Rates & Financial Policy Workshop

4 February 2020
Welcome!

Today’s Purpose Statement:
The goal of this workshop is for Tacoma Public Utilities staff to brief the Public Utility Board on policy issues and questions expected to arise during the upcoming Budget and Rates process, and for the Public Utility Board to provide staff with preliminary thoughts and feedback. This will allow staff to craft budget and rates proposals that more closely align with Public Utility Board goals.

Items not expected to be discussed in this workshop include:
- Financial hedging proposals (Power)
- Individual Budget line items
- Preliminary rate values

Timeline is DRAFT.
# Overview

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Rate & Financial Policies
Rate & Financial Policies

Water Rate and Financial Policy

**Revenue Requirement**
- Regular reviews with full study every two years
- Study includes projected revenue, expenses and capital improvements

**Cost-Based Rates**
- An embedded cost-of-service study will determine the cost of serving each customer class and allocation to recover projected expenses

**Financial Metrics**
- 60 days of current budgeted expenditures
- Capital: $2M minimum in SDC Fund and 1% of original plant in Capital Reserve
- Senior Debt Service Coverage above 1.5x
- All In Debt Service Coverage above 1.25

**Rate Adjustments**
- Sufficient to meet Tacoma Water budgets
- Minimize long-run costs to rate-payer
- Short and long-run rate impacts presented
- Revenue collected to maintain financial sufficiency

**Low-Income**
- Special consideration for low-income senior and/or disabled customers
Water may come with policy change recommendations in April.

- We are in the process of engaging with the Government Finance Officers Association (GFOA) to develop a risk-based model to understand the impact of primary risks to our reserves.
- This could result in changes to target levels currently set in our rate and financial policies.
- Once the modeling is complete, we will provide an update which may include recommendations.
- Examples of analyses:

## Electric Rate and Financial Policy

### Revenue Requirement
- Studies projected revenue, expenses, and capital improvements for the period to be covered by the rate change
- Performed every two years

### Cost-Based Rates
- Cost-of-Service Study determines the cost of serving each customer class
- Allocates class responsibility for projected expenses of the system
- Minimizes cross-subsidies between services or between classes of customers

### Financial Metrics
- AA credit rating goal
- Projected cash balances at minimum of 90 days of current budgeted expenditures
- Minimum Debt Service Coverage Ratio approximately 1.5, based on adverse water conditions

### Low-Income
- Special consideration for low-income senior and/or disabled customers

### New Large Load
- 8-20 MW
- CP Rate + 15% Adder for ten years
**Rate & Financial Policies**

**Recommended Change**

*Power may come with policy change recommendations in April.*

The utility is in the process of evaluating the current risk of incremental resource costs from a new large load, especially in consideration of the strategic directive to promote economic development. The result may be to:

1) to propose modifying or removing the existing rates and financial policy to reflect updated cost and risk perspectives, and/or

2) to create a NLL tariff in the board-approved rate schedules.
Rate & Financial Policies

Rail Rate and Financial Policy

**Revenue Requirement**
- Studies projected revenue, expenses, and capital improvements for the period to be covered by the rate change
- Rates based on best estimates of rail volumes
- Performed at a minimum of every two years as part of the budget process

**Cost-Based Rates**
- Ensure sufficient resource planning and acquisition for reliable service while being as competitive as possible
- Rates for each class of service will be set to reflect the cost of supplying that service
- The character and volume of service will be factors in apportioning costs, developing rates, and tariff revisions

**Financial Metrics**
- Projected cash balances at minimum of 60 days of current budgeted expenditures
- Minimum Debt Service Coverage Ratio of 1.5
Recommended Change

*Rail may come with policy change recommendations in April.*

The railroad is in the process of evaluating the potential need for special funds. It will utilize established rate policies from Power and Water as guidance in establishing Rail’s policy recommendations.

The result may be:

to create a new Rail Rate Stabilization Fund,

and/or

to create a new Rail Capital Reserve Fund.
Tacoma Water
Long-Range
Financial Plan
Tacoma Water Long-Range Financial Plan

How does the utility build a financial plan?

Rate & Financial Policies
• Provide the foundation for the financial plan
• Guide consistent financial and rate decisions
• Promote financial stability and avoid rate shocks

Sensitivities & Priorities
• Blend information and expertise from all departments
• Assess industry trends and environment for risks and opportunities
• Evaluate how upcoming strategic efforts and new technology may impact the plan

Revenue Requirement Analysis
• Determine the amount of revenue necessary to meet our obligations
• Evaluate sufficiency of current rates
• Develop a rate implementation strategy
 Tacoma Water Long-Range Financial Plan

Water has a possible refunding opportunity

Tacoma Water staff recommend a Bank Loan Refunding of Series 2010A Water Revenue Bonds with KeyBanc to achieve nearly $945,000 NPV, or about 5.31% savings.

Series 2010A Projected Refunding Savings

<table>
<thead>
<tr>
<th>Year</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>$194,994</td>
</tr>
<tr>
<td>2021</td>
<td>$261,932</td>
</tr>
<tr>
<td>2022</td>
<td>$261,932</td>
</tr>
<tr>
<td>2023</td>
<td>$261,932</td>
</tr>
</tbody>
</table>
Tacoma Water Long-Range Financial Plan: Follow Up

The Status of Installed AMI Meters to Date

In response to Board Member Watson’s question regarding AMI on 01/13/2020.

