2013 Integrated Resource Plan

Transmission System Benefits Tool Update
IRP Modeling and Results Update
Class 2 DSM Supply Curves Review

February 27, 2013
Agenda

• System Benefits Tool (SBT) update

• Core Case Portfolio updates (System Optimizer)

• Sensitivity Case update

• Planning and Risk update

• Class 2 DSM Supply Curves – Review of Methods and Results
IRP Schedule

• Meeting Schedule
  – March 21, 2013 (Thursday)
    • Follow-up from February 27, 2013 meeting
    • Preferred Portfolio
    • Wind Study
  – April 5, 2013 (Friday)
    • Follow-up from March 21, 2013 meeting
    • Preferred Portfolio to Action Plan
  – April 17, 2013 (Wednesday)
    • Chapter Review and wrap up

• Filing Date Extended – April 30th
  – Received Extensions from State Commissions for Oregon, Washington, Idaho, Utah
  – Wyoming acknowledged receipt of the extension
SYSTEM BENEFITS TOOL
(ENERGY GATEWAY SEGMENT D, WINDSTAR TO POPULUS)
Gateway Segment D - Windstar to Populus

- Part of Gateway West
- Assumes 2019 in-service date
- Approximately 400 miles – single-circuit 230kV and 500kV
Energy Gateway: Review of the context

• Energy Gateway was initiated in 2007 with the following objectives:
  – Secure capacity for the long-term benefit of customers
  – Address load service needs first, regional needs second
  – Support multiple resource scenarios
  – Secure regulatory and community support
  – Improve reliability of energy supply to customers
  – Implement rather than perpetually plan

• “Hub and spoke” AC design has advantages: existing system integration; multiple interconnection points; provides options for a range of future load and resource scenarios
Why continue to develop?

- Prior to Energy Gateway, the Company’s transmission planning traditionally followed its planned generation additions which fluctuated significantly from one IRP to the next.
- Through upgrades, technology and operating practices the existing system is fully utilized and no new capacity can be realized.
- Given the 7-10 years it can take to site, permit and build new transmission, chasing fluctuating resource plans leads to a state of perpetual transmission planning reducing options.
- It is prudent to continue permitting as Gateway provides significant benefits under multiple future load-growth, fuel price and policy scenarios.
- Amidst these changing conditions, the Company continues to evaluate Energy Gateway plans to ensure proper timing and configuration for meeting customer needs.
Gateway Segment D – Asset Additions

• Modified / New Substations
  – Windstar Add, 1-230kV line position
  – Dave Johnston Rebuild, 1-230kV line position
  – Aeolus New 500kV and 230kV substations
  – Anticline New 500kV and 345kV substations
  – Bridger Expand yard, add 1-345kV line position
  – Populus New 500kV substation, add 1-345kV line position

• Modified / New Transmission Lines
  – Windstar – Aeolus #1 New 74 miles, 230kV single circuit
  – Dave Johnston – Aeolus Rebuild 74 miles, 230kV single circuit
  – Aeolus – Anticline New 138 miles, 500kV single circuit
  – Anticline – Bridger New 5 miles, 345kV single circuit
  – Anticline – Populus New 198 miles, 500kV single circuit
Gateway-New Transmission Capacity

- **2019 Segment D**
  - Wyoming to SE Idaho 650MW (Aeolus to Bridger/Anticline)
  - Wyoming to SE Idaho 1000MW (Bridger/Anticline to Populus)
  - SE Idaho to Utah 550MW

- **2020 Segment E**
  - West of Populus 1200MW
  - SE Idaho to Utah 100MW

- **2021 Segment F**
  - Wyoming to Utah South 1500MW
  - Wyoming to SE Idaho 550MW (Aeolus to Bridger/Anticline)

- Wheeling revenue opportunity increases $16m for each additional 100MW of capacity.
System Benefits Tool

- Evaluate proposed Windstar-Populus transmission project
- IRP System Optimizer calculation evaluates operational savings
- Incremental reliability benefits not captured in System Optimizer:
  1. Avoided Transmission System Capital Cost
  2. System Reliability Benefits
  3. Improved Generation Dispatch
  4. Segment Loss Savings
     4.1 Energy
     4.2 Capacity
  5. Customer and Regulatory Benefits
  6. Wheeling Revenue Opportunity
While a range of benefits is currently provided for the System Optimizer Analysis; all categories are subject to a range of benefits based on the underlying assumptions used.

