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## COAL'S ROLE IN CALIFORNIA'S ENERGY NEEDS

Nolan H. Daines

Pacific Gas and Electric Company  
San Francisco, California

### ABSTRACT

California's post-industrial society demands confidence in the energy supply system as an essential ingredient for social harmony and adequate job creating capital investment. Confidence requires policies which balance supply and demand using believable methods with adequate allowance for the unexpected, reliance on diverse sources and locations, respect for our environment, sustain our individual freedoms and provide opportunities for economic mobility. Coal will play only a part, but an important part, in a multi-faceted energy policy using numerous energy sources and systems, conservation techniques, and cooperating societal institutions. Today's extensive and challenging research and development provides the foundation for future technologies which will further remove the environmental effects associated with coal.

### TEXT

Thank you Mr. Chairman, good afternoon ladies, gentlemen and fellow session panelists.

When I first started formulating this talk, being an engineer by training, I was tempted to use a number of precise, multicolored charts. These would have shown you one utility's view of coal's future role. We have that kind of information and it is useful in its proper place. However, the issues surrounding coal's use in California transcend the normal utility practice of gathering demand information and formulating a resource plan to meet it. The issues are public issues and will not be decided by utilities alone. Right now the public's estimate of coal's role is ambiguous. Coal's place will gradually evolve over time and will be the product of innumerable decisions. I hope its role will not be the result of too much indecision and neglect. The decisions will depend on factors ranging from OPEC nations to the outcome of research now planned or underway, and from the ballot box to the ultimate energy user at home and at work. We will be influenced by honest, sincere people with diverse views and people with hidden objectives in mind will attempt to mislead us.

This conference will perform a vital service if it helps communicate to Californians the problems of meeting their energy needs and the true nature of coal use. For many Californians today have misconceptions about both of these. And coal will be measured less by what it actually is, than by the perception of what it seems to be. I am hopeful our perceptions will be helpful in forming yours.

### FIRST IMPRESSIONS COUNT

First impressions have a great deal of influence and, for many, the mention of coal brings visions of smokestacks billowing huge clouds of

black soot-filled smoke and mountains of ash. Historically, that was frequently the case. But technology has made great strides both in reducing the amount of coal needed and cleaning up that which is required. The Centralia, Washington coal plant of Pacific Power and Light Company shows what has been accomplished. It has two units of 665 megawatts each. This plant is the source of some of California's present electricity supply imported from out-of-state coal generation. They are sending 30 percent of the power from that plant to northern California and will continue to do so until 1982 when it will be needed in the Pacific Northwest. There are two stacks and occasionally one is shut down for maintenance. But, if asked to point to the stack which is operating, visitors are hard pressed to correctly identify it. There are no visible emissions (Ref. 1). Centralia shows how coal use has changed for the better. Moreover, technology has further improved since this plant was completed in 1972. Our proposed coal plant in northern California will have even less soot and sulphur emissions than Centralia's. For that matter it will be less than our existing oil plants.

### COAL MAY EVENTUALLY GIVE US NATURAL GAS TOO

My discussion concentrates on coal's potential electric supply role. Coal is also viewed as one of the major potential sources for substitute natural gas, often called SNG, LNG, or liquefied natural gas, is a major potential source now available to us. Making SNG from coal has not yet been demonstrated on a commercial scale. At PGandE, we are continuously working towards reaching that goal by reviewing promising technologies and ways to affirm their commercial feasibility. We expect that coal will play a future role in supplying pipeline gas to California.

### NEED FOR ELECTRICITY FROM COAL

We at PGandE believe there is a need for large, economic, base load electric generation in California. We also believe coal is the best alternative available to fill some of that need and may be the only alternative at the time it will be required. Our announced plans to build two 800 megawatt coal units in the mid-1980's result from this belief. When completed, each unit will supply the electric needs of about half a million people. By then northern California's population will have grown from its present nine and a half million to nearly eleven million.

