
Regional BACKGROUND PAPER

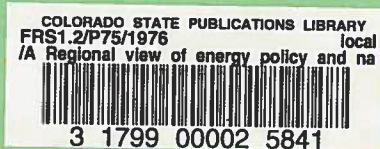
from the Rocky Mountain States



A Regional View of Energy
Policy and Natural Resources
Talks Delivered
During the
1976 National Conference, American
Society for Public Administration,
April 20, 1976

May 1976

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**Federation of
Rocky Mountain States, Inc.**



Federation of Rocky Mountain States, Inc.

The Federation of Rocky Mountain States, Inc., is a private non-profit corporation that includes state government officials and representatives of education and leading business enterprises within the Rocky Mountain region. Members meet in councils to determine multi-state issues, including those related to transportation, market development, housing, arts, human resources, natural resources and telecommunications. Councils develop policies and programs for consideration and approval by the board of directors, led by the governors of the Rocky Mountain states.

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This is a Regional Background Paper from the Federation of Rocky Mountain States, directed by the governors of Colorado, Montana, New Mexico, Utah and Wyoming.

This Regional Background Paper includes four speeches delivered during the 1976 conference of the American Society for Public Administration in Washington, D.C., on April 20, 1976. The speakers are participants in Federation activities on behalf of the Mountain West.

Opinions, findings, conclusions or recommendations do not necessarily reflect the views of the Federation of Rocky Mountain States, Inc.

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Nancy E. Dick
Colorado State Representative, Aspen

ENERGY DEVELOPMENT IN COLORADO AND THE ROCKY MOUNTAIN WEST

West of Denver, on U.S. Highway 40, is the town of Craig, Colorado. Like other small towns in the rural area, Craig is a farm community, the commercial center for farmers and ranchers. Craig is also a boom town, home for hundreds of coal miners who develop the rich veins upon which the town sits. An upsurge in mining activity has brought droves of families to Craig, and the town is buckling under this new growth. Housing is unavailable -- a growing number of residents live in mobile homes. Rents and prices have skyrocketed. The hospital is overcrowded. Schools can no longer hold the growing number of incoming students. The sewage and water system is operating at capacity level. Complicating the situation are the severe credit constraints which make the community's procurement of needed funds very difficult.

Craig isn't unique, however. In response to the nation's growing need for energy, many such towns have sprung up close to the rich mineral fields of the Rocky Mountain West. What is happening in Craig is happening in Hayden, Duchesne, Rock Springs and Gillette. The effort to meet the nation's energy demands has thrust upon these communities unmanageable growth problems -- problems that will be shared by many more communities when the region's great reserves of coal, oil shale, and uranium are further developed.

But these are problems that affect more than the people of the boom town area. These are problems that frustrate the state and local governments that are responsible for the general welfare of their populations. These problems affect the federal government which seeks to increase energy production in the West, and they affect energy companies that operate resource extraction and conversion facilities. The impacted area with its social and environmental problems is a major source of tension in a region and it provokes both litigation and legislation. And, importantly, the impacted area is a major contributor toward the confrontation between state and federal governments about who shall make decisions affecting Western energy resource development.

The energy problem in Colorado, then, is not a problem of mining coal or uranium from our vast reserves, nor is it a problem of extracting oil

from shale rock. Rather, it is a problem of developing a national and regional energy policy which understands and mitigates the impacts of rapid energy development. Without such a policy, Coloradoans are caught between a desire for growth and a fear of it. We want our energy resources to be developed, but in a thoughtful way. We do not want to bear the result of ill-planned, hasty mineral development.

But federal and state governments view energy development from quite different perspectives. The federal government is concerned with the consequences of continued national dependence on foreign energy suppliers. The President and the Congress have enunciated a national energy policy which has focused national attention on the energy reserves of the Rocky Mountains. It is loosely suggested by some that these reserves furnish a permanent solution to our energy crisis.

Indeed, the resources of the Rocky Mountain West will play a major role in the future of this country. The Rockies hold 42 per cent of the nation's high quality bituminous and lignite coal, 95 per cent of its uranium supply, and all of its recoverable oil shale. A conclusion of President Ford's Energy Program is that the U.S. will need significant amounts of these alternative fuels in the 1985-1995 time frame and beyond when our supplies of crude oil and natural gas become rapidly depleted.

While federal prospectives are directed toward these national concerns, state perspectives are more parochial, oriented toward impacts within the state. The primary responsibility of state government is to protect the security and promote the welfare of its constituents. The rapid development of Western energy reserves challenges that responsibility in two areas. First, our ability to maintain a healthy social-economic environment will be severely tested in the coming decade. Second, our Western life style is changing under pressure of industrialization the new development brings.

Accordingly, Colorado wants to influence, and sometime even control, the location of energy developments within its boundaries. Energy development would be permitted according to state-identified priorities concerning environmental quality, social concerns, and fiscal policies. Like other states in the region, Colorado wishes to develop approaches to control and mitigate adverse impacts and thus be assured that energy development can occur without unreasonable costs. Our objective is to determine a rational way to establish Colorado's contribution to the energy program.

In Colorado, public concern for environmental protection and the general welfare has expanded as rapidly as the demand for energy itself. This sentiment has been translated into a state policy which expresses the responsibility of the state to protect the legitimate needs of its citizens. This policy, developed in conjunction with the Federation of Rocky Mountain States, suggests that a balance be set between increased energy production and the maintenance of a high quality of life. It calls upon the federal government to recognize that Colorado has the responsibility to determine

what growth and change is necessary. It must be understood that Colorado will not allow its physical, social, and economic environment to be destroyed as national energy requirements are met.

High clean air and water standards must be preserved in Colorado as a matter of policy. So too, guarantees of acceptable land reclamation must be a prerequisite of expanded development of the state's resources. Colorado must take an active part in setting and enforcing the standards of energy development. In doing so, it must be afforded as much lead time as necessary in determining the need for and the acceptability of proposed developments. The federal government must see that the state is provided with appropriate financial assistance for planning and front-end development. Colorado and its communities should not be forced to bear a disproportionate share of the cost of development impacts.

