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EPA Comments on Docket No. 05-0069
For the State of Hawaii Public Utilities Commission

1. Introduction

The U.S. EPA is pleased to provide the comments below on Hawaii Public Utilities Commission (Commission) Docket No. 05-0069 pertaining to a proposal by Hawaiian Electric Company, Inc. (HECO) to establish, and/or continue, certain Demand Side Management (DSM) Programs. Under an Energy Efficiency and Renewable Energy (EERE) Projects partnership with states, EPA is providing expertise to help the State of Hawaii examine options to meet its clean energy goals.

The comments provided in this summary are based in part on a review of relevant documents and testimony in the docket, including the final Statements of Position (SOPs) submitted by the various parties and participants (parties). We have not conducted a comprehensive review of all documents in the docket. To the extent possible EPA has provided comparisons to experience in other states, drawing upon the experience of EPA's consultants and available information in the public domain. Web links have been provided to the cited documentation wherever possible. The comments are provided in the context of supporting the Commission by generally addressing the key questions raised in the docket, which we have grouped into the following four areas:

- **Question 1**: Whether energy efficiency (EE) goals should be established and if so, what the goals should be for the State.
- **Question 2**: What market structure(s) is the most appropriate for providing these or other DSM programs (e.g., utility-only, utility in competition with non-utility providers, non-utility providers).
- **Question 3**: Whether the seven (7) Proposed DSM Programs (i.e., the Commercial and Industrial Energy Efficiency (CIEE), Commercial and Industrial New Construction (CINC), Commercial and Industrial Customized Rebate (CICR), Residential Efficient Water Heating (REWH) Program, Residential New Construction (RNC) Program, Residential Low Income (RLI) Program, and Energy$Solutions for the Home (ESH) Program) the Residential Customer Energy Awareness (RCEA) Program, and/or other energy efficiency programs will achieve the established energy efficiency goals and whether the programs will be implemented in a cost effective manner. Which of the Proposed DSM Programs [the new energy efficiency DSM programs and the RCEA] should be approved, approved with modifications, or rejected.
- **Question 4**: Cost recovery mechanisms for utility-incurred costs and DSM incentive mechanisms
  - **Question 4a**: For utility-incurred costs, what cost recovery mechanism(s) is appropriate (e.g., base rates, fuel clause, IRP Clause); For utility-incurred costs what cost level is appropriate; whether DSM incentive mechanisms are appropriate to encourage the implementation of DSM programs, and, if so, what is the appropriate mechanism (s) for such DSM incentives.
  - **Question 4b**: If utility-incurred costs for the Proposed DSM Programs are to be included in base rates, what cost level is appropriate, and what the transition mechanism for costs recovery will be until the respective utility's next general rate case; whether HECO's proposed DSM utility incentive is reasonable, and should be approved, approved with modifications, or rejected.

program should devote the largest proportion of rebates to lighting which account for 43% of peak demand and 31% of energy consumption.

- *The Consumer Advocate had raised the issue of the balance between programs.* It should be noted that the load increase forecasted by HECO could be assumed to be all new construction and the basis for the mix of programs. In examining this, we looked at the table below, which reproduces Table 4-7 of T-11 Phase I report. Based on these results, it makes sense to target new construction to avoid these increases, but even by 2015, approximately 80% of the load for all sectors is the existing population. New codes and standards for buildings and appliances could be developed in the 10-year time frame that aggressively hedge against these increases while DSM programs, including load control, target the existing population for the next 10 years.

Table 3: Reproduction of Table 4-7, T-11 Phase I Report

		2004-15	Load Increase	2004-25	Load Increase
Res	GWh	985	21%	1828	35%
Com	GWh	1210	19%	2085	31%
Ind	GWh	183	20%	327	33%
Res	MW	183	20%	363	36%
Com	MW	185	18%	343	31%
Ind	MW	22	18%	43	33%

To reiterate, codes and standards for building construction and systems - as well as appliance efficiency - should be used to reduce future load in addition to the planned DSM programs. This would free up funds to influence the larger existing market beyond what cannot be influenced at all by building codes.

