Tacoma Power
Rate Policy Discussion

2021/2022 Rate & Budget Process

27 MAY 2020

Presentation Overview

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1 **Rate Calendar & COSA**

2 **Rate & Financial Policy**

3 **New Rate Proposals**
(based on customer inquiries)

4 **Summary of Policy Questions for Initial Feedback**

5 **Next Steps**

Changes to Typical Rate Process

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SD-1
Equity & Inclusion

SD-2
Financial Sustainability

SD-3
Rates

SD-4
Stakeholder Engagement

No Cost of Service Assessment (COSA) for 2021/2022

- Significant shifts in load patterns during "Stay Home, Stay Healthy"
- Resulting cost allocations would be questionable

Also allows revenue requirement (RRQ) to be set later in year

- More situational data needed on expected long-term load impacts
- Official load forecast and revenue requirements timing still TBD (June-August)

Staff proposes that all customer classes receive same, system-average rate increase

- Preserves existing relative share of revenue between classes from prior COSA

Initial Protocol meeting with McChord Air Force Base held May 12th

- Supportive of forgoing COSA if rate increase equally applied to classes and increase is modest
- Concern regarding a zero percent increase that could result in high rate increases for the 2023/2024 biennium

New Rate Proposals Overview

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Backgrounder Memoranda

28 April: Overview of 21/22 Biennium Management Recommendations

5 May: New Rates for Electrification & Low-Income Support

- ❑ Shore Power rate
- ❑ Prepay rate options

12 May: New Rate for Renewable Energy

- ❑ Qualifying Facility (QF) avoided cost
- ❑ Net Metering rate (for loads greater than 100 kW)

19 May: New Rate for Economic Development and Demand Response

- ❑ Non-Firm Service option (for Demand Response)

Financial Sustainability & Rates Policy Summary

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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
Stable Rates	• If possible, adjustments should be level across years and not exceed general inflation • Class adjustments significantly in excess of the system average adjustment may be phased-in over a limited time period
Financial Metrics	• AA credit rating goal • Projected cash balances at minimum of 90 days of budgeted expenditures • Minimum Debt Service Coverage Ratio approximately 1.5, based on adverse water
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

Proposed Rate Policy Changes

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Considering recommendation to take New Large Load (NLL) provisions out of rate policy and creating a tariff in its place.

- Implementing a formal rate schedule makes clear and transparent the applicable power prices under the NLL framework
- Board backgrounder to follow in coming weeks

SD-3
Rates

Shore Power

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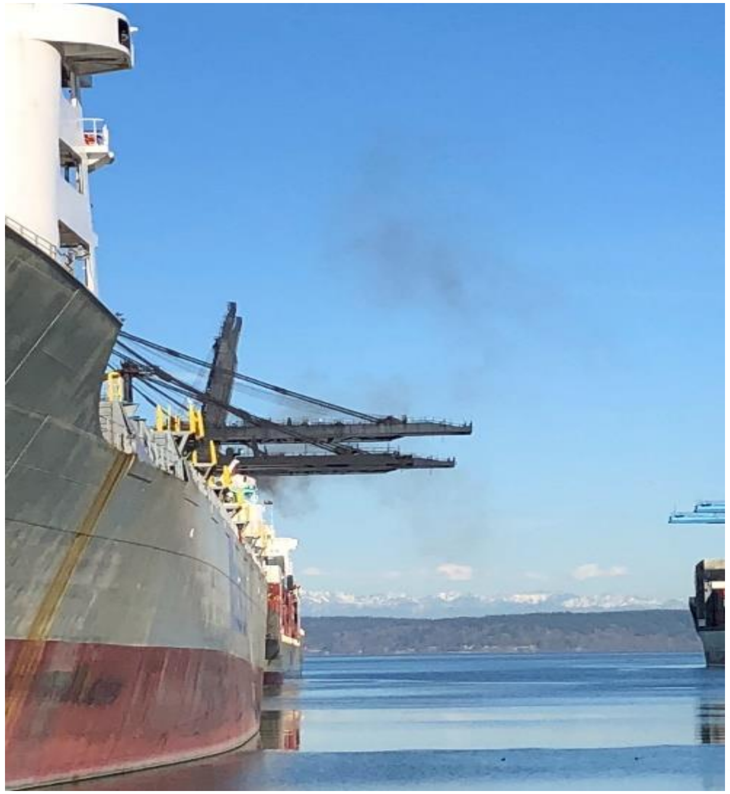
Tacoma Power supports Port electrification.

- Goal: recover the same dollar amount that would be charged in the demand charge with a higher per-kWh charge (no subsidy since one customer)
- Per-kWh charge easier to apportion to shipping lines (demand charges are hard to divide)
- Additional retail load & revenue
- Improved air quality
- $0.1115 per kWh based on 2019 Schedule G; actual rate will be slightly higher after 2021/2022 rate increase



SD-3
Rates

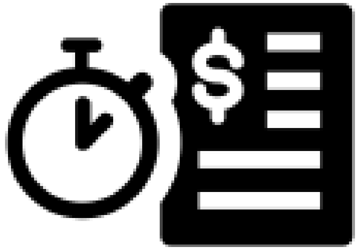
SD-5
Environmental Leadership

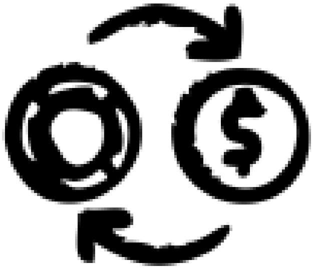
SD-6
Innovation

Prepayment

Prepay Program Overview

- Voluntary program available to all residential customers
- Customers pay for electricity before it is used
- Bill management tool for customers
- Conservation benefits cited
- Strong customer interest (prior pilot)
- Shut-off notification similar to pilot offering





Authorization for fast program start

- Proposing effective date of January 1, 2021 (rather than April 1)
  allows program to start as soon as technically feasible (once AMI meters can be installed)
- Same per-kWh rate as regular Residential
  $0.080242 per kWh in 2019
- Customer charge converted into daily charge

Comparison of QFs & DGs

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	Qualifying Facility (QF)	Distributed Generation (DG)
What is the customer?	A renewable or co-generation facility	A retail load **+** A renewable or co-generation facility
What is the problem?	If Tacoma Power pays too much for the facility's generation, other customers bear the cost.	
What is the rate?	• **Capacity:** monthly market capacity price index (CAISO, adjusted for technology characteristics) • **Energy:** hourly wholesale price indicator (LMP or Mid-C)	• **Generation matches load:** retail rate (energy + delivery) • **Generation varies from load:** hourly wholesale price indicator (LMP or Mid-C)
What about RECs?	RECs must be sold to Tacoma Power at the average price Tacoma pays for other RECs.	

Qualifying Facility (QF)

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What is a QF?

- Renewable or cogeneration facility up to 80 MW in size
- Federal requirement to purchase facility electricity output at “avoided cost”
- Intended to allow third-party generators entry into the power market

What are Avoided Costs?

- For utilities that need additional generation to serve their loads, “avoided cost” is the cost the utility would pay for a new power plant or power contract
- For utilities that do not need additional generation, there is no avoided cost; additional power must be sold on the wholesale market
- Since Tacoma Power’s generation supply (BPA contract + dams) meets retail needs, Tacoma’s avoided cost is the wholesale market price

Why Publish?

- Recent request for indicative pricing for prospective suppliers

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Financial Sustainability

SD-3
Rates

SD-5
Environmental Leadership

Avoided Cost Calculation

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What is the market Energy price?

- **The wholesale price of electricity**
- Locational Marginal Price (LMP) is a market price in CA that is derived in the Energy Imbalance Market (EIM) at the hour the electricity is produced

What is the market Capacity price?