Meters Installed So Far:

~ 2,000 Residential
~ 500 Commercial

Meters To Be Installed:

100,000 Residential
3,000 Commercial

• All new meters installed as part of maintenance and growth are AMI compatible
• They are non-communicating until we also install the modules
• Modules will be installed once the network is built out
• “Mass deployment” will begin December 2020
• The AMI program will be sharing an update at the 02/26/2020 study session
Tacoma Water Long-Range Financial Plan: Follow Up

Cost/Rate Increase Mitigation Communications

In response to Public Utility Board request regarding cost mitigation on 11/08/2019.

Tacoma Power
Long-Range Financial Plan Update
Financial Metrics

Tacoma Power’s financials are holding steady.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Days of Liquidity:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquidity / All Expenses</td>
<td>171</td>
<td>183</td>
<td>167</td>
<td>158</td>
<td>139</td>
</tr>
<tr>
<td><em>(Minimum: 90 Days)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Debt Service Coverage – Bond Covenants:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Operating Revenue / Debt Service</td>
<td>2.69x</td>
<td>3.25x</td>
<td>3.92x</td>
<td>4.25x</td>
<td>2.39x</td>
</tr>
<tr>
<td><em>(Minimum: 1.25x)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Rating Agency Metrics</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019*</th>
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</thead>
<tbody>
<tr>
<td><strong>Days of Liquidity:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquidity / Operating Expenses</td>
<td>214</td>
<td>236</td>
<td>210</td>
<td>206</td>
<td>173</td>
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<tr>
<td>3-year average</td>
<td>286</td>
<td>280</td>
<td>249</td>
<td>236</td>
<td>205</td>
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<tr>
<td><em>(Target: 180 days)</em></td>
<td></td>
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<tr>
<td><strong>Debt Service Coverage – Rating Agencies:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>*(Net Operating Revenue – GET) / Debt Service</td>
<td>2.01x</td>
<td>2.31x</td>
<td>2.82x</td>
<td>3.06x</td>
<td>1.28x</td>
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<tr>
<td>3-year average</td>
<td>1.87x</td>
<td>2.09x</td>
<td>2.38x</td>
<td>2.73x</td>
<td>2.39x</td>
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<tr>
<td><em>(Target: &gt;2.0x)</em></td>
<td></td>
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</tr>
</tbody>
</table>

* Preliminary, as of December 2019.
Tacoma Power Long-Range Financial Plan Update

2019 Rate Increase Projections

Tacoma Power’s financials are holding steady.
No changes in the 2019 estimated rate impacts from 2018 projections.

This forecast is subject to change, and is dependent upon actual financial performance in future years.
## Water Condition Scenario Update

### Projected Rate Increases

<table>
<thead>
<tr>
<th>Scenario</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>
<th>2029</th>
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<tbody>
<tr>
<td><strong>Base Case:</strong></td>
<td></td>
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</tr>
<tr>
<td>Average Water * Conditions</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
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<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
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<tr>
<td>Critical Water in 2021 *</td>
<td>2.0%</td>
<td>2.0%</td>
<td>10.7%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
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<tr>
<td>- with $12M RSF used</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>4.0%</td>
<td>4.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Adverse Water *</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
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<td>2.0%</td>
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<tr>
<td>in 2021 &amp; 2022</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Loss of Large Customer**</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>3.0%</td>
<td>4.0%</td>
<td>2.0%</td>
<td>3.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Lower Wholesale Prices**</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
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<td>2.0%</td>
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</tbody>
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* Preliminary, as of December 2019.
** As of June 2019.
Water Fixed & Variable Rates
Goals of Rate Design

**What are guiding objectives for Water rate decisions?**

*Water rates should ensure adequate supply.*
- We incorporate short-term and long-term customer and demand forecasts in determining rates.

*Water rates should be as low as is responsible.*
- We apply a long-term view of rate impacts through our long-range financial planning.

*Water rates should be fair.*
- Our cost-of-service analysis allows us to allocate costs to customer classes based on their share of the system costs.

*Water rates should be stable and understandable.*
- We design for revenue stability in order to provide customers with rate stability.

*Water rates should be the product of customer involvement.*
- We apply gradualism to provide minimal impact to customers where possible.
- We incorporate customer feedback into our rates process through public outreach.
Fixed & Variable Rates

Evolution of Current Rates

How did Tacoma Water arrive at the current rate design?

2019 COSA Results
- Residential Class:
  - 2.9% increase in revenue needed in 2019 and in 2020
- Commercial Class:
  - 2.2% increase in revenue needed in 2019 and in 2020

Initial Proposal
- Residential Class:
  - Split the rate adjustment between both the fixed and variable charges, or increase in the variable charge only
  - Average monthly increase of $1.02 in 2019 and $1.08 in 2020
- Commercial Class:
  - Split the rate adjustment between both the fixed and variable charges, or increase in the variable charge only
  - Average monthly increase of $4.77 in 2019 and $4.64 in 2020

Final Proposal
- Residential Class:
  - Increase in variable charge only
  - Average monthly increase of $1.02 in 2019 and $1.08 in 2020
- Commercial Class:
  - Increase in variable charge only
  - Average monthly increase of $4.77 in 2019 and $4.64 in 2020
Fixed & Variable Rates

Evolution of Current Rates

Two rate scenarios were modeled for Board policy decision. Scenario 1 was chosen for 2019-2020.

