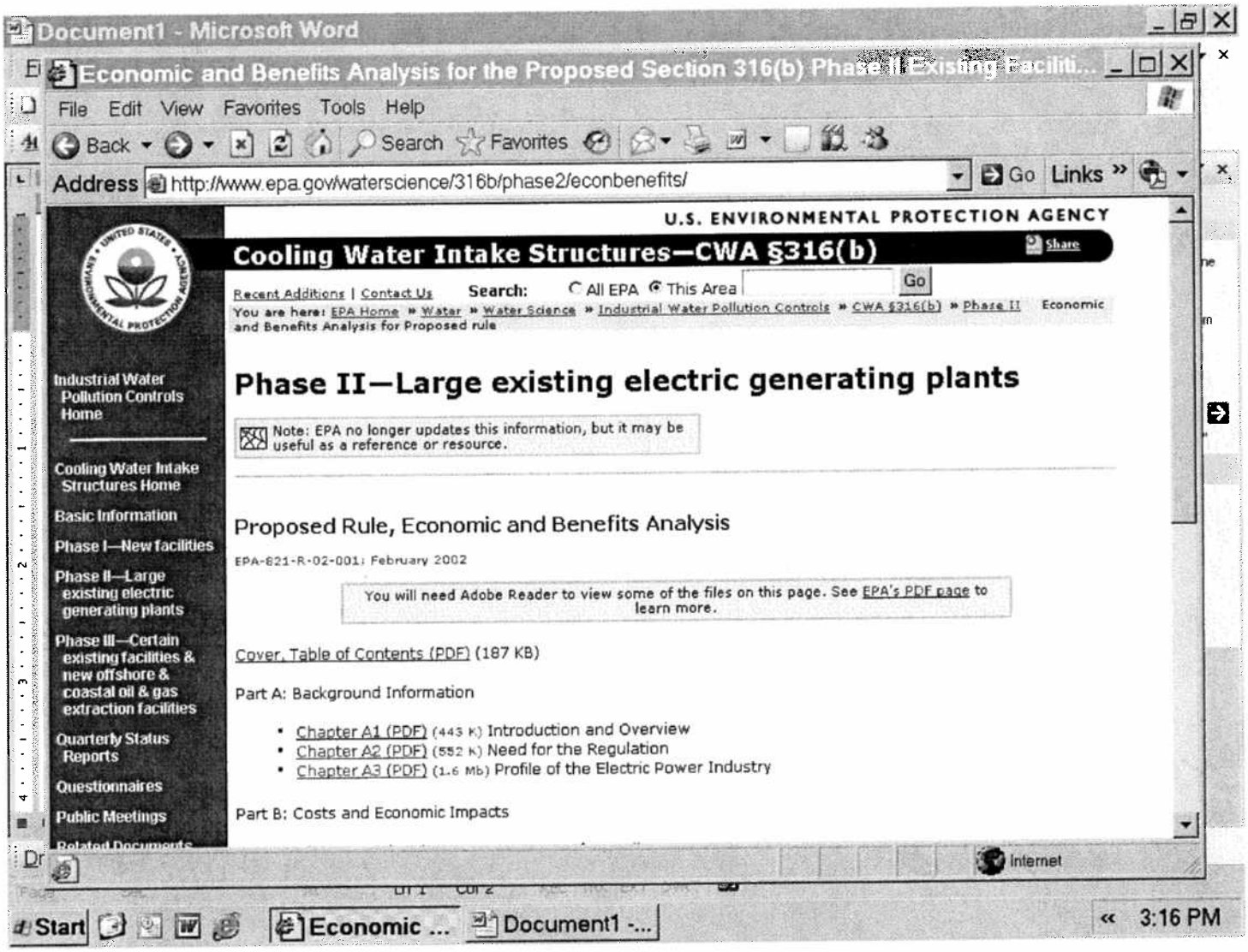
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Economic and Benefits Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule

Economic and Benefits Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule

U.S. Environmental Protection Agency
Office of Science and Technology
Engineering and Analysis Division

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Chapter D1: Comparison of National Costs and Benefits

INTRODUCTION

This chapter summarizes total private costs, develops social costs, and compares total social costs to total benefits at the national level for the proposed rule and five alternative regulatory options.