Colorado already assists in fulfilling a number of national needs in food production, recreation and industry. Important amenities such as scenic and recreational values, wildlife and fishery resources must be maintained as a national resource. It must also be recognized that a balance of land use, water and energy developments in the state and region is necessary to maintain the integrity of environmental, economic and social systems -- systems which have made it possible for the people of Colorado to contribute to the national well-being.

This balancing strategy has as its foundation the recognition that energy conservation is essential to both short and long term energy policies. Wasteful consumption of energy too quickly depletes our energy reserves and thus causes intensive resource development which affects a magnitude of adverse societal and environmental impacts. This intensive resource development occurs only at the expense of other regional attributes. But low or moderate resource development may afford the opportunity to plan for a balanced program of resource use and environmental quality.

Most industrial and government experts conclude that our nation must maintain a strong industrial posture with its necessary energy requirements, but that a balanced use of resources should also be maintained. If energy development in the Rocky Mountain West is to occur without delay, then effective interfacing procedures between the federal and state governments are essential.

It is easy to recognize the complexity of developing a clear energy policy which balances the goals and priorities of the federal government with the goals and priorities of state governments. But because the states of the Rocky Mountain West now and in the future will play an important role in exporting their resources, national policies must reflect the relativist position of the region in meeting the needs of the rest of the nation. While they plan goals of increased energy development, national policymakers must recognize the character and desires of the states and the region. They must analyze all factors involving resource use. At the same time, state and regional goals must reflect the questions of what

kind of environment we want; what kind of economic stability we want, and what kind of social establishment we want.

Primary responsibility for controlling as well as planning energy development could rest with either of three levels of government -- local, state or federal. Although planning must include local participation, large developments are of more than local concern and the state should play an important role. Since federal minerals and national energy demands are involved, the federal government must also take part. The federal role should be one of technical and monetary assistance. Decision making and the setting of priorities should be kept with people at a lower, more local level.

Actual planning must be based on clearly stated policies and regulations from the state and federal level. A combination of consistent legislation and standards, coupled with technical and monetary assistance is needed to implement planning programs. The primary responsibility for developing these devices should rest with state government. The goals of its efforts and programs would be to mitigate adverse environmental impacts during mining operations, to reclaim surface mined lands, and to lessen environmental and societal impacts created by subsequent population increases and support activities. When these goals are formulated, the combination could be advocated as a state and regional proposal for federal involvement in alleviating the problems of impacted resource areas. Such federal involvement is imperative if the state and region is to simultaneously extract energy resources and provide for the general welfare of its residents.

The Mountain States have begun to address the difficult issues related to energy resource development. Each state legislature in the region has concerned itself in one way or another with the need for early funding and planning necessary to confront social and economic problems resulting from rapid energy development. Bills concerning environmental protection, conservation and reclamation have been introduced in most legislatures as well.

The Colorado legislature has considered several funding approaches to assist impacted communities. The costs of planning for any community and funding its facilities and services are massive. These costs are accelerated and heightened in a community like Craig which is experiencing the impact of rapid energy development. This is due to the speed with which development occurs and the frequent use of federal lands not taxable by the local jurisdiction.

To alleviate this problem, members of the state legislature have proposed an underwriting fund to be financed by mineral royalties and be managed to insure bonds and loans to local jurisdictions for public facility development. This fund would make it easier for communities to borrow funds. It removes the danger of default in the event that energy development doesn't reach fruition.

The legislature is attempting to change the allocation formula for school

foundation grants to accommodate for rapidly growing school enrollments. Previously, there was a one year lag between enrollment change and fund grant adjustments. This would be changed so that enrollment during either of the school semesters can be reflected in changes in state grants the following semester.

In addition, members of the state legislature are considering raising the amount of federal mineral royalty payments returned to local jurisdictions to cope with increased demands in impacted areas. These funds can be used only for planning and construction of schools and roads. Since the demand and cost of these services have expanded in resource areas, the amount of these federal royalty payments should be increased as well.

Colorado has for the past two years tried unsuccessfully to levy a severance tax on mineral operations throughout the state. The tax would be of utmost importance to local jurisdictions. A portion of the proceeds would be spent to meet public facility and service impact needs in both energy and mineral resource development areas. Although each attempt to adopt a severance tax package has met defeat, the majority of Coloradoans support the concept and enactment of a severance tax law seems assured in the near future.

While Colorado is making efforts to provide flexible tools for front end costs of community development in resource areas, the state has also made efforts to control the development of energy resources. During the current legislative session an unsuccessful attempt was made to create a special board which would review plans for energy development in Colorado and issue permits for the construction of new energy facilities. Similar to the energy facility siting legislation of other states, the proposal was designed to assess the impacts of energy developments before they occur. Like the severance tax, this proposal seems assured of passage in the near future.

The Colorado legislature also hopes to amend the current surface mining reclamation law. The law would be amended to increase the area subject to regulation; to extend regulation to more types of minerals -- including oil shale -- and to increase the amount of the reclamation required and detail the specific grounds for denial of open mining permits.

Although small in the face of rapid energy development, these and several other proposals represent major state efforts to cope with the problems caused by such development. They would give state and local government additional capacity to maintain conditions essential to a healthy environmental, social and economic climate.

It is our hope that these efforts will exert considerable influence in some key areas of national energy policy, both complementing and constraining federal powers. A state and regional policy which highlights the overall costs of energy development may well spark stronger federal action

on conservation policy. Legislation undertaken by Colorado and other mountain states will hopefully encourage federal policymakers and private developers to work toward reducing the explosive social, environmental and government costs in boom town areas.

Dr. Graciela Olivarez
New Mexico State Planning Officer, Santa Fe

THE ROLE OF THE WESTERN STATES
IN ENERGY DEVELOPMENT AND THE QUALITY OF LIFE

In preparing the following remarks for this panel I was reminded that three themes should be present. To be frank, I am not certain how to link them all successfully together. Each -- energy development and the quality of life, the role of the Western United States in that enterprise, and the relationship of energy to the bicentennial -- is evocative of ample discussion. Perhaps the best approach is to look at each topic independently of the others, weaving them into a cohesive pattern by way of conclusion.

