

**A FRAMEWORK FOR INTEGRATED RESOURCE PLANNING**

**Revised May 22, 1992**

**PUBLIC UTILITIES COMMISSION**

**STATE OF HAWAII**

## TABLE OF CONTENTS

I.	DEFINITIONS.....	1
II.	INTRODUCTION .....	3
	A. Goal of Integrated Resource Planning .....	3
	B. Governing Principles (Statements of Policy).....	3
	C. Utility’s Responsibility .....	4
	D. Commission’s Responsibility .....	5
	E. Consumer Advocate’s Responsibility.....	5
III.	THE PLANNING CONTEXT.....	6
	A. Major Steps .....	6
	B. The Planning Cycle.....	7
	C. The Docket.....	8
	D. Submissions to the Commission.....	9
	E. Public Participation.....	13
	1. Advisory groups.....	13
	2. Public hearings.....	14
	3. Intervention .....	14
	4. Intervenor funding .....	15
	F. Cost Recovery and Incentives.....	16
IV.	PLANNING CONSIDERATIONS .....	19
	A. Forecast .....	19
	B. Objectives .....	20
	C. Effectiveness Measures.....	20
	D. Resource Options .....	20
	E. Data Collection .....	21
	F. Assumptions; Risks; Uncertainties .....	22
	G. Models.....	22
	H. Analyses.....	22
	I. Resource Optimization.....	23
	J. Sensitivity Analysis .....	24
V.	PILOT DEMAND-SIDE MANAGEMENT PROGRAMS .....	24
	A. Purposes .....	24
	B. Pilot Programs.....	24

## I. Definitions

Unless otherwise clear from the context, as used in this framework:

“Capital investment costs” means costs associated with capital improvements, including planning, the acquisition and development of land, the design and construction of new facilities, the making of renovations or additions to existing facilities, the construction of built-in equipment, and consultant and staff services in planning, design, and construction. Capital investment costs for a program are the sum of the program’s capital improvement project costs.

“Costs” means the full and life cycle costs of a resource option.

“Cost categories” means the major types of costs and includes research and development costs, investment costs, and operating and maintenance costs.

“Cost elements” means the major subdivisions of a cost category. For the category “investment costs,” it includes capital investment costs, initial equipment and furnishing costs, and initial education and training costs. For the categories “research and development costs” and “operating and maintenance costs,” it includes labor costs, fuel costs, materials and supplies costs, and other current expenses.

“Demand-side management programs” means programs designed to influence utility customer uses of energy to produce desired changes in demand. It includes conservation, load management, and efficiency resource programs.

“Design costs” means the costs related to the preparation of architectural drawings for capital improvements, from schematics to final construction drawings.

“Effectiveness measure” means the criterion for measuring the degree to which the objective sought is attained.

“External benefits” means external economies; benefits to or positive impacts on the activities of entities outside the utility and its ratepayers. External benefits include environmental, cultural, and general economic benefits.

“External costs” means external diseconomies; costs to or negative impacts on the activities of entities outside the utility and its ratepayers. External costs include environmental, cultural, and general economic costs.

“Full cost” means the total cost of a program, system, or capability, including research and development costs, capital investment costs, and operating and maintenance costs.

“Investment costs” means the one-time costs beyond the development phase to introduce a new system, program, or capability into use. It includes capital investment costs, initial equipment acquisition costs, and initial education and training costs.

“Life cycle costs” means the total cost impact over the life of the program. Life cycle costs include research and development cost, investment cost (the one-time cost of instituting the program), and operating and maintenance (O&M) cost.

“Objective” means a statement of the end result, product, or condition desired, for the accomplishment of which a course of action is taken.

“Operating and maintenance costs” or “O&M costs” means recurring costs of operating, supporting, and maintaining authorized programs, including costs for labor, fuel, materials and supplies, and other current expenses.

“Participant impact” means the impact on participants in a demand-side management program in terms of the costs borne and the direct, economic benefits received by the participants.