- **There is no capacity market in the Northwest**
- California Public Utilities Commission (CPUC) summary of bilaterally-transacted system resource-adequacy capacity for CAISO North Zone

How are RECs involved?

- **"Brown" power is fed into Tacoma's system if the QF keeps the REC**
- Clean Energy Transformation Act (CETA) compliance
- Compensation for RECs

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SD-3 Rates

SD-5 Environmental Leadership

Large Distributed Generation (DG)

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What is DG?

- Customer-owned generation on the customer's premises
- Intended to allow small customers to offset onsite consumption
- Solar most common

How is small DG compensated?

- State law directs how to pay DG under 100 kW
- "Net metering": the difference between the total electricity supplied by the utility and the total electricity generated by a customer-generator over a standard billing period
- ***Problem***: if the customer uses 40 kWh during every night, and then returns 40 kWh back to the grid during every day, then the customer's bill will be zero even though the utility incurred expense to supply the customer during the night

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Large Renewable DG Provision

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If the customer uses energy as it is produced, value is the retail rate.

•Energy produced and consumed immediately reduces the energy drawn from Tacoma Power's system and reduces the customer's bill

•Customer benefits most if the DG generation shape matches customer load

•Cap at 2 MW unless customer reserves standby capacity under contract

If the customer sends excess energy to the grid, value is wholesale market price.

- Locational Marginal Price (LMP) from Energy Imbalance Market (EIM) at the hour the electricity is produced
- Customer benefits most if the excess DG generation shape matches time of regional energy need

Tacoma Power purchases Renewable Energy Credits (REC)s.

- Brown" power is fed into Tacoma's system if the customer keeps the REC
- Easiest Clean Energy Transformation Act (CETA) compliance if Tacoma acquires the REC

Comparison to Other DG Provisions

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Utility	Applicable	Surplus Pricing	Renewable Attribute
Sacramento Municipal Utility District	Various renewable resources (< 3 MW)	Roll over net annual surplus or receive a monetary payment based on expected avoided cost	REC transfers to SMUD if utility purchases energy
Salt River Project	Cogeneration or small power production	Hourly Index – $0.32/MWh	Not addressed in tariff
Seattle City Light	Solar (100 kW - 2 MW)	$31.60 / MWh (revisable down to $18 / MWh until 2035)	Customer retains REC
Snohomish Public Utility District	Small Renewable Resources (100 kW - 2 MW)	One year contract period, where: Contract Price = Energy Price (Aurora price updated quarterly) + T&D Loss Credit + Tradeable REC Value + System Upgrade Deferral Credit + Generation Capacity Credit + Distributed Generation Credit	Customer receives credit for a tradable REC, if applicable.
Turlock Irrigation District	Private-Owned Generation Supply (500 kW - 7 MW)	Stated energy and capacity rates for on-peak and off-peak periods during the winter and summer. Customers whose meter reading for the month shows net generation in the On-Peak and/or Off-Peak period shall be compensated at the District's Short Run Marginal Cost of electricity (SRMC) per kWh applicable to the time of delivery.	Customer receives compensation for REC based on short-run marginal cost at the time of delivery

Industrial Non-Firm Rate Option (DR)

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Demand Response offerings enhance demand-side portfolio.

- Offerings to commercial and residential customers will require AMI
- Wholesale market value of different types of DR are changing with EIM; need more time to develop a standard offer
- Plan to address additional customer classes next rate process

Demand Response mitigates the risk of supplying a NLL.

- NLL can increase utility cost if it requires acquisition of new generation resource to meet resource adequacy tests
- Cost-avoiding alternative allows utility to shut off customer when power supply is strained (“non-firm service”, can be curtailed with 10-minute notice)

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Rates

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Stakeholder Engagement

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How Do Non-Firm Rates Work?

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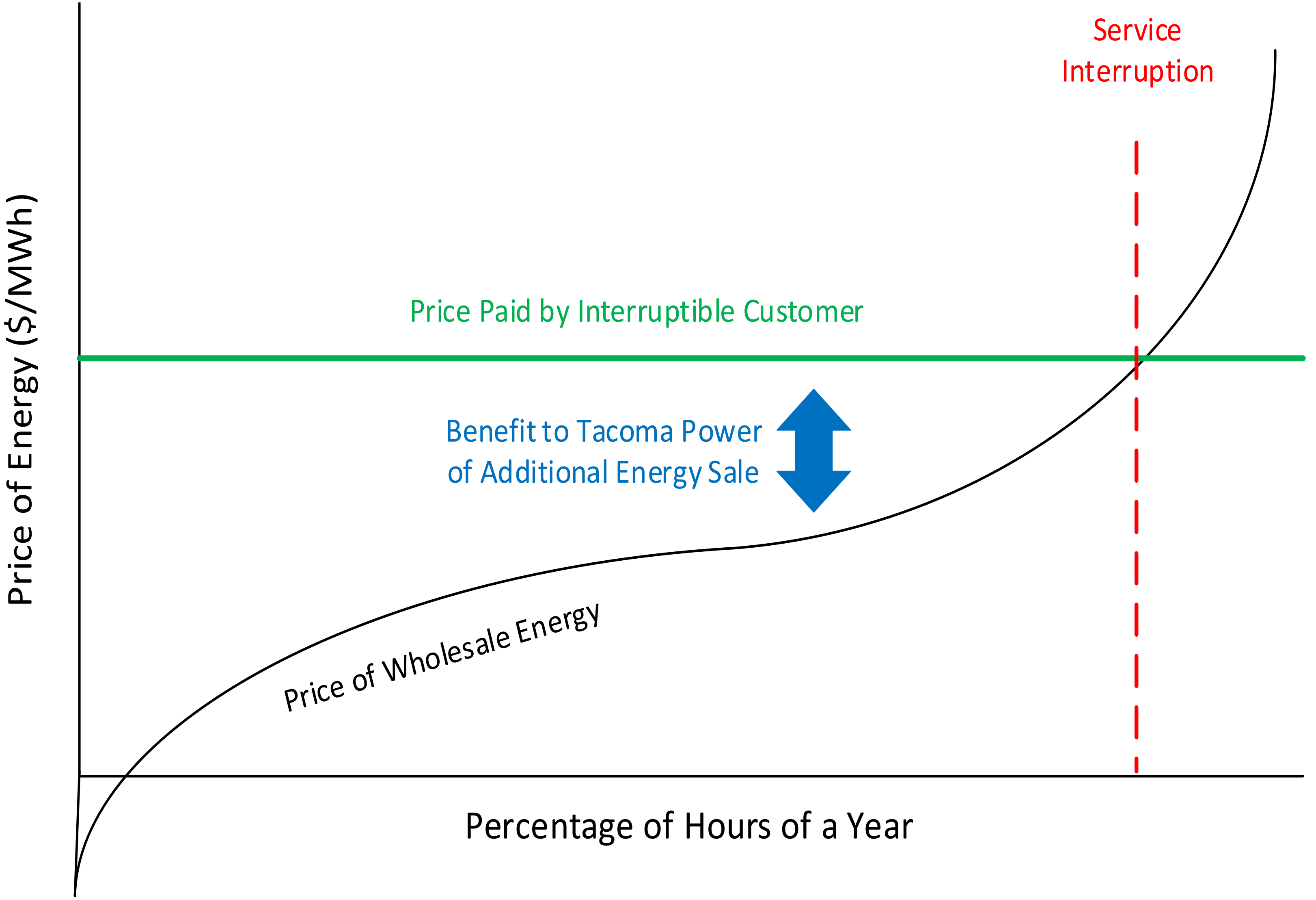

Interruptible Rate

- Utility does not have obligation to plan for generation and transmission services above the denoted availability, thereby reducing cost and risk
- Customer benefits from lower price for electricity

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SD-5 Environmental Leadership

