinks) external to the target boundary.[9] The use of offsets may be appropriate when

GUIDANCE

the cost of internal reductions is high, opportunities for reductions limited, or the company is unable to meet its target because of unexpected circumstances. When reporting on the target, it should be specified whether offsets are used and how much of the target reduction was achieved using them.

CREDIBILITY OF OFFSETS AND TRANSPARENCY

There are currently no generally accepted methodologies for quantifying GHG offsets. The uncertainties that surround GHG project accounting make it difficult to establish that an offset is equivalent in magnitude to the internal emissions it is offsetting.[10] This is why companies should always report their own internal emissions in separate accounts from offsets used to meet the target, rather than providing a net figure (see step 10). It is also important to carefully assess the credibility of offsets used to meet a target and to specify the origin and nature of the offsets when reporting. Information needed includes:

- the type of project
- geographic and organizational origin
- how offsets have been quantified
- whether they have been recognized by external programs (CDM, JI, etc.)

One important way to ensure the credibility of offsets is to demonstrate that the quantification methodology adequately addresses all of the key project accounting challenges in chapter 8. Taking these challenges into account, the forthcoming GHG Protocol Project Quantification Standard aims to improve the consistency, credibility, and rigor of project accounting.

Additionally, it is important to check that offsets have not also been counted towards another organization's GHG target. This might involve a contract between the buyer and seller that transfers ownership of the offset. Step 8 provides more information on accounting for GHG trades in relation to a corporate target, including establishing a policy on double counting.

OFFSETS AND INTENSITY TARGETS

When using offsets under intensity targets, all the above considerations apply. In order to determine compliance with the target, the offsets can be subtracted from the figure used for absolute emissions (the numerator); the resulting difference is then divided by the corresponding metric. It is important, however, that absolute emissions are still reported separately both from offsets and the business metric (see step 9 below).

8. Establish a target double counting policy

This step addresses double counting of GHG reductions and offsets, as well as allowances issued by external trading programs. It applies only to companies that engage in trading (sale or purchase) of GHG offsets or whose corporate target boundaries interface with other companies' targets or external programs.

Given that there is currently no consensus on how such double counting issues should be addressed, companies should develop their own "Target Double Counting Policy." This should specify how reductions and trades related to other targets and programs will be reconciled with their corporate target, and accordingly which types of double counting situations are regarded as relevant. Listed here are some examples of double counting that might need to be addressed in the policy.

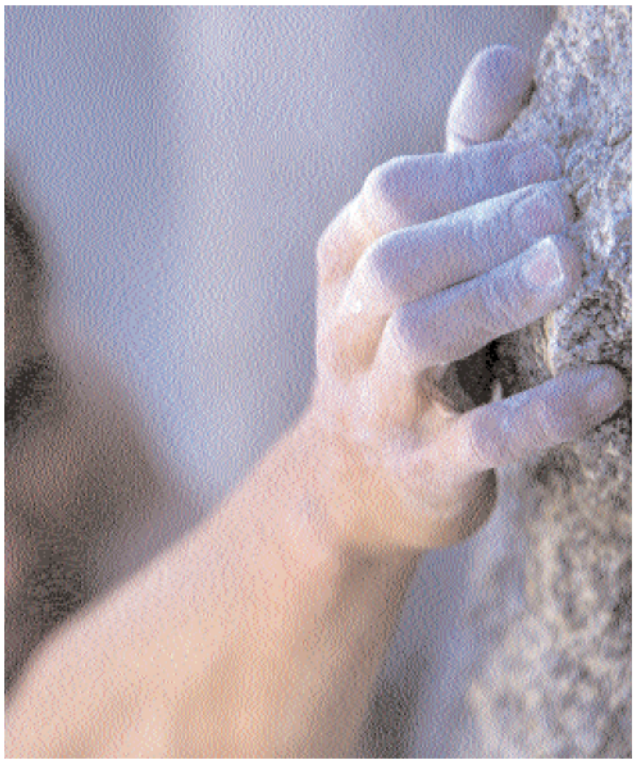
- DOUBLE COUNTING OF OFFSETS. This can occur when a GHG offset is counted towards the target by both the selling and purchasing organizations. For example, company A undertakes an internal reduction project that reduces GHGs at sources included in its own target. Company A then sells this project reduction to company B to use as an offset towards its target, while still counting it toward its own target. In this case, reductions are counted by two different organizations against targets that cover different emissions sources. Trading programs address this by using registries that allocate a serial number to all traded offsets or credits and ensuring the serial numbers are retired once they are used. In the absence of registries this could be addressed by a contract between seller and buyer.
- DOUBLE COUNTING DUE TO TARGET OVERLAP.[11] This can occur when sources included under a company's corporate target are also subject to limits by an external program or another company's target. Two examples:
  - Company A has a corporate target that includes GHG sources that are also regulated under a trading program. In this case, reductions at the common sources are used by company A to meet both its corporate target and the trading program target.

- Company B has a corporate target to reduce its direct emissions from the generation of electricity.[12] Company C who purchases electricity directly from company B also has a corporate target that includes indirect emissions from the purchase of electricity (scope 2). Company C undertakes energy efficiency measures to reduce its indirect emissions from the use of the electricity. These will usually show up as reductions in both companies' targets.[13]

These two examples illustrate that double counting is inherent when the GHG sources where the reductions occur are included in more than one target of the same or different organizations. Without limiting the scope of targets it may be difficult to avoid this type of double counting and it probably does not matter if the double counting is restricted to the organizations sharing the same sources in their targets (i.e., when the two targets overlap).

- **DOUBLE COUNTING OF ALLOWANCES TRADED IN EXTERNAL PROGRAMS.** This occurs when a corporate target overlaps with an external trading program and allowances that cover the common sources are sold in the trading program for use by another organization and reconciled with the regulatory target, but not reconciled with the corporate target. This example differs from the previous example in that double counting occurs across two targets that are not overlapping (i.e., they do not cover the same sources). This type of double counting could be avoided if the company selling the allowances reconciles the trade with its corporate target (see Holcim case study). Whatever the company decides to do in this situation, in order to maintain credibility, it should address buying and selling of allowances in trading programs in a consistent way. For example, if it decides not to reconcile allowances that it sells in a trading program with its corporate target, it should also not count any allowances of the same type that it purchases to meet its corporate target.

Ideally a company should try to avoid double counting in its corporate target if this undermines the environmental integrity of the target. Also, any prevented double counting between two organizations provides an additional incentive for one of these companies to further reduce emissions. However, in practice the avoidance of double counting can be quite challenging, particularly for companies subject to multiple external programs and when indirect GHG emissions are included in the target. Companies should therefore be transparent about their



double counting policy and state any reasons for choosing not to address some double counting situations.

The Holcim case study describes how one company has chosen to track performance towards its target and address double counting issues.

9. Decide on the target level

The decision on setting the target level should be informed by all the previous steps. Other considerations to take into account include:

- Understanding the key drivers affecting GHG emissions by examining the relationship between GHG emissions and other business metrics, such as production, square footage of manufacturing space, number of employees, sales, revenue, etc.
- Developing different reduction strategies based on the major reduction opportunities available and examining their effects on total GHG emissions. Investigate how emissions projections change with different mitigation strategies.
- Looking at the future of the company as it relates to GHG emissions.
- Factoring in relevant growth factors such as production plans, revenue or sales targets, and Return on Investment (ROI) of other criteria that drive investment strategy.

Holcim: Using a GHG balance sheet to track performance towards the target

Holcim, a global cement producer, tracks its performance in relation to its voluntary corporate target using a GHG balance sheet. This balance sheet shows, for each commitment period and for each country business, on one side the actual GHG emissions and on the other side the GHG "assets" and "instruments." These assets and instruments consist of the voluntary GHG target itself (the "voluntary cap"; in other words, the allowances that Holcim provides for itself), a regulatory target ("cap") if applicable, plus the CDM credits purchased (added) or sold (subtracted), and any regulatory emissions trading allowances purchased (added) or sold (subtracted). Thus if any country business sells CDM credits (generated at sources inside the voluntary target boundary), it is ensured that only the buying organization counts the credit (see first example of double counting in step 8).

At the end of the commitment period, every country business must demonstrate a neutral or positive balance towards Holcim's target. Those companies whose voluntary cap overlaps with a regulatory cap (e.g., in Europe) must also demonstrate a neutral or positive balance towards the regulatory cap. GHG reductions in Europe are thus reported towards both targets (see second example of double counting in step 8).

Both sides of the country business balance sheets are consolidated to group level. Credits and allowances traded within the group simply cancel out in the asset column of the consolidated corporate level GHG balance sheet. Any credits or allowances traded externally are reconciled with both the voluntary and regulatory caps at the bottom line of the asset column of the balance sheet. This ensures that any sold allowance is only counted by the buying organization (when Holcim's target and that of the buying organization do not overlap). A purchased allowance or credit is counted towards both the voluntary and regulatory targets of the European business (these two targets overlap).

GHG balance sheet (All values in tonnes CO_2-e/year)	
GHG ASSETS & INSTRUMENTS	**GHG EMISSIONS**
Holcim (country A in Europe)	
Voluntary cap (direct emissions)	Emissions, direct, indirect + biomass
Regulatory cap (direct emissions)	
Reg. allowances purchased (+) or sold (-)	
CDM credits purchased (+) or sold (-)	
Sum of voluntary cap, reg. allowances & credits	Sum of direct emissions
Sum of regulatory cap, reg. allowances & credits	Sum of direct emissions, according to EU ETS
Holcim (country X in Latin America)	
Voluntary cap	Emissions, direct, indirect + biomass
CDM credits purchased (+) or sold (-)	
Sum of voluntary cap & credits	Sum of direct emissions
Holcim Group	
Sum of voluntary cap, reg. allowances & credits	Sum of direct emissions

- Considering whether there are any existing environmental or energy plans, capital investments, product/service changes, or targets that will affect GHG emissions. Are there plans already in place for fuel switching, on site power generation, and/or renewable energy investments that affect the future GHG trajectory?
- Benchmarking GHG emissions with similar organizations. Generally, organizations that have not previously invested in energy and other GHG reductions should be capable of meeting more aggressive reduction levels because they would have more cost-effective reduction opportunities.

10. Track and report progress

Once the target has been set, it is necessary to track performance against it in order to check compliance, and also—in order to maintain credibility—to report emissions and any external reductions in a consistent, complete and transparent manner.

- **CARRY OUT REGULAR PERFORMANCE CHECKS.** In order to track performance against a target, it is important to link the target to the annual GHG inventory process and make regular checks of emissions in relation to the target. Some companies use interim targets for this purpose (a target using a rolling target base year automatically includes interim targets every year).
- **REPORT INFORMATION IN RELATION TO THE TARGET.** Companies should include the following information when setting and reporting progress in relation to a target:

1. Description of the target
   - Provide an outline of the target boundaries chosen
   - Specify target type, target base year, target completion date, and length of commitment period
   - Specify whether offsets can be used to meet the target; if yes, specify the type and amount
   - Describe the target double counting policy
   - Specify target level.
2. Information on emissions and performance in relation to the target
   - Report emissions from sources inside the target boundary separately from any GHG trades
   - If using an intensity target, report absolute emissions from within the target boundary separately, both from any GHG trades and the business metric
   - Report GHG trades that are relevant to compliance with the target (including how many offsets were used to meet the target)
   - Report any internal project reductions sold or transferred to another organization for use as an offset
   - Report overall performance in relation to the target.

NOTES

[1] Some companies may formulate GHG efficiency targets by formulating this ratio the other way around.

[2] Examples include the U.K. ETS, the CCX, and the EU ETS.

[3] Holcim's and Lafarge's target have been formulated using the terminology of the WBCSD Cement CO_2 Protocol (WBCSD, 2001), which uses "specific" to denote emissions per tonne of cement produced.

[4] It is possible to use an interval other than one year. However, the longer the interval at which the base year rolls forward, the more this approach becomes like a fixed target base year. This discussion is based on a rolling target base year that moves forward at annual intervals.

[5] Note that simply adding the yearly emissions changes under the rolling base year yields a different result from the comparison over time made with a fixed base year, even without structural changes. In absolute terms, an X% reduction every year over 5 years (compared to the previous year) is not the same as an (X times 5) reduction in year 5 compared to year 1.

[6] Depending on which recalculation methodology is used when applying the rolling base year, the comparison over time can include emissions that occurred when the company did not own or control the emission sources. However, the inclusion of this type of information is minimized. See also the guidance document "Base year recalculation methodologies for structural changes" on the GHG Protocol website (www.ghgprotocol.org).

[7] For further details on different recalculation methodologies, see the guidance document "Base year recalculation methodologies for structural changes" on the GHG Protocol website (www.ghgprotocol.org).

[8] As noted in chapter 8, offsets can be converted to credits. Credits are thus understood to be a subset of offsets. This chapter uses the term offsets as a generic term.

[9] For the purposes of this chapter, the terms "internal" and "external" refer to whether the reductions occur at sources inside (internal) or outside (external) the target boundary.

[10] This equivalence is sometimes referred to as "fungibility." However, "fungibility" can also refer to equivalence in terms of the value in meeting a target (two fungible offsets have the same value in meeting a target, i.e., they can both be applied to the same target).

[11] Overlap here refers to a situation when two or more targets include the same sources in their target boundaries.

[12] Similarly, company A in this example could be subject to a mandatory cap on its direct emissions under a trading program and engage in trading allowances covering the common sources it shares with company B. In this case, the example in the section "Double counting of allowances traded in external programs" is more relevant.

[13] The energy efficiency measures implemented by company C may not always result in an actual reduction of company B's emissions. See chapter 8 for further details on reductions in indirect emissions.

APPENDIX A

Accounting for Indirect Emissions from Purchased Electricity

This appendix provides guidance on how to account for and report indirect emissions associated with the purchase of electricity. Figure A–1 provides an overview of the transactions associated with purchased electricity and the corresponding emissions.

Purchased electricity for own consumption

Emissions associated with the generation of purchased electricity that is consumed by the reporting company are reported in scope 2. Scope 2 only accounts for the portion of the direct emissions from generating electricity that is actually consumed by the company. A company that purchases electricity and transports it in a transmission and distribution (T&D) system that it owns or controls reports the emissions associated with T&D losses under scope 2. However, if the reporting company owns or controls the T&D system but generates (rather than purchases) the electricity transmitted through its wires, the emissions associated with T&D losses are not reported under scope 2, as they would already be accounted for under scope 1. This is the case when generation, transmission, and distribution systems are vertically integrated and owned or controlled by the same company.