ENERGY DEVELOPMENT AND THE QUALITY OF LIFE

Since the drama of the 1973 oil embargo, we have become acutely aware of the finite quality of our present sources of energy generation. We have also become more conscious than ever of the interdependent role we play in the world order. In an effort to reduce that interdependence and, indeed, to gain "energy independence," the nation has been led along a somewhat indecisive path toward fulfillment of that impossible dream. Obviously we cannot be energy or in any other way "independent" of the rest of the nations in the world. Technology, politics and communication have made that impossible. Then, too, while this country possesses vast deposits of mineral wealth with which to generate enough energy to make us theoretically "independent," several inhibiting factors prevent the achievement of real self-sufficiency, at least given present technology. So we are left with the reality of having to rely in small part, in any event, on foreign oil supplies, and our ability, in greater part, to develop our own energy resources. The questions that follow, of course, are at what costs are we prepared to make use of our energy resources and for what purposes?

The first question is already the subject of considerable and at times acrimonious debate. At one pole are the intransigent development-at-all-costs-environment-be-damned extremists. At the other reside the whimsical back-to-nature-Rousseauists. Neither represents a balanced nor realistic outlook toward the problem. Yet both seem to dominate the public debate.

The second question, in the midst of this current polemic, is one which has been much too ignored and the one which I feel is at the heart of the matter. Just what do we need or for what do we want such vast amounts of energy? Per capita consumption of energy in the U.S. is by far the largest in the world. Yet our quality of life is not necessarily the best. To the contrary, many question quite convincingly our acquisitiveness as symptomatic of a malaise which represents a severe lack of quality in our lives. I happen to agree with those who do not equate consumption with quality. This is not to say we should immediately and totally surrender all our energy consuming products and revert to living in log cabins in bucolic bliss. It is to say, however, that legitimate and urgent concern exists about the way we have become so dependent on energy and how deeply we seem to have developed a life style which confuses consumption and quantity with quality. I am convinced that simple but thoughtful modifications in our present life styles would save energy and at the same time lead to a more beneficial and pleasant way of life.

Let me point to a very few of many examples. The status of our health in this country has been put in doubt. Through the consumption of chemically laden foods, inhalation of toxic fumes, and over-dependence on mechanical transportation we are becoming more and more prone to disease. This is not a good quality of life. Our architecture has become stale and antiseptic. Buildings are square boxes of concrete and steel whose environments are "conditioned" by energy consuming means. It is rare to find a new office building where windows open. Yet elsewhere structures which are imaginatively and attractively designed cope with the elements without such dependence on artificial heating and cooling. Our natural resources have too often been thoughtlessly destroyed by the waste by-products of energy-based industry, depriving us of the beauty, wealth, and recreation of wilderness areas -- not to mention the economic impact on fishing and other commercial enterprises dependent upon a healthy natural balance.

All of this, of course, contributes to an erosion of what we call the quality of life. It is clear, then, that we have arrived at a critical juncture where we will have to make hard and long-lasting decisions. Are we to continue to indulge in wastefulness and acquisition and regard that as the ideal quality of life? Or are we to inject more balance into and a keener appreciation for those dimensions of life which are not necessarily dependent on energy and which appeal to our more refined sensibilities? To be certain, we cannot have both.

It does seem to me that we can strike an acceptable balance. Of course we have a need for more and more efficient energy. But let us pursue this development with the idea in mind that energy should serve us and not dominate our existence.

THE ROLE OF THE WEST

We in the West -- certainly in New Mexico -- are especially accustomed

to playing a major role in times of national need. We were critical actors in the Manhattan Project and once again in space exploration. And clearly we will be instrumental in the drive to develop an improved national energy capability. Yet three caveats need to be explicated.

First, the need for energy resource development should not lead us to the point where we sacrifice precious environmental resources in extracting the minerals necessary to produce energy. Our deserts and mountains in New Mexico are as critical an asset as our coal and uranium. Indeed, after we have extracted those minerals we will have to rely on the natural beauty of the state as a continuous economic base, drawing in millions of dollars worth of tourist trade annually. Thus careful planning can permit us to have the best of both worlds. We can mine our coal and uranium and drill for our natural gas and oil while at the same time guaranteeing the preservation of the land and natural environment. This has been done elsewhere and can be done in New Mexico.

Second, we -- and this is inclusive of most if not all of the energy producing states -- must make certain that our raw materials are not exploited without proper compensation. We need to formulate tax policies which will provide our citizens with increased revenues based on mineral extraction and exportation. It should not be forgotten that New Mexico and other Western states will be expending substantial public revenues by way of investments to set in place the infra-structure and public services required to sustain energy development. If we are not to be insured a fair return on our investment, then we need to review our role as energy producers. We also need advanced financial assistance from the federal government to plan for the orderly development of our energy resources. This support should especially be allocated for adequate planning to meet the socio-economic problems which accompany such large scale activity. The sparsely populated Western states are particularly prone to feel the impact of development when relatively large numbers of workers and their families migrate to the energy development areas.

Third, certainly the role of the West in developing the energy sources necessary to sustain the nation's economy and society is vital. But at this point in time the final extent and nature of that role is still uncertain. An editorial in the February 2, 1976, Washington Post underscored a major problem. It referred to the fact that presently ". . . this country still has no clear idea how much energy it will need 10 years from now, or where it will come from."

There seems little or no doubt that a good portion of it will come from the West's coal, oil, gas and uranium. But just to what degree and under what conditions we do not yet know. So a definitive role of the West in energy development is still to be forthcoming. It is time, then, that national leaders pull together to spell out clearly the policies to be followed. As long as the President and Congress cannot define how the country is going to deal with the energy crisis, then we in the

West are going to find it increasingly difficult to avoid the problems to which I have already alluded.

