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Framework and Criteria for Program Evaluation in the Office of Conservation and Renewable Energy

Prepared for:

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ABSTRACT

This study addresses the development of a framework and generic criteria for conducting program evaluation in the Office of Conservation and Renewable Energy (CE). The evaluation process is intended to provide the Assistant Secretary (AS/CE) with comprehensive and consistent evaluation data for management decisions regarding policy and strategy, crosscutting energy impacts and resource allocation and justification. The study defines evaluation objectives, identifies basic information requirements (criteria), and identifies a process for collecting evaluation results at the basic program level, integrating the results, and summarizing information upward through the CE organization to the Assistant Secretary. Methods are described by which initial criteria were tested, analyzed and refined for CE program applicability. General guidelines pertaining to evaluation and the Sunset Review* requirements are examined and various types, designs and models for evaluation are identified. Existing CE evaluation reports are reviewed and comments on their adequacy for meeting current needs are provided. An inventory and status survey of CE program evaluation activities is presented, as are issues, findings, and recommendations pertaining to CE evaluation and Sunset Review requirements. Also, sources of data for use in evaluation and the Sunset Review response are identified. An inventory of CE evaluation-related documents and reports is provided.

* Sunset Provisions, Title X of the Department of Energy Organization Act, PL95-91.

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APPENDICES

1.0 INTRODUCTION

1.1 OBJECTIVE

This report summarizes the principal results of a ten-month effort to assist the Office of Policy, Planning and Evaluation (PPE) in establishing a framework for program evaluations. The evaluation process being developed is intended to provide comprehensive, consistent and comparable evaluation results that can be aggregated into overall Conservation and Solar Energy analyses. The Office of Policy, Planning and Evaluation will use the evaluation framework to ensure that the Assistant Secretary for Conservation and Renewable Energy (AS/CE) has useful information for management decisions on policy and strategy, resource allocation, and program performance.

In addition to general program evaluations, Conservation and Renewable Energy Programs, along with other DOE programs, must respond to the Sunset Provisions of the Department of Energy Organization Act. These provisions, Title X of PL 95-91, mandate that a comprehensive review of DOE progams be submitted to Congress no later than January 15, 1982. The Sunset requirements and the general evaluation requirements were integrated to provide ongoing evaluations as well as to meet Congressional mandates.

The effort was directed toward developing a comprehensive CE evaluation system, rather than planning or conducting detailed program evaluations. The focus, then, was to design an evaluation process and criteria that would enable CE to implement the system.

The effort was particularly challenging because of the number and diversity of CE programs. At the end of 1980, CE was comprised of 18 subprograms which were divided into 69 program elements and 250 distinct projects. The programs generally fell into 5 categories:

- Research and Development
- Price
- Financial Incentives
- Information/Education
- Regulatory.

The diverse nature of CE programs posed substantial difficulty in designing a common framework and set of evaluation measures that might be applied consistently across the disparate program characteristics. The present effort was designed to create such common measures for evaluating programs and to determine whether overall evaluation guidance could be issued.

Evaluation is a dynamic process where refinements and advancements are integrated periodically. This study is the first stage in a continuing evolution. Findings of this study were given to CE programs throughout the study period and program input was sought actively through meetings and briefings. Many of the study's products have already been absorbed into concept papers, systems definitions, calls for information, directives and briefing documents.

Thus, this effort has already played a major role in developing a comprehensive CE evaluation process. One of the major results has been to make CE personnel aware of the need for evaluations. At the beginning of the study, few CE programs had conducted evaluations and CE personnel had broadly different concepts of evaluation methods and purposes.

The effort has encouraged CE programs to begin planning for evaluations. By the end of the effort, numerous CE programs had either planned, or had actually begun evaluations. Moreover, the programs were reflecting a more consistent set of evaluation criteria.

1.2 ORGANIZATION OF THE REPORT

This report is organized into seven sections roughly parallelling the tasks required to complete the study.

Section 2 details the criteria that have been established for CE evaluations. It contains a discussion of evaluation objectives, criteria and data requirements.

Section 3 summarizes how the criteria were tested. It outlines the sources of information that exist for the required data and details the rationale for the approach that was taken in the pilot evaluation.

Section 4 analyzes the response to the program element data sheet and outlines the framework for integrating CE evaluations.

Section 5 provides guidelines for evaluations. These are both general guidelines and guidelines tailored specifically to meet the DOE Sunset Requirements.

Section 6 analyzes existing CE evaluations.

Section 7 summarizes issues in program evaluations.

The appendices at the end of this report contain the products, grouped by task, that the study created.

Appendix 1 corresponds to Task 1 and is discussed in Section 2 of this paper. Appendix 2 corresponds to Task 2 and is discussed in Section 3 of the paper. The numbering system continues through Appendix 6 which corresponds to Task 6 and is discussed in Section 7.

Since the study was both an iterative and integrated process, the products do not correspond precisely to each task. The papers generally contain elements from several tasks and reflect work done in several related areas. The evaluation process was not studied piecemeal but was approached from the beginning as a complex entity. Its components can be studied singly, but it can be altered only by considering the effect on the entire system.

2.0 PILOT PROGRAM CRITERIA

2.1 EVALUATION OBJECTIVES

The objective in establishing a comprehensive CE evaluation plan is to provide the Assistant Secretary for Conservation and Renewable Energy (AS/CE) with useful information for policy, strategy and resource allocation. The results of evaluations must be comprehensive, consistent and comparable to provide the AS/CE with the information needed to make management decisions. In addition, the information should be in a form that can be aggregated to provide an overall measure of progress.

Programs should be evaluated periodically to:

- o Reassess program objectives and contributions to the CE mission
- o Measure success in achieving stated objectives
- o Identify areas needing improvement
- o Determine if information needs are being met
- o Provide information with which to compare programs
- o Measure the efficiency and effectiveness with which programs are carried out.

The Department of Energy Organization Act (PL 95-91) mandates that a comprehensive review of each DOE program be submitted to Congress by January 15, 1982. The Sunset Provision of the DOE Organization Act sets forth 14 items that each program must assess.

The Sunset Provisions add another dimension to the need for program evaluations. The reviews must provide information that both Congress and DOE managers will find useful in making policy decisions. However, the information must provide a measure for overall DOE progress as well as individual program performance.

2.2 LIBRARY OF EVALUATIONS

An examination of previous evaluations would have been a logical beginning for the development of a CE evaluation system. No central source of information existed for CE evaluations, however, and the data needed to perform evaluations were widely scattered.

Consequently, the AS/CE required each program office to submit evaluation information. In a memorandum issued on July 7, 1980, the AS/CE asked for evaluations plans, reports and other related documents to establish a central repository for such information.

The program offices' responses, summarized in Appendix 1, indicated that CE had performed very few formal, comprehensive program evaluations. Nevertheless, numerous studies, analyses and data existed that could support evaluation efforts. The diversity of the response indicated that no common definition of evaluations existed among CE program offices.

Follow-up efforts were pursued through document reviews and meetings with program office personnel. An updated status report was prepared in December 1980 and is shown in Appendix 1.

Numerous documents pertaining to program evaluations were collected and reviewed during the course of this study. The documents form the basis of a continually growing Program Evaluation Library. The collection encompasses memoranda, program plans, evaluation reports, sources of data, evaluation primers and guidelines. An inventory list was prepared and updated periodically. The current list is shown in Appendix 1.

2.3 EVALUATION CRITERIA

A fundamental concept in developing CE evaluation criteria was that evaluation should be formulated around topics, issues and management information requirements rather than methodologies and techniques. Evaluation criteria represented the principal summary information needed for strategic planning, measuring progress toward CE goals, allocating resources and reporting CE activities.

As indicated in the Concept Paper in Appendix 1, CE evaluations should include:

- o Assessments of program performance and accomplishments in relation to establishing objectives
- o Assessments of program impact
- o Assessments of effectiveness and efficiency in management, procedures and resource use
- o Assessments of contribution to the CE mission.

CE Program Evaluations would not include items normally included in management evaluation, such as:

- o Day-to-day program monitoring
- o Contract reviews
- o Personnel management reviews
- o Routine milestone auditing
- o Project selection and funding.

Evaluation criteria, then, are a measure of a program's results. This includes efficiency, effectiveness, impact, cost and workload. The criteria are derived from the CE programs' stated goals and the Assistant Secretary's information requirements.

2.4 DATA REQUIREMENTS

Information categories were developed through a comprehensive review of program documents. These included multi-year program plans, annual operating plans, program summary documents, fact books, evaluation reports, statements of objectives and enabling legislation. The information was then organized into categories common to many programs.

The information categories were translated into quantitative measures wherever possible and appropriate. An early draft of data requirements was presented in August 1980. It included such measures as energy savings, cost effectiveness, program progress, and national impact.

The requirements went through several iterations based on comments from PPE, the evaluation project team and pre-test reviews by the staff of the Industrial Conservation Program, the Transportation Program, the Buildings and Community Systems Program and the Solar Thermal Program. The data requirements, in their various stages of evolution, are shown in Appendix 1.

The information requirements were finally grouped into 5 major categories:

- o Program Background
- o Energy Impacts
- o Federal and Private Investment
- o Program Progress
- o Other Program Impacts.

2.4.1 Program Background

The program background data provide the basic information with which to understand the program. The information requirements include:

- o Program name
- o Type of program
- o Stage of development, i.e., Basic and Applied Research, Exploratory Development, etc.
- o Percent of funds allocated to policy tools such as standards and regulations, financial incentives, information and evaluation
- o Strategic objectives that the program supports

- o Program objectives, target dates, quantities and measures of accomplishment
- o Congressional mandates or statutes establishing the program or its objectives
- o Justification of the Federal role such as undertaking research and development efforts that the private sector will not do
- o Projected budget requirements
- o Projected personnel requirements
- o Geographic focus or impact
- o Other programs with similar or conflicting objectives.

2.4.2 Energy Impacts

Data requirements on energy impacts provide an indication of energy saving or energy displacement through program activities. The program offices are asked to supply information on:

- o Markets and end-use sectors that are affected
- o Energy impact scenarios which include an energy demand baseline by end-use sector, and savings/displacement projections by sector and budget level
- o The mix of energy savings by energy source
- o Market impact, i.e., market penetration, number of units, number and types of beneficiaries
- o Acceleration of commercial readiness.

2.4.3 Federal and Private Investments

The category for Federal and private investment is intended to determine the total amount being spent to meet the program's objectives and the relative burdens on the Federal government, state and local governments, and the private sector. The information requirements are:

- o Current and planned investment by the Federal government, state and local governments, and the private sector
- o Cumulative past investment.

2.4.4 Program Progress

The information requested in this category indicates how well each program is achieving its objectives. The information that each program should provide includes:

- o Program performance, impact and accomplishments in terms of meeting its original objectives, meeting the proper Federal role and using appropriate methods of analysis
- o Changes to the original program objectives or charter and the consequent program redirection
- o The degree to which program administration (rules, regulations, orders, etc.) meets Congressional objectives in establishing the program
- o Measures of effectiveness such as payback period or cost per MBtu's saved
- o Technical and market risks in meeting program objectives.

2.4.5 Other Program Impacts

Finally, data requirements for other program impacts were designed to measure the program's effect on a broad range of social and economic categories. The 11 areas of interest are:

- o Price Inflation
- o Competition
- o Economic Stability
- o Balance of Payments
- o Capital Investments
- o Employment
- o Productivity
- o Ecology/Environment
- o Health and Safety
- o Societal (Equity and Standard of Living)
- o National Security.

3.0 PILOT CRITERIA TESTING

3.1 SOURCES OF INFORMATION

Sources of information were identified simultaneously with the development of evaluation data requirements. Only existing information was requested, not data that would have required fundamental research. Sources for the required data are shown in Figure 1.

Program summary documents can provide a great deal of background information as well as data on expected program accomplishments and energy impacts. The program memoranda provide much the same sort of information. The PMs, however, give additional budget detail and provide information on the incremental benefits of a changed budget level. Multi-year program plans, annual operating plans, annual reports and fact books again provide information on expected accomplishments, energy impacts and program progress.

The Policy Programming and Fiscal Guidance and the National Energy Plan give information on national objectives and the anticipated effect of government policies on national energy consumption, economic growth, social equity and other social welfare indicators. Publications by the Energy Information Administration also provide estimates of impacts on energy consumption. Some of these publications are listed in the Evaluation Project Library inventory list in Appendix 1.

3.2 PILOT EVALUATION CRITIQUE

3.2.1 Original Selection Plan

With preliminary evaluation criteria and data requirements established, pilot evaluations were necessary to test the evaluation criteria, apply the methodology and prepare evaluation guidelines. A series of criteria were established to select programs for a pilot evaluation. The selection criteria were designed to choose a program for each market sector, each generic sector and each target audience.

Initially, criteria were developed to determine which programs were not candidates for the pilot evaluation. Programs just beginning were excluded since the criteria were for retrospective evaluations. Programs with limited data available were excluded since the evaluations would be marginal or take much longer to complete. Finally, programs that had recently completed an evaluation were excluded to avoid wasted effort.

Both conservation and solar programs were represented in the pilot selection process to ensure that the evaluation criteria would apply to both types of programs. Moreover, a crosswalk could then be constructed between conservation

DATA REQUIREMENTS \ DATA SOURCES	PROGRAM SUMMARY DOCUMENTS	PROGRAM MEMORANDUM	MYPP	AOP	BUDGET ANALYSES	POLICY AND FISCAL GUIDANCE	NATIONAL ENERGY PLAN	FACT BOOKS	ANNUAL REPORTS	CURRENT EVALUATION REPORTS	EIA PUBLICATIONS	LEGISLATION
Background												
Name	•	•	•	•	•			•	•	•		•
Type	•	•	•	•	•			•	•	•		
Stage of Development	•	•			•			•	•	•		
Funds Allocated to Policy Tools			•	•	•			•	•			
Strategic Objectives	•	•	•	•	•			•	•	•		•
Program Objectives	•	•	•	•	•			•	•	•		•
Congressional Mandates	•	•	•	•	•		•	•	•			•
Federal Role	•	•	•	•			•	•	•	•		
Projected Budget Requirements		•	•		•							
Projected Personnel Requirements		•	•		•							
Geographic Focus	•	•	•	•				•	•	•		
Programs with Similar or Conflicting Objectives	•	•			•		•			•		
Energy Impacts												
Markets/End Use Sectors	•	•	•	•			•	•	•	•	•	
Energy Impact Scenarios		•	•		•	•	•	•	•		•	
Savings by Energy Source	•		•	•			•	•	•	•	•	
Market Impact	•	•	•	•		•	•	•	•	•	•	
Acceleration of Commercial Readiness	•	•	•	•			•	•	•	•	•	
Federal and Private Investment												
Current and Planned Investment	•	•	•	•	•	•	•	•	•	•		•
Share of Funding	•	•	•	•			•	•	•			
Cumulative Past Investment		•			•							
Program Progress												
Program Performance	•	•	•	•					•	•		
Changes in Program Objectives	•	•	•	•	•			•	•	•		•
How Does Program Administration Meet Congressional Objectives			•	•								•
Measures of Effectiveness					•			•		•		
Technical and Market Risks	•	•	•	•		•		•		•		
Other Impacts												
Price Inflation						•	•					
Competition							•					
Economic Stability						•	•					
Balance of Payments							•					
Capital Investment						•	•					
Employment						•	•					
Productivity						•	•					
Ecology/Environment							•					
Health and Safety							•					
Societal							•					
National Security							•					

Figure 1

Data Requirements and Data Sources

and solar evaluation criteria. The major types of conservation and solar programs were represented. They are:

- o Research and Development
- o Information/Education
- o Service Delivery
- o Regulatory
- o Price/Economic.

The major energy sectors were also represented so that impact and performance indicators could be developed, if necessary, for different programs . Moreover, potential problems could be identified in aggregating evaluation criteria.

Programs that affect the same sector were also used. Such a grouping helps to develop methods of evaluating individual program impacts and identifies other methods of program integration.

Both new and mature programs were made part of the sample. Standards for each could be set that recognize their differences. Mandatory conservation programs were also selected. These help refine evaluation criteria by recognizing major differences among programs. They also reflect the separate contribution of mandatory and voluntary programs. Finally, both technology and service delivery programs were selected for the sample to reflect the complexity of technology delivery in the evaluation criteria. Such a sample ensures that impact and performance criteria are available for all types of programs.

Four programs were selected for the pilot evaluation. They were:

- o Appliance Standards
- o Industrial Process Efficiency
- o Electric and Hybrid Vehicles
- o Energy Related Inventions.

Two alternative programs were also chosen:

- o Weatherization Assistance Programs
- o Residential Conservation Service.

3.2.2 Revised Approach to Pilot Evaluations

At this point, the approach to conducting the pilot evaluations was revised. The number of evaluations was expanded from four, as stated in the original approach, to encompass all CE programs.

The broader coverage would be accomplished by incorporating outcome criteria into a program element data sheet and distributing the questionnaire to all CE program elements for response. The program element data sheet developed

jointly by PPE and the Office of Policy and Evaluation is presented in Appendix 2, and was based on the information requirements described in Section 2.4.

The analysis of the evaluation criteria would be performed on the responses from all CE programs. The revised approach would yield results similar to an analysis of four program evaluations, but would provide much broader program coverage. The revised approach is documented in a formal conference record.

4.0 PILOT EVALUATION ANALYSIS

4.1 ANALYSIS OF RESPONSES TO THE PROGRAM ELEMENT DATA SHEET

By the end of April 1981, about four fifths of the CE programs had responded to the program element data sheet request. Responses are still being received and may extend beyond the term of the study. Nevertheless, a preliminary analysis of the responses, and recommendations for modifying the data sheet, can be made using the existing sample.

Most respondents apparently made a sincere effort to respond to the questions and provide data. Descriptive questions were generally addressed thoroughly. Such questions included:

- Program element title
- List of subelements and projects which comprise the program element
- Type of program
- End-use sectors affected
- Strategic objectives
- Major program objectives
- Need for the program
- Program element mechanics (management structure and process).

Even so, questions on major program objectives and major achievements were addressed in varying degrees of detail. Responses ranged from general statements of objectives, to specific targets with milestones, dates and indicators.

Discussions of achievements varied in a similar way. Responses often did not relate program achievements to program objectives. Achievements were defined in numerous ways, sometimes relating more to the program's growth than to its accomplishments.

Responses to the question dealing with Federal and private sector investments posed the same type of problem. There was little consistency among the answers and little information by which to judge the validity of baseline data.

Finally, cost performance measures could not be calculated with the data provided from the energy savings and investment questions. The programs provided little supporting information on the expected lifetimes of energy investments. An analysis of the results is presented in Appendix 3.

Recommendations for improving the CE evaluation process are discussed in Section 6.2.

4.2 FRAMEWORK FOR INTEGRATING EVALUATIONS

Under the CE evaluation concept, program and project managers retain the principal responsibility for evaluations. CE will establish general criteria and guidelines to ensure that comprehensive and consistent data are being developed. A Program Evaluation Technical Advisory Committee composed of program managers and evaluators will coordinate the development of the CE Evaluation Plan and then will carry out that plan. The major elements of the CE Evaluation Plan are shown in Figure 2. The responsibilities in the CE Evaluation Plan have been carefully divided between the Office of Policy, Planning and Evaluation and the CE program offices. The Office of Policy, Planning and Evaluation is responsible for:

- Developing and implementing the CE Program Evaluation Plan in coordination with CE programs and PE
- Defining CE evaluation criteria
- Developing evaluation guidelines and sample methodologies
- Identifying programs for priority evaluation
- Conducting staff evaluation training and workshops
- Reviewing evaluation plans and results
- Aggregating evaluation results
- Performing cross-cutting analysis
- Monitoring the status of evaluations
- Performing special evaluations as directed by the Assistant Secretary.

CE programs are responsible for:

- Assigning specific evaluation components to each program with designated manpower and funds to conduct evaluations
- Participating in the development of the CE Evaluation Plan, evaluation criteria, methodologies and data resources
- Reviewing and validating the CE evaluation criteria and guidelines
- Coordinating with PPE in selecting program evaluation priorities and schedules
- Designing and conducting evaluations according to CE evaluation criteria and guidelines
- Providing evaluation results and findings to PPE for aggregation and cross-cutting analysis.

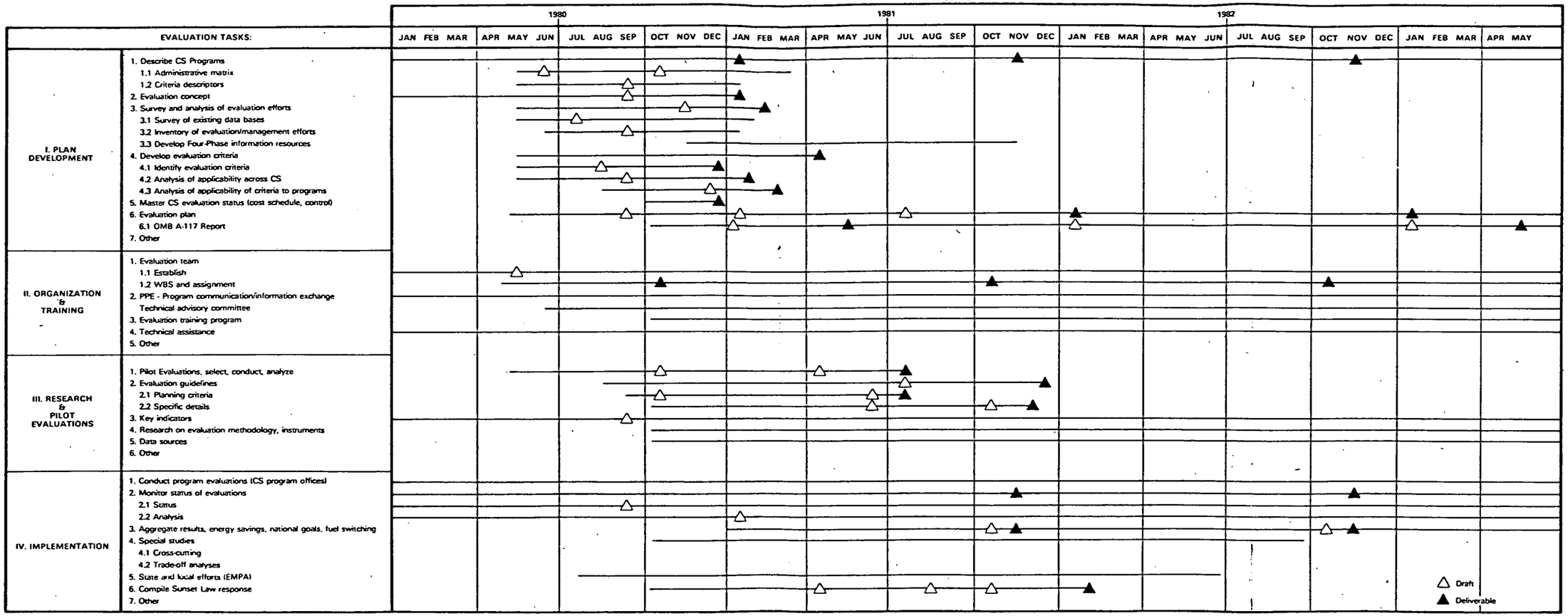


Figure 2

CE Evaluation Plan

Development and Implementation

Within the CE evaluation framework, a program is equivalent to a "program element" as defined in the Planning, Programming and Budgeting System (PPBS). In late 1980, the PPBS structure contained 69 CE program elements under 18 subprograms. Subprograms and program elements are depicted in Appendix 3.

Every program will be evaluated individually, but managers may need to disaggregate programs into finer elements to address evaluation questions adequately. A program consisting of several distinct R&D projects, for instance, may have to evaluate each project against an appropriate measure.

Program offices will conduct the first evaluation review, aggregation and crosswalk analyses. These offices are principally responsible for establishing priorities, assigning budget levels, allocating resources, and reviewing evaluation plans, methodologies, data sources and results. The framework for conducting, reviewing and summarizing evaluations is illustrated in Figure 3.

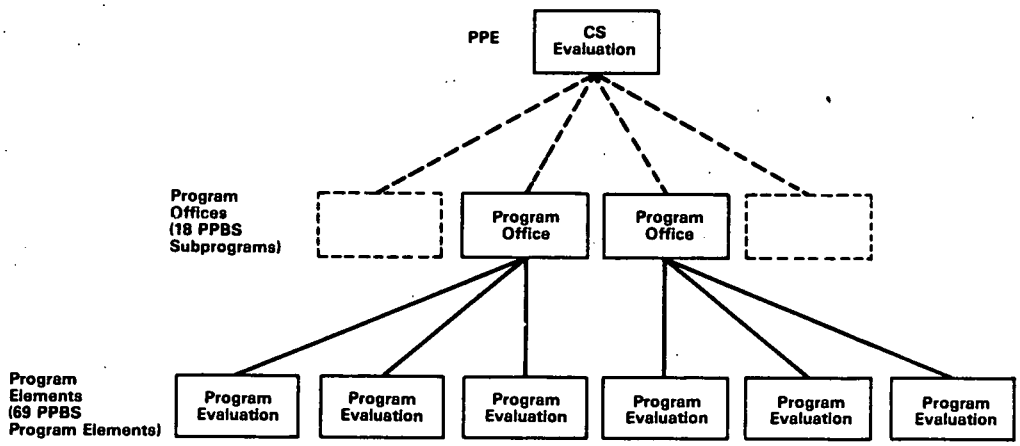


Figure 3
Framework for Evaluation Data Flow and Aggregation

PPE is responsible for aggregating the program results into a CE-wide evaluation package. PPE will review evaluations and perform analyses at this level. Nevertheless, each program evaluation is an independent effort and must stand on its own data, background material, documentation and results.

PPE is responsible for crosswalk analysis and presentation of national impact information. The office must integrate that data with the activities of other DOE programs. Finally, PPE must monitor overall CE performance against goals and objectives.

5.0 EVALUATION GUIDELINES

5.1 GENERAL GUIDELINES

OMB Circular A-117 provides two definitions of government evaluations:

- o Program Evaluation is a formal assessment, through objective measurements and systematic analyses, of the manner and extent to which Federal programs (or their components) achieve their objectives or produce other significant effects, used to assist management and policy decision making.
- o Management Evaluation is a formal assessment of the efficiency of agency operations. It includes assessing the effectiveness of organizational structures and relationships, operating procedures and systems, and work force requirements and utilization.

5.1.1 Types of Evaluation

Evaluability assessment, a landmark concept developed by Joseph S. Wholey and the Urban Institute, can clarify a program's intent and thereby improve its efficiency, effectiveness and responsiveness. An evaluation will improve program performance only if three conditions are met:

- o Program objectives are well defined in terms of specific performance measures and data can be obtained at reasonable cost.
- o Program assumptions and objectives are plausible in their likelihood of inducing progress toward program objectives.
- o Intended uses of evaluation information are well defined.

Evaluability assessment provides an early indication of whether a program's design meets these standards. Its products are a set of program objectives and indicators and a set of evaluation and management options.

After the evaluability assessment, a rapid feedback evaluation summarizes readily obtainable information, estimates the cost of additional information and designs more intensive evaluations. Next, performance monitoring measures program performance. Finally, intensive evaluation uses comparison or control groups to estimate program results.

During the course of this study, other types of evaluation were identified.

- o Context evaluation provides a rationale for determining objectives. It defines the relevant environment, describes actual and desired conditions, identifies needs and diagnoses problems. The evaluation methodology is comprised of two modes:
  - Contingency. This mode searches for opportunities outside the immediate system.

- Congruency. This mode compares actual and intended system performance.

o Input evaluation provides information on how resources should be used to meet program goals. The end product is an analysis in terms of costs and benefits. It is closely related to a management evaluation as defined by OMB.

o Process evaluation detects or predicts defects in program implementation. It studies the means by which a program is carried out. It is also closely related to management evaluation.

o Product evaluation measures program achievements and contains many elements of the OMB definition of Program Evaluation. It reports objectives that were, or were not, achieved. Product evaluation is usually conducted for an experimental design.

5.1.2 Alternative Evaluation Design

The study has also identified six basic evaluation designs:

o One shot case study. This first design measures the effect of a program on a group of recepients. The evaluator notes what happens to the group receiving the program.

o One group pretest - posttest. The second design pretests and posttests a single group. Between the tests, the group receives some type of intervention. Care must be taken to ensure that the first test does not affect the results of the second test.

o Non-equivalent control group. Two or more groups are administered a pretest, an intervention and a posttest. One group serves as a control. The more similar the comparison groups, the more valid the results will be.

o Pretest - posttest control group. Subjects are assigned to similar groups which are then tested. One or more groups is affected by the program and at least one group is used as a control. All groups are measured at the end.

o Posttest-only control group. No pretest is given in this design. An untested control group is measured to estimate how the program effected the recepient group.

o Interrupted time series. A series of measurements is taken both before and after a group is affected by the program.

5.1.3 Evaluation Models

Finally the study identified seven evaluation models:

- o Formative - Summative Model. Formative evaluation assesses progress toward identified goals while the program is still in progress. The evaluation determines if the program is working as originally planned, if all components are working effectively, and if the program should be changed. Summative evaluation determines if the program met its final goals. It is an after-the-fact evaluation that identifies changes as a result of the program.
- o CIPP Model. This model analyzes Context (C), Impact (I), Process (P), and Product (P) to provide information to decision makers. The evaluator collects data and sends it to someone else who will determine its worth. Data identification is done jointly by the evaluator and decision maker.
- o CSE-UCLA Model. This model also emphasizes providing information to decision makers. It requires a series of judgements:
  - Is the program's status satisfactory?
  - Is the program carried out as planned?
  - Is the program meeting its objectives?
  - Is the program worthwhile?
- o Countenance Model. The countenance model has three phases - the anticedent phase, the transaction phase and the outcome phase. The anticedent phase identifies conditions before the beginning of the program, specifies goals and outlines desired impacts. The transaction phase is the program's implementation and describes the study groups' behavior. The outcome phase measures the program's effect at its completion.
- o Goal Attainment Model. This model emphasizes the extent to which the program achieves its goals. Each goal is defined operationally and success is measured in terms of the operational goal.
- o Discrepancy Model. The discrepancy model determines the difference between program performance and standards used for judgement. Standards are set at the beginning. If a discrepancy is found, either the program or the standards must be changed. Discrepancy analyses are performed in the start-up phase, the implementation phase and after the program has been completed.

- o Goal-Free Evaluation. The emphasis is on results, either planned or unplanned. The evaluation specifies the variety of ways the program can affect its target audience and then collects information to determine its actual impact.

