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November 7, 2017

MEMORANDUM

TO: Power Committee

FROM: Tina Jayaweera, Charlie Grist

SUBJECT: Report out ANLYS-3: Exploration of an End Use Conservation Model

BACKGROUND:

Presenter: Tina Jayaweera

Summary: An end-use conservation model is common practice in the industry, where the conservation potential is built up based on end-use conservation. The Council, however, has used a units-based model to determine potential. In March 2017, the Council contracted with a consulting firm to conduct a scoping study for potential development of an end-use conservation model. The study highlighted the advantages and disadvantages, with associated risks, of developing an end-use conservation model. The study recommends, with which Council staff agree, that the Council should incorporate key benefits of an end-use model in its current, units-based approach without full adoption of such a model.

Relevance: The conservation potential model is a critical tool in developing the energy-efficiency supply curves that are used as inputs to the regional portfolio model.

Workplan: B.1. Maintain Analytical Capabilities: Conservation

Background: Action plan item ANLYS-3 is as follows: Explore development of an end-use conservation model. [Council] Many conservation planners in the

industry utilize an integrated end-used based conservation assessment model to closely tie savings to load forecasts. In addition, models may also be improved by including performance-based efficiency approaches. The Council will scope the development of a working model. Depending on findings/budget, the Council may contract out model development. Report on scope will be completed by 2017.

More Info: At the [November 2016 Council meeting](#), the Council approved the release of an [RFP](#) for Scoping End Use Model for Conservation.

The final report from the Consultant is available [here](#)

Should Council Staff Use an End-Use Conservation Model?

Power Committee
November 14, 2017

7P Action Item: ANLYS-3

- **Calls for Council Staff to investigate whether or not to switch from a “units-based” to an “end-use based” conservation potential model**
- **In March 2017, hired consultant (Cadmus) to scope the development of an end-use based model, highlighting advantages and disadvantages**

Current Approach

- Council staff uses a “units-based” model for EE potential

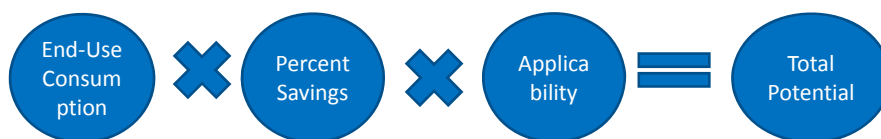


- Number of widgets is derived from load forecast
- Savings fixed for planning horizon

Other Approach:

End-use Conservation Model

- Connection between **loads & potential at end use**
- Measure savings is tied to end-use consumption instead of being fixed value



Should Council Staff Use an End-Use Model?

Advantages

- Better ties conservation to load forecast
- Avoids potential over-counting of potential compared to end-use forecast
- More rigorously captures interactions between measures
- Improved ability to model scenarios

Disadvantages

- More complex with less transparency
- Data requirements increase
- Will not be as closely synced to RTF values
- Will be harder to tie to program/momentum savings
- Model development and support will be extensive

Consultant Recommendations

- **Keep units-based approach, but:**
 - Identify ways to improve modeling of measure interaction in current model
 - Build out comparison at end-use level with load forecasts for key measure groups

Council staff agree with recommendations and will work to incorporate for 8th Plan

EXTRA SLIDES

Units-Based Example

- Attic insulation saves 2,000 kWh/yr
(or 2 MWh/yr)
- 100,000 homes need attic insulation
- Total regional potential
 $2 * 100,000 = 200,000 \text{ MWh/yr}$

End-Use Based Example

- Attic insulation saves 20% of heating load
- Regional heating load 20,000,000 MWh/yr
- Only 5% of homes need attic insulation
- Total regional potential
 $20\% * 20,000,000 * 5\% = 200,000$ MWh/yr

What's the Difference?

- Heating load is not static
 - Other insulation, more efficient equipment will decrease heating load
 - Savings *percentage* is assumed constant but *kWh* value decreases
- End-use model captures these interactions dynamically
- Units-based model savings often assume “last-measure in”, resulting in conservative savings estimate in early years