Tacoma Power

Power Supply & Wholesale Revenue Update

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Graph 1: Tacoma System Flows Near 5th Percentile in May
(Tacoma System Hydro Flows, Water Year 1929 – 2019)
Graph 2: Federal System Flows Have Been Below Average
Graph 3: Cowlitz Has Filled Substantially, but is Unlikely to Reach “Full”
(Cowlitz Elevation, Current vs. Historic)
Graph 4: Lake Cushman unlikely to reach 735 ft this summer
(Cushman Elevation, Current vs. Historic)
Graph 5: Actual Wholesale Net Revenue is $9.3M Below Budget YTD
(Monthly Actual vs. Budget Wholesale Purchases and Net Revenues)

Actual Purchase are $10.9M Above Budget YTD
- Rainfall was about half of normal levels
- Temperature was about 5 degrees below normal for Q1, but February and the first half of March were especially cold (more than 10 degrees below normal)
- Tacoma inflows and Slice were both about 70% of the Adverse levels planned for in the budget
- Load was close to the forecasted amount for the quarter, but about 10% above the forecasted load in February and the first half of March
- Low inflow forecasts for the runoff period limited how much generation we could run in March and still refill the storage reservoirs
Wholesale Net Revenue Update

Graph 6: Wholesale Net Revenue Would Recover in 2020 Under Expected Water
(Cumulative Actual vs. Budget Wholesale Net Revenues, 2019 – 2020)
Low Income Conservation
Today’s Agenda

1. Background on conservation and weatherization
2. Discuss challenges facing low-income conservation
3. High level review of three options to address challenges
4. In-depth review of our intended option
Why we do conservation

1. Low cost power resource
2. Good for our customers
3. Comply with state mandates
Our conservation plan follows three key principles

Conservation is analysis driven
• Conservation is a cost effective power resource
• Portfolio must exceed the EIA target

Programs must satisfy customers
• Products must meet customer needs
• Incentives must be compelling

Equitable access to programs
• All ratepayers fund conservation; Tacoma Power should offer a wide range of programs to allow all customers to participate
Tacoma Power has had an active weatherization program active since 1980

- Weatherization and heating systems represent 45% of the residential potential

- In 2018 low-income and multifamily conservation accounted for 22% of sector savings, but 48% of sector incentive spending
Program is active throughout our service territory

Low-income and Multifamily Spending
2017 - 2018
Low-income spending is trending downward

Spending prior to 2009 was fairly stable

ARRA funding; ductless heat pumps added to program

Large multifamily project

Participation began to decline when double pane windows and ductless heat pumps were removed from program

Created LI grant program to meet EIA goals; added double pane windows
Two trends are putting pressure on our low-income programs

- Lower savings value
- Lower measure savings
Savings value is declining

Value of conservation today is about 35% lower than 2011

- Declining loads
- Lower natural gas prices
- More renewable generation
Measures are saving less

**Measure savings have declined about 45% since 2014**

Savings determined by the Regional Technical Forum, part of the Northwest Power and Conservation Council.

**Key drivers:**
- Improved modeling
- More heat pumps
- Interactive effects

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[3] Under current program design single pane windows will be removed from the program in 2020.
LI will not be cost effective under the current approach

Because of lower wholesale prices and lower savings, most measures not cost effective if Tacoma Power pays 100% of project cost
We expect participation to fall below 2009 levels

Participation expected to fall because critical measures have been removed from the program

- Removed double pane windows in 2016
- Removed ductless heat pumps in 2018
- Need to remove single pane windows in 2020; expect participation to fall to pre 2009 levels
We explored three options to increase participation:

1. Do low-income even though not cost effective
2. Supply low-income agencies with grant funds
3. Offer deferred loans and partial grants
Do low-income even though not cost effective

Ignoring cost effective tests would classify the program as a “public works” project.

Value decreases
Higher costs and lower savings decrease net program benefits.
If not cost effective the program is done “at a cost to the state”.

Higher Costs
“Public works projects” are subject to prevailing wage, public purchasing rules, and special reporting requirements.
Increase costs ~ 300%

Public Works
RCW 39.04.010 classifies improvements made “at a cost to the state” as “public works project”.
Program would become a “public works project”.

This option would serve fewer customers at a significant cost to other customers.
Supply low-income agencies with grant funds

Low-income agencies leverage multiple funding sources to complete projects, thus may have conflicting priorities.

This option is simple but retains all issues of Option 1 with the challenges of agency coordination.
Offer deferred loans and partial grants

Deferred loans lower program costs because the money is eventually paid back; we offered a deferred loan program from 1995 – 2009

This option provides the broadest program offer to the most customers at the least cost
The Deferred Loan option

Tacoma Power offers a grant and deferred loan that cover 100% of project cost; we lien property to ensure repayment.

Customer enjoys energy savings when equipment is installed; loan payments are deferred.

Customer repays the loan using equity from their home; loan is paid back when the home sells or is occupied by somebody else.

