Enhanced Opportunities for Conservation and Renewable Energy Activities Through Establishment of Emissions Trading Programs

Joseph D. Bourg, Karen M. Poff and Stuart B. Schare, NEOS Corporation
Guy Nelson, Western Area Power Administration

The proposed federal Clean Air Act Amendments of 1990 (the Act) will do much more than limit emissions of sulfur dioxide (SO_2). The Act provide a means by which utilities may be able to enhance the cost-effectiveness of conservation and renewable energy (C&RE) options. In addition to requiring utilities to possess enough SO_2 "allowances" to cover annual emissions and establishing an SO_2 trading system, the Act will establish a 300,000 Bonus Allowance Reserve (Reserve) for entities which invest early in C&RE resources. The Reserve encourages utilities to invest in C&RE options and earn surplus allowances to cover compliance costs or to be sold for a profit. When the costs and revenues from buying and selling allowances are considered, the value of avoided emissions increases and C&RE options become more cost effective.

This paper focuses on how Phase II utilities, and utilities which have a minority or indirect stake in a coal- or oil-fired generating unit, can benefit from emission reductions by implementing C&RE options. The paper describes how a Phase II utility can reduce emissions through C&RE programs and earn allowances to reduce the impact of a new unit's compliance costs. In addition, the paper describes how a utility with a minority or indirect stake in a coal- or oil-fired unit can use the Reserve program to earn allowances which may be sold for a profit. Finally, the paper shows how the application of bonus allowances reduces the cost advantage of coal-fired generation over renewable energy sources and increases the cost effectiveness of conservation programs.

Introduction

With the passing of the proposed Clean Air Act Amendments of 1990 (the Act), the Environmental Protection Agency (EPA) is authorized to establish a market-based system of sulfur dioxide emissions trading. Under the system, electric utilities will be granted annual "allowances," each permitting a generating unit to emit one ton of sulfur dioxide (SO_2) in a given year. Through its two-phased approach,[1] the Act limits total sulfur-dioxide emissions by all utilities to 8.9 million tons per year, which is 10 million tons less than 1985. Utilities which do not possess a sufficient number of allowances must purchase allowances from other utilities or entities which have allowances for sale. Any utility which does not possess enough allowances to cover their emissions will be severely penalized and fined $2000 per ton of excessive SO_2. Additionally, the utility must offset their excess emissions during the following year.

In order to comply with the Act, and avoid penalization, utilities must ensure they have enough allowances to cover their emissions or take steps to reduce their SO_2 emissions. Compliance options include:

- purchasing additional allowances from utilities or entities which have allowances for sale;
- scaling down plants with high SO_2 emissions rates;
- installing or upgrading scrubbers; and
- switching to low-sulfur coal.

A final option for obtaining additional allowances and reducing SO_2 emissions is to utilize conservation and renewable energy resources. By implementing C&RE options, utilities reduce their SO_2 emissions and qualify for allowances from the Act's 300,000 Bonus Reserve. Because Reserve allowances are issued on a very low assumed SO_2 emissions rate (0.004 pounds per kWh), it is unlikely that a utility would be able to cover all of its excess emissions with allowances earned from the Reserve. However, the acquisition of Reserve allowances and corresponding reduction in SO_2 emissions, through the displacement of fossil fuel generation and reduction of load growth, suggests that C&RE options can significantly contribute to reducing utility compliance costs.

Additionally, bonus allowances can be utilized for more than just complying with the Act's emission requirements. Many utilities which do not directly operate units that are subject to the SO_2 limitations, or which are already in compliance with the regulations, are eligible to apply for bonus allowances. These utilities can use allowances from the Reserve as a means of increasing the cost-effectiveness of prospective C&RE resources. By selling surplus allowances earned through conservation or renewable generation to parties in need of additional allowances, utilities can recover some of the costs of their C&RE activities. Furthermore, with the allowance system in place, the cost of new fossil fuel resources will increase as utilities incur the cost of obtaining additional allowances to cover expected emissions. Thus when the financial implications of buying and selling allowances are considered, C&RE options effectively become more competitive with other resources.

