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

August 6, 2019

MEMORANDUM

TO: **Power Committee Members**

FROM: **Charlie Grist, Tina Jayaweera**

SUBJECT: **Planning Parameters for Energy Efficiency Supply Curves in 2021 Plan**

BACKGROUND:

Presenter: Charlie Grist

Summary: There are several global inputs and estimates that are used in the energy efficiency supply curves. In development of the curves for the 2021 Power Plan, staff are reviewing these key inputs with the Conservation Resources Advisory Committee (CRAC). At the July 25, 2019 meeting, staff reviewed two key inputs that influence the amount and cost of conservation potential identified in the plan; maximum achievability and program administrative cost. This memo updates the Council on the proposed approach taken for these key inputs for the 2021 Power Plan.

Approach and Recommendations
    The Council selects key inputs based on empirical evidence and judgement where required. For these two key input parameters staff collected and reviewed studies, reports and data from utility programs, codes and standards reviews, and other sources. These findings form the basis of staff recommendations which were presented to the CRAC for review. Materials reviewed by the CRAC are available on the Council website in a link at the end of this memo. Staff recommendations are based on consideration of feedback from the advisory committee and subsequent discussions.

Staff proposes to increase the maximum achievable limits for measures. The maximum achievability estimates will be differentiated by measure types rather than by using one maximum for all measures. The default achievability limit will still be 85 percent for retrofit measures. However, many of the lost opportunity measures, which may be influenced by federal or state standards, could achieve higher limits. Estimates will be determined on a case-by-case basis and reviewed by the CRAC. On the issue of estimating the program administrative costs, staff proposes to retain its previous methodology which uses a single estimate set at 20 percent of incremental measure cost and apply it to all conservation measures. Each of these is discussed in more detail below.

Discussion **Maximum Achievability**
Maximum achievability represents the maximum amount of technically-feasible energy efficiency that could be acquired over the 20-year planning horizon. This factor is introduced to assure that conservation is similarly available and reliable compared to other new resources considered in the plan. Historically, the Council has assumed this maximum to be 85 percent, meaning no more that 85 percent of all measures could be acquired by the end of the 20-years.

This is the estimate of the amount that can reasonably be acquired by all mechanisms available including fully subsidizing costs. These mechanisms include more than utility programs alone. The mechanisms also include improved state and local building codes, federal and state appliance standards, market transformation programs, marketing efforts, voluntary programs, electricity pricing mechanisms, and other tools.

Staff believes the current limit underestimates achievable potential. The rationale for this revision is based on analysis of the region's forty-year track record of conservation potential assessments and development. A Council retrospective done in 2007 looked at the 1983-2002 time frame and came to the conclusion that actual savings met or exceed maximum expectations in terms of energy saved. At the time, there were many examples of better than 85 percent penetration for lost-opportunity measure savings achieved through building codes, appliance standards, and utility programs. In the roughly 15 years since that earlier analysis, federal and state codes and standards processes have increased in the scope of their coverage and the depth of cost-effective savings they achieve. Further, state codes processes in all four Northwest states and the federal standards processes have evolved to incorporate regular periodic review and resetting of efficiency levels that often capture savings not identified in earlier versions due to technology improvements. This continuous-improvement schedule has consistently produced cost-effective savings that meet or exceed the potential identified ten years earlier.

At the CRAC meeting, staff proposed the maximum achievability be increased to 95 percent for lost-opportunity measures. These include measures in new buildings as well as new and replacement appliance and equipment measures where state building codes are a likely mechanism of delivery or where federal or state standards are in play. The maximum of 85 percent would be retained for retrofit measures.

Members of the CRAC generally supported the proposed changes. Discussion centered around several issues:
1. Should the maximum penetration and the maximum ramp rates be combined into one factor?
2. Should maximum penetration be differentiated by measure type?
3. Should the maximum for lost-opportunity measures be higher than 95 percent? Maximums of 100 percent and 125 percent were recommended to reflect the trend that future efficiency improvements often exceed expectations
4. Should the maximum for retrofit measures also be increased?

