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STATEMENT
OF
FRANK G. ZARB
EXECUTIVE DIRECTOR
ENERGY RESOURCES COUNCIL
BEFORE THE
ENERGY RESEARCH, DEVELOPMENT AND DEMONSTRATION
SUBCOMMITTEE
OF THE
COMMITTEE ON SCIENCE AND TECHNOLOGY
U. S. HOUSE OF REPRESENTATIVES
APRIL 1, 1976



MR. ZARB'S TESTIMONY

BEFORE THE HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY

APRIL 1, 1976

Mr. Chairman and Members of the Subcommittee, in my capacity as Executive Director of the Energy Resources Council, I welcome this opportunity to discuss with you the current status and future direction of our efforts to encourage the more efficient use of energy. I understand that one of the purposes of this hearing is to consider the merits of H.R.11091, the Energy Extension Service Act. Consequently I will place particular emphasis in my statement on current Federal efforts that are directed toward dissemination of information about commercially available energy conservation techniques.

My testimony before you will briefly present the history of the Federal Government's role in energy conservation followed by a discussion of the important conservation legislation still before the Congress. Then I would like to highlight some of the research and information transfer programs which already exist throughout Federal agencies. By pointing out these programs, I hope it becomes apparent that we support the underlying goals of the Energy Extension Service Act. However, considering the work still

to be done in energy conservation and the newness of many of the existing programs, we feel it would be unwise to establish a new bureaucracy to duplicate these programs.

My purpose in presenting a brief history of the Federal Government's role in energy conservation, is to give a perspective of how far we have gone and how far we still have to go. The first Presidential message to Congress on energy, entitled "A Program to Insure an Adequate Supply of Clean Energy in the Future," was delivered in June of 1971. This message recommended only two specific Federal programs to encourage energy conservation.

1. A revision of Federal Housing Administration (FHA) standards to require additional insulation in new federally insured homes; and
2. Development and publication of additional information "to help consumers focus on the operating costs as well as the initial cost of energy intensive equipment."

As recently as FY 73 research relevant to understanding the energy system and improving its end-use efficiency received only \$6 million, less than one percent of the Federal R&D expenditure to increase energy supply.

In the President's second energy message to Congress dated April 1973, the emphasis on conservation increased. This message created the Office of Energy Conservation within the Department of Interior which was "To coordinate the Energy Conservation Program" in the Federal Government and to "work with consumer and environmental groups in efforts to educate consumers on the ways to get the greatest return on their energy dollar." The parts of the message relevant to conservation asked for a voluntary energy conservation program for automobiles and appliances, "updating" of FHA insulation standards, demonstration of conservation techniques in new Federal office buildings and recommended that Federal highway trust funds be used to support mass transit.

By mid-1973, concern was gradually rising over prospects of shortages of fuel oil and several other basic fuels during the coming winter. However, it was not until the Arab oil embargo transformed the prospects of a slight winter shortage into a crisis that energy conservation became a high national priority. On December 4, 1973, the President issued Executive

Order 11748 establishing the Federal Energy Office (FEO) in the Executive Office of the President. Thereafter, virtually every Federal agency created energy task forces or offices.

In May 1974, Congress enacted the Federal Energy Administration Act of 1974, (PL 93-275) which established the Federal Energy Administration (FEA) as the successor to the Federal Energy Office. The functions of the original Department of Interior's Office of Energy Conservation were also transferred to FEA. With respect to conservation, FEA was charged to "develop and oversee the implementation of equitable voluntary and mandatory energy conservation programs and promote efficiencies in the use of energy resources."

The Energy Resources Council, of which I am the Executive Director, was established in October 1974 by the Energy Reorganization Act of 1974, (PL 93-438). It is the primary mechanism for interagency review of major energy policy issues. The ERC is composed of the Secretaries of Interior, State, Defense, Treasury, Commerce, and Transportation; the Administrators of FEA, ERDA, and EPA; and the heads of numerous other Federal agencies. It is charged with the formulation and execution of major energy policy initiatives, as well as advising the President of recommended action on specific energy issues.

The Energy Reorganization Act of 1974 also established the Energy Research and Development Administration (ERDA), and specified that it contain an office of energy conservation. With respect to conservation, the Act required ERDA to encourage and conduct research and development in energy conservation. The Act also required ERDA to create and encourage the development of general information to the public on all energy conservation technologies and, in conjunction with FEA, to disseminate that information. I know that this Committee is concerned with the delineation of roles between the Office of Energy Conservation of FEA and Office of Energy Conservation within the Energy Research and Development Administration. Mr. Sant, the Assistant Administrator of Energy Conservation and Environment for FEA testified on February 4, 1976 before this committee regarding how the interface between FEA and ERDA is being defined, and in subsequent testimony discussed the memorandum of understanding that is being drawn up between the two agencies.