Purchased electricity for resale to end-users

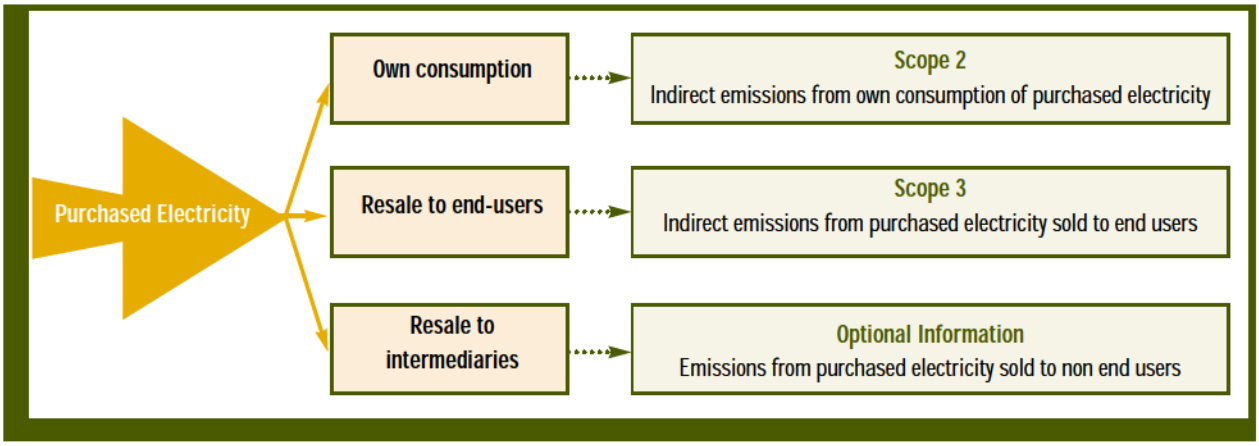
Emissions from the generation of purchased electricity for resale to end-users, for example purchases by a utility company, may be reported under scope 3 in the category "generation of purchased electricity that is sold to end-users." This reporting category is particularly relevant for utility companies that purchase wholesale electricity supplied by independent power producers for resale to their customers. Since utility companies and electricity suppliers often exercise choice over where they purchase electricity, this provides them with an important

GHG reduction opportunity (see Seattle City Light case study in chapter 4). Since scope 3 is optional, companies that are unable to track their electricity sales in terms of end users and non-end users can choose not to report these emissions in scope 3. Instead, they can report the total emissions associated with purchased electricity that is sold to both end- and non-end-users under optional information in the category "generation of purchased electricity, heat, or steam for re-sale to non-end users."

Purchased electricity for resale to intermediaries

Emissions associated with the generation of purchased electricity that is resold to an intermediary (e.g., trading transactions) may be reported under optional information under the category "Generation of purchased electricity, heat, or steam for re-sale to non-end users." Examples of trading transactions include brokerage/trading room transactions involving purchased electricity or any other transaction in which electricity is purchased directly from one source or the spot market and then resold to an intermediary (e.g., a non-end user). These emissions are reported under optional information separately from scope 3 because there could be a number of trading transactions before the electricity finally reaches the end-user. This may cause duplicative reporting of indirect emissions from a series of electricity trading transactions for the same electricity.

FIGURE A-1. **Accounting for the indirect GHG emissions associated with purchased electricity**



GHG emissions upstream of the generation of electricity

Emissions associated with the extraction and production of fuels consumed in the generation of purchased electricity may be reported in scope 3 under the category "extraction, production, and transportation of fuels consumed in the generation of electricity." These emissions occur upstream of the generation of electricity. Examples include emissions from mining of coal, refining of gasoline, extraction of natural gas, and production of hydrogen (if used as a fuel).

Choosing electricity emission factors

To quantify scope 2 emissions, the *GHG Protocol Corporate Standard* recommends that companies obtain source/supplier specific emission factors for the electricity purchased. If these are not available, regional or grid emission factors should be used. For more information on choosing emission factors, see the relevant GHG Protocol calculation tools available on the GHG Protocol website (www.ghgprotocol.org).

GHG emissions associated with the consumption of electricity in T&D

Emissions from the generation of electricity that is consumed in a T&D system may be reported in scope 3 under the category "generation of electricity that is consumed in a T&D system" by end-users. Published electricity grid emission factors do not usually include T&D losses. To calculate these emissions, it may be necessary to apply supplier or location specific T&D loss factors. Companies that purchase electricity and transport it in their own T&D systems would report the portion of electricity consumed in T&D under scope 2.

Accounting for indirect emissions associated with T&D losses

There are two types of electricity emission factors: Emission factor at generation (EFG) and Emissions factor at consumption (EFC). EFG is calculated from CO_2 emissions from generation of electricity divided by amount of electricity generated. EFC is calculated from CO_2 emissions from generation divided by amount of electricity consumed.

$$\text{EFG} = \frac{\text{TOTAL } CO_2 \text{ EMISSIONS FROM GENERATION}}{\text{ELECTRICITY GENERATED}}$$

$$\text{EFC} = \frac{\text{TOTAL } CO_2 \text{ EMISSIONS FROM GENERATION}}{\text{ELECTRICITY CONSUMED}}$$

EFC and EFG are related as shown below.

$$\text{EFC} \times \text{ELECTRICITY CONSUMED} = \text{EFG} \times (\text{ELECTRICITY CONSUMED} + \text{T\&D LOSSES})$$

$$\text{EFC} = \text{EFG} \times \left(1 + \frac{\text{T\&D LOSSES}}{\text{ELECTRICITY CONSUMED}}\right)$$

As these equations indicate, EFC multiplied by the amount of consumed electricity yields the sum of emissions attributable to electricity consumed during end use and transmission and distribution. In contrast, EFG multiplied by the amount of consumed electricity yields emissions attributable to electricity consumed during end use only.

Consistent with the scope 2 definition (see chapter 4), the *GHG Protocol Corporate Standard* requires the use of EFG to calculate scope 2 emissions. The use of EFG ensures internal consistency in the treatment of electricity related upstream emissions categories and avoids double counting in scope 2. Additionally, there are several other advantages in using EFG:

1) It is simpler to calculate and widely available in published regional, national, and international sources.
2) It is based on a commonly used approach to calculate emissions intensity, i.e., emissions per unit of production output.
3) It ensures transparency in reporting of indirect emissions from T&D losses.

The formula to account for emissions associated with T&D losses is the following:

$$\text{EFG} \times \text{ELECTRICITY CONSUMED DURING T\&D} = \text{INDIRECT EMISSIONS FROM CONSUMPTION OF ELECTRICITY DURING T\&D}$$

In some countries such as Japan, local regulations may require utility companies to provide both EFG and EFC to its consumers, and consumers may be required to use EFC to calculate indirect emissions from the consumption of purchased electricity. In this case, a company still needs to use EFG to report its scope 2 emissions for a GHG report prepared in accordance with *GHG Protocol Corporate Standard*.

APPENDIX B

Accounting for Sequestered Atmospheric Carbon

A key purpose of the GHG Protocol Corporate Standard is to provide companies with guidance on how to develop inventories that provide an accurate and complete picture of their GHG emissions both from their direct operations as well as those along the value chain.[1] For some types of companies, this is not possible without addressing the company's impacts on sequestered atmospheric carbon.[2]

Sequestered atmospheric carbon

During photosynthesis, plants remove carbon (as CO_2) from the atmosphere and store it in plant tissue. Until this carbon is cycled back into the atmosphere, it resides in one of a number of "carbon pools." These pools include (a) above ground biomass (e.g., vegetation) in forests, farmland, and other terrestrial environments, (b) below ground biomass (e.g., roots), and (c) biomass-based products (e.g., wood products) both while in use and when stored in a landfill.

Carbon can remain in some of these pools for long periods of time, sometimes for centuries. An increase in the stock of sequestered carbon stored in these pools represents a net removal of carbon from the atmosphere; a decrease in the stock represents a net addition of carbon to the atmosphere.

Why include impacts on sequestered carbon in corporate GHG inventories?

It is generally recognized that changes in stocks of sequestered carbon and the associated exchanges of carbon with the atmosphere are important to national level GHG emissions inventories, and consequently, these impacts on sequestered carbon are commonly addressed in national inventories (UNFCCC, 2000). Similarly, for companies in biomass-based industries, such as the forest products industry, some of the most significant aspects of a company's overall impact on atmospheric CO_2 levels will occur as a result of impacts on sequestered carbon in their direct operations as well as along their value chain. Some forest product companies have begun to address this aspect of their GHG footprint within their corporate GHG inventories (Georgia Pacific, 2002). Moreover, WBCSD's Sustainable Forest Products Industry Working Group—which represents a significant cluster of integrated forestry companies operating internationally—is developing a project that will further investigate carbon measurement, accounting, reporting, and ownership issues associated with the forest products value chain.

Information on a company's impacts on sequestered atmospheric carbon can be used for strategic planning, for educating stakeholders, and for identifying opportunities for improving the company's GHG profile. Opportunities may also exist to create value from reductions created along the value chain by companies acting alone or in partnership with raw material providers or customers.

Accounting for sequestered carbon in the context of the *GHG Protocol Corporate Standard*

Consensus methods have yet to be developed under the GHG Protocol Corporate Standard for accounting of sequestered atmospheric carbon as it moves through the value chain of biomass-based industries. Nonetheless, some issues that would need to be addressed when addressing impacts on sequestered carbon in corporate inventories can be examined in the context of existing guidance provided by the GHG Protocol Corporate Standard as highlighted below.

SETTING ORGANIZATIONAL BOUNDARIES

The GHG Protocol Corporate Standard outlines two approaches for consolidating GHG data—the equity share approach and the control approach. In some cases, it may be possible to apply these approaches directly to emissions/removals associated with sequestered atmospheric carbon. Among the issues that may need to be examined is the ownership of sequestered carbon under the different types of contractual arrangements involving land and wood ownership, harvesting rights, and control of land management and harvesting decisions. The transfer of ownership as carbon moves through the value chain may also need to be addressed. In some cases, as part of a risk management program for instance, companies may be interested in performing value chain assessments of sequestered carbon without regard to ownership or control just as they might do for scope 2 and 3 emissions.

SETTING OPERATIONAL BOUNDARIES

As with GHG emissions accounting, setting operational boundaries for sequestered carbon inventories would help companies transparently report their impacts on sequestered carbon along their value chain. Companies may, for example, provide a description of the value chain capturing impacts that are material to the results of the analysis. This should include which pools are

included in the analysis, which are not, and the rationale for the selections. Until consensus methods are developed for characterizing impacts on sequestered atmospheric carbon along the value chain, this information can be included in the "optional information" section of a GHG inventory compiled using the GHG Protocol Corporate Standard.

TRACKING REMOVALS OVER TIME

As is sometimes the case with accounting for GHG emissions, base year data for impacts on sequestered carbon may need to be averaged over multiple years to accommodate the year-to-year variability expected of these systems. The temporal scale used in sequestered carbon accounting will often be closely tied to the spatial scale over which the accounting is done. The question of how to recalculate base years to account for land acquisition and divestment, land use changes, and other activities also needs to be addressed.

IDENTIFYING AND CALCULATING GHG REMOVALS

The GHG Protocol Corporate Standard does not include consensus methods for sequestered carbon quantification. Companies should, therefore, explain the methods used. In some instances, quantification methods used in national inventories can be adapted for corporate-level quantification of sequestered carbon. IPCC (1997; 2000b) provides useful information on how to do this. In 2004, IPCC is expected to issue Good Practice Guidance for Land Use, Land Use Change and Forestry, with information on methods for quantification of sequestered carbon in forests and forest products. Companies may also find it useful to consult the methods used to prepare national inventories for those countries where significant parts of their company's value chain reside.

In addition, although corporate inventory accounting differs from project-based accounting (as discussed below), it may be possible to use some of the calculation and monitoring methods derived from project level accounting of sequestration projects.

ACCOUNTING FOR REMOVAL ENHANCEMENTS

A corporate inventory can be used to account for yearly removals within the corporate inventory boundary. In contrast, the forthcoming GHG Protocol Project Quantification Standard is designed to calculate project reductions that will be used as offsets, relative to a hypothetical baseline scenario for what would have happened without the project. In the forestry sector, projects take the form of removal enhancements.

Chapter 8 in this document addresses some of the issues that must be addressed when accounting for offsets from GHG reduction projects. Much of this guidance is also applicable to removal enhancement projects. One example is the issue of reversibility of removals — also briefly described in chapter 8.

REPORTING GHG REMOVALS

Until consensus methods are developed for characterizing impacts on sequestered atmospheric carbon along the value chain, this information can be included in the "optional information" section of the inventory (See chapter 9). Information on sequestered carbon in the company's inventory boundary should be kept separate from project-based reductions at sources that are not in the inventory boundary. Where removal enhancement projects take place within a company's inventory boundary they would normally show up as an increase in carbon removals over time, but can also be reported in optional information. However, they should also be identified separately to ensure that they are not double counted. This is especially important when they are sold as offsets or credits to a third party.

As companies develop experience using various methods for characterizing impacts on sequestered carbon, more information will become available on the level of accuracy to expect from these methods. In the early stages of developing this experience, however, companies may find it difficult to assess the uncertainty associated with the estimates and therefore may need to give special care to how the estimates are represented to stakeholders.

NOTES

[1] In this Appendix, "value chain" means a series of operations and entities, starting with the forest and extending through end-of-life management, that (a) supply or add value to raw materials and intermediate products to produce final products for the marketplace and (b) are involved in the use and end-of-life management of these products.

[2] In this Appendix the term "sequestered atmospheric carbon" refers exclusively to sequestration by biological sinks.