5.1.4 CE Evaluation Types

After reviewing the various evaluation types, procedures and models, the Office of Policy, Planning and Evaluation decided to concentrate on impact and process performance issues. Thus, CE will perform both formative and summative evaluations.

- o Process (formative) evaluation seeks to provide prompt feedback to program managers and staff to help them modify the program to improve performance. For example, formative evaluation of the schools and hospitals program might lead to a reduction in the number of forms that each institution must complete.
- o Outcomes (summative) evaluation seeks to quantify the effects of the program on client groups. These responses are of interest both to program personnel and to policy-makers. For example, a summative evaluation of the Residential Conservation Service (RCS) Program would show the effects of the RCS Program on annual energy consumption for participants in comparison with changes in annual energy consumption for nonparticipants.

5.2 SUNSET REQUIREMENTS

The requirements of Title X of the DOE Organization Act, the Sunset Provisions, are being incorporated into the CE evaluation process. The Sunset Provisions will give Congress the information it requires to decide DOE's future. Although it is a one-time reporting requirement, the information requested is similar to the data needed to perform other evaluations. Moreover, the January 15, 1982, deadline establishes a critical schedule for completing the requirements.

The fourteen questions delineated in Title X leave considerable room for interpretation. Consequently, DOE guidance is necessary to ensure consistency of method and comparable results.

The Title X questions were assembled into a Sunset Review worksheet for CE comment. The worksheet is shown in Appendix 4. PPE is using the returns to structure a response to the Sunset requirements and to issue guidance to the program offices.

The reviews were structured around the following issues:

- o How should the program respond to each of the fourteen Sunset items?
- o What data are readily available to respond to the items? Source documents?
- o What data and analysis must be developed? Approach? Benefit? Estimated Schedule? Cost and manpower?
- o What guidance is necessary to structure a response?
- o Recommendations for developing a CE response to Sunset?
- o Other comments or recommendations pertinent to the Sunset Review?

The results of the mini-reviews are presented in Appendix 4. Generally, the reviews found that:

- o Items 6, 7, 9, and 13 are the most difficult to respond to and will require guidance. The other items were generally believed to be straightforward or could be readily addressed with existing sources.
- o There is an apparent lack of data to support items 6, 7, 9, and 13. However this has generally been a problem in CE and has been addressed through analytical procedures with limited data in past exercises.
- o Budget guidance is necessary for item 13 to address the baseline budget level, the "higher than" and "less than" budget level, outyear projections and acceptable budget growth rates.

The CE approach to conducting Sunset evaluations parallels the ongoing evaluation process. Basic data and other material will be developed at the program level. A program is defined as a subprogram in accordance with the DOE Budget terminology.

Program offices will supervise the programs and aggregate the material that is generated. In addition, the DASs will summarize office data for presentation to the AS/CE. Each program will designate a staff member who will be responsible for preparing the Sunset Review response.

The Office of Policy, Planning and Evaluation will develop a plan for assembling the response data and preparing the required reports. PPE will prepare guidelines for the programs and will help to present the data in an effective manner. PPE will integrate program data, perform cross-cutting analyses and prepare the final report, which will be incorporated into the DOE Sunset package.

The process of developing a plan to respond to the Sunset Requirements is still under way. DOE guidance will be necessary for a final plan to be promulgated.

6.0 PROGRAM EVALUATION ANALYSIS

6.1 CURRENT CE EVALUATIONS

CE programs have completed few comprehensive evaluations. A survey of the number, type and status of CE evaluations is presented in Appendix 5 along with sample evaluation analyses.

The survey indicated only four evaluations had been completed in CE. Six evaluations were in process and eleven were in development. An additional five were planned. The December survey was a great improvement over earlier findings that most CE programs had not planned, or even seriously thought about evaluation.

Completed CE evaluations lacked a common framework. The evaluation of the State Energy Conservation Program (SECP) clearly stated the programs' objectives and related the evaluation's findings to those objectives. Specific data were analyzed and recommendations made to improve the program.

The evaluation's weakness was in its methodology. The final report included the results of a "pre-test" subject. Subsequent revisions in the methodology made the tests inconsistent.

The evaluation of the Energy Extension Service was intended to assess the program's impact and to ascertain which programs work best and why. Unfortunately, little effort was made to determine which programs worked best or why.

An additional weakness was the use of data aggregated from several states instead of using data from individual states. Thus, the focus of the evaluation became the program in general rather than specific strengths or weaknesses.

Finally, the SUEDE evaluation was oriented primarily toward social and economic development with little emphasis on solar and renewable issues. In addition, the evaluation was based on a telephone survey rather than written responses or face-to-face discussion. The evaluation's conclusions were very weak based on the number and type of questions asked.

The survey and analysis of CE evaluation efforts along with numerous meetings with program staff members yielded the following findings which have been integrated into the evaluation criteria, data requirements and framework.

- o There is no standard definition of evaluation as applied to Federal programs and a general misunderstanding of the concept throughout CE.
- o Few standard requirements exist for measuring program impact, testing hypotheses or verifying data.

- Useful evaluation is inhibited by a severe lack of performance, impact, and baseline data from which outcomes could be measured. Few CE programs implemented data collection activities that would substantiate a cumulative, measurable knowledge of their impacts in terms of changes on energy consumption or efficiency. Because of this lack of data, impact analyses have been formulated around assumptions while producing only marginally useful results.
- The objectives of many CS programs cannot be measured easily. For example, the objectives of R&D programs are to achieve a future market penetration level and energy savings. Such expectations must be forecasted rather than measuring actual performance.
- Data must be disaggregated into meaningful market and end-use sectors so that program impact analyses can be reconciled at the AS/CE level.
- Evaluation data is constrained and impacts had to be measured for each program. Evaluation design and data collection, then, was often unique for each program.
- Evaluation was often approached on the basis of data collection techniques and analytical methodologies (of which computer modeling was quite popular), as opposed to first defining information needs. Evaluation should be designed around topics, issues, and information needs.
- Little effort was devoted to validating the evaluation data and analysis that CE programs developed.

6.2 RECOMMENDATIONS TO IMPROVE CE EVALUATIONS

CE program evaluations could be improved in the following areas:

- The approach to evaluations should include an assessment of program goals and objectives. They should be judged on whether they are reasonable and appropriate.
- Program objectives must be stated clearly. Accomplishments must be closely related to those objectives.
- Data needs should be appraised and acquisition costs assessed. Programs should determine the cost versus the benefit of additional data collection.
- Energy demand sectors could be broken down into subsectors and end-use categories. Specific markets could then be distinguished and duplicate impacts more readily identified.

- o DOE should establish a common data baseline for program evaluation. The baseline should be disaggregated into sectors, subsectors and end-uses so that program impacts can be readily measured.
- o CE should identify data sources that will assist programs in performing impact and performance evaluation. Standard methods should be developed to calculate energy saving or displacement.
- o Programs should use common factors such as discount rates, energy price scenarios and cost-benefit formulas.
- o Cost performance measures should be a required part of CE evaluations. Programs should demonstrate that they are cost-effective. CE guidance will probably be necessary to ensure consistent analysis and use of data.
- o Technical and economic feasibility should be specified in evaluation measures. End-user performance should be expressed in payback period, cost per MBTu's or similar measures.
- o CE should identify other evaluation models or procedures that will provide more consistent and comparable impact calculations.
- o CE should require program offices to set aside a specific portion of their budgets to conduct evaluations. A set-aside would ensure that the programs have the sufficient resources for evaluations.
- o The evaluation process must ensure that the results are used effectively. The process must be fully integrated into the Planning, Programming and Budgeting System and policy and strategy functions. The process is illustrated in Figure 4.

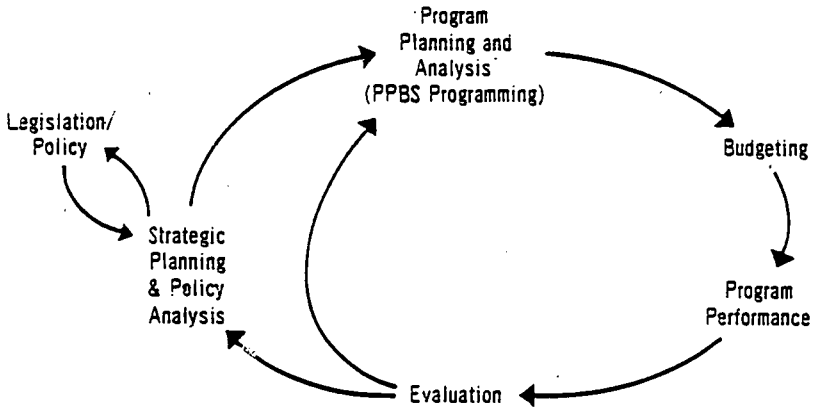


Figure 4
CE Closed Loop Management System

7.0 ISSUE PAPERS

7.1 ALTERNATIVE APPROACHES TO BUDGETING MULTI-YEAR CE PROGRAM EVALUATION

This paper, presented in Appendix 6, explored alternative general approaches to planning, conducting and funding evaluations. It also assessed probable results and their usefulness to the Assistant Secretary for Conservation and Solar Energy.

Evaluation objectives were approached through alternative courses of action. In each scenario, CE program offices and the Office of Policy, Planning and Evaluation were asssigned different degrees of responsibility, guidance and approval authority.

Alternative 1 - Autonomous Program Evaluation.

Under the first scenario, program offices would conduct independent evaluations. They would develop individual evaluation plans, evaluation criteria, milestones and budgets. PPE would only review and comment on the evaluation plans.

Evaluations conducted under such conditions would probably not be consistent or capable of being aggregated. They would not, therefore, meet the Assistant Secretary's needs.

Alternative 2. - Independent Program Evaluation with General Guidelines from PPE.

In the second scenario, PPE would prepare general evaluation guidelines and establish evaluation criteria. PPE would also establish the overall CE evaluation process, schedule, milestones and budget guidance.

CE programs would prepare their own evaluation plans. When PPE approved the plans, the program offices would then conduct the evaluations.

Budget planning would be based upon AS/CE instructions to devote one to two percent of program funding to evaluations. The AS/CE instructions would be a minimum guideline. Some program offices would have to spend far more to evaluate complex or multi-project programs.

The second approach ensures that evaluations will be performed extensively throughout CE and that they will be consistent and comparable. The approach also retains the flexibility that CE program offices need to evaluate individual programs properly.

Alternative 3 - Comprehensive Guidelines for Integrated Program Planning and Evaluation.

In the third scenario, PPE would develop specific and comprehensive criteria along with sample evaluation methodologies. PPE would closely monitor the evaluations as they are conducted by the program offices.

Funds for evaluations would be identified in B&R access codes. Release of such funds would require PPE's prior approval of the applicable evaluation plan. This final approach would greatly limit the program offices' flexibility in developing evaluation plans to meet individual needs. In addition, establishing B&R codes would require approximately a six-month lead time.

Recommendation. The issue paper recommended carrying out Alternative 2.

7.2 SUNSET REVIEW RESPONSE

This issue paper identified data requirements, data sources and types of responses required by the fourteen items of information in the DOE Sunset Requirements. The paper is presented in Appendix 6. Information is readily available to answer approximately half of the Sunset questions. Information must be developed or expanded for seven of the questions.

The items for which more information is needed are:

- Alternative methods of achieving the program's purpose
- Number and types of program beneficiaries
- Impact on the national economy
- Degree to which program administration meets Congressional objectives
- Anticipated program needs and conditions under which objectives can be met
- Services that could be provided under alternate budget levels
- Recommended transitional requirements.

APPENDIX 1

PILOT PROGRAM CRITERIA

AGENDA

CSE Program Evaluation Planning Meeting
June 11, 1980
9:00 - 5:00

9:00 - 9:30	I Introduction	
	A. Purpose	Bob Plunkett
	B. Summary/Status of Current Efforts	Tom Van Der Linden
	C. Overview of Topics	Tom Van Der Linden
9:30 - 10:15	II Evaluation Planning	
	A. Objectives	Bob Plunkett
	1. CSE Overview	"
	2. Sunset Provisions	Phil Kemp
	3. OMB A-117	Phil Kemp
	B. Posture Toward Evaluation	Bob Plunkett
	C. Technical Review Committee	Bob Plunkett
	1. Technical Committee Charter	"
	2. Technical Committee Selection	"
	D. Initial Approach	Bob Plunkett
	1. Identify status of CSE Evaluation Inventory	"
	2. Review of evaluations performed	"
	3. Develop an evaluation process	"
	4. Establish evaluation charter	"
10:15 - 10:30	BREAK	
10:30 - 12:00	III The Evaluation Process	
	A. Perceptions of Evaluation	Ralph Delzell
	B. Context (levels) of Program evaluation	Phil Kemp
	1. Program Identification	Phil Kemp
	C. Basis for Evaluation Criteria	
	1. Legislation through program objectives and managements Interpretation	Phil Kemp
	2. Evaluation Baseline	Phil Kemp
	3. Evaluation Criteria vs. Evaluation Measuring Criteria	Phil Kemp
	4. Internal vs. External Factors	Phil Kemp
12:00 - 1:00	RECESS FOR LUNCH	
1:00 - IV	Criteria for Selecting Pilots (handout)	Tom Van Der Linden

TITLE X SUNSET PROVISIONS - DOE ORGANIZATION ACT PL95-91

Sec 1001 - Presidential submission to Congress of a comprehensive review of each program by Jan 15, 1982

Sec 1002 - Comprehensive Review.

1. Name of responsible Administrative component
2. Objectives and the need(problem) the program was intended to address
3. Identification of other programs with simular or conflicting objectives
4. Assessment of alternative methods of achieving program
5. Justification for budget authorization
6. Assessment of achievement of original objectives
7. Statement of performance and accomplishment of the previously completed 4 years with budgetary costs
8. Number and types of beneficiaries served.
9. Assessment of impact on national economy
10. Assessment of impact on health and safety
11. Assessment of the program administration meeting the Congressional objectives
12. Projection of anticipated needs and date when the objectives will be met
13. Analysis of impact of change in service levels $\leq X \leq$
14. Discontinuance - transition recommendations

OMB CIRCULAR A-117 - MANAGEMENT IMPROVEMENT AND THE USE OF EVALUATION IN THE EXECUTIVE BRANCH

#5 General Guide lines

- o Heads of agencies are responsible for comprehensive management improvement efforts (quality and timeliness of program performance, increase productivity, control costs).
- o Objectives of management improvements
  - efficiency of administration and management
  - effectiveness of program results
- o Evaluation is basis of identifying management improvements
  - focus on program operations and results
  - identify program objectives
  - define output related to objectives
  - develop realistic performance measures
  - relevant to budget process and input to resource allocations decisions
  - evaluation system
    - effective
    - balance between prospective and evaluation analysis
    - use available resource efficiently

o ANNUAL REPORT - 15 MAY - OBLIGATIONS AND STAFF YEARS FOR:

- o Management evaluation
- o Program evaluation
- o Productivity Measurement
- o Other management improvement
- o Identity of principal officials

Emergency Energy

State & Local

- o Institutional Buildings
  - o Schools & Hospitals
  - o Other local government buildings grants
- o Energy Management Partnership
  - o State Energy Conservation
  - o Energy Extension Service
- o Weatherization Assistance

Transportation

- o Vehicle Propulsion R&D
- o Electric Hybrid Vehicle R&D
- o Transportation Utilization

Inventions & Small Scale Technology

- o Appropriate Technology Small Grants
- o Energy Related Inventions

Industrial Energy Conservation

- o Waste Energy Reduction
  Industrial Process Efficiency
  Industrial Conservation
  Conservation Technology Deployment & Monitoring

Alcohol Fuels
Energy Storage
Energy Conversion & Utilization
Solar Industry Applications
Solar Power Applications
Solar Buildings Applications
Energy Information Campaign
SERI Permanent Facility
Solar International Programs
Regional Solar Energy Centers

CONSERVATION AND SOLAR
PROGRAM INVENTORY

At the National or strategic level the program areas are:

- Energy Conservation
- Solar Energy
- State and Local Assistance
- Field Operations and International

Within Conservation and Solar the conservation programs are:

Buildings & Community Systems

Buildings

- Building Systems (sub program)
- Residential Conservation Service (sub program)

Community Systems

- Community Systems
- Urban Waste
- Small Business

Consumer Products

- Technology and Consumer Products
- Appliance Standards

Federal Programs

- Federal Energy Management
- Analysis and Technology Transfer

Industrial Energy Conservation Program

Conservation Research Design & Development

- Waste Energy Reduction
- Industrial Process Efficiency
- Industrial Conservation

Conservation Technology Deployment & Monitoring

- Implementation and Deployment

Transportation Programs

- Vehicle Propulsion RD&D
- Electric Hybrid Vehicle R&D
- Transportation Systems Utilization
- Alternative Fuels Utilization

State & Local Programs

- Institutional Buildings Program
  - Schools & Hospitals Grant Program
  - Other Local Gov't Buildings Grant Program
- Energy Management Partnership Act
  - State Energy Conservation Programs
  - Energy Extension Service
  - Emergency Energy Conservation Act
- Weatherization Assistance Program

Multi Sector

- Appropriate Technology Small Grants Program
- Energy Related Inventions Program (Inventors Program)
- Energy Conservation Technology

Energy Information Campaign

Energy Impact Assistance

Commercialization

...ntext of Evaluation

o The management level that requires the evaluation and the management uses of the evaluation changes the contenxt criteria and measurements.

- o National/Department
- o Conservation and Solar
- o Program
- o Subprogram
- o Project

Program definition

- o PPBS (17)

  Consistent with budget and budget preparations

  Useful for executive management reviews and reporting

  High degree of aggregation required

  Feasibility of evaluation criteria being specific enough to develop valid measurements

  Difficulty of aggregation of projects into subprograms and into programs

- o For evaluation what is the effective level and structure of the programs

- o Specific suggestions for each major program area

- o Buildings & Community Systems

- o Industrial

- o Transportation

- o State and Local

- o Multi Sector

Basis for Evaluation Criteria

The levels and documentation sources for evaluation criteria

o Legislation, Congressional hearing. Executive and Secretary orders or policy statements. Budget requests program memoranda multi-year or annual operating plans.

- o Program objectives, plans, milestones

- o Subprogram/project objectives, plans, schedules.

The context

- o Evaluation a continuous program management activity - primarily informal
- o Formal evaluation to be useful to program management
  - o Context of the appropriate level
  - o Criteria based on the objectives and goals of the oppropriate levels
  - o Designed for multiple management uses
  - o Based on management interpretation and transformation of goals and objectives into program actions.

The Evaluation Baseline

- o Time frame
  - o Snapshot - status as of a specific date
  - o Fiscal year
  - o Sunset 4 year period
- o Definition of the baseline for evaluation criteria
  - o Program objectives and plan - including deficiencies, or gaps
  - o Phase of life cycle
  - o Redirection during or immediately preceding baseline time period
  - o Criteria for measurement of change

    Available data on consistent criteria definition

    External actions of events impact
- o Evaluation Criteria and Evaluation Measurement
  - o Consistency comprehensiveness, comparability of measurements appropriate for phase and scope of the evaluation and valid for the criteria
  - o External data
  - o Internal data
  - o End use data
  - o Aggregability
  - o Quantitative and qualitative measures.

Program Evaluation Criteria

Program Evaluation Criteria are stated in the following documents.

- o Legislation
- o Congressional hearings
- o Executive orders
- o Secretary orders
- o Ass't Secretary orders and policy papers.
- o Annual Budget Requests
- o Program memoranda
- o Multi year plans
- o Program plans, justifications and documentations.

Program evaluation is a continuous program management activity and is accomplished in the management decision process with or without formal documentation. A more formal (documented) evaluation process that is useful to the program management decision process must use criteria that include those specific in

- o legislation
- o congressional hearing
- o executive orders
- o secretary orders

but are primarily focused on the program management plans to carry out the Ass't Secretary's policy interpretations and decisions. Then criteria are documented in general and specific terms in

Ass't Secretary orders and policy decisions
Annual Budget Requests
Program Memoranda
Multi Year Plans
Program plans justifications and documentation.

An evaluation process requires the following analysis be completed to provde an evaluation base thatis useful to program and executive management.

1. Establish a base line of evaluation criteria.

The time frame of the baseline is a key management decision. For example:

- o snapshot approach - current criteria for a given date of evaluation
- o fiscal year - evaluation criteria for the previous fiscal year
- o sunset - the period Oct. 77 through Oct. 81
- o historical - iniation of the program to the present.

A program is a continuous activity that responds to changes in legislative and policy directions, levels of funding and resources and administrative institutional, economic, technial and environmental impacts. The evaluation criteria which is based on the goals and objectives of the program must be analyzed and validated for the period of evaluation.

2. The performance or results measures for the evaluation criteria must be defined in terms of

- o quantitative measures
- o qualitative assessment

A methodology is prepared to obtain the data and information to construct the performance measures and to validate them. The information should be obtained from the program management information base and external available data so that the evalation process can be updated with minimal effort thereby increasing it useful in this program management process.

3. Define th process of analyzing the criteria, perfomrnace measures, relative priorities and judgment criteria to complete a fair and valid program performance evaluation.

CRITERIA FOR SELECTING PILOT EVALUATION EFFORTS

1. Energy Sectors

   - o Residential Commercial
   - o Industrial
   - o Transportation
   - o Energy Management Partnership

   Is the evaluation process significantly affected by the energy sector so that there should be one pilot in each sector?

2. Program Level

   Program
   Sub program or program element
   Project

   a. What are the charactistics of a program that can be evaluated at the program level

      - candidate programs

   b. What characteristics indicate that a program is evaluable at the sub program or project level

   c. Candidate programs

   Should all levels be used in the pilot?

3. Maturity or phase in life cycle.

   - o What is the earliest phase of a program that evaluation is useful?
   - o Are there significantly different evaluation problems in each phase ?

   Should all, or which phases are preferable for the pilot evaluations?

4. Type of Program

- o Research and Development
- o Technology Development and Deployment
- o Delivery of services
- o Others

Are the evaluation requirements so different that the pilot effort should include all of them?

5. Primary Beneficiaries or implementors of the program

- o Public - direct
- o State and local governments
- o Industry
- o Institutions

Are there significant differences in evaluation criteria or measures that the pilot effort should include one from each group?

6. Budget Level

Should the pilot effort be limited to the larger programs, or is this more a criteria for implementation after the pilot effort?

7. Status of Current Evaluation Effort

- o In process - program evaluation
- o In process - technical evaluation
- o Planned evaluations
- o None planned

- What are the advantages and disadvantages of knowledge to be gained by selecting pilot efforts using the status of evaluation?

8. Transferability of evaluation criteria and techniques

- o To other programs or projects
- o Multiple efforts and locations within a program

- Is transferability a major factor for the pilot effort? And, if so, to what program groupings would it be applicable?

9. Disaggregation and aggregation

If a program is more effectively evaluated at a sub program or project level, are the problems of program evaluation disaggregation and aggregation substantive enough to include in the pilot effort?

10. Program complexity

- o Centralized versus decentralized operation
- o Complexity of project interrelationships within a program.
- o Scope of the program effort

Should these differences be a criteria of selection for pilot efforts. If yes, specifically which criteria and what candidate programs.

11. Data Availability

- o Large existing data bases vs. none.
- o Internal data useful existing data.
- o External data
- o Availability of end use data

Should data availability difference be a criteria; for what reasons, and which candidate programs, subprograms, or projects?

12. Program management

- o Program manager requires an evaluation
- o Staff resources available to perform pilots
- o Program management has available time to be involved

EVALUATION CONCEPT

OBJECTIVES

DEFINITION

PPE ROLE

EVALUATION OBJECTIVES

INPUT TO MANAGEMENT DECISIONS

STRATEGIC	_	NATIONAL IMPACT POLICY & PLANNING
EXECUTIVE	_	PROGRAM IMPACT RESOURCE ALLOCATIONS
OPERATING	_	PERFORMANCE PROGRAM & MANAGEMENT IMPROVEMENT

EVALUATION DEFINITION

OMB A-117	-	PROGRAM EVALUATION MANAGEMENT EVALUATION
SUNSET	-	COMPREHENSIVE REVIEW OF EACH PROGRAM OF THE DEP'T
OTA	-	PROCESS (FORMATIVE) OUTCOMES (SUMMATIVE)