- *The proposed programs are generally well designed and are cost-effective based on HECO's assumptions.* However, some of the savings assumptions may need to be slightly adjusted depending on new manufacturing standards, particularly for HVAC systems that are subject to changing federal standards.
- *Savings forecasts for programs that offer end-use renewable energy options (such as on-site residential or commercial photovoltaic systems) should include additional avoided costs based on environmental impacts (emissions reductions) and risk avoidance of volatile fossil fuel costs.* These are costs that are as relevant as the actual cost of avoided fossil fuel generation.
- *Regardless of the program administrator model chosen by the utility, the Commission should require integrated third party measurement and verification of program savings.* Early evaluation would help to refine program designs by identifying improvements that can be put into place before the initial program ends. A third party evaluation at the end of the program funding cycle is also critical to ensure that claimed savings are verified. Verification of savings is modified by the actual savings determined through sampled testing. This results in a ratio called "net to gross" (net verified savings versus gross reported savings). For evaluation cost management, programs that are proved to be consistently productive can be evaluated on longer cycles instead of annually.
- *Fully funded programs should promote well-established technologies and use widely accepted program paths, but provision can be made for new research and strategies.* While the submitted programs reflect sound technologies and strategies, it is beneficial to fund and maintain a small

measure or technology, and upon each technology's age. Technologies that are seen to be more widely adopted than others may be considered less necessary to need program support, and therefore can have more stipulations on incentive levels or paybacks.

Custom programs, by their nature, allow flexibility in technologies and strategies. For maximum customer benefit, the approaches should be as fuel neutral as possible. The custom approaches should be monitored so that simple fuel switching does not occur (i.e., substituting gas-fired technologies as measures to reduce electricity use). A weakness sometimes found in other US utility programs is when a builder is rewarded incentives to reduce electricity load or usage in their planned hot water or HVAC systems, but all that had occurred is a design switch to another system fired by a fossil fuel. The Commission should ensure that customized approaches consider total fuel savings in comparative analyses, and ensure non-renewable fuel switching is not rewarded through incentives.

CINC Baseline HVAC Efficiency

For HVAC units serving new construction commercial buildings in the City and County of Honolulu, the base case unit efficiency should be ASHRAE 90.1-1999 compliant; specifically, they should have an EER of 10.1 (for 5.5 ton – 11 ton) or 9.7 EER for larger units (11.5 – 20 ton). These efficiencies are consistent with Chapter 32: Building Energy Efficiency Standards, Article 10 of the City and County of Honolulu Revised Ordinances.

As per two items mentioned earlier in the general comments, the program qualifications specify package HVAC (10-20 ton) with an energy efficiency rating (EER) of 8.9 or greater, but since savings estimates are based on a higher EER participants may save less than the projected values given; and variable speed drives may have paybacks much shorter than the installation of premium efficiency motors but require a greater capital investment.

It should be explicitly stated that novel measures outside of those considered in the program planning phase be eligible for the custom rebate program if the engineering assessment can prove the measures are cost-effective. These "open-ended" clauses can encourage creative and industry-progressive solutions that cannot be readily anticipated in a more formal prescriptive program setting.

Residential Water Heating

As discussed earlier, a program alliance with dealers will be important to sustain market knowledge and awareness. It will be helpful to have generous rebates to ensure an enthusiastic response.

Solar energy factor (SEF) should be used to compare solar water heaters with high efficiency water heaters since SEF can be in the range of 2 to 3 as opposed to high efficiency water heaters with SEF that can not exceed 1.0. This type of metric values the free solar thermal energy being used in place of electricity that must be purchased. The marketing message should be that solar water heaters require less electricity than any electric water heater even high efficiency models. The term "premium efficiency" could also be used to promote solar water heating over and above high efficiency models.

Residential New Construction

The package qualifications look sound and reasonable. The ENERGY STAR Homes program may be a natural progressive step towards the residential new construction effort. Incentives and program initiatives targeting builders and developers play a key role in moving this type of program.

associated with this model are significantly lower as marketing, advertising and tracking responsibilities are shifted to the manufacturer. An additional benefit to this approach is the promotion of the overall CFL market by increasing competitive pressure on manufacturers on retailers.

