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Office of the White House Press Secretary

THE WHITE HOUSE

FACT SHEET

THE PRESIDENT'S MESSAGE ON SOLAR ENERGY

Highlights

In a Message sent to the Congress today, the President outlined a national strategy for accelerating the use of solar and other renewable resources. The President set a national goal of deriving 20% of the nation's energy needs from the sun by the year 2000.

The President's recommended solar program is based upon the results of a government-wide Domestic Policy Review of Solar Energy which he initiated on Sun Day, May 3, 1978.

The key elements of the President's program are:

- o Establishment of a national solar goal of meeting 20% of the country's energy needs with solar and renewable resources by the end of this century. Attainment of this ambitious and important goal will require a strong commitment by not only the federal government but by State and local governments, private industry, academia, and all individual U.S. energy users.
- o Creation of a new national Solar Bank funded at an initial annual level of \$100 million. The Bank would provide interest subsidies for owners and builders of residences and commercial structures who install solar equipment. The Bank would be funded out of the proposed Energy Security Trust Fund. It is estimated that over 100,000 new and retrofitted solar units would be financed through the Bank during the first year.
- o A 20% tax credit, up to a total of \$2,000 per home, for new homes built using passive solar designs and applications. This provides a significant new incentive for use of cost-effective designs and materials which take maximum advantage of the direct heating power of the sun. This and the following tax credits will be funded from the Energy Security Trust Fund, as announced in the April 5, 1979 Energy Message.
- o A new investment tax credit to encourage the use of solar technologies to provide process heat for use in industry and agriculture. This credit adds to the existing investment tax credit to provide a total of 25%, and it will remain in effect for investments made through 1989.
- o A new 15% tax credit for the purchase and installation of airtight woodburning stoves in principal residences. This credit will permit greater use of our wood resources for home heating, and should permit consumers to save significantly on their heating bills.
- o An exemption for gasoline/alcohol mixtures from the current 4¢ federal gasoline excise tax to encourage the use of gasohol. Gasohol provides a useful supplement for fueling our existing automobile fleet and can help in reducing our needs for imported crude oil.

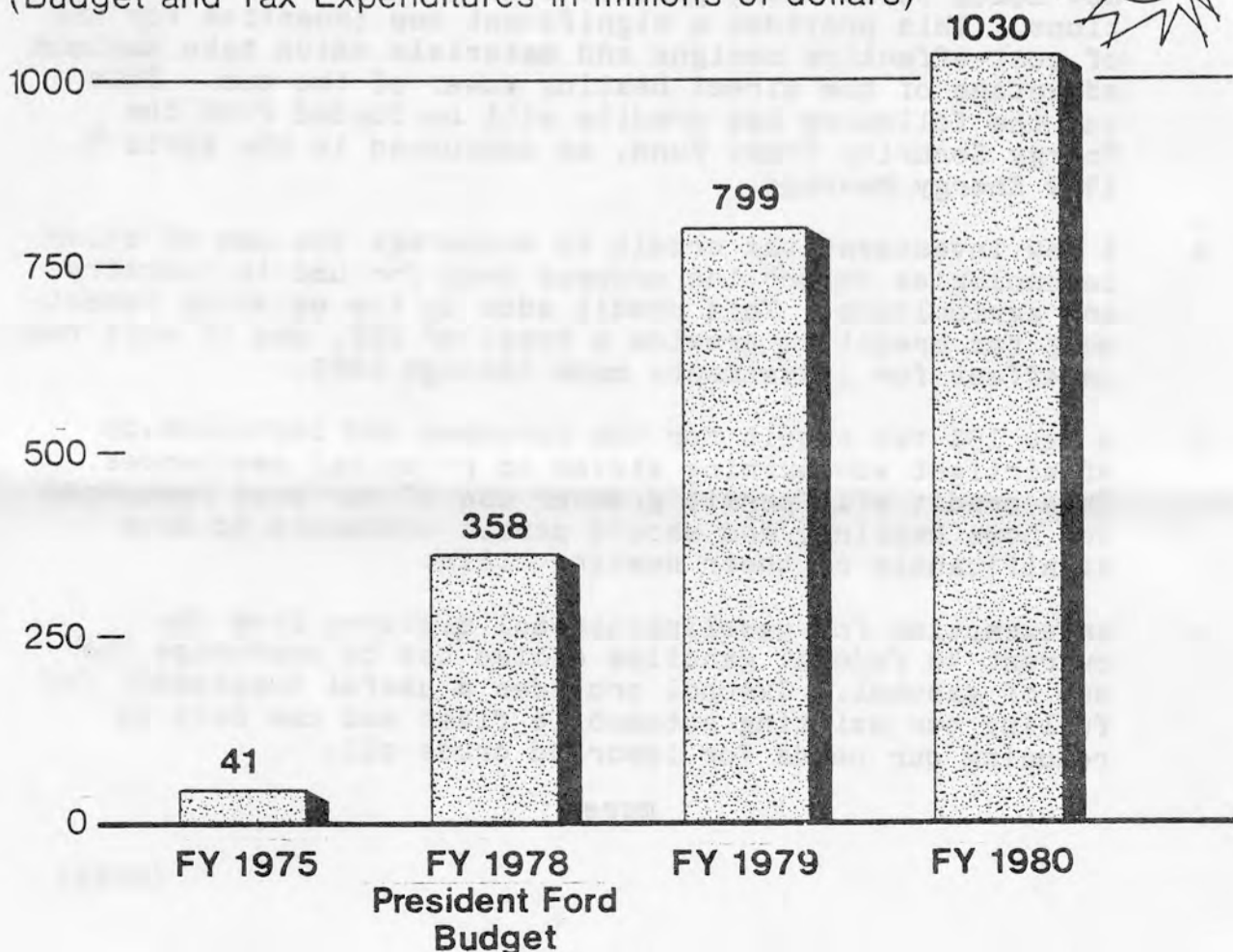
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- o Recommended expenditures for FY 1980 of over \$1 billion to support a range of federal government activities to accelerate development and use of solar and renewable resources including:
 - tax credits and other assistance to encourage use of currently available solar and renewable resource technologies in homes and commercial buildings.
 - information dissemination and training courses for users and installers of solar energy.
 - tax credits and other incentives for accelerated application of solar and renewable resource technologies in the agricultural and industrial sectors.
 - a strong federal research and development program administered by the Department of Energy and funded at \$646 million for FY 1980. Major emphasis will be placed on photovoltaics, wind energy systems, biomass conversion, process heat, advanced passive design and pursuit of solar thermal and ocean thermal systems.
- o Enhanced efforts to encourage the use of solar and renewable resource systems internationally, including a significant program to be administered by the Agency for International Development (AID) to assist developing countries in harnessing the power of the sun.
- o Establishment of a permanent Standing Subcommittee of the Energy Coordinating Committee to monitor and direct the implementation of all of the solar programs across the government. The Subcommittee will report regularly to the Energy Coordinating Committee which is chaired by the Secretary of Energy, and is comprised of representatives of all major agencies of government with responsibility for solar and renewable resource applications.

