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MASTER

Summary of the DPR

J. Easterling
A. Grace
R. Kettle



SERI

Solar Energy Research Institute

A Division of Midwest Research Institute

1617 Cole Boulevard
Golden, Colorado 80401

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SUMMARY OF
THE DPR

J. EASTERLING
A. GRACE
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PREPARED UNDER TASK NO. 6131.13

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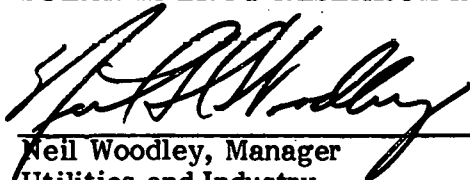
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PREFACE

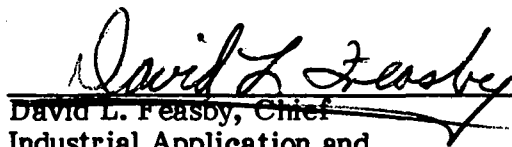
This paper should be used primarily as a reference that places the Domestic Policy Review recommendations into various categories. Policy makers and program planners can use it to determine if their specific recommendations are consistent with the broader recommendations of the DPR.

Approved for:

SOLAR ENERGY RESEARCH INSTITUTE



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SUMMARY

This summary of the Domestic Policy Review of Solar Energy categorizes DPR recommendations and Administration-adopted recommendations according to the following major characteristics:

- type of action,
- reasons for action,
- recipient of actions,
- primary agency to conduct action, and
- organizations providing support to action.

These categories are further defined in the narrative of this report.

Additionally, this report includes a brief history of the DPR and lists assumptions used and barriers identified by each panel.

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NOMENCLATURE

AID	Agency for International Development
APA	Alaska Power Administration
BPA	Bonneville Power Administration
BLM	Bureau of Land Management
BR	Bureau of Reclamation
CDBG	Community Development Block Grant
CDC	Community Development Commission
CETA	Comprehensive Employment Training Act
CSA	Community Services Administration
CORP	Corps of Engineers
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOL	Department of Labor
ECC	Energy Coordinating Committee
EDA	Economic Development Administration
EES	Energy Extension Service
EOP	Executive Office of the President
EPA	Environmental Protection Agency
ERA	Energy Regulatory Administration
FERC	Federal Energy Regulatory Commission
FHA	Federal Housing Authority
FHLMC	Federal Home Loan Mortgage Corporation
FSEC	Florida Solar Energy Commission
FMHA	Farmers Home Administration
FNMA	Federal National Mortgage Association
FPGMA	Federal Power Generating and Marketing Agencies
GNMA	Government National Mortgage Administration
GSA	General Services Administration
HEW	Department of Health, Education and Welfare
HUD	Department of Housing and Urban Development
IEA	International Energy Agency
DOI	Department of Interior
IRS	Internal Revenue Service
JPL	Jet Propulsion Laboratory
DOJ	Department of Justice
NASA	National Aeronautics and Space Administration
NSF	National Science Foundation
NSHCIC	National Solar Heating and Cooling Information Center
OMB	Office of Management and Budget
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
PUC	Public Utilities Commission (State)
REA	Rural Electrification Administration
RSEC	Regional Solar Energy Center
Sandia	Sandia Laboratories, Albuquerque, New Mexico
SBA	Small Business Administration
SEC	Securities and Exchange Commission
SEPA	Southeastern Power Administration
SERI	Solar Energy Research Institute

NOMENCLATURE (concluded)

State	Department of State
SUEDE	Solar Utilization, Economic, Development and Employment
SWPA	Southwestern Power Administration
Treasury	Department of Treasury
TVA	Tennessee Valley Authority
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USPS	United States Postal Service
VA	Veterans Administration
WAPA	Western Area Power Administration

SECTION 1.0

INTRODUCTION

The Domestic Policy Review of Solar Energy (DPR) was initiated to stimulate the commercial development of solar energy. A federal interagency review was scheduled to begin in May 1978 and end in October 1978. Final recommendations were to be sent to the Administration for use in preparing the FY80 budget and legislative initiatives.

This schedule was delayed, and final results were not announced until 20 June 1979 by the Carter Administration. The Presidential message included a new and substantial goal — that the nation obtain 20% of its energy from solar and renewable resources by the year 2000 — and a set of proposed federal actions to move the commercial use of solar energy toward that goal.

1.1 HISTORY OF THE DPR

In early April 1978 an interagency review of solar and renewable resources was urged by James R. Schlesinger, then Secretary of Energy, and Charles Warren, chairman of the Council on Environmental Quality, in a memorandum to Stuart Eizenstat, White House domestic affairs advisor. An announcement on Sun Day, 3 May 1978, resulted in a request for a Cabinet-level domestic policy review of solar energy. Accordingly, the Administration sent a directive to 15 federal agencies requesting participation in this review. This special directive included reference to the objective of including participation from Congress and the public. In his memo announcing the Presidential directive to agency heads, Eizenstat wrote:

To ensure that this Domestic Policy Review is responsive to the increasing public interest in solar energy, a mechanism should be developed for permitting participation by interested members of Congress and the public.

The mechanism used to encourage public participation in the DPR was the Regional Solar Energy Policy Forum. The inclusion of regional forums in the DPR was announced on 6 June 1978 when a public notice of these forums first appeared in the Federal Register. The notice explained the overall purpose of the solar policy review to include the following objectives:

- a sound analysis of the contribution solar energy can make to United States and international energy demand, both in the short and in the long term;
- a thorough review of the current 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
- recommendations for an overall solar strategy to pull together federal, state, and private efforts to accelerate the use of solar technologies.

In addition, six specific areas to be included in the review were identified in the notice:

- an examination of each of the major areas of solar energy use (e.g., industry, building, etc.) and each solar technology to determine technical or scientific needs relating to their commercial use;

- a review of current federal research, development, and demonstration programs for solar technologies to determine whether they are structured appropriately to address needs identified;
- identification of the institutional, economic, and environmental factors affecting solar deployment and development of policy options for dealing with identified problems;
- evaluation of the appropriate federal role in the commercialization of solar energy;
- examination of the potential for the impacts of using solar technologies abroad; and
- review of issues relating to regional diversity of solar resources, matching of solar equipment to end-use requirements, and the integration of solar technology with the existing energy supply system.

1.2 ORGANIZATION AND PARTICIPANTS

Six panels were organized to conduct an interagency review of federal solar-related policy. Each panel's review culminated in a report to the integrating group. The DPR organization is shown in Fig. 1-1.

Five of the six review panel reports contain specific recommendations which were subsequently integrated into policy options and explained in the integrating group report, A Memorandum to the President. The integrating group report provided a crucial link between Administration energy policy makers and the entire DPR. The recommendations from the panel reviews included in the integrating group's report are identified in a complete list of panel recommendations in the appendices.