PPE EVALUATION ROLE

DEVELOP EVALUATION PROCESS

DEFINE CRITERIA

ESTABLISH GUIDELINES

AGGREGATE PROGRAM EVALUATIONS

EVALUATION APPROACH

OBJECTIVE – INPUT TO CS MANAGEMENT

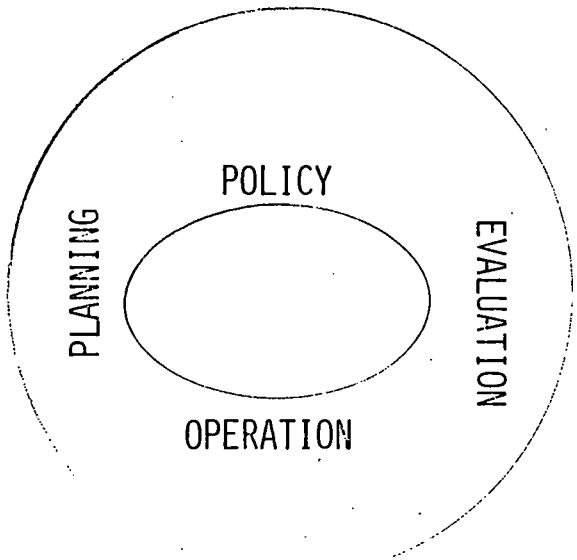
PROCESS –
- RESEARCH
- DEVELOPMENT
- OPERATION
- AGGREGATION

} ITERATIVE INCREMENTAL

PRODUCT –
- DEFINED CRITERIA
- EVALUATION GUIDELINES
- AGGREGATED INFORMATION

EVALUATION OBJECTIVES

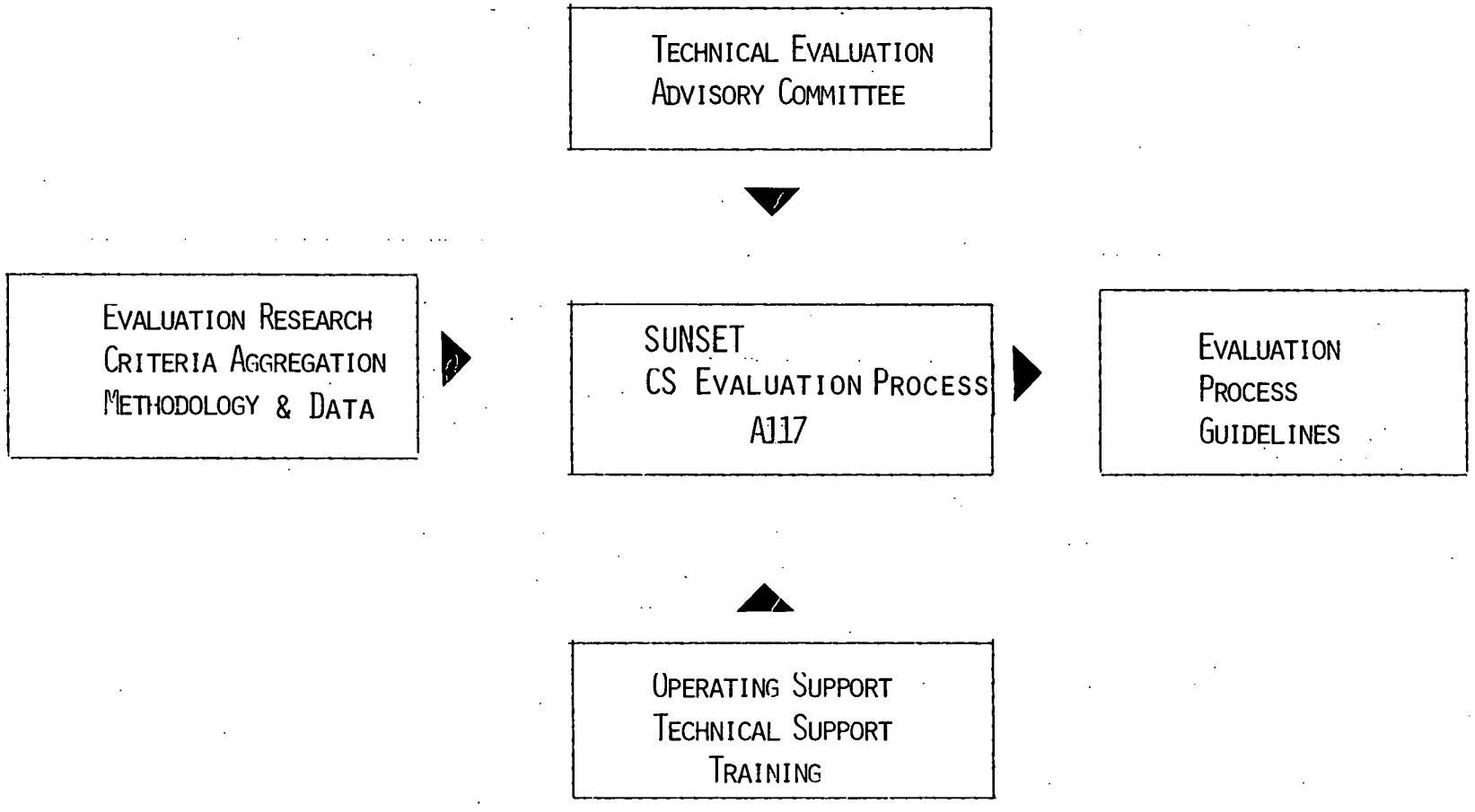
INPUT TO CS MANAGEMENT



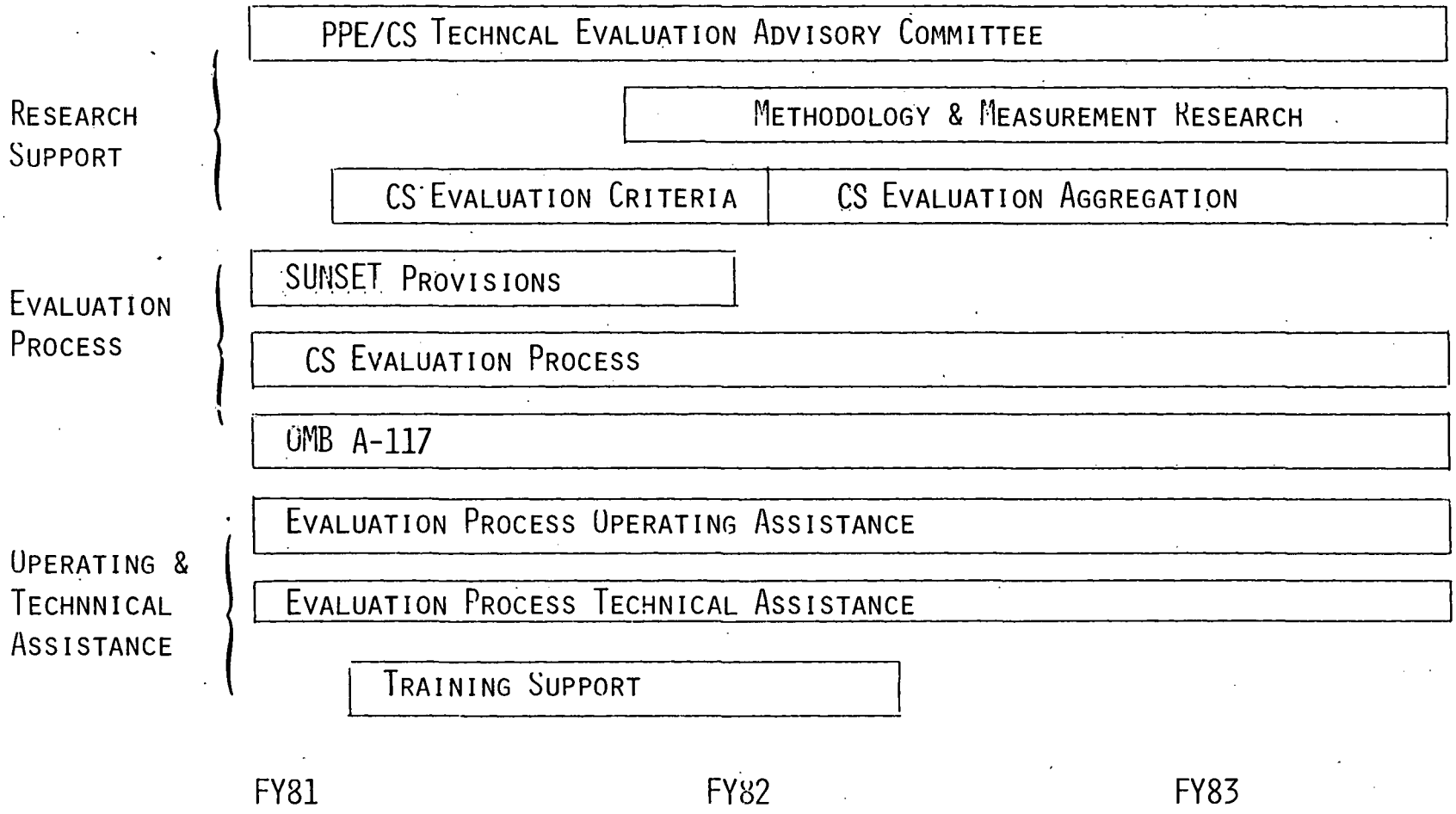
CONSISTENT
COMPARABLE
COMPREHENSIVE

} AGGREGABLE

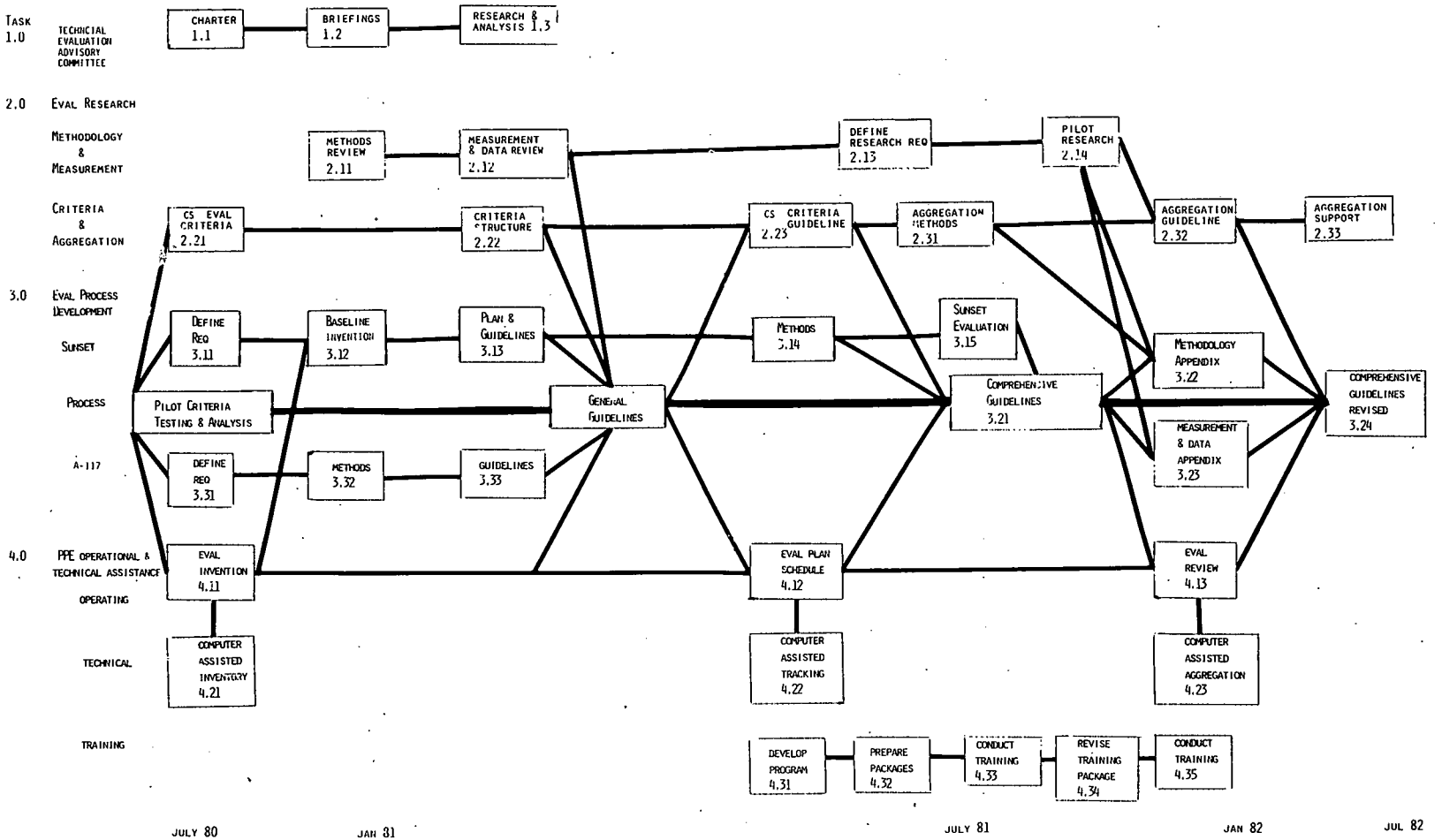
CS PPE EVALUATION APPROACH



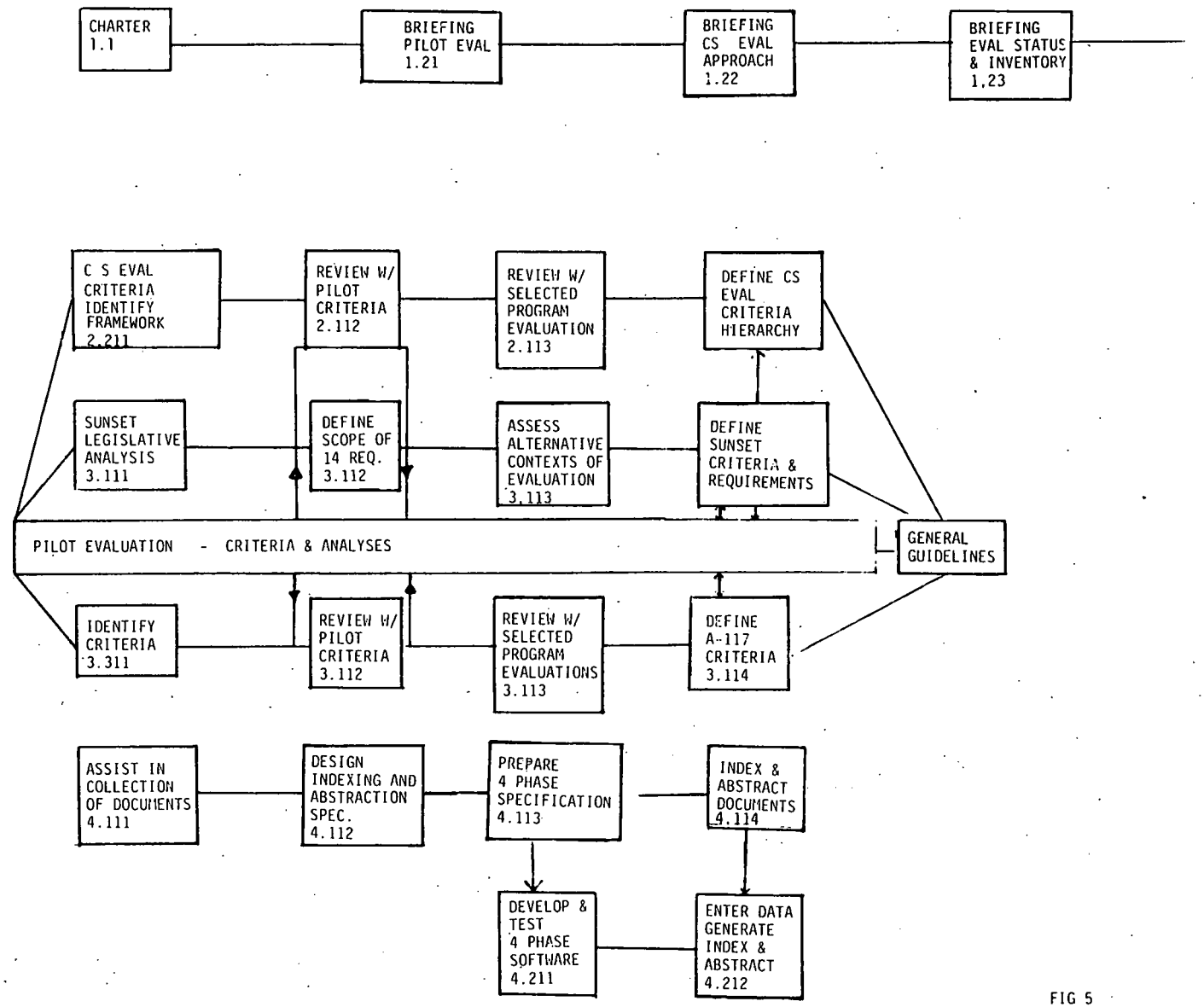
CS PPE EVALUATION APPROACH



CS/PPE EVALUATION APPROACH



CS PPE EVALUATION APPROACH INITIAL SUBTASKS



JUL 80

JAN 81

FIG 5

PRODUCTS

DEFINE CRITERIA

CS-PROGRAM-PROJECT
SUNSET

A-117

GUIDELINES

EVALUATION PLANNING
CRITERIA SELECTION
METHODOLOGY
MEASUREMENT
DATA BASES

EVALUATION PROCESS OPERATION

INVENTORY - EVALUATIONS
METHODOLOGY
MEASUREMENTS & DATA

MONITORING - STATUS OF EVALUATIONS

AGGREGATION - CONSOLIDATION OF INFORMATION FOR THE MANAGEMENT PROCESS

PROGRAM EVALUATION PROJECT TEAM

Member	
R. Plunkett, PPE	o Technical Monitor
J. Reid, PPE	o Evaluation Process/Methodology o Industrial Program Interface o PPBS Interface
ADTECH/P. Blackwell	o Conservation Evaluation Process Design o Pilot Evaluation Criteria o Evaluation Inventory Tracking o CS Evaluation Criteria Research o Evaluation Methodology Measurement o Guidelines o Advisory Committee Research

SERI	o Solar/Renewable Evaluation Process o Solar/Renewable Pilot Evaluation Criteria o Solar/Renewable Evaluation Research and Analysis
Argonne National Lab	o Contract Management/Administration o Industrial Energy Indicators
Oak Ridge National Lab	o Evaluation Conference o Evaluation Training Workshops o Residential/Commercial Evaluation Methodology
Pacific Northwest Lab	o Key Energy Indicators o Four Phase Data Management
TSG	o Sunset Criteria, Planning, Methods and Report

E. CHERIAN	o Advisory Committee Charter and Analytical Support o CS Planning and Analysis o A-117 Criteria Assessment o Conservation and Solar/Renewable Evaluation Process Integration
COLORADO SCHOOL OF MINES	o Capital Stock Research and Analysis o State and Local Data Research and Analysis
YELLOWSTONE	o Evaluation Process Interface with State & Local Programs

PROJECT MILESTONES

JULY 80	DEVELOP EVALUATION PLAN
AUG 80	SUBMIT STATEMENT OF WORK AND RESOURCE REQUIREMENTS FOR 12 MONTH PERIOD; PPE REVIEW AND APPROVAL
SEPT 80	
OCT 80	PROCUREMENT PLAN COMPLETE
NOV 80	
DEC 80	CONTRACTS INITIATED
JAN 81	ISSUE GENERAL GUIDELINES
MARCH 81	DEVELOP TRAINING PROGRAM
MAY 81	A-117 REPORT SUBMISSION
JULY 81	ISSUE COMPREHENSIVE GUIDELINES
FEB 82	SUNSET REPORT SUBMISSION

SELECTION OF PILOT PROJECTS

CRITERIA
MASTER MATRIX
SELECTION MATRIX
CANDIDATE PROGRAMS

SELECTION CRITERIA

GENERIC SECTOR
PRICING, INFORMATION, RD&D, INCENTIVE, REGULATION

DEMAND TARGET
RESIDENTIAL, TRANSPORTATION, INDUSTRY

MATURITY
STARTUP, DEVELOPMENT, OPERATION

BUDGET LEVEL
LESS THAN $100M; 100M TO 180M; OVER 180M

EVALUATION STATUS
PLANNED, IN PROCESS, COMPLETED

COMPLEXITY
PROGRAM/SUBPROGRAM, DELIVERY

DATA AVAILABILITY

TARGET AUDIENCE
INDIVIDUAL, INDUSTRY, INSTITUTIONAL, GOV'T

CONSERVATION AND SOLAR PROGRAM INVENTORY	GENERIC SECTOR					MAJOR DEMAND TARGET			MATURITY			BUDGET LEVEL ($ Million)			STATUS OF EVAL.							TARGET AUDIENCE			
	Pricing/Policy	Information/Education	R,D&D	Economic Incentive	Regulation	Residential	Highway Veh.	Industry Process	Start-up	Development Operation	Phase-down	Up to 100	100 - 180	Over 180	Planned	In Process	Completed Recent or Past	Subelement Complexity	Program Complexity/Delivery System	Data Availability		Individual Public	Manufacturer Industry	Institutional	Government
Solar Industry Applications			•					•		•				•				P		P			X		
Solar Power Applications			•					•		•				•				P		P			X		
Solar Buildings Applications			•			•				•				•				P		P		X	X		
Buildings & Community Systems																									
Buildings																									
Building Systems (sub program)						•				•			•		-			H	C	P		•		•	
Residential Conservation Service (sub program)						•				•		•			F			N	C	P		•			
Community Systems																									
Community Systems						•				•		•			-			P	D	P		•	•	•	•
Urban Waste			•			•				•		•			-			P	D	N		•		•	
Small Business				•		•			•			•			-			P	C	P			•		•
Consumer Products																									
Technology and Consumer Products			•			•				•		•			F			P		N		•	•		
Appliance Standards						•				•		•			F			N	C	P		•	•		
Federal Programs																									
Federal Energy Management					•					•		•			-			N	C	P				•	•
Industrial Energy Conservation Program																									
Conservation Research Design & Development																									
Waste Energy Reduction			•					•		•		•			-			P	D	P			•		
Industrial Process Efficiency			•					•		•		•			-			P	D	P			•		
Industrial Cogeneration			•					•		•		•			-			P	D	P			•		
Conservation Technology Deployment & Monitoring																									
Implementation and Deployment		•						•	•			•			-			P	D	P			•		
Transportation Programs																									
Vehicle Propulsion RD&D			•				•			•			•		-			P	D	N		•	•		
Electric Hybrid Vehicle R&D			•				•			•		•	•		-			P	D	N		•	•		
Transportation Systems Utilization		•					•		•			•			-			P	D	N		•	•		
Alternative Fuels Utilization			•				•		•			•			-			P	D	N		•	•		
State & Local Programs 79 - 80																									
Institutional Buildings Program																									
Schools & Hospitals Grant Program				•						•				•	F			N	C	P				•	•
Other Local Gov't Buildings Grant Program				•						•		•			F			N	C	P				•	•
Energy Management Partnership Act																									
State Energy Conservation Programs		•		•						•				•			C	N	C	P		•	•	•	•
Energy Extension Service		•		•		•		•		•				•			C	N	C	P		•	•	•	•
Emergency Conservation Act					•	•	•	•		•				•	F			N	C	P		•	•	•	•
Weatherization Assistance Program				•		•		•		•				•	F			N	C	P		•			
Inventions & Small Scale Technology																									
Appropriate Technology Small Grants Program			•	•		•	•	•		•		•			F			N	C	P		•	•	•	•
Energy Related Inventions Program (Inventors Program)			•	•		•	•	•		•		•			F			N	C	P		•	•	•	•
Energy Information Campaign																									
Energy Impact Assistance																									
Commercialization																									

Legend: R = Current F = Future T = Technical H = High C = Complex D = Direct P = Probable N = Not

SELECTION PROCESS

EXCLUDE

- START-UP PROGRAMS
- COMPLETED EVALUATIONS
- DATA AVAILABILITY PROBLEMS

GROUP IDENTICAL PROGRAMS

- CONSERVATION RESEARCH DESIGN & DEVELOPMENT (CRD&D)
  - WASTE ENERGY REDUCTION
  - INDUSTRIAL PROCESS EFFICIENCY
  - INDUSTRIAL COGENERATION

- INVENTIONS & SMALL SCALE TECHNOLOGY (ISST)
  - APPROPRIATE TECHNOLOGY SMALL GRANTS
  - INVENTORS PROGRAM

PRIORITY SEQUENCE

1ST - GENERIC SECTOR

2ND - MAJOR DEMAND TARGET

3RD - SIZE

4TH - TARGET AUDIENCE

PROGRAM	Generic Sector				Demand Target				Budget Level			Target Audience				Alternative Priority Selection
	Information	RD&D	Incentive	Reg	Residential Buildings	Transport	Industry	Minor	< 100	100-180	> 180	Individual	Industry	Institutional	Gov't	
Building Systems			X		X				X	X		X		X		3
Residential Consv.			X		X				X			X				3C
Community Systems			X		X				X			X	X	X	X	3B
Appliance Standards	X				X				X			X	X			1
Federal Energy Mgt.				X				X	X					X	X	4A
CRD&D		X					X		X				X			2A
Schools and Hosp.			X					X			X			X	X	3D
Local Gov't Grants			X					X	X					X	X	3E
Emergency Cons. Act				X	X	X	X				X	X	X	X	X	4
Weatherization			X		X						X	X				3A
ISST		X	X		X	X			X			X	X	X	X	2

MATRIX OF INITIAL CANDIDATES FOR PILOT EVALUATION CRITERIA DEVELOPMENT

CONSERVATION AND SOLAR PROGRAM INVENTORY	GENERIC SECTOR					MAJOR DEMAND TARGET			MATURITY			BUDGET LEVEL (FY'83) ($Million)			STATUS OF EVAL.							TARGET AUDIENCE			
	Pricing/Policy	Information/Education	R,D&D	Economic Incentive	Regulation	Residential + Commercial	Highway Veh.	Industry Process	Start-up	Development Operation	Phase-down	Up to 10C	100 - 150	150	Planned	In Process	Completed Recent or Past	Subelement Complexity	Program Complexity/Delivery System	Data Availability		Individual Public	Manufacturer Industry	Institutional	Government
Appliance	X					X				X		X			F			N	C	P		X	X		
ISST		X	X			X	X	X		X		X			F			N	C	P		X	X	X	X
Building Systems			X			X				X			X					N	C	P		X		X	
Energy Cons. Act					X	X	X	X		X				X	F			N	C	P		X	X	X	X

STATUS OF RESPONSES TO

EVALUATION INVENTORY LETTER

PROGRAM	Written Response Received	COMMENT
onservation		
Buildings and Community Systems		
Industrial		
Transportation		Reports and Studies are being compiled by staff.
Energy Storage	✓	Numerous studies cited since 1977. Need review of reports to determine what is evaluation.
Energy Conversion Utilization	✓	Evaluation planned to begin 10/80.
tate and Local Assistance		
State and Local Conservation		Weatherization Program has evaluation in process. Submitted copy of Research Agenda.
Emergency Energy Conservation		Management Evaluation is in process.
Inventions and Small Scale Technology		Project selection assessments have been performed for Appropriate Technology.
olar		
Buildings		
Industrial		
Power Applications		Wind Systems is being evaluated by GAO and IG.
Alcohol Fuels	✓	Office established February 14, 1980. Building a data base which will aid evaluation.
Field Operations and International		
Solar International		
Information Systems		
SERI Permanent Facility		
gional Solar Energy Centers		
Energy Information Compaign		

The CS Evaluation Criteria define summary "outcome" evaluation information required for CS management decisions and consolidated external reporting. The information, developed in accordance with these criteria, should be consistent and comparable for the four major information requirements.

- Energy Savings
- Cost Effectivenss
- Program Progress
- National Impact

1. Energy Savings and Alternative Fuel Use

Energy savings and alternative fuel use information should be aggregated and compared to a CS baseline and projected energy savings objectives. The energy savings should be attributed to each subprogram and then allocated quantitatively by four sets of independent variables.

a. Energy impacts: efficiency, demand, and use of alternative/renewable energy sources.

b. Market demand sectors affected: transportation, industrial, buildings, utilities and sub sectors as applicable.

c. Energy source affected: natural gas, oil, coal, solar/renewable, biomass, other for energy savings and switching displacement effect.

d. Functional methods of achievement: pricing, R&D, demonstration/commercialization, information, financial, incentives / grants, and standards/regulation.

2. Cost Effectiveness

Benefit cost analysis and cost effectiveness information should be prepared using the same methodology and standards so that the summary data is comparable. The cost effectiveness criteria are:

a. Energy benefits (value of energy saved, produced, displaced) to total direct cost.

b. Energy benefits (value of energy saved, produced, displaced) to total private sector cost.

c. Energy benefits (value of energy-saved, produced, displaced) to Government cost.

The cost effectiveness analysis should be projected so that comparable data is prepared for actual to date, mid-term and long-term time periods.

3. Program Progress

The program progress analyses should use a consistent methodology. However, many uncontrollable external factors are considered so that the evaluations, although consistent, are primarily based on a reasonable judgement. The factors to be considered in this analyses are:

a. Achievement/progress toward stated objectives/milestones
b. Total market
c. Market barriers
d. Market penetration rate
e. R&D requirements to reach commercialization
f. Resources and time requirements and other conditions to reach commercialization.

4. National Impact

The national impact assesses the short- and long-term effects on four major areas:

a. Energy use - including oil imports and issues of energy independence.
b. Environment - positive impacts and risks.
c. Economy -
   - productivity and efficiency
   - consumer prices and costs
   - employment
   - inflation
   - investment
   - balance of trade
d. Social -
   - social responsibility to elderly or disadvantaged groups
   - equity of the distribution of costs and benefits
   - competition
   - standard of living.

DRAFT: CS Evaluation
Concept and Framework

1. INTRODUCTION

In the area of evaluation, the Office of Policy, Planning and Evaluation has a clearcut mission not duplicated within Conservation and Solar: to provide that broader view and that guidance which will enable program evaluations to serve the overall strategy for energy conservation of which each program is a necessary and integral but (by definition) limited part. To satisfy this mission, the evaluation branch must:

(1) Provide guidance, leadership, progress monitoring, and constructive review to the evaluation efforts of conservation and Solar program offices.

(2) Analyze program evaluations in the context of overall C&S strategy.

(3) Be the source of recommendations concerning the adequacy of program evaluation plans and methodology.

(4) Establish, in conjunction with the program offices, an evaluation schedule which will satisfy overall C&S priority requirements.

(5) Provide direct evaluation assistance when requested to do so by a program office.

(6) Perform studies, produce issue papers, and provide the crosswalk among program evaluations.

(7) Ensure that each evaluation and subsequent analysis provides the best possible information base for future program decisions.

(8) Ensure that the in-depth base for establishment of C&S strategy emerges from the evaluation program.

Although the managerial and technical expertise for monitoring and managing programs exists (and is continuously in use) in the program offices, evlauation is not a routine part of the activity of program management. Evaluation requires the determination in absolute terms of a program; it also requires the determination of why a program is where it is. Management, on the other hand, to be effective, must evaluate status with respect to baselines and examine causes with respect to attaining baseline goals and objectives. (Otherwise managers would have no means of establishing and executing plans and replans, since a plan without an objective leaves no means of measurement and no means of taking corrective action.)

Evaluation, further, is incomplete when expressed only in terms of a single program. Even when a careful evaluation has been done, analysis must be made of that evaluation in terms of all other program evaluations with which it intersects and shares any degree of dependence, and in terms of the overall conservation strategy and its goals and objectives. Even this analysis is incomplete until it has been summed upward into an overall evaluation of the mission of Conservation and Solar.

A careful plan for evaluation must evolve and a comprehensive procedure be developed if CS is to be successful in its efforts.

. OVERALL CONCEPT

Even while efforts are underway through surveys of existing evaluation efforts to determine the posture of the programs and the amount of effort and expertise which can be drawn upon in overall CS evaluation efforts, a general management plan for CS evaluations must be developed. While this management plan cannot initially consider which programs are furthest along in evaluation efforts, it can and must identify those programs which have intersects with others, those which are far enough along to permit evaluation, and the overriding priorities of CS, without regard to the ease of achieving those priorities. Parenthetically, the simple criteria of program size or potential energy saving are not adequate alone to determine overall CS priorities.

Second, a plan for exercising oversight and maintaining accountability of CS program evauations must be developed. It would be unconscionable for OPPE to interfere with evaluations conducted by program offices, but it would be irresponsible for OPPE to fail to provide CS-wide overview. A delicate line must be walked in this area, since the purpose of evlauation must not ever be wrongly perceived as "spying" or "checking" on the programs in their efforts to perform their assigned missions. Accomplishment of this effort by OPPE is not difficult, but it does depend upon careful delination of authorities and responsibilities so that any suspicions can be allayed at the very start.

Third, a method must be implemented to establish criteria and standard methodology for program evaluation, so that the results can be both meaningful and comparable. Neither OMB A-117 nor the Sunset Law provide guidance in this area, and, in fact, the methodology and criteria are by definition different for any given segment of Government. In the case of CS, the missions and technologies are so disparate that no simple set of rules will suffice. A concerted effort, involving understanding of the ultimate uses of evaluation, the problems of integration of the separate parts, the goals and strategies of CS, and the individual technologies must be brought to bear.

Finally, an ongoing effort must be mounted to monitor and direct the evaluation program, to provide assistance where required by program divisions, to perform the post-evaluation and overall CS analyses, and to produce the issue papers occassioned by the evaluations and analyses.

Concurrently with these efforts, immediate progress must be made in the process of evaluation itself. That is, planning must not stand in the way of actually accomplishing evaluations. A sound approach to this problem is to identify those program areas which are (1) far enough along to be subjected to immediate evaluation, and (2) those program areas for which evaluation criteria can be readily determined with a fair degree of confidence. Evaluation and subsequent analysis can then be conducted on three or four of these programs as test cases to analyze both evaluation criteria and methodology. Even if the evaluations must be in part repeated, the net gain in terms of overall progress toward a goal of complete evaluation of major CS programs will be considerable. It would be remembered that all of Departmentof Energy is under orders to evaluate itself within a very short time. Backing off from the required submittals to Congress, one is led to identify 1 January 1981 as the most rational target date for completion of initial evaluations if the lengthy process of analysis and synthesis is to take place at a normal pace. It may, indeed, be necessary to mount that crash effort is now, not a year from now.

3. IMPACT OF SUMMARY PROGRAM PLANS

The Summary Program Plans as being designed by Policy and Evaluation contain many of the elements which will be found in a program evaluation, but from an entirely different thrust. They will serve the purposes of DOE and of CS in providing appropriate and accurate visibility into key programs. The relationship to National Energy Goals and the cost benefit analysis of these summaries to a small extent must parallel program evaluation. These, however, are merely single-point bottom line statements and do not represent evaluation in its broadest sense. To take an ovious example, socio-economic evaluation is not included in the summaries. Even if that objection were overcome, the integration of evaluations with and among each other and the summarization upward to overall conservation goals and strategies is both neglected and impossible in the fragmented approach of the summaries. The summaries and the evaluations need never be in conflict, but they serve different purposes. Each may serve well to justify the ongoing funding of programs, but only the evaluations will provide a baseline for future strategies within CS.

4. IMPLEMENTATION OF AN EVALUATION EFFORT WITHIN OPEE

The implementation of the evaluation effort within OPPE should take place first by a definition of functions and responsibilities. A master evaluation approach should be undertaken, an implementation effort planned and put in place, and an ongoing monitoring and analysis effort should be initiated even while planning for the overall program and its implementation is underway.

Concept and Strategy Paper:
Master Program Evaluation Plan for
Office on Conservation and Solar

A. Purpose:

1. General

- o Overall Management Plan for CS Program Evaluations
- o Oversight and accountability of CS Programs
- o Measure performance of existing programs
- o Test program and its outcomes against objectives expectations, or values assigned by others
- o Measure other significant effects
- o Assist future CS policy and management decisions.

2. OPPE needs to ensure:

- o Sufficient data information feedback from programs
- o Sufficient evaluation criteria are employed
- o Methodology is objective/acceptable
- o Validate data/information from evaluation

B. Management Strategy

1. Program Offices will:

- o Maintain prime responsibility for performing program evaluations
- o (Program Evaluations planned or in process, in 11 programs. (of total programs)).
- o Develop evaluation criteria to reflect specific nature of program (e.g.,tech vs. non-tech, demo vs. research, etc).
- o Develop evaluation methodology
- o Develop data/information product of evaluation

2. OPPE will assist, monitor and coordinate evaluations:

- o set CS evaluation objectives;
- o review and approve evaluation criteria, methodology, and data products of evaluations;
- o validate data from evaluations;
- o assess and advise on the objectivity of program evaluators;
- o ensure that evaluation is organized and designed to serve potential users of the evaluation;

- o advise of topics for evaluation;
- o select programs for evaluation and priorities;
- o assure proper coordination and minimize unnecessary duplication with other evaluation groups;
- o provide resources and staff as necessary;
- o monitor evaluation efforts to assure acceptable quality, usefulness, and resource expenditures;
- o appraise results and performance, integrate program data, collect data
- o develop policy and management alternatives to reflect program evaluation data.