In November 1974, the Project Independence Report was issued showing that conservation could effect a significant reduction in the Nation's energy growth rate.

The Federal Nonnuclear Energy Research and Development Act (PL 93-577) was enacted December 1974. This Act, which had as one of its governing principals that "Energy conservation shall be a primary consideration in the design and implementation of the Federal nonnuclear energy program," prescribed specific conservation program elements that ERDA, at a minimum, should undertake.

This was closely followed in January 1975 by the President's State of the Union message in which he recommended a "plan to make us invulnerable to cut-offs of foreign oil." Conservation was an important element of this plan. Among the conservation related measures asked for were:

- Deregulation of new natural gas
- Deregulation of crude oil
- Mandatory thermal efficiency standards for new buildings
- An insulation tax credit
- A weatherization program for low-income persons
- Clean Air Act amendments to allow improvement of new car gas mileage.
- Mandatory auto and appliance labeling

The next major milestone that occurred in the area of energy conservation which brings us up to the present time, was the enactment of the Energy Policy and Conservation Act last

December. I think you will agree with me, that this represents a first step toward the establishment of an effective National Energy Policy.

The act allows for the gradual deregulation of oil prices. The Act also incorporates other provisions that can contribute to the eventual realization of energy independence, including the establishment of a strategic petroleum reserve, conversion of oil and gas fired plants to coal, and emergency standby authorities. The conservation measures include mandatory automobile fuel economy standards, mandatory energy efficiency reporting by the ten most energy consumptive industries, energy labeling and energy efficiency improvement targets for major home appliances and a technical and financial assistance program to aid the States in developing and implementing energy conservation programs.

Although we have made progress through the passage of this law, we should not be lulled into believing that it is enough to resolve the Nation's energy problems. There are still four major pieces of pending legislation that must also be enacted to effectively complete a national energy conservation program.

The first is Federal price deregulation of new natural gas supplies. The debate over this issue often centers on how the measure will stimulate new supplies, with the equally important conservation aspects of this measure too often overlooked. Natural gas is our most valuable fuel in terms of its combustion properties and versatility; yet due to Federal price regulation in interstate commerce it is also, inappropriately, our cheapest fossil fuel. The present perverse economics of natural gas don't provide adequate incentives to conserve gas. To the contrary, they provide incentives to use it to accomplish tasks where less valued, more plentiful, but presently more expensive alternate fuels could serve just as well - for example, using natural gas as a boiler fuel.

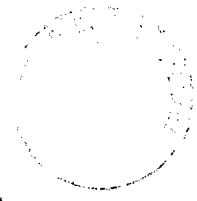
The second piece of legislation required is the Weatherization Act. This act would make grants available through the States for low income persons, with emphasis on the elderly, to help improve the thermal efficiency of their dwellings. As you are aware, bills have been passed by both Houses and will soon be in conference.

The third item of legislation is an Insulation Tax Credit that would provide the vast majority of American households with an additional incentive to improve the thermal efficiency of their homes.

The fourth piece of legislation is the Building Energy Conservation Standards Act. Under this Act the Secretary of Housing and Urban Development would be required to develop and promulgate thermal efficiency standards for all new residential and commercial buildings. Implementation and enforcement would be left to State and local governments. Different versions of this proposed legislation have passed the House and Senate, with the Administration supporting the stronger version passed by the Senate. A conference will, of course, have to resolve these differences, and we hope this can take place expeditiously.

When all four pieces of legislation have been enacted, I believe we will have taken major strides toward a national energy conservation policy.

Another important energy initiative awaiting Congressional action is the Energy Independence Authority which was proposed by the President last October. This proposal would authorize Federal support, in the form of a loan guarantee, not only for major energy supply ventures, but also for conservation projects which are not in widespread commercial use and are unable to obtain private financing.



With greatly increased energy prices, many measures to make more efficient use of energy have become cost effective. We estimate that the energy conservation measures undertaken in response to the higher energy prices coupled with planned government initiatives to encourage and accelerate energy conservation will reduce energy demand in 1985 by the equivalent of more than seven million barrels of oil per day from what it would have been under the pre-embargo conditions. This reduction is just slightly less than our current rate of production of domestic crude oil. Moreover, this reduction in energy demand can be realized without adversely affecting our high standard of living or our economic growth. In addition, several recent analyses have indicated that eliminating inefficient uses of energy would not result in any employment penalty and may, in fact, create more jobs. Of course, the directions for growth in the economy may be altered somewhat as a result of the emphasis we place on conservation.