The SBT displays the sensitivities of the cost and benefit value to the operation date of the project.

For each incremental MW of capacity created by the addition of future Energy Gateway segments, additional benefits are created in some of these metrics (e.g., System Optimizer Analysis, Wheeling Revenue Opportunity).

<table>
<thead>
<tr>
<th>Benefits Calculation</th>
<th>Case A</th>
<th>Case B</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Optimizer Analysis</td>
<td>$512</td>
<td>$314</td>
</tr>
<tr>
<td>Avoided Transmission System Capital Cost</td>
<td>$151</td>
<td>$151</td>
</tr>
<tr>
<td>System Reliability Benefits</td>
<td>$112</td>
<td>$112</td>
</tr>
<tr>
<td>Improved Generation Dispatch</td>
<td>$39</td>
<td>$39</td>
</tr>
<tr>
<td>Segment Loss Savings - Energy</td>
<td>$69</td>
<td>$69</td>
</tr>
<tr>
<td>Segment Loss Savings - Capacity</td>
<td>$18</td>
<td>$18</td>
</tr>
<tr>
<td>Customer and Regulatory Benefits</td>
<td>$249</td>
<td>$249</td>
</tr>
<tr>
<td>Wheeling Revenue Opportunity</td>
<td>$16</td>
<td>$16</td>
</tr>
<tr>
<td>Total Benefits ($m)</td>
<td>$1,167</td>
<td>$969</td>
</tr>
<tr>
<td>Costs ($m)</td>
<td>$ (934)</td>
<td>$ (934)</td>
</tr>
<tr>
<td>Net Benefit ($m, 2012$)</td>
<td>$ 233</td>
<td>$ 35</td>
</tr>
</tbody>
</table>
IRP Cases

• Draft results reflect:
  – Energy Gateway Scenario 2
    • Mona-Oquirrh-Terminal, Sigurd-Red Butte and Windstar-Populus
  – Case A (C18)
    • Clean energy bookend
    • Hard caps assumed for gas and CO$_2$
    • No state or federal RPS requirements assumed
  – Case B (C03)
    • Base case
    • Assumed known state RPS requirements; assumed federal RPS target of 15% by 2025
## Assumptions

Additional assumptions applied in the System Benefits Tool:

- 2019 in-service date for Windstar-Populus
- 100% of the new capacity is set aside for PacifiCorp’s network usage
- Uses 20-year evaluation horizon consistent with IRP horizon (2013-2032)
- All values use same net present value basis discounted back to year-end 2012$
- Palo Verde official forward price curve (September 2012) used to calculate all pricing

### Table - Case Assumptions

<table>
<thead>
<tr>
<th>Case #</th>
<th>Natural Gas</th>
<th>CO₂</th>
<th>Coal Costs</th>
<th>RPS</th>
<th>Regional Haze</th>
<th>Other</th>
</tr>
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<tbody>
<tr>
<td>C-03</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>State &amp; Federal</td>
<td>Base</td>
<td>Reference Case</td>
</tr>
<tr>
<td>C-18</td>
<td>High (Hard Cap)</td>
<td>U.S. Hard Cap</td>
<td>Medium</td>
<td>None</td>
<td>Base</td>
<td>2019 PTC, Acc. DSM</td>
</tr>
</tbody>
</table>
Avoided Transmission System Capital Cost

• This metric is not intended to capture the avoided cost of an alternative to Windstar-Populus. Rather, this metric captures the capital cost of transmission additions for certain load service or reliability needs which are avoided or deferred by the Windstar-Populus transmission project.