CHAPTER CONTENTS

Table D1-1 shows compliance response assumptions for the proposed rule and five alternative regulatory options based on each facility's current technologies installed, capacity utilization, waterbody type, annual intake flow, and design intake flow as a percent of source waterbody mean annual flow. *Chapter A1: Introduction and Overview* includes a more detailed discussion of compliance responses under the proposed rule and alternative regulatory options.

Table D1-1: Number of Facilities by Compliance Assumption and Regulatory Option (based on 539 sample facilities)

Facility Compliance Assumption	Waterbody/Capacity-Based Option (Allows two tracks)		Proposed Rule[a] (Option 3)	Impingement Mortality and Entrainment Controls Everywhere Option (Option 3a)	All Cooling Towers Option (Option 4)	Dry Cooling Option (Option 5)	Waterbody-Based Option (Option 6)
	Option 1	Option 2					
Cooling tower in baseline (no action)	69	69	69	69	69	69	69
Impingement Controls Only	241	241	241	53	53	241	241
Impingement and Entrainment Controls	178	198	229	417	0	178	120
Flow Reduction Technology	51	31	0	0	417	51	109

[a] Alternative less stringent requirements based on both costs and benefits are allowed. There is some uncertainty in predicting compliance responses because the number of facilities requesting alternative less stringent requirements based on costs and benefits is unknown.

Source: U.S. EPA analysis, 2002.

D1-1 Social Costs

This section develops EPA's estimates of the costs to society associated with the proposed rule. The ***social costs*** of regulatory actions are the ***opportunity costs*** to society of employing scarce resources in pollution prevention and pollution control activities. The compliance costs used to estimate total social costs differ in their consideration of taxes from those in *Part B: Costs and Economic Impacts*, which were calculated for the purpose of estimating the private costs and impacts of the rule. For the impact analyses, compliance costs are measured as they affect the financial performance of the regulated facilities and firms. The analyses therefore explicitly consider the tax deductibility of compliance expenditures.[1] In the analysis of costs to society, however, these compliance costs are considered on a pre-tax basis. The costs to society are the full value of the resources used, whether they are paid for by the regulated facilities or by all taxpayers in the form of lost tax revenues.

To assess the economic costs to society of the proposed regulation, EPA relied first on the estimated costs to facilities for the labor, equipment, material, and other economic resources needed to comply with the proposed rule. In this analysis, EPA assumes that the market prices for labor, equipment, material, and other compliance resources represent the opportunity costs to society for use of those resources in regulatory compliance. EPA also assumes that the lost revenue from energy penalties and construction outage – which is recognized as a compliance cost – approximates the cost of the replacement energy that would be provided by other generating units. Implicit in this assumption is that the variable production cost of the replacement energy sources is essentially the same as the energy price received, on the margin, for production of the replacement energy. This assumption is consistent with the market equilibrium concept that the variable production cost of the last generating unit to be dispatched will be approximately the same as the price received for the last unit of production. Finally, EPA assumes in its social cost analysis that the regulation does not affect the aggregate quantity of electricity that would be sold to consumers and, thus, that the regulation's social cost will include no loss in consumer and producer surplus from lost electricity sales *by the electricity industry in aggregate*. Given the very small impact of the regulation on electricity production cost for the total industry, EPA believes this assumption is reasonable the social cost analysis.

Other components of social costs include costs to federal and state governments of administering the permitting and compliance monitoring activities under the proposed regulation.[2] *Chapter B5: UMRA Analysis* presents more information on state and federal implementation costs.

EPA's estimate of social costs includes three components:

- (1) direct costs of compliance incurred by in-scope facilities,
- (2) administrative costs incurred by state governments, and
- (3) administrative costs incurred by the federal government.