APPENDIX C

Overview of GHG Programs

NAME OF PROGRAM	TYPE OF PROGRAM	FOCUS (Organization, project, facility)	GASES COVERED	ORGANIZATIONAL PROJECT BOUNDARIES
California Climate Action Registry www.climateregisty.org	Voluntary registry	Organization (Projects possible in 2004)	Organizations report CO_2 for first three years of participation, all six GHGs thereafter.	Equity share or control for California or US operations
US EPA Climate Leaders www.epa.gov/climateleaders	Voluntary reduction program	Organization	Six	Equity share or control for US operations at a minimum
WWF Climate Savers www.worldwildlife.org/climatesavers	Voluntary registry	Organization	CO_2	Equity share or control for worldwide operations
World Economic Forum Global GHG Register www.weforum.org	Voluntary registry	Organization	Six	Equity share or control for worldwide operations
EU GHG Emissions Allowance Trading Scheme www.europa.eu.int/comm/environment/	Mandatory allowance trading scheme	Facility	Six	Facilities in selected sectors
European Pollutant Emission Registry www.europa.eu.int/comm/environment/ippc/eper/index.htm	Mandatory registry for large industrial facilities	Facility	Six Kyoto gases as well as other pollutants	Facilities that fall under EU IPPC directive
Chicago Climate Exchange www.chicagoclimateexchange.com	Voluntary allowance trading scheme	Organization and project	Six	Equity share
Respect Europe BLICC www.respecteurope.com/rt2/blicc/	Voluntary reduction program	Organization	Six	Equity share or control for worldwide operations

OPERATIONAL BOUNDARIES	NATURE/PURPOSE OF PROGRAM	BASE YEAR	TARGET	VERIFICATION
Scope 1 and 2 required, scope 3 to be decided	Baseline protection, public reporting, possible future targets	Specific to each organization, recalculation consistent with *GHG Protocol Corporate Standard* required	Encouraged but optional	Required through certified third party verifier
Scope 1 and 2 required, scope 3 optional	Public recognition, assistance setting targets and achieving reductions	Year that organization joins program, recalculation consistent with *GHG Protocol Corporate Standard* required	Required, specific to each organization	Optional, provides guidance and checklist of components that should be included if undertaken
Scope 1 and 2 required, scope 3 optional	Achieve targets, public recognition, expert assistance	Chosen year since 1990, specific to each organization, recalculation consistent with *GHG Protocol Corporate Standard* required	Required, specific to each organization	Third party verifier
Scope 1 and 2 required, scope 3 optional	Baseline protection, public reporting, targets encouraged but optional	Chosen year since 1990, specific to each organization, recalculation consistent with *GHG Protocol Corporate Standard* required	Encouraged but optional	Third party verifier or spot checks by WEF
Scope 1	Achieve annual caps through tradable allowance market, initial period from 2005 to 2007	Determined by member country for allowance allocation	Annual compliance with allocated and traded allowances, EU committed to 8% overall reduction below 1990	Third party verifier
Scope 1 required	Permit individual industrial facilities	Not applicable	Not applicable	Local permitting authority
Direct combustion and process emission sources and indirect emissions optional.	Achieve annual targets through tradable allowance market	Average of 1998 through 2001	1% below its baseline in 2003, 2% below baseline in 2004, 3% below baseline in 2005 and 4% below baseline in 2006	Third party verifier
Scope 1 and 2 required, scope 3 strongly encouraged	Achieve targets, public recognition, expert assistance	Specific to each organization, recalculation consistent with *GHG Protocol Corporate Standard* required	Mandatory, specific to each organization	Third party verifier

D Industry Sectors and Scopes

APPENDIX

SECTOR	SCOPE 1 EMISSION SOURCES	SCOPE 2 EMISSION SOURCES	SCOPE 3 EMISSION SOURCES[1]
ENERGY			
Energy Generation	• Stationary combustion (boilers and turbines used in the production of electricity, heat or steam, fuel pumps, fuel cells, flaring) • Mobile combustion (trucks, barges and trains for transportation of fuels) • Fugitive emissions (CH_4 leakage from transmission and storage facilities, HFC emissions from LPG storage facilities, SF_6 emissions from transmission and distribution equipment)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (mining and extraction of fuels, energy for refining or processing fuels) • Process emissions (production of fuels, SF_6 emissions[2]) • Mobile combustion (transportation of fuels/waste, employee business travel, employee commuting) • Fugitive emissions (CH_4 and CO_2 from waste landfills, pipelines, SF_6 emissions)
Oil and Gas[3]	• Stationary combustion (process heaters, engines, turbines, flares, incinerators, oxidizers, production of electricity, heat and steam) • Process emissions (process vents, equipment vents, maintenance/turnaround activities, non-routine activities) • Mobile combustion (transportation of raw materials/products/waste; company owned vehicles) • Fugitive emissions (leaks from pressurized equipment, wastewater treatment, surface impoundments)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (product use as fuel or combustion for the production of purchased materials) • Mobile combustion (transportation of raw materials/products/waste, employee business travel, employee commuting, product use as fuel) • Process emissions (product use as feedstock or emissions from the production of purchased materials) • Fugitive emissions (CH_4 and CO_2 from waste landfills or from the production of purchased materials)
Coal Mining	• Stationary combustion (methane flaring and use, use of explosives, mine fires) • Mobile combustion (mining equipment, transportation of coal) • Fugitive emissions (CH_4 emissions from coal mines and coal piles)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (product use as fuel) • Mobile combustion (transportation of coal/waste, employee business travel, employee commuting) • Process emissions (gasification)
METALS			
Aluminum[4]	• Stationary combustion (bauxite to aluminum processing, coke baking, lime, soda ash and fuel use, on-site CHP) • Process emissions (carbon anode oxidation, electrolysis, PFC) • Mobile combustion (pre- and post-smelting transportation, ore haulers) • Fugitive emissions (fuel line CH_4, HFC and PFC, SF_6 cover gas)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (raw material processing and coke production by second party suppliers, manufacture of production line machinery) • Mobile combustion (transportation services, business travel, employee commuting) • Process emissions (during production of purchased materials) • Fugitive emissions (mining and landfill CH_4 and CO_2, outsourced process emissions)
Iron and Steel[5]	• Stationary combustion (coke, coal and carbonate fluxes, boilers, flares) • Process emissions (crude iron oxidation, consumption of reducing agent, carbon content of crude iron/ferroalloys) • Mobile combustion (on-site transportation) • Fugitive emission (CH_4, N_2O)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (mining equipment, production of purchased materials) • Process emissions (production of ferroalloys) • Mobile combustion (transportation of raw materials/products/waste and intermediate products) • Fugitive emissions (CH_4 and CO_2 from waste landfills)
CHEMICALS			
Nitric acid, Ammonia, Adipic acid, Urea, and Petrochemicals	• Stationary combustion (boilers, flaring, reductive furnaces, flame reactors, steam reformers) • Process emissions (oxidation/reduction of substrates, impurity removal, N_2O byproducts, catalytic cracking, myriad other emissions individual to each process) • Mobile combustion (transportation of raw materials/products/waste) • Fugitive emissions (HFC use, storage tank leakage)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (production of purchased materials, waste combustion) • Process emissions (production of purchased materials) • Mobile combustion (transportation of raw materials/products/waste, employee business travel, employee commuting) • Fugitive emissions (CH_4 and CO_2 from waste landfills and pipelines)

SECTOR	SCOPE 1 EMISSION SOURCES	SCOPE 2 EMISSION SOURCES	SCOPE 3 EMISSION SOURCES
MINERALS			
Cement and Lime[6]	• Process emissions (calcination of limestone) • Stationary combustion (clinker kiln, drying of raw materials, production of electricity) • Mobile combustion (quarry operations, on-site transportation)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (production of purchased materials, waste combustion) • Process emissions (production of purchased clinker and lime) • Mobile combustion (transportation of raw materials/products/waste, employee business travel, employee commuting) • Fugitive emissions (mining and landfill CH_4 and CO_2, outsourced process emissions)
WASTE[7]			
Landfills, Waste combustion, Water services	• Stationary combustion (incinerators, boilers, flaring) • Process emissions (sewage treatment, nitrogen loading) • Fugitive emissions (CH_4 and CO_2 emissions from waste and animal product decomposition) • Mobile combustion (transportation of waste/products)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion(recycled waste used as a fuel) • Process emissions (recycled waste used as a feedstock) • Mobile combustion (transportation of waste/products, employee business travel, employee commuting)
PULP & PAPER			
Pulp and Paper[8]	• Stationary combustion (production of steam and electricity, fossil fuel-derived emissions from calcination of calcium carbonate in lime kilns, drying products with infrared driers fired with fossil fuels) • Mobile combustion (transportation of raw materials, products, and wastes, operation of harvesting equipment) • Fugitive emissions (CH_4 and CO_2 from waste)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (production of purchased materials, waste combustion) • Process emissions (production of purchased materials) • Mobile combustion (transportation of raw materials/products/waste, employee business travel, employee commuting) • Fugitive emissions (landfill CH_4 and CO_2 emissions)
HFC, PFC, SF_6 & HCFC 22 PRODUCTION[9]			
HCFC 22 production	• Stationary combustion(production of electricity, heat or steam) • Process emissions (HFC venting) • Mobile combustion (transportation of raw materials/products/waste) • Fugitive emissions (HFC use)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (production of purchased materials) • Process emissions (production of purchased materials) • Mobile combustion (transportation of raw materials/products/waste, employee business travel, employee commuting) • Fugitive emissions(fugitive leaks in product use, CH_4 and CO_2 from waste landfills)
SEMICONDUCTOR PRODUCTION			
Semiconductor production	• Process emissions (C_2F_6, CH_4, CHF_3, SF_6, NF_3, C_3F_8, C_4F_8, N_2O used in wafer fabrication, CF_4 created from C_2F_6 and C_3F_8 processing) • Stationary combustion (oxidation of volatile organic waste, production of electricity, heat or steam) • Fugitive emissions (process gas storage leaks, container remainders/heel leakage) • Mobile combustion (transportation of raw materials/products/waste)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (production of imported materials, waste combustion, upstream T&D losses of purchased electricity) • Process emissions (production of purchased materials, outsourced disposal of returned process gases and container remainder/heel) • Mobile combustion (transportation of raw materials/products/waste, employee business travel, employee commuting) • Fugitive emissions (landfill CH_4 and CO_2 emissions, downstream process gas container remainder/heel leakage)
OTHER SECTORS[10]			
Service sector/ Office based organizations[10]	• Stationary combustion (production of electricity, heat or steam) • Mobile combustion (transportation of raw materials/waste) • Fugitive emissions (mainly HFC emissions during use of refrigeration and air-conditioning equipment)	• Stationary combustion (consumption of purchased electricity, heat or steam)	• Stationary combustion (production of purchased materials) • Process emissions (production of purchased materials) • Mobile combustion (transportation of raw materials/products/waste, employee business travel, employee commuting)

Appendix D



NOTES

[1] Scope 3 activities of outsourcing, contract manufacturing, and franchises are not addressed in this table because the inclusion of specific GHG sources will depend on the nature of the outsourcing.

[2] Guidelines on unintentional SF_6 process emissions are to be developed.

[3] The American Petroleum Institute's Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry (2004) provides guidelines and calculation methodology for calculating GHG emissions from the oil and gas sector.

[4] The International Aluminum Institute's Aluminum Sector Greenhouse Gas Protocol (2003), in cooperation with WRI and WBCSD, provides guidelines and tools for calculating GHG emissions from the aluminum sector.

[5] The International Iron and Steel Institute's Iron and Steel sector guidelines, in cooperation with WRI and WBCSD, are under development.

[6] The WBCSD Working Group Cement: Toward a Sustainable Cement Industry has developed The Cement CO_2 Protocol: CO_2 Emissions Monitoring and Reporting Protocol for the Cement Industry (2002), which includes guidelines and tools to calculate GHG emissions from the cement sector.

[7] Guidelines for waste sector are to be developed.

[8] The Climate Change Working Group of the International Council of Forest and Paper Associations has developed Calculation Tools for Estimating Greenhouse Gas Emissions from Pulp and Paper Mills (2002), which includes guidelines and tools to calculate GHG emissions from the pulp and paper sector.

[9] Guidelines for PFC and SF_6 production are to be developed.

[10] Businesses in "other sectors" can estimate GHG emissions using cross-sectoral estimation tools—stationary combustion, mobile (transportation) combustion, HFC use, measurement and estimation uncertainty, and waste.

[11] WRI has developed Working 9 to 5 on Climate Change: An Office Guide (2002) and www.Safeclimate.net, which include guidelines and calculation tools for calculating GHG emissions from office-based organizations.

Acronyms

CDM	Clean Development Mechanism
CEM	Continuous Emission Monitoring
CH_4	Methane
CER	Certified Emission Reduction
CCAR	California Climate Action Registry
CCX	Chicago Climate Exchange
CO_2	Carbon Dioxide
CO_2-e	Carbon Dioxide Equivalent
EPER	European Pollutant Emission Register
EU ETS	European Union Emissions Allowance Trading Scheme
GHG	Greenhouse Gas
GAAP	Generally Accepted Accounting Principles
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
ISO	International Standards Organization
JI	Joint Implementation
N_4O	Nitrous Oxide
NGO	Non-Governmental Organization
PFCs	Perfluorocarbons
SF_6	Sulfur Hexafluoride
T&D	Transmission and Distribution
UK ETS	United Kingdom Emission Trading Scheme
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute



Glossary

Absolute target	A target defined by reduction in absolute emissions over time e.g., reduces CO_2 emissions by 25% below 1994 levels by 2010. (Chapter 11)
Additionality	A criterion for assessing whether a project has resulted in GHG emission reductions or removals in addition to what would have occurred in its absence. This is an important criterion when the goal of the project is to offset emissions elsewhere. (Chapter 8)
Allowance	A commodity giving its holder the right to emit a certain quantity of GHG. (Chapter 11)
Annex 1 countries	Defined in the International Climate Change Convention as those countries taking on emissions reduction obligations: Australia; Austria; Belgium; Belarus; Bulgaria; Canada; Croatia; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Japan; Latvia; Liechtenstein; Lithuania; Luxembourg; Monaco; Netherlands; New Zealand; Norway; Poland; Portugal; Romania; Russian Federation; Slovakia; Slovenia; Spain; Sweden; Switzerland; Ukraine; United Kingdom; USA.
Associated/affiliated company	The parent company has significant influence over the operating and financial policies of the associated/affiliated company, but not financial control. (Chapter 3)
Audit Trail	Well organized and transparent historical records documenting how an inventory was compiled.
Baseline	A hypothetical scenario for what GHG emissions, removals or storage would have been in the absence of the GHG project or project activity. (Chapter 8)
Base year	A historic datum (a specific year or an average over multiple years) against which a company's emissions are tracked over time. (Chapter 5)
Base year emissions	GHG emissions in the base year. (Chapter 5)
Base year emissions recalculation	Recalculation of emissions in the base year to reflect a change in the structure of the company, or to reflect a change in the accounting methodology used. This ensures data consistency over time, i.e., comparisons of like with like over time. (Chapter 5, 11)
Biofuels	Fuel made from plant material, e.g. wood, straw and ethanol from plant matter (Chapter 4, 9, Appendix B)
Boundaries	GHG accounting and reporting boundaries can have several dimensions, i.e. organizational, operational, geographic, business unit, and target boundaries. The inventory boundary determines which emissions are accounted and reported by the company. (Chapter 3, 4, 11)
Cap and trade system	A system that sets an overall emissions limit, allocates emissions allowances to participants, and allows them to trade allowances and emission credits with each other. (Chapter 2, 8, 11)
Capital Lease	A lease which transfers substantially all the risks and rewards of ownership to the lessee and is accounted for as an asset on the balance sheet of the lessee. Also known as a Financial or Finance Lease. Leases other than Capital/Financial/Finance leases are Operating leases. Consult an accountant for further detail as definitions of lease types differ between various accepted financial standards. (Chapter 4)
Carbon sequestration	The uptake of CO_2 and storage of carbon in biological sinks.
Clean Development Mechanism (CDM)	A mechanism established by Article 12 of the Kyoto Protocol for project-based emission reduction activities in developing countries. The CDM is designed to meet two main objectives: to address the sustainability needs of the host country and to increase the opportunities available to Annex 1 Parties to meet their GHG reduction commitments. The CDM allows for the creation, acquisition and transfer of CERs from climate change mitigation projects undertaken in non-Annex 1 countries.

