Texas Is Testing Ground for Impact of Coal Use on Economic Growth

Houston. The Texas oil man of popular legend is the epitome of the risk taker, the quintessential American high roller. Contemporary Houston is a monument to the oil men and other independent operators who made and lost fortunes in cotton and lumber and land and endowed Houston with its headlong, headstrong commercial style and the air of a perpetual boomtown.

The old breed of oil man is dying out and being replaced by the executives in the corporate offices of Arco and Exxon and Shell. And Houston has long outgrown its old image as a refinery town and port, spawning the greatest concentration of petrochemical plants in the world. But the boom continues.

Houston grew up with the oil and gas industry and its fortunes are still tied to it. An estimated 70 percent of the state's industrial energy is used along the Gulf coast, 50 percent of it in the Houston area. Houston is ranked as the most energy-intensive metropolitan area in the country.

If Houston is built on energy, the energy of choice and habit has been natural gas. However, declining production of gas and oil within the state and the rising cost of gas are forcing major users of gas to look for alternatives. In 1975 an order by the Texas Railroad Commission, which regulates gas production, decreed a phaseout of the use of natural gas as a boiler fuel, with a reduction by 1985 of 25 percent in levels used in 1974–1975. The national energy plan is expected to levy tax penalties on industries which lag in replacing oil and natural gas as fuels.

President Carter unveiled his comprehensive National Energy Plan on 20 April. The more controversial features included taxes on domestic oil production to raise prices to world levels, extension of price controls on natural gas in interstate commerce to "intrastate" gas, taxes on "gas guzzler" cars, and the levies on major users of oil and gas to spur conversion to coal. The House of Representatives passed a bill (H.R. 8444) which embodies main elements of the Administration plan with some modifications. This bill along with Senate versions of several of the measures are at the center of the struggle now in progress over energy legislation in Congress.

Conversion to coal is prescribed in the national plan, and Texas industry, led by the power companies, is moving to convert. But, because the national plan requires that environmental quality be maintained at the same time as conversion to coal is accomplished, Texas is in trouble. Texans feel there is a direct conflict between the two objectives of the plan, and that they are special victims of the collision because Texas industry, particularly Gulf coast industry, is almost completely dependent on natural gas, which is a clean fuel, and is being told to convert to coal, which is a dirty one.

Meeting environmental standards is by no means the only problem caused by conversion. Costs of the transportation of Western coal, which are perpetually escalating, are a major factor in power company planning. Costs of constructing new coal-burning plants—considerably more expensive to build than gas-fired plants—are stretching capital budgets and raising customer bills.

Problems of Using Coal

In general, power companies in areas near lignite deposits are interested in using lignite because minemouth plants are most economic. The development of lignite fields in East Texas is discussed in a News and Comment article in the 4 November *Science*. Use of Western coal poses different problems. Getting the coal to Texas is a major one (see box).

An important element in the predicament is the Texas attitude toward economic growth. That attitude seems to be shaped by the recollection of hard times in ranching and farming and resentment of prices set and policies made in the northern industrial states and in Washington. Urbanization and industrialization came late in Texas and to a lot of Texans, the city has meant better jobs and higher horizons and even a chance of striking it rich and making it big. And Texans, generally, seem willing to live with pollution and with other inconveniences which they associate with their standard of living.

Houston, of course, is not alone. Austin, Dallas–Fort Worth, San Antonio, Odessa-Midland area, in different, somewhat lesser degrees, have the same economic momentum. But in Houston, because of the heavy dependence on natural gas, there is a special sense of vulnerability, a feeling of hubris, a fear, as one Houston university professor put it, that "it could all fall apart."

Concern about limits to growth animates much of the analysis being turned out by the new energy advisory machinery developing in the state government and the universities. Energy institutes have been created with state money at the University of Texas at Austin, University of Houston, Texas A & M, and Texas Tech. And the Lyndon B. Johnson School of Public Affairs at the University of Texas is making policy aspects of energy problems a serious concern. A lot of this attention is going into putting coal conversion in the perspective of the putative national energy plan; in other words, laying the groundwork for state energy policy.