SD-6 Innovation

Industrial Non-Firm Rate Option

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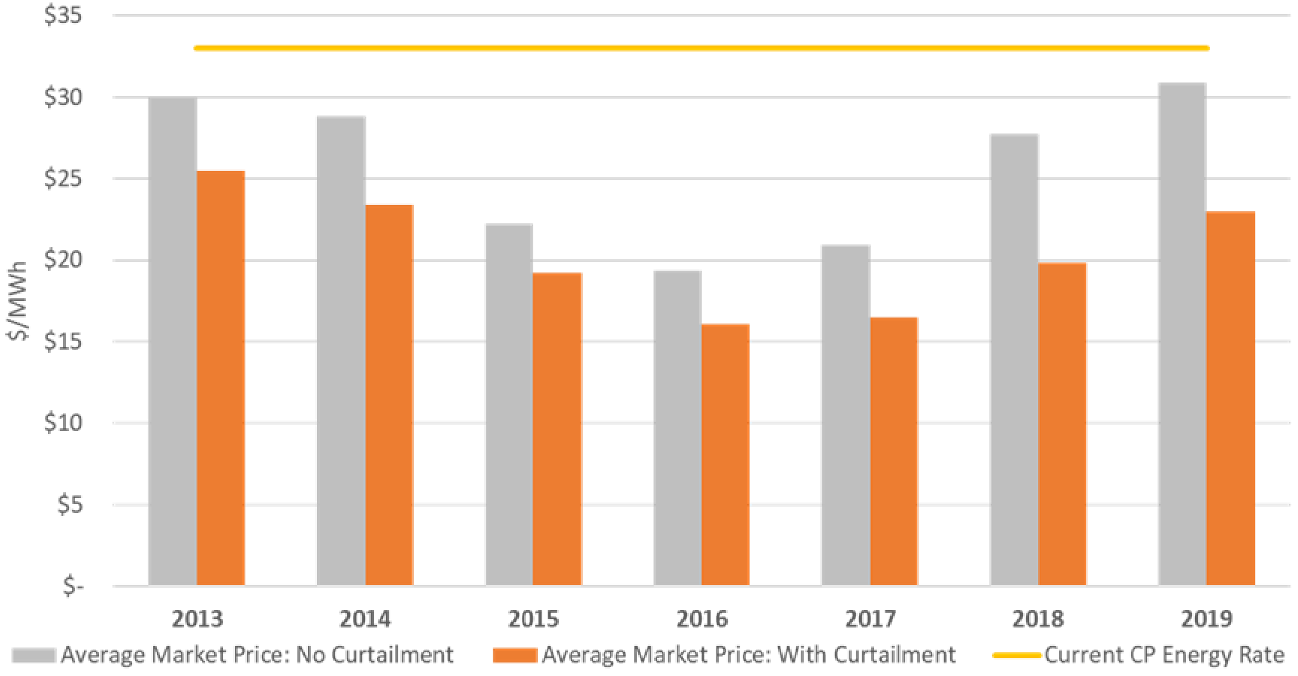
Tacoma Power's First Demand Response (DR) Rate Offering

- Based on CP rate
- Service only guaranteed 85% of time (7450 hours)
- Tacoma Power can curtail 15% of hours with 10 minutes of notice

Electrofuels:
renewable hydrogen production
very flexible load



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SD-5 Environmental Leadership

SD-6 Innovation

Summary of Policy Questions for Initial Board Feedback

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1. *Is the Board amenable to the utility requests to **forgo COSA** for this rate process due to the unique COVID-related circumstances?*
2. *Is the Board supportive of a roll-out of the **Pre-Pay** rate option as soon as AMI meters become available?*
3. *Are there any questions regarding the process of publishing **avoided costs for prospective QF power producers** seeking to sell their output to Tacoma Power?*
4. *Is the Board supportive of offering a **special tariff provision for distributed generation** that offsets onsite load for retail customers between 100 kW and 2 MW?*
5. *Is the Board supportive of introducing a **non-firm (demand-response) rate** for flexible new large loads?*

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SD-3 Rates
SD-4 Stakeholder Engagement
SD-5 Environmental Leadership
SD-6 Innovation

Next Steps

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JUN 24

Long-Range Financial Plan and Revenue Requirement Preview
PUB Meeting

JUL 22

Financial Update
PUB Meeting

AUG 26

Final Rate Proposals and Long Range Financial Plan
PUB Meeting

SEP 23

TPU Budget Presentation
PUB Meeting

OCT 13

Review of Preliminary Biennial Budget & Rates
PUB/City Council Joint Study Session

OCT 28

Consideration of Preliminary Biennial Budget & Rates
PUB Meeting

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May 19, 2020

MEMORANDUM

TO: Chris Robinson, Power Superintendent

FROM: Rick Applegate, Senior Power Analyst
Clay Norris, Power Section Manager

CC: Erin Erben, Rates & Financial Planning Manager
Christina Leinneweber, Senior Utilities Economist

SUBJECT: **NEW LARGE LOAD NON-FIRM RATE BACKGROUNDER**

EXECUTIVE SUMMARY

Tacoma Power staff proposes to offer a new rate schedule for **Non-Firm** service to customers that can have their electrical usage periodically curtailed. This rate would serve as Tacoma Power's first Demand Response (DR) rate. It will be offered to loads over 20 MW at this time. Once AMI is in place, the utility will be able to construct DR offering for additional customer groups.

NON-FIRM ELECTRICAL SERVICE

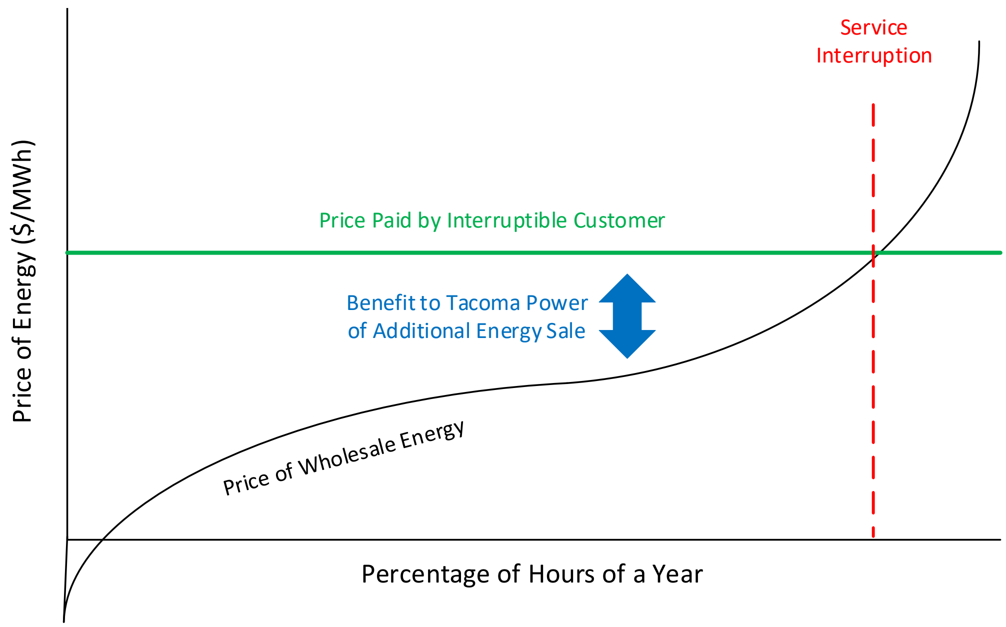
BACKGROUND

The effect of a new large load on a utility's financial position is difficult to quantify. It depends on the size of each new load, and the cumulative total of new loads added. When a utility is "long" in power supply, the utility generally has more resources available than needed by its retail customers. The excess power is sold on the wholesale market to help offset retail rates. At the present time, average retail power prices are higher than average wholesale power prices. Therefore, the utility benefits when retail load grows. However, this is only the case as long as the utility is long in power supply and wholesale power prices are low.