C. Master Evaluation Approach. (OPPE Functions)
Steps(Planning) Phase

1. Identify and establish status of ongoing evaluations in CS programs. (identify/define CS Programs)

2. Establish CS Objectives in program evaluations (Define program evaluation)

3. Develop Strategy and Criteria for priority Program Evaluations.

   - o e.g., funding levels.
   - o capital requirements through commercialization.
   - o length (time) of implementation.
   - o perceived problems.
   - o visibility.
   - o Sunset Act implications

4. Identify data/information requirements necessary at OPPE.

5. Review and assist in identification of program evaluation criteria and topics at specific program level.

6. Review/develop methodology for program evaluations. Ensure objectivity in accordance with OMB Circular A-117. (In-house vs. Contractor)

7. Program Staff Presentations.

   - o Briefing on OPPE data needs, recommended evaluations approaches, evaluation requirements, etc.

   - o Determine program requirements, status, funds, resources, contractor support, etc.

Implementation Phase

1. Develop Priority List for Program Evaluations.
2. Identify funding/assistance requirements for priority programs.
3. Select Programs; commit required funds.
4. Assist programs in kick-off, contracting requirements, etc.

Monitoring/Performance Phase

1. Coordinate evaluations; minimize unneccessary duplications;

2. Monitor evaluation progress, participate in milestone reviews, review quality, usefulness and resource expenditures;

3. Collect data from evlauations;

4. Package evaluation information/data

5. Analyze results and performance toward:

   - o achieving objectives
   - o meeting perceived performance and expectations
   - o producing other significant effects.

6. Analyze policy and management impacts and necessary actions.

7. Disseminate evaluation information.

CONCEPT PAPER

Program Evaluation
in the
Office of Conservation and Solar Energy

August 1980

PROGRAM EVALUATION
IN CONSERVATION AND SOLAR ENERGY (CS)

This paper discusses the objectives of CS program and management evaluation, defines evaluation, examines the roles of the CS Office of Policy, Planning and Evaluation (PPE) and the programs in developing and implementing the CS Evaluation Plan, and sets forth an implementation schedule.

A. Objectives of CS Evaluations

The objectives of establishing and implementing a CS-wide Evaluation Plan are to ensure that:

1. The Assistant Secretary for Conservation and Solar Energy has useful and valid information for management decisions regarding policy and strategy, resource justification and allocation, program performance, and impacts on national energy consumption.

2. Evaluation findings reported by CS programs are comprehensive, consistent, comparable, and to the maximum extent possible, can be aggregated.

3. Programs have suitably framed objectives and evaluation criteria for use in program evaluations.

4. Programs are being evaluated on a periodic basis to:

   - clarify or reassess program objectives, direction and contribution to the CS mission;
   - measure program progress and performance in attaining stated objectives;
   - identify areas for improving program performance;
   - determine if program managers' and policy makers' information needs are being met;
   - provide comparative program information for resource allocation decisions; and
   - measure the efficiency and effectiveness with which programs are conducted so that improvements can be made.

5. All CS programs provide consistent, responsive evaluation information to meet the reporting requirements of OMB Circular A-117 and the Sunset Provisions of the DOE Organization Act.

B. Definitions of Evaluation

OMB Circular No. A-117 provides the following definitions which distinguish types of evaluations:

> Program Evaluation is a formal assessment, through objective measurements and systematic analyses, of the manner and extent to which Federal programs (or their components) achieve their objectives or produce other significant effects, used to assist management and policy decision-making.
>
> Management Evaluation is a formal assessment of the efficiency of agency operations. It includes assessing the effectiveness of organizational structures and relationships, operating procedures and systems, and work force requirements and utilization.

The CS evaluation process will focus on program evaluation (as defined above) and will address both impact and process performance issues as defined by the Office of Technology Assessment.*

- Process (formative) evaluation seeks to provide prompt feedback to program managers and staff to help them modify the program to improve performance. For example, formative evaluation of the schools and hospitals program might lead to a reduction in the number of forms that each institution must complete.

- Outcomes (summative) evaluation seeks to quantify the effects of the program on client groups. These responses are of interest both to program personnel and to policy-makers. For example, a summative evaluation of the Residential Conservation Service (RCS) Program would show the effects of the RCS Program on annual energy consumption for participants in comparison with changes in annual energy consumption for nonparticipants.

For purpose of the CS Evaluation Plan, program evaluations will include:

- Assessments of program performance and accomplishments toward established objectives;

- Assessments of actual program impact and effectiveness;

* Office of Technology Assessment, Conservation and Solar Programs of the Department of Energy, A Critique, Washington, D.C. p.21

- Assessments of the effectiveness and efficiency of the management structure, procedures, and resource use in attaining objectives; and

- Assessments of the projected contribution toward program objectives and the CS mission.

Program evaluation as covered by this plan, does not address the elements normally included in the management evaluation process, for example:

- Day-to-day program monitoring;

- Contract reviews;

- Personnel management reviews;

- Routine milestone audits; and

- Project selection, project funding, and resource allocation assessements or models.

Essential to the design of successful evaluations is a clear definition of the information required from evaluation and the intended uses of that information. To accomplish this, CS will develop and implement evaluation criteria for use by CS program evaluators that:

- are objective indicators and measures of the outcomes of programs including efficiency, effectiveness, impact, productivity effect, output and workload; and

- are derived from the statements of goals and objectives of CS programs and from management information requirements of the Assistant Secretary.

C. CS Evaluation Concept

The concepts that are the foundation of the CS Evaluation Plan are:

- The principal evaluation responsibility and conduct of evaluations will be retained by CS program and project managers;

- CS evaluation criteria and guidelines will be developed for use by the programs as standards to ensure that comprehensive, measurable and consistent evaluation information is developed; and

- The development and implementation of the CS Evaluation Plan will be coordinated through a Program Evaluation Technical Advisory Committee composed of program managers and evaluators.

D. Role of PPE in CS Evaluation

The Office of Policy, Planning and Evaluation (PPE) is responsible for:

- Developing and implementing the CS Program Evaluation Plan in coordination with CS programs and PE, as appropriate;
- Identifying CS evaluation criteria;
- Developing evaluation guidelines;
- Identifying programs for priority evaluation;
- Reviewing evaluation plans and results;
- Aggregating evaluation results;
- Performing cross-cutting analysis;
- Monitoring the status of evaluations; and
- Performing special evaluations as directed by the Assistant Secretary.

E. Role of the CS Programs in Evaluation

CS programs are responsible for:

- Participating in the development of the CS Evaluation Plan, evaluation criteria, methodologies and data resources;
- Reviewing and validating the CS evaluation criteria and guidelines;
- Coordinating with PPE in selecting program evaluation priorities and schedules;
- Designing and conducting evaluations in accordance with CS evaluation criteria and guidelines; and
- Providing evaluation results and findings to PPE for aggregation and crosscutting analysis.

F. Implementation of the CS Evaluation Process

The evaluation process is being initiated through three integrated task efforts:

- Preparing the CS Evaluation Plan;
- Developing the evaluation process; and

- Implementing the evaluation system.

The estimated schedule for these activities is illustrated in Figure 1, page 7.

1. Prepare an Evaluation Plan

The evaluation plan defines the initial concept requirements and tasks to develop and implement the evaluation process. It is being developed in the following successive stages:

a. The Concept Paper defines the CS evaluation objectives, strategy and the responsibilities of PPE and the program offices in implementing a comprehensive evaluation system.

b. The Evaluation Process White Paper specifies the requirements of the evaluation system, defines the issues and management decisions needed and the scope of work and responsibility of each participant in developing the evaluation process.

c. The Evaluation Plan is a detailed definition of each task and product required to develop the evaluation process and implement the evaluation system. The plan will include task products, schedules and milestones, priorities for evaluation, resource estimates, an interdependent network analysis and coordination requirements.

2. Develop the Evaluation Process

The evaluation process, developed in accordance with the evaluation plan, has three major task efforts:

a. Develop CS Evaluation Criteria that will meet the requirements of OMB Circular A-117, the Sunset Provisions and the Assistant Secretary's requirements for policy formulation, program measurement, resource allocation and assessment of progress in fulfilling national objectives.

b. Research methodology and data sources to establish the program and management evaluation methods, measurement techniques and create the data bases and sources for comparable measurements.

c. Prepare comprehensive guidelines for implementing the evaluation system including:

1) evaluation planning, tracking and review,
2) CS criteria,
3) methodology and measurement techniques
4) data bases and sources, and
5) evaluation aggregation.

d. Aggregation technical assistance in aggregating program evaluation information.

G. Key Milestones and Action Items.

The following action items reflect key near-term milestones in developing and implementing the CS Evaluation Plan.

1. Complete by July 31, 1980, a draft CS Evaluation Concept Paper delineating objectives, definitions, roles, and major tasks in implementing the Evaluation Plan.

2. Complete by August 15, 1980, a draft CS Evaluation Process White Paper which highlights evaluation issues and management decisions necessary for developing the detailed CS Evaluation Plan.

3. Complete by August 15, 1980, draft preliminary CS evaluation criteria.

4. Establish by August 29, 1980, a Program Evaluation Technical Advisory Committee composed of program personnel to review and comment on the draft preliminary evaluation criteria and plan, and the selection of priority and pilot programs for testing evaluation criteria.

5. Complete by August 29, 1980, a draft preliminary CS Evaluation Plan.

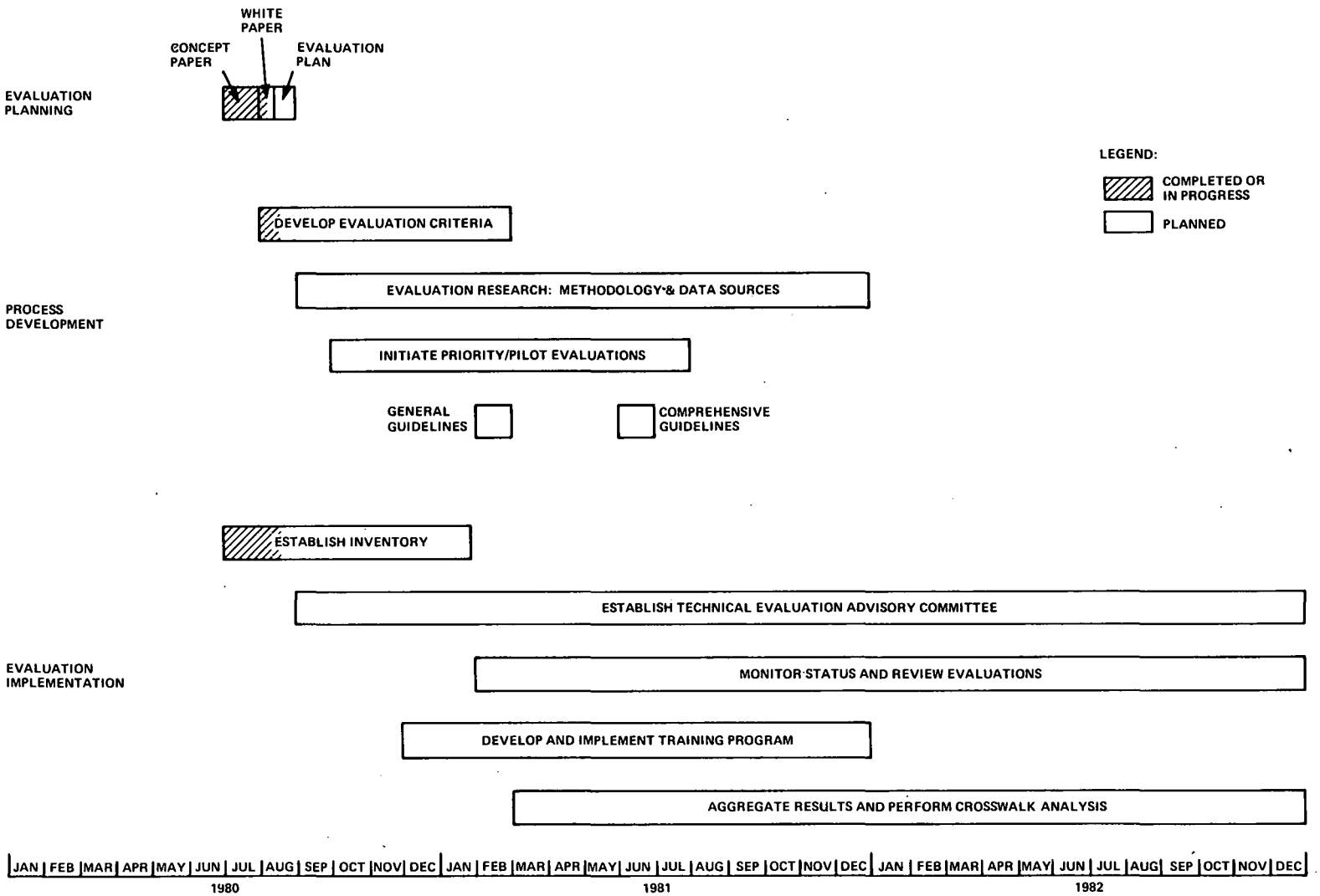
6. Complete by August 29, 1980, a preliminary inventory of evaluations completed, in-process, and planned.

7. In September, 1980, initiate the testing of preliminary evaluation criteria on a pilot basis in six selected programs.

8. February, 1981, issue General Evaluation Guidelines.

9. Ongoing--Define evaluation criteria and guidelines, initiate additional guidelines, aggregate evaluation results and review completed evaluations.

CS EVALUATION PLAN
DEVELOPMENT AND IMPLEMENTATION SCHEDULE



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August 29, 1980

To: Robert Plunkett
Office of Policy, Planning and Evaluation

From: T. Van Der Linden TVDL

Subject: Preliminary CS Program Evaluation Inventory

1. Attached is a preliminary status summary listing of CS program evaluations and related activities. The status information was compiled from the inventory responses as requested by the Assistant Secretary, Conservation and Solar Energy in the July 7, Memorandum, and from follow-up interviews with program personnel. The preliminary nature of this information must be emphasized in that status information has not been verified in all cases, and several programs have not yet responded.

2. Please note that the programs listed on the attached sheet are disaggregated and presented as basic reporting units as described in our July 30, 1980 memorandum to you on a proposed program framework for CS evaluations.

3. In general, it appears that few formal, comprehensive program evaluations have been performed in CS. However, there are numerous studies, analyses and data which can be used in and will support program evaluation. The specific extent and content of these data and the direct utility for evaluation can only be ascertained after an in-depth review on a program by program basis.

4. The following programs have conducted or are planning evaluations which will likely satisfy the evaluation/information requirements of CS or can be supplemented to satisfy CS evaluation requirements:

Attachment (d)

Preliminary CS Program
Evaluation Inventory

Program	Evaluation		
	Completed	In-Process	Planned
Residential Conservation Service			X
Appliance Standards			X
Community Systems			
- Comprehensive Community Energy Management Program		X	
Energy Conservation and Utilization		X	
Institutional Buildings Grants		X	
State Energy Conservation Program	X		X
Energy Extension Service		X	X
Emergency Building Temperature Restrictions	X		
Weatherization		X	X
Energy Related Inventions			X
Appropriate Technology Small Grants Program		X	X
Solar Heating and Cooling Demonstration		X	
Solar International SOLERAS Program			X

5. The evaluation cost information submitted by respondents is not comprehensive enough to develop supportable trends. However, detailed, complete cost information submitted by a few programs may serve as examples if evaluation cost information is required.

6. I would like to note that several programs made exemplary efforts in answering the request for evaluation information. Among these are Advanced Conservation Technologies, The State and Local Conservation Programs, and Transportation Conservation Programs.

Preliminary Evaluation Status
Summary for CS Programs

PROGRAM	EVALUATION STATUS
DAS, Conservation	
Buildings and Community Systems	
Building Systems	
Residential Conservation Service	Expect to begin comprehensive program evaluation plan in December, 1980. State Program Plans are now under review by DOE. Program initiation and evaluation planning are estimated to begin concurrently.
Appliance Standards	Evaluation of the certification and enforcement of final regulations tentatively scheduled for mid-1981. Energy, economic and industry impact analyses have been conducted for proposed regulations.
Technology and Consumer Products	
Community Systems	Ongoing evaluation of Comprehensive Community Energy Management Programs since 1978 for effectiveness of process and approach in 17 communities. Evaluation report scheduled for March 1981.
Small Business	
Analysis and Technology Transfer	Developed and maintain BCS project selection threshold model and resource allocation model.
Energy Impact Assistance	

PROGRAM	EVALUATION STATUS
Urban Waste	
Industrial	
Waste Energy Reduction Industrial Process Efficiency Industrial Cogeneration Technology Deployment and Monitoring	No overall Office evaluations have been conducted. Data available through threshold criteria and ISTUM computer models; Energy Impact Scoreboard; and 2nd Year Project Analysis
Transportation	
Vehicle Propulsion RD&D	Technical analyses and state-of-art assessments performed for advanced engines
Electric and Hybrid Vehicle RD&D	Ongoing Opportunity and Risk analyses, and an Environmental Development Plan has been completed.
Transportation System Utilization	Are developing program evaluation profiles delineating issues and requirements. Numerous technical guides and program summaries prepared for various use sectors.
Alternate Fuels	Technical assessments performed for various use sectors.
Advanced Conservation Technologies	
Energy Storage	Numerous technical, economic, environmental, and energy impact assessments and evaluations performed for specific storage projects and applications.
Energy Conversion and Utilization	Detailed program planning will begin in October 1980 for new program. Evaluation will be planned in from initiation.

PROGRAM	EVALUATION STATUS
DAS, State and Local Conservation	
State and Local Conservation	
Institutional Buildings Grants - Schools and Hospitals - Other Local and Government Building Grants	Evaluation in process. Evaluation plan completed and the Phase I "Program Definition/Evaluation Feasibility Study" is in process.
Energy Management Partnership - Energy Conservation and Production Grant (ECPA) - Energy Policy and Conservation Grant (EPCA)	12 month national evaluation of SECP is planned. Evaluation of program from initiation through September 1978, final report dated March 1980. Energy savings evaluation methodology assistance provided to states through July, 1980. Energy savings data collection and validation by states in process through December, 1980.
- Energy Extension Service (EES)	Pilot Evaluation scheduled for completion in September 1980. Pilot evaluation results published in September 1979 and April 1980. 3 year national EES evaluation is planned.
Weatherization	Management evaluation underway in 9 states. Developing data base on energy impact. Alternative program models being developed. Input/Output type evaluations planned for state and local organizations in subsequent phase of evaluation.
Emergency Energy Conservation	
Emergency Building Temperature Restrictions (EBTR)	EEC is a new program not yet fully implemented. An evaluation and analysis of the effectiveness of EBTR was published in a final report dated July 8, 1980.

PROGRAM	EVALUATION STATUS
Inventions and Small Scale Technology	
Energy Related Inventions	Evaluation planned to begin in December, 1980 on the effectiveness and efficiency of the National Bureau of Standards evaluation of proposed projects.
Appropriate Technology Small Grants Program	Comprehensive management evaluation of national program is in process. Report due in August 1980. Have performed several regional reviews of the management and technical review processes since 1977. Energy impact assessments have been performed on a limited regional basis. In 1981 a national energy impact assessment will be performed.
DAS, SOLAR	
Buildings Industry	A 4-year multi-state Solar heating and cooling demonstration evaluation for residential, commercial and industrial applications is in process. Previous evaluations on residential demonstration program performed by HUD and Federal demonstration program by GAO in 1979. Developing an evaluation system for passive solar programs which addresses evaluability assessment. A report is expected in November, 1980. A preliminary assessment of implementing state solar incentives published in January, 1979.
Power Applications	Hold routine program/contractor reviews
Alcohol Fuels	New program with previously small budget. No evaluation yet. Building a program data base.

PROGRAM	EVALUATION STATUS
DAS, Field Operations and International	
Solar International	Evaluation is being built into the SOLERAS Program/ Project Plans.
Information Systems	Have established an Information Steering Committee
SERI Permanent Facility	
Regional Solar Energy Centers	
Energy Information Campaign	
Federal Energy Management Program	GAO has conducted several evaluations of the program.

ISSUES AND RECOMMENDATIONS PERT TO PROGRAM EVALUATION[1]	CS ACTIVITY	REFERENCE DOC T
1. "...DOE has not systematically evaluated the effectiveness of its conservation and solar energy programs."	A CS-wide system is being developed for the evaluation of all CS programs which establishes responsibilities, the organization, tasks, resources and milestones.	(a) T.E. Stelson Memorandum, CS Program Evaluations, July 7, 1980 (b) Information Memorandum, Conservation and Solar Energy Program Evaluation Plan (c) Program Evaluation Concept Paper.
2. "DOE should expand the use of evaluation information in various decision-making and management processes, particularly resource allocation and program management."	The evaluation system is being designed to ensure that the Assistant Secretary, Conservation and Solar, has useful information for management decisions regarding policy and strategy, resource allocation, program performance toward objectives and impacts on national energy consumption.	Refer to (b) and (c) above.
3. "...evaluation should focus not only on program impact, but should examine program processes."	The evaluation process will address both formative (process) and summative (outcome) evaluation issues as well as management efficiency and program effectiveness issues.	Refer to (b) and (c) above.
4. "...DOE will need to provide guidance to program offices and support offices."	An integral element of the evaluation system is the development of general and, eventually, comprehensive guidelines which address evaluation planning and approaches, criteria, methodology, data bases, and aggregation requirements.	Refer to (b) and (c) above.
5. "...DOE should develop a departmental evaluation strategy that outlines what...	The strategy will be further delineated in the CS Evaluation Plan.	Refer to (b) above.
(a) programs are to be evaluated,	(a) Criteria and a selection matrix for selecting programs for evaluation is currently being developed. An inventory of CS evaluation status is in draft preliminary form.	Refer to (a) above and (d) Preliminary CS Program Evaluation Inventory, August 29 1980 and (e) program framework for CS, Draft.
(b) types of information to be produced and minimum criteria to be applied	(b) A draft of proposed CS Evaluation Criteria to meet the Assistant Secretary's management information needs has been developed and is under review by PPE.	(f) CS Evaluation Criteria August 29, 1980, Draft
(c) timing of evaluation,	(c) The timing for development and implementation of the evaluation process is addressed generally in the Evaluation Concept Paper and a task and milestone network. Planned and in-process evaluations in CS have been identified. Other evaluations have not yet been selected or scheduled, however, pilot evaluations are now being planned for early FY '81.	Refer to (c) and (d) above and (g) Briefing Charts on the Evaluation Approach.

[1] Issues were taken from the Background Document for National Hearings, September 24 & 25, 1980, Washington, D.C., A Review of the Dept. of Energy's Conservation and Solar Energy Program.

(d) Funding mechanisms."	PPE is now developing information on funding requirements for conducting individual program evaluations and is addressing the mechanism for providing funding. Funding for development and implementation of the CS evaluation process is in FY81 AOP.	Refer to (a) and (d) above.
6. "...DOE should clearly delineate responsibilities for carrying out the evaluation strategy."	The Assistant Secretary has assigned PPE the responsibility for developing and implementing the CS Evaluation Plan. PPE and program office role and responsibilities have been delineated. A program evaluation team has been formed and functional areas and tasks for FY 81 have been defined.	Refer to (a), (b), (c), and (g) above.
7. "...should explore alternatives to traditional research designs."	An integral element of the CS evaluation process is to conduct research on methodologies and data sources.	Refer to (c) and (g) above

RECOMMENDATIONS FOR PRELIMINARY CS EVALUATION CRITERIA*

A. Energy Impact

1. BTU's - a. Saved
   b. Converted/Substituted
   c. Produced

2. Type of Fuel

Reduction/Displaced	New or Substituted Source
Petroleum	Synfuel
Natural Gas	Solar/Biomass
Coal	Coal
Hydroelectric	Other
Nuclear	
Other	

3. Time Frame

   a. Current (1980)
   b. Near-Term (1985)
   c. Mid-Term (2000)
   d. Long-Term (2000 +)

4. Market Sector and End Use

a. Residential/Commercial	Space Heat Lighting Air Conditioning Water Heating
b. Industrial	Process Steam Direct Heat Electric Drive Farm Vehicles Other
c. Transportation	Cars and Trucks Others

*Note: This is a preliminary draft intended for review and comment only by those people designated by the Office of Policy, Planning and Evaluation, Office of Conservation and Solar Energy. This draft is not to be cited or quoted.

5 Government Method

- Price
- Regulation
- RD&D
- Incentive
- Information/Education

6. Efficiency Improvement (if applicable)

B. Cost Effectiveness

1. Government Cost/BTU Impact
2. Private Industry Cost/BTU Impact
3. End User Cost/BTU Impact
4. Total Cost/BTU Impact
5. $ Value of BTU Impact
6. Total Cost/Barrel of Oil Equivalent (BOE)

C. Program Progress/Potential for Success

1. Statement of Objectives - Describe revisions to objectives and if positive redirection resulted
2. Adequacy of plans and milestones for achieving objectives
3. Performance in achieving planned milestones and objectives
4. Define total market potential
5. Describe market barriers
   - economic, social, technical, institutional, environmental, etc.
6. Estimated market penetration
7. Units affected/beneficiaries of program
8. Technical breakthroughs to reach commercialization
9. Resources and time required to reach commercialization
10. Describe major obstacles in delivering the program results

D. National Impact

1. Aggreated Energy Impact

   a. Conservation trends

   b. Conversion trends

   c. Alternate production trends

   d. Energy indicators

   e. Efficiency impacts

   f. Impact on imported oil

2. Environment

   a. Summary of environmental concerns

   b. Impact on health and safety

   c. Potential trade-offs

3. Economic

   a. Price impacts and trends/inflationary impact

   b. Balance of trade

   c. Employment impacts

   d. Efficiency impact on productivity

   e. Capital/stock turnover

4. Social

   a. Maintaining service and standard of living through efficiency improvements

   b. Efforts to amerliorate equity concerns

   c. Institutional considerations.

CS Evaluation Information Requirements

The following list of potential evaluation criteria are presented as a discussion guide in identifying the appropriate and applicable evaluation criteria that could be employed across CS programs.

In developing the criteria, please keep in mind that CS is addressing both outcome (impacts of the CS program on client groups) and process (program performance) types of issues.

I. Energy Impact of CS Programs

A. Btu's saved
converted/substituted
produced

B. Time Frame: Current (1980)
Near-Term (1985)
Mid-Term (1990)
Long-Term (2000)

C. Type of Fuel

Reduction/Displaced	New/Substituted
Petroleum	Synfuel
Natural Gas	Solar/Biomass
Coal	Coal
Hydroelectric	Alcohol
Nuclear	Other
Other	

D. Regional Impact (1-10)

E. Market Sector and End Use

1. Residential/Commercial: Space Heat
Lighting
Air Conditioning
Water Heating

2. Industrial: Process Steam
Direct Heat
Electric Drive
Farm Vehicles
Other

3. Transportation: Cars and Trucks
Other

4. Electricity Generation

F. Efficiency Improvement

II. Cost Effectiveness

A. Government cost (CS)/BTU impact
B. Private industry cost/BTU impact
C. End-use cost/BTU impact
D. Total cost/BTU impact
E. $ value of BTU impact
F. Total cost/barrel of oil equivalent (BOE)
(price per barrel saved or produced by program)

III. Program Progress/Potential for Success

A. Statement of objectives - describe past revisions to objectives and if positive redirection resulted

B. Adequacy of plans and milestones for achieving objectives

C. Performance in achieving planned milestones and objectives (actual accomplishments vs. planned over past four year period.)

D. Define total market potential

E. Describe market barriers (economic, social, technical, institutional, environmental, etc.)

F. Estimated market penetration

G. Units affected/beneficiaries of program

H. Technical breakthroughs to reach commercialization

I. Resources and time required to reach commercialization

J. Describe major obstacles in delivering the program results

K. Impact on accelerating commercial readiness

IV. National Impact

A. Aggregated Energy Impact

Conservation trends
Conversion trends
Alternate production trends
Energy indicators
Efficiency impacts
Impact on imported oil

B. Environment

Summary of environmental concerns
Impact on health and safety
Potential trade-offs

C. Economic

Ameliorate Adverse Economic Impacts
Price impacts and trends/inflationary impact
Balance of trade
Employment impacts
Efficiency impact on productivity
Capital/stock turnover

D. Social

Maintaining service and standard of living through efficiency improvements

Efforts to ameliorate equity concerns

Institutional considerations

E. National Security

Chart 1

Status Briefing:

Conservation and Solar Energy

Program Evaluation Plan

Office of Policy, Planning and Evaluation
Office of Conservation and Solar Energy

November 6, 1980

Chart 2

Briefing Topics

- Concept, Objectives, (3)
- Evaluation Schedule (4&5)
- Roles of PPE & Programs (6)
- Overview of Evaluation Plan (7)
- Accomplishments to Date (8)
- Preliminary Evaluation Criteria (9)
- Current Focus/Issues (10)

Chart 3.

Objectives of CS Evaluation Plan (SD)

Establish organization, responsibilities and resources for ensuring that:

- Evaluation is an integral element of the CS closed loop management system encompassing strategy, policy, planning, program performance and evaluation.
- CS is developing a positive and aggressive conservation and solar energy posture.
- Programs are being evaluated on a periodic basis so that improvements can be made.
- The Assistant Secretary has useful information for management decisions regarding policy and strategy, resource allocation, program performance toward objectives, and impacts on national energy consumption.
- Evaluation findings and information are comprehensive, consistent, comparable and can be aggregated for CS-wide analysis.

Evaluation Concept (SD)

- CS program managers retain principal evaluation responsibility.
- CS-wide evaluation criteria and guidelines will be developed by the PPE Evaluation Project Team for use by programs to ensure that evaluation information is comprehensive, measureable and consistent.
- Development and implementation of the CS Evaluation Plan will be coordinated through a Program Evaluation Technical Advisory Committee composed of program managers and evaluators.
- Key Energy Indicators will be developed and integrated into the evaluation process.

