Energy Trust High Priority Measure Development

In 2013 Energy Trust created 426 new measure definitions and revised 575. Every project incentive and technical study is tracked through our systems as a measure, from a custom refrigeration project through the Industrial program to a single showerhead ordered online. Of this large list of additions and revisions, only a handful came to the Conservation Advisory Council (CAC) for review and consideration of some aspect of the measure definition, decision to offer an incentive, or incentive level. These discussions included new incentive proposals and changes to the offering due a combination of cost increases and lower evaluated savings.

CAC members and other stakeholders are interested in gaining greater understanding and insight into our measure development process for key measures. These measures of interest tend to be prescriptive (high volume with pre-determined, deemed incentives and savings and cost assumptions or calculations) with high visibility either from a participant standpoint or a trade ally/market delivery perspective.

To respond to this stakeholder interest for greater insight into high priority measures and as follow-up to prior CAC discussions where we've discussed what types of measures are most likely to be of interest we propose the following; 1) a process for discussion of measures, and 2) a template example for the key variables to be provided in advance of the CAC discussion. Our goal in offering this proposal is to create a more standardized approach to how we provide measure information to the CAC to help make it easier to prepare for and participate in discussions. We plan to review this proposal at the next CAC and incorporate your feedback for future measure related discussions.

Types of measures discussed at CAC:

- Prescriptive measures only, custom measures are within overall program design/approach of C&I programs
- High volume and/or high profile
- Play a key role in program strategies
- Involve complex interpretations of baseline, cost or savings data which impact cost effectiveness. Our interpretation of market studies and our data may vary from regional assumptions
- May contain some controversial aspect
- Potential for high impact on delivery network

Examples of high priority measures we foresee discussing with the CAC in 2014

Existing Homes

- Window replacements
- Direct vent gas fireplaces
- Split system heat pumps

1. **Proposed Process for CAC Measure Discussion**

We propose a two-step CAC meeting process to fully cover the discussion of high priority measure development. Revisiting loose ends at a third meeting may occasionally be needed.

The first meeting is an introduction to the measure. This meeting lays out the approach to determining cost and savings for the measure to be used in the cost effectiveness review and asks for CAC feedback.

- Key variables outlined
- Data sources for key variables
- Our interpretation of that data
- What factors can influence those key variables
- How does that impact cost effectiveness of the measures?
- Which are the key variables where we know the least, and what judgments are we making?
- First-cut proposed disposition:
    - Initial BCR results
    - Whether to include
    - Incentive levels, program design.

If there are assumptions we are still unsure of at this time, we'll make that clear and possibly provide options we are considering.

The second CAC meeting is a follow-up discussion of program design of incentive and delivery for the measures, including cost effectiveness results (final benefit cost ratios for utility cost test and total resource cost test). If the first meeting discussion fully covers all questions and concerns as well as the incentive and delivery aspects, the second meeting may not be needed.

Ultimately, stakeholder/CAC feedback may create an iterative process where we need to re-vet the measures for new takes on key assumptions.

2. Proposed Measure Discussion Outline

Prior to the first measure discussion with the CAC, we propose to provide as much of the following measure specific information as possible in a concise manner. A final version of the document will be sent out prior to the second meeting, incorporating any applicable CAC feedback or new information gathered since the firs discussion. An example of how this information may be appearing for a specific measure follows the outline below.

Measure Discussion Outline

Measure Description/Savings Opportunity

- What's the savings opportunity (potential)
- End use
- Market segment applicability
- Program and cross-program applicability
- Delivery approach (direct install vs. retail vs. trade ally installed)
- Incentive (proposed, change, maximum)
- Trends, history, or other important considerations

Energy Savings

- Baseline energy use – code? Market? Existing equipment?
    - Why? How is this determined?
- Key variables determining savings.
- Method to determine savings – data and assumptions used
- Relationships of savings estimate to program strategy
- Range of savings based on major uncertainties

- Measure life

Measure Cost

- Total cost vs. incremental
- Data sources
- Range, average, median
- Interaction with tax credits or other programs

Non energy benefits

- Quantifiable – describe calculation and source data
- List non measureable, possibly significant non energy benefits that apply

Cost Effectiveness

- BCR results: TRC and UCT
- How range of savings/costs impact cost effectiveness
- Exception justification if applicable

Program requirements/eligibility

- Restrictions to eligibility to insure cost/savings performance

Evaluation Plan

- How will the savings for this measure be evaluated?
- What key variables have most uncertainty and will need to be reviewed within a certain timeframe?