More than 100 officials representing more than 30 federal agencies participated in the DPR. In addition, 12 regional public forums were called throughout the nation during June and July 1978 to receive public comments and recommendations on the development of national solar energy policy. Briefings were also given to members of the DPR by representatives of solar advocacy groups, small businesses, state and local governments, public interest and consumer groups, utilities, the energy industry, and solar equipment manufacturers.

1.3 AUDIENCE AND USES

This paper is directed toward people involved with the federal solar energy program, particularly in the areas of policy analysis and program planning. While the immediate audience includes SERI, the RSECs and DOE/CSE, the general audience includes members of the executive branch, state and local governments, and state and local energy offices.

The paper should be used primarily as a reference that places the DPR recommendations into various categories. Policy makers and program planners can use it to determine if their specific recommendations are consistent with the broader recommendations of the DPR.

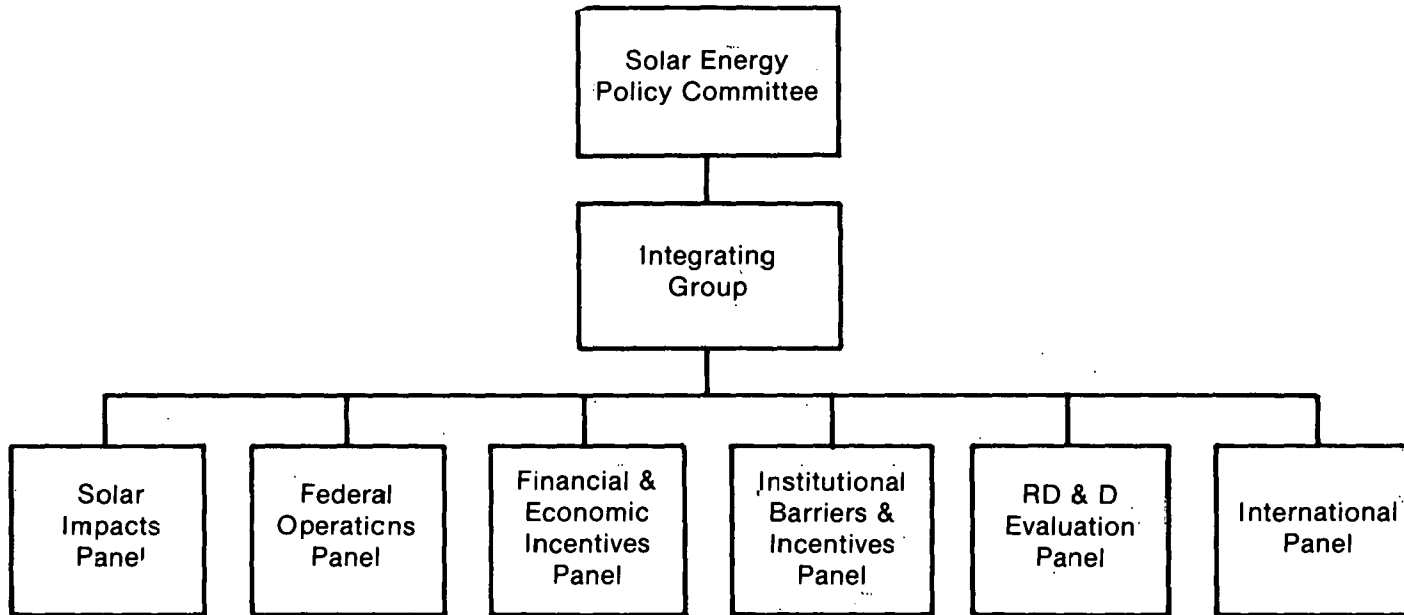


Figure 1-1. Domestic Policy Review Organization

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SECTION 2.0

SUMMARY OF DPR RECOMMENDATIONS

The essence of this study of the DPR recommendations is contained in four tables:

- Table 2-1 DPR Recommendations by Panel Report
- Table 2-2 Administration-Adopted Recommendations
- Table 2-3 Barriers Identified in Panel Reports
- Table 2-4 Assumptions

Tables 2-1 and 2-2 use a set of consistent headings based on the categorization of the following major characteristics:

- type of action,
- reasons for action,
- recipient of action,
- primary agency to conduct action, and
- organizations providing support to action.

The narrative in this section further defines these categories.

Table 2-3 summarizes the barriers identified in the panel reports by technical, social, institutional, and economic reasons for action.

Assumptions used by the DPR panels are identified in Table 2-4. Some assumptions were economic, such as the rate of price increases for conventional fuels and the resulting competitiveness of solar energy. Other assumptions included environmental and social benefits resulting from the increased use of solar energy.

Four appendices have also been included in this summary of the DPR. Appendix A shows the number of times each panel and the Administration recommended a specific type of action; Appendix B, the number of times they recommended each market sector; and Appendix C, the number of times they recommended specific technologies. Appendix D lists pending legislation addressing DPR recommendations (as of September 1979).

2.1 TYPE OF ACTION

This section defines the typology used to categorize actions. The typology includes seven major classifications to identify specified actions included in the DPR. These are:

- exhortation,
- creation and prohibition of organizations,
- requirements (regulations),
- taxation,

- disbursements,
- government services, and
- market activity.

The typology of government actions used in this study is further subdivided into distinct forms that these actions can take. The complete typology is useful when comparing actions proposed with options not taken.

2.1.1 Exhortation

Exhortation is advice, appeal, argument, or a warning issued by the government to set an example or standard of conduct for what is proper or needed, given the circumstances. The most dramatic example of this action is the establishment of a new goal for solar energy use. The goal, that 20% of total energy use by the year 2000 will come from solar energy and renewable resources, provides the basic rationale for other actions.

2.1.2 Creation or Prohibition of Organizations

An important and basic kind of governmental action is the creation (or prohibition) of organizations that carry out different kinds of actions proposed for solar energy. The government can create or prohibit organizations of the following types:

- federal government organizations,
- other government organizations, and
- nongovernment organizations.

Two major organizations are proposed by the Administration. One is the establishment of a Solar Energy Bank, to be financed by the Energy Security Trust Fund. A second is the creation of a Solar Standing Committee as an organizational addition to the Energy Coordinating Committee.

2.1.3 Requirements

Requirements are demands made by government, backed by criminal and civil sanctions. This category includes demands to stop or avoid doing something as well as demands to start or continue doing something.

Requirements are divided according to their announced primary subject matter. The announcement is found in the judicial, legislative, or administrative preamble to the requirement being imposed. The following subcategories were identified:

- economic,
- safety,
- environmental (including zoning), and
- civil rights.