Scenario 1 (variable only)  
Scenario 2 (50/50 split)

Both scenarios showed that the impact of splitting the rate adjustment between the fixed and variable charges or in the variable charge only were not significantly different for an average residential single family customer.

Source: Tacoma Water Budget and Rate Recommendations Presentation on July 25, 2018
Fixed & Variable Rates

Declining Demands

- Actual Historical Demand with Losses
- 1991 Water Demand Forecast (TPU)
- 1995 Water Demand Forecast (EES and CH2Mili) - HIGH
- 1999 Water Demand Forecast (October 1999) (RW Beck) HIGH
- 2012 Demand Forecast (Fiske) MEDIUM
- 2016 Long-term Demand Forecast (TPU)
- 1985 Water Demand Forecast (EES)
- 1993 Water Demand Forecast (EES)
- 1995 Water Demand Forecast (EES and CH2Mili) - LOW
- 1999 Water Demand Forecast (October 1999) (RW Beck) LOW
- 2009 Demand Forecast (Fiske) EXPECTED
- 2012 Demand Forecast (Fiske) LOW
Fixed & Variable Rates

Cost Structure: Fixed/Variable Cost Recovery

Our fixed costs are greater than the current monthly customer charge.

• Water business is “capital-intensive”

• Over 95% of our costs are “fixed” in the very short run (power, treatment, and solids handling are the only variable costs on this time horizon)

• Fixed rates, at a minimum, must recover those costs that have NO connection to demand – e.g. postage, billing, meter reading, administration and general costs

• These only provide high level bookends for fixed cost recovery

• Beyond those bookends, we use the fixed vs. variable split to effect business objectives (e.g. send a conservation signal, effect revenue and bill stability, and maintain high credit ratings) and to improve equitability of rate design

• “Customer charges may be designed to recover up to 65 percent of revenue requirements for customer classes with strong seasonal consumption patterns.”
Residential Fixed/Variable Rate Recovery Ratio

**Fixed & Variable Rates**

**VARIABLE RATE REVENUE**
- 2008: 56%
- 2009: 55%
- 2010: 58%
- 2011: 58%
- 2012: 57%
- 2013: 59%
- 2014: 59%
- 2015: 58%
- 2016: 58%
- 2017: 58%
- 2018: 57%
- 2019: 57%

**FIXED RATE REVENUE**
- 2008: 44%
- 2009: 45%
- 2010: 42%
- 2011: 42%
- 2012: 43%
- 2013: 41%
- 2014: 41%
- 2015: 42%
- 2016: 42%
- 2017: 42%
- 2018: 43%
- 2019: 43%
Cost Structure: Fixed/Variable Cost Recovery

Fixed/Variable Cost Recovery from an Average Single Family Residential Monthly Bill

- **Lakewood**: $8.89 (Variable: $14.72, Fixed: $9.93)
- **Puyallup**: $15.19 (Variable: $22.83, Fixed: $9.93)
- **Everett**: $9.12 (Variable: $22.83, Fixed: $15.63)
- **Tacoma**: $15.63 (Variable: $24.95, Fixed: $24.06)
- **Bellevue**: $26.39 (Variable: $24.06, Fixed: $15.88)
- **Portland**: $36.76 (Variable: $15.88, Fixed: $20.88)
- **Seattle**: $39.02 (Variable: $17.15, Fixed: $21.87)

*Fixed cost recovery ($) is based on an average single family residential customer. The assumption for an average single family residential customer is 6 CCF in winter months and 9 CCF in summer months.*
Power Fixed & Variable Rates
Fixed & Variable Rates

Power Utility Ratemaking: Basic Principles

Rates are set to recover costs.

- Costs largely fixed
- Today, the price of electricity is based primarily on the amount consumed (not fixed)

Customers are generally grouped into classes based on similar cost profiles.

- Size
- Usage patterns
- Use of system

Costs are allocated to classes based on their share of the system costs.

- Generally deemed equitable (“user pays” principle)
- Effort to minimize subsidies within and across classes

Why is this an issue now?

- Changing industry causing utilities to address ratemaking in a new way
- Declining customer consumption
# Fixed & Variable Rates

## Points of Discussion in 2019/2020

### How did Tacoma Power arrive at the current rate design?

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost-of-Service</strong></td>
<td>• Customer costs are $23 for residential and $35 for small general</td>
</tr>
<tr>
<td></td>
<td>• 2020 customer charges will be $17.30 and $23.50, respectively</td>
</tr>
<tr>
<td><strong>$ or %</strong></td>
<td>• Customer charge changes can seem large in percent terms but are capped in dollar impact</td>
</tr>
<tr>
<td><strong>Low-Income</strong></td>
<td>• Fixed increases benefit low-income users in inefficient or large dwellings</td>
</tr>
<tr>
<td></td>
<td>• Variable increases benefit low-income users in small dwellings</td>
</tr>
<tr>
<td><strong>Bill Stability</strong></td>
<td>• Fixed increases are the same throughout the year</td>
</tr>
<tr>
<td></td>
<td>• Variable increases create spikes in winter when bills are high and troughs in summer</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>• Fixed increases benefit large users, variable benefit small users</td>
</tr>
<tr>
<td></td>
<td>• Fixed increases benefit traditional users, variable benefits DER owners</td>
</tr>
</tbody>
</table>
### Fixed & Variable Rates

