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THE FEDERALIZATION OF IDEAS: A NATIONAL ENERGY DEPARTMENT

INTRODUCTION

President Carter has characterized our national energy situation as the "moral equivalent of war." Naturally, he has proposed to win this "equivalent war" by creating an "organizational equivalent of the Pentagon" -- the National Energy Department.

Most Congressional debates have focused on federal tax and price mechanisms to conserve current energy supplies and regulate its use. Also included in the energy bill (H.R. 6804, S. 826), is the Administration's position about the innovation of new energy sources and new conservation technologies and methods. The proposed statutory approach to the introduction of "things that are new" -- innovation -- is the same as the Defense Department's. However, Congress has paid little attention to large-scale economic distortions which this approach will cause.

Whether we are truly in a situation which is the "moral equivalent of war," makes no difference -- the innovation of new products, supplies, services, and processes cannot be centrally financed, managed, and controlled from Washington. The reasons for this are found in the important differences between energy and weapons markets. Energy innovations require the democratization of ideas rather than the federalization of ideas.

NOTE: Nothing written here is to be construed as necessarily reflecting the views of The Heritage Foundation or as an attempt to aid or hinder the passage of any bill before Congress.

MARKETPLACE DIFFERENCES

When the Defense Department implements its innovation policies, it creates choices for the government's eventual investment and use. On the other hand, the choices that the Energy Department proposes to innovate will not be for the Department's investment and use but for nonfederal purchase and use by city and state governments and private energy users and producers.

The National Aeronautics and Space Administration's (NASA) marketplace is the same as the Defense Department's. Both NASA and the Defense Department assess their capabilities to responsibly perform in the future -- and both will, from time to time, create a demand for the innovation of new weapons, space systems, products, and services.

They are organized not only to specify the "demand for innovation," but also to select, manage, and finance ideas which become investment choices to meet their own demand. They do this by performing in-house technical activities and purchasing support services from nongovernmental sources, such as companies, universities, and private nonprofit organizations. What is eventually chosen, with Congressional approval, is purchased and used by these agencies to perform their statutory missions. The Defense Department and NASA legitimately practice the federalization of ideas -- they motivate and select ideas and provide risk capital financing to create future investment choices.

Among other important duties, the new Energy Department is also proposing to specify "demand for the innovation" of new energy sources and conservation methods. And, it is proposed that the Department take on the responsibility of motivating and selecting ideas and manage and finance the innovative process to "supply" this demand. Thus, there is to be close correspondence between the Defense Department, NASA, and the new Energy Department when new products, processes, and services must be introduced because current supply is perceived as inadequate to meet future demand.

COMMON INNOVATION POLICIES WILL NOT WORK

The difference in the end-use marketplace for innovation (federal versus nonfederal buyers) is a critical difference. Here is why:

- Nonfederal energy buyers and users must learn about new innovations along with developers. If not, they will be inferior buyers. The Defense Department and NASA technical personnel learn along with developers so that what they eventually invest in and operate is a consequence of learning about possible choices from their beginnings. While there may be arguments about how efficiently the Pentagon procurement policy operates, there is little argument about its need to perceive the demand for innovation, to manage it, and to finance the process which supplies it. Also, in most cases, the Department of Defense and NASA represent the sole market for the products of innovation which they have sponsored.

- Energy must be delivered within a local framework of price, capability, and availability goals, in a context of local operating conditions. Each locality has a different framework from the next, and an innovation suitable for one locality is not necessarily suitable for another. Thus, the local demand for energy delivery may be common for several localities, but the constraints placed on innovation may be uniquely different. Different alternatives must be explored to deliver a common capability.

- The decision to use and control "seed" or "start-up" risk capital which is required to start proving new ideas must be decentralized. If it is centralized, small firms and individuals will not be able to afford the cost to create and propose their ideas for consideration, and a sizable share of the nation's inventive and innovative resources will remain untapped. Small firms and individuals simply cannot afford the cost of proposing new ideas and waiting for decisions according to federal procurement rules. These elaborate rules have been instituted to control the large costs of large companies. They total more than 4,000 procurement-related statutes and 3,000 pages of implementing regulations.

INNOVATION REQUIRES ADAPTIVE-LEARNING

Why should federal engineers and scientists learn about new energy innovations when they are not part of eventual using organizations? Transferring what they learn to state and local governments, or to private buyers is certainly less effective and efficient than directly engaging eventual buyers and users from the beginning. This practice of engaging buyers and users at the beginning of innovation works well for Defense and NASA and should work equally well for nonfederal buyers and users. So, why statutorily install the "federalization of ideas" where what is learned must go through an additional costly step of transference?

The argument that the federalization of ideas should apply to the new Energy Department because it has worked well in achieving space leadership and deterrent weaponry is an irrational argument. In fact, national productivity will decrease because transferring what has been learned causes excessive and unnecessary nonproductive costs. Also, coercive measures may be applied to force the use of whatever the Department has created. Localities and other nonfederal and private buyers will have no choice but to invest in what the federal level comes up with, even if it does not match what is needed locally.