If several large loads are added, the utility might use all of its length and be required to acquire new resources, potentially raising the average power supply costs for all customers. The utility would also be taking the risk of purchasing a new power supply for a very large customer who might not remain in business for the length of the purchase obligation. In this event, the remaining retail customers would need to pick up the incremental cost (net of wholesale revenue) for the excess supply. Alternatively, if the wholesale power market undergoes a systemic shift and power prices rise substantially, retail load growth may provide less revenue than wholesale sales.

One way to avoid potential long-term cost increases due to large load growth is to assign the new customers the risk of wholesale price volatility, as was done during early deregulation. The outcome at that time was extreme hardship for several large customers when market prices remained very high for the better part of a year. Another approach is to offer service on a "non-firm" basis. Under a non-firm service arrangement, the utility is not required to provide electricity at all times, but only when it is economical to do so. The customer may provide the utility with a mechanism to "turn off" its load in response to certain conditions ("demand response" or "DR"). Alternatively, the customer can plan to operate in response to a wholesale energy price signal sent by the utility. The following graphic illustrates the opportunity that exists for Tacoma Power to serve an interruptible load that that is willing to be curtailed when service is no longer economical for Tacoma Power.

Figure 1: Example of Potential Value of Interruptible Load



At this time, staff believes existing Tacoma Power customers are likely not well-suited for this form of interruptible service as it can be very disruptive to business operations. However, a limited number of customers, such as those using electricity to make "electro-fuels" may present an opportunity. At least one such customer is presently considering such a facility in Tacoma.* Prospective customers developing electro-fuels seek to locate in areas where utilities will offer a lower rate in exchange for utility-dictated service interruptions ("interruptible rate"). Tacoma Power can encourage local deployment of these technologies if the utility strikes the right balance between electric cost and electric service level with these, and other, potential customers.

Load curtailment offers a potentially substantial resource benefit to Tacoma Power. With the ability to curtail a large customer load for days at a time, Tacoma Power could avoid making capacity purchases to serve the customer. With the ability to curtail with less than 10 minutes of notice, Tacoma Power could avoid buying or holding operating reserves for the customer. Finally, with the ability to curtail during high-price times of day, Tacoma Power could serve the customer with surplus energy or low-priced wholesale energy.

Figure 2 shows hourly wholesale market price duration curves (prices sorted from least to greatest) for 2013 through 2019. The gray shaded area represents highest 20% of hours that could have been curtailed had Tacoma Power had any customers on an interruptible rate.

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* Electro-fuels convert renewable or low-carbon electricity and water into hydrogen or some other compound that stores this energy. Many of these electrochemical processes are well-suited to handle periodic curtailment. In conversations with electro-fuel producers, staff learned that the loads could tolerate significant curtailments with short notice, making them a very attractive load from a power-supply management perspective.

Figure 2: Price Duration Curves, Mid-C, 2013-2019

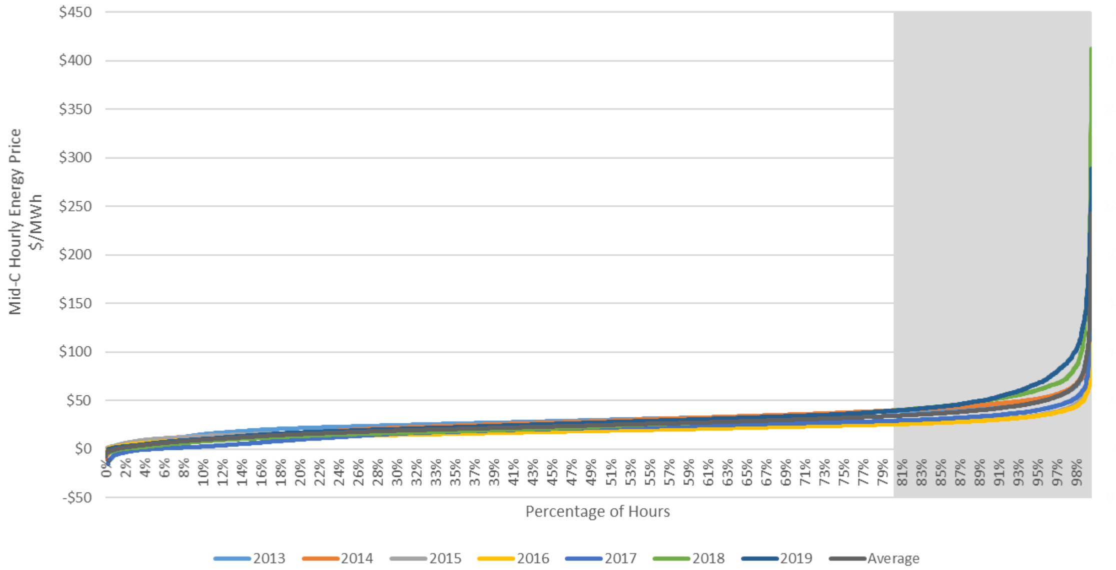
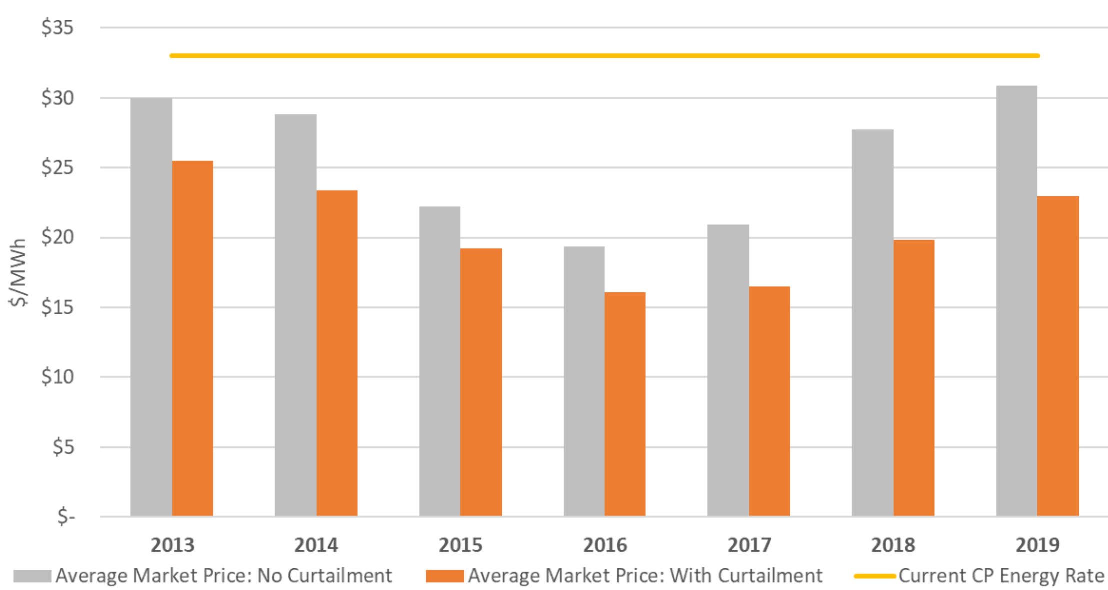


Figure 3 shows the average wholesale market energy cost of the bottom 80% of hours (orange bars) compared to the current CP energy rate (yellow line). As shown, there is significant headroom to absorb escalations in wholesale energy prices without imposing costs on other customers.

Figure 3: Average Wholesale Market Price (Mid-C) with No Curtailment and 20% Curtailment versus CP Energy Rate



Tacoma Power suggests providing this non-firm service at a fixed energy price to qualifying customers.