“Program” means a combination of resources and activities designed to achieve an objective or objectives.

“Program size” means the magnitude of a program, such as the number of persons serviced by the program, the amount of a commodity, the time delays, the volume of service in relation to population or area, etc.

“Program size indicator” means a measure to indicate the magnitude of a program.

“Ratepayer impact” means the impact on ratepayers in terms of the utility rates that ratepayers must pay.

“Research and development costs” means costs associated with the development of a new system, program, or capability to the point where it is ready for introduction into operational use. It includes the costs of prototypes and the testing of the prototypes. It includes the costs of research, planning, and testing and evaluation.

“Societal cost” means the total direct and indirect costs to society as a whole. Society includes the utility and, in a demand-side management program, the participants.

“Societal cost-benefit assessment” means an assessment of the costs and benefits to society as a whole.

“Supply-side programs” means programs designed to supply power. It includes renewable energy.

“Total resource cost” means the total cost of a demand-side management program, including both the utility and participants’ costs.

“Utility cost” means the cost to the utility (including ratepayers), excluding costs incurred by participants in a demand-side management program.

“Utility cost-benefit assessment” means an assessment of the costs and benefits to the utility.

## II. Introduction

### A. Goal of Integrated Resource Planning

The goal of integrated resource planning is the identification of the resources or the mix of resources for meeting near and long-term consumer energy needs in an efficient and reliable manner at the lowest reasonable cost.

### B. Governing Principles (Statements of Policy)

1. The development of integrated resource plans is the responsibility of each utility.
2. Integrated resource plans shall comport with state and county environmental, health, and safety laws and formally adopted state and county plans.
3. Integrated resource plans shall be developed upon consideration and analyses of the costs, effectiveness, and benefits of all appropriate, available, and feasible supply-side and demand-side options.
4. Integrated resource plans shall give consideration to the plans’ impacts upon the utility’s consumers, the environment, culture, community lifestyles, the state’s economy, and society.
5. Integrated resource plans shall take into consideration the utility’s financial integrity, size, and physical capability.
6. Integrated resource planning shall be an open public process. Opportunities shall be provided for participation by the public and governmental agencies in the development and in commission review of integrated resource plans.
7. The utility is entitled to recover all appropriate and reasonable integrated resource planning and implementation costs. In addition, existing disincentives should be removed and, as appropriate, incentives should be established to encourage and reward aggressive utility pursuit of demand-side management programs. Incentive mechanisms should be structured so that investments in suitable and effective demand-side management programs are at least as attractive to the utility as investments in supply-side options.

C. Utility's Responsibility

1. Each utility is responsible for developing a plan or plans for meeting the energy needs of its customers.
2. The utility shall prepare and submit to the commission for commission approval at the time or times specified in this framework the utility's integrated resource plan and program implementation schedule.
3. The utility shall execute the commission approved plan in accordance with the program implementation schedule.
4. The utility shall annually examine and evaluate its achievements in attaining its objectives.

D. Commission's Responsibility

1. The commission's responsibility, in general, is to determine whether the utility's plan represents a reasonable course for meeting the energy needs of the utility's customers and is in the public interest and consistent with the goals and objectives of integrated resource planning.
2. Specifically, the commission will review the utility's integrated resource plan, its program implementation schedule, and its evaluations, and generally monitor the utility's implementation of its plan. Upon review, the commission may approve, reject, approve in part and reject in part, or require modifications of the utility's integrated resource plan and program implementation schedule.
3. The parties shall cooperate in expediting commission hearings on the utility's integrated resource plan and program implementation schedule. To the extent possible, the commission will hear the utility's application for approval of its integrated resource plan within six months of the plan's filing, and the commission will render its decision shortly thereafter.