Earning Bonus Allowances for Conservation and Renewable Energy Activities

Although the Reserve provides an excellent opportunity for allowance short utilities to secure needed allowances, other eligible utilities may also wish to purchase these bonus allowances. According to the Act, a utility may apply for allowances from the Reserve provided that the utility "owns or operates at least one affected unit".[2] In EPA's interpretation, however, ownership applies to many utilities which have only a minority or indirect stake in an affected unit. According to EPA's proposed rules (56 *Federal Register*. December 3, 1991), utilities with only partial ownership or cooperative operation agreements (pursuant to the guidelines set forth in Section 402(27) of the Act) can meet the eligibility requirements.

This qualification encompasses many utilities which have a long term contract (for at least 30 years or the life of the unit) to receive and pay for a specified amount of energy generated by an affected unit. Under these guidelines, individual members of an electric cooperative, joint action agency, or other similar organization which own an affected unit would be eligible to apply for allowances from the Reserve. Also, a utility which owns or operates a "new unit" (one commencing operation after November 15, 1990) will become eligible for bonus allowances at the time the new unit becomes operational.

In addition to the ownership requirements, there are several other criteria which must be satisfied before a utility is eligible to apply for bonus allowances: [3]

- The utility must be implementing a least cost resource plan which contains an evaluation of a full range of supply- and demand-side resources. The plan must be subject to public review and either regulatory oversight or EPA approval.

- Any conservation measure or renewable resource which is used to earn bonus allowances must be consistent with the least cost plan and must be paid for, at least in part, by the utility.

- Utilities applying for bonus allowances must have a rate structure that guarantees net income neutrality (in other words, the utility must have a rate structure which ensures that its net income after the implementation of energy conservation measures is as at least as high as its net income would have been if the energy conservation measures had not been implemented).

Eligible utilities may apply for bonus allowances based on qualified conservation programs and renewable energy projects which were initiated before their units became affected by the Act. Utilities owning Phase I units may apply for Reserve allowances only for C&RE activities initiated prior to 1995. For Phase II units, utilities may receive Reserve allowances for C&RE activities initiated before January 1, 2000.

Qualified conservation measures include those specified by EPA in its Sulfur Dioxide Allowance System rules.[4] These measures include several hundred end-use efficiency measures which have been implemented at utilities throughout the nation. Innovative conservation measures which do not appear on EPA's list are eligible for the Reserve provided that they meet the criteria for qualified measures and receive approval by the State authority that regulates the rates of the applicant. However conservation measures that are exclusively informational or educational in nature, and supply-side efficiency improvements, are specifically excluded from EPA's list and are not qualified for allowances from the Reserve.

Renewable energy generation qualifying for bonus allowances includes energy derived from biomass, solar, geothermal, and wind resources. In the context of the Act, hydroelectric power is not considered a qualified renewable energy resource. As with conservation measures, renewable resources not specified by EPA may qualify for the Reserve with the approval of the State regulatory authority.

The EPA is proposing to award bonus allowances annually based on qualified conservation or renewable generation that occurred during the previous calendar year.[5] EPA will begin accepting applications for allowances on January 1, 1993. Because many utilities seeking allowances from the Reserve may be only part-owners of an affected unit, these utilities may not have their own accounts in EPA's allowance tracking system. In such cases, the utilities must file for a new account in which the bonus allowances may be placed.

Before pursuing bonus allowances, however, there are two important factors for utilities to consider. First, bonus allowances may not be available for the entire duration of some conservation measures or renewable energy generation. Although the Reserve is scheduled to operate until 2010, all 300,000 bonus allowances may be issued before this date. Once the Reserve is exhausted, utilities may no longer earn allowances for their C&RE activities. Consequently, if the lifetime of a conservation measure or renewable energy resource extends beyond the closure of the Reserve, then a utility would not receive allowances for all the energy conserved or generated. It is important to note that although the Reserve is open until 2010, a utility may only apply for allowances for energy savings that occurred before 2000. For example, a utility could not apply in 2002 for savings achieved in 2001, but could apply for savings achieved in 1999.