Certified Emission Reductions (CERs)	A unit of emission reduction generated by a CDM project. CERs are tradable commodities that can be used by Annex 1 countries to meet their commitments under the Kyoto Protocol.
Co-generation unit/Combined heat and power (CHP)	A facility producing both electricity and steam/heat using the same fuel supply. (Chapter 3)
Consolidation	Combination of GHG emissions data from separate operations that form part of one company or group of companies. (Chapter 3, 4)
Control	The ability of a company to direct the policies of another operation. More specifically, it is defined as either operational control (the organization or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation) or financial control (the organization has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities). (Chapter 3)
Corporate inventory program	A program to produce annual corporate inventories that are in keeping with the principles, standards, and guidance of the *GHG Protocol Corporate Standard*. This includes all institutional, managerial and technical arrangements made for the collection of data, preparation of a GHG inventory, and implementation of the steps taken to manage the quality of their emission inventory.
CO_2 equivalent (CO_2-e)	The universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.
Cross-sector calculation tool	A GHG Protocol calculation tool that addresses GHG sources common to various sectors, e.g. emissions from stationary or mobile combustion. See also GHG Protocol calculation tools (www.ghgprotocol.org).
Direct GHG emissions	Emissions from sources that are owned or controlled by the reporting company. (Chapter 4)
Direct monitoring	Direct monitoring of exhaust stream contents in the form of continuous emissions monitoring (CEM) or periodic sampling. (Chapter 6)
Double counting	Two or more reporting companies take ownership of the same emissions or reductions. (Chapter 3, 4, 8, 11)
Emissions	The release of GHG into the atmosphere.
Emission factor	A factor allowing GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions. (Chapter 6)
Emission Reduction Unit (ERU)	A unit of emission reduction generated by a Joint Implementation (JI) project. ERUs are tradable commodities which can be used by Annex 1 countries to help them meet their commitment under the Kyoto Protocol.
Equity share	The equity share reflects economic interest, which is the extent of rights a company has to the risks and rewards flowing from an operation. Typically, the share of economic risks and rewards in an operation is aligned with the company's percentage ownership of that operation, and equity share will normally be the same as the ownership percentage. (Chapter 3)
Estimation uncertainty	Uncertainty that arises whenever GHG emissions are quantified, due to uncertainty in data inputs and calculation methodologies used to quantify GHG emissions. (Chapter 7)
Finance lease	A lease which transfers substantially all the risks and rewards of ownership to the lessee and is accounted for as an asset on the balance sheet of the lessee. Also known as a Capital or Financial Lease. Leases other than Capital/Financial/Finance leases are Operating leases. Consult an accountant for further detail as definitions of lease types differ between various accepted accounting principles. (Chapter 4)

Glossary

Fixed asset investment	Equipment, land, stocks, property, incorporated and non-incorporated joint ventures, and partnerships over which the parent company has neither significant influence nor control. (Chapter 3)
Fugitive emissions	Emissions that are not physically controlled but result from the intentional or unintentional releases of GHGs. They commonly arise from the production, processing transmission storage and use of fuels and other chemicals, often through joints, seals, packing, gaskets, etc. (Chapter 4, 6)
Green power	A generic term for renewable energy sources and specific clean energy technologies that emit fewer GHG emissions relative to other sources of energy that supply the electric grid. Includes solar photovoltaic panels, solar thermal energy, geothermal energy, landfill gas, low-impact hydropower, and wind turbines. (Chapter 4)
Greenhouse gases (GHG)	For the purposes of this standard, GHGs are the six gases listed in the Kyoto Protocol: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF_6).
GHG capture	Collection of GHG emissions from a GHG source for storage in a sink.
GHG credit	GHG offsets can be converted into GHG credits when used to meet an externally imposed target. A GHG credit is a convertible and transferable instrument usually bestowed by a GHG program. (Chapter 8, 11)
GHG offset	Offsets are discrete GHG reductions used to compensate for (i.e., offset) GHG emissions elsewhere, for example to meet a voluntary or mandatory GHG target or cap. Offsets are calculated relative to a baseline that represents a hypothetical scenario for what emissions would have been in the absence of the mitigation project that generates the offsets. To avoid double counting, the reduction giving rise to the offset must occur at sources or sinks not included in the target or cap for which it is used.
GHG program	A generic term used to refer to any voluntary or mandatory international, national, sub-national, government or non-governmental authority that registers, certifies, or regulates GHG emissions or removals outside the company. e.g. CDM, EU ETS, CCX, and CCAR.
GHG project	A specific project or activity designed to achieve GHG emission reductions, storage of carbon, or enhancement of GHG removals from the atmosphere. GHG projects may be stand-alone projects, or specific activities or elements within a larger non-GHG related project. (Chapter 8, 11)
GHG Protocol calculation tools	A number of cross-sector and sector-specific tools that calculate GHG emissions on the basis of activity data and emission factors (available at www.ghgprotocol.org).
GHG Protocol Initiative	A multi-stakeholder collaboration convened by the World Resources Institute and World Business Council for Sustainable Development to design, develop and promote the use of accounting and reporting standards for business. It comprises of two separate but linked standards — the *GHG Protocol Corporate Accounting and Reporting Standard* and the *GHG Protocol Project Quantification Standard.*
GHG Protocol Project Quantification Standard	An additional module of the GHG Protocol Initiative addressing the quantification of GHG reduction projects. This includes projects that will be used to offset emissions elsewhere and/or generate credits. More information available at www.ghgprotocol.org. (Chapter 8, 11)
GHG Protocol sector specific calculation tools	A GHG calculation tool that addresses GHG sources that are unique to certain sectors, e.g., process emissions from aluminum production. (see also GHG Protocol Calculation tools)
GHG public report	Provides, among other details, the reporting company's physical emissions for its chosen inventory boundary. (Chapter 9)

GHG registry	A public database of organizational GHG emissions and/or project reductions. For example, the US Department of Energy 1605b Voluntary GHG Reporting Program, CCAR, World Economic Forum's Global GHG Registry. Each registry has its own rules regarding what and how information is reported. (Introduction, Chapter 2, 5, 8, 10)
GHG removal	Absorbtion or sequestration of GHGs from the atmosphere.
GHG sink	Any physical unit or process that stores GHGs; usually refers to forests and underground/deep sea reservoirs of CO_2.
GHG source	Any physical unit or process which releases GHG into the atmosphere.
GHG trades	All purchases or sales of GHG emission allowances, offsets, and credits.
Global Warming Potential (GWP)	A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO_2.
Group company/subsidiary	The parent company has the ability to direct the financial and operating policies of a group company/subsidiary with a view to gaining economic benefits from its activities. (Chapter 3)
Heating value	The amount of energy released when a fuel is burned completely. Care must be taken not to confuse higher heating values (HHVs), used in the US and Canada, and lower heating values, used in all other countries (for further details refer to the calculation tool for stationary combustion available at www.ghgprotocol.org).
Indirect GHG emissions	Emissions that are a consequence of the operations of the reporting company, but occur at sources owned or controlled by another company. (Chapter 4)
Insourcing	The administration of ancillary business activities, formally performed outside of the company, using resources within a company. (Chapter 3, 4, 5, 9)
Intensity ratios	Ratios that express GHG impact per unit of physical activity or unit of economic value (e.g. tonnes of CO_2 emissions per unit of electricity generated). Intensity ratios are the inverse of productivity/efficiency ratios. (Chapter 9, 11)
Intensity target	A target defined by reduction in the ratio of emissions and a business metric over time e.g., reduce CO_2 per tonne of cement by 12% between 2000 and 2008. (Chapter 11)
Intergovernmental Panel on Climate Change (IPCC)	International body of climate change scientists. The role of the IPCC is to assess the scientific, technical and socio-economic information relevant to the understanding of the risk of human-induced climate change (www.ipcc.ch).
Inventory	A quantified list of an organization's GHG emissions and sources.
Inventory boundary	An imaginary line that encompasses the direct and indirect emissions that are included in the inventory. It results from the chosen organizational and operational boundaries. (Chapter 3, 4)
Inventory quality	The extent to which an inventory provides a faithful, true and fair account of an organization's GHG emissions. (Chapter 7)
Joint Implementation (JI)	The JI mechanism was established in Article 6 of the Kyoto Protocol and refers to climate change mitigation projects implemented between two Annex 1 countries. JI allows for the creation, acquisition and transfer of "emission reduction units" (ERUs).
Kyoto Protocol	A protocol to the United Nations Framework Convention on Climate Change (UNFCCC). Once entered into force it will require countries listed in its Annex B (developed nations) to meet reduction targets of GHG emissions relative to their 1990 levels during the period of 2008–12.

Glossary

Leakage (Secondary effect)	Leakage occurs when a project changes the availability or quantity of a product or service that results in changes in GHG emissions elsewhere. (Chapter 8)
Life Cycle Analysis	Assessment of the sum of a product's effects (e.g. GHG emissions) at each step in its life cycle, including resource extraction, production, use and waste disposal. (Chapter 4)
Material discrepancy	An error (for example from an oversight, omission, or miscalculation) that results in the reported quantity being significantly different to the true value to an extent that will influence performance or decisions. Also known as material misstatement.(Chapter 10)
Materiality threshold	A concept employed in the process of verification. It is often used to determine whether an error or omission is a material discrepancy or not. It should not be viewed as a de minimus for defining a complete inventory. (Chapter 10)
Mobile combustion	Burning of fuels by transportation devices such as cars, trucks, trains, airplanes, ships etc. (Chapter 6)
Model uncertainty	GHG quantification uncertainty associated with mathematical equations used to characterize the relationship between various parameters and emission processes. (Chapter 7)
Non-Annex 1 countries	Countries that have ratified or acceded to the UNFCC but are not listed under Annex 1 and are therefore not under any emission reduction obligation (see also Annex 1 countries).
Operation	A generic term used to denote any kind of business, irrespective of its organizational, governance, or legal structures. An operation can be a facility, subsidiary, affiliated company or other form of joint venture. (Chapter 3, 4)
Operating lease	A lease which does not transfer the risks and rewards of ownership to the lessee and is not recorded as an asset in the balance sheet of the lessee. Leases other than Operating leases are Capital/Financial/Finance leases. Consult an accountant for further detail as definitions of lease types differ between various accepted financial standards. (Chapter 4)
Operational boundaries	The boundaries that determine the direct and indirect emissions associated with operations owned or controlled by the reporting company. This assessment allows a company to establish which operations and sources cause direct and indirect emissions, and to decide which indirect emissions to include that are a consequence of its operations. (Chapter 4)
Organic growth/decline	Increases or decreases in GHG emissions as a result of changes in production output, product mix, plant closures and the opening of new plants. (Chapter 5)
Organizational boundaries	The boundaries that determine the operations owned or controlled by the reporting company, depending on the consolidation approach taken (equity or control approach). (Chapter 3)
Outsourcing	The contracting out of activities to other businesses. (Chapter 3, 4, 5)
Parameter uncertainty	GHG quantification uncertainty associated with quantifying the parameters used as inputs to estimation models. (Chapter 7)
Primary effects	The specific GHG reducing elements or activities (reducing GHG emissions, carbon storage, or enhancing GHG removals) that the project is intended to achieve. (Chapter 8)
Process emissions	Emissions generated from manufacturing processes, such as the CO_2 that is arises from the breakdown of calcium carbonate ($CaCO_3$) during cement manufacture. (Chapter 4, Appendix D)
Productivity/efficiency ratios	Ratios that express the value or achievement of a business divided by its GHG impact. Increasing efficiency ratios reflect a positive performance improvement. e.g. resource productivity(sales per tonne GHG). Productivity/efficiency ratios are the inverse of intensity ratios. (Chapter 9)
Ratio indicator	Indicators providing information on relative performance such as intensity ratios or productivity/efficiency ratios. (Chapter 9)

Renewable energy	Energy taken from sources that are inexhaustible, e.g. wind, water, solar, geothermal energy, and biofuels.
Reporting	Presenting data to internal management and external users such as regulators, shareholders, the general public or specific stakeholder groups. (Chapter 9)
Reversibility of reductions	This occurs when reductions are temporary, or where removed or stored carbon may be returned to the atmosphere at some point in the future. (Chapter 8)
Rolling base year	The process of shifting or rolling the base year forward by a certain number of years at regular intervals of time. (Chapter 5, 11)
Scientific Uncertainty	Uncertainty that arises when the science of the actual emission and/or removal process is not completely understood. (Chapter 7)
Scope	Defines the operational boundaries in relation to indirect and direct GHG emissions. (Chapter 4)
Scope 1 inventory	A reporting organization's direct GHG emissions. (Chapter 4)
Scope 2 inventory	A reporting organization's emissions associated with the generation of electricity, heating/cooling, or steam purchased for own consumption. (Chapter 4)
Scope 3 inventory	A reporting organization's indirect emissions other than those covered in scope 2. (Chapter 4)
Scope of works	An up-front specification that indicates the type of verification to be undertaken and the level of assurance to be provided between the reporting company and the verifier during the verification process. (Chapter 10)
Secondary effects (Leakage)	GHG emissions changes resulting from the project not captured by the primary effect(s). These are typically the small, unintended GHG consequences of a project. (Chapter 8)
Sequestered atmospheric carbon	Carbon removed from the atmosphere by biological sinks and stored in plant tissue. Sequestered atmospheric carbon does not include GHGs captured through carbon capture and storage.
Significance threshold	A qualitative or quantitative criteria used to define a significant structural change. It is the responsibility of the company/verifier to determine the "significance threshold" for considering base year emissions recalculation. In most cases the "significance threshold" depends on the use of the information, the characteristics of the company, and the features of structural changes. (Chapter 5)
Stationary Combustion	Burning of fuels to generate electricity, steam, heat, or power in stationary equipment such as boilers, furnaces etc.
Structural change	A change in the organizational or operational boundaries of a company that result in the transfer of ownership or control of emissions from one company to another. Structural changes usually result from a transfer of ownership of emissions, such as mergers, acquisitions, divestitures, but can also include outsourcing/insourcing. (Chapter 5)
Target base year	The base year used for defining a GHG target, e.g. to reduce CO_2 emissions 25% below the target base year levels by the target base year 2000 by the year 2010. (Chapter 11)
Target boundary	The boundary that defines which GHG's, geographic operations, sources and activities are covered by the target. (Chapter 11)
Target commitment period	The period of time during which emissions performance is actually measured against the target. It ends with the target completion date. (Chapter 11)
Target completion date	The date that defines the end of the target commitment period and determines whether the target is relatively short- or long-term. (Chapter 11)