FEDERAL SOLAR PROGRAMS

(Budget and Tax Expenditures in millions of dollars)



National Solar Goal

In 1977, when the cost of imported oil was \$14.50 a barrel, the United States consumed 77.6 quads (quadrillion British Thermal Units) of energy. Solar and other renewable resources contributed 4.2 quads, or roughly 6% of this total. Slightly under 60% of renewable resource power was produced by high head hydroelectric installations. Virtually all of the balance was provided by wood burning in industrial applications. Future growth in solar use to meet the 20% goal will come from sources other than high head hydro.

The Solar Energy Domestic Policy Review estimated that United States annual energy use would rise to 95 quads by the year 2000, assuming an increase in the price of imported oil to \$32 a barrel. The DPR concluded that a maximum practical effort could increase the amount of conventional energy displaced by solar and other renewable resources to 18.5 quads by the year 2000, or approximately 20% of the total, given the \$32 a barrel price assumption.

The 20% goal established by the President assumes a strong, concerted effort by state and local governments, and private industry and individual energy users, in addition to the continuing Federal program.

Solar Bank

The Solar Bank proposed by the President in his Message would be established by legislation as a government corporation within HUD. The Bank would have the following essential elements:

- o It would be authorized to provide interest subsidies for home improvement loans and mortgages to finance the purchase and installation of approved solar energy systems. The Bank would pay upfront subsidies to banks and other lending institutions which would in turn permit them to make home improvement and mortgage loans for solar investments at interest rates below the prevailing market rate.
- o Solar energy systems would be defined to mean any equipment which uses either active or passive solar design and construction technologies, for example, solar hot water heating, solar heating and cooling, passive solar design, or some combination of these. The Secretary of Housing and Urban Development in consultation with the Secretary of Energy would define the specifications for these systems.
- o The interest subsidy would be provided only for that part of the home improvement or mortgage loan which directly finances the solar investment. The interest rate subsidy would be calculated to compensate the lender for the difference in yield between the subsidized loan and a similar loan made at the prevailing market rate.
- o The interest subsidy would be set from time to time by the Board of Directors of the Bank (composed of the Secretaries of HUD, DOE, and Treasury) at the level which will best serve the purposes of accelerating the use of solar energy systems in residential and commercial buildings.
- o The availability of the subsidy would be conditioned on an appropriate warranty against defects.

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- o A commensurate portion of the subsidy would be recovered by the Solar Bank whenever a solar loan goes into default.
- o At least 60% of the Bank's subsidy payments would have to go to residential loans.
- o The following ceilings would be set on the size of the loan or portion of the loan which would be subsidized: \$10,000 for a single-family residence; \$5,000 for each unit in a multi-family residence (not to exceed \$500,000 per loan); and \$200,000 for a commercial structure.
- o The Bank would be funded at \$100 million in its first year (Fiscal Year 1981). It would be financed with monies to be provided from the Energy Security Trust Fund.

This proposal is similar in many respects to that introduced by Congressman Stephen Neal of North Carolina (H.R. 605) and Senator Robert Morgan of North Carolina (S. 527).

Tax Credits for Residential and Commercial Passive Solar Construction

Builders of new passive solar multi-family and commercial buildings will be provided with a tax credit of \$20 per million Btu estimated design savings per annum for a thermal performance at a specified level above the Building Energy Performance Standard baseline established pursuant to the Energy Conservation and Production Act (P.L. 94-385). The maximum amount of this tax credit is \$10,000 per building. This tax credit will be financed from revenues from the Energy Security Trust Fund.

A tax credit is proposed to be provided to builders of new passive solar residences. Builders would be allowed a tax credit of 20 percent of the cost of solar energy equipment for each unit (up to four residential units per building) in qualifying designs, up to a maximum tax credit of \$2,000 per unit. Starting in 1983, eligibility for the residential tax credit will be provided to builders who exceed the Federal Building Energy Performance Standards by more than 50%.

Tax credits for both residential and commercial buildings will be effective through December 31, 1985.

Tax Credits for Solar Process Heat

An additional tax credit of 15% (for a total of 25%) is proposed to be provided from the Energy Security Trust Fund on the cost of solar thermal energy equipment to produce process heat in agricultural and industrial applications. The credit would be allowed for the installed cost of eligible equipment. The credit is to be effective through December 31, 1989.

Improving the Coordination of Federal Solar Programs

The President's government-wide solar effort includes over twenty separate solar energy programs which are administered by more than a dozen different Federal agencies. To ensure that these funds are used effectively, that overlap and wasteful competition among projects are minimized, and that each part advances the overall objectives of the entire program, the President has directed that a Standing Subcommittee on Solar Energy be created within the Energy Coordinating Committee (ECC), which was established by Executive Order last year.

FEDERAL SOLAR PROGRAMS BY MARKET SECTOR

The ECC has as members the major agencies which have responsibilities for solar and renewable resources. Use of this existing mechanism will make it possible to avoid delay in coordinating the solar energy effort. The Subcommittee will be responsible for tracking the progress of all Federal solar and renewable resource programs, and reporting on a regular basis to the ECC, and through the ECC to the President. It will identify problems and present them to the ECC for resolution. The presence on the ECC of representatives of the Office of Management and Budget, the Council on Environmental Quality, the Special Assistant to the President for Consumer Affairs and the Domestic Policy Staff will facilitate direct Presidential involvement as needed.

electric utility consumers. Valley Authority to demonstrate solar use to passive equipment, and programs by the Tennessee and demonstrations nationwide of active and passive solar information and training, development and wood stoves, a major emphasis on active solar and wood stoves.

Industrial and Agricultural Sectors 88* 134* 825*

Programs aimed principally at the industrial sector include proposed tax credits, technology development and demonstrations for agricultural and industrial process heat and bio-mass technology, loans and loan guarantees for small solar businesses, a broad program of solar agricultural applications by the Department of Agriculture, and tax offsets, grants, loans, and loan guarantees to stimulate production and use of gasohol.

Utility Sector 89* 227 178*

Programs directed primarily at this sector include loans, loan guarantees, grants, demonstrations, and information dissemination to stimulate use of small hydroelectric facilities, R&D on ocean thermal technology, solar thermal electric technology, and the use of solar electric sources on electric utility networks. Also being studied is the solar satellite concept.

Government Sector 91 76 202*

Funds are provided for Federal investments in solar equipment for use on new and existing Federal buildings, and for Agency for International Development assistance in applying solar use in less-developed countries.