ENERGY AND THE BICENTENNIAL

One of the most important birthday presents Congress and the President could give the American people is a well-defined, judicious, and balanced energy policy. But we, as a nation, need to pause on the occasion of this anniversary and reflect over the past two centuries. Despite its glaring faults and inconsistencies, no other nation in the world has been so blessed by an abundance of resources, both human and natural. Because they have been so ample, we have too often taken them for granted. It is time to contemplate, to understand that literally and figuratively Frederick Jackson Turner's safety valve theory has no merit, and that human and natural frontiers have tangible limits. It is time for us to consider the finitude of our resources. The future of the United States as a dynamic and leading nation over the next 200 years will depend on our ability to plan well now and turn our energies toward resource conservation, both in fact and in attitude.

The founders of the nation demonstrated a remarkable ability to account for future political vicissitudes. It is up to us to display a similar capacity with respect to our natural resources. The same spirit of commitment to political liberty found in 1776 will hopefully be applied to the achievement of a sense of environmental and economic balance in 1976. It is time for us to experience another revolution, in the Jeffersonian sense, one predicated on a struggle to break the dependence on over-consumption and wastefulness. It is this more than anything which depletes needlessly our precious energy resources.

CONCLUSIONS

Throughout the three themes there is one constant which emerges -- that the energy crisis is a symptom of a more profound dilemma. The technological capability of this nation is truly astounding. I believe we can develop alternative sources of energy and exploit existing ones to be able to maintain and even increase present consumption rates. But do we want to and should we continue to abuse our environment with dangerous by-products of energy intense industries? Do we want to threaten even more what many believe has become a deteriorating quality of life? Is now not the time to contemplate our attitudes toward use of natural resources and ecological imperatives? I feel these are the issues which need to be explored.

It seems to me that a more balanced and conservative approach to energy consumption would result not only in an improved quality of life, but would also have direct and beneficial economic consequences as well. There is an entire economy which can be developed from wise uses of finite natural resources. Other industries which have been threatened by a de-

generating environment could be rejuvenated. Then, too, the millions of work days which have been lost due to pollution-induced illness could be saved.

It is axiomatic that we have to engage in a massive program of energy development. But let us be careful in our efforts to meet this crisis not to sow the seeds for another one in the future. Through sound planning and balanced policy we can both produce the energy required to meet national needs, and at the same time preserve and enhance the quality of life.

C. E. Smith, Jr.
President, The Carter Mining Company, Gillette, Wyoming

A REGIONAL VIEW OF ENERGY POLICY
AND NATURAL RESOURCES

Thank you for inviting me to participate in this panel and for giving me the opportunity to speak out as a coal man and as a Westerner on these critical issues of energy policy and natural resources.

At the outset, it is important to recognize that there is an energy crisis in the United States. There is an abundant supply of available energy in the world but a shortage of available domestic energy in the United States. The obvious result is that energy is flowing from the area of abundant supplies to the area of shortages in unprecedented volumes. Thus, we have come to the point that almost 40 per cent of the petroleum needs of the United States is imported from foreign countries, and this amount is increasing every day. As you may remember from the long gasoline lines and the lightless Christmas of 1973, much of those imports originate from unreliable sources. A damaging proportion of our critical energy needs can be interrupted without warning. The really frightening thing is that we are becoming increasingly dependent upon those same unreliable sources, and next time, the impact of an embargo upon the economy of the United States could be much more severe.

Because we consume more energy than we produce, America has a real problem. Each American consumes about seven times as much energy as the average citizen in the rest of the world. We are squeezed between an increasing demand for energy and a shrinking supply of the fuels we most commonly use. This is what is meant by the term "energy crisis."

This morning, I would like to briefly share with you our assessment of some of the physical aspects of the energy situation in which the world and particularly the United States finds itself. Then I want to show you how Western coal fits into that picture. And lastly, I would hope to leave you with the conviction that a more effective balance between the necessity of protecting our environment and the necessity of providing secure, reasonably priced energy for our people must be achieved.

THE OUTLOOK FOR THE WORLD AND UNITED STATES ENERGY

First, perhaps a few comments on our assumption may be helpful. In simplest terms, our base case is predicted on a very rational and uneventful economic and political climate throughout the world. We have assumed, for example, that neither a major war nor a depression will occur. We have also assumed that energy prices will keep up with inflation and real cost increases, and that prospective developers as well as consuming countries will have access to the world's energy resources and supplies.

Let's consider for a moment several facets of the world energy outlook:

Currently, taking the non-Communist world as a whole, there is now no physical shortage of petroleum. Spare crude oil production capacity -- virtually all of it outside the United States -- is estimated at seven to eight million barrels a day, and spare refining capacity at 10 million barrels a day -- 20 per cent of total capacity for each of these functions. Spare tanker capacity is estimated at 30 per cent.

Proceeding from this comfortable, energy-secure position, we expect non-Communist world demand to grow at a rate of 4 per cent a year between 1977 and 1990. Even though the U.S., Europe and Japan are expected to have a lower rate of demand growth than the other countries of the non-Communist world, they will still be accounting for 70 per cent of the demand in 1990. The U.S. alone will account for 36 per cent of demand in 1990, compared with 42 per cent today.

Energy sources other than oil -- especially coal and nuclear -- will become increasingly important in meeting this demand; however, oil will still be supplying almost half of world energy requirements in 1990. Total oil requirements are projected to increase from about 46 million barrels a day in 1975 to 78 million barrels a day in 1990 -- an increase of about 70 per cent. Despite concentrated exploration and development in the U.S., Canada and the North Sea, increasing volumes will be needed from OPEC, rising from about 29 million barrels a day currently to more than 47 million barrels a day in 1990. A major question, and one which is of great importance to the world, is whether OPEC will be able to or willing to produce these volumes.

Where will the fuels needed to satisfy this demand come from? By 1990, nuclear could be supplying about half of U.S. electricity demand, compared with eight per cent in 1975. Various problems have retarded the growth of nuclear capacity, but as of now, more than 60 nuclear plants are either in or about to go in operation. By 1990, total nuclear capacity is expected to increase almost eightfold to some 300,000 megawatts. This growth is reasonably well-defined by new plants already under way or announced. But no one knows what roadblocks lie ahead. Since about 1971, the trend has been for each new forecast of nuclear capacity to be lower than the one before.