DEMOCRATIZATION OF IDEAS

It is imperative that private or public organizations are able to make selections and to have control over risk capital expenditure to commence energy innovation. If the selection and control authority is vested in one centralized public group, a group which also has the "seed" capital to commence innovation, too many of the nation's future energy decisions will rest on the wisdom of that group's arbitrary choices. Ideas competitive to those selected by the centralized authorities may be simply "buried" and never heard about.

Centralized public selection authority is a key feature in the "federalization of ideas" -- in stark contrast to the "democratization of ideas" characterized by many private idea inventors, selectors, and risk-takers, each in competition with others.

One of the key issues behind the solution to the energy problem is whether control over the money is decentralized or centralized. Decentralized or democratized control is needed because local energy demands are unique to the locality. Competition between several "idea sponsors" is needed to drive prices down in the delivery of a common capability. The needs and unique conditions of localities will not be met if the selection of ideas and control over risk capital is federalized. This will lead to the introduction of a "common" supply to meet a "common" demand; and unique, local situations and conditions will be bypassed in the process.

Friederich Hayek, the 1975 Nobel Prize winner in economics, had this to say about centralized or decentralized government functions:

While it has always been characteristic of those favoring an increase in governmental powers to support maximum concentration of those powers, those mainly concerned with individual liberty have generally advocated decentralization. There are strong reasons why action by local authorities generally offer the next-best solution when private initiative cannot be relied upon to provide certain services and where some sort of collective action is needed; for it has many advantages of private enterprise and fewer of the dangers of the coercive action of government. Competition between local authorities or between larger units within an area where there is freedom of movement provides...that opportunity for experimentation with alternative methods which will secure most of the advantages of free growth.

It is usually the authoritarian planner who, in the interest of uniformity, governmental efficiency, and administrative convenience, supports the centralists' tendencies...

(The Constitution of Liberty, F. A. Hayek, pages 263-264.)

"LARGE" AND "SMALL" TECHNOLOGIES

Large-scale and expensive technologies are obviously marketed by heavily capitalized companies which have large-scale capabilities. But, most innovations which have benefited

private consumers -- where we find the energy market -- have not come from current producers and do not involve large-scale technologies. To name a few: Xerox was not invented by an office equipment manufacturer; the transistor was not invented by a vacuum tube producer; the ballpoint pen was not invented by a pen producer; the hydromatic auto shifting mechanism was not invented by Detroit car manufacturers. There are many other examples. Each of these privately created and financed ideas has pumped billions of dollars into our private enterprise economy.

Another example of this is electric motor energy conservation. This invention, which is now well into the innovation stage, is of particular interest not only because an electric motor producer did not invent the approach but also because government research and development had nothing to do with it. The engineer/inventor mortgaged his home and borrowed money to finance his idea; he did not spend his resources trying to penetrate the federal bureaucracy.

The ability to create new and beneficial ideas is independent of corporate size. Large firms tend to improve what they are currently producing. All firms, large or small, which are not producing for a particular market but wish to enter it tend to create ideas which deliver similar capability but with products made up of different, competitive technologies.

For example, Chester Carlson, the inventor of the xerography process, approached twenty office equipment manufacturers, and was turned down. He was finally financed by a nonprofit organization, the Battelle Memorial Institute. Mr. Carlson was not only able to invent, he was also able to reduce the idea to practical production. His inventive/innovative talents have inserted about \$1 billion into our domestic economy. He has achieved corporate growth based on competitive merit.

This is not to be construed as an argument that "bigness is bad" and "smallness is good." Large federal contractors have contributed significantly to attaining national goals in the past and will continue to do so in the future. Rather, these questions must be addressed: Do our federal innovation policies foster equal economic opportunity to create and propose ideas to nonfederal and federal sponsors alike? Do they foster corporate growth based on competitive merit?

The answers to these questions are of critical importance to the health and vitality of our private enterprise economy. If federal innovation policies give unequal economic treatment favoring corporate largeness, they may be identified with the growth of economic concentration and oligopoly. This would head us dangerously close to the nationalization process such as has been occurring in Britain. The "means of production" will be transferred from private to public ownership where unequal economic opportunity exists.

WHERE THREE DECADES OF FEDERALIZATION OF IDEAS HAVE LED

Current federal innovation policy, procedure, and practice is largely an outcome of the Defense Department's need for new weapons since World War II. Understandably, private risk capital has shied away from what may be characterized as a monopolistic and highly uncertain marketplace. Three decades of federally sponsored innovation to primarily meet the Defense Department's needs have led to domestic economic distortions. These distortions continue to be promulgated by other civil agencies and are proposed to be continued by the new Energy Department.