The opportunities for energy savings could further be increased with positive economic benefits by developing new and improved conservation technologies. While the Energy Policy and Conservation Act provides incentives for the adoption of innovative conservation technology, it does not in itself directly stimulate the development of new energy

conserving technology. Recognizing that for a variety of reasons the private sector will not be able to do all of the research necessary to develop new energy conservation technology, the Administration has put a high priority on energy conservation research. The FY 77 budget for ERDA, the lead agency in conservation technology research, has been established at a level of \$91 million; this represents an increase of 63 percent over the FY 76 funding level.

Although FEA and ERDA have major Federal responsibilities for conservation, there are, in addition, programs of varying scope to promote energy conservation in virtually every Federal agency. Since Mr. Sant of FEA and Mr. Heller of ERDA have testified about their agencies' programs before this committee on several occasions, I will not detail FEA and ERDA's programs. Instead, I will briefly highlight some of the conservation related activities of other agencies with which you may be less familiar.

The Federal Energy Management Program involves virtually every Federal agency and department even though it is managed by FEA. Its purpose is to reduce the energy intensity of Government operations. Through the concerted conservation efforts of this program, the Government's

energy usage for fiscal year 1975 was approximately 24 percent or 265,000 barrels of oil equivalent per day below the fiscal year 1973 energy consumption.

In the transportation research area, many agencies have programs that have a significant energy conservation aspect. These include: Department of Agriculture's research aimed at improving the efficiency of agricultural product movement; Department of Commerce's Maritime Administration support in development of advanced marine transportation systems; Department of Defense and NASA's research related to fuel efficient aircraft and engines; Environmental Protection Agency evaluation and testing of fuel emissions, fuel economy, new vehicles and retrofit devices; GSA's demonstration and testing of passenger shuttle vehicles with state of the art batteries and components; Department of Interior's research related to transportation of natural resources; National Science Foundation's combustion and materials research to improve automotive energy consumption; U.S. Postal Service's evaluation of mail delivery jeeps and DOT's UMTA programs to shift urban transportation to more efficient modes and FAA's program to improve efficiency and safety of commercial aviation. Some programs are large and direct, such as NASA's \$25 million FY 77 budget request for an R&D program to produce significant savings in transportation aircraft fuel through improvements in aircraft propulsion, structures and aerodynamics. Others are smaller and less direct.

In the areas of building and industry process research, the programs include the Department of Agriculture (DOA) investigating wood as an energy conserving building material, Department of Health Education and Welfare examining an integrated utility system for colleges and hospitals; Department of Defense investigating new concepts in building methods including evaluation of new building materials; Housing and Urban Development construction of a Modular Integrated Utility System to evaluate its operation and provide information for market acceptance if appropriate; and General Services Administration's studies, guidelines and reports on the design, construction and operation of Federal buildings.

Similarly in the area of energy storage research, the important programs being undertaken include Department of Interior's program to study feasibility of seasonal storage of heat in underground aquifer systems; Tennessee Valley Authority's review of technology developments applicable to electric power systems; Departments of Transportation and Defense and U.S. Postal Service R&D in flywheels; National Science Foundation's research in compressed air storage; National Academy of Sciences' research on the potential of advanced energy storage systems and the National Aeronautics and Space Administration's research with ERDA in development of redox batteries.

Besides research, a number of agencies are directly involved in promoting conservation in the private sector. For example, the FEA is working closely with the Civil Aeronautics Board (CAB) to increase airline load factors, and with the Federal Power Commission (FPC) to encourage better utility peaking and baseload management techniques. The EPCA specifically involves a number of agencies in conservation activities besides the FEA. The National Bureau of Standards (NBS) is responsible for developing energy consumption test procedures for consumer products, the Federal Trade Commission (FTC) is responsible for developing consumer product labels which specify energy consumption. The Department of Commerce (DOC) and ERDA must be consulted in establishing targets for the ten most energy consumptive industries. The Department of Transportation (DOT) is responsible for setting fuel economy standards, while the Environmental Protection Agency (EPA) carries out the test procedures.

