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THE HONORABLE FRANK G. ZARB, ADMINISTRATOR
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Chuck, thanks very much for your kind introduction. It's a pleasure to share a platform with someone who has been such a strong force in formulating this nation's energy policy.

I want to answer as many questions from you in the audience as possible, as fully as possible.

But before we get to that portion of the program, I want to develop some perspective for our discussion. And I want to do that by describing some of the progress we've made toward a comprehensive, national energy policy, as well as some of the steps that still need to be taken.

I believe that over the last two years we have begun to lay the foundations of an embargo-proof economy. More remains to be done -- a great deal more. But if we continue to build on the foundation that has been developing over the past few years, we can insulate our economy from embargoes; and we can begin to assure ourselves of adequate energy on into the next century.

Please don't misunderstand me. We still have a problem -- a severe problem.

We import more oil now than we did in 1973, and more of it comes from those same nations that instituted the last embargo. Without a complete program -- fully established and intelligently implemented -- we will remain unacceptably dependent on these countries. We will remain dangerously vulnerable to another embargo. And we will remain increasingly susceptible to the manipulation of oil prices.

Nevertheless, we have made progress over the last two years; and it has been substantial. For a few moments now, I would

like to highlight what has been done and what remains to be accomplished. Then, I will outline the role we think solar energy can play in both the distant and the more immediate future.

Let's begin by examining where we were some two years ago.

Two years ago, the only legal instruments this country had to cope with a radically new energy situation were a complicated allocation program meant to deal with shortages that no longer existed, and other measures that retarded oil production. Today, these are being phased out gradually -- with sensitivity for people's pocket books -- to provide adequate incentives for more energy conservation, greater efficiency, and increased oil production.

And today, there are signs -- tentative signs -- that the decline in oil production may soon be turned around.

Two years ago, another embargo would have meant hoping that oil could be shifted to the United States from friendly countries that were unaffected by the cutoff. Today, we can look forward to an oil storage program that will reduce the threat of future embargoes, and cushion the effects of any that might occur.

Two years ago, coal was a relic of the nineteenth century. Today, we are actively converting industry and utility boilers to coal.

Two years ago, the closest thing we had to an energy policy was an interagency task force report on energy options. Today, the United States has a program that addresses all phases of the energy issue exhaustively -- from point of production to point of consumption.

Two years ago, none of that program existed in law. Today, a number of major pieces of legislation have been enacted -- legislation that will stimulate domestic energy production and foster conservation.

Two years ago, this nation faced the prospect of importing twelve million barrels of foreign oil every day by 1985. Today, as a result of those parts of the program that are now law, that prospect has been reduced by four to five million barrels daily.

That's barrels of oil we won't import; that's American dollars that will stay in our own economy; that is, in short, progress.

But we have only made a beginning -- an uncertain beginning. Much remains to be done. We still need to take steps:

- to encourage conservation by individual Americans;
- to stop the decline in natural gas reserves;

- to almost double coal production;
- to increase the amount of electricity produced from nuclear power to about a quarter of our needs;
- to ensure the commercial availability of synthetic fuels; and
- to proceed with the development of alternate energy sources.

Perhaps we have begun to turn the corner of the energy crisis, but there is a new trail to blaze -- one that will lead toward adequate energy supplies for the future as well as the present.

And to do that successfully, we will need all our skills, and all our ingenuity, and all our resourcefulness, and all our resources -- coal, oil, natural gas, uranium, geothermal fusion, and solar energy, and all the advanced technologies that we can develop successfully and implement practically.

That is the context in which, I think, we have to view solar energy -- as one important resource, with its own unique advantages, and with its own short-term limitations.

I'd like now to examine the immediate and future potential of solar energy. And I will begin by addressing one solar application which lies primarily in the future. I'm talking about the large scale conversion of solar energy into electricity.

The advantages of producing electricity with solar energy are practically self evident. It appears to be the safest and most environmentally sound of all energy sources. It is free, and available to all.

For all practical purposes, the source is inexhaustible and it can't be embargoed. So our source of supply is secure and renewable.

A number of methods for converting the sun's power to electricity have been described. They range from huge fields of mirrors that focus the sun's energy on a boiler to produce steam and then electricity to ocean based power stations which could use the heat stored in the sea to produce electricity or other fuels.

