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The decision to use Federal incentives to assist in the commercialization of energy technologies should be preceded by a careful analysis of the technology's state of development, the technology's economic feasibility, and the target group whose actions will be influenced. Senate Bill 419 meets some of these requirements in that it would enable affirmative congressional response through the normal appropriations process for the costly projects which would be authorized. In addition, it would require the Administrator of the Energy and Research Development Administration to consider specific criteria in evaluating a project's economic, social, and environmental viability. The proposed legislation could be improved if it were amended to (1) emphasize demonstration of smaller than "commercial-size" plants, (2) provide criteria to choose projects and processes, and (3) consider several alternatives to selling the demonstration facilities when demonstration is completed. Furthermore, Section 304 of the bill should be reconsidered since other legislation has already been enacted which provides Federal assistance to State and local communities which can be used to mitigate socioeconomic impacts resulting from energy resource development. Adoption of these proposed amendments would result in stronger legislation for oil shale development. However, a more preferable approach would be to pass legislation which encourages the development of emerging energy technologies based on an overall assessment of all such technologies. (LDM)

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STATEMENT OF
MONTE CANFIELD, JR.
DIRECTOR, ENERGY AND MINERALS DIVISION
BEFORE THE
SUBCOMMITTEE ON ENERGY PRODUCTION AND SUPPLY
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES
ON
S. 419, 95th Congress

Mr. Chairman and Members of the Subcommittee:

We welcome the opportunity to discuss with you our views on developing and commercializing emerging energy technologies and on S. 419 which would establish a Federal program to determine the commercial viability and environmental and social impacts of two oil shale retorting technologies through Federally owned demonstration facilities.

S. 419 is one of several bills before the 95th Congress (e.g., H.R. 36, H.R. 37, H.R. 38, H.R. 1142, S. 36, and S. 429) which would provide various forms of Federal assistance to encourage the use of a variety of energy technologies. The other bills we have seen would provide assistance in the form of loan guarantees and price supports for demonstrating synthetic fuels, oil shale, biomass, ocean thermal gradient, geothermal, and other renewable resource technologies, and grants and loans for community impact assistance.

As you know, we have expressed our views before on proposed Federal assistance for financing commercialization of emerging energy technologies and the role of the Federal Government in encouraging development of these technologies.

Our views remain the same as those expressed in our August 24, 1976, report to the Congress entitled "An Evaluation of Proposed Federal Assistance for Financing Commercialization of Emerging Energy Technologies" (EMD-76-10). In that report, we sought to set forth a framework and perspective for considering (1) energy actions which could contribute to solving energy problems in the next 10 to 25 years and (2) the role of the Federal Government in encouraging activity in each of the areas.

The report discussed criteria for making the right choices among energy technologies. We said that three factors should be considered.

--The contribution that each technology can make in meeting the Nation's energy needs within a specified timeframe either through reducing demand or increasing energy supply.

--The total cost of making the technology commercial including costs of plant construction, costs of alleviating adverse socioeconomic impacts caused by the energy development, and the costs of price supports or further subsidies which may be required.

--The price at which energy produced by the technology would have to be sold and the means by which the price would be assimilated by our economic system.

We also said that the decision to use Federal incentives to assist in the commercialization of energy technologies and the determination of which incentives would be most appropriate required interrelated analysis of at least three factors.

--The technology's state of development. Is the technology developed to the extent that it can be deployed on a broad basis? Have the environmental and socioeconomic questions been answered?

--The technology's economic feasibility. Will the energy produced as a result of deploying the technology be economically competitive with competing energy sources?

--The target group whose actions will be influenced. Are they large industrial firms or diverse and widely dispersed groups such as homeowners?

Interrelated analysis of these three factors should precede the decision to choose the most appropriate financing mechanism or other Government activity to stimulate a particular energy technology.

We continue to believe that--in lieu of providing Federal loan guarantees for commercial-size plants where the commercial viability of the technology is in question--efforts should be

directed to researching and developing the improved energy technology until technical, economic, environmental, socio-economic, and regulatory problems are resolved. We continue to believe also that information on these problems usually can and should first be obtained from smaller than commercial-size plants.

S. 419 does go far in meeting some of our concerns. For example, it would enable affirmative congressional approval or disapproval through the normal appropriations process for the costly projects which would be authorized. Also S. 419 requires the Administrator of the Energy Research and Development Administration (ERDA) to consider specific criteria in evaluating the projects' economic, social, and environmental viability. Other bills we have seen do not contain such provisions.

