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Energy Regulation Subcommittee  
of the  
Energy and Natural Resources Committee  
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Mr. Chairman. I am pleased to appear before this Subcommittee to discuss the issue of converting electric utilities from oil and gas to coal. In my remarks today, I will address the following issues:

- o The potential for reducing oil imports through coal conversion;
- o The economics both of reconverting coal-capable oil and natural gas plants to coal, and of accelerating the rate at which the remaining oil and gas capacity is replaced by coal;
- o The institutional barriers to this reconversion and accelerated replacement; and
- o Alternative federal policy options to accelerate conversion.

#### The Potential for Oil Import Reductions

During the 1960s and early 1970s, electric utilities were encouraged both by economic considerations and by government policy to switch from coal to oil and natural gas to generate electricity. They now consume 3.2 million barrels per day of oil and gas equivalent. With no changes in current policy, it is projected that their oil and gas consumption will decrease to about 2.8 million barrels per day of oil equivalent in 1990. This decrease will come about as the result of reconverting plants from oil and gas to coal, and also from replacing oil and gas plants with new nuclear and coal plants. Of the present 3.2 million barrels per day of oil and gas use, approximately 700,000 are consumed in plants that were at one time capable of burning

coal. Of this total, however, only approximately 400,000 barrels per day are accounted for by plants considered to be economically and environmentally attractive for reconversion. Since these reconversions could be completed over the next two to five years, they represent a significant potential for achieving short-run oil import reductions. Of the remaining 2.4 million barrels per day of oil and gas equivalent that is estimated to be consumed in 1990, up to 2.0 million represents the more important long-run target for accelerated retirement and replacement with coal-fired plants. The other 400,000 barrels per day that would continue on oil and gas represents consumption in peaking and similar uses that would not be attractive for conversion.

### The Economics of Reconversion and Accelerated Replacement

The increasing costs of oil and natural gas make it economic to reconvert coal-capable oil and gas plants to coal and to accelerate the replacement of other plants with new **coal-fired** plants.

Reconversion. The President has identified 50 plants as environmentally and economically attractive for reconversion. Independent estimates of the capital cost of reconverting these plants range from about \$5.4 billion with minimum environmental regulations and no scrubbers, to \$7.3 billion with strict environmental **regulation--that** is, maximum scrubbing

and no new sulfur dioxide emissions. Industry sources, however, estimate the minimum cost to be about \$7 billion, and the maximum cost to be about \$11 billion with the adoption of strict environmental regulations.

Whichever estimate for reconversion is used, the additional capital cost would be more than offset, on an **annualized** cost basis, by the lower operating costs of coal-fired plants, as compared to oil-fired and most gas-fired plants. The approximate range of total costs after reconversion is from slightly over 3 cents per kilowatt hour for a plant that is relatively easy to convert and faces no imposing environmental restrictions, to 3.5 cents per kilowatt hour **for** a plant that is relatively **difficult** to convert and faces strict sulfur dioxide emission levels. The annualized cost of electricity from a plant continuing to burn oil is approximately 4.7 cents per kilowatt hour at **today's** oil price. This cost difference will increase over time as oil prices increase relative to coal prices.

Accelerated Replacement. Annualized cost estimates also reveal a new coal plant to be more economic than an existing oil-fired plant, yet less economic than converting an oil-fired facility to coal. On an annualized basis, the cost for a new coal-fired plant is about 4.2 cents per kilowatt hour, as compared to 4.7 cents per kilowatt hour for an existing plant continuing to burn oil.

As of now, both coal reconversion and accelerated replacement are economic and would in fact reduce electricity rates to consumers over the long run. The question arises why conversion has been proceeding at such a slow rate. The answer requires an examination of the institutional environment within which electric utilities operate.