Based on the CRAC discussion and further considerations, estimates will no longer limit the achievability of measures to 85 percent of the technical potential. Maximum penetration limits and the maximum program ramp rates will be combined to simplify analysis. On the issues of the maximum for lost-opportunity measures, staff recommends that different maximums should be set for individual measures based on circumstances such as measure type and likely delivery mechanism, but not going above 100 percent on a planning basis. On the issue of the maximum for retrofit measures there were voices on both sides of a maximum 85 percent limit proposed at the CRAC. The current limit is based on one study where residential weatherization retrofit measures were free to home owners. Staff recommends retaining the 85 percent maximum as a default for retrofit measures revising it for specific measures when there is sufficient evidence to support higher penetration estimates. All estimates will be set on a case-by-case basis and reviewed by the CRAC.

The impact of the changes on the 2021 Plan supply curves is not known at this time. But a rough calculation of the impact based on the Seventh Power Plan supply curves indicates that increasing all lost-opportunity penetration to 95 percent would increase the estimate of savings potential available by about 5 percent in the first six years and about 6 percent over the twenty-year planning period.

Program Administrator Cost
Program administrative cost represents the additional cost borne by utilities (or other program administrators) to acquire energy efficiency resources and is included in the levelized cost calculation for the energy efficiency measures. administrative cost includes expenses such as marketing, evaluation, implementation, planning, and any technical

assistance related to energy efficiency programs. Note, these costs do not include incentives paid by the utility to the customer. The Council has estimated this cost to be approximated by 20 percent of the incremental cost for a measure. Staff posed to the CRAC two main questions: (1) is percent of incremental cost the best metric to use and (2) what is the best estimate of future administrative costs? Staff reviewed other metrics with the CRAC. Most CRAC members felt that percent of incremental cost was an adequate metric, though there was significant discussion on what the appropriate amount is and how to apply it.

There were two main points of discussion on the level of administrative costs. First, certain acquisition mechanisms may result in lower costs. For example, acquisition via codes and standards is generally at lower administrative cost due to less direct utility involvement with consumers, installers and vendors. Second, additional or incremental measures may be acquired with little extra administrative costs in some cases. For example, during a home visit, the administrative cost is the same whether one measure is installed or five measures are installed. Adding administrative cost to every measure may overstate costs for measures near the cost-effectiveness limit due to this economy of scale.

Staff presented data on historical utility administrative costs collected from a variety of sources. There is a wide range of administrative costs reported and no consistent patterns emerge that would allow assignment of administrative cost by measure type, delivery mechanism, sector, or program bundle. In reviewing program-level aggregate administrative costs for different utilities, 20 percent of incremental measure cost was on the low side. Staff feel that this is a representative estimate of aggregate administrative costs for use in Council planning, recognizing that there will be lower cost implementation for some measures delivered through codes and standards or market transformation.

Staff believes using the aggregate administrative cost in developing supply curves also addresses the issue of overstating administrative cost for incremental measures near the cost-effectiveness limit. First, in developing supply curves a wide variety of measures are bundled together into a cost bin for the regional portfolio model so it is not possible for staff to make a judgment on what measures might be on the margin. It is better for utilities to incorporate the concept as they design and evaluate administrative costs for specific program approaches. Second, the 20 percent program-level aggregate administrative cost estimate used for the supply curves likely already reflects some amount of recognition of economy of scale in administrative cost.

Thus, staff recommend that the Council should continue to assume a 20 percent administrative cost adder across all energy efficiency measures included in the Plan for development of the supply curves.

Workplan: A.1.2. Review methodology with advisory committee on developing conservation resources supply curves for 2021 Power Plan

More Info: The agenda and presentations at the conservation resources advisory committee meeting at which these items were discussed can be found here: https://www.nwcouncil.org/meeting/conservation-resources-adv-committee-2021-power-plan-july-25-2019

The 2007 retrospective study on maximum achievability is here: https://www.nwcouncil.org/reports/2007/2007-13

Planning Parameters for Energy Efficiency Supply Curves in 2021 Plan

Power Committee

August 13, 2019

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FOR A SECURE & AFFORDABLE
ENERGY FUTURE