On the other hand, S. 419 deals with only one technology which might help solve this Nation's energy problems. As a general premise, we would prefer to see legislation designed to demonstrate emerging energy technologies which resulted from an overall assessment of the various alternative technologies based on criteria such as I discussed earlier.

If, however, the Congress does wish to enact legislation to demonstrate oil shale technology, S. 419 with certain changes could provide, in our opinion, a good starting point.

Specifically, we believe that the bill needs to be amended to (1) emphasize demonstration of smaller than "commercial-size"

plants, (2) provide criteria to choose projects and processes, and (3) consider several alternatives to selling the demonstration facilities when demonstration is completed.

Before I get to these suggested amendments, I would like to briefly refer to section 304 of the bill which would provide loan guarantees of up to $40 million and loans and grants to States, political subdivisions, or Indian tribes to mitigate socioeconomic impacts resulting from the oil shale demonstration facilities. We believe that the subcommittee should study carefully the need for this type of assistance and the basis for the $40 million amount.

As you probably are aware, the Congress has recently acted to greatly increase Federal assistance to State and local communities which can be used to mitigate socioeconomic impacts resulting from energy resource development. Specifically:

--The August 1976 amendments to the Mineral Leasing Act of 1920 substantially increased the States' share of royalties from mineral leases on Federal lands from 37.5 percent to 50 percent and increased the royalty on Federal coal from 5 cents per ton to not less than 12.5 percent of the selling price. Royalties to the Rocky Mountain States have been estimated by the Department of the Interior to increase from $82 million

in 1976 to a minimum of $177 million a year from 1979 to 1985.

--The Federal Land Policy and Management Act of 1976, enacted in October 1976, enables the royalties to be used as the legislatures of the States direct, such as for planning, construction, and maintenance of public facilities, and provision of public services. The act also provided for loans to States and political subdivisions for the same purposes. Loans can be made up to the anticipated mineral royalties to be received by the recipients for any prospective 10-year period, which in the case of the Rocky Mountain States will likely be between $1.5 and $2 billion for the next 10 years.

--Public Law 94-565, also enacted in October 1976, provided for annual payments to be made directly to local governments based on the amount of Federal lands within their jurisdiction. Interior estimated these annual payments to Rocky Mountain local governments at $69 million, or about $621 million from 1977 through 1985.

Let me emphasize that all these funds will be available prior to and concurrent with energy resource development and can be used to mitigate the socioeconomic impacts of

that development. It is for this reason that we believe the subcommittee should consider carefully the need for this type of assistance.

We also have a number of other concerns regarding the use of guarantees, and other financial mechanisms to mitigate socioeconomic impacts. These concerns and our suggestions will be included in technical comments and proposed changes which we will provide to you shortly.

My staff is now completing a review entitled "Rocky Mountain Energy Resource Development: Status, Potential, and Socioeconomic Issues." The main issue being addressed is: "What should be the roles of the States, the Federal Government, and industry in providing assistance to Rocky Mountain communities affected by development of the region's vast sources of largely untapped energy?"

We believe that our report, which we expect to issue by the end of this month, should aid in making national energy decisions and decisions on the need for additional Federal assistance for Rocky Mountain communities that will be affected by energy resource development. The report will be issued to the Congress, with copies to appropriate congressional committees; to you, Mr. Chairman; and to all the other Senators and Representatives of the Rocky Mountain States.

Let me turn now to our specific suggestions for amending S. 419.

NEED TO EMPHASIZE DEMONSTRATION FACILITIES

The bill states that facilities are to be limited to a size no larger than necessary to demonstrate the oil shale technologies. As presently written, however, the bill encourages the construction of commercial-size plants, thus skipping an important step in the research and development process.

In essence, a technology must pass through four stages of evolution: (1) laboratory tests to prove that the technology can provide a useful product; (2) project demonstration to resolve technical, economic, environmental, socioeconomic, and regulatory problems on a scale smaller than a commercial-size plant; (3) commercial demonstration to prove that a commercial-scale system can function routinely in a working environment at or near its ultimate commercial-size; and (4) commercialization, which is the introduction of the technology into the society as an industry. As I indicated before, we believe that technical, economic, environmental, socioeconomic, and regulatory issues can and should be resolved on a scale smaller than a commercial-size demonstration.