The economic subcategory is subdivided into price, quantity, quality, and market entry or exit requirements. All requirements can be further divided according to whether they require activities by nongovernmental entities, require disclosure of aspects of nongovernmental activities, or exempt entities from otherwise normal requirements. In addition, all requirements can be subdivided once more into those enforced by civil sanctions, those enforced by criminal sanctions, and those enforced by both.

New economic requirements are intended to influence fuel costs or interfuel economics. One action requires the development of standard measures of residential energy costs. Two other actions offer exemptions from requirements on fuel allocation to encourage the use of solar energy: One allows for an exemption from coal conversions for utility power plants and industrial plants using solar applications for 20% of their energy needs; the other extends priority supplies of oil and natural gas to customers to supplement solar energy use.

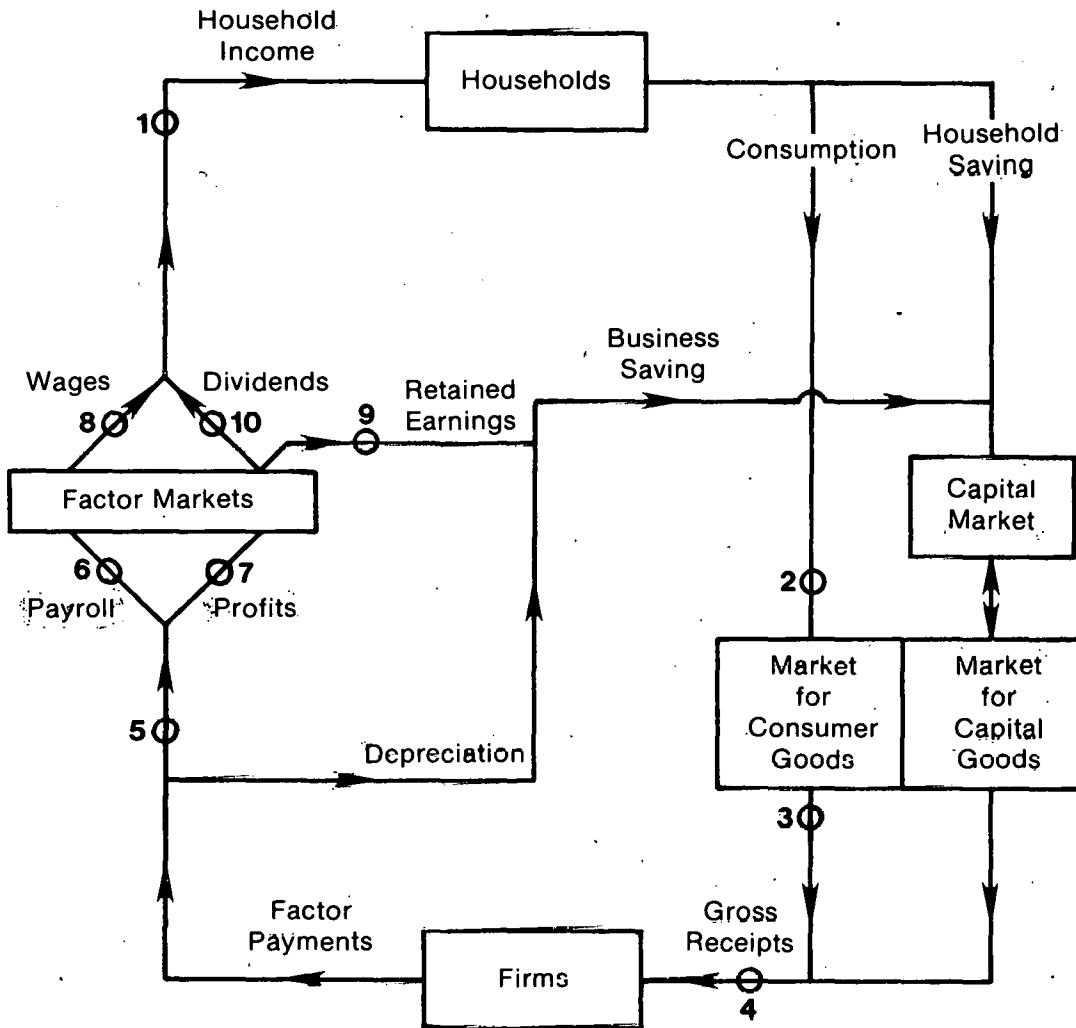
Two new requirements are based upon existing environmental protection standards: One allows for an offset in pollutions savings generated from the use of solar energy; the other promotes a streamlined siting process for low-head hydropower.

2.1.4 Taxation

Taxes are levied upon persons, property, or businesses as compulsory support for a government. This category includes the levying of a tax or the exemption/reduction of a tax.

The following categories of taxes are derived from Musgrave and Musgrave, particularly their diagram of the production-consumption cycle (Fig. 2-1). The divisions are:

- Within the production-consumption cycle
 - Personal income tax
 - Consumer expenditure tax
 - Sales (general) or excise (specific) tax
 - Gross receipts tax
 - Value-added tax
 - Business payroll tax
 - Personal payroll tax
 - Dividends tax
- Outside the production-consumption cycle
 - Taxes on the holding of property
 - General purpose
 - Special purpose
 - Taxes on the transfer of property
 - Gift taxes
 - Estate (death taxes)



Source: Musgrave, Richard A., and Peggy B. Musgrave, **Public Finance in Theory and Practice, Second Edition**, San Francisco: McGraw-Hill Book Company, 1976. p. 225.

Figure 2-1. Types of Tax in Production-Consumption Cycle

Inheritance taxes

Capital gains taxes

- Taxes on the crossing of political boundaries

Import taxes

Use taxes (to compensate for the failure to collect sales or excise taxes because purchased outside jurisdiction)

Export taxes (the U.S. Constitution prohibits their use in the United States)

- Exemptions from the taxes of other jurisdictions.

Five Administration proposals fall under taxation. Four of them use tax credit for solar investments. Tax credits are expanded (in addition to NEA tax credits) to include passive solar technologies. The fifth tax proposal applies to the removal of gasohol as a taxable item within the federal fuel excise tax category.

2.1.5 Disbursements

Disbursements occur when the Federal Government gives out money without receiving anything in return directly or immediately. The category includes promises to disburse under certain circumstances as well as actual disbursements. Disbursements have been divided according to the recipient of the federal money.

Grants-in-aid. Adopting the definition of a grant-in-aid as "a grant of funds by a central government to a local government or agency for assistance in a civic undertaking," the Federal Government is the "central government," all other governments are the "local government or agency," and almost all purposes qualify as "civic undertakings."