Chart 4

CS Status of Evaluation

Recently Completed	5
In-Process - Program	4
- Project	3
Currently Planned	6
Deferred - Start Up	7
Programs to be evaluated	30

Recently Completed

Energy Policy & Conservation Grant* SECP
Energy Conservation & Production Grant* SECP
Energy Extension Service*
Emergency Building Temperature
No Cost/Low Cost* (part of Community Systems)

In Process Program

Schools and Hospital Grant*
Energy Conversion and Utilization
Appropriate Technology
Weatherization*

In Process Project

Community Systems - Comprehensive Community Energy Management*
Solar Heating & Cooling*
Solar Applications Buildings

Currently Planned

Residential Conservation Service*
Appliance Standards*
State Energy Conservation
Energy Extension
Energy Related Inventions
Solar International - SOLERAS

Start Up - Deferred

Emergency Energy Conservation
Energy Management Partnership
Energy Conversion Technology
Energy Information Campaign
Solar International Applications
Solar International
Solar Energy Information Data Base

Chart 5

Programs to be Evaluated

CONSERVATION (17)

Building & Community Systems
- Building Systems[1]
- Urban Waste[1]
- Small Business
- Technology & Consumer Products[1]
- Federal Energy Management[2]
- Analysis & Technology Transfer[1]

Industrial Energy Conservation
- Waste Energy Reduction[1]
- Industrial Process Efficiency*[1]
- Industrial Cogeneration
- Implementation & Deployment

Transportation
- Vehicle Propulsion RD&D* [1/2]
- Electric & Hybrid Vehicle RD&D[1/3]
- Transportation Utilization
- Alternative Fuels Utilization

Energy Impact Assistance[1/3]

Advanced Conservation Technology
Energy Storage
Advanced Conversion Utilization

Energy Impact Assistance

Advanced Conservation Technology
- Energy Conversion Technology[1/4]
- Energy Utilization Technology[1/4]

SOLAR (12)

Solar Technology
- Technical Support and Utilization
- Biomass[2/]
- Solar Thermal Elect. Power[1/2]
- Photovoltaics Energy Dev.[1/]
- Wind Energy Conversion System[1/]
- Ocean Systems[2/]

Energy Storage Systems
- Battery Storage[1/]
- Thermal & Mechanical Storage[4/]

Energy Supply Research & Development
- Systems Development
- Market Development & Training

Energy Prod. Demo. & Distribution[3]
- Federal Buildings
- Market Analysis

[1]Large current or planned budget
[2]Vulnerable/Controversial
[3]Politicial Visibility
[4]Cross/Sectorial Importance to Major Programs

Chart 6

Role of PPE (SD)

- Identify evaluation criteria
- Develop guidelines
- Coordinate with PE Program Summary Information Requests
- Develop and implement the CS Evaluation Plan
- Review program evaluation plans and findings
- Aggregate results for policy, strategy and budget decisions
- Perform cross-cutting analysis
- Monitor status of evaluations
- Perform special evaluations
- Transfer useful evaluation techniques and results

Role of Programs (SD)

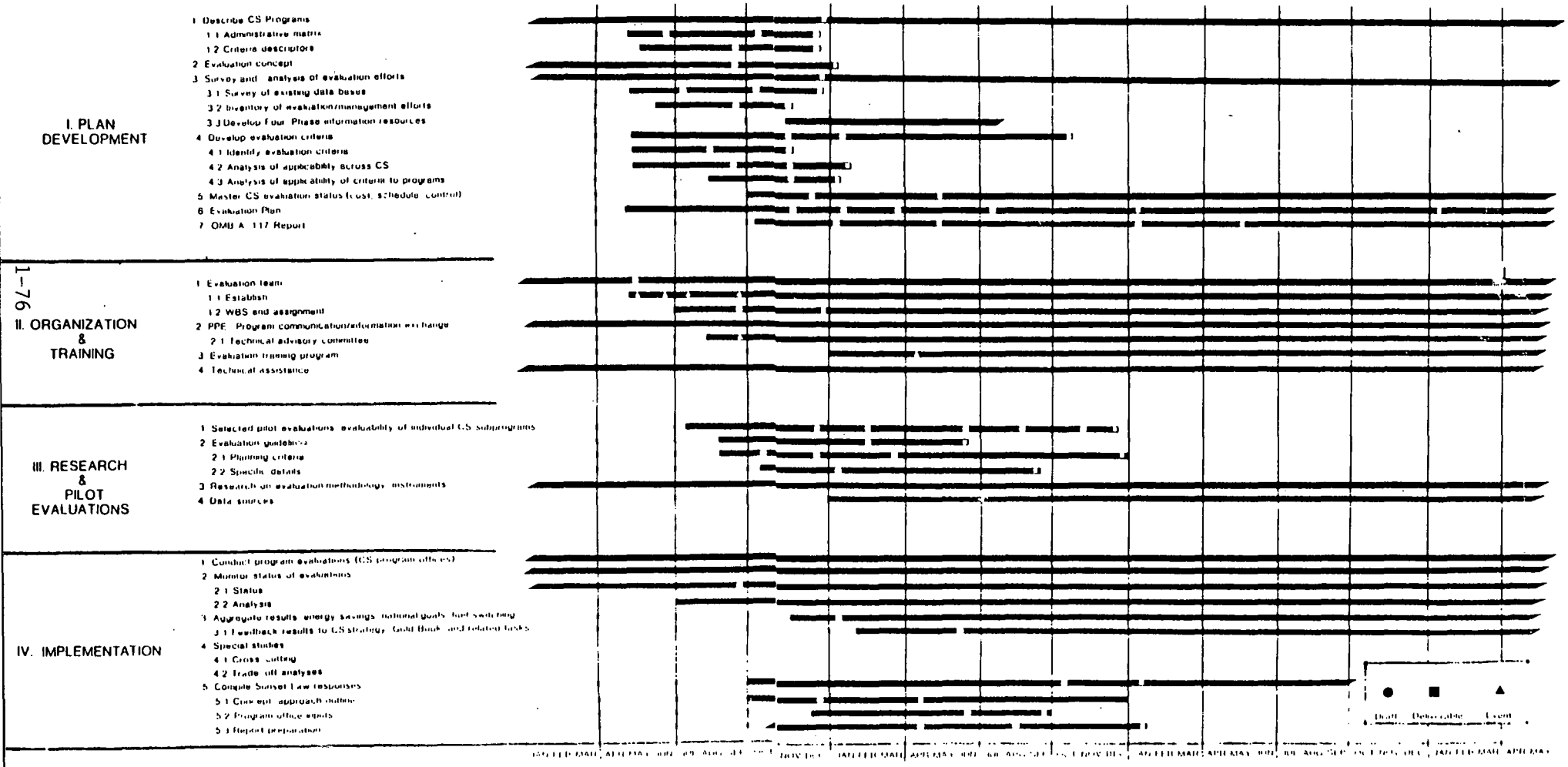
- Participate in the development of the CS Evaluation Plan, criteria, guidelines and methodologies
- Review and commitment to selected criteria and guidelines
- Coordinate with PPE in selecting evaluation priorities and schedules
- Plan and conduct evaluations in accordance with CS criteria and guidelines
- Provide evaluation results and findings for aggregation and cross-cutting analysis

Chart 1

CS EVALUATION PLAN: DEVELOPMENT AND IMPLEMENTATION

Office of Policy, Planning and Evaluation
Assistant Secretary for Conservation and Solar
Department of Energy

EVALUATION TASKS



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NOTE: Key Objectives are reflected in ACTS as specified in Objectives Book input for Program Evaluation Plan.

Chart 8

Accomplishments to Date

- Assignment of responsibility by the Assistant Secretary (SD)
- Formation of an evaluation project team (SD)
- Draft CS evaluation process (SD)
- CS evaluation concept paper (objectives, definitions, roles, responsibilities) (SD)
- Research on Key Energy Indicators (SD)
- Information Memorandum to the Secretary (SD)
- Meetings with CS program staff (SD)
- Coordinating with PE on CS Program Summary Information (SD)
- Preliminary survey of CS program evaluations (SD)
- Meetings and technical discussions with EPA Section 11 Staff and other Federal agencies (SD)
- Formation of a technical evaluation advisory committee (SD)
- Addressing Assistant Secretary's evaluation information needs (i.e., CS Evaluation Criteria) (SD)
- Selection of programs to test criteria in evaluations (SD)
- Review of preliminary criteria with programs (SD)

Chart 9

Preliminary Information Requirements in Pilot Programs (SD)

(Criteria Overview)

Energy Impact

- Total Energy Saved
- Total Imported Oil Saved
- Energy Savings
  - Fuel Substitution
  - Reduction of Demand
  - Efficiency Improvement

Cost Effectiveness

- Gov't Cost
- Private Industry Cost
- End User Cost
- Comparative Benefit/Cost

Program Progress

- Objectives
- Accomplishments
- Cost Performance
- Schedule Performance

National Impact

- Environment
- Economic
- Social
- Equity

Chart 10

Current Focus

- Testing criteria and applicability in pilot programs (SD)
- Refining criteria and applicability framework
- Issuing guidelines to programs for measuring and reporting against criteria and aggregating results
- Refining a Draft Program Evaluation Plan
- Sunset Provision Response (SD)

Issues

- Applicability of criteria across all CS Programs and capability of programs/DOE to develop evaluation information
- Design of guidelines to address diverse CS programs
- Resources for PPE to continue development and implementation of CS Evaluation Plan and to aggregate results.
- Resources for programs to conduct evaluations, (Assistance on OMB A-117)
- Greater emphasis on Sunset Evaluations
- Integration of planning, strategy and evaluation process

INVENTORY OF DOCUMENTS
PROGRAM EVALUATION LIBRARY

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PROGRAM DESCRIPTOR AND INFORMATION MATRIX

I. Program Background

1. Name of Program
   (Program, Subprogram, Element, Subelement as applicable).

2. Type of Program (See Note 1)

3. Objectives (See Note 2)

   a. Strategic Objectives

   Reduce vulnerability to import disruptions _____
   Improve energy productivity _____
   Accelerate use of renewable resources _____
   Narrow key uncertainties in energy sector _____

   b. Principal program-specific objectives

4. Statement of Need and the Federal Role.
   Discuss market disfunction, institutional and market barriers inadequate private sector involvement. Identify studies and data that demonstrate the need.

5. Budget

FY80 FY81 FY82 FY83 FY84 FY85 FY86

7. Geographic Focus or Applications of Program.
   List Federal Regions, national sectors, or states specifically affected by the program and explain sectoral characteristics.

II. Energy Impact

1. List major market sectors and end-uses affected by the program. (See note 3)

2. Energy Impact Scenarios
   For each major market sector end-use listed in 1 above, provide the following information:

   a. Consumption baseline
      (1970 - 1980) - Actual Btus/yr of conventional or fossil fuel demand nation-wide in the end user sector.

      (1985,1990,2000) - Projected Btus/yr of conventional or fossil fuel demand national-wide in the end use sector if there are no further Federal Program funds beyond 1981.

b. Savings/Displacement Projections

(1985,1990,2000) - Projected energy savings or displacement of conventional or fossil fuel nation-wide attributable to the program in the end use sector(s) under the following budget scenarios:
- minimum budget level 1982-1986
- basic budget level 1982-1986
- enhanced budget level 1982-1986

3. Energy Savings Mix

a. Provide the percentage of savings/displacement by energy source listed below:

	Percent of Savings				Percentage of energy savings due to improveed efficiency	Percentage of program funds alloted by energy source.
Energy Source	1980	1985	1990	2000		
oil					____	____
gas					____	____
coal					____	____
elec					____	____
other					____	____
	100%	100%	100%			

b. If savings or displacement resulted from switching to an alternate energy source, please specify alternate (e.g., coal, solar/renewable, alcohol, electricity, synfuel, etc.)

4. Market Impact

	1980	1985	1990	2000
Number of Units installed/users affected				
Percent Market Penetration				

5. Acceleration of Commercialization
Describe the effect of the program on accelerating commercial readiness and implementation by the user.

III. 1. Private and Federal investment required to achieve savings/ displacement projections, by program element.

	FY85	FY90	FY2000
a. Federal RD&D plus other CS investments ($ 000)			

b. Private sector investment to achieve savings projections in II.2.b. (Savings Potential)

c. Private sector investment without the effect of CS program or the Federal Investment shown in II.2.a (above)

d. Leverage

Amount of out-year private sector investment stimulated by Federal investment = $\frac{b-c}{a}$

IV. Program Progress and Potential

1. Plans and Milestones

a. Describe plans and milestones for achieving objectives.

b. Describe actual accomplishments (relative to planned) over the past four year period.

c. Describe past revisions to program objectives and redirection that has resulted.

2. Effectiveness Measures

a. Payback period of project or technology to user

b. Federal Investment (from III.1.a.) per MBtu Saved (from II.2.b.)

c. Discounted cumulative energy savings to net present value for 1985, 1990, and 2000.

3. Risk

a. Technical probability of project success over projected timeframe.

b. Market probability of project success over projected timeframe.

V. Other Program Impacts

Indicate the potential impact of the program (P-positive, O-none, 1-minor, 2-major (explain) on the following areas:

1. Inflation (price) _____
2. Capital Investments _____
3. International trade/ Balance of payments _____
4. International Co-op _____
5. Raw Materials _____

6. Ecological/Environmental _____
7. Pollution _____
8. Societal (equity, standard of living) _____
9. Health and Safety _____
10. National Security _____
11. Other _____

Provide titles, dates, authors, and other identifying information on applicable reports, studies, and analyses addressing the areas listed above.

Note 1 Type of Program

Select the descriptor(s) below which most closely identifies the program element. If the program element falls into more than one of the categories shown below, show percentage of program element funds allocated to each category.

	Percentage
Basic & Applied Research	_____
Exploratory Development	_____
Technology Development	_____
Demonstration - Process	_____
Demonstration - Market Development	_____
Regulatory - Performance Standards	_____
Regulatory - Emergency Management	_____
Regulatory - Outreach Services	_____
Price Support, Loan, & Loan Guarantee	_____
State Grants for Conservation Projects	_____
State Grants for State Energy Management	_____
Information services	_____
Program Evaluation	_____
Planning Studies and Analyses	_____
Other (Specify)	_____
Total:	100%

Note 2 Objectives

A. Strategic Objectives

Most program elements will be aimed at more than one of the strategic objectives listed below. Indicate below the relevence of these objectives to the program element, as follows: P--principal objective(s); S--secondary objective(s); NA--not applicable.

Reduce vulnerability to import disruption	_____
Improve energy productivity	_____
Accelerate use of renewable resources	_____
Narrow key uncertainties in energy sector	_____

B. Principal Program-Specific Objectives

Major Objectives at program element level (as reported in CS Objectives Book or as seen by program office or others -- identify sources). Cite target dates, quantities and appropriate measures of accomplishments as applicable.

Note 3 Examples of Major Market Sectors and End Uses.

Indicate the market sector(s) and end use application(s) affected by the program. Indicate by subsectors if possible. If the program element falls into more than one of the categories shown below, show percentage of program funds allocated to each category.

	Market Sector	End Use	Percentage of Funds
1.	Residential/Commercial:	Space Heat	_____
		Lighting	_____
		Air Conditioning	_____
		Water Heating	_____
		Other	_____
2.	Industrial:	Process Steam	_____
		Direct Heat	_____
		Electric Drive	_____
		Farm Vehicles	_____
		Other	_____
4.	Electricity Generation:		_____
		Total	100%

PROGRAM DESCRIPTORS, AND PLANNING AND EVALUATION CRITERIA

I. PROGRAM BACKGROUND

1. Name of Program Element (as defined in PPBS)

_____

2. Type of Program

Select the descriptor(s) below which most closely identifies the program element. If the program element falls into more than one of the categories shown below, show percentage of program element funds allocated to each category.

		Percentage
Basic & Applied Research		_____
Exploratory Development		_____
Technology Development		_____
Demonstration - Process		_____
Demonstration - Market Development		_____
Total R&D %	_____	
Regulatory - Performance Standards		_____
Regulatory - Emergency Management		_____
Regulatory - Outreach Services		_____
Total Regulatory %	_____	
Price Support, Loan, & Loan Guarantee		_____
State Grants for Conservation Projects		_____
State Grants for State Energy Management		_____
Total Incentive %	_____	
Information Services/Education		_____
Total Information %	_____	
Program Evaluation		_____
Planning Studies and Analyses		_____
Other (Specify)		_____
Total		100%

3. Objectives

A. Strategic Objectives

Most program elements will be directed at more than one of the strategic objectives listed below. Indicate below the relevence of these objectives to the program element, as follows: P - Principal objective(s); S - Secondary objective(s); NA - Not applicable.

Reduce vulnerability to import disruption _____
Improve energy productivity _____
Accelerate use of renewable resources _____
Narrow key uncertainties in energy sector _____

B. Principal Program-Specific Objectives

List major objectives for the program element (as reported in CS Objectives Book or as seen by program office). Identify target dates, quantities and appropriate measures of accomplishments as applicable. How do they support strategic objectives?

C. Identify authority, Congressional mandates or statues establishing program and objectives. _____

4. Statement of Need and the Federal Role.

Briefly discuss the need for federal intervention in terms of whether the private sector would perform this function on its own. If the program meets private sector investment criteria, discuss other rationale for government involvement such as market disfunction, institutional barriers or market inertia. Identify supporting data or studies.

5. Resources - Budget and Personnel for Program Element Assumed

	FY80	FY81	FY82	FY83	FY84	FY85	FY86	FY87
a. Budget								
- minimum	____	____	____	____	____	____	____	____
- basic	____	____	____	____	____	____	____	____
- enhanced	____	____	____	____	____	____	____	____
b. FTE Personnel	____	____	____	____	____	____	____	____

6. Geographic Focus or Applications of Program Element
If program element has other than a broadly distributed national direction or application, list Federal, Regions, national sectors, or states specifically affected by the program and explain sectoral characteristics.

_____
_____
_____
_____
_____
_____
_____
_____
_____

7. Similar Programs

Identify other federal or non-federal programs having similar or potentially conflicting or duplicative objectives. Explain.

_____
_____
_____
_____
_____
_____
_____

II. ENERGY IMPACTS

1. Market and End Use Sectors

Identify the market sector(s) and end use application(s)(by detailed subsectors if possible) affected by the program. If the program element falls into more than one of the categories shown below, show percentage of program funds allocated to each category.

Sample Market Sectors and End Uses

Market Sector	End Uses	Percentage of Funds
1. Residential/Commercial:	Space Heat	
	Lighting	
	Air Conditioning	
	Water Heating	
	Other _____	
2. Industrial:	Process Steam	
	Direct Heat	
	Electric Drive	
	Farm Vehicles	
	Other _____	
3. Transportation:	Cars	
	Truck	
	Other _____	
4. Electricity Generation:		
	Total	100%

2. Energy Impact Scenarios. (To be completed only by program elements for which energy saving measures are applicable).

For each major market sector end-use affected in II.1 above, provide the following information:

a. Demand Baseline

(1970 - 1980) - Actual MBtus/yr of conventional or fossil fuel demand nation-wide in the end use sector(s).

(1985, 1990, 2000) - Projected MBtus/yr of conventional or fossil fuel demand nation-wide in the end use sector(s) if there are no further Federal program funds beyond 1981.

Identify source of data (if available) for the demand baseline data.

MBTUs Energy Demand

End Use Sectors (e.g., Residential Water Heating)	1970	1975	1978	1980	1985	1990	2000

b. Savings/Displacement Projections. (To be completed only by program elements for which energy saving measures are applicable).

Actual: (1970 - 1980)- Actual Energy Savings or displacement of conventional or fossil fuel nation-wide attributable to the program element in the end-use sector(s).

Projected: (1985, 1990, 2000) - Projected energy savings or displacement of conventional or fossil fuel nation-wide attributable to the program element in the end use sector(s) affected under the following budget scenarios:

- minimum budget level 1983-1987
- basic budget level 1983-1987
- enhanced budget level 1983-1987

Please specify budget assumptions (Refer to I.5.a). Provide supporting documentation which delineates data sources and methodology for savings/displacement data.

	MBtus Energy Savings/Displacement from Baseline Data						
by End Use Sectors	1970	1975	1978	1980	1985	1990	2000
________							
- minimum budget							
- basic budget							
- enhanced budget							
________							
- minimum budget							
- basic budget							
- enhanced budget							
________							
- minimum budget							
- basic budget							
- enhanced budget							

3. Energy Savings Mix (To be completed only by program elements for which energy saving measures are applicable).

   a. Provide the percentage of savings/displacement by energy source listed below:

Energy Source	Percent reduction from baseline data 1980	1985	1990	2000	Percentage of energy savings due to improved efficiency as a result of program efforts	Percentage of program funds alloted by energy source
Oil	____	____	____	____	____	____
Gas	____	____	____	____	____	____
Coal	____	____	____	____	____	____
Electricity	____	____	____	____	____	____
Other	____	____	____	____	____	____
	100%	100%	100%	100%		

   b. If savings or displacement resulted from switching to an alternate energy source, please specify alternate and amount (e.g., oil to coal, solar/renewable, alcohol, electricity, synfuel, etc.)

4. Market Impact (If applicable or meaningful for a program element). Identify studies, assessments, and reports which delineate data sources and analysis.

	1980	1985	1990	2000
- Number of units installed/users affected Specify affected unit (e.g., home weatherized, etc.)	____	____	____	____
- Percent market penetration	____	____	____	____

   - Number and types of beneficiaries or persons served:

5. Acceleration of Commercialization (if applicable or meaningful for a program element).

Describe the effect of the program on accelerating commercial readiness and implementation by end user. Estimate number of years saved. Describe data sources and methodology for determining market acceleration.

III FEDERAL AND PRIVATE INVESTMENT[1]

	Dollars and Percent of Total			
	FY 80	FY 85	FY 90	FY2000
1. Current and Planned Investment				
a. Program Element Investment to meet energy savings objectives stated in II.2.b. (Assume energy savings under basic budget projection)	$ (%)	$ (%)	$ (%)	$ (%)
b. Other government (federal, state, local) investment to meet energy savings objectives stated in II.2.b. (Assume energy savings under basic budget projection)	$ (%)	$ (%)	$ (%)	$ (%)
c. Private sector investment for development and implementation stimulated by this program element to meet energy savings objectives stated in II.2.b. (Assume energy savings under basic budget projection)	$ (%)	$ (%)	$ (%)	$ (%)
d. Total Investment	$ (100%)	$ (100%)	$ (100%)	$ (100%)

2. Past Investment

Identify year that program element was established and cumulative expenditures to date. If multi-phase, list years and describe the phases. Identify cumulative spending by other government levels and the private sector.

Note 1. The term investment represents expenditures as opposed to budgeted amounts.

V Program Progress

1. Describe the performance, impact and accomplishments of the program element, particularly in terms of achieving the original objectives, meeting program objectives, and milestones in schedule, meeting the federal role and employing the procedures or methods of analysis appropriate to the type of program. (Refer to I.3 and I.4).

2. Describe past changes to program element objectives or charter and redirection that has resulted.

3. Describe and assess the degree to which the overall administration of the program, as expressed in the rules, regulations, orders, standards, criteria, procedures, and decisions of the program officers are believed to meet the objective of (the Congress in establishing) the program.

4. Effectiveness Measures (If applicable or meaningful for program element). Provide sample methodology and source of data.

   a. Payback (simple) period for end-user. _____

   b. Program element investment (from III.1.a.) per MBtu Saved (from II.2.b., assuming basic budget level). _____

5. Risk (If applicable or meaningful for program element).
   a. Technical probability of meeting objectives over the projected timeframe. Provide percentage probability and explain as necessary.

_____
_____
_____
_____
_____
_____
_____
_____

   b. Market probability of project success over the projected timeframe. Provide percentage probability and discuss potential barriers and how they will be overcome.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

V. OTHER PROGRAM IMPACTS (As Applicable Or Meaningful For The Program Element)

Indicate the potential impact of the program element (P - positive, N - negative, 0 - no impact, 1 - minor, 2 - major, N.A. - not applicable) on the following areas:

1. Price Inflation (costs to consumers and businesses _____
2. Competition _____
3. Economic Stability _____
4. Balance of Payments _____
5. Capital Investment _____
6. Employment _____
7. Productivity _____
8. Ecological/Environmental _____
9. Health and Safety _____
10. Societal (equity and standard of living) _____
11. National Security _____

Provide titles, dates, authors, report numbers and other pertinent information on reports, studies and analyses addressing the areas listed above. If available, provide copies of reports or background documentation.

APPENDIX 2

PILOT CRITERIA TESTING

STATUS OF EVALUATION PROCESS

- ACCOMPLISHMENTS TO DATE
- PLANNED DIRECTION
- TECHNICAL EVALUATION ADVISORY COMMITTEE

ACCOMPLISHMENTS TO DATE

- ASSIGNMENT OF RESPONSIBILITY BY THE ASSISTANT SECRETARY
- FORMATION OF AN EVALUATION PROJECT TEAM
- DRAFT CS EVALUATION PROCESS
- CS EVALUATION CONCEPT PAPER (OBJECTIVES, DEFINITIONS, ROLES, RESPONSIBILITIES)
- INFORMATION MEMORANDUM TO THE SECRETARY
- MEETINGS WITH CS PROGRAM STAFF
- PRELIMINARY SURVEY OF CS PROGRAM EVALUATIONS
- MEETINGS AND TECHNICAL DISCUSSIONS WITH EPA SECTION 11 STAFF AND OTHER FEDERAL AGENCIES
- FORMATION OF A TECHNICAL EVALUATION ADVISORY COMMITTEE
- ADDRESSING ASSISTANT SECRETARY'S EVALUATION INFORMATION NEEDS (I.E., CS EVALUATION CRITERIA)
- SELECTION OF PROGRAMS TO TEST CRITERIA IN EVALUATIONS.

TECHNICAL EVALUATION ADVISORY COMMITTEE

- TWO-WAY COMMUNICATION BETWEEN PPE AND PROGRAM OFFICES
- PROVIDE PROGRAM PERSPECTIVE AND COORDINATION
- APPRAISE EVALUATION TEAM OF MANAGEMENT NEEDS FROM THE EVALUATION PROCESS
- ADVISE PPE ON
  - EVALUATION CRITERIA
  - EVALUATION RESEARCH
  - PRIORITIES AND SCHEDULES
  - SUPPORT REQUIREMENTS
- IDENTIFY ISSUES TO BE ADDRESSED BY THE EVALUATION PROJECT TEAM.

EXTERNAL EVALUATION INTEREST

- OFFICE OF TECHNOLOGY ASSESSMENT
- GENERAL ACCOUNTING OFFICE
- ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF TECHNOLOGY ASSESSMENT

- LACKS CLEAR GOALS
- SETTING PRIORITIES
- INADEQUATE PLANNING
- INADEQUATE PROGRAM EVALUATION
  - NO CONSISTENT METHOD OF EVALUATING PROGRAM PERFORMANCE
  - FORMATIVE AND SUMMATIVE EVALUATIONS
- INADEQUATE DATA COLLECTION AND ANALYSIS

GENERAL ACCOUNTING OFFICE

- DOE HAS YET TO:
  - O ESTABLISH OVERALL LONG-TERM ENERGY CONSERVATION GOALS, AND
  - O COMPREHENSIVE NATIONAL PLAN TO MEET THOSE GOALS
- NEED EXPLANATION OF PROGRAM CONTRIBUTION
- MEASURE EFFECTIVENESS OF EXISTING PROGRAMS
- ESTABLISH SYSTEM FOR MONITORING AND EVALUATING PROGRESS TOWARD GOALS.

ENVIRONMENTAL PROTECTION AGENCY

- SECTION 11 OF THE FEDERAL NON-NUCLEAR ENERGY RESEARCH AND DEVELOPMENT ACT OF 1974
- RESPONSIBILITY FOR ASSESSING
  - o ADEQUACY OF ATTENTION TO ENERGY CONSERVATION METHODS
  - o ENVIRONMENTAL CONSEQUENCES OF THE APPLICATION OF ENERGY TECHNOLOGIES
- REGIONAL AND NATIONAL HEARINGS ON:
  - o ENERGY POLICY ANALYSIS
  - o PROGRAM EVALUATION
  - o RESEARCH, DEVELOPMENT AND APPLICATION
  - o STATE AND LOCAL ASSISTANCE PROGRAMS

EPA RECOMMENDATIONS

- SYSTEMATICALLY EVALUATE EFFECTIVENESS OF CS PROGRAMS
- EXPAND USE OF EVALUATION INFORMATION IN DECISION MAKING
- EVALUATE IMPACT AND THE PROCESS
- PROVIDE GUIDANCE
- DEVELOP AN EVALUATION STRATEGY
  - PROGRAMS TO BE EVALUATED
  - INFORMATION TO BE PRODUCED AND CRITERIA
  - TIMING
  - FUNDING MECHANISM
- DELINEATE RESPONSIBILITIES
- ALTERNATIVES TO TRADITIONAL RESEARCH DESIGNS

PILOT EVALUATION

OBJECTIVE

- o TEST CS EVALUATION CRITERIA
- o APPLY PLANNING & METHODOLOGY PROCESSES
- o PREPARE EVALUATION GUIDELINES

PILOT EVALUATION

PROGRAM SELECTION CRITERIA (4)

- PROGRAM PLANS TO CONDUCT EVALUATION FY 81
- ONE PROGRAM
  - EACH MARKET SECTOR
  - EACH GENERIC SECTOR
  - EACH TARGET AUDIENCE
- EXCLUDE PROGRAMS
  - COMPLETED EVALUATION
  - IN PROCESS
  - START UP PHASE

PROPOSED PILOT EVALUATIONS

- APPLIANCE STANDARDS
- INDUSTRIAL PROCESS EFFICIENCY
- ELECTRIC AND HYBRID VEHICLE
- ENERGY RELATED INVENTIONS

ALTERNATES

- WEATHERIZATION
- RESIDENTIAL CONSERVATION SERVICE

CS EVALUATION CRITERIA

- INFORMATION TO BE PRODUCED FROM EVALUATION
- ASSISTANT SECRETARY'S MANAGEMENT DECISION AND REPORTING REQUIREMENTS
- INFORMATION NEEDS MUST BE TRANSLATED TO CONSISTENT MEASURES
- GENERIC CATEGORIES OF INFORMATION

EVALUATION CRITERIA
GENERIC INFORMATION CATEGORIES

DOE GOALS	
ENERGY SAVINGS	NATIONAL IMPACT
COST EFFECTIVENESS	PROGRAM PROGRESS

ENERGY DEMAND/EFFICIENCY IMPACT BY

- MARKET SECTORS AND END-USE
- ENERGY SOURCE
- METHOD OF ACHIEVEMENT

COST EFFECTIVENESS

ENERGY SAVINGS

- 0 TOTAL COST
- 0 END USER COST
- 0 GOVERNMENT COST

PROGRAM PROGRESS

- ADEQUACY OF PLANS AND MILESTONES
- ACHIEVEMENT OF PROGRAM MILESTONES
- MARKET BARRIERS
- MARKET PENETRATION
- NUMBER OF UNITS AFFECTED BY PROGRAM
- RESEARCH/DEVELOPMENT/TECHNOLOGY REQUIREMENTS
- RESOURCE AND TIME REQUIREMENTS
- MEASURES FOR GENERIC PROGRAM TYPES
  - PRICING
  - INFORMATION/EDUCATION
  - R&D
  - INCENTIVE
  - REGULATION

NATIONAL IMPACT

- ENERGY USE
- ENVIRONMENT
- ECONOMIC
- SOCIAL

PILOT SELECTION CRITERIA ANALYSIS

1. Criteria for deferring pilot evaluation for the initial pilot evaluation criteria development effort the following criteria are applied to defer the pilot evaluation.