Energy policy in the state will inevitably be influenced by tradition and government organization. It must be kept in mind that size, history, geography, and geology make Texas a special case. The state started out as a republic, of course, and retains something of the Lone Star spirit. More significant, however, it was settled and its formative period of development came in the post–Civil War period. The prevailing mixture of late 19-century individualism and populist sentiment shaped Texas attitudes and institutions. Politically, Texas remains a conservative state. Its 100-year-old constitution reflects a Reconstruction era suspicion of centralized authority in state government, and power is kept diffused. The legislature meets only every other year and then for a specified term. The heads of the departments of the state government are not appointed by the governor but elected in their own right. All of this affects the Texas approach to making energy policy.

The Railroad Commission, which has jurisdiction over gas and oil production, is a case in point. Its members are elected statewide, not appointed. It was set up to regulate the railroads by a 19th-century governor who felt the ranchers and farmers needed some help. When oil pipelines came along early in this century, Texans figured pipelines were transportation too and the Railroad Commission might as well regulate them. One thing led to another, natural gas being next and then lignite and uranium.

For years the commission was regarded as responsive to the desires of the oil and gas industry, but more recently

Conversion to Coal Means a Long Haul to Texas

If all the estimated 40 to 50 million tons of coal which Texas will import annually from out of state by 1985 were carried on the same track it would mean a 100-car train passing a particular point every 45 minutes. Even with more realistic routing the noise and dirt and inconvenience of such a volume of traffic can be readily imagined.

For the power companies, the bottom line on coal use is the total cost of importing and generating power with it. The City Public Service Board of San Antonio, a public power company, is already using Western coal and the San Antonio experience is instructive.

In 1973, faced with a shortage of natural gas created when a supplier was unable to deliver on a contract, the San Antonio company decided to convert some plants to oil and to redesign a big plant then on the drawing boards to burn Western coal. The first 418-Mw unit, using Wyoming coal, went into service in July; a second unit the same size is scheduled to begin operation in 1978. The company estimates that the coal-fired units will account for 50 to 60 percent of kilowatt-hours of electricity it generates.

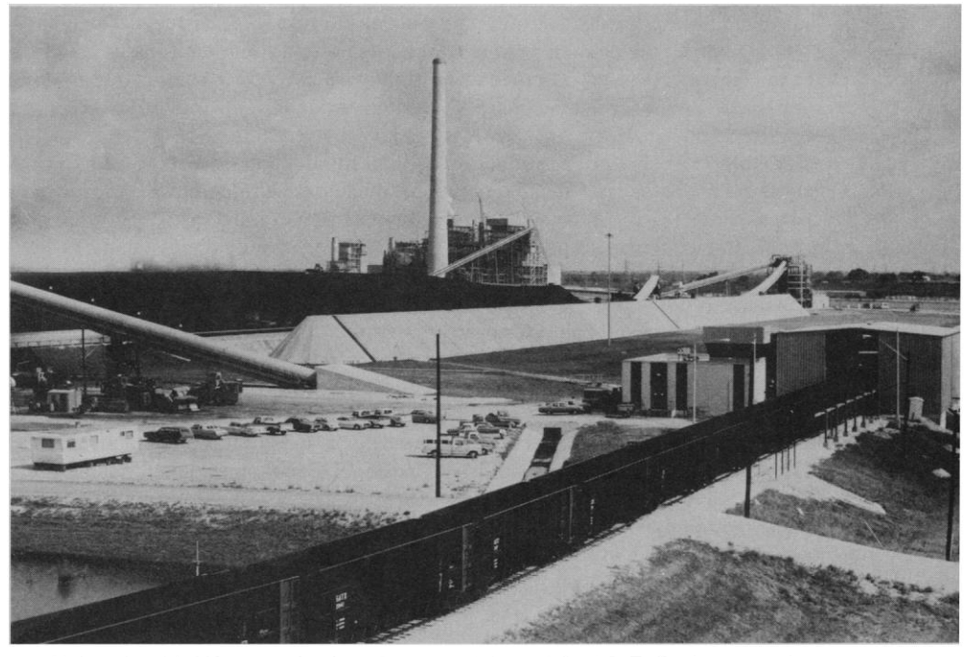
The plant was built on a site on the fringes of San Antonio closer to a center of population than most of the new coal and lignite plants will be. The new plant is equipped with electrostatic precipitators, but Wyoming coal is fairly low in sulfur content and the plant was not required to have scrubbers to control sulfur dioxide emissions by air quality laws then in effect. New standards prescribed by the Clean Air Act Amendments passed this summer will require plants using Western coal to be built with scrubbers that will entail substantially higher construction and operating costs.