EXAMPLE: Leave Behind Showerheads

Measure Description

In Washington State, HER contractors leave behind 1.75 of 1.5gpm showerheads for residents to self-install. These low flow showerheads reduce the amount of water heating energy needed by restricting the flow rate of water. The resulting reduction in warm water use produces energy savings from the gas water heater.

This measure is applicable to single family homes in NW Natural Washington service territory through the Home Energy Savings (existing residential, HES) program. Showerheads are delivered by Home Energy Review contractors at no cost to the homeowner and installed by the homeowner. Homeowner installs are also called leave behinds.

Energy Savings

<u>Baseline:</u>

Baseline energy use is associated with a 2.51gpm showerhead. This baseline line flow rate was determined through the Residential Building Stock Assessment (RBSA) data by surveying showerhead flow rate in existing homes.

Key energy use assumptions include

- 75 degree Fahrenheit temperature rise
- 68% of water is hot, which results in a delivery of approximately 106 degrees Fahrenheit
- 0.46 showers per person per day
- Household occupancy in Clark County, Washington is 2.76 people, according to the 2010 U.S. Census
- 7.84 minutes per shower
- Measured flow rate is 90% of rated flow rate, as rated flow is tested at 80 psi, which is higher than the water pressure in most locations.
- Showerheads are installed and remain in place 75% of the time

Savings:

- Combining the above major assumptions, annual energy use per home for a baseline showerhead can be calculated and compared to annual energy for a 1.5 GPM and a 1.75 GPM showerhead.
- For a homeowner installed 1.75 gpm showerhead, energy savings are 14.4 annual therms. For a showerhead with a flow rate of 1.5 gpm, energy savings are 17.9 annual therms.

Measure life:
Showerheads are assumed to remain installed for 15 years.

Uncertainties:

- All of the above assumptions are meant to characterize the typical homeowner shower usage. More occupants than 2.76 taking longer and hotter showers with higher water pressure than average would result in more water savings, with the opposite of each of these assumptions producing lower savings.

- For leave behind measures, a key assumption is the installation rate. The rates for homeowner installs are taken from an Energy Saver Kit analysis, performed by an evaluator for Energy Trust.

Important considerations:
Low flow showerheads are a high volume measure for the program as a low cost way to meet savings goals. Due to high volumes distributed per year, penetration rates are growing, resulting in a lower existing flow rate assumption over time. Therefore, this measure has limited lifetime duration, 1-2 additional years of delivery are estimated depending on future program activity.

Measure Cost
The cost of the measure is our full cost per showerhead.

Non energy benefits
Energy Trust uses the water and sewer rates of the City of Vancouver to calculate the non-energy benefit of reducing water consumption in Washington. The combined rate is $8.14 per 1000 gallons. The change in water volume annually includes both cold and hot water.

Cost Effectiveness

Project	Measure	Measure Lifetime (yrs)	Annual Electricity Savings, kWh	Annual Gas Savings, therm	Total Cost	ETO Incentives	Non Energy Benefits (if any)	Combined Utility System BCR	Combined Societal BCR
Homeowner installed showerhead	1.75 GPM	15	0	14.4	$3.60	$3.60	$212	35.83	94.72
Homeowner installed showerhead	1.5 GPM	15	0	17.9	$3.60	$3.60	$263	44.44	117.50

Due to inclusion of substantial non energy benefits, these measures have the highest benefit cost ratios of all measures.

Program requirements/eligibility

- A maximum of 2 showerheads per household.

Evaluation Plan

- Review of these measures will be monitored internally, third party impact evaluation or billing analysis does not reasonably apply
- Planning will monitor existing showerhead gpm rates to advise when the measure has reached market saturation.