E. Consumer Advocate's Responsibility

1. The director of commerce and consumer affairs, as the consumer advocate and through the division of consumer advocacy, has the statutory responsibility to represent, protect, and advance the interest of consumers of utility services. The consumer advocate, therefore, has the duty to ensure that the utility's integrated resource plan promotes the interest of utility consumers.
2. The consumer advocate shall be a party to each utility's integrated resource planning docket and a member of any and all advisory groups established by the utility in the development of its integrated resource plan. The consumer advocate shall also participate in all public hearings

and other sessions held in furtherance of the utility's efforts in integrated resource planning.

### III. The Planning Context

#### A. Major Steps

There are four major steps in the integrated resource planning process: planning, programming, implementation, and evaluation.

1. Planning is the process in which the utility's need are identified; the utility's objectives are formulated; measures by which effectiveness in attaining objectives are specified; the alternatives by which the objectives may be attained are identified; the full cost, effectiveness, and benefit implications of each alternative are determined; the assumptions, risks, and uncertainties are clarified; the cost, effectiveness, and benefit tradeoffs of the alternatives are made; the resource options are chosen; and program choices are subjected to sensitivity analyses. The product of this process is the utility's integrated resource plan. The planning horizon for utility integrated resource plans is 20 years. Unless otherwise ordered by the commission, the 20-year period begins on January 1 following the completion of the plan.
2. Programming is that process by which the utility's long-range resource program plans are scheduled for implementation over a five-year period. In this process, a determination is made as to the order in which the selected program options are to be implemented; the phases or steps in which each program is to be implemented; the expected target group and the annual size of the target group or annual level of penetration of demand-side management programs; the expected annual supply-side capacity additions; the expected annual levels of effectiveness in achieving integrated resource planning objectives; and the annual expenditures, by cost categories and cost elements, required to be made by the utility to support implementation of the programs. The result of this process is a program implementation schedule or action plan. The schedule represents an implementation strategy or timetable for program implementation.
3. Implementation is that process by which the resource program options to be implemented are acquired and instituted in accordance with the utility's program implementation schedule.
4. Evaluation is that process by which the results of the resource program options are measured in light of the utility's objectives. In this process the actual costs, effectiveness, and benefits of the resource options and the attainment of the utility's objectives are measured against those that were projected in the planning and programming stages of the planning cycle.

B. The Planning Cycle

1. Each utility shall complete its initial integrated resource plan and implementation schedule and submit them for commission approval by the following dates:
  - a. Kauai Electric Division of Citizens Utilities Company: May 1, 1993
  - b. Gasco, Inc.: May 1, 1993
  - c. Hawaiian Electric Company, Inc.: July 1, 1993
  - d. Hawaii Electric Light Company, Inc.: September 1, 1993
  - e. Maui Electric Company, Limited: November 1, 1993
2. Each utility shall conduct a major review of its integrated resource plan every three years. In such a review, a new 20-year time horizon shall be adopted, the planning process repeated, and the utility's resource programs re-analyzed fully. The first major review, following the submission of each utility's initial integrated resource plan to the commission in 1993, shall commence in 1995 so as to result in the submission to the commission of a new (second) integrated resource plan and implementation schedule in 1996 as follows:
  - a. Hawaiian Electric Company, Inc.: January 1, 1996
  - b. Kauai Electric Division of Citizens Utilities Company: April 1, 1996
  - c. Gasco, Inc.: April 1, 1996
  - d. Hawaii Electric Light Company, Inc.: June 1, 1996
  - e. Maui Electric Company, Limited: October 1, 1996

Thereafter, each utility shall conduct a major review, resulting in the submission to the commission of a new integrated resource plan and implementation schedule on the same day every three years.

C. The Docket

1. Each planning cycle for a utility will commence with the issuance of an order by the commission opening a docket for integrated resource planning.