Although the power company is pleased with the performance of coal as a boiler fuel, it is less than happy with rising transportation costs. In negotiations before the Arab oil embargo it appeared that the company would buy coal from a Sun Oil subsidiary's mine near Gilette, Wyoming, for slightly more than $5 a ton and pay about $7.90 a ton to the Southern Pacific and Burlington Northern railroads to haul it to Texas. After the embargo, Burlington notified the power company that circumstances had changed and asked for a rate of $11.09 per ton.

The power company requested figures supporting the request and, as is usual in such cases, the matter went to the Interstate Commerce Commission to examine the claims and set the tariff. The San Antonio company argued that the railroad was moving comparable loads at lower rates and, in the public interest, asked for a $9 rate. The railroad, which uses diesel engines on the line, noted that fuel costs and other costs were rising and upped its figure. The tariff set by the ICC was $10.93 a year ago and is up to about $11.33 now (the price of coal is now over $7 a ton). Houston Lighting & Power, which will soon have a coal plant in operation, is opposing a request for a $16 tariff.

Faced with this sort of cost escalation it is not surprising that power companies have shown interest in proposals for construction of slurry pipelines to transport Western coal southward. Pipelines require heavy capital investment, but power companies see them as a way to avoid such heavy cost escalation. The Texas legislature in this year's session granted the right of eminent domain for building of slurry pipelines in order to make such projects more feasible.

At about the same time, however, the Colorado legislature prohibited the export of water in a move aimed explicitly at forestalling the pipeline builders. Water is seen as being in short supply in Wyoming and Montana, where Texas currently gets its coal, and farmers and ranchers in the high plains region are especially defensive about projects such as the pipeline. A proposal to build a double line in order to have a return flow of water—the slurry would be composed of half coal, half water—is regarded as making the project uneconomic since it would raise the costs an estimated 60 percent. An idea for tapping a deep-lying aquifer under Wyoming and Montana to provide the water for the pipeline has been put forward, but questions of the effect of pumping on the water table near the surface are being raised as are suggestions for other uses of the aquifer.



Unit train with 110 cars unloads at San Antonio's coal-fired J. T. Deely power plant

While the San Antonio company is a major user of Western coal, it has no current plans to expand that use. It is a participant in the so-called South Texas project in Matagordo County, where a nuclear power plant with two 1250-Mw units is scheduled to be completed in the early 1980's. San Antonio expects a 700-Mw share of power from the nuclear plant. All in all it expects to be 70 percent "off" oil and gas by 1985. The company does have a lignite-fired plant tentatively scheduled for completion by 1986 and is increasing its lignite holdings. But company officials say, "After that, nuclear looks more attractive."—J.W.

its membership has reflected broader interests. The commission, a conservative body, has not been known for farsighted research or for seizing policy initiative, although its hearings on issues such as the gas phaseout order are regarded as balanced and illuminating.

The policy gap has to some extent been filled by an energy advisory council established by Governor Dolf Briscoe. Set up before the Arab boycott, the council is chaired by Lieutenant Governor William P. Hobby and numbers among its members a cross section of top officials from the legislature and executive branch including the chairman of the Railroad Commission. It has an able staff and its research arm has done a good job of acquainting state government with consequences of coal conversion and the options available. In the last session, the legislature changed the council's name to the Texas Energy Advisory Council and decreed that it would serve the state government at large.

Incidentally, the decline in production of gas and oil has special meaning for Texas government since a state severance tax on oil and gas production provides about a third of state revenues and helps make it possible for Texas to hold out against imposing either a corporate or personal income tax.

A Strictly Advisory Role

The advisory council, it should be noted, has stuck very close to an advisory function, although there is a possibility that the council will recommend a package of legislative initiatives at the next session of the legislature. Early this year the council came out with "A Policy Position on Selected Energy Issues," a generally noninflammatory statement which endorsed the restrictions on boiler fuel.

The statement strongly affirms the Texas commitment to economic development. The role of the state government is depicted as influencing the course of events to ease the transition during conversion. But there is no suggestion of drastic action and the general tenor of the statement is of hope that things will work out.