#### Coordination with Strategic Directives

<table>
<thead>
<tr>
<th></th>
<th><strong>Higher Fixed</strong></th>
<th><strong>Higher Variable</strong></th>
</tr>
</thead>
</table>
| **Equity & Inclusion** | + low-income, high users benefit  
+ caps dollar impact of rate increase  
+ reduces subsidy to customers that can afford to invest in DER and conservation | + low-income, low users benefit                                                  |
| **Financial Sustainability** | + better aligns prices with cost-to-serve  
+ reduces financial risk of declining loads causing rate increases  
+ increases bill predictability |                                                                                  |
| **Rates**           | - difficult for some customers to understand/accept  | + easier to understand  
- low elasticity of demand for electricity requires very high price signals to significantly impact consumption |
| **Environmental Leadership** | + encourages electrification | + encourages solar and other DER  
+ encourages conservation |
Fixed & Variable Rates

Detailed Customer Cost Breakdown

Minimum System Analysis

The ability to take electricity off the grid requires infrastructure. Even when only 1kWh is used, the utility makes fixed investments to connect each customer to the system.

The cost of the smallest theoretical distribution system required to connect a customer to the grid is assigned to the customer charge in the cost of service analysis.
Fixed & Variable Rates

Detailed Customer Charge Breakdown

Customer Charge Components
2019/2020 Cost-of-Service Results

Data from 2019/2020 Cost-of-Service Analysis. Does not include $2.46 per month allocated cost for Click! underrecovery.
Tacoma Power Residential Ratemaking

**Fixed Cost Recovery**
- Sales figures are declining, which means fixed cost recovery drives rate increases
  - 65% of costs are fixed
  - 18% of revenues are fixed

**Policy Issues**
- Today, higher-usage customers pay more than their share of the utility’s fixed costs
- Individual customer bill impacts, especially low-income bill impacts, are a key concern
- Rate design changes impact policy objectives, such as the promotion of:
  - energy efficiency,
  - electric vehicle, and
  - solar energy adoption

---

**Fixed & Variable Rates**

Data from 2019/2020 Cost-of-Service Analysis. Does not include $9.6 million in fixed cost allocated for Click! underrecovery.
Fixed Cost Recovery

- Fixed cost recovery is also an issue for this class, although typically not as stark due to the use of demand charges
  - 53% of costs are fixed
  - 30% of revenues are fixed

Policy Issues

- Commercial classes can be broad and diverse. There is no “typical” non-residential customer, yet there is often one rate for all of them
- Customers with a higher load factor (average usage ÷ maximum usage) are less costly to serve and so should arguably pay a lower average rate

Data from 2019/2020 Cost-of-Service Analysis. Does not include $0.96 million in fixed cost allocated for Click! underrecovery.
Fixed & Variable Rates

Detailed Residential Breakdown: All Elements

Residential Costs & Revenues

Data from 2019/2020 Cost-of-Service Analysis.
## Detailed Residential Breakdown: All Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Residential Pure COSA</th>
<th>Residential 2020 Rate</th>
<th>Actual vs. COSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Energy</td>
<td>$0.032893</td>
<td>$0.073750 per kWh</td>
<td></td>
</tr>
<tr>
<td>Production Capacity</td>
<td>$0.013266</td>
<td>$0.045351+ $0.035353= $0.080704 per kWh</td>
<td>$0.006954</td>
</tr>
<tr>
<td>Transmission Capacity</td>
<td>$0.010922</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution Capacity</td>
<td>$0.016669</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum System</td>
<td>$8.83</td>
<td>$23.32 per month</td>
<td></td>
</tr>
<tr>
<td>Meters &amp; Services</td>
<td>$4.25</td>
<td>$17.30 per month</td>
<td>($6.02)</td>
</tr>
<tr>
<td>Customer Account &amp; Billing</td>
<td>$7.79</td>
<td></td>
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</tr>
<tr>
<td>Click! Underrecovery</td>
<td>$2.46</td>
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</tr>
</tbody>
</table>

Data from 2019/2020 Cost-of-Service Analysis.
Snohomish County PUD is currently revising customer charge to increase fixed cost recovery.
Fixed Charge Policy Topics

**Fixed & Variable Rates**

**Carbon Reduction**
- Household heating choices
- Vehicle electrification costs

**Conservation Incentives**
- I-937 incentives & utility programs
- Demand elasticity
- Perception

**Low-Income Impacts**
- Usage patterns
- Bill impact on high users can outweigh benefit to low users
- Mitigation options

**Customer Bill Stability**
- Dollar impacts versus percent impacts
- Seasonality
Carbon Impacts of Household Choices: Heating

Gas heat is the fuel of choice for many new homes.