2. The docket will be maintained throughout the planning cycle for the filing of documents, the resolution of procedural disputes, and other purposes related to the utility's integrated resource plan.
3. Within 30 days after the opening of the docket, the utility shall prepare, in consultation with the consumer advocate, and file with the commission a schedule that it intends to follow in the development of its integrated resource plan. The schedule may be amended upon the formation of an advisory group or groups and thereafter as appropriate.
4. The utility shall complete its integrated resource plan and program implementation schedule within one year of the commencement of the planning cycle.

D. Submissions to the Commission

1. The utility shall submit its integrated resource plan as follows.
  - a. The utility shall include in its integrated resource plan a full and detailed description of (1) the needs identified; (2) the forecasts made; (3) the assumptions underlying the forecasts; (4) the objectives to be attained by the plan; (5) the measures by which achievement of the objectives is to be assessed; (6) the resource options or mix of options included in the plan; (7) the assumptions and the basis of the assumptions underlying the plan; (8) the risks and uncertainties associated with the plan; (9) the revenue requirements on a present value basis and on an annual basis; (10) the expected impact of the plan on demand; (11) the expected achievement of objectives; (12) the potential impact of the plan on rates, consumer bills, and consumer energy use; (13) the plan's external costs and benefits; and (14) the relative sensitivity of the plan to changes in assumptions and other conditions. The items enumerated should, where appropriate, be described for the plan as a whole and for each of the resources or mix of resources included in the plan.
  - b. The utility shall file with the integrated resource plan a full and detailed description of the analysis or analyses upon which the plan is based. The utility shall fully describe, among other things, (1) the data (and the source of the data) upon which needs were identified and forecasts made; (2) the methodologies used in forecasting; (3) the various objectives and measures of assessing attainment of objectives that were considered, but rejected, and the reasons for rejecting any objective or measure; (4) the resource options that were identified, but screened out and not considered and the reasons for the rejection of any resource option; (5) the assumptions and the basis of the assumptions, the risks and

uncertainties, the costs, effectiveness, and benefits (including external costs and benefits), and the impacts on demand, rates, consumer bills, and consumer energy uses associated with each resource option or mix of options that was considered; (6) the comparisons and the cost, effectiveness, and benefit tradeoffs and optimization made of the options and mixes of options; (7) the models used in the comparisons, tradeoffs, and optimization; (8) the criteria used in any ranking of options and mixes of options; and (9) the sensitivity analyses conducted for the options and mixes of options.

- c. The utility shall also file with the integrated resource plan a description of all alternate plans that the utility developed, the ranking it accorded the various plans, the criteria used in such ranking, and a full and detailed explanation of the analysis upon which it decided its preferred integrated resource plan.
- d. The submissions should be simply and clearly written and, to the extent possible, in non-technical language. Charts, graphs, and other visual devices may be utilized to aid in understanding its plan and the analyses made by the utility. The utility shall provide an executive summary of the plan and of the analyses and appropriately index its submissions.

2. The utility shall submit its program implementation schedule as follows.

- a. The utility shall include in the schedule by year: the programs or phases of programs to be implemented in the year; the expected level of achievement of objectives; the expected size of the target group or level of penetration of any demand-side management program; the expected supply-side capacity addition; the expenditures, by cost categories and cost elements, required to be made by the utility to support implementation of each program or phase of a program.
- b. The utility shall file with its program implementation schedule a full and detailed description of the analysis upon which the schedule is based. The utility shall fully describe, among other things:
  - (1) The steps required to realize and implement the supply-side and demand-side resource programs included in the schedule.
  - (2) How the target groups were selected and how program penetration for demand-side management programs and the

expected levels of effectiveness in achieving integrated resource planning objectives were derived.

(3) The expected annual effects of program implementation on the utility and its system, the ratepayers, the environment, public health and safety, cultural interests, the state economy, and society in general.

c. The program implementation schedule shall also be accompanied by the utility's proposals on cost and revenue loss recovery and incentives, as appropriate.