Glossary

Target double counting policy	A policy that determines how double counting of GHG reductions or other instruments, such as allowances issued by external trading programs, is dealt with under a GHG target. It applies only to companies that engage in trading (sale or purchase) of offsets or whose corporate target boundaries interface with other companies' targets or external programs. (Chapter 11)
Uncertainty	1. Statistical definition: A parameter associated with the result of a measurement that characterizes the dispersion of the values that could be reasonably attributed to the measured quantity. (e.g., the sample variance or coefficient of variation). (Chapter 7) 2. Inventory definition: A general and imprecise term which refers to the lack of certainty in emissions-related data resulting from any causal factor, such as the application of non-representative factors or methods, incomplete data on sources and sinks, lack of transparency etc. Reported uncertainty information typically specifies a quantitative estimates of the likely or perceived difference between a reported value and a qualitative description of the likely causes of the difference. (Chapter 7).
United Nations Framework Convention on Climate Change (UNFCCC)	Signed in 1992 at the Rio Earth Summit, the UNFCCC is a milestone Convention on Climate Change treaty that provides an overall framework for international efforts to (UNFCCC) mitigate climate change. The Kyoto Protocol is a protocol to the UNFCCC.
Value chain emissions	Emissions from the upstream and downstream activities associated with the operations of the reporting company. (Chapter 4)
Verification	An independent assessment of the reliability (considering completeness and accuracy) of a GHG inventory. (Chapter 10)



References

API (2004), *Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry,* Final Draft, American Petroleum Institute

BP (2000), *Environmental Performance: Group Reporting Guidelines,* Version 2.2

CCAR (2003), *General Reporting Guidelines,* California Climate Action Registry

DEFRA (2003), *Guidelines for the Measurement and Reporting of Emissions by direct participants in the UK Emissions Trading Scheme,* UK Department for Environment, Food and Rural Affairs, London, UK ETS(01)05rev2

EC-DGE (2000), *Guidance Document for EPER Implementation,* European Commission Directorate-General for Environment

EPA (1999), *Emission Inventory Improvement Program, Volume VI: Quality Assurance/Quality Control,* U.S. Environmental Protection Agency

Georgia Pacific (2002), *Protocol for the Inventory of Greenhouse Gases in Georgia-Pacific Corporation,* Georgia-Pacific Corporation, Atlanta

GRI (2002), *Global Reporting Initiative, Sustainability Reporting Guidelines,* Global Reporting Initiative

IAI (2003), *Aluminum Sector Greenhouse Gas Protocol,* International Aluminum Institute

ICFPA (2002), *Calculation Tools and for Estimating Greenhouse Gas Emissions from Pulp and Paper Mills,* Climate Change Working Group of the International Council of Forest and Paper Associations

IPCC (1996), *Revised IPCC Guidelines for National GHG Inventories: Reference Manual,* Intergovernmental Panel on Climate Change

IPCC (1997), *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories,* Intergovernmental Panel on Climate Change

IPCC (1998), *Evaluating Approaches for Estimating Net Emissions of Carbon Dioxide from Forest Harvesting and Wood Products,* by S. **Brown**, B. **Lim**, and B. **Schlamadinger**, Intergovernmental Panel on Climate Change

IPCC (2000a), *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories,* Intergovernmental Panel on Climate Change

IPCC (2000b), *Land Use, Land Use Change, and Forestry: A Special Report of the IPCC,* Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK

IPIECA (2003), *Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions,* International Petroleum Industry Environmental Conservation Association, London

ISO (1999), *International Standard on Environmental Performance Evaluation,* (ISO 14031), International Standard Organization, Geneva

KPMG (2000), *Global Accounting: UK, US, IAS and Netherlands Compared,* 2nd Edition, KPMG Accountants NV

NZBCSD (2002), *The Challenge of GHG Emissions: the "why" and "how" of accounting and reporting for GHG emissions: An Industry Guide,* New Zealand Business Council for Sustainable Development, Auckland

Ontario MOE (2001), *Airborne Contaminant Discharge Monitoring and Reporting,* Ontario Ministry of the Environment, Toronto, Ontario Regulation 127/01

UNFCCC (2000), *Synthesis Report on National Greenhouse Gas Information Reported by Annex I Parties for the Land-Use Change and Forestry Sector and Agricultural Soils Category,* FCCC/TP/1997/5, United Nations Framework Convention on Climate Change

Verfaillie, H., and **R. Bidwell** (2000), *Measuring Eco-efficiency: A Guide to Reporting Company Performance,* World Business Council for Sustainable Development, Geneva

WBCSD (2001), *The Cement CO_2 Protocol: CO_2 Emissions Monitoring and Reporting Protocol for the Cement Industry,* World Business Council for Sustainable Development: Working Group Cement, Geneva

WRI (2002), *Working 9 to 5 on Climate Change: An Office Guide,* World Resources Institute, Washington, DC

WRI (2003), *Renewable Energy Certificates: An Attractive Means for Corporate Customers to Purchase Renewable Energy,* World Resources Institute, Washington, DC

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Nike, Inc.
Norsk Hydro
Ontario Power Generation
Petro-Canada
PricewaterhouseCoopers road tested with European companies in the non-ferrous metal sector
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World Resources Institute is an independent nonprofit organization with a staff of more than 100 scientists, economists, policy experts, business analysts, statistical analysts, mapmakers, and communicators working to protect the Earth and improve people's lives. The GHG Protocol Initiative is managed by WRI's Sustainable Enterprise Program which for more than a decade, has harnessed the power of business to create profitable solutions to environment and development challenges. WRI is the only organization that brings together four influential forces to accelerate change in business practice: corporations, entrepreneurs, investors, and business schools.



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First Amendment to the United States Constitution

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.

Fourteenth Amendment to the United States Constitution

Section 1.

All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the state wherein they reside. No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any state deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

Section 2.

Representatives shall be apportioned among the several states according to their respective numbers, counting the whole number of persons in each state, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice President of the United States, Representatives in Congress, the executive and judicial officers of a state, or the members of the legislature thereof, is denied to any of the male inhabitants of such state, being twenty-one years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion, or other crime, the basis of representation therein shall be reduced in the proportion which the number of such male citizens shall bear to the whole number of male citizens twenty-one years of age in such state.

Section 3.

No person shall be a Senator or Representative in Congress, or elector of President and Vice President, or hold any office, civil or military, under the United

States, or under any state, who, having previously taken an oath, as a member of Congress, or as an officer of the United States, or as a member of any state legislature, or as an executive or judicial officer of any state, to support the Constitution of the United States, shall have engaged in insurrection or rebellion against the same, or given aid or comfort to the enemies thereof. But Congress may by a vote of two-thirds of each House, remove such disability.

Section 4.

The validity of the public debt of the United States, authorized by law, including debts incurred for payment of pensions and bounties for services in suppressing insurrection or rebellion, shall not be questioned. But neither the United States nor any state shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations and claims shall be held illegal and void.

Section 5.

The Congress shall have power to enforce, by appropriate legislation, the provisions of this article.

Exhibit 13

Session Law Version of S.B. 253

Declaration of Bradley J. Hamburger In Support Of
Plaintiffs' Motion for Summary Judgment on Claim I
May 24, 2024

Chamber of Commerce of the United States of America, et al. v. Randolph, et al.,
Case No. 2:24-cv-00801-ODW-PVC (C.D. Cal.)

STATE OF CALIFORNIA
LEGISLATIVE COUNSEL BUREAU
AUTHENTICATED
ELECTRONIC LEGAL MATERIAL

Senate Bill No. 253

CHAPTER 382

An act to add Section 38532 to the Health and Safety Code, relating to greenhouse gases, and making an appropriation therefor.

[Approved by Governor October 7, 2023. Filed with Secretary of State October 7, 2023.]

LEGISLATIVE COUNSEL'S DIGEST

SB 253, Wiener. Climate Corporate Data Accountability Act.

The California Global Warming Solutions Act of 2006 requires the State Air Resources Board to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with the act. The act requires the state board to make available, and update at least annually, on its internet website the emissions of greenhouse gases, criteria pollutants, and toxic air contaminants for each facility that reports to the state board, as provided.

This bill would require the state board, on or before January 1, 2025, to develop and adopt regulations requiring specified partnerships, corporations, limited liability companies, and other business entities with total annual revenues in excess of $1,000,000,000 and that do business in California, defined as "reporting entities," to publicly disclose to the emissions reporting organization, as defined, and obtain an assurance engagement on, starting in 2026 on a date to be determined by the state board, and annually thereafter, their scope 1 and scope 2 greenhouse gas emissions, as defined, and, starting in 2027 and annually thereafter, their scope 3 greenhouse gas emissions, as defined, from the reporting entity's prior fiscal year, as provided. The bill would require the state board to review during 2029, and update as necessary on or before January 1, 2030, these deadlines to evaluate trends in scope 3 emissions reporting and to consider changes to the deadlines, as provided. The bill would require a reporting entity to obtain an assurance engagement, performed by an independent third-party assurance provider, of the entity's public disclosure as provided. The bill would require the state board, in developing these regulations, to consult with the Attorney General, other government stakeholders, investors, stakeholders representing consumer and environmental justice interests, and reporting entities that have demonstrated leadership in full-scope greenhouse gas emissions accounting and public disclosure and greenhouse gas emissions reductions. The bill would also require the state board to ensure that the assurance process minimizes the need for reporting entities to engage multiple assurance providers and ensures sufficient assurance provider capacity, as well as timely reporting implementation, as required. The bill would further require the state board to contract with an emissions reporting organization to

develop a reporting program to receive and make publicly available the required disclosures. The bill would authorize the state board, starting in 2033 and every 5 years thereafter, to assess the global greenhouse gas accounting and reporting standards and to adopt an alternative standard if it determines that using the alternative standard would more effectively further the goals of the bill.

This bill would require the state board, on or before July 1, 2027, to contract with the University of California, the California State University, a national laboratory, or another equivalent academic institution to prepare a report on the public disclosures made by reporting entities to the emissions reporting organization. The bill would require, in preparing the report, consideration to be given to, at a minimum, greenhouse gas emissions from reporting entities in the context of state greenhouse gas emissions reduction and climate goals. The bill would require the state board to provide the report to the emissions reporting organization to post on a digital platform that would be required to be created by the emissions reporting organization, and publicly accessible, to house the state board's report and the reporting entities' public disclosures. The bill would require the emissions reporting organization to provide the state board's report to the relevant policy committees of the Legislature.

This bill would require a reporting entity, upon filing its disclosure, to pay to the state board an annual fee set by the state board, as provided. The bill would create the Climate Accountability and Emissions Disclosure Fund, require the proceeds of the fees to be deposited in the fund, and continuously appropriate the moneys in the fund to the state board for purposes of the bill. By creating a continuously appropriated fund, the bill would create an appropriation. The bill would require the state board to adopt regulations that authorize it to seek administrative penalties for violations of these provisions, as specified.

Appropriation: yes.

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds and declares all of the following:

(a) California has demonstrated its leadership in the battle against climate change and the climate actions of the state have inspired and contributed to bold actions in other states and across the globe.

(b) Californians are already facing devastating wildfires, sea level rise, drought, and other impacts associated with climate change that threaten the health and safety of Californians, undermines the sustainability of our communities, particularly those communities most affected by the negative effects of climate change, and the economic well-being of the state and its residents, including threatening many of the state's largest industries.

(c) Climate change also poses a significant risk to companies' long-term economic success and disrupts the value chains on which they rely. Managing these risks requires investments in decarbonization strategies that

unlock emissions reductions and provide economic benefits for Californians and the state economy.

(d) California has achieved record economic growth, is on track to be the fourth largest economy in the world, and is a highly desirable market for the globe's most profitable companies.

(e) California investors, consumers, and other stakeholders deserve transparency from companies regarding their greenhouse gas (GHG) emissions to inform their decisionmaking.

(f) United States companies that have access to California's tremendously valuable consumer market by virtue of exercising their corporate franchise in the state also share responsibility for disclosing their contributions to global GHG emissions.

(g) Companies can increase the state's climate risk through emissions activities that include, but are not limited to, company operations, supply chain activities, employee and consumer transportation, goods production and movement, construction, land use, and natural resource extraction.

(h) Accurate and comprehensive data that is subject to an assurance engagement performed by an independent third-party assurance provider is required to determine a company's direct and indirect GHG emissions, also known as its carbon footprint, and to effectively identify the sources of the emissions and develop means to reduce the same.

(i) The current approach for disclosure of climate emissions from public and private corporate enterprises relies largely on voluntary reporting of GHG inventories, goals, commitments, and agreements, and lacks the full transparency and consistency needed by residents and financial markets to fully understand these climate risks.

(j) The people, communities, and other stakeholders in California, facing the existential threat of climate change, have a right to know about the sources of carbon pollution, as measured by the comprehensive GHG emissions data of those companies benefiting from doing business in the state, in order to make informed decisions.

(k) The Greenhouse Gas Protocol is the globally recognized GHG emissions accounting and reporting standard developed and updated by the World Resources Institute and the World Business Council for Sustainable Development and provides the framework for corporate GHG emissions accounting and reporting. The framework defines and categorizes emissions as scopes 1, 2, and 3 emissions. Many companies already partially or fully disclose their emissions data.

(*l*) Mandating annual, full-scope GHG emissions data reporting to the emissions reporting organization for all United States companies with total annual revenues in excess of $1,000,000,000 that do business in California, as well as ensuring public access to the data in a manner that is easily understandable and accessible, will inform investors, empower consumers, and activate companies to improve risk management in order to move towards a net-zero carbon economy and is a critical next step that California must take to protect the state and its residents.

SEC. 2. Section 38532 is added to the Health and Safety Code, to read:

38532. (a) This section shall be known, and may be cited, as the Climate Corporate Data Accountability Act.

(b) For purposes of this section, the following terms have the following definitions:

(1) "Emissions reporting organization" means a nonprofit emissions reporting organization contracted by the state board pursuant to paragraph (2) of subdivision (c) that both:

(A) Currently operates a greenhouse gas emission reporting organization for organizations operating in the United States.