This partial list of Government activities illustrates the depth and breadth of the Federal Government's conservation activities. I would like to concentrate my remaining remarks on one of the major barriers that has to be overcome to achieve the total potential for conservation. The level we have talked about is much less than the potential. This

major impediment to energy conservation occurs when people, both on an individual basis and as business or industrial workers and managers, do not have adequate information about the specific cost-effective steps they can take to save energy nor are sure about the costs they would incur and the dollar savings that would result.

This impediment is directly related to H.R.11091, an Act to Establish an Energy Extension Service, that this committee has under consideration.

We recognize that there can be no practical benefits from technology until it is deployed; therefore, we are currently developing and expanding our efforts to disseminate information on both existing and new technology through a variety of programs, while in parallel we are continuing to develop and improve conservation technologies. Technology transfer has always been a complex task, but it is particularly difficult for energy conservation. The audience is huge and quite heterogeneous with very divergent interests even when considering relatively small geographical areas. The type of information to be disseminated ranges from non-technical data on widely applicable changes in energy use practices, to highly technical data on high-risk capital investment decisions. Furthermore, decisions affecting energy use are the prerogative of State, city and county governments, independent regulatory commissions, professional societies,

as well as company boards of directors, bankers, businessmen, and the general public.

It is clear from this diverse set of users that multifaceted technology transfer programs have to be pursued. To be effective, such programs must utilize and have the support of the traditional sources of technical information. For example, professionals who act as agents for others, such as architects or buildings engineers, will continue to respond through professional societies and to regulations, such as local building codes. Major industrial firms deciding whether or not to invest in more energy efficient equipment will, no doubt, continue to rely upon information provided by their management and engineering staffs or consulting firms. Similarly, a technology transfer system should include interactions with trade associations, utility commissioners, State, county and municipal government agencies, universities, schools, and hospitals, as well as other existing institutions.

I would like to describe briefly a number of programs that are designed to provide technical information to the appropriate user. These programs are either now operational or are



starting up as a result of recently passed legislation. A very important effort is the FEA State Conservation Program which is being greatly expanded as directed by the Energy Policy and Conservation Act. The State Program will provide a clearinghouse of information to State governments so that each State can design a State energy conservation plan that meets local economic, climatic, geographic, and other unique conditions and requirements of that State. States will submit their plans in November for technical and financial assistance. (Congress has authorized \$50 million for each of Fiscal Years 1976, 1977 and 1978.)

Other EPCA programs include the dissemination of several million new car fuel economy booklets, the requirement that manufacturers put labels providing energy consumption information on their appliances, a program to work with the ten most energy consumptive industries, and a general public education program on existing opportunities for energy savings. The public education program will continue to include the development and distribution of public service advertisements for radio, TV, print and other media. In addition, booklets and pamphlets on existing energy conservation opportunities will be developed and disseminated. Programs for preschool, primary, secondary schools, universities and adult education courses will also be developed.



In addition to the program mandated by EPCA, a large number of other information transfer programs exist, both in the public and private sector. I would like to highlight a few.

- o Project Conserve will soon be operational in Massachusetts and New Mexico. This is an interactive program that provides participants information on conservation measures they can take for their specific situation. In another 12 States approximately ten million homeowners, while not participating in the interactive program, will receive information on specific steps they can take to save energy.

- o Big 3 Program. FEA is organizing roughly 700 conferences and workshops where the economic and energy benefits of industrial energy conservation, buildings energy management and vanpooling are presented to the chief executive officers and other managers.



- o Utilities Conservation Action Now (UCAN). The purpose of this program is to encourage the voluntary cooperative participation of gas and electric utilities, State regulatory agencies, energy office and public interest groups in achieving conservation and efficiency goals. Last August I invited 175 of the largest electric and gas utilities and their regulatory commissions to participate in the program. Last autumn, FEA field representatives conducted ten regional workshops. We now have approximately 125 firm commitments--conservation action plans--from UCAN participants, which we are now reviewing.

The list of energy conservation information transfer programs in FEA alone is quite long. Besides the programs already mentioned, it includes: a voluntary industrial program, an architectural information program, voluntary buildings program and a program to promote the reuse of waste oil.

The Energy Research and Development Administration (ERDA), in an effort to make available information on new technologies will undertake a diversified technology transfer program.

This program will include not only the research and development of new, more energy efficient technologies but also demonstration projects, the development of technical publications and other technology transfer efforts. One example of such efforts is the ERDA Technical Information Center at Oak Ridge National Laboratory. Part of the information center is the Solar Energy Information Data Bank which distributes a solar equipment buyers guide and an equipment supply listing.