Another possible approach would be to directly install CFLs at both residential and commercial buildings. These DSM direct acquisition programs are typically conducted using a "neighborhood blitz" approach where utility representatives fan out in a targeted neighborhood and offer to install a set of CFLs for each recipient they can find. Direct install CFL strategies are also often done in conjunction with other services, such as home weatherization, a home energy audit, or utility-sponsored water conservation measures.

In 2005, HECO partnered with General Electric and WEBCO to install 100,000 CFLs in homes by December 31, 2005. It would be interesting to determine the success rate of this program and how the administrative costs measured up to the incentive offered.

Residential Low Income Assistance

In addition to the above discussion for the Energy Solutions program, community assistance providers (CAPs) are an integral part of the program success. This is the most cost effective channel to administer the funding through these existing agencies. This is because these agencies are familiar with the people and neighborhoods that they serve. They also have a client intake and management procedure already in place, so the utility program simply becomes part of the services the agency already offers.

Residential Direct Load Control

These residential direct control programs are new. The Commission should carefully monitor this program for results and ensure that negative reactions are within a pre-determined range, i.e., a level of user dissatisfaction is at a minimal range of perhaps 10% or less.

Residential air conditioner switches are a reasonable measure since air conditioning accounts for 23% of peak demand. Residential water heaters account for only 14% of peak demand, and incentives may be better used for solar water heating as a strategy to reduce peak demand.

Customer Energy Awareness Program

The program premise is similar to other awareness and educational approaches in the U.S. The underlying and reasonable assumption is that this awareness building better sustains knowledge, recognition, and acceptance of high efficiency purchasing choices and end use behaviors. It will be critical for the program administrators to establish firm baseline metrics on awareness and behavior that can be measured and subsequently re-measured over established periods of time to ensure that this program is making reasonable impact. Ideally, a series of baseline metrics can be established and measured on awareness, activities, knowledge, and purchasing decisions relating to energy efficiency before the program begins; when a survey is done to capture a second set of metrics for comparison, the desirable outcome should reveal a majority of metrics that show a positive trend.

C&I Load Management

There are three components of design, delivery, and evaluation that are necessary to consider for this type of program. For the program design, it is important to ensure that the proper infrastructure is created to move potential candidates to program participation. A walk-through audit directed at identifying demand response opportunities is extremely beneficial as a means to recruit customers into the program. The audit could also recommend CIEE and custom rebate opportunities to avoid missing opportunities. Incentives or metering equipment should be part of the overall program design.

For the program delivery, a one-on-one marketing approach by utility account executives provides a very powerful outreach into the market. Outreach informational meetings to key industry groups such as hospital or manufacturing associations can also provide substantial marketing value.

Early evaluation is necessary as well. It is critical to prove out the value of the demand response resource through early testing. Generally, a demand reduction test is conducted by the utility on a non-critical day to establish the foundation for estimating the true amount of load reduction.

IMPLICATIONS FOR HAWAII

The proposed programs, and their related technologies, all emulate similar offerings by many different utilities, state agencies, and regional energy efficiency organizations throughout the US. The technologies to be promoted in the program offerings are well established, and as such allow for reasonable market potential forecasts.

Regular impact evaluations will be important to confirm the reported program savings, while process evaluations are important for programs with a high level of administration and management. Baseline metrics that are established and re-measured at periodic intervals allow all parties to readily assess the progress of end user awareness, knowledge, and adoption of energy efficient behaviors, technologies, and measures.

As testified in some SOPs, there may be potential benefits to promote emerging technologies or alternative program strategies that capture even more savings than the established, well-practiced, and well-recognized versions. These technologies may not yet be reliable enough to allow for planned savings, but pilots and demonstrations provide first-person and real time net savings measurements for the program administrators; timely decisions can then be made to incorporate these technologies into existing programs. It would be useful to allow consideration of pilots and demonstration projects to test new strategies or technologies that might eventually be folded into the more established programs. These pilot offerings would also help to satisfy other stakeholders who have expressed differing opinions on technologies or strategies not currently submitted by the utilities.

and non-participants, must be considered in the tradeoff between encouraging program success and equity for the ratepayers.

RMI, who favors a hybrid market structure, suggested in its SOP that if there are no positive incentives offered for the DSM programs then the utility is merely recovering costs and would be indifferent to using ratepayer funds. An incentive, on the other hand, provides a way for a utility to earn returns on invested capital and encourages aggressive DSM implementation.