(B) Has experience with greenhouse gas emissions disclosure by entities operating in California.

(2) "Reporting entity" means a partnership, corporation, limited liability company, or other business entity formed under the laws of this state, the laws of any other state of the United States or the District of Columbia, or under an act of the Congress of the United States with total annual revenues in excess of one billion dollars ($1,000,000,000) and that does business in California. Applicability shall be determined based on the reporting entity's revenue for the prior fiscal year.

(3) "Scope 1 emissions" means all direct greenhouse gas emissions that stem from sources that a reporting entity owns or directly controls, regardless of location, including, but not limited to, fuel combustion activities.

(4) "Scope 2 emissions" means indirect greenhouse gas emissions from consumed electricity, steam, heating, or cooling purchased or acquired by a reporting entity, regardless of location.

(5) "Scope 3 emissions" means indirect upstream and downstream greenhouse gas emissions, other than scope 2 emissions, from sources that the reporting entity does not own or directly control and may include, but are not limited to, purchased goods and services, business travel, employee commutes, and processing and use of sold products.

(c) (1) On or before January 1, 2025, the state board shall develop and adopt regulations to require a reporting entity to annually disclose to the emissions reporting organization, and obtain an assurance engagement performed by an independent third-party assurance provider on all of the reporting entity's scope 1 emissions, scope 2 emissions, and scope 3 emissions. The state board shall ensure that the regulations adopted pursuant to this subdivision require all of the following:

(A) (i) (I) That a reporting entity, starting in 2026 on or by a date to be determined by the state board, and annually thereafter on or by that date, publicly disclose to the emissions reporting organization all of the reporting entity's scope 1 emissions and scope 2 emissions for the reporting entity's prior fiscal year.

(II) That a reporting entity, starting in 2027 and annually thereafter, publicly disclose its scope 3 emissions no later than 180 days after its scope 1 emissions and scope 2 emissions are publicly disclosed to the emissions reporting organization for the prior fiscal year.

(ii) A reporting entity shall, beginning in 2026, measure and report its emissions of greenhouse gases in conformance with the Greenhouse Gas

Protocol standards and guidance, including the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard and the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard developed by the World Resources Institute and the World Business Council for Sustainable Development, including guidance for scope 3 emissions calculations that detail acceptable use of both primary and secondary data sources, including the use of industry average data, proxy data, and other generic data in its scope 3 emissions calculations.

(iii) (I) Starting in 2033 and every five years thereafter, the state board may survey and assess currently available greenhouse gas accounting and reporting standards. At the conclusion of this assessment the state board may adopt a globally recognized alternative accounting and reporting standard if it determines its use would more effectively further the goals of this section. This review process shall include consultation with the stakeholders identified in paragraph (4).

(II) If the state board adopts an alternative accounting and reporting standard, the state board shall develop and adopt new regulations, pursuant to paragraph (1), to ensure full conformance with the new standard and reporting of scopes 1, 2, and 3 emissions and other requirements of this section.

(iv) During 2029 the state board shall review, and on or before January 1, 2030, the state board shall update as necessary, the public disclosure deadlines established pursuant to clause (i) to evaluate trends in scope 3 emissions reporting and consider changes to the disclosure deadlines to ensure that scope 3 emissions data is disclosed to the emissions reporting organization as close in time as practicable to the deadline for reporting entities to disclose scope 1 emissions and scope 2 emissions data.

(v) The reporting timelines shall consider industry stakeholder input and shall take into account the timelines by which reporting entities typically receive scope 1, scope 2, and scope 3 emissions data, as well as the capacity for an independent assurance engagement to be performed by a third-party assurance provider.

(B) That a reporting entity's public disclosure maximizes access for consumers, investors, and other stakeholders to comprehensive and detailed greenhouse gas emissions data across scopes 1, 2, and 3 emissions, as defined by this section, and is made in a manner that is easily understandable and accessible.

(C) That a reporting entity's public disclosure includes the name of the reporting entity and any fictitious names, trade names, assumed names, and logos used by the reporting entity.

(D) (i) That the emissions reporting is structured in a way that minimizes duplication of effort and allows a reporting entity to submit to the emissions reporting organization reports prepared to meet other national and international reporting requirements, including any reports required by the federal government, as long as those reports satisfy all of the requirements of this section.

(ii) Reporting entities that are required to report mandatory industrial emissions pursuant to regulations adopted pursuant to Section 38530 may provide that data with the disclosure required pursuant to this section.

(E) That a reporting entity's disclosure takes into account acquisitions, divestments, mergers, and other structural changes that can affect the greenhouse gas emissions reporting, and is disclosed in a manner consistent with the Greenhouse Gas Protocol standards and guidance or an alternative standard, if one is adopted after 2033.

(F) (i) That a reporting entity obtains an assurance engagement, performed by an independent third-party assurance provider, of their public disclosure. The reporting entity shall ensure that a copy of the complete assurance provider's report on the greenhouse gas emissions inventory, including the name of the third-party assurance provider, is provided to the emissions reporting organization as part of or in connection with the reporting entity's public disclosure.

(ii) The assurance engagement for scope 1 emissions and scope 2 emissions shall be performed at a limited assurance level beginning in 2026 and at a reasonable assurance level beginning in 2030.

(iii) During 2026, the state board shall review and evaluate trends in third-party assurance requirements for scope 3 emissions. On or before January 1, 2027, the state board may establish an assurance requirement for third-party assurance engagements of scope 3 emissions. The assurance engagement for scope 3 emissions shall be performed at a limited assurance level beginning in 2030.

(iv) A third-party assurance provider shall have significant experience in measuring, analyzing, reporting, or attesting to the emission of greenhouse gasses and sufficient competence and capabilities necessary to perform engagements in accordance with professional standards and applicable legal and regulatory requirements. The assurance provider shall be able to issue reports that are appropriate under the circumstances and independent with respect to the reporting entity, and any of the reporting entity's affiliates for which it is providing the assurance report. During 2029 the state board shall review and, on or before January 1, 2030, shall update as necessary, the qualifications for third-party assurance providers based on an evaluation of trends in education relating to the emission of greenhouse gases and the qualifications of third-party assurance providers.

(v) The state board shall ensure that the assurance process minimizes the need for reporting entities to engage multiple assurance providers and ensures sufficient assurance provider capacity, as well as timely reporting implementation as required under clause (i) of subparagraph (A).

(G) (i) That a reporting entity, upon filing its disclosure, shall pay an annual fee to the state board for the administration and implementation of this section.

(ii) The state board shall set the fee established pursuant to clause (i) in an amount sufficient to cover the state board's full costs of administrating and implementing this section. The total amount of fees collected shall not

exceed the state board's actual and reasonable costs to administer and implement this section.

(iii) The proceeds of the fees imposed pursuant to clause (i) shall be deposited in the Climate Accountability and Emissions Disclosure Fund, which is hereby created in the State Treasury. Notwithstanding Section 13340 of the Government Code, the money in the fund is continuously appropriated to the state board and shall be expended by the state board for the state board's activities pursuant to this section and to reimburse any outstanding loans made from other funds used to finance the initial costs of the state board's activities pursuant to this section. Moneys in the fund shall not be expended for any purpose not enumerated in this section.

(iv) The state board may adjust the fee in any year to reflect changes in the California Consumer Price Index during the prior year.

(2) The state board shall contract with an emissions reporting organization to develop a reporting program to receive and make publicly available disclosures required by this section pursuant to paragraph (1).

(3) The state board may adopt or update any other regulations that it deems necessary and appropriate to implement this section.

(4) In developing the regulations required pursuant to this subdivision, the state board shall consult with all of the following:

(A) The Attorney General.

(B) Other government stakeholders, including, but not limited to, experts in climate science and corporate carbon emissions accounting and reporting.

(C) Investors.

(D) Stakeholders representing consumer and environmental justice interests.

(E) Reporting entities that have demonstrated leadership in full-scope greenhouse gas emissions accounting and public disclosure and greenhouse gas emissions reductions.

(5) This section does not require additional reporting of emissions of greenhouse gases beyond the reporting of scope 1 emissions, scope 2 emissions, and scope 3 emissions required pursuant to the Greenhouse Gas Protocol standards and guidance or an alternative standard, if one is adopted after 2033.

(d) (1) On or before July 1, 2027, the state board shall contract with the University of California, the California State University, a national laboratory, or another equivalent academic institution to prepare a report on the public disclosures made by reporting entities to the emissions reporting organization pursuant to subdivision (c) and the regulations adopted by the state board pursuant to that subdivision. In preparing the report, consideration shall be given to, at a minimum, greenhouse gas emissions from reporting entities in the context of state greenhouse gas emissions reduction and climate goals. The entity preparing the report shall not require reporting entities to report any information beyond what is required pursuant to subdivision (c) or the regulations adopted by the state board pursuant to that subdivision.

(2) The state board shall submit the report required by this subdivision to the emissions reporting organization to be made publicly available on the digital platform required to be created by the emissions reporting organization pursuant to subdivision (e).

(e) (1) (A) The emissions reporting organization, on or before the date determined by the state board pursuant to clause (i) of subparagraph (A) of paragraph (1) of subdivision (c), shall create a digital platform, which shall be accessible to the public, that will feature the emissions data of reporting entities in conformance with the regulations adopted by the state board pursuant to subdivision (c) and the report prepared for the state board pursuant to subdivision (d). The emissions reporting organization shall make the reporting entities' disclosures and the state board's report available on the digital platform within 30 days of receipt.

(B) The digital platform shall be capable of featuring individual reporting entity disclosures, and shall allow consumers, investors, and other stakeholders to view reported data elements aggregated in a variety of ways, including multiyear data, in a manner that is easily understandable and accessible to residents of the state. All data sets and customized views shall be available in electronic format for access and use by the public.

(2) The emissions reporting organization shall submit, within 30 days of receipt, the report prepared for the state board pursuant to subdivision (d) to the relevant policy committees of the Legislature.

(f) (1) Section 38580 does not apply to a violation of this section.

(2) (A) The state board shall adopt regulations that authorize it to seek administrative penalties for nonfiling, late filing, or other failure to meet the requirements of this section. The administrative penalties authorized by this section shall be imposed and recovered by the state board in administrative hearings conducted pursuant to Article 3 (commencing with Section 60065.1) and Article 4 (commencing with Section 60075.1) of Subchapter 1.25 of Chapter 1 of Division 3 of Title 17 of the California Code of Regulations. The administrative penalties imposed on a reporting entity shall not exceed five hundred thousand dollars ($500,000) in a reporting year. In imposing penalties for a violation of this section, the state board shall consider all relevant circumstances, including both of the following:

(i) The violator's past and present compliance with this section.

(ii) Whether the violator took good faith measures to comply with this section and when those measures were taken.

(B) A reporting entity shall not be subject to an administrative penalty under this section for any misstatements with regard to scope 3 emissions disclosures made with a reasonable basis and disclosed in good faith.

(C) Penalties assessed on scope 3 reporting, between 2027 and 2030, shall only occur for nonfiling.

(g) This section applies to the University of California only to the extent that the Regents of the University of California, by resolution, make any of these provisions applicable to the university.

(h) The provisions of this section are severable. If any provision of this section or its application is held invalid, that invalidity shall not affect other provisions or applications that can be given effect without the invalid provision or application.

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Proposed Legislation

West's Annotated California Codes
Health and Safety Code (Refs & Annos)
Division 25.5. California Global Warming Solutions Act of 2006 (Refs & Annos)
Part 2. Mandatory Greenhouse Gas Emissions Reporting (Refs & Annos)

West's Ann.Cal.Health & Safety Code § 38532

§ 38532. Climate Corporate Data Accountability Act

Currentness

(a) This section shall be known, and may be cited, as the Climate Corporate Data Accountability Act.

(b) For purposes of this section, the following terms have the following definitions:

(1) “Emissions reporting organization” means a nonprofit emissions reporting organization contracted by the state board pursuant to paragraph (3) of subdivision (c) that both:

(A) Currently operates a greenhouse gas emissions reporting organization for organizations operating in the United States.

(B) Has experience with greenhouse gas emissions disclosure by entities operating in California.

(2) “Reporting entity” means a partnership, corporation, limited liability company, or other business entity formed under the laws of this state, the laws of any other state of the United States or the District of Columbia, or under an act of the Congress of the United States with total annual revenues in excess of one billion dollars ($1,000,000,000) and that does business in California. Applicability shall be determined based on the reporting entity's revenue for the prior fiscal year.

(3) “Scope 1 emissions” means all direct greenhouse gas emissions that stem from sources that a reporting entity owns or directly controls, regardless of location, including, but not limited to, fuel combustion activities.

(4) “Scope 2 emissions” means indirect greenhouse gas emissions from consumed electricity, steam, heating, or cooling purchased or acquired by a reporting entity, regardless of location.

(5) “Scope 3 emissions” means indirect upstream and downstream greenhouse gas emissions, other than scope 2 emissions, from sources that the reporting entity does not own or directly control and may include, but are not limited to, purchased goods and services, business travel, employee commutes, and processing and use of sold products.

(c)(1) On or before July 1, 2025, the state board shall develop and adopt regulations to require a reporting entity to annually disclose all of the reporting entity's scope 1 emissions, scope 2 emissions, and scope 3 emissions, and obtain an assurance engagement performed by an independent third-party assurance provider. Those regulations shall require the reporting entity to make the annual disclosure to either of the following:

(A) The emissions reporting organization, if contracted for services.

(B) The state board.

(2) The state board shall ensure that the regulations adopted pursuant to this subdivision require all of the following:

(A)(i)(I) That a reporting entity, starting in 2026 on or by a date to be determined by the state board, and annually thereafter on or by that date, publicly disclose to the emissions reporting organization, if contracted for services, or the state board, all of the reporting entity's scope 1 emissions and scope 2 emissions for the reporting entity's prior fiscal year.

(II) That a reporting entity, starting in 2027 and annually thereafter, publicly disclose its scope 3 emissions on a schedule specified by the state board as part of the regulations developed pursuant to this subdivision for the prior fiscal year.

(ii) A reporting entity shall, beginning in 2026, measure and report its emissions of greenhouse gases in conformance with the Greenhouse Gas Protocol standards and guidance, including the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard and the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard developed by the World Resources Institute and the World Business Council for Sustainable Development, including guidance for scope 3 emissions calculations that detail acceptable use of both primary and secondary data sources, including the use of industry average data, proxy data, and other generic data in its scope 3 emissions calculations.

(iii) Reports may be consolidated at the parent company level. If a subsidiary of a parent company qualifies as a reporting entity pursuant to paragraph (2) of subdivision (b), the subsidiary is not required to prepare a separate report.