   Start Up - Programs in the start up phase were excluded since the initial criteria are for retrospective evaluations and limited data and information are available.

   Data Availability -
   If data is not available the testing of criteria would be either marginal or take a longer time period to complete.

   Completed Evaluation -

   A second evaluation in an immediate future is unlikely and criteria can be tested against the completed evaluation documentation.

2. Identical Criteria Characteristics

   Conservation Research Design and Development (CRD&D)

	Waste Energy Reduction	Identical
in process	Industrial Process Efficiency	at primary
evaluation	Industrial Cogeneration	characteristics

   Inventions and Small Scale Technology (ISST)

Appropriate Technology Small Grants	Identical at
Inventors Program	primary
See Figure I	characteristics

3. Generic Sector and Demand Target

   A pilot evaluation in each generic sector would include the functional diversity evaluation criteria problems.

   A pilot evaluation in each of the three major demand sectors would include the principal conservation objectives and energy consumption markets.

Therefore, the analysis based on these two criteria results in the following candidate selections

Information -	Applicance Standards
RD&D	CRD&D or ISSD program
Incentives	Building Systmes
	Residential Conservation Service
	Community Systems
	Schools and Hospital Grants
	Local Gov't Building Grants
	Weatherization
	Inventions and Small Scale Technology
Regulation	Emergency Conservation Act (ACA)
	FEMP
	ECA reaches each major demand sector and FEMP none

Recommendation - Select appliance standards to include the information generic sector and Energy Conservation act the regulatory sector

For selection of the RD&D and Incentives sector pilot candidates the following additional criteria are used:

Budget level - The initial pilot evaluations should include at least one project in each budget range

less than 100.000
100.000 to 180.00
over 180.000

Target Audience - Each target audience is included an multiple audiences preferred

By applying these criteria, Building systems is selected based on the budget criteria to include a mid range program

The criteria of target audience is thus applied to RD&D projects and one of the two Inventions and Small Scale Technology is preferred. Additional information is required to select between the small grants and the Inventors program.

By successfully applying the criteria a priority of alternatives selections can be established. These are listed on Fig 2. by an alphabetic suffix.

CONSERVATION AND SOLAR PROGRAM INVENTORY	GENERIC SECTOR					MAJOR DEMAND TARGET			MATURITY			BUDGET LEVEL FY 81 - '83			STATUS OF CURRENT EVAL.							TARGET AUDIENCE			
	Pricing/Policy	Information/Education	R,D&D	Economic Incentive	Regulation	Residential	Highway Veh.	Industry Process	Start-up	Development Operation	Phase-down	Up to 100 [illegible]	100 - 180	180 [illegible]	Planned	In Process	Completed Recent or Past	Subelement Complexity	Program Complexity/Delivery System	Data Availability		Individual Public	Manufacturer Industry	Institutional	Government
y Applications			•					•		•				•				P		P			X		
Applications			•					•		•				•				P		P			X		
ge Applications			•			•				•				•				P		P		X	X		
& Community Systems																									
ngs																									
ting Systems (sub program)				•		•				•			•		–			N	C	P		•		•	
dential Conservation Service (sub program)				•		•				•		•			F			N	C	P		•			
unity Systems																									
mmunity Systems				•		•				•		•			–			P	D	P		•	•	•	•
ban Waste			•			•				•		•			–			P	D	N		•		•	
hall Business				•		•			•			•			–			P	C	P			•		•
mer Products																									
chnology and Consumer Products			•			•				•		•			F			P		N		•	•		
ial Standards						•				•		•			F			N	C	P		•	•		
Policy																									
deral Energy Management					•					•		•			–			N	C	P				•	•
al Energy Conservation Program																									
ation Research Design & Development																									
aste Energy Reduction			•					•		•		•			–			P	D	P			•		
dustrial Process Efficiency			•					•		•		•			–			P	D	P			•		
dustrial Cogeneration			•					•		•		•			–			P	D	P			•		
ervation Technology Deployment & Monitoring																									
mplementation and Deployment		•						•	•			•			–			P	D	P			•		
ortation Programs																									
cle Propulsion RD&D			•				•			•			•		–			P	D	N		•	•		
ric Hybrid Vehicle R&D			•				•			•		•	•		–			P	D	N		•	•		
sportation Systems Utilization		•					•		•			•			–			P	D	N		•	•		
rnative Fuels Utilization			•				•		•			•			–			P	D	N		•	•		
Local Programs 79 - 80																									
tutional Buildings Program																									
Schools & Hospitals Grant Program				•		•				•			•		F			N	C	P				•	•
Other Local Gov't Buildings Grant Program				•		•				•		•			F			N	C	P				•	•
gy Management Partnership Act																									
State Energy Conservation Programs		•		•						•			•				C	N	C	P		•	•	•	•
nergy Extension Service		•		•		•		•		•			•				C	N	C	P		•	•	•	•
gy Conservation Act					•	•	•	•		•			•		F			N	C	P		•	•	•	•
chnical Assistance Program				•		•		•		•			•		F			N	C	P		•			
ons & Small Scale Technology																									
Appropriate Technology Small Grants Program			•	•		•	•	•		•		•			F			N	C	P		•	•	•	•
Inventors Program (Inventors Program)			•	•		•	•	•		•		•			F			N	C	P		•	•	•	•
Information Campaign																									
Impact Assistance																									
ercialization																									

R = Current F = Future T = Technical H = High C = Complex D = Direct P = Probable N = Not

CS PROGRAM ELEMENT DATA SHEET

1. PROGRAM ELEMENT NUMBER _____
   PROGRAM ELEMENT TITLE _____
   CS ORGANIZATION RESPONSIBLE _____

   Description (50 words)

2. List of subelements and projects which comprise this program element

   (This is the next two levels of your work breakdown structure - See Waste Energy Reduction example.)

3. TYPE OF PROGRAM

   Note: If the program element falls into more than one of the categories shown below, show percentage of program element resources allocated to each category.

		Percentage
Basic & Applied Research		
Exploratory Development		
Technology Development		
Demonstration - Process		
Demonstration - Market Development		
TOTAL RD&D%		
Regulatory - Performance Standards		
Regulatory - Emergency Management		
Regulatory - Outreach Services		
TOTAL RD&D%		
Price Support, Loan, & Loan Guarantee		
State Grants for Conservation Projects		
State Grants for State Energy Management		
TOTAL RD&D%		
Information services		
Program Evaluation		
Planning Studies and Analyses		
Other (specify)		
	Total:	100%

Note: This document was prepared by the Office of Policy, Planning and Evaluation in conjunction with the Office of Policy and Evaluation.

4. ID USE SECTOR(S) AFFECTED

Indicate end use sector(s) affected by program element. List by subsectors, if possible. If program affects more than one sector or subsector, show % of program element resources allocated to each.

Buildings	Industry	Transportation	Utilities
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Total: 100%

5. STRATEGIC OBJECTIVES

Most program elements will be aimed at more than one of the strategic objectives listed below. Indicate below the relevance of these objectives to the program element, as follows: P -- principal objectives(s); S -- secondary objective(s); NA -- not applicable.

Reduce vulnerability to import disruption _____
Improve energy productivity _____
Accelerate use of renewable resources _____
Narrow key uncertainties in energy sector _____

6. MAJOR OBJECTIVES AT PROGRAM ELEMENT LEVEL (as reported in CS Objectives Book or seen by program office or others -- identify sources):

Objective	Target Date	Indicator(s)	Source

7. NEED FOR PROGRAM

a. Type of Need. (Identify specific market barriers addressed)

Word limit: 50 words for each subelement

b. Documentation of Need. (Summarize main points of surveys, studies, etc. which show that the problem is real, demonstrate its size, policy significance, etc. Identify studies by name.)

Word Limit: 100 words for each subelement

c. Statutory Mandate. Is the program element required by statute? Explicitly authorized by statute? Please identify statute titles, paragraphs, year of enactment. Describe mandate and what explanation is required if mandate is not accomplished.

8. OGRAM ELEMENT MECHANICS

a. Briefly describe the program management structure and process by which the program functions or include form "F" from the FY82 - 86 PPBS program memorandum.

Note: Word limit one page

b. Identify major achievements attributable to the program element. Include projections if possible.

Example:	FY 79	FY 80	FY 81	FY 82	FY 83	----	FY 87
Homes Weatherized							
Buildings Audited							
Demo projects							
Others (describe)							

Note: Word limit one page

9. ENERGY SAVINGS DISPLACEMENT (BOE/yr)

(Document methodology. State assumptions used if other than attached planning assumptions)

a. Baseline Projections (BOE/yr)	FY85	FY90	FY2000
1. Energy demand in end use sector without program			
- oil/gas	_____	_____	_____
- all forms (primary)	_____	_____	_____
2. Energy demand in program element sector without program			
- oil/gas	_____	_____	_____
- oil forms (primary)	_____	_____	_____

b. Savings - Displacement Projections (BOE/yr)

1. Total potential energy savings or displacement for program element sector			
- oil/gas	_____	_____	_____
- all forms (primary)	_____	_____	_____

2. Projected energy savings or displacement program element sector attributable to program
   - oil/gas _____ _____ _____
   - all forms (primary) _____ _____ _____

3. Projected energy savings or displacement for program element sector without program.
   - oil/gas _____ _____ _____
   - all forms (primary) _____ _____ _____

10. PROGRAM ELEMENT RESOURCES

a.

Actual	Assumed in Savings Budget	Assumed in Savings Estimate	As Assumed in Savings Estimate				
FY/80	FY/81	FY/82	FY/83	FY/84	FY/85	FY/86	FY/87

b. DOE Manpower (FTE for CS and CS field)

Note: Same years as above

FY/80	FY/81	FY/82	FY/83	FY/84	FY/85	FY/86	FY/87

1. PRIVATE AND FEDERAL INVESTMENT REQUIRED TO ACHIEVE SAVINGS/DISPLACEMENT PROJECTIONS, BY PROGRAM ELEMENT

	FY/80	FY/81	FY/82	FY/83	FY/84	FY/85	FY/86	FY/87
a. Federal RD&D plus other CS investments ($000)								
b. Private sector investment to achieve savings projections in 9b2. (Savings Potential)								

c. Private sector investment without the effect of CS Program or the Federal Investment shown in 11a (above) _____ _____ _____ _____ _____ _____ _____ _____

13. EVALUATION STATUS

a. Summarize results of any evaluations done with in the past two years for work within this program element. Identify evaluation by name, author and date.

Note: Limit one page

b. Plans to do evaluation or evaluations underway. Give details.

Note: Limit one half page.

14. ADDITIONAL REMARKS.

Note: Limit one half page.

APPENDIX 3

PILOT EVALUATION ANALYSES

ADTECH
ADVANCED TECHNOLOGY, INC

7923 JONES BRANCH DRIVE
SUITE 500
McLEAN, VIRGINIA 22102
TEL. 703/442-4000

April 24, 1981

To: Robert A. Plunkett, Office of Policy, Planning and Evaluation
Jim Reid, Office of Policy, Planning and Evaluation

From: Tom Van Der Linden TVDL

Subject: Review of Program Element Data Sheets

1. I have reviewed the responses to the program element data sheet information requests that were distributed by PPE. The exercise was particularly useful as a pilot in aiding the refinement of the CS evaluation criteria. The following paragraphs present comments and observations on the data element sheet responses and recommendations as they pertain to the development of CS evaluation measures.

2. The following are some observations on the data sheets:

   a. As of this date, 34 program elements (80%) responded to the data element sheet request. (See Enclosure 1).

   b. Most of the respondents made a recognized effort to respond to the questions and provide data.

   c. Descriptive type questions (1-8) were, for the most part, addressed thoroughly. However, approaches to item 6, Major Objectives at Program Element level, and item 8b., Major Achievements, were addressed in varying degrees of detail. For example, responses to item 6 varied from generalized objective statements to specific milestones target objectives with dates and indicators. Achievements varied similarly.

   d. A recurring discrepancy in many of the responses is that stated achievements do not clearly relate back to the stated program objectives. This is a major problem from a program evaluation perspective.

e. Statements of achievement are defined in numerous ways in the data sheets and should be studied carefully as potential evaluation measures. For example, the achievements were expressed in terms of: employment in the program and by contractors; market size; sales level; capacity on line; R&D goal attainment; cost attainment; completion/-installation of demonstration and pilot units; completion of testing; management performance; private risk capital investment; number of applications received, processed, awarded; number of units served and beneficiaries of program; and success stories.

f. As would be expected, item 9, which addresses energy demand and savings data, raises more questions than provides substantiated answers. Keeping in mind that this very crucial set of data elements was requested on a "quick and dirty" basis, the responses and lack of supporting data/analysis indicate that there is a lot of work yet to be done in providing consistent and comparable data accross the CS programs.

- o There appears to be little consistency and no explanation regarding the energy demand sector (MBOE) definition. For example, it was not clear what the figure in item 9a and b represented in terms of a defined market sector or subsector, e.g., residential heating, commercial lighting, etc.

- o While some programs were able to calculate energy savings data, (item 9b) they were not able to answer the demand sector baseline questions (item 9a).

- o Supporting data, analysis, and assumptions should be provided by programs to verify the validity and accuracy of energy baseline and savings data.

g. Item 11, which pertains to federal and private investments in program-related endeavors and the private investment stimulated by the program and leverage, also raise suspicions similar to those raised in item f. above.

h. From the energy savings and investment data (items 9 and 11), there is no way to calculate a cost-performance measure (i.e., cost-benefit, cost-effectiveness, $/bbl saved, payback) because no supporting information is provided on the duration or life expectancy of the projected cumulative energy savings due to the investments.

i. Item 11, investment information, should distinguish RD&D investments from user implementation investments. As commercialization becomes more prominent, one might expect government and private RD&D funds to diminish. There is no data presented to indicate that this is or is not the case.

j Some program elements cannot legitimately address impact issues at that level. They must be aggregated or developed at the Office level. For example, the program elements comprising Urban Waste presented the same energy impact data, which represented the aggregate impact

of the technologies. Other programs with commercialization, market analysis and outreach elements that support a principal R&D effort have the same problem.

3. With regard to the development of CS-wide generic program evaluation measures, the following recommendations should be examined further.

   a. Energy demand sectors should be further disaggregated into subsectors and end-use categories (e.g., industrial-direct heat, residential-space heating, commercial-lighting) so that more specific target markets can be distinguished and duplicate sector/end-use impacts more readily identified.

   b. DOE should establish a common data baseline (through EIA), disaggregated by sector, subsector and end-use so that program outcomes can be measured in terms of a delta against that standard baseline. In addition, the baseline will serve as a means of appraising relative program and aggregate CS program impact in more discreet demand sectors. The Energy Indicators work in CS should be fully integrated into baseline and trend measurements.

   c. Although total projected energy savings may be a meaningful measure for many CS programs, its importance in an absolute sense is limited unless one understands the investment necessary to effect the energy savings. Cost-performance measures (e.g., cost-benefit, cost effectiveness) should be required in the CS evaluation criteria. This will likely require guidance from CS to aid consistent data use and analysis.

   d. End user, technical and economic feasibility measures (exclusive of RD&D and federal program costs) should be specified in evaluation measures. End-user cost performance could be expressed in payback, cost/BOE saved, etc.

   e. For program evaluation purposes, specific program objectives must be clearly stated and measures of program accomplishment structured directly in accordance with the objectives.

   f. CS should pursue the identification or development of alternate evaluation models or procedures that will enable more consistent and comparable progam impact calculations.

Program Element Data Sheet
Receipt Status

A. Received Total - 34

Energy Related Inventions
Appropriate Technology
Photovoltaic Energy Systems
Passive and Hybrid Solar Energy Systems
Active Solar Energy Systems
Biomass Energy Systems
Solar Thermal Energy Systems
Ocean Energy Systems
Wind Energy Systems
Electrochemical Storage Systems
Physical and Chemical Energy Storage
SERI Permanent Facility
M-X/RES Project
Solar International Technology Applications
Systems Analysis and Technology Transfer (BCS)
Appliance Standards
Technology and Consumer Products
Energy Conversion and Utilization
Waste Energy Reduction
Process Efficiency
Industrial Cogeneration
Implementation and Deployment
Community Systems
Weatherization
Buildings Conservation Services (RCS)
Small Business
Urban Waste R&D
Urban Waste Demonstration
Urban Waste Commercialization
Energy Impact Assistance
Federal Energy Management
Institutional Conservation Programs
Energy Management Partnership (SECP, EES)
DOE Showcase

B. Not Received Total - 9

Building Systems
Electric and Hybrid Vehicle
Transportation Systems Utilization
Emergency Programs
Biomass Systems
Vehicle Propulsion R&D
Alternative Fuels Utilization
Power Marketing Administration
Energy Information Campaign

1.0 The CS Evaluation Process
1.1 Introduction

This paper summarizes the principal thrusts, tasks, and interrelationships among tasks in developing and implementing the CS program evaluation plan.

1.2 Overview of the process.

In a broad sense, the evaluation process may be viewed as two major simultaneous thrusts: development and implementation/operation Although planning and development should normally precede development and operation, the dynamic program environment and current ongoing evaluations by the program offices preclude completion of thorough planning before implementing the overall process. Therefore, planning and development functions will occur simultaneously with implementation and operation functions to a large degree, with interim planning and guidance documents distributed as they are developed and approved. Consequently, the developmental process will involve a series of iterative, more refined planning documents over the course of development and operation.

The principal thrusts of the CS evaluation process are:

Development:	I	Plan Development
	II	Organization and Training
Implementation/ Operation:	III	Research and Pilot Evaluations
	IV	Implementation

2. Planning

2.1 Plan Development.

The ultimate product of the planning and development effort is the CS Evaluation Plan. The evaluation plan defines the initial concept requirements and tasks to develop and implement the evaluation process. It is being developed in the following successive stages:

- The Concept Paper defines the CS evaluation objectives, strategy and the responsibilities of PPE and the program offices in implementing a comprehensive evaluation system.

- The Evaluation Process White Paper specifies the requirements of the evaluation system, defines the issues and management decisions needed and the scope of work and responsibility of each participant in developing the evaluation process.

- The CS Evaluation Plan is a detailed definition of each task and product required to develop the evaluation process and implement the evaluation system. The plan will include task descriptions, products, schedules and milestones; resource estimates and mechanisms; an interdependent network analysis; management plan; CS evaluation criteria; schedule of evaluations; list of priority evaluations and pilot evaluations; and a reporting network and format.

Included in the evaluation plan and essential to the evaluation process are:

- CS Evaluation Criteria that will meet the information requirements of OMB Circular A-117, the Sunset Provisions and the Assistant Secretary's information requirements for policy formulation, program measurement, resource allocation, assessment of progress in fulfilling national objectives and reporting on the national energy situation. Evaluation criteria are essential to defining the information that is needed from the evaluations.

- Survey and assessment of the status and content of CS evaluations completed, in-process and planned. This information is required for planning, scheduling and establishing priorities in the evaluation plan.

Through the development process and continuing through the implementation phase, there will be an ongoing research effort on evaluation methodology and data sources to establish the program and management evaluation methods, measurement techniques and to create the data bases and sources for comparable measurements. This research will be reported on an iteritive basis in the evaluation plan and guidance documents as findings become available.

2.2 Organization and training

Concurrent with the development of the evaluation plan is the formulation of an evaluation project team composed of experienced evaluators from government, national labs, universities and contractor firms. The evaluation team has been organized to assist PPE in planning, research, analysis, and development of products in the planning phase. Assignments have been made to team members for addressing functions and tasks in the evaluation process. Project team participants will continue through the implementation and operation phases as necessary to assist PPE monitoring, data aggregation, analysis and special studies.

To facilitate two-way communication between PPE and the program offices throughout the evaluation process, a Technical Evaluation

Advisory Committee is being formed. Deputy Assistant Secretaries are appointing members to participate in reviews and meetings pertinent to the evaluation process development and implementation. The committee will provide program perspective, particular insight into criteria requirements and guidance needs of programs.

An evaluation training and workshop effort is being initiated to address information needs pertinent to the evaluation process, approaches, methodologies, sample evaluations, lessons learned and other training needs as identified. The training and workshop efforts will incorporate evolving evaluation research findings, as applicable, into training programs.

3. Implementation and Operations.

3.1 Research and Pilot Evaluations

Research efforts regarding evaluation methodology, data sources and indicators carry over into the implementation and operation phases. This research is essential in developing and refining iterative guidelines. The guidelines will address approaches, methodologies, data sources and reporting instructions for use by programs conducting evaluations so that comprehensive, consistent and comparable information is developed and reported.

Implementation of the evaluation process begins early during the planning phase with the initiation of pilot evaluations. Following the development and approval of draft evaluation criteria, the applicability and feasibility of the proposed criteria will be tested in pilot program evaluations. Pilot evaluation program candidates are being selected from diverse generic program types so that criteria are tested against broad program characteristics. Pilot evaluation will assess the capability of obtaining consistent and comparable information from diverse program types. The refinement of and revisions to criteria will be incorporated into the evaluation plan and guideline documents.

3.2. Implementation

Implementation begins with the introduction of planning documents, guidelines, and evaluation criteria into the evaluations that are conducted by the programs. Implementation also encompasses the operational functions of monitoring the status and analyzing the adequacy of evaluations, aggregating evaluation information, performing cross-cutting analyses and special analyses, and compiling reports for the Assistant Secretary.

CS PROGRAM FRAMEWORK

PROGRAMS, SUBPROGRAMS, AND PROGRAM ELEMENTS *

* The CS program structure presented on the following pages is based on the 1983 - 1987 PPBS structure as defined in December, 1980.

PROGRAM
SUBPROGRAM
O PROGRAM ELEMENT

CONSERVATION

BUILDINGS AND COMMUNITY SYSTEMS

- O BUILDING SYSTEMS
- O COMMUNITY SYSTEMS
- O TECHNOLOGY AND CONSUMER PRODUCTS
- O APPLIANCE STANDARDS
- O ANALYSIS AND TECHNOLOGY TRANSFER
- O BUILDINGS CONSERVATION SERVICES (RCS)
  - Residential conservation Services (RCS)
  - Residential/Commercial Retrofit
- O SMALL BUSINESS
- O PROGRAM DIRECTION

MUNICIPAL WASTE

- O URBAN WASTE R&D
- O DEMONSTRATION
- O COMMERCIALIZATION
- O PROGRAM DIRECTION
  - Urban Waste
  - Alternative Fuels Production

INDUSTRIAL PROGRAMS

- O WASTE ENERGY REDUCTION
- O INDUSTRIAL COGENERATION
- O PROCESS EFFICIENCY
- O IMPLEMENTATION AND DEPLOYMENT
- O PROGRAM DIRECTION

TRANSPORTATION PROGRAMS

- O VEHICLE PROPULSION RD&D
  - Advanced Automotive Heat Engine Systems Development Project
- O ELECTRIC & HYBRID VEHICLE RD&D
  - Electric Vehicle Commercialization Project
  - Hybrid Vehicle Commercialization Project
- O ALTERNATIVE FUELS UTILIZATION
- O TRANSPORTATION SYSTEMS UTILIZATION
- O PROGRAM DIRECTION

PROGRAM
SUBPROGRAM
O PROGRAM ELEMENT

ENERGY IMPACT ASSISTANCE

- O ENERGY IMPACT ASSISTANCE
- O PROGRAM DIRECTION

FEDERAL ENERGY MANAGEMENT PROGRAM

- O FEDERAL ENERGY MANAGEMENT
- O PROGRAM DIRECTION

STATE AND LOCAL ASSISTANCE PROGRAMS

- O INSTITUTIONAL CONSERVATION PROGRAMS
  - Schools and Hospitals
  - Local Government Buildings and Public Care Facilities
- O ENERGY MANAGEMENT PARTNERSHIP PROGRAM
  - Energy Extension Service
  - ECPA State Energy Conservation Program
  - Additional EMPS Activities
- O WEATHERIZATION ASSISTANCE PROGRAM
- O EMERGENCY PROGRAMS
  - Emergency Energy Conservation
  - Emergency Building Temperature Restrictions
- O PROGRAM DIRECTION

INVENTIONS AND SMALL SCALE TECHNOLOGY

- O APPROPRIATE TECHNOLOGY
- O ENERGY-RELATED INVENTIONS
- O PROGRAM DIRECTION

ENERGY CONVERSION & UTILIZATION TECHNOLOGY

- O ENERGY CONVERSION AND UTILIZATION
- O PROGRAM DIRECTION

ENERGY INFORMATION CAMPAIGN

- O ENERGY INFORMATION CAMPAIGN (CS)
- O PROGRAM DIRECTION (CS)

PROGRAM
SUBPROGRAM
O PROGRAM ELEMENT

RENEWABLE ENERGY RESOURCES

ENERGY STORAGE SYSTEMS

- O BATTERY STORAGE
  - Near-Term Electric Vehicle Batteries
- O THERMAL AND MECHANICAL ENERGY STORAGE
  - SPE Electrolyzer for Hydrogen Production
  - Aquifer Thermal Energy Demo. Project
- O PROGRAM DIRECTION

SOLAR APPLICATIONS FOR BUILDINGS

- O ACTIVE SOLAR ENERGY SYSTEMS
  - Federal Buildings Program
- O PASSIVE SOLAR ENERGY SYSTEMS
- O PHOTOVOLTAIC ENERGY SYSTEMS
- O MARKET ANALYSIS
- O PROGRAM DIRECTION
  - Federal Buildings & Market Analysis
  - Other Federal Buildings

SOLAR APPLICATIONS FOR INDUSTRY

- O SOLAR THERMAL ENERGY SYSTEMS
  - 10 MWe Central Receiver Solar Thermal Pilot Plan
  - Solar Thermal Utility Repowering Project
  - Solar Thermal Industrial Retrofit Project
  - Total Energy Experiment, Shenandoah, GA
  - Small Community Applications Experiment I
  - Small Community Solar Thermal Power Experiment
- O BIOMASS ENERGY SYSTEMS
  - Biomass Thermochemical Gasification Experiment I
- O BIOMASS SYSTEMS
- O MARKET ANALYSIS
- O PROGRAM DIRECTION
  - Market Analysis
  - Other Solar Industrial
  - Alternative Fuels Production

PROGRAM
SUBPROGRAM
O PROGRAM ELEMENT

SOLAR APPLICATIONS FOR POWER

- O WIND ENERGY SYSTEMS
  - Model 2 Wind Turbine
- O OCEAN ENERGY SYSTEMS
  - Ocean Thermal Energy Conversion (OTEC) Pilot Plan Project
  - Ocean Test Facility (OTEC-1)
- O MARKET ANALYSIS
- O PROGRAM DIRECTION
  - Market Analysis
  - Other Solar Power

SOLAR INTERNATIONAL PROGRAMS

- O TECHNOLOGY DEVELOPMENT AND APPLICATIONS
- O PROGRAM SUPPORT

SERI PERMANENT FACILITY

- O DESIGN CONSTRUCTION
  - Solar Energy Research Institute Permanent Facility
- O PROGRAM DIRECTION

INTER-PROGRAM APPLICATIONS

- O DOD SHOWCASE
- O POWER MARKETING ADMINISTRATION
- O RURAL ENERGY INITIATIVES
- O PROGRAM DIRECTION

MX-RENEWABLE ENERGY SYSTEMS

- O MX-RES
  - MX-Renewable Energy System (MX-RES) Project
- O PROGRAM DIRECTION

SOLAR INFORMATION SYSTEMS

- O CS INFORMATION NETWORK
- O PROGRAM DIRECTION

PROGRAM
SUBPROGRAM
O PROGRAM ELEMENT

POLICY AND MANAGMENT

ASSISTANT SECRETARY FOR CONSERVATION AND SOLAR ENERGY

* CS - SUPPORT

O PROGRAM SUPPORT
O PROGRAM DIRECTION

*Memo (Non-Add) Account

O	PROGRAM ELEMENTS:	TOTAL 69
—	PROJECTS:	TOTAL 213

APPENDIX 4

GENERAL EVALUATION GUIDELINES

NOTES ON EVALUATION

Status & Issues -- Federal Program Evaluation, October 1978. U.S. Gen. Accounting Office.

This is an excellent overview of evaluation from the federal program point of view. In fact, there is so much in it that it is easy to overlook some important points. Notes include:

GAO defines program evaluation as studies of programs that are effectiveness-oriented. But any program must first define what effective is. This probably means specific statement of measurable outcomes and I stress measurable.

Stated objectives, in legislation or policy, may not be only objectives. New ones may arise in the course of the project; evaluation must ferret these out. And, objectives can change, for valid or invalid reasons; a good evaluation will sort these out.

There must be some understanding of the actual program process -- how was it undertaken and how was it actually carried out.

Must determine early on just whom the evaluation will serve (policy official? Congress? public interest group? program manager?) Evaluations which serve multiple audiences often are less informative. Might be better to have several "executive summaries" slanted to the particular audience.

Section A-3 is a good summary of the design and organization of the evaluation function. These are questions which must be answered prior to actual conduct of the evaluation.

On page 26, three common mistakes (taken from Abt) are given. They are really important.

Research methodology obviously is a place where there is room for a lot of problems -- amazing how few people really know much about research methodology. I find that many persons classify themselves as expert after one introductory course. They list 17 common weaknesses.

Solar Energy Program Evaluation: An Introduction, Peter DeLeon, SERI, September 1979.

This is perhaps one of the best articles I've read. Was really pleased to receive it and plan to use it in an evaluation course I'll be teaching next fall.

The Brewer model of the policy process (p. 3) presents a good overview of how evaluation fits into the policy process. Emphasis is on accomplishment of outcomes as well as unanticipated consequences.

Formal evaluation includes: explicit description of what program is actually doing (and was intended to do if there is a major discrepancy); systematic measurement of effects of the program (need some quantitative data here); comparison of the measured effects of the program to the program objectives (both stated and unexpected); and potential for policy (actual implications,ramifications).

No one evaluation model may be adequate; a synthesis of models may be required. Or desired. This report presents, as evaluation models: 1) simple output; 2) formative/summative; 3) input/process/output; 4) process levels. Government agencies also have their own typologies.