Electrification of housing is decreasing in the service territory.

Due to the low cost of natural gas, many homebuilders are choosing to install natural gas instead of electric heat.

The choice of natural gas heat over electric heat increases a home’s carbon footprint by about 92%.

Electric “fuel” prices (variable charges) must remain as low as possible to encourage consumers to choose or remain on electric heat. It is rare to convert to electric once gas has been chosen.

Based on data from 2005 Tacoma Power building stock survey.
Fixed & Variable Rates

Carbon Impacts of Household Choices: EVs

Example Electric Vehicle: 2017 Nissan Leaf, approximately 3.6 miles per kWh
Tacoma Power is required to acquire a certain amount of conservation each year. The target is set using a “societal test” of cost-effectiveness. This formula does not include the level of retail rates. Therefore, Tacoma Power will seek to acquire the same amount of conservation regardless of rate design or level.

The responsiveness of individual consumers to price increases is measured by economists as the “elasticity of demand.” If the elasticity of demand for electricity is low (“inelastic”), consumers do not reduce usage (conserve) very much even when prices are raised. Most studies find that electric demand is very inelastic; when rates increase by 1%, then consumers conserve between 0.05% and 0.81%.

Due to the low elasticity of demand, raising rates is not an efficient way of encouraging conservation. If policymakers wish to expand conservation efforts, they should focus on expanding direct consumer programs (rebates, retrofits, et cetera) and lobbying for tougher codes & standards.
Fixed & Variable Rates

Conservation: How much price signal remains?

Most retail revenue is still recovered through variable charges.
**Fixed & Variable Rates**

**Focus on Low-Income**

Approximately one-third of the customers in Power’s service territory are low-income. Many low-income customers live in high-use houses or inefficient apartments. They are large users and benefit from a fixed increase. Many other low-income customers live in efficient houses or small-use apartments. They benefit from a variable charge increase.

Tacoma Power estimated the value of houses, apartments, and other dwellings in the service territory from County Assessor data.

Consumption records were pulled for the valued houses, apartments, mobile homes, *et cetera*.

NO LINK was found between the value of the house, apartment, or other dwelling and the consumption level.

**Conclusion:** Because low-income customer consumption is highly variable, rate design cannot protect low-income customers as a group.
Income Does Not Determine Usage

Only 1% of the variation in Tacoma Power’s customers’ electric use can be explained by estimated income.

Tacoma Power’s internal studies have failed to find systematic correlations between estimated income level and electric usage.

In Tacoma Power’s service territory, air conditioning is relatively rare, and many homes, particularly older homes, are heated electrically. It is much harder for low-income residents to forego heating than air conditioning.

While some low-income individuals live in small apartments with low usage, others live in single-family homes with high usage. Regardless of home type, low-income housing units tend to be less efficient than high-income ones.
Fixed & Variable Rates

Income Does Not Determine Usage

Average Daily Consumption Across Home Values

Correlation = 0.17

Home Value Percentile
Fixed & Variable Rates

Fixed Charges Limit Rate Increase Dollar Impact

Under a fixed-charge increase, the dollar value of the increase for all customers is fixed. Under a variable-charge increase, some high users can see extremely high dollar increases. Consider the example of a small user of 600 kWh/month and a large user of 1800 kWh per month.

<table>
<thead>
<tr>
<th>EXAMPLE</th>
<th>Higher Fixed Charge*</th>
<th>Higher Variable Charge†</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>$ 68.39</td>
<td>$ 60.78</td>
<td>$(7.61)</td>
</tr>
<tr>
<td>High</td>
<td>$ 155.17</td>
<td>$ 172.33</td>
<td>$ 17.16</td>
</tr>
</tbody>
</table>

The small user pays $7.61/month more under an higher-fixed rate design, while the large user pays $17.16/month more under an higher-variable rate design. The negative impact of the variable rate design is 225% higher.

*$25.00/month, $0.072319/kWh†$5.00/month, $0.092961/kWh
Fixed Charges Reduce Seasonality

High variable costs result in high winter bills, especially for bimonthly-billed customers. Low-income customers in particular have difficulty managing bill volatility.

High-Fixed versus High-Variable Seasonality

* $25.00/month, $0.072319/kWh
† $5.00/month, $0.092961/kWh
Fixed & Variable Rates

Policy Choices for 2021/2022: Trade-Offs

The Customer Charge in 2021/2022
Retail rates are anticipated to rise in 2021/2022. Staff anticipates that the cost-of-service analysis will continue to show fixed costs greater than the current customer charge. Management anticipates a proposal to continue to increase the customer charge.
Section 7

Rail Tariffs
Rail Tariffs

Tacoma Rail has Three Active Tariffs.