The key factors driving our need for new energy sources are not only the increasing demand, but California's almost total dependence on oil and natural gas. Nearly 85% of all California's energy comes from these two sources (Ref. 2). Reducing this dependence means we must develop other energy supplies faster than demand increases. That's one of the reasons why conservation is vital. The slower electric demand grows, the faster we can reduce our dependence on oil and gas.

Conservation is essential and all acceptable techniques must be used. Conservation is not new to PGandE. One of our conservation programs goes back to 1914 (pump testing). Since the oil embargo, we are planning a larger role for conservation, and ten years from now, it will be saving more energy than our two coal units will generate (Ref. 3). But, even though conservation is saving a great deal and even though two-thirds of our new plants won't use oil, by 1987 we'll need more oil and gas than today; and, that assumes the planned coal plant is operating. Looking at it from a different perspective, if three times the forecasted conservation occurs and our coal plant is built, oil and gas in 1987 will still be needed to generate twice the amount of electricity generated from coal.

Economics favor coal over oil. Not only will a new coal plant produce less soot and sulfur air emissions than our existing oil plants, but it will cost less too. Power from a new coal plant costs less than just the oil needed to run our existing plants (Ref. 4).

Before leaving the discussion of electricity demand forecasts and conservation it's important to help clear up one point. There has been a lot said about the subject as it relates to the need for new power plants and it is confusing. Demand forecasts are not that different. The Energy Commission's forecast of electric needs in our service area is essentially the same as ours. Both forecasts are about 4 percent annually, with the Energy Commission's eleven-year forecast at the same level as our ten-year forecast. Both will probably be proven wrong. In fact, the Energy Commission has indicated that its 1985 forecast for all of California may be 8,900 megawatts too high or it may be 8,300 megawatts too low (Ref. 5). This difference of 17,000 megawatts is more than PGandE's total existing generation. It is more than ten times the size of our proposed coal plant. This measure of uncertainty poses difficult questions when assessing the State's need for coal. But the issue must be confronted.

From this uncertain perspective, it is our view that there exists a large need for secure, reliable energy sources. These are needed not only to meet our customers' increased energy requirements, but also to decrease their dependence on oil. Electricity from geothermal, hydroelectric, solid waste biomass, and co-generation are all helping to supply our power today and we plan to utilize these and other alternative resources to their full feasibility in the future. But alone they will not be enough to stem the tide of oil. We expect that solar energy will continue replacing some natural gas in water and space heating, but will not be a significant energy producer in the 1980's. After implementing acceptable conservation, coal and nuclear are the only realistic base load alternatives available today to significantly reduce our dependence on oil for electrical generation. They are credible because they have a long-term assured domestic fuel supply, they represent a mature, commercially proven technology, their generation is economical and the large transportation system needed for coal exists.

#### COAL USE TECHNOLOGY

I mentioned earlier that great strides had

been made in cleaning up coal but it's not all roses.

Using the best combustion controls available, nitrogen oxides will likely be higher from coal than oil. That's important because they may be a necessary ingredient for smog. Cleaning devices may become available, and we hope they do. On this point, I believe we should clear up some confusion. Leaders in California's Executive Branch have been searching for an alternative to Sundersert. Your Legislature directed that it be "economically comparable", "technically available" and "environmentally acceptable" (Ref. 6). In the process, they were told that nitrogen oxide cleaning technology using ammonia and removing up to 90 percent is demonstrated, technologically proven and can be purchased from a number of manufacturers (Ref. 7). One might get the impression from this that the only issue remaining in cleaning up nitrogen oxides was who is going to get the equipment order and how much will it cost? Unfortunately this is not the case, especially for coal. All the coal pilot tests for this high level NO<sub>x</sub> control are less than one megawatt, so considerable scale up will be required. It is unknown how much ammonia will escape to the atmosphere or its effect on the environment when it does. Large scale tests of nitrogen oxide control have been on oil plants burning very low sulfur fuels. But there are indications that the higher sulfur contents of coal may have side effects which would shorten the life of boiler and reduce its efficiency. And, the combustion gas after sulfur removal may be too cold for the necessary chemical reaction removing nitrogen oxides. Particulates may cause similar problems. At PGandE we are hopeful that these problems can eventually be overcome, but we don't believe it would be responsible for us to tell you they don't exist.