• The System Benefits Tool currently factors in the one-time capital investment avoided cost, present-valued to 2012$.

• For example, the following projects would be displaced if Windstar-Populus was constructed:

<table>
<thead>
<tr>
<th>Project</th>
<th>$2012, m</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Horse – Mustang – Freezeout 230 kV line</td>
<td>$149</td>
</tr>
<tr>
<td>Voltage Support capital project requested to replace DJ 1-4</td>
<td>$3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$151</strong></td>
</tr>
</tbody>
</table>

• Additional load or reliability projects may be identified depending on conditions assumed at the time.

• As shown in this example, the Windstar-Populus project saves at least $151m of capital transmission additions.
System Reliability Benefits

- This metric quantifies the performance benefits to the existing system due to the new transmission segments which benefits customers by improving the reliability of the energy supply, reducing exposure to loss of customer firm load and increasing availability of power to serve customers:
  - Avoiding transmission derates
  - Reducing forced generator outages
  - Minimizing remedial action scheme use

- Benefits are calculated from segments due to increased transmission availability during outages of six existing system elements. For purposes of this metric, incremental power is valued at the Palo Verde forward curve, and is net of plant operating costs:

<table>
<thead>
<tr>
<th>Transmission Path</th>
<th>Capacity (MW)</th>
<th>HLH Hours per year</th>
<th>LLH Hours per year</th>
<th>20-year benefit (2012$, m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridger West Path</td>
<td>1359</td>
<td>96</td>
<td>72</td>
<td>$67</td>
</tr>
<tr>
<td>Freezeout to Miners</td>
<td>125</td>
<td>19</td>
<td>14</td>
<td>$1</td>
</tr>
<tr>
<td>Miners to Platte</td>
<td>340</td>
<td>51</td>
<td>38</td>
<td>$9</td>
</tr>
<tr>
<td>Platte to Point of Rocks</td>
<td>265</td>
<td>140</td>
<td>105</td>
<td>$19</td>
</tr>
<tr>
<td>Rock Springs Monument</td>
<td>216</td>
<td>67</td>
<td>51</td>
<td>$7</td>
</tr>
<tr>
<td>DJ-Shirley Basin</td>
<td>172</td>
<td>96</td>
<td>72</td>
<td>$8</td>
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<tr>
<td>total</td>
<td></td>
<td></td>
<td></td>
<td>$112</td>
</tr>
</tbody>
</table>

- Based on these assumptions, the system reliability benefits total approximately $112m.
Improved Generation Dispatch

• This metric measures the backdown of coal unit production as well as curtailment of wind plant production due to existing transmission constraints.

• A with-and-without analysis of the project’s effects on expected coal plant backdown and wind plant curtailment due to transmission constraints yielded the following nominal benefits:

<table>
<thead>
<tr>
<th>Nominal Benefit, $m</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$11</td>
<td>$12</td>
<td>$12</td>
<td>$10</td>
<td>$9</td>
<td>$7</td>
<td>$5</td>
<td>$5</td>
<td>$5</td>
<td>$0</td>
</tr>
</tbody>
</table>

• Based on these assumptions, the improved generation dispatch benefit totals approximately $39m.
The Windstar to Populus line improves power flow distribution across the existing parallel line(s) such that less power is lost to impedance, resulting in lower line losses.

Line loss reductions (in megawatt hours per month) were calculated using Siemens PTI Power Systems Simulator for Engineering (PSS/E) software. In this example, the reduced power losses are treated as an avoided purchase of the same volume, valued at the Palo Verde (PV) forward curve.

Based on these assumptions, the energy value benefit totals approximately $69m.
Segment Line Loss Savings – Capacity

• System demand is reduced as a result of decreased line losses.