Switch & demurrage charges, published on Tacoma Rail’s website

Freight Tariff TMBL 8807-I

- Defines line haul switch charges
- Intermodal, unit trains, commercial & hazardous
- Defines miscellaneous switch charges

Freight Tariff TRMW 8807-I

- Defines line haul switch charges
- Defines miscellaneous switch charges

Demurrage Tariff TMBL 6004-C

- Defines demurrage charges for both TMBL & TRMW
- Demurrage is the undue detention of a railcar
- $60 per day excluding Saturday, Sunday, and holidays
- Pooled credits and debits
Major Line Haul Rate Type Characteristics

**Intermodal**
- Less labor intensive
- More volume
- Yard management
- Higher track wear
- Service windows
- Fewer destinations
- Do not incur demurrage

**Unit Trains**
- Less labor intensive
- More volume
- Yard management
- Higher track wear
- Service windows
- Fewer destinations
- Subject to demurrage
- Increased regulatory requirements

**Commercial**
- Labor intensive
- Lower volume
- Less track utilization
- Lower track wear
- Daily service
- More destinations
- Subject to demurrage
Intermodal railcars are currently charged per loaded or empty platform. A platform is a location within a railcar, used for loading containers, that is separated by articulations.
**Rail Tariffs**

**Line Haul Rate Types & History**

**Unit trains are charged per loaded railcar.**
A unit train is defined as a train consisting of more than 90 railcars, other than intermodal, all destined to a single facility.

**Two unit train rates:**
- $224 for each loaded railcar to a facility which can unload or load the unit train in its entirety
- $300 for each loaded railcar to a facility which cannot unload or load the unit train in its entirety

**All other line haul charges fall under the following categories:**
- $306 commercial railcar
- $356 hazardous commercial railcar
- $570 Lakewood Subdivision commercial railcar

![Graph showing the rates over time](image-url)
Fuel Surcharge

**Freight Tariff TMBL 8807-I ITEM 1220:**
All loaded railcars will have a per car fuel surcharge applied in addition to the switch charge in item 1010-series.

**NOTE 1** – The fuel surcharge will be reviewed and adjusted quarterly.

**NOTE 2** – Adjustments to the fuel surcharge will reflect any rate changes to Tacoma Rail’s current fuel price above $2.50 per gallon at the time of review. The Fuel Surcharge Rate will also include 10% to cover taxes and administrative costs.

**NOTE 3** – Fuel surcharge collected above or below actual cost of fuel over the previous three months will offset the new fuel surcharge rate appropriately. If the offset applied to the fuel surcharge drops below $0.00, no fuel surcharge will apply.

**Historical (posted on the website)**
Current: $0.00
Q4 2018: $0.00
Q3 2018: $1.25
Q2 2015: $0.00
Q1 2015: $1.89
Demand-Side Management
Demand-Side Management

Demand-Side Management & Environmental Policy Promotion through Pricing

Shore Power Rate
• Concept & Methodology

Demand Response/Interruptible Rate
• Rationale
• Avoided Cost in IRP

Residential Prepay
• Usage patterns
• Mitigation

Time-of-Use
• Post-AMI possibilities
• Timeline

Looking for general feedback, concerns and considerations…
Demand-Side Management

Shore Power

The utility is supporting the Port’s electrification efforts.

• $2 million grant from DERA and TransAlta to the Port to electrify Husky terminal
• Long-term plan to electrify all major terminals at the Port
• Ideal rate design for the Port makes easy to apportion shore power electricity bill to shipping lines; demand charges are hard to divide

The proposed shore power rate is designed to recover the same costs in a different ways.

• Based on otherwise-applicable rate (Schedule G)
• No subsidy planned. Goal is to recover the same dollar amount that would be charged in the demand charge with a higher per-kWh charge

The rate is designed based on the estimates of the kWh usage of shore power.

• All rates require load forecast estimates.
• Two methods found similar results:
  1) Deterministic model
  2) Stochastic model

DERA is an EPA program under the Diesel Emissions Reduction Act.
Suggested Rate: Monte Carlo Methodology

Recommended Rate: 10.82¢

• Additional retail load & revenue
• Improved air quality
• May require some utility-side investment, which may be recovered with capital recovery charge
**Demand-Side Management**

**Demand Response / Non-Firm Pilot**

**Rationale**

There are two drivers for utilities to pursue demand-response programs:

- One is to create an alternative to acquiring supply-side resources, either for cost or environmental reasons
- The other is to improve customer satisfaction through offering bill control and service-level options

Since demand-side resources can be seen as substitutes for generation resources, current thinking is to let the IRP process define the need and the value of such resources.

**Mechanism**

Rate options would be created that offer cost savings opportunities based on IRP findings to help ensure cost-based ratemaking and internal consistency.

Defining the program as a pilot program will allow the utility to make adjustments based on learnings while setting appropriate expectations with our customers.
Demand-Side Management

Prepay

Advantages

• High customer satisfaction
• Provides consumers with greater control over electricity costs
• Informs consumers in real time of the energy consumption of various appliances and activities
• Research indicates a conservation effect is found from participants
• Reduces “bill shock” by allowing small payments throughout a billing cycle
• Eliminates disconnect/reconnect fees
• Helps customer pay down arrearages
• Can help cash-strapped customers by avoiding or reducing security deposit for service
• Can be a good budgeting tool for room-mates
• Reduces number of customer write-offs, resulting in better cash-flow stability
• Reduced call-center costs
**Demand-Side Management**

Tacoma Power’s PAYGO Experience

- **Very popular** with customers
- **Changed customer behavior**
  *ineffective attempts at conservation replaced with effective actions*
- **Informed** customers of the cost of running certain appliances, performing certain activities
- **Ability to pay anytime** very helpful to unbanked and shift-working customers
- **Ability to designate a certain proportion of payment to arrears** resulted in some large debt repayments
Demand-Side Management

Time-of-Use (TOU): Post-AMI

Customers have expressed interest in monitoring electric usage in real time.