ALTERNATIVES

Staff considered several alternatives on this issue, including:

- Making a non-firm, fixed-price tariff available to a customer that can tolerate the significant interruption provisions
- Making the non-firm rate a variable pass-through of wholesale energy and capacity costs plus local delivery costs

Creating a tariff that simply passes the wholesale costs to the customer is attractive because it completely isolates existing customers from power-price risks. However, in conversations with prospective companies, staff learned that energy price uncertainty is not desirable and could encourages them to locate elsewhere.

STAFF RECOMMENDATION

Tacoma Power staff recommends creation of a new fixed rate schedule, Non-Firm Large Load (NFLL). This rate offering creates an opportunity to leverage customer flexibility as a substitute for generation and transmission resource additions. It also supports the development of renewable hydrogen and other businesses in Tacoma. Governments and regulators are recognizing electro-fuel's ability to decarbonize sectors that are otherwise impossible or difficult to abate—such as intensive personal or collective transport, freight logistics, industrial heating, and industry feedstock. Meanwhile, industry leaders across the automotive, chemicals, oil and gas, and heating sectors look to low-carbon electro-fuels as a serious alternative to reach their increasingly substantial sustainability objectives.

Under this schedule, a customer would receive power at a fixed cost, no less than 7,450 hours per year (approximately 85% of the hours). Service above this threshold would be at Tacoma Power's discretion and the utility would be able to curtail customer load at its discretion. Staff is finalizing specific draft tariff provisions but expects to recommend energy be priced at the CP energy rate and include demand charges that only reflect the local transmission costs, in addition to a customer charge identical to the CP rate.

April 28, 2020

MEMORANDUM

TO: Chris Robinson, Tacoma Power Superintendent/COO

FROM: Erin Erben, Rates & Financial Planning Manager
Christina Leinneweber, Senior Utility Economist

SUBJECT: **OVERVIEW OF 2021/2022 BIENNIUM MANAGEMENT RECOMMENDATIONS**

EXECUTIVE SUMMARY

In lieu of the in-person study sessions previously planned, Rates, Planning & Analysis (RPA) staff will prepare a series of memoranda with necessary "background" information to prepare the Public Utility Board to have informed policy discussions on rates for the upcoming 2021/2022 biennium. After the initial series, additional informational documents may be prepared to answer any outstanding questions the PUB members may have.

In response to the current economic situation evolving from the COVID-19 pandemic, and order to increase the amount of time and information available to prepare forecasts and budgets for the 2021/2022 biennium, the Long-Range Financial Plan that sets the 2021/2022 retail revenue requirement has been delayed until at least June 24th. Maintaining the same overall scheduled implementation timeline for approving rates and budget this year will require foregoing a cost-of-service analysis. Instead, Tacoma Power staff recommends that all customer classes receive any system-average rate increase ultimately adopted by the board and council. In this way, the economic impact of a rate increase to the community is somewhat mitigated, without exacerbating any potential deviation from the last cost-of-service allocations that is likely to result from new data.

SCHEDULE

In the original rates process plan, the Public Utility Board (PUB) was scheduled to discuss a number of rate policy items on 8 April 2020. Because this meeting did not take place, staff are preparing a series of memoranda to transmit important rates information to the PUB in advance of the formal rates process. After the initial series of "backgrounder" memoranda, additional informational documents may be prepared to answer any outstanding questions the PUB members may have.

COMMUNICATIONS

During the past year, inquires have been made regarding a number of special rates, such as a shore-power rate requested by the Port of Tacoma to enhance the economics of electrification, non-firm and demand-response rate options requested by Power Management to enhance customer load flexibility, and a Very Large Load rate requested by Economic Development to facilitate constructive conversations with potential customers. Since many of these rates are completely new constructs for Tacoma Power, the proposed "backgrounder" series will allow the PUB to understand the high-level concepts before it is requested to pass policy judgements on the rates themselves.

Table 1 shows the planned schedule for delivery of the "backgrounder" documents.

Table 1: Proposed Schedule for "Backgrounder" Memoranda to be delivered to the Public Utility Board.

Date	Discussion	Description
28 April	Overview of 2021/2022 Biennium Management Recommendations	*this memorandum*
5 May	New Rates for Electrification & Low-Income Support	▪ Shore Power rate ▪ Prepay rate options
12 May	New Rates for Renewable Energy	▪ Qualifying Facility (QF) rate ▪ Net Metering rate (for loads greater than 100 kW)
19 May	New Rates for Economic Development and Demand Response	▪ Non-Firm Service option (for Demand Response) ▪ Very Large Load (VLL) pricing

COST-OF-SERVICE ANALYSIS

The COVID-19 pandemic has caused a significant deviation from the utility's revenue and expense forecasts. Although staff is updating these forecasts as quickly as possible as new data becomes availiable, the future remains highly uncertain. Each day brings changes that affect our forecasts. Budgets are still in flux, as are projections of customer loads for the next few years. Therefore, instead of producing highly-speculative forecasts right away, as would be required to complete the cost-of-service analysis (COSA) process according to schedule, staff believes that Tacoma Power should forgo a full COSA process to set the 2021/2022 rates during this highly unusual time. Instead, it would be most prudent to settle on a revenue requirement projection sometime in July or August 2020 in order to set an overall system-average rate increase for 2021 and 2022. This increase could be applied equally to all customer classes and rate components. Staff proposes to resume analysis regarding COSA methodology and allocation to rate components during the subsequent biennium.

REVENUE REQUIREMENT

In response to the rapid decline in customer demand and the uncertaintly regarding future economic conditions, Tacoma Power is in the process of reassessing its capital plan and identifying spending reductions for the remainder of 2020 as well as budget reductions for the 2021 and 2022 biennium. In order to implement such changes with minimal disruption to utility operations, it is important that adequate time is devoted to the analysis by the respective business units. Meanwhile, a hiring freeze has been implemented and negotiations have ensued with Key Bank for a liquidity agreement to increase available cash and mitigate near-term rate increases to customers. At the same time, staff are refining the load forecast based on the observed load impacts of social distancing and projected recession scenarios. Changes to the load forecast impact both the retail revenue and wholesale revenue forecasts, as well as the long-term Bonneville Power Adminstration purchased power cost (post-September 2021).

Once the net effect of these actions has been compiled, the situation will be re-evaluated and expense targets adjusted. The more time that is availiable for these iterations, the more accurate the projection will be. Therefore, an alternative timeline is recommended. Instead of approving the Long-Range

Financial Plan on May 27th and reviewing the draft retail rates and COSA findings on June 24th, staff is planning to use the May 27th date to provide the PUB an update on the utility's financial outlook, and to address questions and take policy direction from the Board regarding the proposed rate changes. Staff also plans to solicit feedback from customers potentially impacted by the new rate options during this time.

It may be necessary to request additional time and flexibility to adapt the revenue requirement to the realities of the pandemic as it unfolds. Hopefully, better insight into the potential depth and length of this global recession will be available by the June 24th meeting.

May 5, 2020

MEMORANDUM

TO: Chris Robinson, Tacoma Power Superintendent/COO

FROM: Erin Erben, Rates & Financial Planning Manager
Christina Leinneweber, Senior Utilities Economist

CC: Bill Berry, Rates, Planning & Analysis Manager
Francine Artis, Customer Solutions

SUBJECT: **PREPAY BACKGROUNDER**

EXECUTIVE SUMMARY

In an effort to assist payment-challenged customers and those with limited incomes, Tacoma Power proposes to create a prepay rate as part of the 2020 rate process.

HISTORY

WHAT ARE PREPAY RATES?