### Institutional Barriers

The primary obstacle in the path of both accelerated reconversion of coal-capable plants and the replacement of others with new coal-fired plants is that the total costs of electricity generation will increase in the short run. This is true even though costs will be lower over the long run. The state public utility commissions, which regulate electricity rates, have been reluctant to give the necessary rate increases in recent years to cover higher short-run costs. Another major inhibition lies in the bias of automatic fuel adjustment clauses against capital expenditures. Since these clauses allow higher oil and gas prices to be passed on automatically to rate payers, while capital expenditures typically require longer litigation periods before they can be recouped, electric utilities are often reluctant to undertake capital-intensive conversion programs. These two factors bias utility decisions against building new coal plants, which are more capital intensive, in favor of continuing to operate the oil and gas plants, which have a higher total cost.

The problem of recouping investment is one that has become more pronounced in recent years. The trend toward nuclear and coal-fired, as opposed to oil and gas-fired, capacity has increased capital costs as a percentage of total costs. This increased capital intensity, along with both the lag and reluctance of public utility commissions in approving rate increases, has contributed to the current difficulty of utilities in realizing the necessary return on capital investment. The recoupment problem has been further exacerbated by the fact that most states only allow a percentage of construction work in progress to be included in the rate base. This is particularly a problem for utilities that have new nuclear-fired plants ready for service, but are unable to get them licensed due to the moratorium that has followed Three Mile Island. Recent high rates of inflation and the very high cost of money have also had a negative impact on the ability of utilities to maintain an adequate rate of return on invested capital.

In sum, the reluctance of utilities to undertake capital investment for both reconversions of existing plants and the construction of new coal-fired units is due, first to the reluctance of public utility commissions to allow rate increases, and second, to the fact that fuel adjustment clauses for oil and gas allow automatic rate increases that the public utility commissions do not have to approve. The recent high rates of inflation and cost of capital, as well as the trend toward a more capital-intensive industry, have also exacerbated the problem.

For these reasons, utilities are not perceived as an attractive investment by the financial community, which in turn has made it difficult for utilities to attract external financing, historically their major source of capital. This has been reflected in substantial declines in the market-to-book ratios of utility companies, their bond ratings, and their interest coverage ratios (the ratios of their total earnings to their interest indebtedness).

#### Alternative Federal Policy Options

The two major options are federal government grants to assist the utilities with the capital costs of conversion or regulatory reform to eliminate the disincentives to undertake the capital investment to convert to coal. While federal government loans or loan guarantees have been discussed, it is doubtful that they would provide more than a minimum amount of conversion. The problem is that federal loans or guarantees are likely only to replace private loans. This in turn limits the utilities' ability to raise future debt capital unless they also increase their equity financing. The latter may be precluded since it dilutes the individual utility's earnings.

Federal Government Grants. The Administration has selected a grant approach, as embodied in S. 2470, Powerplant Fuels Conservation Act of 1980, introduced by Senator Ford. This is a two-phased program. Phase I

has as its objective the reconversion of 50 oil-fired plants (107 units) to coal. It provides \$3.6 billion in grants to assist in financing the capital conversion costs. This assistance is not to exceed 50 percent of capital costs, or \$4 per displaced barrel of oil, whichever is lower. Due to increasing concern over acid rain, the proposal provides an additional \$300 million for the installation of advanced scrubber systems and \$100 million for the construction and operation of coal cleaning facilities. The projected savings for Phase I are the equivalent of 400,000 barrels of oil per day by 1985. Phase n provides \$6 billion in grants to utilities to encourage the displacement of an additional 600,000 barrels per day by 1990 through a number of options, including the construction of new coal-fired or nuclear plants, and conservation.

Regulatory Reform. The goal of regulatory reform should be to eliminate the current bias which is against new coal capacity and in favor of continuing to operate current oil and gas plants. Some important aspects of reform would most likely include allowing utilities to include work in progress in their rate base, limiting the use of automatic fuel adjustment clauses, and guaranteeing an adequate rate of return on invested capital. It might be necessary to allow utilities to appeal to the courts if public utility commissions do not allow an adequate return on invested capital. The commissions would do well to emulate the Federal Energy Regulatory Commission's recent treatment of the New England Power **Company's**

Brayton Point coal conversion project, where the utility was allowed to include these conversion costs in its rate base and to increase its interim rates.