During the rate outreach for the 2019/2020 biennium, small business owners in particular expressed support for AMI because they are interested in greater control of their electric bills. This is a natural market segment for TOU rate offerings.

Changes in utility costs should be the driver for pricing changes.

With the advent of the EIM, power markets in the Northwest are expected to change. Currently, there is very little difference in the cost to serve customers at different times of day. As power markets change, staff is very aware of the need to understand any cost bases for time-differentiated rates.

Sufficient data is required to properly design TOU rates.

Utility best-practices suggest that at least one year of data be collected before a major changes such as TOU is implemented. An expedited timeline could be facilitated if AMI meters are installed as a statistically-valid random sample throughout the service territory. Such a deployment, however, is more costly than installing the meters in a geographic pattern. Staff is working with the AMI team to understand the best balance of cost and data acquisition.
Commercial & Industrial Rates
Commercial & Industrial Rates

Non-Residential Ratemaking Considerations

Schedule G versus Schedules HVG/CP
• G class is broad and diverse. There is no “typical” G customer, yet there is one rate for all of them
• Some G class customers are bigger than some HVG customers. Size may be a better class distinction than voltage for large customer designation

Load Factor
• Customers with a higher load factor (average usage ÷ maximum usage) are less costly to serve and so should arguably pay a lower average rate

New Large Loads
• Tacoma Power is receiving more inquiries regarding large load terms, after a long period of industrial load decline
• A re-evaluation of marginal generation costs is underway

Special Considerations
• McChord Participation Protocol

Looking for general feedback, concerns and considerations…
Commercial & Industrial Rates

G Class Load Research Findings

Customer Reclassification
default demand thresholds are based on k-means clustering algorithm

- Billing Demand Level 1 Threshold
- Billing Demand Level 2 Threshold
- Billing Demand Level 3 Threshold
- Billing Demand Level 4 Threshold

KWh per Day

Demand

Desired Number of Rate Classes
- 4

Billing Demand Level 1 Threshold
- 50

Billing Demand Level 2 Threshold
- 500

Billing Demand Level 3 Threshold
- 1,500

Billing Demand Level 4 Threshold
- 3,000

Legend:
- General Service
- Medium General Service
- Large General Service
- Extra Large General Service
Commercial & Industrial Rates

G Class Load Research (Preparation for 2022/23)
Commercial & Industrial Rates

Chart of all customers 1+ MW / load factor

Load Factor Versus Demand
customers served under the G, HVG, or CP rate schedules with actual demand 1,000 to 50,000kW
Commercial & Industrial Rates

Load Factor Measures the Efficiency of a Load

How do you use 10 kWh?

1 kW per hour for 10 hours

10 kW for 1 hour

High-load-factor customers use most of their capacity at all time.

Low-load-factor customers have excess capacity for much of the time.
Commercial & Industrial Rates

Time-of-Use is Another Important Factor

The energy used by one 100-watt lightbulb lit for ten hours is the same as the energy used by ten 100-watt lightbulbs lit for one hour. However, the demand of ten 100-watt lightbulbs lit for one hour is ten times the demand of one 100-watt lightbulb lit for ten hours.

<table>
<thead>
<tr>
<th>DEMAND</th>
<th>TIME</th>
<th>ENERGY</th>
<th>RESOURCES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>100W</td>
<td>10 HOURS</td>
<td>1 KILOWATT HOUR</td>
<td>SAME 1 KILOWATT HOUR, BUT 10 TIMES THE RESOURCES!</td>
</tr>
<tr>
<td>10 x 100W (1,000 WATTS)</td>
<td>1 HOUR</td>
<td>1 KILOWATT HOUR</td>
<td></td>
</tr>
</tbody>
</table>
Commercial & Industrial Rates

HVG/CP Class Consolidation

CP Rate is an Artifact of the Power Crisis

• Contractual requirement that scheduled power demands match actual load, or customer is subject to penalties
• Historically lower than HVG rate for high-load factor customers and very large loads
• Minimum contractual demand of 8 MW
• Confusion regarding eligibility for new and existing customers, especially vis-à-vis NLL rate policy provision for new customers

Options for Existing HVG/CP Customers

• Given the limited number of customer served and that the customers are generally similarly situated, it makes sense to consolidate and standardize the two rate options.
• The alternative is to sunset these rate options (close to new customers) and set up a new set of general service rate schedules that logically flow from one to another.