The federal government is now the "risk-taker of last resort" and finances more risk capital than all private industry combined. Civil agencies have adopted the Defense Department's innovation policies and their sponsorship of risk capital research and development funding has been on the rise. In constant dollars, civil agencies have shown real growth while Defense and NASA research and development funding has been in decline. The 1967-1977 rise in civil research and development, in constant 1967 dollars, has been 50 percent, from \$3.2 to \$4.8 billion, while Defense Department/NASA research and development funding has dropped 40 percent, from \$13.3 to \$8.3 billion.

Individuals and small firms go to private capital markets to get "seed" money in order to challenge established federal contractors. However, privately-sponsored risk capital is in decline and small technical firms are finding private risk capital increasingly more difficult to obtain. A Department of Commerce report shows that small, technical firms' public stock offerings declined from \$1.16 billion in 1969 to \$16 million in 1974 -- a reduction of more than 10 to 1 over five years when inflation is taken into account. No small, technical-firm public offerings were made between March 1974 and August 1975. The earliest risk capital expenditure, "seed" or "start-up" money, is almost impossible to get through new offerings.

In contrast, during 1975, the federal government controlled and distributed \$20.8 billion of taxpayer-supplied risk capital. Fifty-four percent of the money went to organizations which do not pay federal taxes, the not-for-profit organizations; the remainder went to profit organizations. This means that most of the critical beginnings of innovation, the selection of technologies to configure into new products, is not performed within a price competitive supplier's marketplace.

FEDERAL RISK CAPITAL MECHANISMS

Government uses two mechanisms in the distribution of risk capital: indirect payments by federal contract price mark-ups and direct payments by research and development contracts, grants, and agency budget allocations for in-house scientific and technical work.

Eight-five percent of the federal equivalent to private "seed" or "start-up" capital was indirectly paid to ninety-nine of the largest defense contractors out of 23,875 defense suppliers. The amount the ninety-nine received was slightly less than \$1 billion while the 23,776 remaining suppliers received only an estimated \$100 million.

This "start-up" risk capital is indirectly distributed according to the amount of federal contracts a contractor has or expects in the next year -- the more federal contracts, the more "start-up" risk capital allowed in federal contract price mark-ups.

Obviously, it is beneficial to be "big" in federal contracting because "start-up" capital is more readily obtained from the federal Treasury. The corollary, however, is that individuals and firms without federal contracts will not receive "start-up" capital indirectly from government and, very likely, not from private sources either.

Federal government also makes direct risk capital payments to support innovation after indirectly paid "start-up" capital has been spent. These direct payments are received mainly by large federal contractors to create, propose, and partially prove acceptable ideas. These direct payments are called "applied research" expenditures in the scientific and technical community. In 1975, out of \$5 billion directly spent, \$3.5 billion went to not-for-profit organizations, the remainder to profit companies -- a distribution of over 2 to 1 favoring organizations not obligated to pay federal taxes or perform work competitively with a profit objective.

THE NET OUTCOME

The net outcome of three decades of the federalization of ideas, as practiced by the Defense Department and NASA is that their federal innovation policies foster an unequal economic opportunity to participate in federally sponsored innovation markets. Hard-to-get seed capital is mainly distributed to the largest defense suppliers. Follow-on-money for applied research is mainly distributed to not-for-profit organizations; privately supplied risk capital is increasingly difficult to come by.

This has serious long-term economic consequences. The essential economic role of individuals and small firms is to challenge economically-concentrated large firms and their economy-of-scale marketplace advantages.

Equal economic opportunity to create and propose ideas should be an essential feature of federal innovation policy and practice, but the opposite has been the case.

These problems have not gone unnoticed, and changes are being made. It will take time to reverse accumulated policies and practices and achieve an equal economic opportunity for all qualified firms, regardless of corporate or individual wealth, to participate in Defense Department and NASA innovation markets. Civil agencies have inappropriately adopted Defense Department and NASA innovation policies and are doubly inefficient; first because they have a completely different marketplace to supply, and second because they contribute to the same economic distortions as do the Defense Department and NASA.

CONCLUSION

Two important considerations should have provided the framework for the new Energy Department:

- a recognition that the Defense Department/NASA innovation policies and practices have led to serious distortions to our domestic economy. These distortions should not be adopted by the new Department.
- a recognition that the Energy Department's demand for innovation should open choices for nonfederal buyers, not federal buyers, and that nonfederal buyers must learn along with developers before investment decisions are made. This means that the selection and financing of ideas must be spread wider, rather than concentrated.

These two considerations offer opportunities to the Administration to construct innovation policies which foster equal economic opportunity for qualified individuals and firms of any size to create and propose ideas to nonfederal buyers. Opportunities for competition between localities and suppliers would yield price advantages of ultimate benefit to energy consumers. The Administration so far has missed this important opportunity. It is also missing the opportunity to allow local developers, financiers, and buyers to equally learn about new innovations before large-scale investments are made.

It is not in the nation's interest that the federalization of ideas be applied to civil markets. Where it is legitimately applied, such as the Defense Department and NASA, extremely important changes are still to be made.