- Full insulation package
- Single pane windows
- Double pane windows
- Ductless heat pumps
- One-off custom projects
Deferred loan program details

How much will Option 3 cost?
- Estimate additional outlay of $6M over 10 years
- Will need ~ $4 million to stabilize loan fund
- May inhibit other uses of the loan fund

How long until loans repaid?
- Half of loans paid off in under 5 years
- 20% of loans issued 1995-2009 are still open
- The oldest loan was issued in 1995

What about default?
- Lien on property with ability to disconnect power
- Low default rate; 1 of 410 have defaulted
- Likely to see more defaults as older loans mature
Deferred loan is part of our low-income program
Many challenges remain

**Uptake is unknown**
- Could be higher (require more funds)
- Could be lower (unforeseen barriers)

**Rental housing remains a challenge**
- Planned outreach to landlords
- Actively engaged in the City’s Affordable Housing Action Plan\(^1\)

**Coordination is hard**
- Agencies have different requirements
- Actively engaging with City programs, TPU Customer Solutions, Rebuilding Together South Sound, MDC, and Pierce County Human Services

\(^1\) Details available in Supporting Data on slide 24
Thank you
Supporting Data
How proposed program would compares to other utilities

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Average</th>
<th>TP Proposed</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01%</td>
<td>0.48%</td>
<td>1.18%</td>
<td>2.35%</td>
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</tbody>
</table>

Low-income spending as a % of residential retail revenue

12 Municipal and cooperative utilities

- Anaheim Public Utilities
- Austin Energy
- Burlington Electric Department
- City of Palo Alto
- Jacksonville Electric Authority
- Long Island Power Authority
- Los Angles Dept. of Water and Power
- New Hampshire Electric Co-Op
- Orlando Utilities Commission
- Pasadena Water and Power
- Sacramento Municipal District
- Southern Maryland Electric Co-Op
Details of partnership with the City’s AHAS effort

AHAS 2.1
Add minimum efficiency standards to rental housing occupancy standards

AHAS 2.3
Promote our deferred loan program to improve livability of owner occupied homes

AHAS 3.1
Explore assigning energy bills to negligent landlords when they fail to improve property

AHAS 1.8
Promote our custom program to encourage efficient construction in all new building types

Unique program offers

Minimum standards

Billing solutions

Partner with others
# Low-income portfolio economic analysis

<table>
<thead>
<tr>
<th>Program</th>
<th>Savings (aMW)</th>
<th>Grants ($ Total)</th>
<th>Deferred Loan ($/total)</th>
<th>Overhead ($/total)</th>
<th>Projects (total)</th>
<th>TRC B/C Ratio</th>
<th>UCT B/C Ratio</th>
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</thead>
<tbody>
<tr>
<td>Deferred Loan</td>
<td>0.077</td>
<td>$243,635</td>
<td>$1,102,285</td>
<td>$263,103</td>
<td>375</td>
<td>0.40</td>
<td>1.01</td>
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<td>Partner program</td>
<td>0.014</td>
<td>$69,515</td>
<td>$0</td>
<td>$14,305</td>
<td>45</td>
<td>0.39</td>
<td>1.03</td>
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<tr>
<td>Multifamily Weatherization</td>
<td>0.039</td>
<td>$181,946</td>
<td>$0</td>
<td>$15,000</td>
<td>20</td>
<td>0.98</td>
<td>1.80</td>
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<tr>
<td><strong>Total or Average</strong></td>
<td><strong>0.130</strong></td>
<td><strong>$495,096</strong></td>
<td><strong>$1,102,285</strong></td>
<td><strong>$292,408</strong></td>
<td><strong>440</strong></td>
<td><strong>0.50</strong></td>
<td><strong>1.21</strong></td>
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</tbody>
</table>
## Deferred loan incentives and economic analysis

<table>
<thead>
<tr>
<th>Measure or Program</th>
<th>Incentive ($/Unit)</th>
<th>Deferred Loan ($/Unit)</th>
<th>TRC B/C Ratio</th>
<th>UCT B/C Ratio</th>
<th>Participant B/C Ratio</th>
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<tbody>
<tr>
<td>Typical weatherization project</td>
<td>$2,075</td>
<td>$2,075</td>
<td>0.75</td>
<td>1.22</td>
<td>14.26</td>
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<tr>
<td>Attic insulation (no existing)</td>
<td>$1/ft²</td>
<td>$1/ft²</td>
<td>1.29</td>
<td>1.75</td>
<td>25.52</td>
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<tr>
<td>Attic insulation (some existing)</td>
<td>$1/ft²</td>
<td>$1/ft²</td>
<td>0.57</td>
<td>0.48</td>
<td>7.04</td>
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<tr>
<td>Floor insulation (average)</td>
<td>$1/ft²</td>
<td>$1/ft²</td>
<td>0.76</td>
<td>0.90</td>
<td>12.87</td>
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<tr>
<td>Wall insulation</td>
<td>$1/ft²</td>
<td>$1/ft²</td>
<td>1.14</td>
<td>1.29</td>
<td>18.81</td>
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<tr>
<td>Single Pane Windows</td>
<td>$5.00/ft²</td>
<td>$18.00/ft²</td>
<td>0.57</td>
<td>1.22</td>
<td>6.00</td>
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<tr>
<td>Double Pane Windows</td>
<td>$2.50/ft²</td>
<td>$18.00/ft²</td>
<td>0.23</td>
<td>0.79</td>
<td>2.79</td>
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<tr>
<td>Ductless Heat Pump</td>
<td>$300</td>
<td>$3,600</td>
<td>0.28</td>
<td>1.08</td>
<td>1.01</td>
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<tr>
<td>Custom Project</td>
<td>$4,000</td>
<td>$8,000</td>
<td>0.72</td>
<td>1.03</td>
<td>2.17</td>
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<tr>
<td><strong>Program Average</strong></td>
<td></td>
<td></td>
<td><strong>0.40</strong></td>
<td><strong>1.01</strong></td>
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### Partner program incentives and economic analysis