Air emissions are of vital concern to California. This concern is not without justification and we believe it is possible to build coal plants today which will meet the expectations and requirements of Californians. The future may bring better control technology but, even with the best conceivable emission controls, California's air will be cleaner with a generation mix that includes some nuclear power plants.

Burning coal produces prodigious amounts of ash and scrubber wastes. We believe that the technology is available such that by mixing these two we can produce an inert earthlike substance which can be landfilled without harm to the environment.

In the years ahead the options we have to choose from will be more plentiful as today's research is successfully completed. And PGandE spent \$50 million last year in research and development to help assure that we have more options available. As part of the nation's broad energy research program, the extensive efforts on coal should have large payoffs--not only in lower cost, more efficient and cleaner coal conversion options, but also by giving us a better understanding about what aspects of coal use are most undesirable. With that knowledge we can concentrate our efforts on their mitigation. We are optimistic that some new technologies will survive the challenge of technological feasibility, cost competitiveness, environmental sensitivity and public acceptance.

Besides better ways to use coal, the nation's efforts will likely bring forth economic and acceptable techniques to capture electric power from wind and the sun's rays and other renewable sources. As that occurs we stand ready and able to implement them. But, today we don't know which will pass the test nor when. The future will always hold the prospect of improved technologies waiting just over the horizon and we must strive for them. But, we also must assure that the economic engine providing the means to reach these greener pastures has enough fuel to get us there. So, we must build base load generation using today's proven technology.

#### ENERGY SUPPLY MUST BE CERTAIN

At the start of this talk I stated that people make decisions based on their perceptions. An important test for the State's energy supply policies will be how credible they are perceived to be by business decision makers. Recently Fortune magazine told us that many companies were avoiding expansion in or moves to California, and making job-creating investments elsewhere (Ref. 8). Among other reasons, uncertainty concerning energy was cited as a principal cause. As the article relates, one manufacturer states that California doesn't understand how uncertainty about energy translates into increased risk and increased risk dampens enthusiasm for investment. We can help eliminate this perception of uncertainty by adopting an understandable State energy policy that draws support and confidence from a broad spectrum of interests. For the need is not for coal per se, but for reliable energy equal to our requirements.

PG&E's future is with California serving the needs of its citizens. We want to work together with other groups on the immense problem in reducing our dependence on oil and natural gas while fueling a growing economy. We believe the job should be started today with the best that's available. For energy production cannot be turned on and off at will like a faucet, nor can it be called into existence at a moment's notice. With lead times of eight or more years for a coal plant, the principal regulatory agencies must recognize that we are beginning to run out of time, and speed up their procedures accordingly. The Governor, the legislature, and the public at large should also understand the need for, and insist upon, the expedited authorizations required to bring these essential new energy supplies in on time.

#### REFERENCE

- (1) "Centralia Steam Electric Project" - Pacific Power and Light Company, et al.
- (2) "Meeting California's Energy Requirements, 1975-2000" - Stanford Research Institute, 1973, pp 66.
- (3) PG&E Common Forecasting Methodology--II - CERDEC Docket No. 77-EA-10, February and March 1978.
- (4) PG&E Notice of Intention for Fossil I and 2 - December 1977, pp IV-10's.
- (5) CERDEC 1977 Biennial Report, Vol 2, pp 11.
- (6) Public Resources Code Section 25525.25(a)2.
- (7) Mardian, C. L. Letter to Gough, T - April 11, 1978.
- (8) Orlitz, John "Why the Future No Longer Looks So Golden in California" - Fortune magazine, March 27, 1978, pp 130-139.

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