• Generation capacity savings were calculated using the losses saved at the 2011 PACE peak and multiplying the capital cost of a combined cycle gas generating plant (CCCT).
  – Capital replacement is estimated using the 2013 SSR Tables – Type F CCCT
  – Capacity value is assigned beginning in 2019.

• Based on these assumptions, the capacity value benefit totals approximately $18m.
Customer and Regulatory Benefits

- Transmission limitations increase the likelihood of a need to curtail load under abnormal conditions which can result in economic impacts to the company and customers, including:
  - lost customer production, employee productivity, lost sales, lost revenue opportunity
  - regulatory costs and associated mitigation

- The customer and regulatory benefits are derived from actual experience and utility industry research based on the 2002 CPI to show the momentary and sustained per-outage cost for the Mountain region of the U.S. and applied across the Company’s average customer class data.

- How this metric should be applied is still under evaluation.

  Regulatory Benefits   $10m
  Customer Benefits    $239m

- Based on this application, the customer and regulatory benefits total approximately $249m.
Wheeling Revenue Opportunity

• New incremental Available Transmission Capacity is identified using PSS/E for each segment analyzed.

• Incremental capacity created on paths outside of Segment D are valued at the Company’s current OATT long-term, firm point-to-point rate:
  – Assumes 100MW of available capacity sold on WYOE to WYON (TOT 4B)

• Based on these assumptions, the wheeling revenue opportunity totals $16m.

• As discussed earlier, additional wheeling revenue opportunity can be captured when additional segments of Energy Gateway come on-line.
CORE CASE PORTFOLIO UPDATES (SYSTEM OPTIMIZER)
Overview

• Core case portfolio results presented at the January 31, 2013 public input meeting have been revised

• Revised results incorporate a correction to escalation rates applied to new resource costs in the System Optimizer Model

• Revised core case result templates in Excel format were posted online 2/14/2013

• Core Case C-19 has been completed
Escalation Rate Correction

- Costs for supply side resource alternatives are populated into the System Optimizer model for a specific year (i.e. in 2012$)

- The new version of the System Optimizer model being used for the 2013 IRP allows for use of escalation rates and general inflation rates

- An escalation rate is populated for each supply side resource alternative (an escalation rate of 1.9% per year is assumed for most resources)*

- The System Optimizer model also has an input field for “general inflation” that can be populated separate from the escalation rates assumed for specific supply side resource options

- Company was not aware the “general inflation” parameter available in the Planning at Risk model was made available in the new version of the System Optimizer model

- Upon further review of the Core Case results, the Company discovered that the general inflation and resource specific escalation rates were being compounded (i.e. a 1.9% escalation rate was being applied on top of a 1.2% general inflation rate, yielding a compounded escalation rate of 3.12%)

- Consequently, the original core case results were developed with overstated supply side resource costs (capital, annual fixed and annual variable costs)

*Note, escalation for solar resources reflect assumed technological advancements such that annual escalation of costs is less than inflation.
Impact on Portfolio Results

• The correction lowers the cost of supply side resource alternatives with the reduced costs being largely proportionate among each alternative

• Given cost changes are largely proportionate among resource alternatives, general conclusions from the original results are largely unchanged
  – Through 2022, resource portfolios have stable levels of FOTs and DSM
    • Scenarios with early coal retirements yield incremental gas resource additions
    • Scenarios with no RPS have limited incremental renewables
  – Through 2032, incremental resource needs are met with new gas resources and more DSM
    • Scenarios with early coal retirements produce portfolios with the most incremental gas resource additions
    • Long-term growth in renewable resources is driven by RPS requirements and/or significant CO₂ costs

• Case C-18 (Clean Energy Bookend) was most impacted, with selection of over 2,000 MW of nuclear resources in 2024, increased selection of renewables, and reduced selection of natural gas resources