HREA, who favors a competitively bid "efficiency utility" market structure, suggests that "all bidders (including HECO) should be allowed to propose their costs plus a profit for administering and managing Commission-approved DSMs."[22]

The DOD appears to favor the "stick" without the "carrot" approach, as they do not believe shareholders should be rewarded for doing what HECO is supposed to do consistent with the IRP Framework. However, DOD suggests that overall quality and performance of DSM management should be taken into account when operations are reviewed during a general rate case. If DSM program performance has been exemplary, the DOD states, then the Commission may take this into account when deciding the rate of return.

DSM Incentive Mechanisms

There are a variety of DSM incentive mechanisms used in different states and utility jurisdictions across the United States. However, it should be pointed out that not all utilities offering DSM programs are eligible for incentive mechanisms. The incentive mechanisms vary widely between utilities across jurisdictions. The key differences are related to:

- The variable or variables upon which the incentive mechanism is based
- The level of performance (relative to the target) at which the utility is eligible for an incentive, and
- The degree to which the net benefits of the DSM activities influence the incentive

In many jurisdictions, the incentive mechanism relies on more than one variable. The most frequently used variables include:

- Total Energy Savings
- Benefit/cost ratio of DSM portfolio
- Net Benefit of DSM activities, and
- DSM spending or DSM budget

The TRC test is commonly used to measure the net benefits of DSM programs; however, some utilities use other methodologies.

Many utilities must exceed a minimum performance level (MPL) before they are eligible for an incentive award. Although incentive mechanisms vary widely across jurisdictions, several key factors emerge upon close examination:

- Net DSM benefits are often a key input into incentive mechanisms

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[22] Final SOP of HREA and Certificate of Service; Docket No. 05-0069; page 6

- Where incentives are based on net DSM benefits, the incentive is calculated based on every unit of TRC achieved (not just above a target)
- Utilities have a minimum performance level that they must exceed before they are eligible for an incentive award. This minimum performance level is typically set at some level below the utility's DSM target[23]
- The metric for the minimum performance level is often different than the metric upon which the incentive payment is based. For example, the minimum performance level may be based on energy savings, whereas the incentive payment level may be based on net DSM benefits.

A brief survey of approaches used in different states and jurisdictions is included below to illustrate different examples of DSM Incentive mechanisms.

British Columbia utility company FortisBC has an incentive mechanism where if it achieves 105% of its target net benefit target for the residential sector, it is eligible for 3% of TRC achieved in that sector. If it achieves 115% of its target, it is eligible for 4.5% of TRC.

Table 4: FortisBC Incentives (+) or Penalties (-) at Selected Performance

% of PBR Target Net Benefits	<50%	<70%	<90%	90-100%	>100%	>110%	>120%
Residential	-6.0%	-4.5%	-3.0%	0.0%	3.0%	4.5%	6.0%
General Service	-4.0%	-3.0%	-2.0%	0.0%	2.0%	3.0%	4.0%
Industrial	-3.0%	-2.0%	-1.0%	0.0%	1.0%	2.0%	3.0%

Under this approach incentives are capped at 150% of the target net benefits. The incentive awarded is the sum of the incentives and penalties in the three sectors. However, penalties accrued in each sector only serve to reduce incentives earned in other sectors. If the sum across all three sectors is negative, then there is no DSM incentive and no penalty is charged[24].

New Jersey is currently transitioning to a state-run administrator but has provided incentive mechanisms for utility run programs. New Jersey utilities may apply for an incentive mechanism using a shared savings approach. The shared savings to be retained by a utility are calculated as a percentage of the net benefits, with the percentage to be proposed in a DSM Plan. The Net Benefits are determined by the Total Resource Cost Test. If the net benefits are less than zero, then the utility would receive a penalty based upon the same percentages the utility proposes to determine the positive incentives[25].

The shared savings approach is the current mechanism by which HECO is compensated. Under this mechanism, net system benefits are equal to the net present value of the energy savings and load reductions acquired, less program costs:

"Net System Benefits = NPV (system benefits of energy savings and load reduction) – DSM Program Costs

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[23] For example, in Massachusetts, the threshold level of savings that must be achieved for incentive eligibility is 75% of the savings target. In New Hampshire, gas utilities must achieve 65% of their predicted energy savings in order to be eligible for any incentives.