Multi-Sector 91 240 332*

These programs provide support to all more including research, development and demonstration for photovoltaics research, wind, and solar storage of solar technologies, solar basic research and construction of the solar Energy Research Institute Facility.

TOTAL PROPOSED FEDERAL SOLAR PROGRAM 2 799 2,103 259*

*includes some \$310 million in grants, loans, loan guarantees, and technical assistance to be provided by several Federal agencies to assist development of small hydropower and gasohol facilities as part of the President's recently announced Rural Energy Initiatives.

FEDERAL SOLAR PROGRAMS BY MARKET SECTOR

(Budget Authority and Tax Expenditures, \$ in millions)

	<u>FY 1979</u>	<u>Proposed FY 1980</u>	<u>% Change</u>
<u>Residential and Commercial Sector</u>	\$ 219	\$ 286	+31%
Programs targetted to this sector include tax credits for active solar heating and cooling and wind equipment, proposed credits for passive solar and wood stoves, a major emphasis on active and passive solar information and training, development and demonstrations nationwide of active and passive equipment, and programs by the Tennessee Valley Authority to demonstrate solar use to electric utility consumers.			
<u>Industrial and Agricultural Sectors</u>	88*	134*	+52%
Programs aimed principally at the industrial sector include proposed tax credits, technology development and demonstrations for agricultural and industrial process heat and bio-mass technologies, loans and loan guarantees for small solar businesses, a broad program of solar agricultural applications by the Department of Agriculture, and tax offsets, grants, loans, and loan guarantees to stimulate production and use of gasohol.			
<u>Utility Sector</u>	219*	257	+17%
Programs directed primarily at this sector include loans, loan guarantees, grants, demonstrations, and information dissemination to stimulate use of small hydroelectric facilities, R&D on ocean thermal technology, solar thermal electric technology, and the use of solar electric sources on electric utility networks. Also being studied is the solar satellite concept.			
<u>Government Sector</u>	76	91	+20%
Funds are provided for Federal investments in solar equipment for use on new and existing Federal buildings, and for Agency for International Development assistance in applying solar use in less-developed countries.			
<u>Multi-Sector</u>	240	319	+33%
These programs provide support to all sectors, including: research, development and demonstration for photovoltaics research, wind, and solar storage technology development, and environmental analysis of solar technologies, solar basic research and construction of the Solar Energy Research Institute Facility.			
TOTAL PROPOSED FEDERAL SOLAR PROGRAM	\$ 799	\$ 1,030	+29%

*Includes some \$310 million in grants, loans, loan guarantees, and technical assistance to be provided by several Federal agencies to assist development of small hydropower and gasohol facilities as part of the President's recently announced Rural Energy Initiatives.

RESIDENTIAL AND COMMERCIAL SECTOR

In addition to the National Solar Bank and the new tax credits for residential and commercial use of passive solar designs, the following additional new initiatives are proposed.

Residential Tax Credit for Wood Stoves

The Nation's wood resources are very large and more than sufficient to allow a significant increase in the present use of wood for home heating. A tax credit is to be provided out of the Energy Security Trust Fund on the purchase of efficient wood stoves for principal places of residence. Qualifying stoves purchased after April 5, 1979 would be made eligible for the 1978 National Energy Act conservation credit of 15 percent, which will be effective through December 31, 1982.

Residential Financing

The Federal Home Loan Mortgage Corporation (FHLMC) and the Federal National Mortgage Association (FNMA) are currently developing property improvement loan purchase programs which will include loans to install solar heating and cooling systems. Both corporations have made these programs high development priorities.

The Federal Home Loan Mortgage Corporation has recently made changes in its single family conventional mortgage underwriting guidelines to give enhanced recognition in its income requirements for homebuyers to the savings brought about by the purchase of an energy efficient home. The secondary market corporations, as well as primary lenders, should make more extensive use of energy costs in their underwriting and appraisal policies, but cannot do so until more accurate means of estimating the energy costs of a home are found.

The President is therefore directing the Department of Energy, in consultation with the Department of Housing and Urban Development, to begin immediately to develop the technological means of accurately estimating home energy costs which can be used in the mortgage underwriting and appraisal processes.

Legislation will be proposed to enable the Federal Home Loan Mortgage Corporation and the Federal National Mortgage Association to increase their maximum mortgage purchase ceilings by 20 percent in the case of homes with active solar space heating, water heating or cooling systems. This authority will parallel that provided in the National Energy Act for loans insured by the Federal Housing Administration. This would mean that lenders would be more willing to make loans on solar homes which currently do not qualify for purchase by FNMA or FHLMC because the costs of a solar system often push the mortgage amount over the eligible purchase ceiling.

Solar Home and Water Heating in Rural Areas

The Farmers Home Administration provides loans for construction of rural homes. Some 110,000 single family and 32,000 multi-family units are being financed through FmHA. Conservation of energy is a major element in the FmHA home loan program and in the Business and Industrial loan program. New stringent thermal

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standards have been implemented in all new FmHA financed homes. The possible use of solar energy to provide hot water and to space heat residences has been examined, and the FmHA has constructed well over 200 housing units utilizing either passive or active solar systems. The majority of the systems are for heating water for which solar units now appear to be cost effective with electricity in some areas. Since March 1979, loans for wood burning equipment have been available.

The President is directing the Secretary of Agriculture to require builders seeking FmHA loans to cost out solar heating systems as alternatives to fossil fuel systems, and to finance installation where they can be cost effective.

Passive Solar Information Program

There are several thousand buildings in the United States that incorporate passive solar energy concepts in their design materials and operation. These passive solar techniques supply a substantial fraction of a building's space heating needs at only a small increase in initial cost. Yet, the potential of passive solar energy use will not be realized until design and construction techniques are better understood by the building industry.

The President is directing the Secretary of Energy in consultation with the Secretary of Housing and Urban Development to develop a passive solar energy information program designed to address the needs of the building community, including architects, engineers, contractors, builders, and building material suppliers, as well as bankers and the general public. This program will begin in FY 1980.

Solar Financial Information and Training Program

The Domestic Policy Review found that a well informed financial community is necessary for the rapid and orderly introduction of solar energy systems. This need was also recognized by the Department of Energy in a pilot series of nationwide Solar Heating Workshops for the financial community.