Traditionally, electric power utilities bill customers for power consumption after it occurs. In contrast, prepay rate designs allow customers to pay in advance for power consumption; this is the payment model of most items consumers purchase. Under a prepay system, customers pay an amount of their choice toward their account, and, as energy is consumed, they pay more to "fill up the tank" again. Generally, a smartphone app or special device in the home allows real-time monitoring of energy use and account balance, and provides warnings before power shutoff. Real-time tracking of the power credits allows customers to make informed decisions to save energy so that they can carry the credit for a longer time.

PAY-AS-YOU-GO PILOT

Tacoma Power was an industry leader in offering prepay programs when the utility first began offering its Pay-As-You-Go[*] program to customers in 2005 using Gateway wired meters. Since then, numerous customers have used the program not only to manage their electric usage on a real-time basis, but also to pay off utility arrears. Due to the cancellation of the Gateway program, the prepay pilot program was closed. The number of prepay customers declined to 274 before the program was terminated in preparation for AMI rollout. Customer Solutions still regularly receives requests from customers for prepayment options.

BENEFITS

Customer benefits of prepayment rates include:

- Protection against unexpected electricity shut-off, including the associated disconnection and reconnection fees

[*] Formerly known as PAYGO

- Protection against “surprise” bills which arrive at the end of the billing period (when it is too late to do anything about it)
- Elimination of the account-activation deposit.

RATE DESIGN

VARIABLE AND FIXED CHARGES

The standard rate for a residential application is the Schedule A rate. This rate consists of two parts:

1. A customer charge consisting of a fixed amount per month (planned to be $17.30 in July 2020),
2. A variable charge consisting of a price for the total units (kWh) of electricity consumed, listed as an energy charge and a delivery charge. The energy charge is planned to be 4.5351¢ per kWh and the delivery charge is planned to be 3.5353¢ per kWh, effective 1 July 2020.

For prepay customers, the fixed charge is converted to a per-day charge. A full year’s revenue from the customer charge is divided by the number of days in the year to arrive at the daily charge.

Equation 1: Example of Daily Charge Calculation

$$\frac{\$17.30\text{ per month } \times 12\text{ months}}{365\text{ days per year}} = \frac{\$207.60}{365\text{ days}} = 57¢\text{ per day}$$

This is essentially a daily proration of the customer charge for the days in which the prepay customer has an active account. This methodology is equitable for non-prepayment customers, because non-prepayment customers also have their customer charge prorated if they close their account in the middle of a month.

LOW-INCOME ELDERLY/DISABLED RATE

Currently, Tacoma Power offers a special discount rate (Schedule A-1) for low-income disabled and low-income senior customers. Prepayment would also be offered on this rate schedule, in the same manner as regular residential customers.

APPLICABILITY TO SCHEDULE B

Tacoma Power is exploring the interest among small commercial accountholders for Schedule B prepayment. If it is offered, it would be structured the same as the residential prepayment program.

SPECIAL CONSIDERATIONS

A wide variety of customers took advantage of the PAYGO program while it was offered. However, it does bring special benefits to certain vulnerable customer groups:

- Customers with **low liquidity**. Because the customer does not accrue a monthly (or bimonthly) account payable to the utility, customers do not need to provide a deposit[†] to start service.
- **Unbanked** customers. Payboxes are available in various locations across Tacoma. Cash payments can also be made at some local stores including 7-Eleven and Walmart. Customers who do not have

[†] Power residential deposits are $200 ($100 for apartments). Water residential deposits are $75.

banking facilities can nevertheless "deposit" some of their earnings with the utility, who will "save" it for them to be used for future electric needs.

- **Shift** workers. Unlike the Customer Service lobby or call center, prepayment accounts can accept funds 24 hours a day.
- **Students and roomates**. Prepayment accounts provide an easy and straightforward way to share electricity costs for multiple parties living together.
- Customers with large **pre-existing arrears**. During the prepay pilot, customers with large pre-existing arrears were not required to clear their balance with the utility before establishing a new service. Instead, 30% of each payment on the account was credited against their debt, until it was repaid.
- Customers who **do not understand electric usage**. Sometimes, customers engage in behaviors that they believe will reduce their bill, but are actually counterproductive[‡]. When they can see the impact of their actions in real-time, they are empowered to make constructive conservation choices.

Protecting vulnerable customer groups is a particularly important mission for a publicly-owned utility. Prepayment options are a key way this demographic will be able to leverage the utility's investment in Advanced Metering Infrastructure (AMI). Indeed, the ability to offer prepayment was one of the business drivers behind the AMI project. Although the utility may not have AMI fully implemented by the time the 2021/2022 rates are adopted, inclusion of prepayment-enabling language in the rate package will allow the utility to implement it as soon as it becomes technically feasible.

[‡] For example, a customer may turn off an efficient heat pump and turn on an inefficient space heater, under the mistaken belief that the "smaller" appliance is conserving power.

TACOMA POWER
TACOMA PUBLIC UTILITIES

May 12, 2020

MEMORANDUM

TO: Chris Robinson, Tacoma Power Superintendent/COO

FROM: Ray Johnson, Assistant Power Manager

CC: Clay Norris, Power Section Manager
Bill Berry, Rates, Planning & Analysis Section Manager
Erin Erben, Rates & Financial Planning Manager
Christina Leinneweber, Senior Utilities Economist

SUBJECT: **QUALIFYING FACILITY RATE POLICY BACKGROUNDER**

EXECUTIVE SUMMARY

The Federal Public Utility Regulatory Policy Act of 1978 (PURPA) requires electric utilities to purchase the output of a "Qualifying Facility" (QF) at the utility's "avoided cost" of energy and capacity*. However, PURPA provides local regulators broad discretion to develop policy and pricing methodology to determine that avoided cost. Tacoma Power currently does not purchase the output of any QF and does not have an avoided-cost policy or tariff in place. Developing a policy now avoids uncertainty and confusion for future QF developers.

Due to the mechanics of the Bonneville Power Administration (BPA) contracts, any output from a QF is surplus to needs and would be sold in the wholesale market. Consequently, Tacoma Power's "avoided cost" is wholesale market prices. Therefore, the most representative avoided-cost pricing construct for Tacoma Power is to **pass through market prices for energy and capacity**.

PURPA does not regulate the sale of renewable energy credits (RECs). Developers often "strip" RECs from the energy produced by QFs to get the highest price. To avoid receipt of "brown power"† and assure compliance with the Washington Clean Energy Transformation Act (CETA), **all QFs should be required to bundle RECs with energy produced**. The QF developer should be compensated for these RECs based on the weighted-average historical cost of RECs to Tacoma Power.

To protect existing customers from bearing costs caused by QF suppliers, incremental costs related to transmission, integration, and taxes should also be recovered as a reduction to the avoided cost rate.

WHAT IS A QF?

The Public Utility Regulatory Policies Act of 1978 (PURPA) establishes a new class of generating facilities which receive special rate and regulatory treatment. Generating facilities in this group are known as qualifying facilities, and fall into two categories:

* Pricing based on "avoided cost" means that the utility should pass on any generation cost savings to the QF owner. This policy approach was adopted in the belief that it would encourage additional cogeneration and renewable projects without harming other utility customers.

† "Brown power" is power deemed to have carbon emissions similar to a natural gas power plant.

- A *small power production* facility is a generating facility of 80 MW or less whose primary energy source is hydro, wind, solar, biomass, waste, or geothermal resources.
- A *cogeneration* facility is a generating facility that sequentially produces electricity and another form of useful thermal energy (such as heat or steam) in a way that is more efficient than the separate production of both forms of energy.

Utilities are required by law to purchase energy and capacity from QFs at an avoided-cost rate approved by their regulator.

HOW ARE QFS DIFFERENTIATED IN WASHINGTON STATE?

