Northwest **Power** and **Conservation** Council

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

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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

Northwest Power and Conservation Council

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

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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 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