Increasing the involvement of the federal government in state regulatory efforts raises sensitive political issues for the Congress to consider. Yet the economic costs of not doing so must also be considered. The cost to the federal government of replacing 400,000 barrels per day of oil and gas through subsidizing reconversion would be \$3.6 billion. Under the Administration plan it would cost the government another \$6 billion to replace an equivalent of 600,000 barrels per day. If the federal government were to continue to provide grants under Phase n to replace the remaining oil and gas consumption in the same proportion, it would cost an additional \$14 billion over the next 10 to 15 years.

Several issues are relevant to the choice between grants and regulatory reform as a policy for accelerating conversion of utilities to coal:

- o Who should pay for the conversion?
- o The relative speed of conversion.
- o The impact on the financial viability and fuel choices of the utilities.

Who Should Pay? It can be argued that reductions in oil imports from coal reconversion and replacement will make the country as a whole less vulnerable to both oil supply curtailments and future OPEC price increases, and therefore represents a national benefit that should be financed by taxpayers in general. While it is true that national benefits would occur to society in general, it is also true that consumers would benefit directly from lower electricity costs. Since these benefits are identifiable, it appears that the consumer beneficiaries, not the general taxpayer, should pay for the short-run costs of conversion. On this criterion, regulatory reform would be preferable to a grant program since consumers who reap the long-term benefits would pay for the short-run conversion. The Administration's program, on the other hand, would divide the cost between the general taxpayer and the consumer.

Speed of Conversion. A grant program similar to the Administration's **would** most likely stimulate faster reconversion than a program of regulatory reform. The Administration's original goal of 400,000 barrels per day by 1985 might therefore be attainable. But progress toward the long-run goal of displacing Z million barrels per day would most likely not be very rapid unless the grants were much larger than currently anticipated. Regulatory reform, on the other hand, would probably enable faster retirement and replacement, and therefore represents a more effective long-run policy for achieving the potential conversion of up to an additional Z million barrels a day of oil equivalent.

### Impact on the Financial Viability and Fuel Choices of the Utilities.

The grant program would improve the short-run cash flow position of those utilities whose facilities were eligible for the program. However, it would not alter the **utilities'** incentives toward continuing to operate oil and gas instead of converting to coal, which would be less expensive over the long run. Regulatory reform, on the other hand, should alter these incentives, thereby accelerating the rate of conversion while also improving the long-run financial outlook of the industry. The grant program, in order to advance rapid oil displacement, would also entail some very expensive reconversions of plants having high site-specific costs where it would be more economic to build new coal-fired plants.

### Conclusion

Under current policy, approximately **2.8** million barrels a day of oil and natural gas equivalent are expected to be consumed by utilities in 1990. Of this total up to 2.4 million barrels represent an important and economic target for coal conversion and replacement. In evaluating the two policy **options**, however, it is critical to take a long-term view. While reconversions over the next three to five years could reduce oil imports by up to 400,000 barrels per day by 1985, the major target must be the additional 2 million barrels per day that could be saved through accelerated retirement and replacement by new coal-fired capacity.

Both reconversion and accelerated retirement are economic over the long run. They are not taking place because of institutional problems that bias decisions against capital-intensive coal plants. Among these problems are the reluctance of public utility commissions to allow the necessary rate increases, the existence of automatic fuel adjustments, and the fact that construction work in progress is often not included in the rate base. The situation has been exacerbated by high rates of inflation and the increased cost of capital. A grant program, such as the Administration has requested, would probably attain the 400,000 barrels per day oil import reduction from reconversion, but it would do little to accelerate the rate of replacement necessary to attain the 2 million barrels a day of oil and gas use not found in coal-capable units. One must also question the desirability of financing conversion out of general revenues when most of the benefits in terms of lower electricity rates will accrue to consumers. More important, grants would not help the long-run viability of the utility industry or change the current bias against coal plants. Regulatory reform, on the other hand, would allow the utilities to choose once again the minimum-cost fuel. In turn, this would stimulate long-run conversion and replacement, which would reduce oil imports more significantly than the grant program. Finally, under regulatory reform consumers, who would be the major beneficiary, not the general taxpayer, would pay for the short-run conversion costs.