In response to the DPR recommendations, the Secretary of Energy is:

- o establishing a solar financial information and training program with the goals of:
 - (1) informing financial personnel in both the private and the public sector so that they are able to make better judgements on solar loan applications, and,
 - (2) providing consumers with information to make knowledgeable purchases of solar systems and to utilize Federal and state financial programs and tax incentives;
- o establishing relationships with the financial community to provide the private sector with information about the benefits of this Federal program;
- o working with the financial community to provide information to the consumer through the use of conferences, seminars, workshops, publications, films, and other methods;

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- o working with the financial community to inform lenders, appraisers, insurers, realtors, etc. about the solar-related information needed to enhance consumer interest in solar financing; and,
- o working with the Regional Solar Energy Centers, the National Solar Heating and Cooling Information Center, and State and local governments as appropriate.

Solar Equipment Standards

The Domestic Policy Review of Solar Energy found that widespread use of solar energy is dependent upon consumer confidence in the reliability and performance of solar equipment. Due to the wide variety of solar technologies and the rapid rate of innovation private sector and State and local government activities to develop equipment performance standards, testing and certification need to be coordinated and accelerated.

The President is directing a strengthening of current efforts to meet the consumer's need for valid information and assurance that solar equipment and systems purchased under Federal incentive programs will perform and last as expected. He has also asked for a study of alternative mechanisms for providing Federal assistance to development and implementation of programs to provide solar consumer assurance, within the framework of the Residential Conservation Service, as part of the National Energy Act.

This effort will be conducted by the Task Force on Solar Energy Standards and Specifications, chaired by the Department of Energy, which is developing specifications to be used for Federal solar applications and the private sector as well.

Building Code Development

The Domestic Policy Review of Solar Energy found that State and local building codes and restrictions on housing design can impede the use of solar energy. It also found that local communities that set building codes have too little information about solar construction techniques and the overall economic and environmental benefits of solar energy. Increased information on how solar energy can be incorporated into local building codes is required if the use of solar energy is to be accelerated.

The President is directing the Department of Energy, in cooperation with the Department of Housing and Urban Development, to:

- (1) Expedite the development of one or more model solar building codes for use by States and localities.
- (2) Sponsor workshops and other informational programs to accelerate the adoption of such codes.
- (3) Develop training programs for State and local officials so that the solar building codes can be effectively administered.
- (4) Report to the Solar Energy Coordinating Committee within six months on the Department's progress in this area, and periodically thereafter.

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Low Income Weatherization Grant Program

The Low Income Weatherization Grant Program was initially authorized by the Energy Conservation and Production Act of 1976 (ECPA). Subsequently, the Administration has increased the budget for the Weatherization program from \$27 million in 1977 to a projection of \$198 million for 1980. In addition, the National Energy Conservation Policy Act of 1978 (NECPA) contained within the President's National Energy Plan increased the grant maximum to \$800 per dwelling unit for insulation, storm windows and doors, caulking and weatherstripping, furnace efficiency modifications, and clock thermostats.

The President is asking the Department of Energy to examine in connection with its FY 1981 budget preparation whether an expansion of the Low Income Weatherization Grant Program to include low-cost solar energy systems should be funded.

Timber Stand Improvement and Firewood Marketing

As a followup to the April 5 proposed tax incentive to purchasers of wood burning stoves, the President is directing the Secretary of Agriculture to survey the 48 States for possible expansion of the non-commercial Timber Stand Improvement program into areas where woodland would be improved and reasonably priced firewood would become available as an alternative to petroleum fuels.

A pilot project involving 10,000 acres in New England was announced on April 16, 1979. In this program, State and U.S. foresters will provide supervision and help landowners with marketing a total of 80,000 cords of fuelwood from this land. This is the equivalent of 240,000 barrels of oil. The estimated cost of the pilot program of \$38 per acre compares favorably with the current Federal cost for timber stand thinning of about \$65 per acre. In addition, it provides substantial fuelwood to homeowners.

Existing NEA Solar Tax Credits

Incentives provided by the National Energy Act include the following tax credits:

o Residential Solar

A non-refundable credit for investments in solar, wind, and other renewable sources of energy is available for both new and existing residences. The credit is equal to 30 percent of the first \$2,000 and 20 percent of the next \$8,000 spent, for a maximum of \$2,200. Any investment from April 20, 1977 through December 31, 1985, is eligible if the equipment is used to heat or cool a home or provide hot water.

o Business Tax Credits for Solar or Wind Energy Property

An additional refundable 10 percent investment tax credit is provided for investment in equipment to use renewable energy to generate electricity or to heat or cool, or provide hot water. This credit is not available to utilities.

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Passive Systems Development

A passive solar building design utilizes natural environment forces for heating and cooling, in contrast to traditional conservation which stresses isolation from the environment. In passive solar designs, energy is transferred to and from a building utilizing natural conduction, convection and radiation with minimal dependence on mechanical equipment such as fans, pumps and compressors.

The lack of adequate design, cost, and performance information has been a major obstacle to greater use of passive solar concepts. To address this need, DOE has supported the instrumentation of passive buildings and test rooms to provide the information to develop handbooks and computer programs to architects and designers.

A second major obstacle to the use of passive solar designs is the lack of marketable products that are easily incorporated into buildings. In FY 1979, completed studies have identified the need for new passive components to collect, store and distribute energy. The development of these products will be undertaken by DOE in FY 1979 and technical information on products will be made available to building material suppliers, architects and builders as they are developed in FY 1980.

A study completed by DOE in FY 1979 shows that passive cooling can satisfy comfort requirements generally throughout the U.S., with dehumidification devices required in areas of high humidity. Information on passive which meets the needs of architects, developers, lenders and others involved in the use of passive solar concepts, will be made available in FY 1980.

Active Systems Development

Using the sun to cool requires sophisticated techniques, many of which are in the early stages of product development. In response to the different climatic variations and building types throughout the nation the program is identifying and developing the most promising solar cooling concepts. Twenty-five projects are currently being supported, including six different chemical and mechanical approaches to solar cooling, passive cooling techniques, and the adaptation of current cooling equipment to solar energy.

The performance of several of these new solar cooling systems is being monitored in prime potential market areas throughout the country.

Also, four types of solar systems are being developed to meet the space heating needs of buildings; those using air or liquid-heating collectors directly, those using a heat pump in conjunction with the collected solar energy, and those using the building itself to collect and store the sun's energy. Fourteen projects are underway in this area.

Residential and Commercial Building Demonstrations

There are a total of about 70 million residential and commercial buildings which use about 20 percent of the annual U.S. energy consumption for heating and cooling where a significant portion of this need could be met by solar heating and cooling systems. Informed surveys indicate there now are some 100,000 solar energy installations on buildings and the President has established a goal of 2.5 million such solar installations by 1985.

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An early deterrent to market acceptance of solar energy was the absence of experience with this energy source among architects, engineers, designers and builders. A major demonstration program was undertaken to show how the various solar systems available could be used on all building types in each climatic area of the country.

Through FY 1979, some 12,000 individual projects will be underway, including single and multi-family housing, totaling over 20,000 dwelling units in all 50 states, (including both passive and active systems), and some 400 commercial projects.