Subsidy. Subsidy is defined as "pecuniary aid directly granted by government to an individual or private commercial enterprise deemed beneficial to the public." The recipient can be any nongovernment organization, group, or individual; and the purpose of the grant is to support some activity the recipient is undertaking for himself or for others, but not for the Federal Government.

Transfer. Transfer is "a delivery of title or property from one person to another," meaning, in this case, the delivery of money from the Federal Government to individuals as a consequence of the status of those individuals (as opposed to grants designed to support an activity).

Two actions proposed by the Administration are considered disbursements. One proposal directs the Small Business Administration to accelerate its spending on loan guarantees to small businesses that supply conservation and renewable energy goods and services. The second proposed disbursement is the Solar Energy Bank. In the list of proposed actions, this is categorized as organizational creation. When the Solar Energy Bank is established, however, its purpose will be to offer interest rate subsidies, which are a form of disbursement. These subsidies will cover at least 6% of the interest rate charges for residential and commercial purchases of passive and active solar applications.

2.1.6 Government Services

Services are assistance or benefits provided by the government to nongovernment entities without direct charge. These include actions of the Federal Government such as national defense, regulation of interstate and foreign commerce, conduct of basic and applied research, and dissemination of research results.

2.1.7 Market Activity

Market activity is defined as government involvement in a market under conditions similar to those faced by nongovernmental producers and consumers.

In order to divide this category, the Musgraves' diagram of the production-consumption cycle and their discussion of phenomena outside of it are referred to again. The government can itself act as a market entity at each step in the cycle.

- government borrowing,
- savings,
- consumption (procurement) of consumer goods,
- investment,
- production of consumer products,
- production of capital goods,
- production of labor (training or manpower development),
- consumption of capital goods,
- consumption of labor (employment),
- ownership of land and other natural resources, and
- transfer of land and other natural resources.

2.2 REASONS FOR ACTION

For a government action to move from a proposal to an official action, there must be justification for taking that action, and it must receive considerable support. Most proposed actions place greatest emphasis on lessening institutional constraints. Proposals address expected results of an action, usually concerning some existing barrier constraining the commercial development of solar energy.

2.3 NEW LEGISLATION

Some of the proposed actions already have legislative support. For example, many of the statutory changes needed to give priority to solar energy investments by the Federal Home Loan Mortgage Corporation, the Federal National Mortgage Administration, and the Farmers Home Administration were enacted by the National Energy Conservation Policy Act of 1978.

Legislation is pending for other proposals. Appendix D lists proposed actions and related legislation currently pending in Congress.

2.4 RECIPIENT OF ACTION

Each proposed action identifies one or more market sectors eligible to receive the benefits of a new action. This category includes a consideration of how recommendations affect market sectors, technology, and their interactions. Market sectors assisted by actions include the following:

- residential,
- commercial,
- agricultural,
- industrial,
- utility,
- synfuels,
- international, and
- all market sectors.

Technologies are divided into these major solar applications:

- solar heating and cooling (active and passive),
- wind systems (large and small),
- solar thermal (STE and STR),
- photovoltaic (central and dispersed),
- biomass (combustion and synfuels),
- ocean thermal energy conversion (OTEC),
- hydropower,
- hydrogen generation,
- agricultural/industrial process heat (A/IPH), and
- all technologies.

2.5 AGENCY

Preferences for the lead agency to implement recommendations are shown in Tables 2-1 and 2-2.

2.6 ORGANIZATIONAL RESPONSE

Organizational responses are provided in the appropriately labeled column of Tables 2-1 and 2-2. This list of support organizations gives an initial indication of those additional agencies probably needed to implement recommended actions.

TABLE 2-1. DPR RECOMMENDATIONS BY PANEL REPORT

Panel	Type of Action	Reasons for Action		Legislation		Recipient of Action			Organizational Responses
	Generic	Barriers	Intended Effects	Yes	No	Market Sector	Technology	Agency	
Federal Operations	Government services: demonstration research	Lack of user information on solar energy; no data on system performance and reliability; high initial system cost	Establish marketing opportunity for federal power administrations, utility retailers, and consumers		x	Utility	Solar heating and cooling, biomass, wind, hydrogen-generation	FPGMA	DOE DOD
Federal Operations	Government services: demonstration research	Financial uncertainty of new solar technologies available for use in new construction	Establish marketing opportunity	x		Commercial	Passive, active, PV	DOE	All federal agencies with procurement authority
Federal Operations	Government services: demonstration research	Same as above except for retrofit applications	Establish marketing opportunity	x		Commercial	Hot water, space heating	DOE	All federal agencies with procurement authority
Federal Operations	Organizational creation	Lack of public awareness about solar energy opportunities	Increase public awareness of federal commitment to solar energy	x		Commercial	Passive, active solar	USPS	DOE
Federal Operations	Organizational creation	No distinct federal procurement agency responsible for all solar energy purchases	Encourage consolidated procedure for solar energy procurements	x		Commercial	Passive, active solar systems	ECC	OMB
Federal Operations	Requirements	Procurement rules on allowable costs of federal purchases, such as discount rate, exclude opportunities for federal solar use	Give higher priority to other cost consideration in federal purchases such as replacement and life-cycle	x		Commercial	Passive, active solar systems	OMB, USPS, other federal agencies with procurement authority	GSA
Federal Operations	Government services: demonstration research	Uncertainty about system efficiency and first time cost	Improve conversion efficiency and overcome first time cost with conversion plants		x	Synfuels	Gasohol, biomass	USDA	EPA DOE
Federal Operations	Market activity	No experience in the utility sector with integrating solar power sources into utility grids	Initiate utility experience with solar power and load management		x	Utility	All near-term	FPGMA	DOE HUD

TABLE 2-1. DPR RECOMMENDATIONS BY PANEL REPORT (continued)

Panel	Type of Action		Reasons for Action		Legislation		Recipient of Action		Organizational Responses
	Generic	Barriers	Intended Effects	Yes	No	Market Sector	Technology	Agency	
Institutional & Barriers	Requirements	High marginal cost for solar systems	Encourage use of financial criteria for solar systems corresponding to their cost requirements	x		Industrial	All near-term	DOE (ERA)	State PUCs
Institutional & Barriers	Government services	Lack of cooperatives providing service related to solar	Network of coops to include mass buying, credit, leasing, etc.		x	Utility	All near-term	REA USDA	CDBG EDA
Institutional & Barriers	Disbursements	Lack of state, federal, and local programs of consumer protection for purchasers of solar systems	Create a "full disclosure" of estimated technical and economic performance	x		Residential, commercial	All near-term	DOE	FSEC
Institutional & Barriers	Requirements	Regulation of products by utilities	Energy conservation and investment in solar technologies	x		Utility	All near-term	DOE ERA	State PUCs
Institutional & Barriers	Disbursements	Inability of solar manufacturers to get proper insurance and provide minimum warranties	Stimulate the solar market through government supported warranty/risk reinsurance program	x		Commercial	All near-term	DOE ERA	None
Institutional & Barriers	Government services	Lack of program coordination at the federal level	Stronger marketplace development program by federal government	x		Commercial	All near-term	DOE, SERI, RSECs	HUD DOE CSA
Institutional & Barriers	Government services	Lack of information regarding solar technologies which are already available	Expand the marketplace through education and information	x		Commercial, residential, industrial	All near-term	DOE	NSHCIC, SERI, RSECs, EES
Institutional & Barriers	Government services	Lack of adequate commercialization program	Increase market penetration by dealing with different technologies in light of the status of their development	x		All	All near-term	DOE	HUD, DOE, RSECs, SERI USDA, other national laboratories