Our reading of the bill indicates that it would skip the second stage (project demonstration phase) and would encourage the use of commercial-size plants to obtain the needed information. This opinion is based on the bill's numerous references to the facilities' ability to "demonstrate the

commercial viability of the process" and to demonstrate the "viability of a commercial oil shale industry."

We do not believe that the technical, economic, environmental, socioeconomic, and regulatory problems relating to oil shale technologies have been resolved to the point where a full-size commercial demonstration is possible. Thus, constructing "commercial-size" oil shale facilities would be inconsistent with our view that (1) efforts should first be directed to researching and developing improved emerging energy technologies until their problems are resolved and (2) information on these problems could first be obtained from smaller than commercial-size plants.

We suggest, therefore, that S. 419 be amended to provide that the authorized facilities be of a size sufficient--but smaller than a full-scale commercial demonstration--to resolve the technical, economic, environmental, socioeconomic, and regulatory issues relating to these technologies. If these demonstrations prove successful, consideration should then be given to proceeding to the commercial demonstration phase. Hopefully, industry would take the initiative in this effort with little, if any, Federal assistance being required.

I should also point out that one or two facilities, whether full-size commercial plants or smaller plants, cannot "demonstrate the viability of a commercial oil shale industry" or technology. There is a considerable difference between demonstrating that a single plant can operate routinely and

demonstrating the commercial viability of an entire industry. The difference is primarily one of magnitude. For example, the environmental and socioeconomic problems of many plants in the concentrated oil shale region would present far greater problems than would one or two plants. In addition, one or two plants cannot resolve all the problems of the total supporting facilities and industry, or infrastructure, which would be required for a commercial oil shale industry.

NEED FOR CRITERIA FOR CHOOSING PROJECTS

Although section 207 provides criteria for evaluating performance of the demonstration facilities, the bill does not provide the even more important criteria for choosing the types of processes to be selected for demonstration. Such criteria is needed, in our opinion, to make the right choices among oil shale technologies. We believe that criteria similar to those which I mentioned earlier need to be added to the bill.

We believe that the bill should also specify that no process should be demonstrated unless private industry is either unable or unwilling to develop it on its own. Because of the apparent renewed private sector interest in in-situ retorting, we suggest that the bill not have a specific requirement that at least one of the demonstration projects use the in-situ or modified in-situ retorting process.

ALTERNATIVES TO SELLING FACILITIES NEED TO BE CONSIDERED

Section 206 of the bill would provide for sale of the demonstration facilities on a competitive bid basis if they demonstrate the economic, social, and environmental viability of a commercial oil shale industry. Successful bidders would also receive a lease for a tract of land of sufficient size to permit commercial operation.

If such facilities were constructed on a project demonstration scale as I suggested earlier, it would be highly unlikely that the plants would prove commercially viable to prospective bidders. Therefore, alternatives to selling them need to be considered. The Government could, for example, cease operations and close down the facilities or it could contract for their continued operation and sell the products on the open market. We believe the second alternative is preferable to selling the facilities even in the unlikely event that the facilities would prove to be commercially viable.

This is because selling a facility independent of access to adjacent oil shale resources would substantially reduce the value of the resources to all but the successful bidder for the facility. In effect, therefore, there would be no competition for the adjacent oil shale resources and the successful bidder for the facility could later obtain it at a bargain price. In view of this, we believe that it

would be necessary to offer the facility and the land as one package, either by sale or lease. Such an arrangement, however, would require an amendment to the Mineral Leasing Act of 1920--something we perceive as unrealistic.

In any event, should the Congress choose to authorize the sale of the facilities, we are concerned that the bill does not require that information on subsequent facility operations and performance be available to the public. We believe that a provision should be added to require purchasers to (1) report on operations and performance in such manner and form and under such terms and conditions prescribed by the Administrator of ERDA and (2) permit the Administrator to observe and monitor the performance and operation of the facility. This information should be made available to the public by the Administrator of ERDA, thereby providing maximum input towards any eventual widespread commercialization of oil shale technologies.

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Mr. Chairman, this concludes my specific comments on S. 419. I want to reemphasize that we would prefer to see legislation encouraging the development of emerging energy technologies based on an overall assessment of all such technologies using the criteria outlined in our earlier report and in this testimony. As I noted, however, if the Congress does wish to enact legislation for oil shale development,

S. 419 with our suggested amendments, could provide a good starting point. Our comments are intended to be constructive with a view toward strengthening the bill.

We will be glad to respond to any questions you may have.