The Federally funded residential and commercial demonstration projects through FY 1979 represent approximately \$100 million in total sales for the solar industry, which for 1978 had estimated sales of about \$180 million.

To date, about half of the over 12,000 residential and commercial demonstration projects are operational, with about 100 instrumented to provide detailed technical performance information. This provides a comprehensive resource for information on all aspects of solar heating and cooling systems which is being collected and provided to all interested parties through a national solar-user information program.

The demonstration program, under provisions of Public Law 93-409, is concluding in FY 1979.

National Solar User Information Program

The National Solar User Information Program was developed as a part of the Federal solar heating and cooling demonstration program to collect, evaluate, and publish information on the performance of solar systems located throughout the U.S. Using a sophisticated information network, data from residential and commercial demonstration sites are being collected, analyzed, and distributed to serve the information needs of all interested parties, particularly those involved with solar use.

Both suppliers and consumers need information on how well the solar systems work for consumers to understand potential benefits and for manufacturers to further improve their products. To provide this information to both consumers and manufacturers DOE is significantly increasing the number of instrumented projects in FY 1979 to a total of 75 residential and 75 commercial. Currently, comprehensive information is being collected from about 100 projects with complete heating and cooling season coverage for 10 systems achieved.

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The general public has shown a great interest in information on solar energy use, particularly solar heating and cooling. As one response to this need, the National Solar Heating and Cooling Information Center was established in 1976. To date, over 2,000,000 telephone inquiries have been responded to and several million mailings of information have been made. This information service will be continued in FY 1980.

Solar technologies are relatively new and their practical use not yet well understood by the public at large. In FY 1980, increased efforts will be made in disseminating solar information to potential solar users to increase general awareness and to provide specific information to decisionmakers. In this way, the public and the industry will become better informed and more willing to participate in the development and use of solar energy.

Tennessee Valley Authority Solar Energy Program

TVA is already a leader in the Federal effort to accelerate the use of solar energy. The main emphasis of TVA's solar energy program is the demonstration of solar space and water-heating applications through the financing of actual installation of solar water-heating units, wood heaters and passive solar buildings in homes and businesses of Valley residents to demonstrate the cost and energy-saving benefits from using solar energy. For example, in its "Solar Memphis" program, TVA's goal is to install 1,000 solar water heaters this year by offering long-term, low-interest loans, inspection of solar installations, and backing of manufacturers' warranties. In addition, TVA's 1.75 million square foot passive solar office complex in Chattanooga, Tennessee will be designed to be completely energy self-sufficient and will be a model for the Nation for the use of renewable technologies in office buildings.

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INDUSTRIAL AND AGRICULTURAL SECTOR

The following programs are in addition to the tax credits for solar process heat proposed to be provided out of the Energy Security Trust Fund.

Small Business Energy Loans

In January of this year, the Small Business Administration initiated a special program to accelerate commercialization of solar and other renewable energy resources by providing direct loans and loan guarantees for new and existing small businesses. Suppliers of energy conservation and renewable energy goods and services are eligible to apply for this program.

Since that time SBA has made 42 direct loans for \$5 million and 10 loan guarantees for \$1 million. The program has been extremely popular, and SBA has pending requests for an additional \$5 million in lending. To help meet this need, the President has directed the SBA to reprogram \$7 million in direct loan funds and \$5 million in loan guarantees from other programs into the Energy Loan Program. An appropriation level of \$15 million in direct loans and \$30 million in loan guarantees is being sought for Fiscal Year 1980.

In addition, SBA's regular loan guarantee program, which will provide \$3 billion in loan guarantees in Fiscal Year 1979, may also be used to finance investments in solar energy systems.

Air Pollution Offset Credits

The United States Environmental Protection Agency has developed a system allowing states to "offset" pollution from existing sources. These reductions can be "banked" and saved until needed.

In response to the DPR recommendations, EPA is allowing pollution savings from the conversion to solar energy by existing plants to qualify as an "offset." This will encourage owners of new industrial facilities powered by conventional fuels to finance installation of solar energy at existing plants where it is practical as a pollution control strategy. Thus, solar investments can help stimulate new industrial development in areas where growth is currently limited by air pollution problems.

Exemption from Coal Conversion Regulations

The Department of Energy is proposing a "permanent mixture exemption" for industrial and utility facilities which use solar energy equipment in combination with oil or gas. A firm or utility that proposes to construct a boiler which derives at least 20% of its annual energy from a solar source, and which would otherwise be prohibited from using oil or gas, would be exempted from the Fuel Use Act (FUA) regulations that would prohibit use of oil and gas in that boiler.

As a result of the DPR, the Department of Energy will establish the commercial feasibility of various industrial solar technologies. Based upon this information, DOE may require that an applicant for FUA exemptions show that a solar/oil or solar/gas mix is not a feasible alternative to a 100% oil based system. This action would promote the increased use of solar by making all who seek to use oil and gas also evaluate their use in combination with renewable resources.

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Natural Gas Priorities

As part of the on-going development of curtailment policies, the Economic Regulatory Administration (ERA) is asking for comments from the public on providing a higher priority for the use of natural gas as a back-up fuel for solar applications. Comments are due within a month and a decision on the issue is expected to be made by the spring of 1980.

Oil Allocation Priorities

The President is also directing the Department of Energy to amend its standby petroleum allocation regulations to give higher priority in the event of shortages to users of solar energy equipment who may require oil as a backup or supplemental fuel. This will help to make the supply of fuel more secure for solar users, especially in regions of the country where oil is an important heating fuel.

Economic Development Administration Programs

EDA's ability to take further actions to accelerate the use of solar energy in the industrial sector is constrained by its existing authorizing legislation which restricts EDA funding for energy related activities under Titles I and II of the Public Works and Economic Development Act of 1965 to \$7 million annually. The National Public Works and Economic Development Act of 1979, presently pending before the Congress, would remove the constraint. The President urges the approval of the provision so as to permit EDA to provide financing assistance:

- o to help industries producing solar equipment;
- o to provide a solar energy source when recycling old buildings for industrial purposes;
- o to provide solar energy package systems for industrial parks; and
- o to refit existing energy facilities in industrial plants with a solar power source.

A program goal of \$50 million has been established for solar investments for each of fiscal years 1980 and 1981. While EDA would not be setting aside these funds, it will attempt to reach the \$50 million goal by encouraging applicants for appropriate industrial projects to use solar energy.

Gasohol

o Gasohol Tax Exemption

In order to increase the availability and use of gasohol (gasoline containing at least 10% alcohol), the President will seek legislation to make permanent the current gasohol exemption from the gasoline tax, conditional on the enactment of the Energy Security Trust Fund.