3. The utility shall submit its annual evaluation as follows.

a. The utility shall include in its annual evaluation, an assessment of the continuing validity of the forecasts and assumptions upon which its integrated resource plan and its program implementation schedule were fashioned.

b. The utility shall also include for each program or phase of program included in the program implementation schedule for the immediately preceding year a comparison of:

(1) The expenditures anticipated to be made and the expenditures actually made, by cost categories and cost elements.

(2) The level of achievement of objectives anticipated and the level actually attained.

(3) The target group size or level of penetration anticipated for each demand-side management program and the size or level actually realized.

(4) The effects of program implementation anticipated and the effects actually experienced.

c. The utility shall provide an assessment of all substantial differences between original estimates and actual experience and of what the actual experience portends for the future.

d. Together with its annual evaluation, the utility shall submit a revised program implementation plan that drops the immediately preceding year from the schedule and includes a new year. The program implementation plan must always reflect a five-year time span.

4. The utility may at any time, as a result of its annual evaluation or change in conditions, circumstances, or assumptions, revise or amend its integrated resource plan or its program implementation schedule. All revisions and amendments must conform to the appropriate requirements of this part D.
5. The integrated resource plan and program implementation schedule approved by the commission shall govern all utility expenditures for capital projects, purchased power, and demand-side manage programs. Notwithstanding approval of an integrated resource plan: (a) an expenditure for any capital project in excess of \$500,000 shall be submitted to the commission for review as provided in paragraph 2.3.g.2 of General Order No. 7; and (b) no obligation under any purchased power contract shall be undertaken and no expenditure for any specific demand-side management program included in an integrated resource plan or a program implementation schedule shall be made without prior commission approval. All power purchases from qualifying facilities and independent power producers shall be subject to statute and commission rules.

E. Public Participation

To maximize public participation in each utility's integrated resource planning process, opportunities for such participation shall be provided through advisory groups to the utility, public hearings, and interventions in formal proceedings before the commission.

1. Advisory groups
  - a. The utility shall organize in each county in which the utility provides service or conducts utility business a group or groups of representatives of public and private entities to advise the utility in the development of its integrated resource plan. A separate advisory group may be formed for each stage of the planning process, as appropriate. The utility shall chair each advisory group.
  - b. The public and private entities includable in an advisory group are those that represent interests that are affected by the utility's integrated resource plan and that can provide significant perspective or useful expertise in the development of the plan. These entities include state and county agencies and environmental, cultural, business, and community interest groups. An advisory group should be representative of as broad a spectrum of interests as possible, subject to the limitation that the interests represented should not be so numerous as to make deliberations as a group unwieldy.

- c. The utility shall consider the input of each advisory group; but the utility is not bound to follow the advice of any advisory group.
  - d. All data reasonably necessary for an advisory group to participate in the utility's integrated resource planning process shall be provided by the utility, subject to the need to protect the confidentiality of customer-specific and proprietary information.
  - e. The use by the advisory groups of the collaborative process is encouraged to arrive at a consensus on issues.
  - f. All reasonable out-of-pocket costs incurred by participants in advisory groups (other than governmental agencies) shall be paid for by the utility, subject to recovery as part of the utility's costs of integrated resource planning.
2. Public hearings
- a. The utility is encouraged to conduct public hearings or provide public forums at the various, discrete phases of the planning process for the purpose of securing the input of those members of the public who are not represented by entities constituting advisory groups.
  - b. Upon the filing of requests for approval of an integrated resource plan or projects, the commission may, and it shall where required by statute, conduct public hearings for the purpose of securing public input on the utility's proposal. The commission may also conduct such informal public meetings as it deems advisable.
3. Intervention
- a. Upon the filing of its integrated resource plan, the utility shall cause to be published in a newspaper of general circulation in the State a notice informing the general public that the utility has filed its proposed integrated resource plan with the commission for the commission's approval.
  - b. To encourage public awareness of the filing of a proposed utility plan, a copy of the proposed plan and the supporting analysis shall be available for public review at the commission's office and at the office of the commission's representative in the county serviced by the utility. In the case of Maui Electric Company, Limited, the utility shall also make a copy of its proposed plan and the supporting analysis available at a public library on each of the islands of Molokai and Lanai. In the case of Hawaii Electric Light Company, Inc., the utility shall also make a copy of its proposed plan and the supporting analysis available at the public library in

Kona. Each utility shall note the availability of the documents for public review at these locations in its published notice. The utility shall make copies of the executive summary of the plan and the analysis available to the general public at no cost, except the cost of duplication.