TABLE 2-1. DPR RECOMMENDATIONS BY PANEL REPORT (continued)

Type of Action		Reasons for Action		Legislation		Recipient of Action			
Panel	Generic	Barriers	Intended Effects	Yes	No	Market Sector	Technology	Agency	Organizational Responses
Institutional & Barriers	Requirements	Need to sell solar created electricity back to local power grid	Encourage decentralized solar systems through a consistent policy regarding buy-back	x		Residential commercial industrial	PV, low head hydro, biomass, wind	DOE FERC	State PUCs
Institutional & Barriers	Organizational creation	Consumer protection from possible abuses by the solar industry	Increased consumer confidence; maturation and development of the solar industry		x	Residential commercial	Passive, active	Proposed organization: SWAC	State solar warranty programs
Institutional & Barriers	Government services	Lack of trained individuals in installation & maintenance; inability of low-income to benefit from solar	Create a pool of skilled workers & lower energy costs to the low-income		x	Residential	Passive, active	CSA	DOE, DOL (CETA), HEW
Institutional & Barriers	Government services	High initial cost, lack of experience and/or information	Enlist utilities in developing new markets for solar		x	Commercial residential agricultural	Passive, active	DOE FERC	State PUCs
Institutional & Barriers	Government services	Utility rate structures at cross purposes with NEA proposals	Assist solar in becoming a competitive investment decision	x		Utility	Active	DOE ERA	None
Institutional & Barriers	Requirements	High capital costs of solar equipment; need for long-term financing	Require gas and electric utilities to finance solar water heating and cooling systems	x		Utility	Active	DOE ERA	State PUCs
Institutional & Barriers	Requirements	High initial cost; lack of consumer confidence	Encourage water utilities to lease solar water heaters to customers and to provide maintenance service	x		Residential commercial	Active	DOE FERC	State PUCs
Institutional & Barriers	Requirements	Complexity of the solar/utility relationship	Greater use of solar through the assistance of existing utilities	x		Utility residential commercial	Passive, active	DOE	NSF, State PUCs
Institutional & Barriers	Requirements	Lack of information; high first-costs; lack of marketable designs and systems	Reduce energy requirements to stimulate small business growth		x	Industrial	Passive	DOE	HUD, USDA, GSA, DOD

TABLE 2-1. DPR RECOMMENDATIONS BY PANEL REPORT (continued)

Panel	Type of Action		Reasons for Action		Legislation		Recipient of Action		
	Generic	Barriers	Intended Effects	Yes	No	Market Sector	Technology	Agency	Organizational Responses
Financing & Incentives	Disbursement	High welfare cost and lack of return on welfare expenditures	Create new, permanent jobs while simultaneously reducing welfare costs	x		Commercial	All near-term	DOL DOC	None
Financing & Incentives	Government services	No study has been performed to determine the number of small businesses which have sought loans	Facilitates loans to small businesses		x	Commercial	All near-term	SBA	None
Financing & Incentives	Organizational creation	Gap between public/private sector with respect to solar development	Fill this void in national solar development		x	Commercial	All near-term	New corporation	DOE, SEC, SBA, Treasury DOJ
Financing & Incentives	Organizational creation	Lack of a centralized federal financial assistance program for solar investments	Create a centralized assistance program	x		Commercial residential	Passive, active	New corporation	HUD FHA
Financing & Incentives	Taxation	Need to stimulate solar investment by business on behalf of multifamily rental property	Cover the initial capital cost of a solar system		x	Residential	Passive	DOE	None
Financing & Incentives	Disbursement	Need for higher level of lending for solar projects	Stimulate market activity		x	Industrial agricultural commercial	All near-term	DOC	USDA SBA
Financing & Incentives	Taxation	High initial systems costs	Create a higher rate of return on solar installations	x		Commercial	All near-term	IRS	None
Financing & Incentives	Disbursement	Lack of solar applications in rural areas	Create cooperatives in rural areas for solar	x		Utility	Low head hydro, wind, passive, biomass	REA	USDA
Financing & Incentives	Disbursement	Need to stimulate solar directly through grant, rather than through tax credits	Encourage greater level of usage of solar	x		Residential	Hot water, space heating	DOE USPS	None
Financing & Incentives	Disbursement	Lack of special programs on behalf of the low-income	Achieve widespread use of solar across socioeconomic lines	x		Residential	Passive, active	FmHA	USDA, CSA HUD, CETA

TABLE 2-1. DPR RECOMMENDATIONS BY PANEL REPORT (continued)

Panel	Type of Action		Reasons for Action		Legislation		Recipient of Action		
	Generic	Barriers	Intended Effects	Yes	No	Market Sector	Technology	Agency	Organizational Responses
Financing & Incentives	Disbursement	Need to integrate solar programs with numerous nonprofit self-help programs particularly for low-moderate income areas	Assist the implementation of solar enterprises in low and moderate income areas		x	Commercial residential	Passive, active	CSA; SUEDE	DOE DOL CDC
Financing & Incentives	Taxation	Need for residential tax credits for solar in order to permit competitiveness	More than 1 million solar units could be installed in residences by 1985	x		Residential	Hot water and space heating	IRS	DOE HUD
Financing & Incentives	Taxation	Lack of incorporation of solar systems in the residential rental sector	Make solar applications available to lower income and elderly	x		Residential	Passive, active	IRS	HUD FHA GNMA
Financing & Incentives	Disbursements: loan subsidy	Insufficient financial sources	Increase access to financial sources	x		Residential	Hot water and space heating	DOE	HUD, FHA, VA GNMA, FNMA
RD&D	Government services: demonstration	Uncertainty of solar technology performance and life cycle cost	Increase consumer confidence and quality assurance		x	Buildings utility	Passive and active	DOE	HUD, DOD, GSA, EPA, DOL, DOC
RD&D	Government services	High cost of active solar cooling systems	Develop economically feasible solar cooling equipment, particularly retrofit	x		Commercial industrial	Active	DOE	None
RD&D	Government services	Severe capital investment criteria; lack of a diverse development effort for high temperature systems	Improved systems engineering, component cost reduction and durability, performance standards and criteria		x	Agricultural industrial	APH	USDA	DOE
RD&D	Government services	High system cost of solar thermal prohibits competition with conventional power resources	Reduce solar thermal system cost by improving systems performance		x	Industrial agriculture	Solar thermal electric-STH	DOE	CSA, NASA, Sandia, ORNL
RD&D	Government services	High system cost of solar thermal prohibits competition with conventional power resources	Reduce array cost/peak watt		x	Industrial agriculture	Solar thermal electric-STH	DOE	SERI, JPL, Sandia, Albuquerque Operations Laboratory