Coal will show strong growth as more coal-fired generating plants are built. Domestic coal production is expected to reach a billion tons annually by 1990, the equivalent of nearly 13 million barrels of oil a day, or nearly twice last year's coal production. We project that about 10 per cent of U.S. coal output in 1990 will go toward the production of synthetic oil and gas.

Most of the growth in coal production is expected to come from low-sulfur Western reserves. Development of these reserves has become economically feasible as demand for low-sulfur coal to meet environmental regulations has increased. This development has been impeded by a suit filed by the Sierra Club, which resulted in an injunction prohibiting the Secretary of Interior from approving certain mining plans in Wyoming, but the U.S. Supreme Court stayed this injunction in January and is expected to rule on the case this year.

Oil from shale is not expected to become commercially available for several years, nor can we look for commercial quantities of oil from coal until the mid-1980's. Synthetic gas from coal should become commercially available in the early 1980's, but total synthetic oil and gas production will only represent two per cent of domestic energy supply in 1990, just over one million barrels per day of oil equivalent.

Since oil and natural gas currently supply more than three-fourths of our energy, let's carefully consider the outlook for these two fuels, starting with gas.

Gas production peaked in 1972 and has been declining ever since. Even with new gas coming onstream from offshore leases and Alaska's North Slope, we do not expect the domestic output to recover to 1972 levels. By 1990, more than half of the projected gas production must come from reserves still to be found. This implies additions averaging 16.5 trillion cubic feet a year over the next 15 years, or about the same discovery rate we've had in the last 15 years, including the big North Slope find.

I have left oil until last to emphasize its function as the nation's swing fuel. Oil will remain the dominant fuel over the forecast period, but the decline in domestic production should continue until late 1977 when North Slope oil begins moving through the Trans-Alaska pipeline. Production of North Slope oil should reach two million barrels a day by 1982.

With the Alaskan oil, plus new supplies from other areas, domestic production is projected to recover to about the early 1970's level. As with gas, however, more than half of domestic oil production in 1990 will have to come from future discoveries. Here again, large additions to reserves are implied: an average of 3.2 billion barrels a year over the next 15 years, or slightly more than the three billion barrels a year added during the 1960-1975 period.

On balance, then, the domestic oil supply is expected to lag far behind demand. This will call for increased oil imports to fill the gap between supply and demand. Imports are forecast to increase from nearly 40 per cent of total oil supply to about 50 per cent by 1980, and to maintain this share of demand through 1990. Any slower-than-forecast growth in coal, nuclear or gas would, of course, automatically increase the need for additional oil imports. Whether OPEC will be willing or able to increase its production to provide all of the volumes needed is an important factor in the U.S. energy picture.

THE IMPORTANCE OF WESTERN COAL

As a nation, we have some very clear choices: (1) We can import the energy we need; (2) We can reduce consumption; (3) We can accelerate development of new energy technologies, and (4) We can accelerate development of domestic supplies of conventional fuels. Actually, all will be necessary.

Imports are the only way we can plug the short-term gap. Earlier this month, Eric Zausner, Deputy Federal Energy Administrator, said, "By 1985, when imports are expected to reach 14 million barrels a day, an embargo would have a crushing effect and the country would come to a standstill."

He said the country is still in a dangerous position and a potential for an embargo still exists. "As dangerous as an embargo," Zausner said, "is the already pressing problem of price. After the 1973 embargo, oil prices went up by about \$8 a barrel. In October of last year, it rose by another dollar, and a meeting is expected in June to consider another raise. What this means for the American family is that in 1970, before the embargo, every family spent \$50 a year on foreign oil. Last year it jumped to \$350, and next year it could be as high as \$500."

Some very influential voices have urged that the solution is conservation. During the Arab embargo, the American people proved that they can conserve energy, and there is little doubt that we can conserve more. However, curtailments of the magnitude contemplated would be perilous for the economy of the nation, potentially increasing unemployment and reducing the overall quality of life.

Technology is probably the answer for the future, but it can be only minimally effective before 1990. It was 11 years after NASA was created before the first American stepped onto the surface of the moon, even though it was one of our nation's highest priorities.

In the final analysis, the United States really has but two choices -- we can develop our own energy resources, or we can become increasingly dependent upon foreign sources at whatever prices and conditions they dictate.

Real improvement of our energy outlook depends on an accelerated development of domestic supplies. The U.S. has a large resource base of oil, coal and gas. Our studies indicate there is as much oil and gas remaining to be discovered in the U.S. as has been discovered in the country up until now. As for coal, the U.S. has nearly half the non-Communist world's deposits, and this coal contains twice the energy of all the Middle East oil reserves.

Despite our best conservation efforts, the dampening effect of high oil prices, and slower economic growth, most responsible forecasts say that U.S. coal production must double by 1990. We know where our coal is. We know how to mine it, ship it and use it. What we urgently need right now is (1) a national awareness that coal is indeed the most viable near-term answer to the energy crisis, and (2) a national determination to bring our coal resources to bear upon the problem as quickly as possible.

That is my story as an energy man. Now let me put on my hat as a coal man and as a Westerner and start with a little history.

In the past, obstacles to Western coal development were largely economic -- it was too far from major consumption points and, in general, its low heating value made other coals more attractive. In short, the cost was too high to compete with lower-cost abundant alternate fuels.

But as they always do, times have changed. As we all know, energy resources of all kinds have risen in value and traditional fuel supplies have grown scarce. Environmental legislation has made the use of Eastern coal unattractive in some of our major population centers, largely because of its high-sulfur content. As a result, low-sulfur Western coal has become economical and desirable, and the demand for Western coal has risen. This demand is expected to grow. In a report issued in 1975, the National Electric Reliability Council forecast a total consumption by electric utilities of 253 million tons of Western coal in 1984 (compared to about 74 million tons in 1975). This is not the highest forecast available; however, it is representative of one conclusion that is common to all responsible projections of U.S. energy supply and demand. That conclusion is that the nation is going to need a lot of Western coal.