- c. Applications to intervene or to participate without intervention in any proceeding in which a utility seeks commission approval of its integrated resource plan are subject to the rules prescribed in part IV of the commission's General Order No. 1 (Practice and Procedure before the Public Utilities Commission); except that such applications may be filed with the commission not later than 20 days after the publication by the utility of a notice informing the general public of the filing of the utility's application for commission approval of its integrated resource plan, notwithstanding the opening of the docket before such publication.
- d. A person's status as an intervenor or participant shall continue through the life of the docket, unless the person voluntarily withdraws or is dismissed as an intervenor or participant by the commission for cause.

4. Intervenor funding

- a. Upon the issuance of the commission's final order on a utility's integrated resource plan or any amendment to the plan, the commission may grant an intervenor or participant (other than a governmental agency, a for-profit entity, and an association of for-profit entities) recovery of all or part of the intervenor's or participant's direct out-of-pocket costs reasonably and necessarily incurred in intervention or participation. Any recovery and the amount of such recovery are in the sole discretion of the commission.
- b. To be eligible for such recovery:
  - (1) The intervenor or participant must show a need for financial assistance;
  - (2) The intervenor or participant must demonstrate that it has made reasonable efforts to secure funding elsewhere, without success;
  - (3) The intervenor or participant must maintain accurate and meaningful books of account on the expenditures incurred; and

- (4) The commission must find that the intervenor or participant made a substantial contribution in assisting the commission in arriving at its decision.
- c. The intervenor's or participant's books of account are subject to audit, and the commission may impose other requirements in any specific case.
- d. Such allowance may be made only upon the application of the intervenor or participant within 20 days after the issuance of the commission's final order, together with justification and documented proof of the costs incurred.
- e. The costs of intervenor funding shall be paid for by the utility, subject to recovery as part of its costs of integrated resource planning.

F. Cost Recovery and Incentives

- 1. The utility is entitled to recover its integrated resource planning and implementation costs that are reasonably incurred, including the costs of planning and implementing pilot and full-scale demand-side management programs.
  - a. The cost recovery may be had through the following mechanisms:
    - (1) Base rate recovery--the inclusion of costs in the utility's base rate during each rate case. A balancing account may be appropriate in this instance to reconcile, with interest, the utility's recovered expenditures with its actual expenditures. It may also be appropriate to consider the utility's under-expenditure of authorized cost to limit recovery, unless program objectives are met or exceeded.
    - (2) Adjustment clause—the recovery of costs incurred between rate cases in excess of the baseline integrated resource planning-related costs that are included in the utility's base rates.
    - (3) Ratebasing--the inclusion of costs that are capital in character (i.e., expenditures considered to produce long-term savings or benefits, such as appliance rebates, loans, etc.), with accumulated AFUDC, in the utility's rate base at its next rate case. The costs are to be amortized over a period set by the commission.
    - (4) Escrow accounting--the accumulation, with interest, of costs, not capital in character, incurred between rate cases



management program performance (e.g., adjusting the return upward for achieving a certain level of kilowatt or kilowatt-hour savings) (ROE adjustment).

- b. The commission will determine whether the utility will be provided with incentives and the form of such incentives, if any, when specific demand-side management programs are submitted for approval. The utility may propose incentive forms for a particular program, based on the particular attributes of the program and the results to be attained.
- c. The commission may terminate any and all incentives whenever circumstances or conditions warrant such termination.