TABLE 2-1. DPR RECOMMENDATIONS BY PANEL REPORT (concluded)

Panel	Type of Action		Reasons for Action		Legislation		Recipient of Action		
	Generic	Barriers	Intended Effects	Yes	No	Market Sector	Technology	Agency	Organizational Responses
RD&D	Government services	Currently not cost-competitive with conventional energy systems		x		Synfuels	Biomass	DOE	USDA, EPA, SERI, IEA, DOE, DOC
RD&D	Government services	Systematic technical issues	In order to utilize OTEC by 2000, the technical issues must be resolved now		x	Commercial	OTEC	DOE	SERI, BLM, USGS, Corp, EPA, OSHA USCG
RD&D	Government services	High costs of feasibility studies, construction and engineering costs	Exempt decentralized small-scale hydro plants from general hydro provisions applicable only to large-scale development	x		Utility	Low head hydropower	DOE	Corp
RD&D	Government services					Industrial	Biomass	DOE	None
RD&D	Government services	High cost and low performance of wind machines	R&D in technological and engineering improvements could result in satisfactory durability and reliability		x	Utility agriculture	Wind	DOE	BR SERI, NASA
RD&D	Government services	Achieve higher product quality consistency	Enhance consumer confidence		x	Utilities buildings	Passive, active	HUD	DOD, GSA HEW
RD&D	Government services	Solar technologies currently are not integrated with existing power grids	Integration to create a smoother transition to solar		x	Utility	STE-STR	DOE FPGMA	HUD
International	Government services	Lack of a coordinated international technology development effort	Accelerate, on an international level, development and implementation of solar/renewable energy resources	x		Industrial	All near-term	IEA DOE	AID international financing institutions
International	Government services	Energy-related constraints are an international problem; there is a need, then, for the cost effectiveness of solar/renewable resources	Aid LDCs in achieving immediate cost effectiveness in solar/renewable resources	x		Industry	All near-term	DOE	SERI, RSECs

TABLE 2-2. ADMINISTRATION-ADOPTED RECOMMENDATIONS
June 20, 1979

Administration Recommendations	Type of Action	Reasons for Action	Recipient of Action			
	Generic	Barriers or Intended Effects	Market Sector	Technology	Agency	Organizational Responses
1.	Exhortation	Establish new solar goal of 20% solar energy component to total energy supply	All	All	EOP	None
2.	Organizational creation	Provide interest subsidies on private sector loans to finance solar use; 60% of subsidies must be residential loans	Residential commercial	Solar hot water heating and cooling, passive solar design, all other active or passive solar technologies	Solar bank and board of directors: HUD; DOE & treasury	Energy security trust fund
3.	Organizational creation	Monitor and direct federal solar-related programs	All	All	Solar standing committee	EEC
4.	Taxation credit	Increase credit to 25% on installed AIPH equipment	Agricultural industrial	AIPH	IRS	Energy security trust fund
5.	Requirements	Standard measures of home energy costs	Residential	Passive, active solar systems	DOE	Undefined
6.	Requirements	Allow pollution savings from conversion to solar energy to qualify as an "offset"	Industrial utility	IPH, STR STE	EPA	DOE
7.	Requirements	Exempt plants using 20% solar energy from coal conversions	Residential utility	IPH, STR STE	DOE, ERA	None
8.	Requirements	Higher priority extended to consumers of oil and natural gas on hookup to solar systems	Residential	Passive, active solar systems	DOE, ERA	None
9.	Requirements	Speed facilities licensing process	Utility	Small-scale hydropower	DOE, FERC	None
10.	Taxation	Support most cost-effective solar technology	Residential	All passive and active solar technology	IRS	Energy security trust fund
11.	Taxation	Permit greater use of wood resources for home heating	Residential	Biomass, wood-burning stoves	IRS	Information dissemination: DOE, SERI, RSECs
12.	Taxation	Remove 4¢ fuel excise tax on gasohol	Transportation	Biomass, gasohol	IRS	OMB, IRS regional offices

TABLE 2-2. ADMINISTRATION-ADOPTED RECOMMENDATIONS (continued)
June 20, 1979

Administration Recommendations	Type of Action	Reasons for Action	Recipient of Action			Organizational Responses
	Generic	Barriers or Intended Effects	Market Sector	Technology	Agency	
13.	Taxation: Credit	Encourage builders to use solar technology \$20/MBtu/yr per building up to \$10,000	Residential commercial	Passive solar design	IRS	Energy security trust fund; DOE
14.	Disbursements: loan guarantees	Redirect energy loan program at solar energy use	Residential commercial agricultural industrial	All	SBA	None
15.	Government services: foreign aid	Assist developing countries' use of solar energy	Foreign market sector	All	AID	Unknown
16.	Government services: R&D	Strengthen research activities	All	PV, WECS, biomass conversion, AIPH, passive, STE, OTEC	DOE	National research activities
17.	Government services	Gasohol excise tax exemption to accelerate conversion plants	Transportation	Biomass, gasohol	EDA, CSA DOE	None
18.	Government services	Implement pilot program of on-farm methane generation	Agricultural	Biomass, methane generation	USDA	Agricultural conservation program, biomass and industrial loan program, FmHA
19.	Government services	Implement broader demonstration programs for grain drying using APH	Agricultural	APH	USDA	
20.	Government services: information dissemination	Address solar information needs of professions, skilled labor, and users	Residential commercial	Passive solar technology	DOE, HUD	Unknown
21.	Government services: information dissemination	Facilitate private sector financing opportunities for solar technology	Residential commercial	Solar hot water, solar heating and cooling	DOE	Unknown
22.	Market activity	Demonstrate cost and energy savings from using solar energy	Residential commercial	Passive solar design, solar hot water, wood heaters	TVA	None