The estimated after-tax annualized compliance costs incurred by facilities under the proposed Phase II rule are $182 million (see *Chapter B1: Summary of Compliance Costs*, Table B1-6). The estimated social value of these compliance costs, calculated on a pre-tax basis is $279 million. EPA estimates that state implementation costs for the proposed rule are $3.6 million annually and that federal implementation costs are approximately $62,000. The estimated total social costs of the Proposed Phase II Existing Facilities Rule are therefore $283 million.

Total social costs for the four alternative regulatory options range from $300 million for the impingement mortality and entrainment controls everywhere option (Option 3a) to $3,507 million for the all cooling towers option (Option 4).[3]

[1] Costs incurred by government facilities and cooperatives are not adjusted for taxes, since these facilities are not subject to income taxes.

[2] State and federal implementation costs were developed for the proposed rule and Options 1 and 2 only. EPA assumed that the costs for Option 3a would be similar to the proposed rule and that the costs for Options 4 and 5 would be similar to Option 1.

[3] Note that EPA did not develop costs for Option 6.

Table D1-2 summarizes the total private and social costs of the proposed rule and five alternative regulatory options.

Table D1-2: Total Private and Social Costs of Compliance by Option ($2001; million)

Option		Total Private Compliance Costs to Facilities (Post-tax)	Social Costs			
			Pre-Tax Compliance Costs to Facilities	State Implementation Costs	Federal Implementation Costs	Total Social Costs
Waterbody/ Capacity-Based Option (Allows two tracks)	All Track I (Option 1)	$595	$968	$1.4	$0.04	$969
	Track I and II (Option 2)	$379	$609	$1.4	$0.04	$610
Proposed Rule (Option 3) **Alternative less stringent requirements based on both costs and benefits are allowed.**		**$182**	**$279**	**$3.6**	**$0.1**	**$283**
Impingement Mortality and Entrainment Controls Everywhere Option (Option 3a)		$195	$296	$3.6	$0.1	$300
All Cooling Towers Option (Option 4)		$2,316	$3,506	$1.4	$0.04	$3,507
Dry Cooling Option (Option 5)		$1,252	$2,052	$1.4	$0.04	$2,054
Waterbody-Based Option (Option 6)		Not costed. Costs expected to be greater than Option 1 (51 have flow reduction), but significantly less than Option 5 (417 have flow reduction).				

Source: U.S. EPA analysis, 2002.

D1-2 Summary of National Benefits and Social Costs

The summary of national benefit estimates for the proposed option and five regulatory options is reported in *Chapter C4: Benefits*. Table D1-3 presents EPA's national social cost and benefit estimates for the proposed Phase II rule and five alternative regulatory options. The table shows that the proposed rule, the impingement mortality and entrainment controls everywhere option, and the waterbody/capacity-based option all have estimated benefits that exceed social costs. The all cooling towers option and dry cooling option have negative net benefits (i.e., social costs exceed benefits). The Agency's proposed rule has the largest estimated net benefits, $452 million, of the five regulatory options analyzed.

Table D1-3: Total National Social Costs, Benefits, and Net Benefits by Option ($2001; million)

Option		Total Benefits	Total Social Costs	Net Benefits (Benefits minus Costs)
Waterbody/ Capacity-Based Option (Allows two tracks)	All Track I (Option 1)	$1,034	$969	$65
	Track I and II (Option 2)	$890	$610	$280
Proposed Rule (Option 3) **Alternative less stringent requirements based on both costs and benefits are allowed.**		**$735**	**$283**	**$452**
Impingement Mortality and Entrainment Controls Everywhere Option (Option 3a)		$749	$300	$449
All Cooling Towers Option (Option 4)		$1,223	$3,507	($2,284)
Dry Cooling Option (Option 5)		$1,536	$2,054	($518)
Waterbody-Based Option (Option 6)		$1,159	Not costed: greater than Option 1, significantly less than Option 5.	N/A

Source: U.S. EPA analysis, 2002.

GLOSSARY

opportunity cost: The lost value of alternative uses of resources (capital, labor, and raw materials) used in pollution control activities.

social costs: The costs incurred by society as a whole as a result of the proposed rule. Social costs do not include costs that are transfers among parties but that do not represent a net cost overall.

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