(iv)(I) Starting in 2033, the state board may survey and assess currently available greenhouse gas accounting and reporting standards. At the conclusion of this assessment the state board may adopt a globally recognized alternative accounting and reporting standard if it determines its use would more effectively further the goals of this section. This review process shall include consultation with the stakeholders identified in paragraph (5).

(II) If the state board adopts an alternative accounting and reporting standard, the state board shall develop and adopt new regulations, pursuant to paragraph (1), to ensure full conformance with the new standard and reporting of scope 1 emissions, scope 2 emissions, and scope 3 emissions and other requirements of this section.

(v) During 2029 the state board shall review, and on or before January 1, 2030, the state board shall update as necessary, the public disclosure deadlines established pursuant to clause (i) to evaluate trends in scope 3 emissions reporting and consider changes to the disclosure deadlines to ensure that scope 3 emissions data is disclosed to the emissions reporting organization, if

contracted for services, or the state board, as close in time as practicable to the deadline for reporting entities to disclose scope 1 emissions and scope 2 emissions data.

(vi) The reporting timelines shall consider industry stakeholder input and shall take into account the timelines by which reporting entities typically receive scope 1 emissions, scope 2 emissions, and scope 3 emissions data, as well as the capacity for an independent assurance engagement to be performed by a third-party assurance provider.

(B) That a reporting entity's public disclosure maximizes access for consumers, investors, and other stakeholders to comprehensive and detailed greenhouse gas emissions data across scope 1 emissions, scope 2 emissions, and scope 3 emissions, as defined by this section, and is made in a manner that is easily understandable and accessible.

(C) That a reporting entity's public disclosure includes the name of the reporting entity and any fictitious names, trade names, assumed names, and logos used by the reporting entity.

(D)(i) That the emissions reporting is structured in a way that minimizes duplication of effort and allows a reporting entity to submit to the emissions reporting organization, if contracted for services, or the state board, reports prepared to meet other national and international reporting requirements, including any reports required by the federal government, as long as those reports satisfy all of the requirements of this section.

(ii) Reporting entities that are required to report mandatory industrial emissions pursuant to regulations adopted pursuant to Section 38530 may provide that data with the disclosure required pursuant to this section.

(E) That a reporting entity's disclosure takes into account acquisitions, divestments, mergers, and other structural changes that can affect the greenhouse gas emissions reporting, and is disclosed in a manner consistent with the Greenhouse Gas Protocol standards and guidance or an alternative standard, if one is adopted after 2033.

(F)(i) That a reporting entity obtains an assurance engagement, performed by an independent third-party assurance provider, of their public disclosure. The reporting entity shall ensure that a copy of the complete assurance provider's report on the greenhouse gas emissions inventory, including the name of the third-party assurance provider, is provided to the emissions reporting organization, if contracted for services, or the state board, as part of or in connection with the reporting entity's public disclosure.

(ii) The assurance engagement for scope 1 emissions and scope 2 emissions shall be performed at a limited assurance level beginning in 2026 and at a reasonable assurance level beginning in 2030.

(iii) During 2026, the state board shall review and evaluate trends in third-party assurance requirements for scope 3 emissions. On or before January 1, 2027, the state board may establish an assurance requirement for third-party assurance engagements of scope 3 emissions. The assurance engagement for scope 3 emissions shall be performed at a limited assurance level beginning in 2030.

(iv) A third-party assurance provider shall have significant experience in measuring, analyzing, reporting, or attesting to the emission of greenhouse gasses and sufficient competence and capabilities necessary to perform engagements in accordance with

professional standards and applicable legal and regulatory requirements. The assurance provider shall be able to issue reports that are appropriate under the circumstances and independent with respect to the reporting entity, and any of the reporting entity's affiliates for which it is providing the assurance report. During 2029 the state board shall review and, on or before January 1, 2030, shall update as necessary, the qualifications for third-party assurance providers based on an evaluation of trends in education relating to the emission of greenhouse gases and the qualifications of third-party assurance providers.

(v) The state board shall ensure that the assurance process minimizes the need for reporting entities to engage multiple assurance providers and ensures sufficient assurance provider capacity, as well as timely reporting implementation as required under clause (i) of subparagraph (A).

(G)(i) That a reporting entity shall pay an annual fee to the state board for the administration and implementation of this section.

(ii) The state board shall set the fee established pursuant to clause (i) in an amount sufficient to cover the state board's full costs of administrating and implementing this section. The total amount of fees collected shall not exceed the state board's actual and reasonable costs to administer and implement this section.

(iii) The proceeds of the fees imposed pursuant to clause (i) shall be deposited in the Climate Accountability and Emissions Disclosure Fund, which is hereby created in the State Treasury. Notwithstanding Section 13340 of the Government Code, the money in the fund is continuously appropriated to the state board and shall be expended by the state board for the state board's activities pursuant to this section and to reimburse any outstanding loans made from other funds used to finance the initial costs of the state board's activities pursuant to this section. Moneys in the fund shall not be expended for any purpose not enumerated in this section.

(iv) The state board may adjust the fee in any year to reflect changes in the California Consumer Price Index during the prior year.

(3) The state board may contract with an emissions reporting organization to develop a reporting program to receive and make publicly available disclosures required by this section pursuant to paragraph (1).

(4) The state board may adopt or update any other regulations that it deems necessary and appropriate to implement this section.

(5) In developing the regulations required pursuant to this subdivision, the state board shall consult with all of the following:

(A) The Attorney General.

(B) Other government stakeholders, including, but not limited to, experts in climate science and corporate carbon emissions accounting and reporting.

(C) Investors.

(D) Stakeholders representing consumer and environmental justice interests.

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(E) Reporting entities that have demonstrated leadership in full-scope greenhouse gas emissions accounting and public disclosure and greenhouse gas emissions reductions.

(6) This section does not require additional reporting of emissions of greenhouse gases beyond the reporting of scope 1 emissions, scope 2 emissions, and scope 3 emissions required pursuant to the Greenhouse Gas Protocol standards and guidance or an alternative standard, if one is adopted after 2033.

(d)(1) On or before July 1, 2027, the state board shall contract with the University of California, the California State University, a national laboratory, or another equivalent academic institution to prepare a report on the public disclosures made by reporting entities to the emissions reporting organization, if contracted for services, or the state board, pursuant to subdivision (c) and the regulations adopted by the state board pursuant to that subdivision. In preparing the report, consideration shall be given to, at a minimum, greenhouse gas emissions from reporting entities in the context of state greenhouse gas emissions reduction and climate goals. The entity preparing the report shall not require reporting entities to report any information beyond what is required pursuant to subdivision (c) or the regulations adopted by the state board pursuant to that subdivision.

(2) The state board shall ensure the report required by this subdivision is posted publicly by either of the following:

(A) The emissions reporting organization, if contracted for services, to be made publicly available on the digital platform required to be created by the emissions reporting organization pursuant to subdivision (e).

(B) The state board on its public internet website.

(e)(1)(A) The state board, or the emissions reporting organization, if contracted for services, on or before the date determined by the state board pursuant to clause (i) of subparagraph (A) of paragraph (2) of subdivision (c), shall create a digital platform, which shall be accessible to the public, that will feature the emissions data of reporting entities in conformance with the regulations adopted by the state board pursuant to subdivision (c) and the report prepared for the state board pursuant to subdivision (d). The state board, or the emissions reporting organization, if contracted for services, shall make the reporting entities' disclosures and the state board's report available on the digital platform no later than 90 days after receipt.

(B) The digital platform shall be capable of featuring individual reporting entity disclosures, and shall allow consumers, investors, and other stakeholders to view reported data elements aggregated in a variety of ways, including multiyear data, in a manner that is easily understandable and accessible to residents of the state. All data sets and customized views shall be available in electronic format for access and use by the public.

(C) Any contract for services with a reporting organization shall be considered a noninformation technology services contract for procurement purposes.

(2) The emissions reporting organization, if contracted for services, or the state board, shall submit, within 30 days of receipt, the report prepared for the state board pursuant to subdivision (d) to the relevant policy committees of the Legislature.

(f)(1) Section 38580 does not apply to a violation of this section.

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(2)(A) The state board shall adopt regulations that authorize it to seek administrative penalties for nonfiling, late filing, or other failure to meet the requirements of this section. The administrative penalties authorized by this section shall be imposed and recovered by the state board in administrative hearings conducted pursuant to Article 3 (commencing with Section 60065.1) and Article 4 (commencing with Section 60075.1) of Subchapter 1.25 of Chapter 1 of Division 3 of Title 17 of the California Code of Regulations. The administrative penalties imposed on a reporting entity shall not exceed five hundred thousand dollars ($500,000) in a reporting year. In imposing penalties for a violation of this section, the state board shall consider all relevant circumstances, including both of the following:

(i) The violator's past and present compliance with this section.

(ii) Whether the violator took good faith measures to comply with this section and when those measures were taken.

(B) A reporting entity shall not be subject to an administrative penalty under this section for any misstatements with regard to scope 3 emissions disclosures made with a reasonable basis and disclosed in good faith.

(C) Penalties assessed on scope 3 reporting, between 2027 and 2030, shall only occur for nonfiling.

(g) A regulation adopted by the state board pursuant to this section is exempt from the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code).

(h) This section applies to the University of California only to the extent that the Regents of the University of California, by resolution, make any of these provisions applicable to the university.

(i) The provisions of this section are severable. If any provision of this section or its application is held invalid, that invalidity shall not affect other provisions or applications that can be given effect without the invalid provision or application.

Credits
(Added by Stats.2023, c. 382 (S.B.253), § 2, eff. Jan. 1, 2024. Amended by Stats.2024, c. 766 (S.B.219), § 1, eff. Jan. 1, 2025; Stats.2025, c. 609 (A.B.154), § 1, eff. Oct. 11, 2025.)

Notes of Decisions (6)

West's Ann. Cal. Health & Safety Code § 38532, CA HLTH & S § 38532
Current with urgency legislation through Ch. 764 of 2025 Reg.Sess., and Governor's Reorganization Plan No. 1 of 2025. Some statute sections may be more current, see credits for details.

End of Document

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Exhibit 26

Session Law Version of S.B. 261

Declaration of Bradley J. Hamburger In Support Of
Plaintiffs' Motion for Summary Judgment on Claim I
May 24, 2024

Chamber of Commerce of the United States of America, et al. v. Randolph, et al.,
Case No. 2:24-cv-00801-ODW-PVC (C.D. Cal.)

STATE OF CALIFORNIA
LEGISLATIVE COUNSEL BUREAU
AUTHENTICATED
ELECTRONIC LEGAL MATERIAL

Senate Bill No. 261

CHAPTER 383

An act to add Section 38533 to the Health and Safety Code, relating to greenhouse gases, and making an appropriation therefor.

[Approved by Governor October 7, 2023. Filed with Secretary of State October 7, 2023.]

LEGISLATIVE COUNSEL'S DIGEST

SB 261, Stern. Greenhouse gases: climate-related financial risk.

The California Global Warming Solutions Act of 2006 requires the State Air Resources Board to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with the act. The act requires the state board to make available, and update at least annually, on its internet website the emissions of greenhouse gases, criteria pollutants, and toxic air contaminants for each facility that reports to the state board, as provided.

This bill would require, on or before January 1, 2026, and biennially thereafter, a covered entity, as defined, to prepare a climate-related financial risk report disclosing the entity's climate-related financial risk and measures adopted to reduce and adapt to climate-related financial risk. The bill would require the covered entity to make a copy of the report available to the public on its own internet website.

The bill would require the state board to contract with a climate reporting organization, as defined, to biennially prepare a public report that contains specified information, including a review of the disclosure of climate-related financial risk contained in a subset of publicly available climate-related financial risk reports and an analysis of the systemic and sectorwide climate-related financial risks facing the state. The bill would require the state board to adopt regulations that authorize it to seek administrative penalties from covered entities for failing to make the report publicly available on its internet website or publishing an inadequate or insufficient report, as specified.

The bill would require covered entities to pay an annual fee for the state board's actual and reasonable costs to administer and implement the bill. The bill would create the Climate-Related Financial Risk Disclosure Fund, require the proceeds of the fees to be deposited in the fund, and continuously appropriate the moneys in the fund to the state board for purposes of the bill. By creating a continuously appropriated fund, the bill would make an appropriation.

Appropriation: yes.

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds and declares all of the following:

(a) Climate change is affecting California's communities and economy with impacts including wildfires, sea level rise, extreme weather events, extreme droughts, and associated impacts to the global economy.

(b) Global economic and climate policy leaders have conclusively established that the long-term strength of global and local economies will depend on their ability to withstand climate-related risks, including physical impacts, economic transitions, and policy and legal responses.

(c) Failure of economic actors to adequately plan for and adapt to climate-related risks to their businesses and to the economy will result in significant harm to California, residents, and investors, in particular to financially vulnerable Californians who are employed by, live in communities reliant on, or have invested in or obtained financing from these institutions.

(d) California is a global leader in addressing climate risk through state policy, as demonstrated by the requirement for state public pension funds to analyze and report material climate-related financial risks, as required by Section 7510.5 of the Government Code, and the state climate investment framework directed by, and Climate-Related Risk Disclosure Advisory Group established in accordance with, Executive Order No. N-19-19.

(e) Leading voluntary initiatives have begun to develop frameworks for disclosure of climate change- and sustainability-related information. Thousands of companies already disclose their climate-related financial risks.

(f) Other jurisdictions have begun to require certain entities to develop and disclose sustainability policies, including public entities, as required by the State of Illinois' Sustainable Investing Act (PA 101-473), and both public and private entities, as required by France's Energy Transition Law, as set forth in Article 173-VI for institutional investors and Article 173-IV for companies.

(g) On May 20, 2021, President Joseph Biden signed Executive Order 14030, Climate-Related Financial Risk, which directs federal agencies to develop a comprehensive, governmentwide strategy regarding the measurement, assessment, mitigation, and disclosure of climate-related financial risk to federal government programs, assets, and liabilities in order to increase the long-term stability of federal operations.

(h) On March 21, 2022, the United States Securities and Exchange Commission (SEC) proposed a rule that would require publicly traded United States companies to include climate-related disclosures in their registration statements and periodic reports, including information about climate-related risks that are reasonably likely to have a material impact on their business, results of operations, or financial condition, and certain climate-related financial statement metrics in a note to their audited financial statements. The required information about climate-related risks also would include

disclosure of a registrant's greenhouse gas emissions, which have become a commonly used metric to assess a registrant's exposure to those risks.

(i) On April 8, 2022, the National Association of Insurance Commissioners, which includes California's Insurance Commissioner, adopted a new standard for insurance companies to report their climate-related risks, in alignment with the internationally recognized Task Force on Climate-Related Financial Disclosures (TCFD). The TCFD standard is the international benchmark for climate risk disclosure and will help insurance regulators and the public better understand the climate-related risks to the United States insurance market, which is the largest in the world.