[24] FortisBC 2005 Revenue Requirements filing. November 26, 2004.

[25] New Jersey Board of Public Utilities; Supp 1-22-02. 14:12. Chapter 12, Demand Side Management.

The system benefits of energy savings and load reductions are measured by the additional energy and capacity costs that would have been incurred by HECO in the absence of the acquired energy savings and load reductions. Program costs currently consist of customer incentives, direct labor, and outside services necessary to administer the programs, but do not include the cost of measurement and evaluation efforts, nor do the include the current shareholder incentives"[26] HECO' compensation is currently calculated as 10% of the net system benefits.

In Massachusetts, the DSM plan proposed by utilities includes a design performance level, or target, which is the level of savings it expects to achieve through the implementation of the DSM programs included in its proposed plan. This target is expressed in levels of energy savings, and in other measures of performance, as appropriate. Utilities receive an after-tax incentive of 75% of the total DSM program implementation cost times the average yield of the 3-month Treasury bill for achieving 75% of its DSM target (the minimum performance level for incentive eligibility). The incentive increases linearly according to the same formula from the threshold level to 125% of the target, at which point the utility would receive 125% of the total DSM program implementation cost times the average yield of the 3-month Treasury bill.

One incentive approach, which mirrors HECO's proposed incentive approach for its seven (7) new DSM Programs, is where utilities earn a percentage of their DSM expenditures. However, unlike HECO's proposal the mechanism used in Connecticut requires utilities to meet specific performance targets to earn a range of incentives. As illustrated in the table below, the utility earns an escalating percentage of expenditures as it meets increased levels of performance. Weighted performance indicators and targets are set for the different residential and commercial/industrial programs as well as for those sectors as a whole, in the plan.

Table 5: Connecticut Incentive as a Percent of Expenditure Tied to Performance

Minimum performance ratio (% of target)	Incentive (% of expenditure)
70%	2%
80%	3%
90%	4%
100%	5%
110%	6%
120%	7%
130%	8%

Minnesota's Natural Gas Utilities have a complex incentive formula (shown below) which uses a stepwise (sliding scale) function, where the incentive awarded is a function of the percent of the energy savings target achieved[27]. Under the incentive mechanism, utilities can earn a share of the net societal benefits based on the societal cost test achieved through their DSM activities, up to a maximum value. This maximum value, or incentive cap, is equal to 30% of the approved or actual DSM spending, whichever is less.

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[26] HECO: Final Statement of Position and Exhibits 1-3 and Certificate of Service; Docket 05-0069; pg. 73

[27] Xcel's 2002 Conservation Improvement Plan (CIP) Status Report and associated compliance filings (docket no. E,G001/CIP-00-1457)

performance target appear favorable when compared to an approach based on a percentage of expenses with no performance target.

IMPLICATIONS FOR HAWAII

The DSM/Energy Efficiency policy objectives in this docket will drive program decisions regarding cost levels, cost recovery and incentives. Therefore, it is essential that the Commission begin by clearly articulating its policy objectives with respect to a statewide DSM/Energy Efficiency program.

As discussed at length in this section, there are a variety of approaches to address the issues associated with cost levels, cost recovery and incentives in the context of statewide DSM/EE programs. There is also a wide range of experience in addressing these issues across many states and utility jurisdictions. There is no single, simple model for implementing a statewide DSM/EE program. Therefore, it is strongly recommended that a more detailed analysis of the pros and cons of each option, as part of a more structured approach towards EE policies is warranted before deciding on these issues.

It is recommended that further investigation be conducted in regards to the level of cost proposed for HECO's seven (7) new energy efficiency DSM programs. In its SOP, HECO provided updated DSM program costs information for the programs that must be carefully reviewed and analyzed. The majority of the parties in the proceeding are opposed to HECO's proposed program cost recovery, the mechanism proposed for shareholder incentives and the mechanism for recovery of lost margins. HECO has acknowledged this opposition and has stated that both the compensation mechanism and the level of compensation proposed in the rate case require re-evaluation. As such it is recommended that the discussion remain open on these issues and that a number of alternatives should be studied and considered.