As a Westerner, I take pride in the fact that Western resources -- energy and environment -- are so important to the nation. It is not out of line to speculate that the security of the nation may ultimately depend on Western coal. Jobs for thousands of people may depend upon Western coal. Western communities and states can absorb and would prosper from the new business and civic growth which coal development can bring. Land areas actually in mining at any one time would be insignificant. We are confident that Western coal can be mined without significant damage to the environment or to agriculture. Surface-mined lands can be reclaimed to equal or better post-mining use. The value of the coal would contribute to the economic well-being not only of the mining companies and suppliers, but also

to the well-being of thousands of individuals, scores of communities, several states and the entire nation.

BOTTLENECKS OF WESTERN COAL DEVELOPMENT

There are many obstacles between today's forecasts and tomorrow's realities, and the most formidable of these are neither technological nor economic. The technology to mine Western coal is currently available. Western coal is now economically competitive. Environmental constraints can be met. . . the land can be effectively reclaimed.

Today's impediments to the prompt development of Western coal are of another variety. They are the legislative and regulatory bottlenecks of a control system which has good intentions, but a poor grasp of the factors which allow development to take place. 60 per cent of the coal in the West is owned by the federal government, and the Bureau of Land Management has estimated that because of ownership patterns, federal policy influences over 80 per cent of Western coal. For this reason, it would be useful to consider just a few of the impediments caused by federal action and inaction.

First, natural gas is priced artificially low, both stimulating excessive demand and reducing incentives for new supplies.

Second, a five-year moratorium on federal coal leasing has blocked the formation of potentially productive coal tracts and makes inaccessible some of the most attractive reserves.

Third, uncertainty over surface mining requirements discourages investment and complicates sales agreements.

Fourth, Clean Air Act (CAA) prohibitions (and the uncertainty of pending legislation) make plant siting and coal marketing so complex that projects are often delayed and potentially abandoned permanently.

Recognizing the need for flexibility, both the Administration and the Congress have been working on amendments to the CAA. The objective of the President was to delay implementation or relax standards so that new standards could be efficiently phased-in without jeopardizing the economic recovery. However, the objective of many in Congress has been to tighten timing deadlines and increase the areas which would be protected from "significant deterioration" of air quality. The Federal Energy Administration (FEA) has estimated that if currently proposed legislation were enacted, as much as 65 per cent of the land area of the continental United States could be excluded from any significant energy or industrial development. According to the FEA, this "off-limits" area could be reduced to 16 per cent through the use of additional controls, like scrubbers. However, the American Petroleum Institute estimates that "if the proposed amendments were fully applied, more than 90 per cent of America's land area would be off-limits to many new industrial and energy-producing activities, unless they practiced a degree of emission control not attainable by today's technology."

Naturally utility company planners are having a very difficult time determining where to turn. The people who underwrite their financial requirements are also a little nervous. The only thing that is certain is that nothing is certain.

Fifth, the National Environmental Policy Act (NEPA), because of its ambiguity and uncertain guidelines, imposes extensive delays and additional costs upon potential mining ventures.

There are two major areas where NEPA adversely impacts coal development:

The first is the requirement for preparation of a detailed environmental impact statement on any "major federal action significantly affecting the quality of the human environment." Congress did not provide any guidance as to what constitutes a "major federal action" or what a "detailed statement" is. Administrative and judicial interpretation has required these statements to include an enormous amount of information which is expensive and time-consuming to obtain and often only minimally relevant to development or to protection of the environment. In the case of our first Wyoming mining project, it was over two years after the environmental assessment was initiated before the EIS was published by the Department of Interior (DOI).

The second major area where NEPA can be used to obstruct coal development is in the abundant possibilities for legal challenge which can delay implementation of projects for still more years, if not indefinitely.

These are but a few of the federally-imposed constraints upon Western coal development, and they must effectively be resolved before our abundant Western resources can be meaningfully utilized to relieve the nation's energy crisis.

TOWARD A BALANCE BETWEEN ENERGY AND ENVIRONMENT

Visions of the ravaged valleys of Appalachia spring to the mind of the concerned citizen when the subject of surface mining Western coal is mentioned. While this is a worthy concern, it is a concern based upon outdated facts. It is this same concern which has led state governments, concerned citizens and responsible coal operators to adopt modern laws and operating practices which have made such abuses a thing of the past. Today, the West is in danger of no worse than short-term, temporary disturbance of minimal land areas. Reclamation to equal or better use and appearance is the name of the game in 1976.

Most coal miners are responsible citizens who will restore the land to equal or better use after surface mining. However, to protect against those who are not, 35 states have passed laws regulating the surface mining of coal, 29 of these since 1970. These laws, which cover 90 per cent of U.S. coal production, provide the balance of development and environmental protection which the people of each state desire. Almost without exception, these state

laws provide for proper and effective reclamation of mined lands, yet make it possible for the resources to be developed in a responsible manner. Effective laws at the state level minimize the need for overly restrictive federal legislation while providing assurances to the people that responsible reclamation will take place.

The pendulum has swung far toward environmental protection, and I think we can all agree that the swing was vital to the nation and long overdue. But adequate domestic energy supplies are also vital to the nation, and it is my opinion that a swing back to moderation and balance is in order. As providers of the nation's energy, we and other responsible coal companies know that we can develop the nation's major energy resource without permanently damaging the nation's land, air or water. It is my opinion that the rational, reasonable men who establish national policy, who make the laws, and who render decisions based upon them must very soon agree upon an effective balance between the necessity of protecting our environment and the necessity of providing secure, reasonably priced energy for our people.

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GENIE AND MAN IN THE ROCKY MOUNTAIN WEST

INTRODUCTION

One and a quarter centuries ago a distinguished Senator from Massachusetts named Daniel Webster was reported to have asked the following about the Rocky Mountain West:

"What do we want with that vast and worthless area, this region. . . of shifting sands and whirlwinds of dust, of cactus and prairie dogs? To what use could we ever hope to put these great deserts and these endless mountain ranges?"¹

Those lands which were once considered by Webster and others as barren and worthless are now recognized in a different light. On the one extreme there are those who see the Rocky Mountain West as a landscape never to be tarnished. And at the other end of the spectrum are those who are perhaps over-confident in the ability of man and his environment to be able to withstand any and all developments.