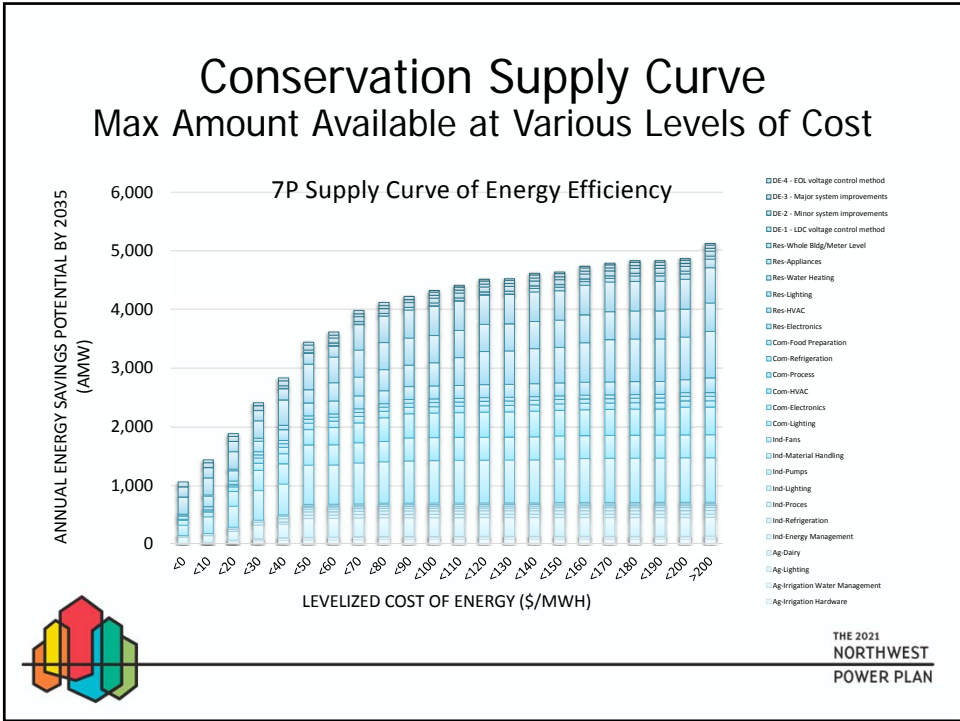## Two of Many EE Input Parameters

Max Achievability	Administrative Cost
Impacts Amount of EE Available	Impacts Cost of EE Available

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Conservation Supply Curve
Max Amount Available at Various Levels of Cost
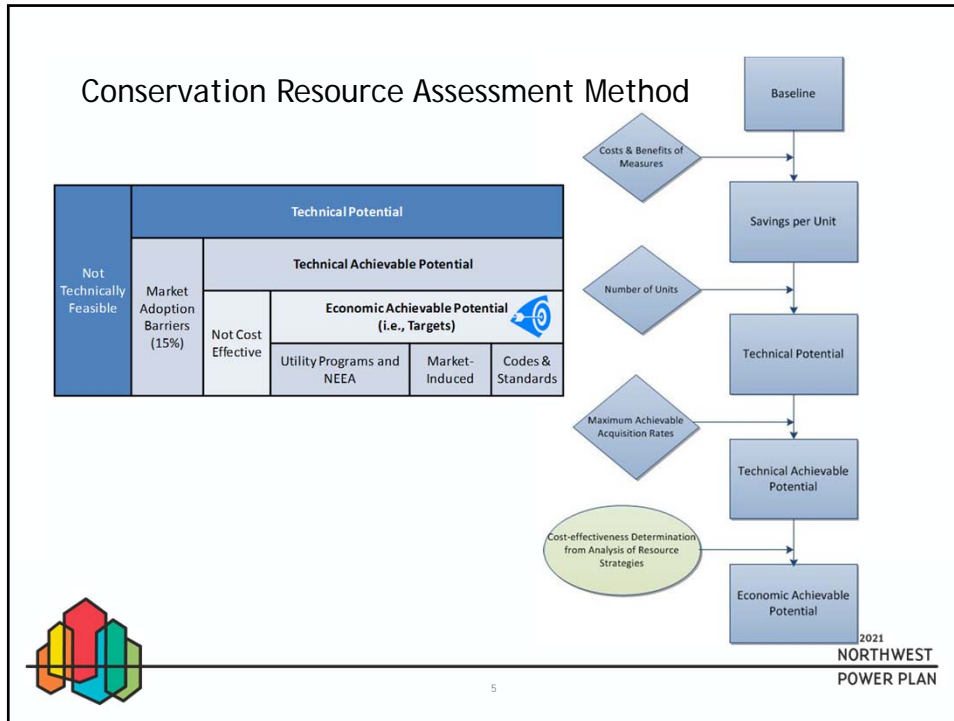