Another important issue for utilities to consider is costs associated with the application process. In applying for bonus allowances from the Reserve, the utility will have to incur administrative costs associated with applying to the Reserve and possibly costs associated with the verification of energy savings. If the utility has not already implemented a system for measuring energy savings, costs associated with accurately measuring the savings must be considered. Verification costs may include labor and material costs associated with monitoring yearly energy savings and performing energy savings calculations, and costs associated with obtaining a method of measuring the decrease in SO_2 emissions. Because each utility has a different potential for conservation or renewable generation, the value of pursuing bonus allowances will vary. Based on the number of allowances which can be earned each year, the efficiency with which the application can be processed, and the cost of verifying the energy savings, individual utilities must determine whether or not it would be prudent to seek allowances from the Reserve.

How the SO_2 Allowance System Improves C&RE Resource Economics

The SO_2 allowance system provides utilities with an additional factor to consider in evaluating the cost-effectiveness of various resources. In determining the cost of a coal plant, for example, a utility will now have to factor in the cost of obtaining sufficient allowances to cover emissions from the unit. Conversely, in evaluating the cost of a conservation program or renewable energy resource, the utility may consider the value of bonus allowances which can be earned.

The market price of allowances will depend on several factors, including the marginal cost of pollution abatement and the degree to which units are retrofitted with pollution control equipment. In independent articles published in 1991, three well-known journals in the energy industry (*Public Utilities Fortnightly* 1991; *EPRI Journal* 1991; *Public Power* 1991) have presented price estimates with lower ranges between \$300 and \$750, and upper ranges of \$1000, \$1200, and \$1500 respectively EPRI states that most experts agree that allowances will be worth significantly more in Phase II than in Phase I.[6]

In order to demonstrate how allowances may be quantitatively incorporated into resource planning, consider a utility which is in compliance with SO_2 emission regulations and which is evaluating a variety of new supply- and demand-side resources to meet its future system requirements. For a new 300 MW conventional pulverized coal-fired plant that emits SO_2 at a rate of 0.00465 pounds per kWh, [7] one ton of SO_2 would be emitted for every 430,108 kWh of energy produced. Thus, in order to cover these emissions, a utility would have to secure one additional allowance for every 430 MWh produced by the plant. Assuming that allowances will sell for between \$500 and \$1500 on the market, purchasing the necessary allowances would effectively raise the cost of the resource by \$500 to \$1500 for every 430 MW generated. This cost increase translates into 1.2 to 3.5 mills/kWh. [8]

Conversely, the effective cost of implementing a conservation program or utilizing a renewable resource may be reduced by the same amount to account for the value of allowances that can be earned from the Reserve. According to the Act, bonus allowances are allocated based on the amount of SO_2 emissions that a conservation program or renewable resource is presumed to displace.[9] Based on the assumption that emissions are displaced from a coal plant releasing 0.004 pounds of SO_2 per kWh, the Act awards one bonus allowance for every 500 MWh saved through conservation or generated from renewable energy resources.[10] The total value of these allowances is illustrated in Figure 1. The Figure presents a range for the aggregate value of yearly bonus allowances that can be earned relative to the amount of energy derived from qualified C&RE resources. By applying the value of these