The point is made that the petrochemical industry is the state's largest industry and faces large problems in converting to coal while preserving environmental standards. The largest and most immediate problems are those facing the industry and utilities in the Houston–Gulf coast region.

The Houston area currently has no major coal-fired power capacity, but conversion is coming fairly fast. And the dilemma of converting to coal without untracking economic growth is being described explicitly by the Houston Lighting & Power Company (HL & P).

HL & P and the Texas Utilities system based in Dallas are the two biggest systems in the state. They generate about two-thirds of the Texas power, roughly half each. HL & P, however, has a much more concentrated service area than the three companies of the TU system, producing, as it does, power for the energy-intensive industry of the Houston–Gulf coast area. Through the years when natural gas was plentiful and cheap, HL & P provided the area with low-cost power which was one of the principal attractions for industry.

Like other utilities in Texas, HL & P was impelled by the rising price of natural gas to turn to other fuels. The company has a coal-fired plant under construction with two 660 Mw units due to come into service in 1978 and 1979. HL & P is also involved in the South Texas nuclear plant project and expects to add 750 Mw of nuclear-generated power to its system between 1982 and 1984.

By 1990, the company plans to have 5300 Mw of coal-fired plant capacity and 2000 Mw of nuclear capacity. This amounts to an increase of about 70 percent of the present total of slightly more than 10,000 Mw capacity of gas-fired plants.

The catch is that the company expects continued economic development in the area to increase the demand for electricity so that the coal-, nuclear-, and gas-fired plants will all be needed. This, of course, runs directly counter to both the state Railroad Commission's order and federal policy. The company is arguing that the construction costs of $8.3 billion for the new generating units are the maximum that the company and its customers can be expected to bear.

HL & P deplores the potential cost burden which would be added if the taxes on gas and oil use for boiler fuel embodied in the draft National Energy Act and being argued over in Congress are levied. These taxes, designed to hasten the shift from oil and gas use, would be imposed beginning in 1983. HL & P estimates that the taxes would cost the company nearly $900 million, which would not be available for construction of new facilities.

HL & P insists that it is not arguing with the goals set forth in the national plan, but merely with the pace, and that financing expansion of new generating plants to replace the gas-fired plants would put an unbearable burden on the customers who pay the electric bills. Implicit in the argument is the assumption widely shared in the Houston area that continued economic growth at the rates that have become familiar are desirable and necessary.

Power plants, of course, operate in a broader environmental-economic context. The increased use of coal by industry as well as by utilities will cause additional air pollution, particularly with particulate matter, sulfur oxide, and nitrogen oxide. The problem will obviously be greatest where industry and population are concentrated. The Houston–Gulf coast area is expected to be a major regulatory battleground.

The implications of coal utilization in Texas have been the subject of a formidable analytic effort. A comprehensive appraisal in a paper* recently completed at the University of Texas at Austin and being prepared for publication identified the Gulf coast as one of two areas in which coal conversion can be expected to have an adverse impact on air quality. The other is East Texas where the burning of lignite in power plants will predictably cause acid rainfall and other undesirable effects.

The Environmental Question

There is general agreement that it is too early to tell what the impact of environmental regulation—strengthened by the Clean Air Act Amendments enacted this summer—will have on the Texas economy. Too many crucial questions remain unresolved about implementation of federal law. There are differences, for example, between the federal Environmental Protection Agency and the Texas Air Control Board over the so-called nonattainment areas, the term used to denote areas which do not meet ambient air quality standards. EPA includes an entire large air control region if readings on a single monitor exceed standards. The state agency favors drawing the line around much smaller areas near sources of offending emissions.

Until push comes to shove on the regulatory front, the prognosis will remain uncertain. This is not to suggest that Texas will act like an environmental outlaw. The state's record on implementing laws controlling SO_2 emissions, for example, is regarded as good. But it is reasonable to expect that, to the extent that state agencies are delegated authority to implement the law and that relevant issues are reconsidered in Congress and the Courts, Texas will give growth the benefit of the doubt.—JOHN WALSH

*William R. Kaiser and Hal B. H. Cooper, Jr., "The impact of coal utilization under the National Energy Plan."