<table>
<thead>
<tr>
<th>Measure or Program</th>
<th>Incentive ($/Unit)</th>
<th>TRC B/C Ratio</th>
<th>UCT B/C Ratio</th>
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<tbody>
<tr>
<td>Combination WX project</td>
<td>$2,750</td>
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<td>1.00</td>
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<tr>
<td>Attic insulation (no existing)</td>
<td>$1.50/ft²</td>
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<tr>
<td>Attic insulation (some existing)</td>
<td>$1.00/ft²</td>
<td>0.61</td>
<td>0.54</td>
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<tr>
<td>Floor insulation (average)</td>
<td>$1.50/ft²</td>
<td>0.81</td>
<td>0.71</td>
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<tr>
<td>Wall insulation</td>
<td>$1.50/ft²</td>
<td>1.22</td>
<td>1.03</td>
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<tr>
<td>Single Pane Windows</td>
<td>$8.00/ft²</td>
<td>0.63</td>
<td>1.21</td>
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<tr>
<td>Double Pane Windows</td>
<td>$4.00/ft²</td>
<td>0.25</td>
<td>1.00</td>
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<tr>
<td>Ductless Heat Pump</td>
<td>$800</td>
<td>0.31</td>
<td>1.11</td>
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<tr>
<td>Custom Project</td>
<td>$5,000</td>
<td>0.77</td>
<td>1.03</td>
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<td>MFG Home Replacement</td>
<td>$5,500</td>
<td>0.07</td>
<td>1.02</td>
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<tr>
<td><strong>Program Average</strong></td>
<td></td>
<td><strong>0.39</strong></td>
<td><strong>1.03</strong></td>
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## Multifamily incentives and economic analysis

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<thead>
<tr>
<th>Measure or Program</th>
<th>Incentive ($/Unit)</th>
<th>TRC B/C Ratio</th>
<th>UCT B/C Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attic insulation (no existing)</td>
<td>$0.80/ft²</td>
<td>0.84</td>
<td>1.16</td>
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<tr>
<td>Floor insulation</td>
<td>$0.80/ft²</td>
<td>0.99</td>
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<tr>
<td>Wall insulation</td>
<td>$0.80/ft²</td>
<td>1.34</td>
<td>1.58</td>
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<tr>
<td>Single Pane Windows</td>
<td>$12.00/ft²</td>
<td>1.17</td>
<td>2.00</td>
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<tr>
<td>Double Pane Windows</td>
<td>$8.00/ft²</td>
<td>0.59</td>
<td>1.48</td>
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<tr>
<td>Custom Project</td>
<td>$0.50/kWh</td>
<td>0.94</td>
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<tr>
<td><strong>Program Average</strong></td>
<td><strong>0.98</strong></td>
<td><strong>1.80</strong></td>
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## TRC values over time

<table>
<thead>
<tr>
<th>Measure</th>
<th>2011/12 TRC</th>
<th>2014/15 TRC</th>
<th>2016/17 TRC</th>
<th>2018/19 TRC</th>
<th>2020/21 TRC</th>
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</thead>
<tbody>
<tr>
<td>Attic Insulation - no existing</td>
<td>2.97</td>
<td>2.77</td>
<td>3.97</td>
<td>2.50</td>
<td>1.47</td>
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<tr>
<td>Attic Insulation - some existing</td>
<td>1.22</td>
<td>1.00</td>
<td>1.27</td>
<td>0.87</td>
<td>0.53</td>
</tr>
<tr>
<td>Wall Insulation</td>
<td>2.26</td>
<td>2.22</td>
<td>2.52</td>
<td>1.98</td>
<td>1.20</td>
</tr>
<tr>
<td>Floor Insulation</td>
<td>2.28</td>
<td>1.40</td>
<td>1.80</td>
<td>1.13</td>
<td>0.84</td>
</tr>
<tr>
<td>Single Pane Windows</td>
<td>2.35</td>
<td>1.74</td>
<td>1.48</td>
<td>0.75</td>
<td>0.61</td>
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<tr>
<td>Double Pane Windows</td>
<td>1.62</td>
<td>1.04</td>
<td>0.75</td>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td>Ductless Heat Pump</td>
<td>n/a</td>
<td>1.28</td>
<td>1.07</td>
<td>0.44</td>
<td>0.33</td>
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<tr>
<td>Heat pump water heater</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>0.27</td>
</tr>
</tbody>
</table>