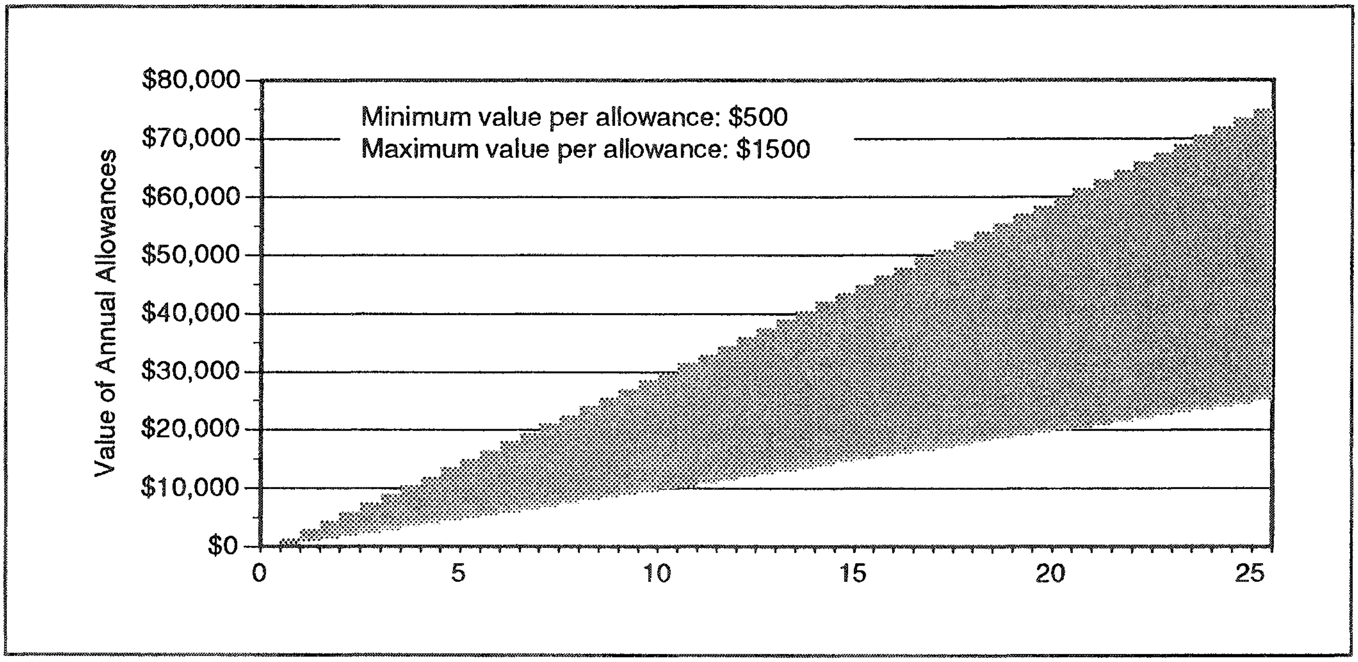

Figure 1. Value of Bonus Allowances Earned Each Year for Energy Conservation and Renewable Energy Generation

surplus allowances to the economic analysis of C&RE resources, utilities effectively lower the cost of these resource options by 1 to 3 mills/kWh.

Through consideration of the cost and value of allowances, a new conventional pulverized coal-fired unit is applied a 1.2 to 3.5 mills/kWh adder, while C&RE resources receive a credit of 1 to 3 mills/kWh. Therefore, the value of the allowances allocated to C&RE resources exceeds the coal-unit's allowances costs by 2.2 to 6.5 mills/kWh.

The impact of the allowances on C&RE economics can be more clearly demonstrated by comparing the costs of a renewable energy resource and a conservation program with those of a coal plant. To illustrate, costs will first be compared without consideration of allowances, and then again with the cost of allowances factored into the analysis. For the comparison between a renewable energy resource and a coal-plant, assume that a utility is looking to increase capacity by 25 MW and is considering two options. The first is joint participation in the construction of a 75 MW wind power plant; the utility would pay for and own one-third of the plant. The second is participation in a joint action agreement to construct a 300 MW conventional pulverized coal plant; the utility would pay for and own 8.3% of the facility and receive its proportionate share of energy and capacity.

Representative data on costs and operating parameters for each plant is shown in Tables 1 and 2. Table 1 illustrates the costs of a new 300 MW conventional pulverized coal-fired unit equipped with a flue gas desulfurization unit.[11] The total annual cost of the plant, expressed in $/kW-yr, is calculated by levelizing the lifetime costs (capital, fuel, and operation and maintenance) on a per kilowatt basis, over the 30 year life of the plant. Under the assumption of a joint-action agreement, the utility receives 25 MW, at 8.33% of the total annual cost. Without incorporation of allowances, the utility's annual share of the coal plant would cost 25.83 $/kW-yr. However, each year the coal plant will generate about 1,839,600 MWh of energy which will require 4,277 allowances to cover emissions of SO2. Assuming that allowances sell for $1000, the coal plant would incur an annual allowance cost of $4.27 million dollars, or approximately 13.27 $/kW-yr. The allowance cost reflects 22 years of allowance purchases, assuming the unit begins operation in 1992 and will not be required to purchase allowances until the year 2000 (for 8 years of the unit's 30 year life, 1992 through 2000, allowances will not be required). Incorporating the cost of the allowances into the unit costs increases the utility's annual share of the coal plant to 26.93 $/kW-yr, a cost increase of 4.3%.