The Rocky Mountains are blessed with an abundance of natural resources. Over 40 per cent of the nation's bituminous coal reserves are located there and close to 10 per cent of our country's oil and natural gas production takes place there.² There are yet vast quantities of natural gas locked up in very tight formations waiting, along with the extensive deposits of oil shale and bituminous tar sands, for someone to determine technically and economically how to release the precious fossil fuels the Rocky Mountains contain over 90 per cent of the nation's uranium reserves. And besides the non-renewable resources the Rocky Mountains are blessed in abundance with thermal springs that prompt us to be confident that our geothermal energy resources may play a relatively small but significant role in our future along with solar, wind and the already existing hydro developments.

REMNANTS OF A COLONIAL HERITAGE?

This year we celebrate our country's bicentennial and our release--so to speak-- from the bonds of a colonial power and the establishment of con-

stitutional government. As we look back to our founding fathers, we are awed with their accomplishments and are also grateful for those who dared to venture west to what was then and is even now a land of uncertainty.

There are many in the Rocky Mountain region that even yet feel as though we are but a colony -- by Noah Webster's definition -- "a body of emigrants or their descendants in a remote region under the control of a parent country."

On the average, about 50 per cent of the vast lands in our region are owned and controlled by the federal government. For example, in the states of Nevada, Utah and Idaho, federal land ownership amounts respectively to 86.5 per cent, 66.1 per cent and 63.7 per cent.³

These federal lands are administered by several federal departments of government -- the Bureau of Land Management, the Forest Service, the National Park Service, the military and others.

If you were to observe a land ownership map of Utah, for example, it looks like a mosaic of checkerboards. When Utah became a state on July 16, 1894, the U.S. Congress provided that Utah would receive sections 2, 16, 32 and 36 of each township in the state to support the public schools. This totaled 5,844,196 acres.⁴ However, the land had to be surveyed before title could be given to the state. In some cases, withdrawals of some state-designated land were made by the federal government for defense or other purposes before the land was surveyed. In those cases, the state was allowed the right to select other lands "in lieu" of mineral lands if the lands withdrawn by the federal government were mineral in character. Utah has approximately 200,000 acres still remaining as its entitlement. Part of this entitlement was chosen to lie in the rich oil shale region in the eastern part of the state and is awaiting adjudication by the federal court.

Individual states do share, however, in federal revenues derived from private use of the federal lands through such mechanisms as the Mineral Leasing Act and the Taylor Grazing Act. There are proposals in Congress at the present time to change the partitioning of the mineral lease revenues in order to provide an increase in funds to the states to handle some of the costs associated with energy and mineral developments. With regard to the grazing act, there is a great concern that grazing fees are set in such a manner that they neglect market fluctuations and other localized costs of doing business and thus cause great hardships to those who have developed that part of the livestock industry which depends on federal grazing lands. At the beginning of this decade there were about 10 million head of livestock on federal lands in the region, or approximately 1.25 head of livestock per person residing in the region.⁵

Vestiges of colonial-type control over federal lands show up in some of

the land use decisions made -- or not made -- by Washington-based agency heads who have control over the land. For example, the Interior Department's Bureau of Land Management controls about 53 per cent of the region's federal lands.⁶

We do witness as a positive note a spirit of cooperation between state and federal agencies at the state and regional level. In 1974, state and federal agencies in Utah organized an "Energy Forum" through which they could regularly communicate and work to resolve interagency problems. One of the products of this forum was a handbook of federal and state energy laws.⁷ Part of the costs of the forum were financed by the Department of Agriculture's SEAM program and facilitated through a cooperative agreement between Utah's State Advisory Council on Science and Technology, and the state or regional offices of the U.S. Forest Service, and the Bureau of Land Management.

The states in the Rocky Mountain region regularly cooperate on common energy related issues. This cooperation is accomplished through such formal organizations as the Federation of Rocky Mountain States, the Western Interstate Nuclear Board, the Western Governors' Regional Energy Policy Office and others.

THE INTERNALIZATION OF EXTERNAL COSTS

For sometime economists have been studying and placing increased emphasis on the phenomenon of social costs and the internalization of undesirable "spill-over" effects from private as well as public developments.⁸ Undesirable spill-over effects are considered as costs external to -- or in addition to -- regular production costs.

In the Rocky Mountain West -- as in other regions -- we have been slow to recognize these diseconomies. Perhaps we felt they were just a necessary part of industry -- or maybe we took for granted our clean air and beautiful panoramic vistas. Perhaps we were much too busy to notice, or maybe we were just plain ignorant of the full impact of these "spill-overs" and the fact that technological (or nonpecuniary) externalities should be rightly internalized by the producer and these social costs paid for by the ultimate consumer or beneficiary of that which is produced.^{9 & 10}

The handling of technological externalities is a challenge not only to the public but especially to public administrators. I have had occasion recently to encounter examples where public administrators did not understand the concept of industry's assumption of total social costs and where representatives of a public agency (like any other biased party at interest) were unwilling to acknowledge responsibility to assume a clearly identified and cost-assignable technological spill-over. Whereas in the past it has been felt that problems created by technological externalities were the exception rather than the rule, Kneese and Ayres point out that externalities "associated with the disposal of residuals resulting from the consumption and production process" are a "normal, indeed, meritable part of these processes.