The Washington Utilities and Transportation Commission (WUTC) recently adopted WAC 480-106 (Purchase of Electricity from QFs), which applies to regulated investor-owned utilities (IOUs) and breaks QFs into two categories:

- **Standard QFs**: QFs with a nameplate capacity of 5 MW or less (Standard QFs) are entitled to standard avoided-cost rates and power purchase agreement (PPA) terms and conditions as provided in Chapter 480-106 of the WAC.
- **Non-Standard QFs**: QFs with a nameplate capacity greater than 5 MW (Non-Standard QFs) are subject to the non-standard avoided-cost rate methodology as most recently filed with the Commission, and Non-Standard QF Sellers will negotiate a PPA with the interconnecting IOU.

WAC 480-106 does not provide detailed guidance for Non-Standard QF pricing – only that it must be consistent with Standard QFs. Staff recommends the adoption of a single construct that would be applicable to all QFs.

WHAT ARE TACOMA POWER'S AVOIDED COSTS?

PURPA and WUTC rules are based upon the premise that the QF's energy serves the utility's retail load. This is not an accurate assumption in the case of Tacoma Power. The amount of BPA contract energy received by Tacoma Power increases as the utility's load increases. Therefore, no new resources are needed. Because it is not needed, **QF energy would be sold in the wholesale market and would not serve Tacoma Power load**. As a result, a construct that passes through market prices is the least-risk alternative for Tacoma Power ratepayers.

QF RECS & CETA CONSIDERATIONS

In 2030 and beyond, Tacoma Power is subject to clean energy requirements under the Clean Energy Transformation Act (CETA). PURPA does not regulate the sale of renewable energy credits (RECs). Developers often "strip" RECs from the energy produced by QFs to get the highest price. This would result in the utility receiving "brown power" (*i.e.* power deemed to have carbon emissions similar to a natural gas power plant) from the QF, which would complicate CETA compliance.

The value of RECs from QFs is time-dependent. Pre-2029 vintage RECs are only eligible for compliance with the state's existing Energy Independence Act (EIA) renewable portfolio standard statute. During this period, the value of QF RECs is equal to Tacoma Power's general REC acquisition cost. This is a market-based value since Tacoma Power complies with the renewable portfolio standard largely through purchases of "unbundled" RECs on the market.

To assure CETA compliance, staff recommends the Public Utility Board require that all QF RECs be bundled with energy produced. Tacoma Power has several options for compensating the QF for its RECs:

- **Forward Market**: usually $5-$10 per REC
- **Spot Market**: usually $1-$3 per REC
- **Weighted Average of Purchased RECs**: usually $3-$5 per REC

Since the REC market is very illiquid and opaque, staff recommends referencing the blend of short- and long-term purchases in Tacoma Power's portfolio as a fair proxy of the value received and the costs avoided.

INTEGRATION COSTS

Although Tacoma Power is not under the jurisdiction of the WUTC, staff recommends that Tacoma Power adopt a policy consistent with WUTC rules. Under these regulations, utilities may recover the integration costs associated with variable generation technologies as approved by their regulator. Tacoma Power recommends conducting an integration study to determine integration costs to be included in the QF rate as a reduction to the avoided-cost value the QF receives. If it is not feasible for Tacoma Power to conduct its own study for this purpose, the utility may also elect to use the integration rate values published in the BPA QF tariff as a proxy instead.

INTERCONNECTION COSTS

Under WUTC rules, QFs must pay for interconnection costs. "Interconnection costs" means the reasonable costs of connection, switching, metering, transmission, distribution, safety provisions, and administration incurred by the utility directly related to the installation and maintenance of the physical facilities necessary to permit interconnected operations with a QF that are in excess of the corresponding costs the utility would have incurred if it had not engaged in interconnected operations. Interconnection costs do not include any costs included in the calculation of avoided costs. Staff recommends that Tacoma Power adopt a policy consistent with the WUTC approach. QFs would be required to cover all their interconnection costs.

PROPOSED APPROACH

Consistent with the previous discussion, Tacoma Power staff proposes the following:

Element	Methodology
Energy	Locational Marginal Price (LMP) or Powerdex index; settled hourly
Capacity	Qualifying Capacity (QC) × market capacity price for November through March; monthly attribution
RECs	Obligation to sell Tacoma Power RECs at tariff rate
Adjustments	Recovery for integration, transmission, and taxes
Interconnection	QF responsible for interconnection costs

ENERGY

Staff proposes that the QF is credited for electricity according to a representative real-time Locational Marginal Price (LMP)[‡] for energy in an Energy Imbalance Market (EIM) in the hour during which the electricity is generated. If generation is provided during any hour when a representative LMP for an EIM is unavailable, Tacoma Power may estimate the price of the energy in accordance with the Powerdex published index value for power that reflects the actual same-day firm transactions at the Mid-Columbia trading hub.

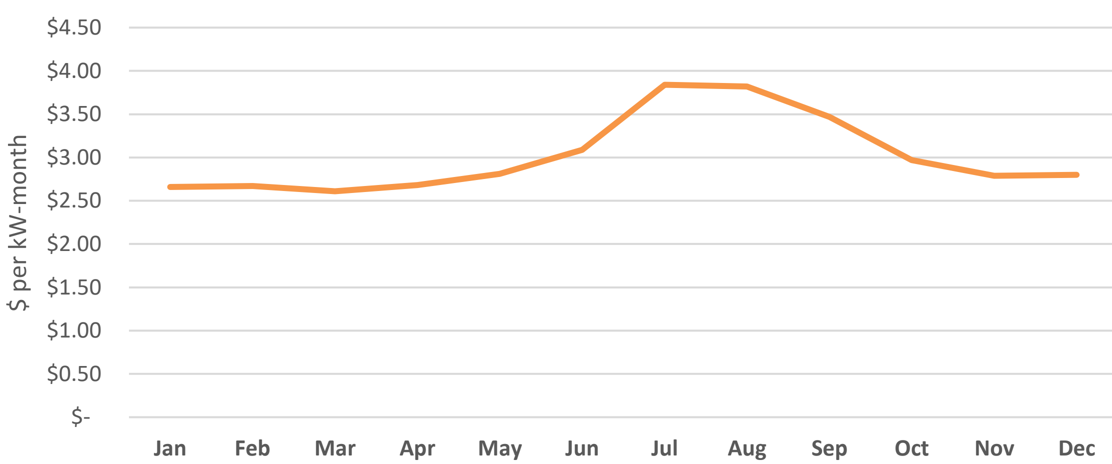
CAPACITY

Staff proposes that the QF be compensated for system resource-adequacy capacity according to the market value and the amount of useful capacity that the resource provides (known as "qualifying capacity" or QC). The QC values would depend on the generating technology. The market capacity value would be updated every two years.

MARKET CAPACITY VALUE

There is currently no transparent capacity market indicator for the Pacific Northwest. However, the California Public Utilities Commission (CPUC) publishes a summary of bilaterally-transacted system resource-adequacy capacity annually. Staff proposes using the most recent average transacted value for the California North Zone as a proxy until a Pacific Northwest reference is established. Figure 1 shows the most recent prices reported.