Table 2 illustrates the costs of a 75 MW wind power plant.[12] The total annual cost of the plant is levelized on a per kilowatt basis over the 20 year life of the plant. Under the ownership agreement, the utility receives 25 MW at one-third the total annual cost. Without incorporation of allowances, the utility's annual 25 MW share of the wind plant would cost 55.02 $/kW-yr. Because the wind plant

Table 1. Levelized Costs of a New Conventional Pulverized Coal-fired Plant With and Without Consideration of Allowances

Assumptions: New, conventional pulverized coal-fired plant with FGD (Flue Gas Desulfurization). Utility is participating in a joint-action agreement to construct a 300 MW conventional pulverized coal-fired plant. Utility would pay for and own 8.3% (25 MW) of the facility and receive its proportionate share of energy and capacity.

Capacity (MW)	300
Capacity Factor	70%
Heat Rate (Btu/kWh)	9400
Capital Cost ($/kW)	$1,713
Fuel Cost ($/MBTU)	$1.25
O&M Cost	
Fixed ($/kW-yr)	$34.15
Variable (mills/kWh)	3.59
S02 Emission Rate (lbS02/kWh)	0.00465
Unit Lifetime (yr)	30
Annual Energy Output (MWh)	1,839,600
Annual S02 Emissions (Tons)	4,277
Price of Allowances	$1,000

Levelized Cost Calculations:
(costs are levelized over coal plant lifetime of 30 years, assuming a 10% discount rate)

Without Consideration of Allowances

Costs

Capital ($/kW-yr)	$181.78
O&M ($/kW-yr)	
Fixed	$34.16
Variable	$22.02
Fuel ($/kW-yr)	$72.07
Total Cost ($/kW-yr)	$310.02
Total Cost Incurred by Utility for 8.3% (25 MW):	$25.83 ($/kW-yr)

With Considerations of Allowances

Costs:

Capital ($/kW-yr)	$181.78
O&M ($/kW-yr)	
Fixed	$34.16
Variable	$22.02
Fuel ($/kW-yr)	$72.07
Allowance Cost ($/kW-yr)	$13.27
Total Cost ($/kW-yr)	$323.29
Total Cost Incurred by Utility for 8.3% (25 MW):	$26.93 ($/kW-yr)

Table 2. Levelized Costs of a Wind Power Plant With and Without Consideration of Allowances

Assumptions: Utility is participating in a joint-action agreement to construct a 75 MW wind power plant. Utility would pay for and own one-third (25 MW) of the plant and receive its proportionate share of energy.

Number of Units	300
Unit Capacity (kW)	250
Total Capacity (MW)	75
Capacity Factor	25%
Heat Rate (Btu/kWh)	-
Capital Cost ($/kW)	$1,173
Fuel Cost ($/MBTU)	$0.00
O&M Cost	
Fixed ($/kW-yr)	$9.26
Variable (mills/kWh)	8.22
Assumed S02 Emission Rate (lbS02/kWh)	0.004
Unit Lifetime (yr)	20
Annual Energy Output (MWh)	164,250
Annual Avoided SO2 Emissions (Tons)	329
Annual Allowances Earned	329
Price of Allowances	$1,000

Levelized Cost Calculations:
(costs are levelized over wind power plant lifetime of 20 years, assuming 10% discount rate)

Without Consideration of Allowances

Costs

Capital ($/kW-yr)	$137.79
O&M ($/kW-yr)	
Fixed	$9.26
Variable	$18.01
Fuel ($/kW-yr)	$0.00
Total Plant Cost ($/kW-yr)	$165.06
Total Cost Incurred by Utility for one-third (25 MW) of the facility:	$55.02 ($/kW-yr)

With Considerations of Allowances

Costs:

Capital ($/kW-yr)	$137.79
O&M ($/kW-yr)	
Fixed	$ 9.26
Variable	$18.01
Fuel ($/kW-yr)	$0.00
Annual Value of Allowances ($/kW-yr)	($2.75)
Total Plant Cost ($/kW-yr)	$162.31
Total Cost Incurred by Utility for one-third (25 MW) of the facilty:	$54.10 ($/kW-yr)

saves 320 tons of SO_2 emissions per year, bonus allowances could be earned for an annual cost savings of 2.75 $/kW-yr, assuming a $1000 allowance price. Assuming allowances are available, the wind plant would qualify to receive allowances for 8 years from 1992 to 1999. Subtracting the annual allowance savings from the plant's costs decreases the utility's share of the total annual cost from 55.02 $/kW-yr to 54.10 $/kW-yr, a 1.7% savings.

An economic analysis of the two resource options adds the cost of allowance purchases to the total annual cost of the coal plant, and credits the value of bonus allowances to the total annual cost of the wind power plant. With these additional factors, the cost of the coal resource increases by 1.1 $/kW-yr and the wind power plant costs fall by .92 $/kW-yr. Although the relative cost-effectiveness of the two resources remains unchanged in this scenario, the new costs imply a shift in the resource economics.

Another example of the favorable impact of allowances savings on C&RE economics is demonstrated by examining the increase in savings of a conservation program. For this example, assume a utility is looking to save 25 MW per year through a lighting program and implements the replacement of 438,594 - 75 W lamps with the same number of 18 W lamps. The cost savings and corresponding calculations for this program are shown in Table 3. The replacement results in a 153,299 MWh energy savings and 25,000 kW-yr demand savings. Without considering the cost savings of the allowances, the program savings is calculated by subtracting the program costs from the program energy and demand cost savings. Program costs include the utility supplied rebate of $4 for each lamp. The energy cost savings is calculated based on an assumed utility electricity rate of 3.5 cents/kWh, and the demand cost savings is based on an assumed marginal cost of 156 $/kW-yr.[13] The cost calculations illustrate the lighting program results in an annual cost savings of 327.73 $/kW-yr.

Additionally, the lighting program will save 307 tons of SO_2 emissions per year. Assuming the program receives allowances for 8 years, the annual allowance cost savings is 12.26 $/kW-yr. Adding this savings to the program's total cost savings increases the annual cost savings from 327.73 $/kW-yr to 339.99 $/kW-yr.

In comparing the lighting program cost savings to the coal plant costs, it is apparent that the lighting program is significantly more cost effective. A 25 MW reduction in energy use results in a utility savings of $327.73 per kW-yr in comparison to a 25 MW addition of coal-fired generation at a utility cost of $25.83 $/kW-yr. With the addition of allowances, the value of the lighting program increases by 3.7% and coal-fired generation costs increase by 4.2%. With or without the inclusion of allowances, the lighting program is more cost effective. However, the addition of allowances continues to increase the lighting program's value which could be significant in evaluating a more conservative conservation program. For example, a conservation program with equal cost and benefits could earn enough allowances to increase its value over its costs.

Conclusion

Environmental impacts of electricity generation, and the associated societal costs, are often ignored or subjectively valued in utility resource planning. However, through the implementation of a nation-wide allowance trading system for sulfur dioxide, SO_2 emissions will soon impose quantifiable operating costs on electric utilities. In order to meet system electricity requirements at the lowest overall cost, it is essential that utilities incorporate this new economic factor into their resource evaluation methodologies.

After accounting for the buying and selling of allowances, utilities will find that prospective conservation measures and renewable energy options compare more favorably with fossil fuel resources. For some utilities, the value of SO_2 allowances may already be significant enough to affect resource selection. If other major pollutants were included in emissions trading programs, the economic advantage given to resources would become even more pronounced. For example, California's South Coast Air Quality Management District (SCAQMD), whose jurisdiction includes the Los Angeles Air Basin, has recently resolved to implement an emissions trading program to control releases of SO_2, nitrogen oxides (NO_x), and hydrocarbons.