None of them should be derided as "visionary." But by the same token, we should not underestimate the job they must undertake.

My reason for saying this is, in part, a paradox. Lets consider the central station system -- the field of mirrors -- as an example. The technology exists -- now -- to build power plants like this. A test facility is being built in Albuquerque, New Mexico. The technology is, in fact, remarkably simple; the basic component is just a sophisticated mirror that rotates to follow the sun.

But the very simplicity of the technology is one of the impediments to reducing its cost to the very low levels needed to make solar electric power competitive. It will be very difficult to reduce the cost by simplification. The answer lies in expanding markets, and -- perhaps -- different technological approaches.

Right now, we're uncertain. But we are so convinced of solar energy's value for electricity generation that we're aggressively proceeding with the research and development needed to find out.

Another limitation could be storage. As we all know, the sun does not shine 24 hours a day. Some economical means of storage has to be developed so that a central station power plant can remain in service at night and during periods of cloudiness.

Will one be developed? Yes -- but it will depend on a continued, vigorous program of research, development and demonstration.

Storage of solar based electricity also means that the array of solar collectors -- that simple field of mirrors I mentioned -- must be large enough to produce electricity that can be stored for night time use, while simultaneously generating electricity for daylight demand. That problem becomes even more important in areas of the country subject to prolonged periods of cloudiness.

The significance of the larger generating capacity is that it could add to the cost of electricity.

Can it be brought into an economical range? I believe it can, but we're working to find out to find out for sure.

But, even if the problems that I mentioned cannot be solved in the near-term, some useful electricity could still be generated with solar energy. What would be questionable would be the availability of solar energy for what is called base-load electric generating capacity -- the basic capacity which is kept in use twenty-four hours a day.

Quite possibly, that base load energy would have to come from some other technology. Solar electricity might then be used to satisfy intermediate, or peak electricity demands, which occur during the day because of the increased domestic and industrial need for power.

So, electricity from solar energy is not an all or nothing at all proposition today. We are optimistic that it will have a role in the future, but the scope of that role is not fully apparent -- yet. What is clear is that our efforts to develop the largest, feasible role for solar electricity will be continued and intensified.

Even now, we are beginning to examine opportunities for accelerating the use of solar energy by the utility industry. A few days ago, we provided a half-million dollars to analyze approaches for assuring the large-scale, accelerated use of solar energy in eight southwestern states. And, as far as I'm concerned, this is only the beginning of our effort to make solar electricity available to the public.

My chief purpose in dwelling on some of the uncertainties is not to dismiss the promise of solar energy, but to sharpen our perspective, and clarify some of our expectations. But -- perhaps most important -- it is to point to the challenges that American technology must -- and, I believe, will -- solve.

So, we should not be discouraged simply because we cannot say with absolute certainty that solar energy is the single, unqualified answer. Instead, we should recognize that some uncertainties may remain uncertaon, and proceed with prudence anf flexibility on an active program of research, development and demonstration.

Prudence dictates using research funds to pursue all reasonable solar options, and flexibility means being prepared to accept the answers produced by our best -- and most exhaustive -- research and development efforts.

Flexibility also means funding research on a variety of advanced energy technologies, such as fusion. It may not have all the appeal of solar energy, but, nonetheless, fusion does appear to be capable of providing economical energy in a safe and environmentally acceptable manner in the next century.

But a vitally important and growing part of that research effort remains solar energy.

Funding for solar research has gone from virtually nothing in 1970 to a budget authorization of $115 million in the last fiscal year. The actual outlay for solar research last fiscal year was more than 400 percent higher than the year before. And I see every reason to expect healthy increases in funding for solar tesearch over the next few years.

So far, I've been talking about the longer range solar technologies -- those for the next century -- or, at best, late in this century. And, from my perspective, I find that prospect very promising. But, in some very important respects, the future of solar energy is now.

Perhaps I can illustrate that point by briefly examining the way we deployed last fiscal year's solar research funds. Of the total solar R&D budget, about two-thirds was devoted to solar electric applications, such as those I mentioned earlier. Roughly a third went for research on the heating and cooling of homes and large buildings.