Maximum Limits on Achievable EE Potential

- **Conservation Potential Assessment**
  - EE needs to be cost-effective (with 10 percent advantage)
  - EE needs to be "..similarly reliable and available"

Achievability is part of this test in the Regional Act

Reflect pragmatic barriers to adoption:
Most, but not all, conservation potential is achievable thru resource development strategies

Proposal: MAX ACHIEVABLE LIMIT OF 85% FOR LOST-OPPORTUNITY MEASURES IS TOO LOW

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Conservation Resource Assessment Method

Method for Achievability

- **All mechanisms are available to develop EE**
  - **Utility programs & incentives**
  - **BPA programs**
  - **State & local building codes**
  - **Federal & state standards**
  - **Market transformation initiatives**
  - **Electricity pricing mechanisms**
  - **Voluntary**
- **Goal: Identify max achievable over 20-year forecast period**
  - **How fast and deep could you go**
  - **Assume utility system could pay all cost**
  - **Account for pragmatic constraints – like infrastructure**
  - **Limits for pace of adoption**
  - **Annual limits methods have varied among Council Plans**
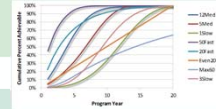
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Key Interactions for Achievability

Stock Turnover Rate	• Annual Availability
	  • LO: New Units, Replace on Burnout Units
	  • Retrofit: Remaining Stock Units

Program Ramp Rate	• How fast can programs accelerate
Achievable Maximum	• What fraction attainable in 20 years

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7

A Brief History

- **Hood River Conservation Project 1989**
  - Free Wx for electric heat customers for two years
  - Achieved 83% of measures and 93% of savings
- **Council "Achievability" method emerged in first plans:**
  - For 20-year planning assume 85% penetration max
  - Use for both Retrofit and Lost-Opportunity applications
- **2007 Retrospective by Council staff**
  - Plenty of evidence 20-year achievable at least 85%
  - Evidence that 20-year ramp rates to 85% is too low for LO
  - Near-term rates more important than long-term
- **Measure differentiated ramp rates emerge 2009**
  - But still max out at 85% of technical potential

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8

Review Findings at CRAC

Lost-Opportunity: New & Replace on Burnout applications

- Can exceed 85% penetration (units)
- Fundamentally Asymptotic: Rarely 100% units
- Can exceed 100% on savings basis
    - Technology advances overtake penetration limits
- Modern codes & standards processes improve scope and depth of savings and enhance penetration

Retrofit

- Retrofit: Few tests of penetration if paid all costs

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9

Approach for 2021 Plan

Set Limits on Case-by Case Basis

Allow Maximum Above 85% Where Justified

Review by Advisory Committee

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10

Program Administrative Cost

- Represents the additional cost borne by program administrators (generally, utilities) to acquire EE
  - Accounts for marketing, implementation, evaluation, etc.
  - Does NOT include incentives
  - Is included in levelized cost calculation
- Council has assumed 20% of incremental cost as proxy for admin cost
  - Example: a high-efficiency heat pump upgrade has an incremental equipment cost of $500. The admin cost would be 20%*$500 = $100
  - Total incremental cost = $500+$100 = $600

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CRAC Discussion

1. Different acquisition mechanisms (e.g. codes & standards) may have lower costs
   - Council does not project acquisition mechanisms
   - 20% assumption aligned with lower end of cost comparison
2. Incremental/marginal measures may be less expensive to acquire
   - Power Plan encompasses many different delivery channels, not possible for staff to make judgment of which are incremental

Staff Recommendation: Maintain 20% assumption

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