• The renewable resource floors developed using the RPS Scenario Maker model are not impacted
Segment D Alternative (Case C-19)

- Case Characteristics
  - 900 MW of capacity of a 3,000 MW DC line in 2021 as an alternative to Segment D
  - $18.98/kW-mo cost reflects cost of transmission, cost of incremental generation required to maintain reliability and a DC – AC converter substation
    - Rate assumes the full 3,000 MW is subscribed but PacifiCorp has only subscribed to 900 MW of capacity
- Among all Energy Gateway scenarios, the Segment D alternative yields higher system costs
- Costs associated with the required remedial action scheme that would shut down 3,000 MW of generation with the loss of the DC line are not included in the results below
- The DC line does not provide any reliability benefits to PacifiCorp’s existing system and as such may require additional infrastructure
- The DC line does not provide for interconnection of new generation or customers at any points other than the converter stations, and due to technical issues no additional converter stations can be added
  - The line is not scalable and cannot be built in segments

<table>
<thead>
<tr>
<th>PVRR($m)</th>
<th>EG-2</th>
<th>EG-3</th>
<th>EG-4</th>
<th>EG-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-03</td>
<td>$32,225</td>
<td>$32,890</td>
<td>$32,863</td>
<td>$33,521</td>
</tr>
<tr>
<td>C-19</td>
<td>$32,273</td>
<td>$32,936</td>
<td>$32,897</td>
<td>$33,555</td>
</tr>
<tr>
<td>Change</td>
<td>$48</td>
<td>$46</td>
<td>$34</td>
<td>$34</td>
</tr>
</tbody>
</table>
SENSITIVITY CASE UPDATE
Overview

• Sensitivity Case “Fact Sheets”

• Sensitivity Cases by theme

  – Load Forecast
    • Low, high, 1 in 20 weather

  – Targeted Resources
    • PTC/ITC extension (with and without RPS)
    • Endogenous RPS Compliance
    • 2013 Business Plan portfolio
    • Targeted renewables (high gas, high CO₂, PTC/ITC extension)
    • Class 3 DSM

  – Environmental Policy (Confidential Volume 3)
    • Hypothetical Regional Haze Compliance
    • Clean Air PVRR(d) Analysis
• Focus on near-term emissions control investments

• Craig/Hayden partner plant SCR/SNCR investments to be addressed qualitatively given contractual limitations associated with these assets

• Hypothetical Regional Haze compliance alternative
  – Assume SCR investments can be avoided with early retirement commitment
  – Jim Bridger 3 & 4 SCRs (2020/2021 early retirement)
  – Cholla Unit 4 SCR (2023 early retirement)

• Emissions control investment PVRR(d) analysis
  – Hunter 1 baghouse/LNB (2014)
  – Jim Bridger 3 & 4 SCRs (2015/2016)
  – Cholla 4 SCR (2017)
PLANNING AND RISK UPDATE
Status Update

• Stochastic PaR runs
  – Stochastic variables (load, power & gas prices, hydro, outages)
  – 94 Core Cases x 3 CO\textsubscript{2} price assumptions (zero, medium, high) = 282 runs
  – Including sensitivities, there would be in excess of 300 PaR runs at 100 iterations each
  – 11 PaR runs completed (3 with EG-1 transmission, and 8 with EG-2 transmission)

• Challenges
  – To date, run-times range between 15 and 40 hours
  – Very large output data files contributing to failed simulations
  – Large data storage requirements

• Schedule mitigation efforts
  – Architecture improvements
    • Increase from 1 to 3 servers
    • Increase from 8 to 38 work stations
    • Increase from 1 to 6 databases
    • Significant increase in mid- to high-quality SQL server storage (28 to 35 TB)
  – Daily vendor calls to explore performance improvement
  – Prioritization April 30, 2013 deadline
    • Primary focus on “medium CO\textsubscript{2}” runs
    • Energy Gateway scenarios 1, 2, then 5
Considerations for Future IRP Improvements