The primer on evaluation methodology is excellent. It may be that Bob will want to use parts of this in their primer for the workshops. One key point to stress is that the final analysis of the data must be conducted in a manner to allow the basic questions to be answered. Otherwise, might as well scrap the entire thing.

Somewhere along the line there definitely needs to be a meta-evaluation.

Remainder of the report is more philosophical. Could be used in white papers, justifications.

Conservation and Solar Energy Programs of the Department of Energy, Office of Technology Assessment

A good document to point out problems, questions to be used for evaluation. Makes the point that a major deficiency is inadequate program evaluation. Without adequate evaluation have no way of determining which program should be expanded or withdrawn. Also points out that programs often are not linked to solar and conservation goals, nor do present programs appear adequate to meet the goals. (Obvious is -- goals should be more realistic or programs should be modified -- either represents major policy shifts where evaluation can and should play a substantial role.) Once the goals for C&SE are determined and the specific -programs have clearly defined goals, these should be translated into statements which can be measured. Then the data must be collected then analyzed and then translated into understandable reports for different audiences. This report also points out that new techniques may be needed to understand efforts to conserve energy. (If I were an assist. secretary, this one effort would be of primary concern-- I would want to sell conservation, solar and would use evaluation as a tool to do just that.)

Energy Conservation: An Expanding Program Needing More Direction, GAO, July 24, 1980

As one reads these documents about the conservation programs at DOE, a central theme emerges: there is no consistent, systematic program for conservation and no method of determining whether worthwhile conservation is being achieved. One has the impression that conservation is a type of stepchild of DOE, tolerated but not overtly abused. There does appear to be a subtle type of abuse, however. If clear goals are not established, if goals that are established are constantly revised, if no national plan is established, if no milestones are set, if there is no systematic interrelationship between programs, if programs are unrelated to what goals there are, then C&SE has little, if any, opportunity of success. Evaluation will not solve all these problems. It may help of bring some of them into sharper focus. The document points out that DOE needs (I would say must) to develop its own set of criteria to effectively assess program options. One clear advantage of mandating evaluation -- it will force the establishment of goals and monitoring methods if there were none before.

Evaluation Models

Some general thoughts about evaluation

1. It's probably not a good idea for evaluation to focus on whether a program has attained its goals.
2. What ever the evaluation decides to measure or assess tends to become the goal of the program.
3. Evaluators probably will meet resistance if they try to ask difficult questions of entrenched programs.
4. Data collection can only be planned after the evaluator knows a great deal about the project.
5. Data collection should generate information (facts) useful to both proponents and critics of a program.
6. Evaluation should be flexible and questions should show diversity and should invite a differentiated answer.
7. An evaluation report can defeat its purpose if it attempts to report every detail to the nth degree.
8. Reality may dictate a less than scientifically rigorous approach.
9. In a very real sense, the evaluator becomes the historian of a program.
10. Information should be relevant.
11. Questions should be squarely addressed.
12. External validity (ability to generalize) is the key; emphasis on interval validity can reduce the relevance of the evaluation.
13. The laboratory research design is rarely appropriate for an evaluation.
14. Federal programs make most basic research decisions without consulting evaluators.
15. Since the purpose of evaluation is to provide information for decision making, it is necessary to know the decisions to be served.
16. Different types of decisions (planning, implementation, policy) require different types of evaluation design. A generalized and efficient model should be structured accordingly.
17. A large scale evaluation is not necessarily better than a small one.

Types of Evaluations

1. Context evaluation. The purpose is to provide a rationale for determination of objectives. It defines the relevant environment, describes the desired and actual conditions, identifies unmet needs and/or unused opportunities, and diagnoses the problems that prevent needs from being met and opportunities from being used. It is macro analytic. The methodology of context evaluation can be divided into two modes: a) contingency and b) congruence.

a) contingence. It searches for opportunities and pressures outside of the immediate system to promote improvement within it. If-then questions are asked.

b) congruence. Compares actual and intended system performance. Discrepancy information is then reported.

2. Input evaluation. This provides information for determining how to use resources to meet program goals. The end product is an analysis in terms of costs and benefits. It is micro analytic.

3. Process evaluation. The objectives include detecting or predicting defects in the implementation state and maintaining a record as implementation occurs.

4. Product evaluation. Its purpose is to measure and assess attainments. Product evaluation reports that objectives were or were not achieved. Traditionally, experimental design has been the recommended strategy for conducting product types of evaluation.

Alternative Evaluation Designs

These designs are the traditional experimental/quasi-experimental designs often recommended for evaluation. Symbols to be used:

R = random assignment, where "subjects" are randomly assigned to treatment (intervention)

I = intervention or treatment

M = measurement.

Treatment or intervention refers to a program, policy, or practice being evaluated.

1. One shot case study. I ----------→ M

Involves the administration of measuring devices to a group of clients who have received some program. The evaluator notes what happens to those who receive the program or intervention. This design may be useful in the beginning stages of a formative evaluation.

2. One group pretest-posttest. M ----------→ I ----------→ M

Consists of pretesting and then posttesting a single group, that between the testings, has been exposed to some sort of intervention. This design may be useful in a formative evaluation. Care should be taken that the pretest does not affect the performance on the posttest.

3. Nonequivalent control group design.

Group 1: M ----------→ I ----------→ M
Group 2: M ----------→ M

Uses two or more groups, all of which are administered a pretest, and following intervention, the posttest, with one group serving as control. The major application of this design arises where it is impossible to randomly assign to groups. The more similar the comparison groups, the more straightforward will be the interpretation of the data collected. The less similar the groups, the less likely one will be to make defensible inferences from the data.

4. Pretest-posttest control group design.

Group 1: R M ----------→ I --------→ M
Group 2: R M ----------→ M

Clients are randomly assigned to the groups. Data can easily be interpreted. If the pretest is reactive, its influence may confound the design.

5. Posttest only control group design.

Group 1: R I ----------→ M
Group 2: R M

No pretest is given. By measuring an untreated, randomly assigned control group one can secure an estimate of how the treated control group would have responded on a pretest without introducing a pretest.

5. Interrupted Time-series design.

M_1 -------→ M_2 ---------→ M_3 -------→ I -------→ M_4 ---------→ M_5 ---------→ M_6

A series of measurements (the more the better) is taken both before and after the intervention.

lodels

1. Formative-Summative model.

Formative evaluation involves the assessment of progress toward the identified goals while the program is still in progress. Under this model, "midstream measurements" would be taken, and the extent to which the program appeared to be meeting these criteria could be assessed. A formative evaluation is concerned with questions such as:

-does the program seem to be working as originally planned?
-are all components of the program functioning effectively?
-should the program be implemented elsewhere?
-are there serendipitous events that should be incorporated into the formal structure of the program?

Summative evaluation is useful in determining the extent to which the final, end of product goals of the program were actually met. It is an after the fact event, at a time when recommendations for program changes may well be influenced by the availability of time, money, and staff. Summative evaluation questions might include:

-what do the clients do now that they did not do before? (e.g., what conservation measures do they actually use)
-to what extent have attitudes and/or behaviors changed as a result of the program?
-have the goals and objectives set forth by the program developers been met?

2. CIPP model.

The emphasis is on provision of information for decision makers. Data are collected and presented to someone else who will determine their worth. Identification of information is usually done by the evaluator and the decision maker working jointly. The actual data collection is done by the evaluator. The last step is the provision of information as a basis for decision making and again is a cooperative effort between the evaluator and decision maker. This model uses Context (C), Input (I), Process (P) and Product (P).

3. CSE-UCLA model.

This model emphasis the provision of the information required by decision makers. It requires a series of decision to be made at each of several stages:

1. Is there a discrepancy between the current status of the program and the desired status?
2. The emphasis here is to plan a program to meet the needs identified in stage 1.
3. Is the program being carried out as was specified in the original plan? Changes should be identified, described, and evaluated in terms of the degree to which they facilitate the attaining of the objectives.
4. To what extent is the program meeting the objectives? Special attention is given to the products that have been developed during the program up to this point. Are there some components of the program that are more successful than others? What products are available?

5. What is the overall worth of the program? To what extent did it meet the identified objectives? The decisions to be made here include: what will happen to the program? will it be implemented, revised, or dumped?

4. Countenance model.

This model terms the decision making process judgment.and adds the dimension of description. Three aspects of the evaluation are: the antecedent phase, or the period before the program is implemented. The description of the antecedent phase would also include the identification of conditions existing prior to the program that might affect the results. The second phase is transaction, or the actual process of implementation. Is the program being delivered as intended? The third phase is outcome or measures of the effect of theprogram after its completion.

Antecedent Phase:
- -description
  - *intents (what goals are specified, what effects are desired)
  - *observations (data concerning the activities and events taking place during this phase; description of existing conditions)
- -Judgments
  - *standards (criteria to be used as basis of comparison)
  - *judgments (the process of comparing the intents, observation, and standards)

Transactional Phase:
- -Description
  - *intents (the planned intervention)
  - *observations (actual behavior of clients)
- -Judgments
  - *standards (criteria to be used as the basis of comparison)
  - * judgments (the process of comparing the intents, observations, and standards)

Outcome Phase:
- -Description
  - *intents (what are the intended or predicted outcomes of the program?)
  - *observations (the data gathered at teh end of the program)
- -Judgments
  - *standards (criteria to be used as the basis of comparison)
  - *judgements (the process of comparing the intents, observations, and standards)

5. Goal Attainment Model

The emphasis of this model is on the determination of the extent to which the goals defined for the program have been attained. The important first step is the specification of the goals. Each goal should be operationally defined. After the delivery of theprogram, the measurements are gathered and the success of theprogram is judged in terms of the extent to which the goals have been attained.

6. Discrepancy Model.

The discrepancy is between the standards set for the basis of judgment and the actual performance of the program during and after completion. Standards to be used must be stated at the outset. If a discrepancy is found, a decision must be made as to whether to change the program or the standards. The first discrepancy analysis comes during the installation phase and involves questions such as is the program being installed as the designed intended? The second discrepancy analysis comes during the actual implementation phase and addresses issues such as does the program seem to be working as it was intended. The third discrepancy analysis comes after theprogram has been completed and asks questions such as did the program fulfill the objectives for which it was designed? The fourth discrepancy is concerned with a cost-benefits analysis.

7. Goal free evaluation.

The emphasis is on the results, whether they were planned or unplanned. The evaluator must specify the variety of ways in which a program could have potential impact on the clients and then collect information to determine the actual impact.

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April 20, 1981

To: Dr. Robert Plunkett
Office of Policy, Planning and Evaluation

From: Tom Van Der Linden TVDL

Subject: Sunset Pilot Mini-Reviews

1. During the past three weeks, we have met with several programs to discuss their perspectives and approach to the Sunset review questions. These pilot reviews were intended to elicit issues and guidance requirements that may be applicable to conducting the Sunset review. In particular, the programs were provided a list of the Sunset questions, sample response guidance, and sources of data that could be useful in developing a response. This Sunset Worksheet is presented as Attachment 1. The meetings addressed and discussed the following issues.

   a. How should and would your program respond to each of the 14 Sunset items?

   b. What data is readily available to respond to items? Source Documents?

   c. What data and analysis must be developed to respond? approach? schedule? cost? manpower?

   d. What guidance/standards are necessary to structure a response?

   e. Recommendations for developing a CS response to Sunset?

   f. Other comments or recommendations pertinent to the Sunset review?

Pilot reviews were conducted with program representatives from Consumer Products, Building Energy Performance Standards, Energy-Related Inventions, and State and Local Assistance Programs. In addition, a more informal discussion was held with Residential Conservation Service program staff on Sunset.

The attached worksheet was completed for each program to record their responses. Rather than reiterate an item by item summary of the Sunset pilot reviews, a summary of major findings is presented in the following paragraphs.

- Sunset questions 1,3,4,5,8,10,11,12, and 14 are believed to be relatively straight-forward and can be compiled readily from existing sources of information with minor modifications.

- Item 2 is generally believed to be straight-forward. However, some programs believe that their stated objectives may be in conflict with the new interpretation of the federal role. In such cases, they feel that guidance on the proper federal energy role may be necessary so that objectives can be reoriented as necessary. This item relates to Item 11, which is essentially believed to be a writing job.

- Item 6 may be difficult to answer for programs that have undergone numerous organizational and administrative transitions. The reinterpretations and changes in direction resulting from management and policy turnover must be reconstructed and explained. This assumes that either good documentation or "corporate memory" is available.

  In addition, expressing achievements in terms of performance, impact, or accomplishments should entail measurable data which reflects the intent and objectives of the program. Few programs are in a position to offer real data to support impact claims, especially in terms of energy savings. Instead they will rely on analytical appraisals with whatever data is available. This is characterstic of the evaluation problem in CE.

- As addressed in Item 6 above, Item 7 has similar data problems and historic documentation or "corporate memory" problems. In addition, Item 7, alludes to conducting cost/benefit analysis in that each of the four previous years performance and accomplishments are to be presented with budgetary costs. If cost/benefit analysis is required, guidance will be required in attributing allowable benefits and quantifying those benefits.

- Item 9 is interpreted as being both retrospective and prospective. The challenge of this item received a broad range of responses from programs including: a. this item can be addressed with existing technical support documentation or economic analysis, b. this item can be addressed in an existing model, but input data must be prepared; c. data and methodology does not exist for addressing this item.

The prospective side of this item must reflect anticipated future impacts under future funding scenarios, which are addressed in Item 13 below.

- o Item 13, which is a projective question, requires major guidance on the budget baseline level the "greater than" and "less than" budget level, and the outyear period of projection. As discussed in Item 6 above, there are some data problems associated with projecting impacts in terms of energy savings, but almost all programs are prepared to perform this analysis to varying degrees of reasonableness.

2. Other issues and comments raised by program offices include:

- What is the definition of a program?
- Should programs with a zeroed budget in FY 82 respond?
- How much effort should be expended on this effort if FY 83 funding decisions have already been defined in accordance with the declining federal role in energy matters?
- What is an acceptable document length?
- Program Offices should be responsible for aggregating results of program elements under their cognizance.
- Programs are seeking guidance on when and how the Sunset items should be addressed.

Sunset Review Worksheet Program Element:_____

(1) The name of the component of the Department responsible for administrating the program.

- DOE organizational unit directly responsible for administering program.

(2) An identification of the objectives intended for the program and the problem or need which the program was intended to address.

- List objectives or goals stated in authorizing legislation and cite legislation title and number.
- List strategic objectives addressed by program.
- List principal program-specific objectives.
- Check CS Objectives Book.
- Describe changes in program objectives, emphasis, etc. due to changing needs, organizational changes, etc. and the program redirection that resulted. Provide details on the circumstances, date, etc.

(3) An identification of any other programs having similar or potentially conflicting or duplicative objectives.

- Both DOE and other Federal or State programs.
- Cite functional distinctions, integration efforts, and responsibilities.
- See DOE Organization and Functons document and Objectives Book.

(4) An assessment of alternative methods of achieving the purposes of the program.

- Describe alternative approaches. Were they addressed in a program development study? Cite pros and cons.
- Why is this program the best approach to achieving the objectives?

(5) A justification for the authorization of new budget authority, and an explanation of the manner in which it conforms to and integrates with other efforts.

- See Program Memoranda, Gold Books, and Budget Package.
- This should agree with integration efforts described in Item 3.

An assessment of the degree to which the original objectives of the program have been achieved, expressed in terms of the performance, impact, or accomplishments of the program and of the problem or need which it was intended to address, and employing the procedures or methods of analysis appropriate to the type or character of the program.

- Check data element sheets, evaluation reports, and Gold Books for performance impact measures and accomplishments.
- Quantify results wherever possible.
- Cite studies and results conducted by DOE.
- Cite external reviews, evaluations, university studies, news articles, etc.
- Cite expert panel reviews, conferences, etc.
- Cite successes or failures of procedures and methods and how these have been revised to ensure effectiveness.
- Remember the original objectives that the program is pursuing.

(7) A statement of the performance and accomplishments of the program in each of the previous four completed fiscal years and of the budgetary costs incurred in the operation of the program.

- Applicable for FY78 - 81.*
- Program Memoranda, Gold Books, Program Approval Documents (PADs), Program Plans, Budget Request Packages, Office of Budget and Management Records.
- Budgetary costs are actual expenditures, not commitments or unexpended obligations e.g., loan guarantees.
- Performance and accomplishments should be quantified wherever possible.
- Cite studies, external reviews, panel results, evaluations, news articles, etc.

* Based on FY82 Reporting Date

3) A statement of the number and types of beneficiaries or persons served by the program.

- Not only numbers but characteristics such as rich, poor, elderly, large/small businesses, high energy cost areas, troubled industries, energy-vulnerable areas, geographic distribution etc.

- This should be supported if possible, by the particular need for the program by recipients.

i). An assessment of the effect of the program on the national economy, including, but not limited to, the effects on competition, economic stability, employment, unemployment, productivity, and price inflation, including costs to consumers and businesses.

- The emphasis is on current and retrospective. The present and past must be addressed before citing the results of predictive analyses or models.

- Focus on results of economic impact analyses, environmental impact analyses, regulatory impact analyses, market impact analyses, etc.

- Quantify wherever possible and cite internal and external reports/reviews.

- Provide cost/benefit analysis or other economic measure. If study has been performed, cite it.

10) An assessment of the impact of the program on the Nation's Health and Safety.

- Cite EAs, EISs, and Environmental Development Plans (EDPs).

(11) An assessment of the degree to which the overall administration of the program, as expressed in the rules, regulations, orders, standards, criteria, and decisions of the officers executing the program, are believed to meet the objectives of the Congress in establishing the program.

- Legislative analysis performed? Refer to legislative records and congressional records to identify congressional intent in establishing the program.

- Does the program as presently defined and operating accurately reflect the congressional intent and objectives?

- Review source and reference documents in responding to this item.

(12) A projection of the anticipated needs for accomplishing the objectives of the program, including an estimate if applicable of the date on which, and the conditions under which, the program may fulfill such objectives.

- Describe resource levels, prices, regulations, information dissemination, institutional aid, and other conditions under which program objectives are being or will be met.

- Describe market barriers and disfunctions, and R&D gaps which must be overcome to meet objectives.

- Refer to the Gold Books and Program Memoranda.

3) An analysis of the services which could be provided and performance which could be achieved if the program were continued at a level less than, equal to, or greater than the existing level.

- Refer to Program Memoranda and Gold Books.

(14) Recommendations for necessary transitional requirements in the event that funding for such program is discontinued, including proposals for such executive or legislative action as may be necessary to prevent such discontinuation from being unduly disruptive.

- How can this function be integrated with other functions?

- What actions should be taken to eliminate disruptive impacts? What are those impacts?

APPENDIX 5

PROGRAM EVALUATION ANALYSIS

META EVALUATION OF THE STATE ENERGY CONSERVATION PROGRAM

Evaluation Conducted by Energy and Environment Analysis, Inc.
March, 1980

Evaluation Methodology

The objective of the evaluation was to evaluate the actions initiatives taken by the states and to assess the ability of the state conservation programs to meet the legislated EPCA and ECPA objectives. An evaluation team of five persons was formed at Energy and Environment Analysis, Inc (EEA); they selected a sample of nine states. For the sample selection, three criteria were considered: 1) economic, demographic, energy consumption, and other physical characteristics of the states; 2) program measures described in state conservation plans; and 3) subjective comments of the DOE regional staff. The sample was selected in such a way as to represent a wide-spectrum of characteristics. The evaluation team was careful to point out that the sample was biased in terms of industrial energy consumption due to the inclusion of heavily populated states as well as energy production states.

The interview questions and data worksheets were prepared by the team, pinpointing areas of inquiry for the regional DOE level, and for the sample states.

The methodology was pre-tested in West Virginia, which is a weakness of the methodology -- normally a pre-test "subject" is not included in the final sample, as West Virginia was. The final report implies that following the pre-test, questionnaires and worksheets were revised but that the pre-test data from West Virginia was included in the final results. Revision of instruments probably means that data from West Virginia is not directly comparable to the other 8 states.

Following the pre-test, data collection occurred in the remaining eight states and in the nine DOE regions. Each data collection session typically took two days and involved two team members. The report carefully points out the individuals who were interviewed.

Following the field visits, EEA briefed officials at DOE headquarters; during this phase of the evaluation, data were collected from OSGP on policy guidance, relationships with other DOE divisions, and use of contractors. Key DOE headquarters personnel were interviewed.

Data analysis was then conducted and financial information and other follow-up information collected. The final phase of the evaluation was the preparation of the report.

verview of the report

This is a highly organized report, presenting the information in logical order. Background and basic program are described, with information given about the eight basic programs states were required to implement.

The program's objects are clearly stated (in list form), with the findings of the evaluation team about each objective. This approach to presentation of findings is highly satisfactory, because a reader can easily identify not only the objectives, but the findings about each. At this stage of the report, data for states are combined (e.g., each state result for each objective not presented separately). Also presented are the findings of the team about DOE's management of the program and findings about the state meanagement of theprogram. In addition, findings are given about the quality of state plans and the implementation of the plans.

The evaluation team made five specific recommendations for changes in SECP, stemming from the findings in the evaluation. In essence, this evaluation performed as an evaluation should -- identification of objectives, evaluation of how those objectives were being met and recommendations based on the evaluation.

Specific data are also provided, such as financial information (federal and state), energy savings data, staff information, and economic sectors.

This evaluation strikes a good balance between being responsive to the program and objectively assessing the implementation of the program. The overall impression is of an evaluation which is objective, carefully conducted, which leads to concrete recommendations.

Significants points raised in the evaluation

In the final reports, several issues are raised which easily can generalize to evaluation of other energy programs. They include:

-without federal funds, some states would eliminate or curtail conservation activities.

-achieving energy savings through state action is extremely difficult. A major part of this difficulty lies in the problem of reaching the target audiences who need the help. The report also points out that people do not always act as predicted.

-incremental value of energy savings from SECP is not measurable.

-evaluation is rarely considered in program design; as a consequence there is no base line against which progress may be measured.

-states place a low priority on gathering and analyzing data which determine cost effectiveness of a program.

-the most effective conservation measures are those that tend to be simple ones implemented by highly motivated people.

-EPCA mandatory measures were much more successful than the mandatory measures in ECPA.

-DOE regional offices are understaffed to carry out their responsibilities.

-DOE national headquarters needs some authority over regional offices for effectiveness of program implementation.

-either state or DOE regional offices or both have diverted SECP program resources into other programs, largely due to lack of DOE headquarters control.

-DOE is lenient about providing extensions; no program grant has (to date) been terminated. No policies are provided for defunding a state.

-DOE technical assistance for specific program measures was generally not successful. States tended to rely on assistance from universities, private consultants, etc.

-DOE's monitoring and evaluation efforts have generally been superficial and of limited value. Monitoring should provide data, locate programs in trouble, and provide for technical assistance. To date monitoring efforts have not provided enough precise information to judge accurately the effectiveness of the SECP programs.

-few states provide direct state financial support for SECP activities.

-program staffing delays and turn-over were ongoing problems in most state SECP programs.

-delays in program implementation are the rule.

-utilities can play a key role in implementing energy conservation programs, but it has been difficult for most of the state energy offices to get them involved.

-much of the state implementation efforts is dissipated on conservation programs with minimal energy savings.

-mandatory programs should only be included in new legislation if they offer significant energy savings and performance requirements can be clearly specified.

-states were generally unwilling to accept the costs or sacrifieces of implementing conservation programs in the transportation sector. Those that have been implemented account for very small energy savings.

-cost effectiveness should be considered as an explicit criterion when programs are designed.

-many state programs tended to consider evaluation only at the completion of a program.

-because each state grant was partially related to estimated energy savings in the state, states had a strong incentive to claim whatever measures and savings that DOE regional offices would allow.

-review of state plans at the regional level was often delayed due to inexperienced staff and extraordinary attention to detail.

-absence of rigidly defined national policy on allowable programs caused confusion among the states and inconsistency from region to region.

-milestones in state plans were often inconsistent and often comparable. Vague milestones frequently meant that a program had been inadequately developed, resulting in potential implementation problems.

-most state plans included the following deficiencies: a) lack of an adequate analysis of potential obstacles to specific conservation programs; b) absence of implementation alternatives or contingency plans; c) inadequate pretesting or implementation phasing of major programs; d) inadequate plans for evaluation; e) inconsistent reporting of program measure funding or projected energy savings.

-there is a need to increase communication between states on problems and solutions to conservation program implementation.

EVALUATION OF THE ENERGY EXTENSION SERVICE PILOT PROGRAM EVALUATION REPORT
YEARS ONE AND TWO

In general, this evaluation report is fairly complete and generally well written. Other than its sheer length, a lay person should be able to understand the information presented.

In the Year One Executive Summary, the purpose of the evaluation is given as "to determine which programs worked best under what conditions." The Year Two Executive Summary states the purpose of the evaluation as twofold: "to assess the impact of the program over the two years of the pilot effort" and "to ascertain which programs work best and why, in order to guide States (sic) in designing programs for the nationwide EES effort." (p viii and p 5)

A thorough review of the three volumes for the Year One report and the two volumes for the Year Two report revealed that no attempt was made to meet the stated purpose of determining which program(s) worked best and why. The second purpose of assessing the impact of the program over the two years was addressed in the Year Two report.

This evaluation will focus primarily on the two volumes entitled Executive Summary; the other volumes are presentations of descriptive information about each state project and the surveys conducted for the evaluation.

Volume I: Year One.

The evaluation was carried out by ICF Incorporated of Washington, D. C. with a subcontract to Westat Incorporated of Rockville, Maryland, in collaboration with the Department of Energy and the ten pilot programs of the Energy Extension Service (EES).

The major weakness of the evaluation report is that data are collapsed across states (e.g. clients vs. non-clients, rather than clients of Texas vs. clients of New Mexico) so that the purpose of the evaluation becomes to assess whether clients behaved differently from non-clients, relative cost per client, and the impact of the EES program in general. I think this one mistake places the entire report in question. As I understand the EES program, a major purpose of funding 10 pilot programs was to determine what approaches worked, what management plans were most efficient, etc. One can glean a little of this by careful reading of the descriptive volumes, but no attempt was made to compare states. And no attempt was made to answer why some of the programs worked well and others appeared not to work at all. If the only purpose of EES was to determine whether an extension service would have an impact why not fund only one program? That would have been cheaper and would have answered the question much more efficiently. The only possible reason for funding 10 programs, with flexibility, should have been so that they could be compared.

Specifically in Volume I:

p. 18: Table III-1: the summary of mean activity measures should have been presented in aggregate and then by state (by state was not done). Aggregate information for cost is relatively meaningless in programs as diverse as these were. What was the cost of residential programs in Alabama, which had problems, as compared with Washington which was successful? etc. This criticism hold for almost every table in this volume, and rather than detail each, I simply will choose those which appear most crucial.

p. 19: workshop cost is listed as $10 to $120 per client served -- I assume that the variation was between states, not within states. But these data are not useful in this form unless explanatory information is provided. No one should have to dig around in the second and third volumes to try to find it. The same criticism holds for hotlines.

p. 19: the report states that EES programs for residential target audiences had less impact on clients than those serving small business or public institutions. Again, there were wide variations in residential programs and the method of aggregating data may have served to mask some important results.

p. 20: the analysis of variance, one-way, I assume, used 17 dependent variables with 13 independent variables! ! ! I do not know how they interpreted any of this (this was done by program and the fact that this is almost beyond interpretation may have been the cause for the breakdown in the rest of the report.

p. 48: budget authorized and expended -- aggregate information. Need this by state.

p. 49: mean cost per client, target achievement rate and response rate by service type: aggregate date; need this by state.

p. 53: a provocative statement: "Generally, programs fell short of activity goals." Was there any program that generally met activity goals? Were some worse than others?

p. 56: EES emphasis prgrams achieved one response for each five contacts. I assume this is an average. Or is it? Previous explanation is not totally clear. And was there variation between states? (I hope so.)

p. 68: table V-2 compares Tennessee with all EES small business clients. This is a more information type of analysis than the simple aggregate.

p. 74: attitude change: I have some fundamental questions are reliability here. I could not find anything to indicate that reliability measures were calculated. (Attitude is somewhat unstable and these results probably reflect that.)

p. 80: Table V-9 is excellent. A lot of information here.

p. 81: Table V-10 is just the opposite of V-9 -- no useful information.

p. 82: Table V-11. I spent a lot of time here. Useful, but the text does not attempt to explain the "whys." For example: why did 47% of Alabama say the program had no influence? Why did 77% of Texas say it did? What was the explicit difference in the two programs? Would anyone want to replicate Alabama's efforts? Would everyone want to replicate Texas' efforts? and so on.

p. 84: N = 1359; that's total for all states. (I assume)

p. 90: Again, a good table, very informative.

The methodology for estimating energy savings appears satisfactory.

p. 110: Table VI-3 again a good table once you figure out what the numbers are.

Statistical Analysis. the one-way analysis of variance is weak. The text they cite is Downie & Heath, which is a very low-level book for psychology and education (I use it with students who suffer extreme math anxiety and need an easy-to-read text.) My reaction when I saw the citation was shock. My impression after reading their procedures section and the presentation of the results is that analysis of variance is not a procedure this team knew anything about. A case in point is the use of the term posterior for the technical term a posteriori. But, more important, what a posteriori test did they use? There are about 7 or 8 of them, some with great power, and some very conservative. It is incredible that they actually did 234 analyses of variance -- the error rate is excessively high. My calculations indicate their estimate of a Type I error (their 50/50) is low -- I calculated a .65 chance of committing a Type I error (saying something is significant when the results are due to chance alone). This level of Type I error is unacceptable. The authors should have taken the alpha level (.10) and divided it by the number of tests conducted (234) to give the required significance level to control the rate of errors (it should be obvious why I was astounded that someone would choose to conduct 234 analyses on the same data set).

A less conservative approach would be to take each dependent variable and determine the number of times it was used in analysis (e.g. percent attitude change -- used in 13 analyses of variance and in 3 a posteriori tests -- so the alpha level of .10 would be divided by 16 to yield the correct alpha level for determining significance.) Of course, the major criticism of this evaluation holds for these analyses -- all data have been aggregated.

The multivariate approach obviously is the better method of handling this complex data set and the AID program looks interesting. Results, while not definitive, are promising. Regression analysis is where I would have started with the data.

Implications. I agree with their stated implications, but again find that not enough has been done with the available data.

Volume III: Year One

This volume presents energy saving methodology, program by program. The methodology looks reasonable and the results valid. It is this volume that most persons interested in the program or in replication of a state program should begin with. While states are not compared, basic data for each state is presented. A diligent person can draw some basic conclusions about the success/failure of each.