TABLE 2-2. ADMINISTRATION-ADOPTED RECOMMENDATIONS (concluded)
June 20, 1979

Administration Recommendations	Type of Action		Reasons for Action		Recipient of Action		Organizational Responses
	Generic	Barriers or Intended Effects	Market Sector	Technology	Agency		
23.	Market activity	Include solar heating and cooling in property improvement loans	Residential	Solar heating and cooling	FHLMC, FNMA	DOE, HUD	
24.	Market activity	Increase maximum mortgage purchase ceilings by 20% for solar system	Residential	Active solar space heating, water heating or cooling systems	FHLMC, FNMA	None	
25.	Market activity	Increase finance availability for rural residences to use solar energy	Residential (rural) solar heating and cooling, wood burning equipment	Solar hot water	FIRHA	USDA	
26.	Market activity	Help industries producing solar equipment	Industrial	Passive, active solar systems	EDA	None	
27.	Market activity	Solar energy package systems for industrial parks	Transportation	Biomass, gasohol	GSA, USPS	All federal agencies engaged in procurements	
28.	Market activity	Purchase energy from renewable resource generating facilities; redesign capacity load to support generation from renewables; provide power grid access to those generating from renewable sources; pursue pilot demonstrations on conservation and use of renewable sources; use labs to experiment with conservation and renewable sources	Utility	All	EPGMA	None	

Table 2-3. BARRIERS IDENTIFIED IN PANEL REPORTS

Institutional-Political

- A. No one agency responsible for all solar purchases.
- B. Codification of solar energy procurement rule.
- C. Gap between public and private interest in solar development.
- D. Lack of centralized federal financial assistance program for solar investments.
- E. Need to stimulate solar energy directly through grants rather than through tax credits.
- F. Utility cooperatives not providing service related to solar energy.
- G. Lack of state, federal, local programs of consumer protection for purchasers of solar systems.
- H. Regulation of products by utilities.
- I. Inability of solar manufacturers to get proper insurance and provide minimum warranties.
- J. Lack of program coordination at the federal level.
- K. Lack of information regarding readily available solar technologies.
- L. Lack of adequate commercialization programs.
- M. Need to sell solar-created electricity back to the local power grid.
- N. Lack of consumer protection from possible abuses by the solar industry.
- O. Lack of trained individuals in installation and maintenance.
- P. High initial cost; lack of experience and/or information.
- Q. Utility rate structures at cross purposes with NEA proposals.
- R. Need for long-term financing.
- S. Complexity of the solar/utility relationship.
- T. Lack of marketable designs and systems.
- U. Lack of coordinated international technology development effort.

Economic

- A. Financial uncertainty.
- B. Investment criteria nonapplicable to solar energy.
- C. Integration of solar power into utility grids.
- D. High cost of feasibility studies, construction and engineering cost estimates.
- E. No data on small business demand for solar-related loans.
- F. Need to stimulate solar investment for multi-family rental property.
- G. Increase loan opportunities for centralized solar projects.
- H. Need for residential tax credits to enhance solar energy's interfuel competitiveness.
- I. High marginal cost for solar systems.
- J. Lack of cost-effectiveness of solar/renewable resources, internationally.
- K. No present link to potential foreign markets.

Technology

- A. Uncertainty regarding efficiency and first time cost.
- B. Lack of user information.
- C. Lack of data on system reliability.
- D. Lack of product quality assurance.

Social

- A. Lack of public awareness.
- B. No welfare expenditures allocated to capitalize on solar energy opportunities.
- C. Lack of solar applications in rural areas.
- D. Lack of special program to assist low-income residential solar purchasers.
- E. Need to integrate solar programs with numerous nonprofit self-help programs, particularly for low to moderate income areas.

Table 2-4. ASSUMPTIONS

Panel Report	Major Assumptions Underlying Review
Federal Operations	<p>In the year 2000, the Federal Vehicular Fleet Composition will be basically the same as today and size will grow no more than 10%, number and location of remote facilities will be substantially the same as today, and federally owned real property will consist of substantially the same composition and involve minor annual growth.</p> <p>Future Federal Power Generation and Marketing Agencies activities will reflect their current planning projections except as modified to increase/foster use of renewable energy sources.</p> <p>Coal conversion programs at federal facilities will follow the provisions of the proposed executive order dealing with this subject.</p> <p>Requirements in Executive Order 12003 will be met.</p> <p>Base year for our work is 1977 (1975 or 1976 when later data were unavailable).</p> <p>Currently committed agency conversion and solar plans will be accomplished.</p> <p>Various acquisition directives (example, OMB Circular A-109) will remain in effect.</p>
Financing and Incentives	<p>The Administration currently has a policy directed toward having the prices of conventional energy resources more closely reflect their true cost or replacement value.</p> <p>The Federal Government must intervene in the market to subsidize solar activities; this is a long practiced activity in regard to conventional energy sources.</p> <p>In studying identifiable financing problems, the Panel's report develops specific financial options that would assist, through federal incentives, private efforts to accelerate the use of solar technologies.</p>
Institutional Incentives Barriers	<p>These barriers are diverse: they represent a wide variety of circumstances which can explicitly or implicitly hinder a given objective.</p> <p>Because barriers have arisen from a variety of motives, they must ultimately be removed by actions that recognize those underlying motives.</p>

Table 2-4. ASSUMPTIONS (concluded)

Panel Report	Major Assumptions Underlying Review
Institutional Incentives and Barriers (cont.)	Institutional barriers tend to be actual binding constraints when a problem is near at hand; i.e., when a technology is in an advanced stage of development, ready for specific applications.
Research, Development and Demonstration	<p data-bbox="655 537 1401 657"><u>Rationale for Strategy:</u> The Panel believes that an integrated RD&D strategy should consider the relative priority of each technological area given its likely contribution in augmenting energy supply.</p> <p data-bbox="655 684 1401 804">The nation's energy supply problem is multifaceted. The overall energy system in the United States is most immediately being stressed by declining gas and oil supplies.</p> <p data-bbox="655 831 1401 1045"><u>Criteria for Option Section:</u> (1) merits Presidential consideration, (2) likely to lead to an augmentation of U.S. energy supply in a specific market sector, (3) would contribute to the development of an economically viable product which will enhance the nation's welfare, (4) allow leverage to enhance the benefit to the public obtained from federal investments.</p>
International	Need to ease the pressure on world fossil fuel demand. Need to cooperate with the industrialized countries in meeting the global energy challenge. Need to help the developing countries attain greater energy and economic self-sufficiency. Need to improve U.S. trade and balance-of-payment.
Impact	This panel tackled two major questions: (1) what energy impact will specific solar technologies make as a result of an assumed set of government programs and policies and assumed prices on fuels and solar equipment, (2) granted a given level of successful solar commercialization, what would the various impacts be on employment, the environment, the economy, national security, and so forth.