#### IV. Planning Considerations

##### A. Forecast

- 1. The utility shall develop a range of forecasts of the amount of energy consumers will need over the planning horizon. It shall develop forecasts for multiple scenarios that are necessary or appropriate in the development of its integrated resource plan. Among the scenarios are the base case scenario (a scenario based on the most likely assumptions), a high-growth scenario, and a low-growth scenario.
- 2. Each forecast shall identify the significant demand and use determinants; describe the data, the sources of the data, the assumptions (including assumptions about fuel prices, energy prices, economic conditions, demographics, population growth, technological improvements, and end-use), and the analysis upon which the forecast is based; indicate the relative sensitivity of the forecast result to changes in assumptions and varying conditions; and describe the procedures, methodologies, and models used in the forecast, together with the rationale underlying the use of such procedures, methodologies, and models.
- 3. Among the data to be considered are historical data on energy sales, peak demand, system load factor, system peaks, and such other data of sufficient duration to provide a reasonable basis for the utility's estimates of future demand.
- 4. As feasible and appropriate, the forecast shall be by the system as a whole and by customer classes.
- 5. The utility shall use all reasonable methodologies in forecasting, including, as practicable and economically feasible, the disaggregated end-use methodology.

##### B. Objectives

1. The ultimate objective of a utility's integrated resource plan is meeting the energy needs of the utility's customers over the ensuing 20 years.
2. The utility may specify any other utility-specific objective that it seeks to achieve through its integrated resource plan. For example, given the parameter of the State goal of less dependence on imported oil, the utility may set as an objective the achievement of lowering to a specified level the use of imported oil.
3. The commission may specify other objectives for the utility. Such specifications, if any, shall be included in the order opening a docket for integrated resource planning at the commencement of each planning cycle.

C. Effectiveness Measures

1. The utility shall specify the measures by which attainment of the objective or objectives is to be determined.
2. Where direct, quantifiable measures are not available, the utility may utilize proxy measures.

D. Resource Options

1. In the development of its integrated resource plan, the utility shall consider all feasible supply-side and demand-side resource options appropriate to Hawaii and available within the years encompassed by the integrated resource planning horizon to meet the stated objectives.
2. The utility shall include among the options the supply-side and demand-side resources or mixes of options currently in use, promoted, planned, or programmed for implementation by the utility. Supply-side and demand-side resource options include those resources that are or may be supplied by persons other than the utility.
3. The utility shall initially identify all possible supply-side and demand-side resource options. The utility may, upon review, screen out those options that are clearly infeasible. An option may be deemed infeasible where the option's life cycle costs clearly outweigh its benefits or effectiveness under both societal cost-benefit and utility cost-benefit assessments. The utility, with the advice of the advisory groups, may establish such other criteria for screening out clearly infeasible options.

E. Data Collection

1. For each feasible resource option, the utility shall determine its life cycle costs and benefits and its potential level of achievement of objectives. The utility shall identify the option's total costs and benefits—the costs to the utility and its ratepayers and the indirect, including external (spillover),

costs and benefits. External costs and benefits include the cost and benefit impact on the environment, people's lifestyle and culture, and the State's economy.

2. To the extent helpful in analysis, the utility shall distinguish between fixed costs and variable costs and between sunk costs and incremental costs; and the utility shall identify any opportunity costs.
3. The costs and benefits shall, to the extent possible and feasible, be (a) quantified and (b) expressed in dollar terms. When it is neither possible nor feasible to quantify any cost or benefit, such cost or benefit shall be qualitatively measured. The methodology used in quantifying or in qualitatively stating costs and benefits shall be detailed.

F. Assumptions; Risks; Uncertainties

1. The utility shall identify the assumptions underlying any resource option or the cost or benefit of any option or any analysis performed.
2. The utility shall also identify the risks and uncertainties associated with each resource option.
3. The utility shall further identify any technological limitations, infrastructural constraints, legal and governmental policy requirements, and other constraints that impact on any option or the utility's analysis.