(j) Though a precedent has been set to address climate risk to businesses, corporations, and financial institutions nationwide, current disclosure standards are voluntary, and thus inadequate, for meeting rapidly accelerating climate risks. In order to begin to address the climate crisis, consistent, higher level, and mandatory disclosures are needed from all major economic actors, and California has an opportunity to set mandatory and comprehensive risk disclosure requirements for public and private entities to ensure a sustainable, resilient, and prosperous future for our state.

SEC. 2. Section 38533 is added to the Health and Safety Code, to read:

38533. (a) For purposes of this section, the following definitions apply:

(1) "Climate reporting organization" means a nonprofit climate reporting organization contracted by the state board pursuant to paragraph (2) of subdivision (b) that both:

(A) Currently operates a climate reporting organization for organizations operating in the United States.

(B) Has experience with climate-related financial risk disclosure by entities operating in California.

(2) "Climate-related financial risk" means material risk of harm to immediate and long-term financial outcomes due to physical and transition risks, including, but not limited to, risks to corporate operations, provision of goods and services, supply chains, employee health and safety, capital and financial investments, institutional investments, financial standing of loan recipients and borrowers, shareholder value, consumer demand, and financial markets and economic health.

(3) "Climate-related financial risk report" means a report required by subdivision (b).

(4) "Covered entity" means a corporation, partnership, limited liability company, or other business entity formed under the laws of the state, the laws of any other state of the United States or the District of Columbia, or under an act of the Congress of the United States with total annual revenues in excess of five hundred million United States dollars ($500,000,000) and that does business in California. Applicability shall be determined based on the business entity's revenue for the prior fiscal year. "Covered entity" does not include a business entity that is subject to regulation by the Department of Insurance in this state, or that is in the business of insurance in any other state.

(b) (1) (A) On or before January 1, 2026, and biennially thereafter, a covered entity shall prepare a climate-related financial risk report disclosing both of the following:

(i) Its climate-related financial risk, in accordance with the recommended framework and disclosures contained in the Final Report of Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017) published by the Task Force on Climate-related Financial Disclosures, or any successor thereto, or pursuant to an equivalent reporting requirement as described in paragraph (4).

(ii) Its measures adopted to reduce and adapt to climate-related financial risk disclosed pursuant to clause (i).

(B) If a covered entity does not complete a report consistent with all required disclosures pursuant to clause (i) of subparagraph (A), the covered entity shall provide the recommended disclosures to the best of its ability, provide a detailed explanation for any reporting gaps, and describe steps the covered entity will take to prepare complete disclosures.

(2) Climate-related financial risk reports may be consolidated at the parent company level. If a subsidiary of a parent company qualifies as a covered entity pursuant to paragraph (4) of subdivision (a), the subsidiary is not required to prepare a separate climate-related financial risk report.

(3) The state board shall contract with a climate reporting organization to prepare a biennial public report on the climate-related financial risk disclosures required by this section.

(4) Notwithstanding paragraph (1), a covered entity satisfies the requirements of paragraph (1) if it prepares a publicly accessible biennial report that includes climate-related financial risk disclosure information by any of the following methods:

(A) Pursuant to a law, regulation, or listing requirement issued by any regulated exchange, national government, or other governmental entity, including a law or regulation issued by the United States government, incorporating disclosure requirements consistent with clause (i) of subparagraph (A) of paragraph (1), including the International Financial Reporting Standards Sustainability Disclosure Standards, as issued by the International Sustainability Standards Board.

(B) Voluntarily using a framework that meets the requirements of clause (i) of subparagraph (A) of paragraph (1) or the International Financial Reporting Standards Sustainability Disclosure Standards, as issued by the International Sustainability Standards Board.

(5) To the extent a climate-related financial risk report contains a description of a covered entity's greenhouse gases or voluntary mitigation of greenhouse gases, the state board may consider covered entity's claims if those claims are verified by a third-party independent verifier.

(c) (1) On or before January 1, 2026, and biennially thereafter, a covered entity shall make available to the public, on its own internet website, a copy of the report required by this section.

(2) (A) On or before January 1, 2026, and annually thereafter, a covered entity shall pay a fee, upon filing its disclosure, to the state board for the administration and implementation of this section.

(B) (i) The state board shall set the fee described in subparagraph (A) at an amount adequate to cover the state board's full costs of administrating and implementing this section. The total amount of fees collected shall not exceed the state board's actual and reasonable costs to administer and implement this section.

(ii) The state board may adjust the fee in any year to reflect changes in the California Consumer Price Index during the prior year.

(C) The proceeds of the fees imposed pursuant to this paragraph shall be deposited in the Climate-Related Financial Risk Disclosure Fund, which is hereby created in the State Treasury. Notwithstanding Section 13340 of the Government Code, the money in the fund is continuously appropriated to the state board and shall be expended by the state board for the state board's activities pursuant to this section and to reimburse any outstanding loans made from other funds used to finance the initial costs of the state board's activities pursuant to this section. Money in the fund shall not be expended for any other purpose not described in this subparagraph.

(d) The climate reporting organization shall be contracted to do all of the following:

(1) Biennially prepare a public report that contains all of the following elements:

(A) A review of the disclosure of climate-related financial risk contained in a subset of publicly available climate-related financial risk reports by industry.

(B) Analysis of the systemic and sectorwide climate-related financial risks facing the state based on the contents of climate-related financial risk reports, including, but not limited to, potential impacts on economically vulnerable communities.

(C) Identification of inadequate or insufficient reports.

(2) Regularly convene representatives of sectors responsible for reporting climate-related financial risks, state agencies responsible for oversight of reporting sectors, investment managers, academic experts, standard-setting organizations, climate and corporate sustainability organizations, labor union representatives whose members work in impacted sectors, and other stakeholders to offer input on current best practices regarding the disclosure of financial risks resulting from climate change, including, but not limited to, proposals to update the definition of "climate-related financial risk," and the framework or disclosure standard of "climate-related financial risk reports" that meets the requirements of clause (i) of subparagraph (A) of paragraph (1) of subdivision (b).

(3) Monitor federal regulatory actions among agency members of the federal Financial Stability Oversight Council, as well as nonindependent regulators overseen by the White House.

(e) (1) Section 38580 does not apply to a violation of this section.

(2) The state board shall adopt regulations that authorize it to seek administrative penalties from a covered entity that fails to make the report required by this section publicly available on its internet website or publishes an inadequate or insufficient report. The administrative penalties authorized by this section shall be imposed and recovered by the state board in administrative hearings conducted pursuant to Article 3 (commencing with Section 60065.1) and Article 4 (commencing with Section 60075.1) of Subchapter 1.25 of Chapter 1 of Division 3 of Title 17 of the California Code of Regulations. The administrative penalties imposed on a reporting entity shall not exceed fifty thousand dollars ($50,000) in a reporting year. In imposing penalties for a violation of this section, the state board shall consider all relevant circumstances, including both of the following:

(A) The violator's past and present compliance with this section.

(B) Whether the violator took good faith measures to comply with this section and when those measures were taken.

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Proposed Legislation

West's Annotated California Codes
Health and Safety Code (Refs & Annos)
Division 25.5. California Global Warming Solutions Act of 2006 (Refs & Annos)
Part 2. Mandatory Greenhouse Gas Emissions Reporting (Refs & Annos)

West's Ann.Cal.Health & Safety Code § 38533

§ 38533. Climate-related financial risk report; contents; publication; filing fees; violations and penalties

Currentness

(a) For purposes of this section, the following definitions apply:

(1) “Climate reporting organization” means a nonprofit climate reporting organization contracted by the state board pursuant to subdivision (d) that both:

(A) Currently operates a climate reporting organization for organizations operating in the United States.

(B) Has experience with climate-related financial risk disclosure by entities operating in California.

(2) “Climate-related financial risk” means material risk of harm to immediate and long-term financial outcomes due to physical and transition risks, including, but not limited to, risks to corporate operations, provision of goods and services, supply chains, employee health and safety, capital and financial investments, institutional investments, financial standing of loan recipients and borrowers, shareholder value, consumer demand, and financial markets and economic health.

(3) “Climate-related financial risk report” means a report required by subdivision (b).

(4) “Covered entity” means a corporation, partnership, limited liability company, or other business entity formed under the laws of the state, the laws of any other state of the United States or the District of Columbia, or under an act of the Congress of the United States with total annual revenues in excess of five hundred million United States dollars ($500,000,000) and that does business in California. Applicability shall be determined based on the business entity's revenue for the prior fiscal year. “Covered entity” does not include a business entity that is subject to regulation by the Department of Insurance in this state, or that is in the business of insurance in any other state.

(b)(1)(A) On or before January 1, 2026, and biennially thereafter, a covered entity shall prepare a climate-related financial risk report disclosing both of the following:

(i) Its climate-related financial risk, in accordance with the recommended framework and disclosures contained in the Final Report of Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017) published by the Task Force on Climate-related Financial Disclosures, or any successor thereto, or pursuant to an equivalent reporting requirement as described in paragraph (3).

(ii) Its measures adopted to reduce and adapt to climate-related financial risk disclosed pursuant to clause (i).

(B) If a covered entity does not complete a report consistent with all required disclosures pursuant to clause (i) of subparagraph (A), the covered entity shall provide the recommended disclosures to the best of its ability, provide a detailed explanation for any reporting gaps, and describe steps the covered entity will take to prepare complete disclosures.

(2) Climate-related financial risk reports may be consolidated at the parent company level. If a subsidiary of a parent company qualifies as a covered entity pursuant to paragraph (4) of subdivision (a), the subsidiary is not required to prepare a separate climate-related financial risk report.

(3) Notwithstanding paragraph (1), a covered entity satisfies the requirements of paragraph (1) if it prepares a publicly accessible biennial report that includes climate-related financial risk disclosure information by any of the following methods:

(A) Pursuant to a law, regulation, or listing requirement issued by any regulated exchange, national government, or other governmental entity, including a law or regulation issued by the United States government, incorporating disclosure requirements consistent with clause (i) of subparagraph (A) of paragraph (1), including the International Financial Reporting Standards Sustainability Disclosure Standards, as issued by the International Sustainability Standards Board.

(B) Voluntarily using a framework that meets the requirements of clause (i) of subparagraph (A) of paragraph (1) or the International Financial Reporting Standards Sustainability Disclosure Standards, as issued by the International Sustainability Standards Board.

(4) To the extent a climate-related financial risk report contains a description of a covered entity's greenhouse gas emissions or voluntary mitigation of greenhouse gas emissions, the state board may consider the covered entity's claims if those claims are verified by a third-party independent verifier.

(c)(1) On or before January 1, 2026, and biennially thereafter, a covered entity shall make available to the public, on its own internet website, a copy of the report required by this section.

(2)(A) On or before January 1, 2026, and annually thereafter, a covered entity shall pay a fee to the state board for the administration and implementation of this section.

(B)(i) The state board shall set the fee described in subparagraph (A) at an amount adequate to cover the state board's full costs of administrating and implementing this section. The total amount of fees collected shall not exceed the state board's actual and reasonable costs to administer and implement this section.

(ii) The state board may adjust the fee in any year to reflect changes in the California Consumer Price Index during the prior year.

(C) The proceeds of the fees imposed pursuant to this paragraph shall be deposited in the Climate-Related Financial Risk Disclosure Fund, which is hereby created in the State Treasury. Notwithstanding Section 13340 of the Government Code, the money in the fund is continuously appropriated to the state board and shall be expended by the state board for the state board's activities pursuant to this section and to reimburse any outstanding loans made from other funds used to finance the initial costs of the state board's activities pursuant to this section. Money in the fund shall not be expended for any other purpose not described in this subparagraph.

(d) The state board may contract with a climate reporting organization to do any of the following it deems appropriate:

(1) Biennially prepare a public report that contains all of the following elements:

(A) A review of the disclosure of climate-related financial risk contained in a subset of publicly available climate-related financial risk reports by industry.

(B) Analysis of the systemic and sectorwide climate-related financial risks facing the state based on the contents of climate-related financial risk reports, including, but not limited to, potential impacts on economically vulnerable communities.

(C) Identification of inadequate or insufficient reports.

(2) Regularly convene representatives of sectors responsible for reporting climate-related financial risks, state agencies responsible for oversight of reporting sectors, investment managers, academic experts, standard-setting organizations, climate and corporate sustainability organizations, labor union representatives whose members work in impacted sectors, and other stakeholders to offer input on current best practices regarding the disclosure of financial risks resulting from climate change, including, but not limited to, proposals to update the definition of “climate-related financial risk,” and the framework or disclosure standard of “climate-related financial risk reports” that meets the requirements of clause (i) of subparagraph (A) of paragraph (1) of subdivision (b).

(3) Monitor federal regulatory actions among agency members of the federal Financial Stability Oversight Council, as well as nonindependent regulators overseen by the White House.

(e) Any contract for services with a reporting organization shall be considered a noninformation technology services contract for procurement purposes.

(f)(1) Section 38580 does not apply to a violation of this section.

(2) The state board shall adopt regulations that authorize it to seek administrative penalties from a covered entity that fails to make the report required by this section publicly available on its internet website or publishes an inadequate or insufficient report. The administrative penalties authorized by this section shall be imposed and recovered by the state board in administrative hearings conducted pursuant to Article 3 (commencing with Section 60065.1) and Article 4 (commencing with Section 60075.1)

of Subchapter 1.25 of Chapter 1 of Division 3 of Title 17 of the California Code of Regulations. The administrative penalties imposed on a reporting entity shall not exceed fifty thousand dollars ($50,000) in a reporting year. In imposing penalties for a violation of this section, the state board shall consider all relevant circumstances, including both of the following:

(A) The violator's past and present compliance with this section.

(B) Whether the violator took good faith measures to comply with this section and when those measures were taken.

(g) A regulation adopted by the state board pursuant to this section is exempt from the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code).

Credits

(Added by Stats.2023, c. 383 (S.B.261), § 2, eff. Jan. 1, 2024. Amended by Stats.2024, c. 80 (S.B.1525), § 91, eff. Jan. 1, 2025; Stats.2024, c. 766 (S.B.219), § 2, eff. Jan. 1, 2025; Stats.2025, c. 609 (A.B.154), § 2, eff. Oct. 11, 2025.)

Notes of Decisions (12)

West's Ann. Cal. Health & Safety Code § 38533, CA HLTH & S § 38533
Current with urgency legislation through Ch. 764 of 2025 Reg.Sess., and Governor's Reorganization Plan No. 1 of 2025. Some statute sections may be more current, see credits for details.

End of Document

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