Emissions trading programs such as the one being developed in Los Angeles could become commonplace as regulators attempt to provide the industry with more flexibility in meeting environmental regulations. With the growth of these programs, C&RE options could gain prominence as a means of avoiding costly air emissions. Expanded use of emissions trading at either the federal, state, or local levels will require further consideration of allowance costs by electric utilities. Incorporation of these costs into resource evaluations could significantly increase the economic viability of future conservation programs and renewable energy resources in the coming years.

Table 3. Levelized Cost Savings of a Commercial Lighting Program With and Without Consideration of Allowances

Assumptions: Replace a 75-W incandescent lamp with an 18-W compact fluorescent lamp. Replacement results in a savings of 57-W per lamp, not including any avoided cooling costs or peak demand charges.

Number of Lamps	438,594
Energy Savings Per Lamp (W)	57
Program Energy Savings (MWh)	153,299
Program Demand Savings (kW-yr)	25,000
Program Cost:	
Rebate on bulbs (%/bulb)	$4.00
Program Rebate Cost ($)	$1,754,376
Program Cost Savings:	
Energy Cost Savings (cents/kWh)	$3.53
Demand Cost Savings ($/kW-yr)	$156.00
Lamp Lifetime (hrs)	
75W	10,000
18W	750
Duty Factor	70%
Avoided S02 Emission Rate (lbs/kWh)	0.004
Annual S02 Avoided Emissions (Tons)	307
Annual Allowances Earned	307
Price of Allowances	$1,000
Annual Value of Allowances ($/yr)	$306,598

Levelized Cost Calculations for a 25 MW Lighting Program
(costs are levelized over 18-W lamp lifetime of 10,000 hrs, assuming 10% discount rate)

Without Consideration of Allowances

Program Costs:	
Rebate Costs ($/kW-yr)	($50.38)
Program Cost Savings:	
Energy Cost Savings ($/kW-yr)	$222.11
Demand Cost Savings	$156.00
Annual Cost Savings ($/kW-yr)	$327.73

With Considerations of Allowances

Program Costs:	
Rebate Costs ($/kW-yr)	($50.38)
Program Cost Savings:	
Energy Cost Savings ($/kW-yr)	$222.11
Demand Cost Savings	$156.00
Allowance Cost Savings ($/kW-yr)	$12.26
Annual Cost Savings ($/kW-yr)	$339.99

Endnotes

1. The SO_2 allowance trading program will be initiated in two phases. Phase I will begin in 1995 and primarily target coal-burning plants in the eastern and midwestern United States. Phase II begins in 2000 and affects all fossil fuel-fired generating units in excess of 25 megawatts and all newly constructed units of any size. New units subject to SO_2 allowance regulations are those commencing operation on or after November 15, 1990. Existing units affected by the Act will be allocated annual allowances based on historic fuel consumption and emissions rates. Owners of new units will not be allocated any additional allowances, but will have to purchase or otherwise obtain them. The Act specifically exempts simple combustion turbines from the SO_2 allowance regulations. In addition, EPA is proposing to exempt existing combined cycle units which do not have auxiliary firing.

2. §404(f)(2)(B)(v)

3. Federal Register, §73.82

4. Federal Register, §73, Appendix A

5. Federal Register, §73.82

6. *EPRI Journal*. 1991. "Responding to the Clean Air Challenge." 16(3):20-29.

7. This assumption is based on U.S. Department of Energy data for emissions from a conventional pulverized coal-fired plant with Flue Gas Desulfurization (FGD). Source: Pace 1990.

8. [$500/allowance] x [1 allowance/430,108 kWh generated] = $0.0012/kWh generated; or 1.2 mills/kWh. at $1500 per allowance, the cost adjustment would be 3.5 mills/kWh.

9. §404(f)(2)(A)

10. §§404(f)(2)(E) and (F)

11. EPRI, *TAG Technical Assessment Guide, Volume 1: Electricity Supply-1989 (Revision 6)* , (applied a 5% inflation rate to raise costs to 1992 values.)

12. EPRI, *TAG Technical Assessment Guide, Volume 1: Electricity Supply-1989 (Revision 6)*, (applied a 5% inflation rate to raise costs to 1992 values)

13. NEOS, June 1990. *City of Alameda, Bureau of Electricity: Demand Side Management Program Evaluations and Recommendations.*

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