The tax portion of the National Energy Act provides an exemption from the 4¢ Federal gasoline tax for gasohol. That exemption is, however, scheduled to expire on October 1, 1984. With this 4¢ subsidy, gasohol sales have risen rapidly from nearly zero a year ago to a rate exceeding 7 million gallons per year of alcohol in February of this year. New

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alcohol production facilities for gasohol, which could expand production beyond these levels, are not now being planned or built. A permanent extension of this gasohol exemption could significantly increase the incentive for production of this fuel by providing the certainty new investors need. It would provide a petroleum supplement and octane booster which is now in wide demand and which could help moderate current pressures on U.S. oil supplies.

o Gasohol in Federal Vehicles

The President has directed that gasohol be used in federal vehicles wherever it is available.

o Construction of Gasohol Plants

The Economic Development Administration, Community Services Administration, and Department of Energy are working together to provide technical assistance, grants, loans, and loan guarantees to farmers, farm cooperatives, and others for the development and construction of small-scale fuel alcohol plants. Up to \$10 million will be made available in fiscal years 1979-1981 as part of the President's rural energy initiatives to enable construction of as many as 100 small plants.

As a result of the tax incentives and the combined efforts of Federal agencies, alcohol for motor fuel is expected to reach 300 million gallons per year in 1982, and may approach 600 million gallons in 1985.

Industrial Process Heat (IPH) R&D

Current IPH systems indicate a need for both cost and performance improvements. To this end a program to develop low-cost mass-producible collectors and components was initiated in FY 1979. Testing of prototype collectors is scheduled for FY 1980.

A large market exists in medium (200° to 500° F) and high (greater than 500° F) temperature applications. Research and development of systems that will operate in those temperature ranges is being conducted and will continue in FY 1980.

Industrial Applications Program

- o Industrial process heat requires about 25 percent of the total energy now used in the U.S. The Industrial Applications program has been underway for several years with a goal to significantly reduce dependence on fossil fuels. Seven experiments are underway for low temperature (approximately 200°F) process heat applications with four more to be completed in 1979. Seven new projects are being designed to perform in the mid-temperature range (approximately 400° F). These experiments will demonstrate the feasibility of using solar energy for industrial applications.
- o Most industrial sites require large amounts of energy for process heat. In FY 1979 and FY 1980 the Industrial Applications program will support the development of larger solar energy systems. Projects will be developed for industries having a high potential for solar utilization, such as the paper and pulp, food processing, and oil extraction industries. Some 8 - 10 systems, consisting of about 50,000 square feet of collectors each, will be designed in FY 1979. Four or five of these systems will be constructed in FY 1980. Costs will be shared by DOE and industry.

Agricultural Programs

o On-Farm Methane Generation

Animal waste is causing water pollution problems in a number of areas and farmers are being required to curtail their polluting practices. Animal waste is also a source of methane gas; a 50-cow dairy herd generates enough waste when converted to methane gas to produce 3,400 kilowatt hours per month of electricity. This is more than three times as much electricity as the average farm uses.

Methane generators will cost about \$20,000 each. The farmer can obtain electricity cheaper from public utilities than he can produce it from methane generators. However, in instances where investment in a pollution control system is necessary anyway, the production of electricity for sale to the utility is an attractive bonus.

The President is directing the Secretary of Agriculture to implement a pilot program of on-farm methane generation and use to substitute for fossil fuels and control water pollution. This program will work through the Agricultural Conservation Program, as well as the Business and Industrial Loan program of the FmHA.

o Agricultural Research, Development and Extension

The USDA continues to be engaged in studies of solar energy systems having near-term economic feasibility: for heating rural homes and greenhouses and poultry and swine farrowing houses, grain drying with multipurpose solar collectors, and for windpowered irrigation. This research has been demonstrated on farms by the Cooperative Extension Service in selected States.

The President is directing the Secretary of Agriculture to place a high priority on solar energy applications in the USDA agricultural research and extension programs with the goals of making agriculture more energy self-sufficient and the production of energy crops for the Nation.

o Solar Grain Drying

Crop drying is an essential function on many grain farms, especially in the more humid areas of the Corn Belt. Liquified petroleum gas and natural gas are the most commonly used fuels. Interest in alternative grain drying methods is growing because of increasing costs of conventional fuels and the threat of short supplies in the future. Solar energy is one such alternative.

The President is directing the Secretary of Agriculture to implement a broader demonstration program that emphasizes grain drying applications that utilize the same solar collectors that meet other farm needs, such as heating livestock shelters.

Biomass R&D Program

The goal of the biomass program is to help develop technology and bring to commercial readiness economically attractive and environmentally acceptable processes which displace traditional liquid and gaseous fuels through direct combustion of biomass material and the use of biomass-derived substitute fuels and chemical feedstocks.

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Agricultural Research and Applications

Agriculture consumes about 2 percent of the total energy now used in the U.S., principally in the form of liquified petroleum gas. Approximately 20 percent is used as source of relatively low temperature heat for on-farm applications.

- o The DOE/USDA combined solar program is supporting the research and development of low cost, efficient solar energy heating systems for on-farm applications for several years. Systems for these applications work well but are often more expensive than conventional systems. Research to reduce installed costs will continue into the 1980's.
- o A total of 52 agricultural experiments are underway for heating greenhouses, livestock shelters, drying crops and grains, and food processing. The results of this research are being passed on to the farmer via periodic workshops, seminars and publications.
- o The FmHA is engaged in a feasibility study of a large-scale methane generator system at Lamar, Colorado. In addition, the FmHA, ASCS and DOE are considering implementing a small demonstration project of less than 10 units for on-farm generation and use.

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UTILITY SECTORPublic Utility Commissions

Utilities can inhibit solar energy use by offering backup energy to users of solar equipment at discriminatory rates or by refusing to buy back system-compatible electric energy at reasonable rates. Because utility system load patterns, daily and yearly peaks, and the mix of customers vary widely, no national rate structure would be suitable for every system. The Department of Energy, under the Public Utility Regulatory Policies Act of 1978 (PURPA) has authority to ensure that solar energy applications are given equitable treatment in all utility rules, regulations and rates.

The President is directing the Secretary of Energy to:

- o Develop and publish within 120 days voluntary guidelines applying specifically to solar energy and renewable resources for the eleven rate standards established in PURPA,
- o Encourage State Public Utility Commissions and consumer groups to participate and cooperate fully in this effort,
- o Provide technical and analytical assistance to the State Public Utility Commissions in developing innovative rates that are based on the operating characteristics of solar energy systems, and,
- o Aggressively intervene in regulatory rate proceedings to advocate equitable rate structures for solar energy users.