G. Models

1. The utility may utilize any reasonable model or models in comparing resource options and otherwise in analyzing the relative values of the various options or combinations of options.
2. Each model used must be fully described and documented.

H. Analyses

1. The utility shall conduct cost-benefit and cost-effectiveness analyses to compare and weigh the various options and various alternative mixes of options. Alternative mixes of options include variously integrated supply-side and demand-side management programs.
2. The utility shall conduct such analyses from varying perspectives, including the utility cost perspective, the ratepayer impact perspective, the participant impact perspective, the total resource cost perspective, and the societal cost perspective.
3. The utility shall analyze all options on a consistent and comparable basis. It shall give the costs, effectiveness, and benefits and demand-side

management options consideration equal to that given to the costs, effectiveness, and benefits of supply-side options. The utility may use any reasonable and appropriate means to assure that such equal consideration is given.

4. The utility shall compare the options on the present value basis. For this purpose, the utility shall discount the estimated annual costs (and benefits, as appropriate) at an appropriate rate. The utility shall fully explain the rationale for its choice of the discount rate.
5. The utility may rank, as appropriate, the various options and mixes of options upon such reasonable criterion as it may establish with the advice of its advisory groups.

#### I. Resource Optimization

1. Based on its analyses, the utility shall select those resource options or mix of resource options that achieve that level of effectiveness or that level of benefits specified in the objectives at the least cost. The utility shall also identify those resource options or mix of resource options that achieve the highest level of effectiveness or level of benefits at various levels of cost.
  - a. The options or mix of options shall be selected in a fashion as to achieve an integration of supply-side and demand-side options.
  - b. The selection of options or mix of options constitutes the utility's integrated resource plan.
2. The utility shall develop a number of alternative plans, each representing optimization from a differing perspective, including the perspective of the utility, the ratepayers, the non-participant, and society. It shall also develop alternate plans to meet the needs identified by each demand forecast scenario.
3. For each plan, the utility shall identify the revenue requirements on a present value and annual basis. It shall note the risks and uncertainties associated with the plan. It shall also describe the plan's impact on rates, customer energy use, customer bills, and the utility system. It shall also describe the plan's impact on external elements--the environment, people's lifestyle and culture, the State's economy, and society in general.
4. The utility shall rank the various plans, based on such criterion as it may establish with the advice of its advisory groups. The utility shall designate one of these plans as its preferred plan and submit to the commission the preferred plan as its integrated resource plan.

#### J. Sensitivity Analysis

The utility shall subject its selection of resource options to sensitivity analysis by altering assumptions and other parameters.

V. Pilot Demand-Side Management Programs

A. Purposes

1. A purpose of piloting demand-side management programs is to ascertain whether a given program, not yet proven in Hawaii, is cost-effective-- whether it will have the penetration and will achieve accomplishment of the utility's objectives as originally believed.
2. A second purpose of piloting demand-side management programs is to determine whether the program design and configuration (including how it is managed and promoted) are such as to permit implementation of the program as efficiently and effectively as desired.

B. Utility Pilot Programs

1. A utility may implement on a full-scale basis (without pilot testing) any demand-side management program that has been proven cost effective as a result of a full-scale or pilot implementation of the program in another comparable utility service territory or as a result of pilot testing by a utility in Hawaii. In all other cases, the utility shall pilot test a demand-side management program before implementing it on a full-scale basis.
2. Each utility shall develop appropriate pilot demand-side management programs for implementation without awaiting commission approval of its initial integrated resource plan. For each program, the utility shall clearly articulate the parameters of the program, the expected level of achievement of the objectives, the measures by which the attainment of the objectives is to be assessed, the data to be gathered to assist in the evaluation of the pilot program, and the expenditure it proposes to make by appropriate cost components.
3. All proposed pilot demand-side management programs are subject to commission approval.