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APPENDIX A

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APPENDIX A
NUMBER OF TIMES ACTIONS RECOMMENDED BY DPR PANEL REPORTS

Type of Action	Federal Operations	Financial & Economic Incentives	Institutional Barriers & Incentives	RD&D	International	Total	Legislation Required			Administration June 20, 1979
							Yes	No	Undetermined	
Requirements	1	—	7	—	—	8	7	1		5
Taxation	—	4	—	—	—	4	3	1		6
Distribution	—	7	2	—	—	9	7	2		—
Organizational Creation	1	2	1	—	—	4	3	1		2
Government Services	5	1	7	12	2	27	12	13	2	8
Market Activity	1	—	—	—	—	1	—	1		7

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APPENDIX B

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APPENDIX B
NUMBER OF TIMES MARKET SECTORS ADDRESSED BY DPR PANEL REPORTS

Market Sector	Federal Operations	Financial & Economic Incentives	Institutional Barriers & Incentives	RD&D	Inter-national	Admin-istration June 20, 1979
Residential	—	9	8	—	—	14
Commercial	6	7	9	2	—	6
Agricultural	—	1	2	3	—	4
Industrial	—	1	5	4	2	7
Utilities	2	1	7	4	—	4
Synfuels	1	—	—	1	—	—
International	—	—	—	—	—	1
All	—	—	1	—	—	3



APPENDIX C

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APPENDIX C
NUMBER OF TIMES TECHNOLOGIES MENTIONED BY DPR PANEL REPORTS

Technology	Federal Operations	Financial & Economic Incentives	Institutional Barriers & Incentives	RD&D	Inter- national	Admin- istration June 20, 1979
Solar heating and cooling (active and passive)	7	9	8	3	—	13
Wind	1	1	2	—	—	1
STE/STR	—	—	—	2	—	2
PV	1	—	1	1	—	1
Biomass	2	1	3	—	—	7
OTEC	—	—	—	1	—	1
Hydropower	—	—	2	1	—	1
All	1	5	8	—	2	5
A/IPH	—	—	—	1	—	4
Hydrogen generation	1	—	—	—	—	—

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PENDING LEGISLATION ADDRESSING DPR RECOMMENDATIONS

Administration-Approved DPR Recommendations		Related Pending Legislation (As of 9/79)
Establish 20% goal	S.950 S.1308	Omnibus Solar Energy Commercialization Act of 1979 Energy Supply Act
Interest subsidies on residential and commercial loans; 60% residential	H.R.155 H.R.605 H.R.4748 S.524 S.950 S.1308	V.A. Solar Energy Revolving Fund Solar Energy Bank Act Accelerated Solar Energy Utilization Act Solar Energy Bank Act Omnibus Solar Energy Commercialization Act Energy Supply Act
Tax credit to support residential passive and active technology	H.R.4748 S.1571	Accelerated Solar Energy Utilization Act Alternative Energy Source and Conservation Tax Incentive Act
Tax credit for wood resources for home heating	H.R.4748	Accelerated Solar Energy Utilization Act
4¢ fuel excise tax exemption on gasohol	H.R.4748 S.1571	Accelerated Solar Energy Utilization Act Alternative Energy Source and Conservation Tax Incentive Act
Residential and commercial passive solar information dissemination	S.950 S.J.Res.53 S.931	Omnibus Solar Energy Commercialization Act National Renewable Energy Week Local Energy Management Act
Information dissemination of financing opportunities for solar hot water, heating, and cooling	S.950	Omnibus Solar Energy Commercialization Act
Stronger R&D activities for photo- voltaics, WECS, biomass conversion, AIPH, passive, STE, OTEC	H.R.2288 H.R.3000 H.R.3556 H.R.4335 H.R.4388 S.688 S.1613	National Energy Trust Fund Act DOE Authorization for Civilian Programs, FY80, FY81 Wind Energy Systems RD&D Act Wind Energy Utilization Act Energy and Water Development Appropriation Bill DOE Authorization for Civilian Programs, FY80, FY81 Rural Energy Independence Act

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APPENDIX D

PENDING LEGISLATION ADDRESSING DPR RECOMMENDATIONS (continued)

Administration-Approved DPR Recommendations		Related Pending Legislation (As of 9/79)
Assist developing countries' use of solar energy	H.R.2815 S.588 S.Con.Res.21	Amendment to Foreign Assistance Act of 1961 International Development Assistance Act U.N. Conference on New and Renewable Energy Sources
Monitor and direct federal solar programs		None
Tax credit for builders using solar (passive) on residences and commercial buildings, up to \$10K per building	H.R.4748 S.1571	Accelerated Solar Energy Utilization Act Alternative Energy Source and Conservation Tax Incentive Act
Increase tax credit on AIPH equipment to 25%	H.R.4748 S.1571	Accelerated Solar Energy Utilization Act Alternative Energy Source and Conservation Tax Incentive Act
Demonstrate cost and energy savings of passive and active solar systems	H.R.3000 S.688 S.914	DOE Authorization for Civilian Programs, FY80, FY81 DOE Authorization for Civilian Programs, FY80, FY81 National Public Works and Economic Development Act
Direct energy loan program at solar use	H.R.155 H.R.605 H.R.4748 H.R.4974 S.524 S.950 S.1308	VA Solar Energy Revolving Fund Solar Energy Bank Act Accelerated Solar Energy Utilization Act Solar Energy Development Act Solar Energy Bank Act Omnibus Solar Energy Commercialization Act Energy Supply Act
Home property improvement loans for solar heating and cooling	H.R.155 H.R.605 H.R.4748 H.R.4974 S.950 S.1308	VA Solar Energy Revolving Fund Solar Energy Bank Act Accelerated Solar Energy Utilization Act Solar Energy Development Bank Omnibus Solar Energy Commercialization Act Energy Supply Act
Require standard measures of home energy costs		None

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APPENDIX D

PENDING LEGISLATION ADDRESSING DPR RECOMMENDATIONS (concluded)

Administration-Approved DPR Recommendations		Related Pending Legislation (As of 9/79)
Increase maximum mortgage by 20% for solar systems	H.R.4748	Accelerated Solar Energy Utilization Act
Increase financing availability for rural residential solar systems and woodburning equipment		None specific to rural homeowners See Interest Subsidies
"Offset" pollution savings from using solar energy for industries and utilities		None
Exempt plants using 20% solar from coal conversion		None
Extend high priority to oil and gas consumers for solar system hookup		None
Market activity to help industries producing passive and active solar equipment		None
Market activity for solar energy package systems for industrial parks (gasohol)		None
Accelerate conversion from gasohol plant excise tax	S.858	Alternative Energy Production Tax Incentive Act
Implement pilot program of on-farm methane generation	S.1613	Rural Energy Independence Act
Implement broader demonstration program for grain drying using APH		None
Speed facilities licensing process for small-scale hydropower		None

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