This volume also presents the evaluation procedures (they look good). The data collection forms seem to be complete, but the format is really awkward -- I would have hated to take data from them. This type of format leads to high rate of error in coding and/or keypunching.

They obviously had sampling problems and that is to be expected. I think they did the best they could with a difficult situation. The questionnaires also look good.

This same information is presented in the Year II report -- also with the statement that Westat pretested their questionnaires. I felt very comfortable with the Westat report. I would tend to place faith in their results.

Volume II: Year I:

This volume presents a case-study description of each state program, along with a fairly detailed description of the two programs in each state selected for in depth study and survey (those results presented in volumes III and I).

This volume seems to be quite adequate.

Volume I: Year II:

The comments made about the Year I report also hold for the Year II report. The entire focus of this report seems to be on impact over time.

The rationale for selection of programs to be used for the evaluation are reasonable.

The qualifications presented on p. 13 are points well-taken. Point #4 needs some additional information -- when the N is as large as their (over 1,000) significant differences may simply be an artificat of sample size and nothing else. That, taken with error rate, makes one be exceedingly cautious in accepting significant differences as such.

p. 79: Conclusions address two areas -- impact and costs. Nothing is addressed toward the question of what programs worked best and why. I also would have liked to see something on the basic issue of whether the EES program(s) are worth extending to all states (although that issue may have been decided by the time this report was written).

p. 44: Appendix VII: statistical methodology. They are testing the difference between proportions. Although they state that the formula is directly from Downie & Heath (no year given), I was unable to find this exactly. They have (seemingly) substituted symbols in the denominator at the bottom of the page. The denominator is simply a standard error of the proportion for each group, pooled.

Volume II: Year II:

Again this volume presents a case-study descriptive of each state program. Those programs accepted for in-depth study are also detailed.

Peggy J. Blackwell
12/12/80

10/27/80

Comments on SUEDE Interim Evaluation Report, October, 1980

1. The objectives of this program use primarily oriented toward economic and social development - little emphasis on the solar/renewable issues.

2. The purpose and use of the evaluation is not stated nor is it clear, although it may be inferred from the questions asked.

3. The comments in quotes on page 2 could be a useful unplanned finding.

4. The outcomes on page 2 are not very clear or conclusive for an evaluation findings report.

5. Question #10 on page 7 is very subjective: Why was that question asked? Are questions #6 and #19 somewhat redundant?

7. I question whether or not the telephone interview was the best mechanism for conducting a formative-type of evaluation like this. A face-to-face discussion would have enabled more personal interaction and pursuit of unplanned issues. There are instances where this approach has yielded very useful findings. The statement on page 9 that "... until a more complete description of SUEDE exists, the telephone interview must be utilized." does not make sense.

8. Page 21. Community linkage purpose and expectations should be described in more detail. How does this affect the objectives of the program?

9. Based on the number of questions that were asked (I don't believe the number of actual respondents was given), the conclusions are very weak and appear to evade the issues that were to be addressed. Does this program appear to be accomplishing what it was intended to do? Why? How well, how poor? How can the effectiveness be enhanced?

10. The Casebook (a program information category listed on page 9) was not addressed in the conclusions or elsewhere although questions were asked pertinent to it.

Survey and Analysis of CS Evaluation Efforts

Summary
CS Program Evaluation Status

	Completed	In-Process	Plan under Development	Planned
Building Conservation Services				
- Residential Conservation Service			X	
- Commercial and Apartment Conservation Service			X	
- Innovative Conservation Delivery Systems Demonstration Program			X	
Appliance Standards				X
Technology and Consumer Products				
- No Cost/Low Cost	X			
Community Systems		X	X	
- Comprehensive Community Energy Management		X		
Vehicle Propulsion RD&D				X
Transportation Systems Utilization				
- Driver Awareness Program				X
- Voluntary Truck/Bus Program				X
Institutional Conservation Programs		X	X	
State Energy Conservation Programs	X		X	
Energy Extension Service	X		X	
Weatherization Assistance Program		X	X	
Emergency Energy Conservation Programs				
- Emergency Building Temperature Restrictions	X			
Energy Related Inventions			X	
Appropriate Technology Small Grants Program		X		X
Active Solar Heating and Cooling		X	X	
Passive Solar Energy Systems			X	

Attachment 1

PROGRAM

Buildings and Community Systems

o Building Systems - Building Energy Performance Standards	Following congressional decision whether final BEP standards are mandatory or voluntary, quad reduction and penetration rates will be established for annual evaluation.
o Building Conservation Services - Residential Conservation Services - Commercial and Apartment Conservation Service - Innovative Conservation Delivery Systems Demonstration Programs	Evaluation Plans are being developed for the three program subelements listed. Evaluation measurement criteria for penetration and energy savings are being developed for RCS.
o Appliance Standards	Evaluation of the certification and enforcement of final regulations tentatively scheduled for mid-1981. Energy economic and industry impact analyses have been conducted for proposed regulations.
o Technology and Consumer Products - No cost/Low Cost	No cost/low cost Evaluation Completed. Conduct numerous market impact and technical economic performance analyses of products.
o Community Systems	Conducting prototype evaluations in the division (i.e., evaluability assessments of programs) with results available in December 1980. Specific evaluation designs will be developed in early 1981 for implementation later in the year. Since 1978 Comprehensive Community Energy Management Program has conducted ongoing evaluation of 17 communities for effectiveness of process and approach.
o Small Business	
o Analysis and Technology Transfer	Developed and maintain BCS project selection threshold model and resource allocation model.
o Energy Impact Assistance	

Attachment 2

PROGRAM	EVALUATION
Industrial Programs	
o Waste Energy Reduction o Process Efficiency o Industrial Cogeneration o Implementation and Deployment	No overall Office evaluations have been conducted. Data available through threshold criteria and ISTUM computer models; Energy Impact Scoreboard; and 2nd Year Project Analysis. The National Academy of Sciences conducts an annual review of overall program composition and directions.
Transportation Programs	
o Vehicle Propulsion RD&D	Gas Turbine and Stirling Programs are subject to the Energy System Acquisition Reviews in November, 1980 and April 1982. An annual evaluation is required by the automotive Propulsion Research and Development Act, P.L. 95-238 for report to congress
o Electric and Hybrid Vehicle RD&D	Ongoing Opportunity and Risk Analyses and an Environmental Development Plan have been completed. Have developed evaluation measurement criteria.
o Transportation System Utilization	Specific evaluations will be performed on the Driver Awareness Program and the Voluntary Truck/Bus Program.
o Alternative Fuels Utilization	Conduct monthly project reviews against project work statements.
Energy Conversion and Utilization Technology	
o Energy Conversion and Utilization	Detailed program planning will begin in October 1980 for new program. Evaluation will be planned in from initiation. Rate candidate projects with a Project Appraisal Methodology (PAM).
State and Local Assistance Program	
o Institutional Conservation Programs - Schools and Hospitals - Other Local and Government Building Grants	Evaluation plan under development for 1981 evaluation activities. Plan scheduled for completion end of December 1980. Evaluation will address objective achievement, program penetration and energy savings.

PROGRAM	EVALUATION STATUS/REMARKS
o Energy Management Partnership - Energy Conservation and Production Grant (ECPA) - Energy Policy and Conservation Grant (EPCA)	The SECP program will be evaluated in 1981 in terms of states availability to plan and implement energy conservation measures. Completed evaluation of program from initiation through September 1978; final report dated March 1980. Energy savings evaluation methodology assistance provided to states through July, 1980. Energy savings data collection and validation by states in process through December, 1980.
- Energy Extension Service (EES)	Major 3 year evaluation will address client attitudes toward energy conservation, actions taken and resulting savings. Data will be obtained from 15 state survey. 2 year pilot evaluation of EES was completed in September 1980.
o Weatherization Assistance Program	Management evaluation has been conducted in 9 states. Final report under preparation. Two major evaluations will be conducted during FY 1981: (1) assess the program's delivery system and capacity for growth, and (2) a management, production and impact analysis of the program. An evaluation plan was issued in November, 1980.
o Emergency Energy Conservation Programs	
- Emergency Building Temperature Restrictions (EBTR)	EEC is a new program. An evaluation and analysis of the effectiveness of EBTR was published in a final report dated July 8, 1980.
Energy Information Campaign	
o Energy Information Campaign	
Inventions and Small Scale Technology	
o Energy Related Inventions	FY 1981 evaluation planned to measure efficiency and effectiveness of NBS and DOE phases of the program. Will address management and impact issues.

o Appropriate Technology Small Grants Program	Preliminary evaluation of program operations and administration will be completed early in 1981. Lawr[illegible] Berkeley Lab will complete energy savings analysis o[illegible] projects in 1981. A major evaluation will be initiated in the 4th Quarter of FY 1981.
Municipal Waste	
o Urban Waste R&D	Have established evaluation measurement criteria for projects.
o Demonstration	
o Commercialization	
Federal Energy Management Programs	
o Federal Energy Management	Have conducted internal program progress and status reviews by Secretarial officers and when necessary by the "656" committee. GAO has conducted reviews of the program.

RENEWABLE ENERGY RESOURCES

Energy Storage Systems	
o Battery Storage - Near term Electric Vehicle Batteries	Numerous technical economic environmental and energy impact assessments performed for specific projects and applications using performance criteria to meet mission requirements.
o Thermal and Mechanical Energy Storage	Technologies are evaluated to measure cost performance, energy savings and other impacts
Solar Applications for Buildings	
o Active Solar Energy Systems - Federal Buildings Program	A four year multi-state Solar heating and cooling demonstration evaluation for residential, commercial and industrial applications is in process. Previous evaluations on residential demonstration program performed by HUD and Federal demonstration program by GAO in 1979. Office is currently developing evaluation criteria for solar programs.
o Passive Solar Energy Systems	In 1981 a system will be implemented to monitor passive construction. A detailed multi-level evaluation plan is under preparation which currently addressed evaluability assessment. A report is expected in December 1980.
o Photovoltaic Energy Systems	Program progress is assessed annually to reflect policy objectives and performance goals of the Photovoltaics RD&D Act of 1978.
o Market Analysis	
Solar Applications for Industry	
o Solar Thermal Energy Systems	Will conduct ESAAB review prior to full scale demonstration.
o Biomass Energy Systems	Perform project evaluations with established criteria for technical feasibility market potential, energy impacts and environmental, health and safety impacts.
o Biomass Systems	
o Market Analysis	

Solar Applications for Power

- o Wind Energy Systems
- o Ocean Energy Systems
- o Market Analysis

Perform cost of energy and energy production impacts.

Will perform risk assessments and commercial/economic viability assessments on pilot plants.

Perform management evaluation and assess impact on the utility sector.

Solar International Programs

- o Technology Development and Applications

Evaluation is being built into the SOLERAS Program and project plans in accordance with established criteria.

SERI Permanent Facility

- o Design Construction - Solar Energy Research Institute Permanent Facility

Inter-Program Applications

- o DOD Showcase
- o Power Marketing Administration
- o Rural Energy Initiatives
- o Program Direction

MX-Renewable Energy Systems

- o MX-RES

Solar Information Systems

- o CS Information Network

Developing methods and criteria for measuring the effectiveness of CS Information Programs such as SEIDB and assessing program performance for each criteria.

APPENDIX 6

ISSUE PAPERS

ALTERNATIVE APPROACHES TO BUDGETING MULTI-YEAR CS PROGRAM EVALUATION

PURPOSE

The purpose of this paper is to explore alternative general approaches to planning, conducting and funding evaluations, and to assess the probable consistency of results and utility to the Assistant Secretary, Conservation and Solar Energy (CS).

The principal emphasis of this paper is on the budgeting and control of funds designated for evaluation. This paper presents only general approaches; the specific process and mechanics of the selected alternatives will be addressed in the CS Evaluation Plan.

BACKGROUND AND OBJECTIVES

The Office of Policy, Planning and Evaluation (PPE) is developing a CS-wide Evaluation Plan which addresses the organization, tasks, responsibilities and resources to ensure that (a) the Assistant Secretary has useful and valid information for management decisions regarding policy and strategy, resource allocation, program performance toward toward objectives, and impacts on national energy consumption, and (b) evaluation findings and information are comprehensive, consistent, comparable, and can be aggregated for CS analysis.

Through the development and refinement of the CS Evaluation Plan, CS must ensure:

(a) continuing support for evaluation planning and in-process evaluations during FY 81,
(b) that programs [1/] not currently planning evaluations in FY 81 budget the funds necessary for evaluation planning and evaluability assessments in FY 82, and
(c) that by FY 83 all CS programs to the subelement level will conduct or have completed comprehensive program evaluation.

DISCUSSION OF ALTERNATIVE APPROACHES

The CS evaluation objectives may be approached through alternative courses of action based on varying degrees of functional responsibility, guidance, and approval authority assigned to the CS programs and the Office of Policy, Planning and Evaluation.

Alternative No. 1: Autonomous Program Evaluation

A. Concept: Programs, at whatever level evaluation is designated, independently of PPE develop evaluation plans, evaluation measure criteria, milestones and funding/budget requirements for evaluation. Evaluation milestones are established in the CS Objectives Book (Red Book) for monitoring within CS. PPE reviews and comments on evaluation plans prepared by the programs.

1/ Unless otherwise designated, the word program is used generically to represent subprogram, program elements or program subelements.

I Discussion: This alternative approximates the current evaluation approach in CS. Because of the autonomy of the evaluation efforts, it is unlikely that evaluations will be performed by other than a few programs, that the results will be consistent or comparable between programs, and that funding and budgeting control will be adequate to perform comprehensive evaluations. Evaluation results would not likely be consistent or capable of being aggregated and therefore of limited value to the Assistant Secretary's information needs.

Alternative 2: Independent Program Evaluation with General Guidelines from PPE.

A. Concept. PPE is responsible for preparing general evaluation guidelines which address minimal CS-wide evaluation measurement criteria to be employed in all CS program evaluations; the overall CS evaluation process, schedule and milestones; and budgetary guidance for evaluation funding. CS programs are responsible for developing evaluation plans and upon approval of the plans by PPE, conducting the evaluations. For FY 82, each CS program not currently planning or conducting evaluation should budget adequate funds to develop a detailed evaluation plan, identify baseline information and conduct evaluability assessments. Based on the detailed evaluation plan, a comprehensive evaluation should be performed during FY 83.

In practice, budgetary planning and control could be based upon guidance issued by the Assistant Secretary which instructs each CS Office (at the PPBS subprogram level) to reallocate an estimated 1 to 2 percent of their FY 82 budgets for planning and conducting evaluations. Office Directors, with PPE concurrence, would allocate the funds to program elements according to need and stage of progress in planning or conducting evaluation. The 1 to 2 percent budget planning figure is proposed as a minimum guideline; it is likely that some programs will far exceed these funding guidelines because of the complex or multi-project programs, or because of advanced progress in conducting comprehensive evaluation.

The Assistant Secretary's guidance would also instruct the CS Budget and Financial Management Division to separately identify evaluation funds within B&R access numbers. The Budget and Financial Management Division can apply controls which will enable access to these funds only upon notification by PPE that an evaluation plan has been approved.

Budgeting for FY 83 comprehensive evaluations should be based on the detailed evaluation plans developed in FY 82, which specify internal and external resource requirements. Once again, the funding control by B&R access numbers would be in effect in FY 83 and outyears.

B. Discussion: Through the general evaluation guidelines, criteria and the budgetary guidelines, this approach offers a defined process with controls to ensure that evaluations are performed extensively throughout CS, that the evaluation findings are consistent and comparable, and that evaluation funds are adequate and committed only to evaluations with approved plans. The general evaluation guidelines and the ability of Office Directors to reallocate funds according to particular needs enable the flexibility for evaluations to address specific program characteristics and evaluation requirements.

A native 3: Comprehensive Guidelines for Integrated Program Planning and Evaluation

A. Concept: This approach is much like Alternative 2 except that PPE develops specific and comprehensive sets of evaluation criteria and applicable detailed sample methodologies for conducting individual program evaluations. These are developed in coordination with the specific programs conducting evaluations and integrated into the program evaluation plans. Evaluations would be conducted by the programs and monitored by PPE. Evaluation budgeting would be on a program by program basis with a specified amount to be allocated to each program conducting evaluations. These evaluation funds would be identified in B&R access codes designated specifically for evaluation. Access to those funds, as in Alternative 2, would require notification from PPE that the applicable evaluation plan has been approved.

In developing the evaluation criteria PPE would ensure that they are consistent with programming and planning criteria. PPE would also establish guidelines to ensure that each program establishes a baseline as applicable for energy savings, cost, or demand by end-use sector so that incremental changes reflecting program progress or performance can be measured. The concept of identifying and establishing baselines for each program requires further research to resolve issues on consistency of data and identification of cross-sectoral impacts. This approach allows for total integration of evaluation and information consistency with the planning, programming and budgeting cycle.

B. Discussion: This approach requires much greater guidance and direction from PPE while reducing the flexibility of the Office Directors to respond to individual and changing program or priority evaluation needs. Establishing B&R codes specifically for evaluation on a program by program basis would require approval by the DOE Controller and an approximate 6 month lead time. The funding requirement for PPE to implement this alternative could approach $3 million for guidelines, criteria, planning and implementation.

RECOMMENDATION

Develop and implement Alternative 2, Independent Program Evaluation with PPE Guidelines.

- The general CS-wide evaluation guidelines and criteria will enable the development of comprehensive, consistent and comparable information to meet the Assistant Secretary's management information requirements. The guidelines and criteria can be developed and implemented quickly (two to four months) on a preliminary basis.

- The budget guidelines and control mechanisms can be developed and implemented in a short time frame with nominal resource requirements. This approach will ensure that adequate funds are budgeted for evaluation and the funds are being used effectively.

- This approach allows Program Directors and program offices flexibility in allocating the resources according to specific need and priority, while enabling CS monitoring and concurrence with evaluation expenditures.

Discussion Topics

CS Sunset Review Response

1. At what program/organizational level should the Sunset review be directed for information collection? At what level should it be aggregated? (e.g., program, subprogram, element, subelement).

2. Should Sunset be addressed as a reporting requirement or a step in the programmatic decision process?

3. How much quantitative information is necessary? Does it already exist? Where? Are new information/data collection efforts warranted?

4. How should the initial draft information be gathered or compiled?

   Options

   A. PPE compiles information from existing documents.
   B. Option A. plus creative writing by PPE.
   C. Option A. plus supplemental request for information from programs.
   D. Request information from programs with PPE guidance.

5. What are the appropriate schedule and milestones for collecting and compiling interim and final Sunset Information?

Sunset Review Item	Data Element	Gold Book	Objectives Book	Other Sources	Qualitative Narrative	Quantitative	Comments
1. DOE component responsible for administering program.	✓	✓	✓		✓		
2. identification of objectives and the need addressed.	✓	✓	✓		✓	✓	
3. other programs with similar or conflicting objectives.	✓	✓	✓		✓		
4. assess alternative methods of achieving purposes of program.					✓		Must be developed
5. a. justify authorization of new budget authority		✓		Program Memorandum	✓	✓	
b. explain manner in which it conforms and integrates with other efforts.				Program Memorandum	✓		
6. assess degree to which original objectives of program have been achieved (performance, impact, accomplishments)	✓	✓			✓	✓	
7. performance and accomplishments in each of the previous four fiscal years and budget costs for operation of program.	✓	✓		MYPPs, PADs	✓	✓	Requires literature review, analysis and development.
8. number and types of beneficiaries or persons served.							Probably must be developed for most programs.

	Data Element	Gold Book	Objectives Book	Other Sources	Qualitative Narrative	Quantitative	Comments
effect of program on national economy (competition, economic stability, employment, unemployment, productivity and price inflation, costs to consumers and businesses).				Eco Analysis, Regul. Anal, EIS/EAs, EDPs,	✓	✓	Requires extensive literature search, analysis and development.
impact on Nation's health and safety.				EIS/EAs, EDPs	✓	✓	
assess degree to which overall administration of the program is believed to meet objectives of Congress.					✓		Requires Evaluation.
project anticipated needs for accomplishing program objectives, and conditions under which program can meet objectives.		✓		Program Memorandum	✓	✓	Must be developed.
analyze services which could be provided and performance achieved at less, equal, or greater budget levels.		✓		Program Memorandum	✓	✓	Must be developed.
recommend transitional requirements.					✓		Must be developed.

NDIX B. TITLE X--SUNSET PROVISIONS OF THE DEPARTMENT OF ENERGY ORGANIZATION ACT (PL 95-91)

SUBMISSION OF COMPREHENSIVE REVIEW

C. 1001. Not later than January 15, 1982, the President shall prepare and bmit to the Congress a comprehensive review of each program of the partment. Each such review shall be made available to the committee or mmittees of the Senate and House of Representatives having jurisdiction th respect to the annual authorization of funds, pursuant to section 660, r such programs for the fiscal year beginning October 15, 1982.

CONTENTS OF REVIEW

C. 1002. Each comprehensive review prepared for submission under section 001 shall include-

(1) The name of the component of the Department responsible for administrating the program;

(2) an identification of the objectives intended for the program and the problem or need which the program was intended to address;

(3) an identification of any other programs having similar or potentially conflicting or duplicative objectives;

(4) an assessment of alternative methods of achieving the purposes of the program;

(5) a justification for the authorization of new budget authority, and an explanation of the manner in which it conforms to and integrates with other efforts;

(6) an assessment of the degree to which the original objectives of the program have been achieved, expressed in terms of the performance, impact, or accomplishments of the program and of the problem or need which it was intended to address, and employing the procedures or methods of analysis appropriate to the type or character of the program;

(7) a statement of the performance and accomplishments of the program in each of the previous four completed fiscal years and of the budgetary costs incurred in the operation of the program;

(8) a statement of the number and types of beneficiaries or persons served by the program;

(9) an assessment of the effect of the program on the national economy, including, but not limited to, the effects on competition, economic stability, employment, unemployment, productivity, and price inflation, including costs to consumers and businesses;

(an assessment of the impact of the program on the Nation's health and safety;

(11) an assessment of the degree to which the overall administration of the program, as expressed in the rules, regulations, orders, standards, criteria, and decisions of the officers executing the program, are believed to meet the objectives of the Congress in establishing the program;

(12) a projection of the anticipated needs for accomplishing the objectives of the program, including an estimate if applicable of the date on which, and the conditions under which, the program may fulfill such objectives;

(13) an analysis of the services which could be provided and performance which could be achieved if the program were continued at a level less than, equal to, or greater than the existing level; and

(14) recommendations for necessary transitional requirements in the event that funding for such program is discontinued, including proposals for such executives or legislative action as may be necessary to prevent such discontinuation from being unduly disruptive.

SUNSET COMPREHENSIVE PROGRAM REVIEW
(TITLE X, DOE ORGANIZATION ACT, PL 95-91)

REQUIREMENT

- Congress has mandated a comprehensive review of each program by January 15, 1982
- Congress will use reviews for FY83 authorization of funds

ISSUES

- Is DOE guidance forthcoming?
- If CS guidance is necessary to collect Sunset data, what level of detail is necessary?
- How is a program defined?
- When should CS prepare interim and final reports?
- What is the thematic emphasis of the CS Sunset response?
- How should the report be structured?
- How can CS obtain the resources to prepare the Sunset response?

GUIDANCE

- o DOE GUIDANCE HAS NOT BEEN ISSUED, NOR IS IT ANTICIPATED IN NEAR FUTURE
- o PROGRAMS SHOULD DEVELOP INITIAL INPUT FOR THE SUNSET RESPONSE
- o THE FINAL CS SUNSET RESPONSE SHOULD BE COMPLETE BY NOVEMBER 1, 1981 SO THAT IT CAN BE INTEGRATED WITH THE DOE RESPONSE BEFORE JANUARY 15, 1982.
- o CS GUIDANCE IS NECESSARY TO ENSURE THAT PROGRAM RESOURCES ARE USED EFFECTIVELY AND THAT USEFUL INFORMATION IS PROVIDED WHILE ALLOWING PROGRAM FLEXIBILITY IN ADDRESSING SUNSET QUESTIONS.
- o CS GUIDANCE SHOULD BE ISSUED IMMEDIATELY.

PROGRAM DEFINITION

- o OPTIONS - BUDGET STRUCTURE, PPBS, ORGANIZATION?
- o RECOMMENDATION - SUNSET REVIEW IS ORIENTED TOWARD ACCOMPLISHMENTS RELATIVE TO ENABLING LEGISLATION AND PROGRAM OBJECTIVES.
  - PPBS PROGRAM ELEMENTS ARE CLOSELY ALIGNED TO ENABLING LEGISLATION. WILL REQUIRE CROSSWALKING CAPABILITY TO THE BUDGET STRUCTURE AND/OR ORGANIZATION.

PROGRAM COVERAGE

- o PROPOSED PROGRAM CUTS DO NOT NEGATE VALUE OF RECORDED ACCOMPLISHMENTS.
- o A RECORD OF PROGRAM INTENT AND ACCOMPLISHMENTS CAN BE DOCUMENTED FOR POTENTIAL CONSIDERATION OF PROGRAM REESTABLISHMENT IN FUTURE.
- o FULL PROGRAM ELEMENT COVERAGE CAN PROVIDE A HISTORICAL RECORD FOR FUTURE SURROGATE COMPARISONS AND REFERENCES FOR FUTURE PROGRAM DESIGN.

SCHEDULE

- o COMPLETE AGGREGATION OF READILY AVAILABLE DATA BY JULY 1, 1981 AND COMPILE INTERIM REPORT.
- o IDENTIFY PROBLEM AREAS AND DATA GAPS.
- o PERFORM STUDIES AND COLLECT DATA AS NECESSARY TO REINFORCE SUNSET RESPONSE.
- o PREPARE FINAL CS RESPONSE BY NOVEMBER 1, 1981 FOR INTEGRATION WITH OVERALL DOE SUNSET RESPONSE.

THEMATIC EMPHASIS

- o National Performance (FY78-82) in conserving energy and transitioning to renewables.
- o CS contribution to energy goals including private sector stimulation.
- o CS relationship to U.S. oil import vulnerability.
- o CS complement to other DOE programs.

REPORT PREPARATION

- o PPE Prepares CS Guidance and issues to programs for quick response.
- o PPE coordinates and integrates program submissions.
- o PPE provides quality control regarding validation of source input.
- o PPE consolidates program input into a report with executive overview.
- o Report organized by the following categories.

SECTION	SUNSET REVIEW ITEM NUMBERS
I Background	1,2,3,8
II Evaluation of Past Performance	6,7,11
III Assessment of Impacts	9,10
IV Analysis of Alternatives	4,5,12,13,14

RESOURCE REQUIREMENTS

- o REQUIRES MAJOR INFORMATION COLLECTION, AGGREGATION AND REPORT PREPARATION EFFORT.
- o NEED SPECIALIZED EXPERTISE WITH SPECIFIC TECHNICAL, POLICY, PROGRAMMATIC AND HISTORICAL KNOWLEDGE TO ADEQUATELY RESPOND TO SUNSET.
- o TEAM APPROACH REQUIRED TO OBTAIN EXPERTISE AND MEET CRITICAL SCHEDULE REQUIREMENTS.
- o CURRENT RESOURCES ARE INADEQUATE TO MEET SUNSET REQUIREMENTS.
  - PPE STAFF HAVE CONFLICTING ASSIGNMENTS.
  - NO CONTRACTOR PERSONNEL TO DEDICATE TO SUNSET REQUIREMENT.
- o BECAUSE OF RESOURCE CONSTRAINTS, SUNSET RESPONSE REQUIREMENTS WILL REPLACE PPE EFFORTS IN DEVELOPING AND IMPLEMENTING THE CS PROGRAM EVALUATION PROCESS.

UPDATE ON EVALUATION AND SUNSET REVIEW

- EVALUATION PLAN DRAFTED
- EVALUATION CRITERIA DRAFTED
- DRAFT EVALUATION BUDGETING AND FUNDS CONTROL MEMORANDUM
- EVALUATION PRIMER DRAFTED
- INDICATOR WORKSHOP PRESENTATION, APRIL 21
- LEGISLATION BOOK COMPILED FOR EACH PROGRAM
- PPA GUIDANCE ON SUNSET

SUNSET REQUIREMENTS

- 14 QUESTIONS
- QUESTIONS 2, 6, 9 AND 13 ARE DIFFICULT
- CONDUCTED MINI-REVIEWS WITH SEVERAL CE PROGRAMS
- REQUIRE SOME INTERPRETATION AND GUIDANCE FOR CONSISTENT RESPONSE - ESPECIALLY ON FUTURE BUDGETS

KEY ISSUES TO BE RESOLVED FOR DOE

A. BUDGET GUIDANCE (ESSENTIAL FOR CONSISTENT RESPONSE ON QUESTIONS 9 AND 13)

   1. BASELINE BUDGET YEAR ('81, '81 W/RECISSION, '82)
   2. ASSUMPTIONS ABOUT ALTERNATE BUDGETS
      - HIGHER THAN BASELINE
      - LESS THAN BASELINE

B. SCENARIO(S) TO BE USED

C. DEFINITION OF A "PROGRAM"

D. LENGTH/STRUCTURE OF DOCUMENT

OPTIONS FOR COORDINATION WITH PPA

1. WAIT FOR GUIDANCE:
   - PRO
     - o MAINTAINS LOW PROFILE
     - o NON-POLITICAL
   - CON
     - o LESS TIME FOR RESPONSE
     - o LESS VISIBILITY FOR CE PROGRAMS
     - o LOSE INITIATIVE WITH PPA
     - o LOSS OF KNOWLEDGEABLE STAFF

2. AGGRESSIVE PUSH FOR EARLY DECISIONS
   - PRO
     - o MORE TIME FOR RESPONSE
     - o DECREASED FALSE STARTS
   - CON
     - o MAY LIMIT CE FLEXIBILITY
     - o MAY PRECLUDE PROGRAM INNOVATION
     - 0 MAY NOT GET A DECISION

3. INFORMAL DISCUSSIONS
   - PRO
     - o CAN MINIMIZE RESTRICTIVE GUIDANCE
     - o ALLOWS PROGRAMS TO DEMONSTRATE INNOVATIVE FLEXIBILITY
     - o ALLOWS CE MORE ADMINISTRATIVE FLEXIBILITY
   - CON
     - o MAY PROMOTE FALSE STARTS
     - o CAN LEAD TO RESTRICTIVE GUIDANCE

Attachment 2

List of Attendees: CF Sunset Briefing, April 16, 1981

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Robert Plunkett
Gurmukh Gill
Taia Frgueta
Tom Van Der Linden
Ron Larson
M. Carasso