Their economic significance tends to increase as economic development proceeds, and the ability of the ambient environment to receive and assimilate them is an important natural resource of increasing value."¹¹

PROJECTED REGIONAL COAL AND URANIUM DEVELOPMENTS

It may be that the region's greatest challenges lie ahead during the next one or two decades. If national policy is directed towards lessening our dependence on foreign oil and conserving our decreasingly available supplies of domestic oil and gas, then production of coal and uranium in the region could more than double by 1985 and double again by the year 2000.^{12 & 13} This statement is in line with projections and recommendations made by the Electric Power Research Institute (EPRI). In a recent presentation before the Congressional Subcommittee on Energy Research, Development and Demonstration of the House Committee on Science and Technology, Chauncey Starr noted the following as one of his summary remarks:

"Substantial dependence on foreign fuel sources is undesirable for reasons of national security, balance of payments, and unforeseeable costs. Therefore, energy options must concentrate on indigenous fuel resources available for this purpose -- principally coal and uranium. The apparently limited availability of oil and gas, and their greater utility as a petrochemical base, airplane and auto fuel, and other unique uses, makes it desirable to minimize their use for future electricity growth."¹⁴

Dr. Starr specifically concludes that by the year 2000 the target for electricity supply will be "almost four times present levels"¹⁵ assuming a historical growth rate coupled with a reasonable level of energy conservation. And he concludes that "90 per cent of our electricity needs will have to be supplied by coal-fired and nuclear power plants" and that solar and geothermal energy developments will optimistically be furnishing five per cent of our needs and the remaining five per cent will be provided by hydro-electricity.

What will the impact be on the region between now and the year 2000? This depends upon many factors including the availability of new technology in mining, conversion and transmission. The labor force/people impact due to mining and construction of power plants will depend upon whether the coal is such that it be surface or deep-mined, and where the power plants will be located. Your guess at present is as good as mine regarding power plant siting. The uncertainty is illustrated by the ill-fated Kaiparowits 3000MWe plant in southern Utah, which was initiated in the fall of 1962. Just last week -- on April 14, almost 14 years later -- the principal power companies say they have "dropped out of the project because delays in federal approval, lawsuits and legislative opposition all put the ultimate costs of the project in doubt."¹⁶

EPA objected to the Environmental Impact Statement, the National Park

Service is on the verge of declaring air standards in the region which most likely would have killed the project, the Secretary of the Interior was in the process of making up his mind as to whether or not he would approve it, and an environmentalist group in Arizona was reported to be initiating a court injunction to prevent the project's development.

EXTERNALITIES ASSOCIATED WITH COAL AND URANIUM IN THE REGION

The states in the region are more aware than ever before of the need for each energy/mineral development project to account for and internalize within reason all adverse "spill-overs" or external costs. The power plants, the mines and the mills will be expected to comply with state and federal regulations which hopefully will be based on rational benefit/cost analyses using the most current scientific methods and data. It is expected that those who develop projects will act responsibly over the life of the project and work cooperatively with state officials to assure that adequate reserve funds, performance bonds, etc., are established to take care of ash dumps, and tailing piles, which may require perpetual surveillance and maintenance. The West has had some sad experiences in the past with mineral development programs. There are, for example, 21 more or less abandoned uranium tailings piles in the West presently under study to determine reclamation alternatives and costs. Until recently, federal administrators have been slow to respond to the need to internalize these adverse externalities which have taken place over the past two-and-a-half decades. If the federal government were to fail to recognize the principle of externalities in the case of low-level radioactive residuals, how will they possibly then bridge the credibility gap associated with high level wastes?

IMPROVED CONVERSION EFFICIENCIES PREDICTED TO OFFSET EXTERNAL COSTS

The Electric Power Research Institute (EPRI) predicts that by the year 2000 improvements in plant efficiencies will more than compensate for environmental energy costs.¹⁷ They point out that "although the potential for conservation is greater for the non-electric uses of energy, the probability of actually realizing the savings is higher for the electric sector. This stems from the fact that technology of conservation is most easily applied to electrical uses, because the conservation effort can be centralized in the technical aspects of large power systems and in the manufacturer's design of mass-produced equipment. In contrast, for example, the heat insulation of homes involves highly decentralized individual actions. Also, the capital intensive nature of electrical equipment makes efficiency a normal design objective."¹⁸

Inasmuch as the consumer of electricity ends up paying the costs associated with internalization of externalities he undoubtedly will be pleased with the prospects of having these costs negated by improved plant efficiencies. It should be pointed out, however, that these external costs must be internalized regardless of whether or not savings result from improved efficiencies.

EXTERNALITIES, NEPA AND MAN

In 1969, when Congress passed the National Environmental Policy Act (NEPA), they in essence told the nation that it is time we began to be better "neighbors." NEPA could be interpreted as the ethic which encompasses the Golden Rule, i.e., to "do unto others as we would have them do unto us." The language of the law, however, is not quite that simple. In fact, it is almost contradictory in places.

For example, it says the federal government should strive to "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences. ."19 It is impossible to do anything without degradation!

Further on, the law expresses the goal that the nation "approach the maximum attainable recycling of depletable resources";²⁰ whereas, the word optimum should have been used in lieu of maximum. Maximization of recycling can be sub-optimal!

The law finally recommends that a "systematic, interdisciplinary approach"²¹ be used and that each environmental impact study include a detailed statement which includes "any adverse environmental effects which cannot be avoided should the proposed be implemented. ."22 This language causes one to believe that parties at interest will be rational and that decisions will be made to proceed with a development project of high national priority even in the face of known environmental degradation, be it of a temporary or lasting nature. This, of course, assumes that national priorities have been established and developed in a rational manner.

Included within NEPA is the concept of externalities referred to earlier, i.e., if a project is approved then it must absorb or internalize within reason the external costs associated with the project. I believe industry will show a willingness to do this provided that the public administrator makes an effort to understand and accept marginalism as a fundamental principle of applied economics. Marginalism essentially means that you optimize the internalization of external costs to the point where additional incremental increases in costs will not exceed the associated incremental increases in benefits, i.e., to the point where marginal costs are equal to marginal benefits. The difficulty we experience here, of course, is in the measurement and quantification of benefits which is very subjective and in essence can be debated and challenged indefinitely.

Whereas NEPA declares "a national policy which will encourage productive and enjoyable harmony between man and his environment,"²³ it has not yet fostered an optimal harmony between man and man. That perhaps is our greatest challenge.

SUMMARY

In summary, if somehow or other we can get man to "rub the lantern" just right, we can get GENIE to do marvels for us. GENIE is the acronym I have selected for an optimum mix of government, energy, NEPA, industry and externalities.

We are capable of optimizing the mix and to do otherwise would be a great letdown to those who preceded us as founders of this great nation and to those pioneers in the development of the West who we now represent.

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