

FEDERAL FUELS R&D AS AN ARM OF ENERGY POLICY

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It would be a truism to state that Federal support or lack thereof of energy research, development and demonstration (RD&D) has become one of the key elements in the implementation of energy policy. Examples abound. They range from the cutback and restructuring of nuclear breeder R&D in line with the Administration's non-proliferation policy, to growing support for unconventional natural gas R&D in line with the Administration's recognition that increased domestic pipeline quality gas supply and use is one of the most effective means to constrain oil imports.

In the fossil fuel or, more generally, the non-nuclear area, the role of Federal energy R&D as an energy policy tool is of relatively recent vintage. The step-up in the scope and magnitude, and the shift to relatively near-term commercialization goals, dates roughly from the consolidation of all energy-related RD&D programs under the Energy Research and Development Administration (ERDA) in January 1975. Prior to that time the technical data base for fossil energy policy came largely from private R&D sources. In contrast with nuclear energy policy and RD&D, which was under Federal control from its inception, most early attempts of major Federal intervention in fossil fuel RD&D failed. The fossil energy industry with its large and effective in-house R&D programs successfully bypassed such Federal initiatives as the abortive post-World War II synthetic fuels effort. Prior to the official recognition of an "energy crisis" in 1971 in the form of the first pronouncement of a comprehensive energy policy by a U.S. president, only the coal industry actively sought Federal support for relatively short-term commercial applications-oriented fossil fuel R&D. Some minor exceptions were co-operative programs with the gas industry in such areas as nuclear stimulation of tight gas formations and the production of pipeline quality gas from coal.

The coal industry initiative led to the establishment in 1963 of the relatively small program of the Office of Coal Research in the Department of the Interior which became the nucleus of the vastly expanded ERDA and Department of Energy (DOE) fossil energy RD&D programs developed with the urging of Congress. The blueprint for integrating nuclear and fossil fuel R&D, and developing a better balance between the two, was prepared in 1973 under the direction of Dixy Lee Ray, the last Chairman of the Atomic Energy Commission (AEC). In this blueprint, the AEC RD&D model was followed closely because of its success in moving government-developed technology into the private sector

following World War II. Although defense-related and nuclear material supply activities continued to be a major share of the Federal nuclear program, civilian RD&D by the National Laboratories and industry grew rapidly and formed the foundation for the development of commercial nuclear power.

The expansion of the Federal role in energy RD&D was, of course, greatly accelerated by the 1973/74 oil embargo and led to the increase of Federal energy RD&D budgets from less than \$1 billion to more than \$3 billion today. However, even during the short ERDA days, it became apparent that the AEC model could not be successfully applied to fossil fuel RD&D and to non-nuclear R&D in general. Nuclear RD&D, nuclear energy policy, and nuclear power commercialization were always fully integrated under Federal control. This is not true in any sense in the fossil fuel area. In fact, with some notable exceptions, relationships between the Administration, Congress and industry in this area could be better characterized as adversary rather than as cooperative.

Thus, the basic objective of Federal fossil fuel RD&D — commercialization of new technologies leading to increased use of domestic resources and a reduction of oil imports — has become increasingly elusive. The difficulty extends far beyond the government/industry interface. Whereas, until the relatively recent doubts concerning safety, the goal of nuclear programs was to reduce electric power cost and environmental impact while simultaneously relying on abundant domestic resources, the goal in much of fossil fuel RD&D has been to substitute more costly, environmentally more difficult energy sources for conventional oil and natural gas. The direct benefits often defy conventional economic or social justifications. Rather they are of broad national scope — improved military security and monetary stability, greater freedom to implement foreign policy and trade objectives, etc., not cheaper energy.

The synthetic fuels program is, of course, the best example of the difficulty of applying the lessons of the civilian nuclear reactor program, the wartime synthetic rubber program, the civilian air transport program, etc., to commercialization of Federally developed fossil fuel technology. Various administrative, legislative and regulatory approaches so far have either failed or have poor prospects. This includes loan guarantees, cost sharing, construction grants, tax credits, favorable regulatory treatment in case of synthetic pipeline gas, and several combinations and permutations of these means to compensate the producer, user and investor for higher costs and risks. It has been next to impossible to have the stockholder, tax payer and consumer or rate payer assume costs or risks on behalf of the national interest which they perceive to be inequitable. Thus, in spite of a lot of good R&D and widespread acceptance of the overall goal of increased energy self-sufficiency, little progress has been made. Apparently, the model, the logic and the entire approach have been faulty. The biggest problem is, of course, that synthetic fuels continue to cost about twice as much as their fossil fuel counterparts as has been the case since World War II.

As an alternative, I would like to propose a plan for new fossil fuel technology development and commercialization modeled after the legislatively

mandated automotive fuel efficiency standards. Evidence abounds that they have indeed been successful. Without National Laboratories, any major Federal RD&D programs, loan guarantees, special tax treatment or other forms of Federal intervention, the automotive industry has risen to the challenge and is indeed far along the road to meeting the efficiency standards. In the process, they are probably now building domestic automobiles which will again be competitive in the world market.

This is not an original idea, of course, but why not legislate that by 1990, say, 5 percent of total pipeline gas and total liquid fuels marketed must consist of the domestic supplemental source of the wholesaler's choice, i.e., it can be derived from coal, oil shale, unconventional natural sources, or biomass, by whatever process that gives the desired results. Purchase of entitlements should be encouraged to ensure optimum economy of scale, etc. This would drive the system to the quickest and lowest cost solutions. It would take government largely out of the process of developing and commercializing synthetics and biomass fuels, a task at which government so far has an unbroken record of failure. It would mandate industry, including its regulated utility component, to do the job instead, under conditions which distribute the financial burdens and risks equitably, thereby eliminating the need for complex systems of selective subsidies. If, through some miracle, further expansion of synthetics and other supplementals after 1990 is not needed, the consumer impact of 5 percent of supply at, say, double conventional fuel price, would have been marginal. If, as many believe, supplementals will be essential to the survival of the United States, then this investment would have untold benefits at relatively little cost.