Federal Power Generating and Marketing Agencies

The Solar Domestic Policy Review found that the Federal Power Generating and Marketing agencies could be used as models of how electric utilities and their customers can use solar energy. The Alaska, Bonneville, Southeastern, Southwestern and Western Area Power Administrations in the Department of Energy are in a unique position within their present statutory authority, where possible, to:

- (1) use reservoirs as "storage batteries" to accommodate intermittent power production from solar, wind and other renewable resource generating facilities;
- (2) purchase and transmit the output of such facilities; and
- (3) identify and promote where appropriate cost effective conservation and renewable resource measures by utilities and their customers.

The President is directing the Secretary of Energy, acting by and through the Administrators of the five power marketing administrations to develop and implement by September 30, 1980, to the extent possible under existing authority and contractual obligations, programs to:

- o Purchase energy from renewable resource generating facilities, as appropriate, to meet authorized program needs;
- o Provide, as appropriate, standby energy storage and other load-shaping services to those generating electricity from renewable resource;

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- o Provide transmission and interconnection services, as appropriate, to integrate energy from renewable resource generating facilities into regional grid systems;
- o Encourage customers to pursue pilot programs to demonstrate the cost effectiveness of energy conservation and renewable resource measures by utilities and their customers;
- o Cooperate with power marketing administration customers to develop solar and other renewable energy resources and to promote energy conservation; and,
- o Where appropriate, use the power marketing administrations as laboratories for experimenting with conservation and renewable energy initiatives.

The President is also requesting that the Tennessee Valley Authority expand its existing self-financed programs and undertake new initiatives to ensure an adequate market delivery system to accelerate solar energy applications in its region. This could include a major information dissemination campaign on solar energy applications and the incentives currently available for them; information for solar designers, builders, engineers, and the financial community; onsite installation inspections; application of model building codes and standards which promote solar applications, and appropriate financial incentives. Such activities could be coordinated with State and local governments and the Department of Energy where appropriate, and build upon TVA's energy conservation programs.

Rural Electrification

The Rural Electrification Administration (REA) has successfully brought electricity to rural areas through direct and guaranteed loans to rural cooperatives. Renewable energy resources can be utilized by these same cooperatives as an alternative to the use of conventional fuels for central station power generation.

The President is directing REA to:

- o Actively encourage energy conservation programs to reduce the need for additional capacity by providing special short-term insured and guaranteed loans, consistent with Congressional criteria.
- o Actively encourage and promote development of supplemental sources of energy by the cooperatives or their member-consumers, using such renewable resources as solar heating and cooling equipment, solar crop drying, small wind generators, farm-based biomass generators, and small-scale hydroelectric facilities.
- o Require generation and transmission cooperatives, as part of their loan application, to consider those resources capable of producing central station electric power, such as hydroelectric plants, biomass facilities, wood chips, or peat, wherever it is technologically feasible and cost-effective.
- o Work with other Federal agencies, as appropriate, to develop promising solar demonstration projects.

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Solar Thermal Power Systems

The technology in this DOE program entails using highly concentrating mirror configurations to provide advanced space heating and cooling, more efficient photovoltaic conversion, and high temperature industrial heat, in addition to central station electric power generation.

For small systems, the primary effort is to reduce the costs of distributed collector systems to near market value by 1983, and to reduce costs for central (power tower) technology to near market value by 1985. Enhanced performance and reduced costs are being sought through improved (e.g., lighter, fewer materials) collectors, higher temperature capabilities, and through utility and industry experience in field experiments.

Ocean Systems

This program helps to develop technology for extracting and converting ocean energy to usable energy forms in a commercially attractive and environmentally acceptable manner.

Key efforts include:

- o Development of components for ocean thermal energy conversion (OTEC) technology, such as more efficient low temperature heat exchangers, and special cleaning methods.
- o Completion and initial operations of the first sea-based OTEC test facility.
- o Development of other ocean-derived energy concepts, including use of salinity gradients, waves, and ocean currents.

Solar Power Satellite Program

The objective of the solar power satellite (SPS) program is to undertake a broadly based evaluation of the concept of capturing solar energy in space for transmission to earth, in order to recommend whether studies should proceed to the exploratory research stage. The joint DOE/NASA evaluation is scheduled to be completed in late 1980. DOE, which is managing the effort, is studying the environmental, economic, and societal impacts, and the merits of SPS relative to other future energy options. NASA is studying the hardware systems.

Small Scale Hydropower

The goal of the small hydropower program is to help accelerate private sector development or redevelopment of small-scale hydroelectric capacity at existing dams.

Specifically for FY 1980, the program will:

- o Continue the project at Idaho Falls, Idaho, to demonstrate community-scale hydro redevelopment using modern technology.
- o Stimulate the conversion of existing small dams to hydroelectric production by
 - (a) loans for feasibility studies, and
 - (b) providing appropriate technical assistance to prospective dam developers.

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- o Examine carefully the economic, environmental, legal, and institutional barriers to small hydropower development and redevelopment to reduce or eliminate such barriers.
- o Complete the non-recurring technical development program to reduce the costs of small hydropower design, construction, and operation and maintenance.

In addition, as part of the recently announced Rural Energy Initiatives, several Federal utilities will apply \$300 million in fiscal year 1979-1981 grant, loan, and loan guarantee assistance to stimulate up to 100 small-scale hydroelectric projects by 1981, and up to 300 projects by 1985.

Also, pursuant to the requirements of the Public Utility Regulatory Policies Act, the Federal Energy Regulatory Commission (FERC) has recently proposed revisions of FERC requirements for preliminary permits and licenses for small-scale hydropower facilities. These revisions will simplify application requirements and reduce considerably the burden on prospective small-scale hydropower developers, and speed up the licensing process, consistent with the President's directive to reduce Government paperwork. Thus, FERC will facilitate development of these once productive facilities in the Northeast, Southeast, Pacific Northwest, and other regions.

Solar Use on Electric Utility Grids

Present electric utility networks have been built around central electric power generating stations and bulk power transmission. With the emergence of dispersed sources, such as wind and photovoltaic systems, these networks have to undergo significant modifications to meet required safety and reliability standards. The DOE has a program to develop techniques to allow the Nation's electric power networks to accept dispersed systems with safety, reliability, and efficiency.

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FEDERAL GOVERNMENT SECTORFederal Purchases of Solar Equipment

The Solar in Federal Buildings Program demonstrates the Federal government's confidence in solar systems by purchasing solar equipment for heating and cooling.

This program will place an estimated 350 solar systems in Federal buildings and facilities by the end of FY 1980. Project selections and initial design funding for an estimated \$20-40 million worth of solar space and water heating systems will be implemented in fiscal years 1979 and 1980. In addition, by the end of this year, 20 Federal agencies will begin installation of more than 2,000 cost-effective photovoltaic projects, totaling \$16 million.