• Contribution of DSM to model performance
  – Increase from 9 to 27 cost bundles for each state
  – Hourly profiles went from one shape for the 20-year planning period to an hourly profile unique to each year (for each cost bundle for each state)
  – Results in a very large number of small resource options
  – The vendor has identified the significant number of DSM resource options as a primary contributor to model performance problems

• Future IRP considerations
  – Simplify representation of DSM in core case development and initial PaR analyses
  – Develop candidate preferred portfolios with simplified DSM structure
  – Perform DSM sensitivities on a small number of candidate portfolios to fine tune DSM resources in the preferred portfolio
  – These steps could reduce hardware costs and free up resources to explore other IRP topics (CO₂ scenarios, emissions control investment analysis, etc.)
PaR Reporting

• The following metrics will be reported as additional PaR studies are completed

  – PVRR
    • Mean
    • 95\textsuperscript{th} percentile
    • Risk-adjusted PVRR (mean plus 5% of 95\textsuperscript{th} percentile)

  – Energy not served (ENS)
    • Average annual
    • Upper tail mean

  – CO\textsubscript{2} emissions
Draft Scatter Plot: EG-1

Medium CO₂ EG-1

- C08
- C05
- C12
Draft Scatter Plot: EG-2

Medium CO$_2$ EG-2

Upper Tail Mean PVRR ($\text{billion}$)

Stochastic Mean PVRR ($\text{billion}$)
Class 2 DSM Supply Curves – Review of Methods and Results
Class 2 DSM Potential Studies

- Studies conducted in 2012 - updated roughly every two years to reflect changes in load forecasts, available measures, costs, codes and standards, etc.
  - PacifiCorp study (The Cadmus Group) estimated potential for California, Idaho, Utah, Washington and Wyoming
  - Energy Trust study (Stellar Processes) estimated potential for Oregon (including PGE, NW Natural, and Cascade Natural Gas) – PacifiCorp-specific data used in IRP
  - Aligned of key assumptions – measure lists, discount rate, line losses, administrative costs, and treatment of non-energy benefits
General Potential Study Methodology

• State-specific assessments of opportunities in all major sectors and market segments
• Comprehensive database of measures
  – 19,000+ across states, sectors, and market segments
  – Developed based on review of Council 6th Plan, RTF, Energy Trust assessment, ENERGY STAR, etc.
  – Data on cost, savings, life, and applicability used to calculate potential and levelized cost of each measure
  – Accounts for measure interactions, competition, and technical constraints
Types of Class 2 DSM Potential

• **Technical potential** – savings from installing all technically feasible measures, regardless of cost or other market barriers, after netting out estimated naturally occurring impacts.

• **Achievable technical potential (provided to the IRP model)** - the share of technical potential that might reasonably be achievable over the planning period, given market barriers possibly impeding customer adoption.
  – Draft write-up sent to stakeholders October 22, 2012 with description of PacifiCorp and Energy Trust ramping and achievability methodology.

• **Achievable economic potential (selected by the IRP model)** - the portion of achievable technical potential deemed cost-effective by the IRP model.
Key PacifiCorp Potential Study Updates

• Measure list builds on 2010 study based on review of:
  – Council 6th Plan and recent Regional Technical Forum analysis
  – 2012 Energy Trust resource assessment
  – Regional and national databases (DEER, ENERGY STAR, etc.)
  – Near commercially available emerging technologies

• New building codes and equipment efficiency standards
• Recent program accomplishments and evaluation results
• Updated data on market shares of efficient equipment
• Recent sales and customer forecasts
Potential Study Results – 2012 vs. 2010

• Decrease in long-term achievable technical potential in all states

• Variance by state - share of sales by sector, saturations of electric end use equipment, maturity of DSM programs, stringency of local codes