In addition to specific programs, many other Federal agencies have developed numerous reports and other information on ways that energy may be conserved. For example, Making The Most Of Your Energy Dollars In Heating And Cooling, In The Bank...Or Up The Chiminey and Energy Conservation Program Guide For Industry And Commerce (EPIC) have been prepared by the National Bureau of Standards, Department of Housing and Urban Development and the National Bureau of Standards respectively. This material is made available for general consumption through the Government Printing Office and National Technical Information Service as well as disseminated directly by the agency that developed the material.

As was mentioned in previous testimony before this committee, the Department of Commerce, Community Services Administration and Department of Agriculture all have major programs for the development and dissemination of energy conservation information. These include:

The Department of Agriculture's Agricultural Extension Service which conducts major programs for the Nation's 51 land grant colleges to present energy conservation measures and procedures to the agricultural community.

The Department of Commerce, through its Office of Energy Policy and Programs has developed and distributed a wide variety of materials to business. This is done primarily through an established network of 43 district offices, 17 satellite offices and 850 associate offices as well as through other Government agencies.

The Community Services Administration directs its energy conservation information services primarily at community action agencies. This includes developing a manual for community action agencies planning a Weatherization Program. If enacted, the Weatherization Assistance Act, which I mentioned earlier, will transfer the responsibilities for implementing such programs to the States who will receive Federal support in the form of grants.



Similar programs exist in other Government agencies. For example, the Public Health Service's Health Resources Administration disseminates information to the health care community on energy conservation and its relationship to health care delivery and facilities.

To ensure that each Federal energy conservation program is coordinated with the other relevant Federal efforts and that duplication is minimized, we have relied on several different mechanisms. Foremost among these is the Energy Resources Council, which I have already briefly described. Another channel for high level coordination of many conservation efforts is as you know, the Office of Management and Budget. On a day-to-day basis, however, we rely largely on the regular communications that occur between agencies at the staff level. In several instances, agencies have agreed to memoranda of understanding which most often outline the respective roles of agencies involved in a joint effort. Finally, through cooperative agreements and interagency transfers, many Federal agency conservation programs have been jointly funded.

In addition to the efforts of Federal agencies, information on energy conservation is available through State agencies,



universities, utilities, trade associations, trade journals, and professional societies. These institutions also serve as vehicles for transferring information gathered by Federal agencies.

Both public and private universities have responded to the energy problem. Considerable activities including research projects, extension courses, and seminars have addressed the need for energy conservation. For example, the University of Tennessee has published a 40-page manual entitled "How to Cut the Energy Budget in Business and Industry" for 500 industrial concerns in Tennessee.

A number of utilities provide both their individual and industrial customers information on how they can conserve energy. Besides supplying information, some such as the Michigan Consolidated Gas Company have taken a more active role in promoting conservation. This company, in cooperation with other utility companies within the State, obtained permission from the public service commission to actively promote a program to increase attic insulation by providing low cost financing for the cost of such insulation for homeowners. This program allows Michigan residents to obtain assistance and low interest loans from their local utility companies to insulate their homes in order to reduce

heating and cooling costs. The cost of the insulation was added to the customer's bill, but was offset by the reduction in fuel consumption, so that the total cost to the consumer was, at a minimum, no higher than he would be paying without the insulation.

The trade press has traditionally been a source of technical information. As the interest in conservation has grown, numerous trade journals have started to publish articles and even devote entire issues to energy conservation.

It is apparent from the list of activities that I have just cited that an energy extension service would duplicate the intent of the programs that are already underway or planned. Because many of the programs are new, having only been legislatively established within the past few months, and not yet even funded, we are not now in a position to report on how effective they will be. Considering all that can and must be done in the energy area, and our concerns about the overall impact of energy programs on the Federal budget, I believe that we can ill afford any overlap or duplication of effort at this time. Therefore, while I strongly support the intent of H.R.11091, I believe it would be unwise to establish a new bureaucracy in the form of an energy extension service. After we have had some operational experience with these new programs, we will then be in a

position to judge whether an extension type service is warranted, and if it is, how it might best be fashioned to complement the myriad of existing communication channels for technical information.

I began my presentation with a brief history of the Federal role in energy conservation. I would like to close by saying that a complete Federal conservation program consists of three elements: Providing adequate incentives for conservation, encouraging the development of conservation technology and disseminating information on ways energy can be conserved. We are vigorously pushing all three approaches.

Thank you. I will be happy to answer your questions.