There's a reason for that disparity, and its a very practical one: large amounts of money are not really required to develop and demonstrate heating and cooling technologies on a large scale. In many respects, these applications of solar energy either are now, or are rapidly becoming, competitive with other energy sources.

Solar heating and cooling technologies, in a real sense, are already out of the research laboratory, and on their way to the building contractor. In fact, some are already there.

Commercial production of solar collectors in 1975 was roughly 400 percent higher than in 1974. And, in fact, the industry seems to be in a trend of quadrupling production annually.

We aren't talking about an industrial giant -- yet. The industry only does about $12 million worth of business today. But, still, it is evident that we are not dealing with fundamental research, but with product and market development -- in short, broad commercial availability.

And we are prepared to accelerate that transition to commercial availability. The Energy Conservation and Production Act -- which we consider an extremely important achievement -- calls for a National Plan to do just that. We are already beginning to develop that plan to stimulate market demand, encourage consumer acceptance, and add to the growth of the solar heating and cooling industry.

That effort will continue and grow. We have the authority; we have the money; and we intend to use both to promote these technologies. We want to move vigorously in this area because it is in the national interest, and in the interest of the American consumer.

For example, given certain assumptions about mortgage availability, interest rates and installation costs, there is every reason to believe that residents of many areas of the country could economically install a solar hot water system in a new home.

In some areas, it would mean saving money over electrically heated water in only two years. And in thirteen years, the system would have paid for itself with savings on utility bills.

If that individual chose at the same time to add solar space heat, the entire system would be saving him money over electricity in three years, over a heat pump in seven, and over heating oil in eight. As the industry develops more experience with these solar technologies, their costs will certainly drop. And as the cost of oil and electricity increase, the economy of these solar technologies will improve.

There are a number of things the government can do to help overcome the two chief obstacles to market development. We think we understand them; we feel they are manageable; and we are dealing with them.

The first barrier is the high production cost. This characterizes the initial stages of any new industry. These costs are governed, in part, by the volume of production, which, in turn, is a function of demand. There is something the government can do about that volume since we are just about the biggest, single consumer in the economy. And we're going to use that market power by making the government a customer of solar energy.

The FEA, the Department of Defense, the General Services Administration and the Veterans Administration are working to identify specific opportunities for the use of solar hot water heaters in their facilities. For the industry, this could mean several million additional square feet of production over the next few years -- more volume which should help lower the cost of production, and make solar heated water even more competitive than it is.

And that means less oil and natural gas used to heat water, a growing solar industry, and more jobs for Americans who will be needed to design, manufacture, and install solar equipment.

The second factor, which is hindering the expansion of demand in the private sector, is the high cost of installation. You may begin to save money over other fuels with a solar energy system, but to accomplish this, you must spend a lot of money right up front.

We're beginning to do something about that. Two billion dollars has been authorized to guarantee loans for investments in energy conservation and renewable energy sources -- and that includes solar energy technologies.

We will use some of this authority to reduce the burden of installation costs, and help the builders, owners, and occupants of multi-family dwellings and commercial buildings to take advantage of the life time value of solar energy.

We think this will help. But the initial high cost of installing solar heating and cooling systems will still hinder the development of the solar industry -- unless some adjustments can be made in the way we build and finance new construction, and renovate existing buildings.

That's one objective of a nationwide program to demonstrate the practicality of solar heating and cooling in private residences, apartment buildings, and commercial structures, as well as government facilities. Based on the results, we plan to recommend legislation to enact building and financial reforms that will pave the way

for the widespread use of solar energy in private buildings. I don't mean just new buildings, but existing buildings as well.

Twenty-five percent of the energy used in this country goes for heating and cooling buildings, and for heating water. That means that this nation has a profound economic and political interest in the most economical and secure source of energy to perform these functions. That can be solar energy. And it's earliest, practical, widespread availability is a commitment of the United States.

I think we have the resources to fulfill this short-term commitment, and also our commitment to adequate energy for the next century. We have an abundance of creativity, a wealth of capital, and a store of technological talent unmatched anywhere in the world -- or in history.

What other people only dream, Americans habitually seek to transform into reality. We have begun that process with solar energy, and it will continue.

Thank you.