<table>
<thead>
<tr>
<th>State</th>
<th>2010 aMW</th>
<th>2012 aMW</th>
<th>% Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>26</td>
<td>14</td>
<td>46%</td>
</tr>
<tr>
<td>Idaho</td>
<td>63</td>
<td>34</td>
<td>46%</td>
</tr>
<tr>
<td>Utah</td>
<td>737</td>
<td>389</td>
<td>47%</td>
</tr>
<tr>
<td>Washington</td>
<td>122</td>
<td>75</td>
<td>39%</td>
</tr>
<tr>
<td>Wyoming</td>
<td>208</td>
<td>136</td>
<td>35%</td>
</tr>
<tr>
<td>Oregon</td>
<td>372</td>
<td>323</td>
<td>13%</td>
</tr>
</tbody>
</table>
2013 IRP Supply Curve Development

• Not practical to model individual measures, so annual achievable technical potential grouped by levelized cost
• 27 cost bundles compared to 9 in 2011 IRP, providing additional flexibility in resource screening and selection
• Removed pre-screening of Oregon resources for economics (used in 2011 IRP)
• Additional scenario accelerating acquisition of discretionary resources to provide the IRP model up to 2% of retail sales annually in each state (modeled in 3 of 19 core cases)
Levelized Costs

- Methodology Developed to align with Council/RTF (as shown in June 20, 2012 IRP presentation)

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Total Resource</th>
<th>Utility</th>
<th>Included In:</th>
</tr>
</thead>
<tbody>
<tr>
<td>State and Sector-Specific Line Losses</td>
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<td>✓</td>
</tr>
<tr>
<td>Customer Cost</td>
<td>✓</td>
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<tr>
<td>Utility Investment</td>
<td>✓</td>
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<td>Annual Incremental O&amp;M</td>
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<td>Secondary Fuel Impacts</td>
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<tr>
<td>Non-Energy Impacts</td>
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<tr>
<td>10% Conservation Credit</td>
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<td>T&amp;D Deferral Benefits</td>
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<tr>
<td>Risk Mitigation Benefits</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Selection of Class 2 DSM Resources

• Class 2 DSM resources are selected based upon “cost and performance” as compared to other resource alternatives

• Performance
  – Energy profile
  – Capacity contribution

• Cost
  – Levelized cost
  – Average cost of measures in a bundle
Class 2 DSM Selections – EG1

Energy Gateway Scenario 1: 2022

Energy Gateway Scenario 1: 2032
IRP Inputs and Selections – Example: Case 1, EG 1

- % selected varies by state due to levelized cost calculation, sales distribution by sector, per-unit savings and costs, etc.
- MW/aMW ratio function of potential by sector and end use (e.g. Wyoming potential heavily industrial with flatter shape)

<table>
<thead>
<tr>
<th>State</th>
<th>Achievable Technical GWh</th>
<th>Selected GWh</th>
<th>% Energy Selected</th>
<th>Selected MW</th>
<th>MW/aMW Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>150</td>
<td>91</td>
<td>60%</td>
<td>18</td>
<td>1.77</td>
</tr>
<tr>
<td>Idaho</td>
<td>346</td>
<td>249</td>
<td>72%</td>
<td>58</td>
<td>2.06</td>
</tr>
<tr>
<td>Oregon</td>
<td>2,753</td>
<td>2,244</td>
<td>82%</td>
<td>504</td>
<td>1.97</td>
</tr>
<tr>
<td>Utah</td>
<td>4,018</td>
<td>2,963</td>
<td>74%</td>
<td>754</td>
<td>2.23</td>
</tr>
<tr>
<td>Washington</td>
<td>755</td>
<td>489</td>
<td>65%</td>
<td>105</td>
<td>1.88</td>
</tr>
<tr>
<td>Wyoming</td>
<td>1,263</td>
<td>913</td>
<td>72%</td>
<td>125</td>
<td>1.20</td>
</tr>
</tbody>
</table>