The President is directing the Department of Energy to examine the feasibility of extending this program.

Federal Energy Management Plan

Solar energy systems will be installed in Federal buildings under provisions of the National Energy Act. The NEA calls for a Federal Energy Management Program (FEMP) to reduce energy consumption in existing Federal buildings by 20 percent through conservation and solar measures. Energy audits of all Federal buildings over 30,000 square feet area will be completed in 1979. In 1980, energy audits of Federal buildings of less than 30,000 square feet will be completed. It is expected that this program will identify the extent to which the Federal government can utilize solar equipment, beyond applications already underway. DOE is developing guidelines for evaluating cost-effectiveness in a way that reflects the replacement costs of energy and the full national benefits of conservation and solar investments.

Agency for International Development

Existing programs within AID provide assistance to help less developed countries through greater emphasis on renewable energy resources. Key activities for FY 1980 include:

- o Sponsorship of seminars and workshops on utilization of renewable energy technologies such as biomass, photovoltaics, and solar thermal;
- o Technical assistance and grant support for research, development, and production of small-scale, renewable energy technologies, and for related education, training and institutional development support; and,
- o The funding of field tests and demonstrations of cost-effective applications for biomass (wood, peat, agricultural wastes), solar photovoltaics, solar thermal, wind and wave energy technologies.

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MULTI SECTORPhotovoltaic Systems R&D

Photovoltaic or solar cells take light energy and convert it into electricity. Photovoltaic systems are inherently modular, which allows them to be sized to fit any power requirement need. For 20 years, photovoltaic energy conversion systems have powered satellite and spacecraft electrical systems. The basic technology is well proven and many terrestrial applications offer potential for development including small remote locations and residential applications with combinations of grid backup or on-site electrical storage, and eventually, generation of electricity for the grid.

The goals of the research and development photovoltaic program are to develop economically competitive, commercially available, safe and reliable photovoltaic conversion systems. To achieve significant fuel displacement, they must be capable of producing electricity that is cost competitive with utility generated electricity from conventional fuel sources. To reduce costs, the U.S. program is pursuing programs for both distributed and centralized grid-connected applications through an aggressive program of research and development, technology development, systems and engineering standards, tests and applications, and market development.

Wind Energy Conversion Systems

This program seeks to develop, through R&D support to industry, a series of wind systems of improved capability with total costs which, if the machines were produced and deployed on a large scale, would be competitive with other energy sources.

Efforts are proceeding for equipment sizes ranging from small farm and rural systems to large utility class machines.

Construction of Solar Energy Research Institute Facility

SERI is currently housed in temporary facilities in Golden, Colorado. The Congress appropriated design funds for the new permanent facility in FY 1979. The President's FY 1980 budget requests the construction funds.

The new Solar Energy Research Institute (SERI) facility will consist of office space, laboratories, and information systems center and appropriate support facilities. SERI will be located on a 300-acre site in Golden, Colorado, known as South Table Mountain.

SERI conducts research, analysis, and information efforts to serve the needs of all of the major DOE solar energy programs.

Solar Energy Storage

Many types of solar energy systems require on-site storage to achieve their maximum performance levels. For example, some photovoltaic systems include batteries to store electricity produced at midday, when the sun is brightest, for use in the late afternoon when air conditioning needs are greatest. The DOE is developing advanced, highly efficient batteries for this purpose, and developing other technologies to allow longer-term storage of solar thermal energy for space heating and industrial purposes, and developing flywheel concepts for possible use with small and large wind machines.

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Solar Basic Research

Significantly increased efforts for solar-related basic research are being conducted throughout the DOE basic energy sciences programs. Examples of projects receiving emphasis in FY 1980 include:

- o Solar related materials research;
- o Research on solar photochemistry, including investigation of concepts to use electrochemical cells for converting the energy of sunlight into electricity and/or fuels, as well as other approaches to produce fuels and other valuable chemicals; and
- o Research on artificial photosynthesis.

Domestic Policy Review of Solar Energy

A. BACKGROUND

On Sun Day, May 3, 1978, the President directed that a major government-wide Domestic Policy Review (DPR) of solar energy be undertaken to provide him with:

- o a sound analysis of the contribution which solar energy can make to U.S. and international energy demand, both in the short and longer term;
- o a thorough review of Federal solar programs to determine whether they, taken as a whole, represent an optimal program for bringing solar technologies into widespread commercial use on an accelerated timetable; and
- o recommendations for an overall solar strategy to pull together Federal, State, and private efforts to accelerate the use of solar technologies.

In response to the President's directive, a Federal Interagency Solar Energy Policy Committee, under the chairmanship of the Secretary of Energy, was formed to carry out the DPR. Over 100 Federal officials representing more than 30 executive departments and agencies were involved in the study.

B. PUBLIC PARTICIPATION

The solar energy DPR was conducted with significant public participation. Twelve regional public forums were held nationwide to receive public comments and recommendations on the use of solar energy. These meetings were attended by several thousand people and over 2000 individuals and organizations submitted oral and written comments to the Solar Energy Policy Committee.

In addition, briefings were held in Washington for the DPR staff by representatives of solar advocacy groups, small business, State and local governments, public interest and consumer groups, utilities, the energy industry and solar equipment manufacturers.

C. REPORT TO THE PRESIDENT

The Solar Energy Policy Committee concluded its study late last year and forwarded its report to the President. The results of the Domestic Policy Review can be summarized in nine major findings:

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1. Significant potential exists for expanding the Nation's use of solar energy.
2. Solar energy offers numerous important advantages over competing technologies.
3. Even with today's subsidized energy prices, many solar technologies are already economic and can be used in a wide range of applications.
4. Limited public awareness of and confidence in solar technologies is a major barrier to accelerated solar energy use.
5. Widespread use of solar energy is also hindered by Federal and State policies and market imperfections that effectively subsidize competing energy sources.
6. Financial barriers faced by users and small producers are among the most serious obstacles to increased solar energy use.
7. Although the current Federal solar research, development and demonstration (RD&D) program is substantial, government funding priorities should be linked more closely with national energy goals.
8. Solar energy presents the U.S. with an important opportunity to advance its foreign policy and international trade objectives.
9. Although the Federal government can provide a leadership role, Federal actions alone cannot ensure widespread solar use.

The Committee's report also contains a description of the barriers to accelerated use of solar energy in residences, business, agriculture, transportation, and power generation, as well as in the international sector; a summary of current Federal solar policies and programs; an analysis of economic, environmental, and employment impacts of increased solar energy use and a series of potential Federal policy scenarios which could be undertaken to further help accelerate solar use in this country and abroad. These policy scenarios contained illustrative examples of specific Federal programs which could be carried out to achieve the various policy objectives.

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