Next Steps

• Bill impacts being assessed
• Stakeholder/customer conversations planned
**New Large Loads**

**Current NLL policy provision applies only to 8-20 MW customers.**
- Economic Development and Power Management both engaging with potential customers that could bring loads greater than 20 MW
- No clear provisions in place; need indicative pricing for customers over 20 MW
- Makes sense to address this potential customer group in conjunction with Industrial and General Service customer class rate revisions

**Current NLL policy provision is based on now-outdated IRP.**
- 15% Adder based on conservation (marginal resource) in 2016, compared to the 2016 CP rate
- Reflects concern to protect current customers from paying for new generation resources needed to serve new customers that may not remain in business long enough to pay for new resources
- Since 2016, loads have continued to decline and wholesale prices remain soft, such that the utility is increasingly concerned to protect against risk of “too little” load as well as “too much” load

**The NLL policy should be more adaptive to changes in utility conditions.**
- Initial thinking is to reference the IRP and current portfolio length under various hydro conditions to identify the appropriate pricing for “regular” industrial loads, to be updated each IRP
- A new NLL rate could be a formula using the latest resource cost prices as determined in the IRP
- The utility may still require a negotiated price for extremely large loads over some size to be determined based on expected utility length, transmission constraints, and other factors
McChord Update: History

What is the McChord Participation Protocol?
The McChord Air Force Base contract provides the base a perpetual right to negotiate rate increases.

In response to a 2003 rate case dispute, Tacoma Power agreed upon a framework, called the McChord Participation Protocol, to facilitate these contracted negotiations. The Protocol specifies rate case events and information exchanges intended to facilitate good-faith negotiations.

As part of the Participation Protocol, Tacoma Power provides the military a copy of the Cost-of-Service Analysis. The Base frequently retains a rate consultant to make technical suggestions regarding the model.

What was the issue in the 2019/2020 process?
Tacoma Power uses a “coincident peak” (CP) allocator to allocate certain Demand-classified costs. This is a standard modeling choice. However, there are several versions of CP allocators which are in use.

Historically, Tacoma Power has used a “12-CP” allocator, which allocates relatively more cost to non-seasonal classes as compared to seasonal classes. The military consultant suggested use of a “3-CP” allocator, which has the opposite effect.

To illustrate the dollar values involved, in the last biennium, the residential class is allocated $4.9 million dollars of Demand-classified cost using the 12-CP allocator, and $12.3 million dollars using a 3-CP allocator.

What is Coincident Peak Allocation?
Demand-driven costs are often allocated based on “coincident peak”. At the moment of a system peak, the demand of each class of customers is estimated. The contribution of each customer class to the peak is used to allocate the costs to each class.

In a 3-CP allocation, monthly peak for each of the three highest months is used to create the allocator. In a 12-CP allocation, monthly peak for each of the months of the year is used to create the allocator.

During the peak season (winter), the residential class tends to contribute the most to the peak, because residential customers tend to be the most weather-sensitive (have the most heating load). Therefore, a peak-season (3-CP) allocator allocates more to the residential class.
Commercial & Industrial Rates

Effect of Coincident Peak Allocation (Example)

Illustrative Example

Consider the example of a winter-peaking utility with two classes, a weather-sensitive Class A and a flat-load Class B.

The percent contribution to monthly peak of Class A varies from 90% in winter to 50% in summer. Therefore, an average that includes the summer months is lower than an average which only includes winter months.

<table>
<thead>
<tr>
<th>Estimated Class Load at Time of Monthly Peak</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A (MW)</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Class B (MW)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Total System (MW)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>20</td>
<td>20</td>
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<td>50</td>
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<table>
<thead>
<tr>
<th>Class Contribution to Peak as percent</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Class B</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Average for 3 Months (Winter)</td>
<td>90% Class A, 10% Class B</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Average for 12 Months</td>
<td>75% Class A, 25% Class B</td>
<td></td>
<td></td>
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</table>
McChord Update: Results

Tacoma Power maintains that the existing 12-CP allocator best reflects the current cost structure of the utility.

Arguments for 3-CP allocators are more applicable to thermal utilities. Hydroelectric systems are unique because:

- Plants are built for energy instead of capacity
- Time of greatest resource constraint is not necessarily time of highest load
- Zero fuel cost and fish passage costs greatly reduce direct link between generator cost and output

A peak-season allocator for Demand-allocated Production costs is most theoretically appropriate when the system is built to meet the seasonal load peak. Tacoma Power’s current Integrated Resource Plan (IRP) standard specifically notes that hydroelectric resource inadequacy might occur in any month, not just in three Winter months.

In traditional thermal-based systems, the time of most constrained power supply (lowest load/resource balance) occurs at time of system peak (Winter). In contrast, Tacoma Power experiences its expected lowest load/resource balance in October (Fall), while experiencing expected retail peak in February.

Staff requests the Board to support use of the 12-CP allocator until cost studies show otherwise

The Public Utility Board was briefed on this issue at the 8 May 2019 Study Session.
Post-AMI Opportunities
Customers have expressed interest in monitoring usage in real time

As customers are better to able understand how their behavior affects their bill, they may be more likely to respond to behavioral change messaging from the utilities as well as new rate plan options.

Expect more class subdivisions

Staff expects to be able to use AMI data to identify customer groups previously unrecognizable. Cost allocation methods can be better aligned and rate offerings can be tailored for these groups after they are identified.
Specific AMI Rate Options for Future Consideration

Water changes are expected to be minimal at first, but subdivisions will be likely

Parks & Irrigation may be separated into two rate classes.

Having an irrigation-only class would provide tax benefits to the utility.

Customers may also realize savings from other utilities (such as Environmental Services).

AMI opens up many new possibilities for retail power rate options

TOU expected to be an offering for power post-implementation.