Figure 1: Average CAISO RA Capacity Transacted Price, North Zone, 2018-2022



QUALIFYING CAPACITY

Ensuring sufficient resource deliverability under stressed system conditions is a critical part of Tacoma Power's ability to support reliable grid operations. "Qualifying Capacity" (QC) is the amount of resource adequacy (RA) capacity provided by a resource during stressed conditions. Different resources have

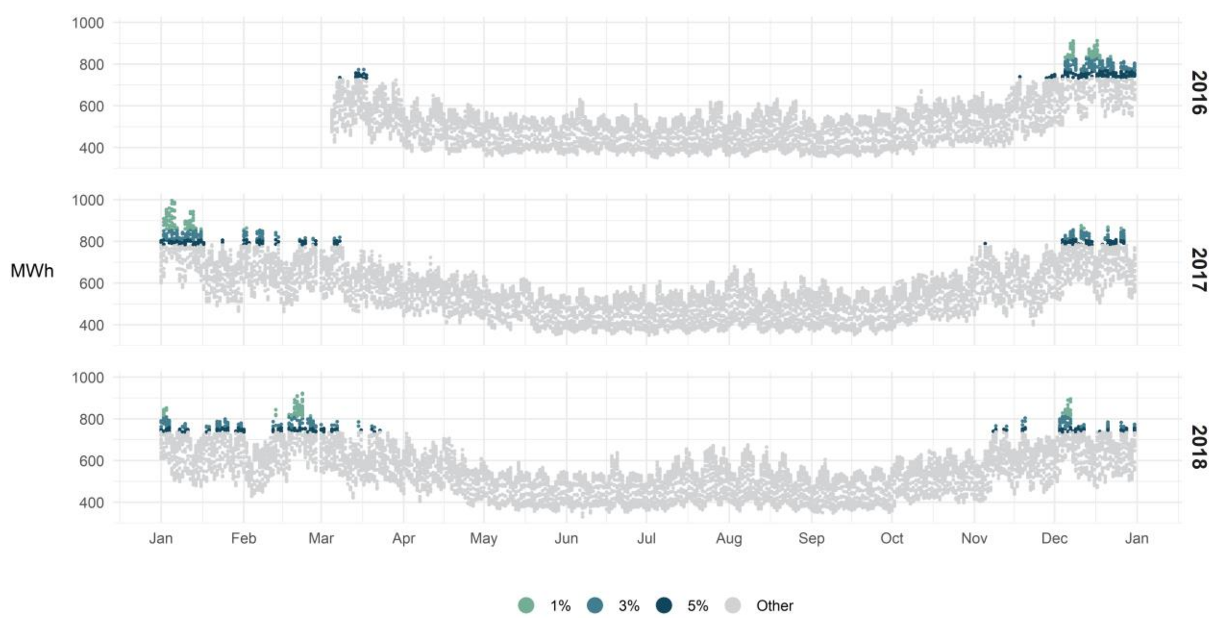
[‡] The LMP represents the cost to buy and sell power at different locations within the California ISO. LMPs are made up of three components: Energy Price, Congestion Cost, and Losses. Real-time LMPs represent prices in real-time markets which let participants buy and sell power during the day of operation.

different abilities to provide RA. A resource with a constant flat generation profile is more likely to be available than one that is dependent on weather (hydrology, wind, or solar).

A QC value of 100% denotes "perfect" capacity – capacity that is assured to be available at all times. For example, a 100 MW resource with a 100% QC would be assumed to provide 100 MW of capacity under stressed conditions. A resource that is available 15% of the time during stressed system conditions would have a QC of 15% - so if it had maximum generating capability of 100 MW, it would be credited 15 MW of RA capacity.

At the present time, staff proposes defining "stressed system conditions" in accordance with Tacoma Power's peak load hours. Figure 2 highlights the top 1%, 3%, and 5% of loads in 2016 through 2018. Peak loads most often occur in November through March. Consequently, capacity value would be attributed for this timeframe. It is important to note that this definition may need to change in the near future, as regional capacity markets change. If Tacoma Power elects to join a resource-adequacy program, the QF RA pricing time period would need to be consistent with the time period relevant to the RA program.

Figure 2: Peak Hour Selection by Year



<u>**CAPACITY PAYMENT**</u>

The capacity payment to the QF would be as follows:

$$Monthly\ Payment = (QC_m \times CV_m) \times NP$$

Where:

QC_m is the Qualifying Capacity for a given resource type for the month. The QC_m is determined by the amount a reference plant would generate over a peak load period relative to the plant's maximum generation.

CV_m is the market Capacity Value for the month in dollars per kW-month.

NP is the Nameplate Capacity for a given resource; this is the maximum amount of generation capability adjusted for unplanned outages.

Example

- A wind generation QF has a nameplate capacity of 80 MW (80,000 kW) but generates 19 MW on average during Tacoma Power's peak load hours during January. The qualifying capacity for January would be QC_{Jan} = 19 MW ÷ 80 MW = **24%**.
- The January market value for capacity is CV_{Jan} = $2.66 per kW-month.
- The capacity value for this particular QF in the month of January is $QC_{Jan} \times CV_{Jan}$ = 24% × $2.66 = **$0.6384** per kW-month.
- The QF would receive a capacity payment for the month of $(QC_{Jan} \times CV_{Jan}) \times NP$ = ($0.6384 per kW-month) × 80,000 kW = **$51,072**.

RENEWABLE ENERGY CREDITS

Staff proposes requiring the QF to bundle renewable energy credits (RECs) with all generation. Tacoma Power would include a section for REC compensation in the tariff and pay the QF based on the weighted-average price of Tacoma's non-QF RECs retired in the Western Renewable Energy Generation Information System (WREGIS)[§] over the past two years. This would average the cost of more expensive longer-term contracts with less expensive shorter-term purchases. The REC pricing would be updated every rate case.

OTHER ADJUSTMENTS

Staff recommends that the energy price paid to the QFs be reduced by an amount sufficient to compensate Tacoma Power for incremental costs related to point-to-point transmission, integration, State B&O taxes, and Tacoma gross earnings tax.

INTERCONNECTION COSTS

Staff recommends that the QF be held responsible for interconnection costs to connect to Tacoma Power's transmission or distribution system.

[§] The Western Renewable Energy Generation Information System (WREGIS) is an independent, web-based tracking system for renewable energy certificates (REC) that covers the Western Interconnection territory and acts as the system of record for REC transactions.

TACOMA POWER
TACOMA PUBLIC UTILITIES

May 12, 2020

MEMORANDUM

TO:	Chris Robinson, Superintendent/COO
FROM:	Rick Applegate, Senior Power Analyst
CC:	Clay Norris, Power Section Manager Bill Berry, Rates, Planning & Analysis Section Manager Erin Erben, Rates & Financial Planning Manager Christina Leinneweber, Senior Utilities Economist
SUBJECT:	**RENEWABLE DISTRIBUTED GENERATION BACKGROUNDER**

EXECUTIVE SUMMARY

Tacoma Power has recently received multiple requests from existing customers to integrate large generators into their facilities. The main goal of the generation is to serve each customer's energy requirements; however, in every instance, Tacoma Power anticipates that there will be intervals when this generation will be surplus to the customer's requirements. As a result, Tacoma Power must determine how, if at all, it will compensate these customers for this surplus generation.

This memorandum presents some of the key issues surrounding customer-owned generation for the Public Utility Board's consideration. It also offers a Tacoma Power staff recommendation that provides for compensation at a market-based rate for renewable energy provided from facilities up to a certain size.

COMPENSATION FOR SURPLUS GENERATION

BACKGROUND

In recent months, Tacoma Power has received requests from customers seeking to use solar and biomass generators to serve load at their commercial facilities. In every instance, Tacoma Power anticipates that there will be hourly intervals when the customer's generation output will exceed the customer's energy requirements, and, thus, surplus energy will be injected into Tacoma Power's system. However, Tacoma Power does not currently offer any framework on how to compensate these customers for this surplus generation.

For renewable generators that are smaller than 100 kW in output capability, the State of Washington requires utilities to offer net metering. Under the law, "net metering means measuring the difference between the electricity supplied by an electric utility and the electricity generated by a customer-generator over the applicable billing period." No adjustments are made to account for customer consumption and generation patterns within a billing period. For example, if the customer uses 40 kWh during each night, and then returns 40 kWh back to the grid during each day, then the customer's bill will be zero. Therefore, net metering results in the customer receiving credit for all generation at Tacoma Power's retail energy rate. However, the proposed customer-owned generation is too large (100 kW or more) to qualify for State-mandated net metering.

ALTERNATIVES

The 100-kW cap on generation capability for net metering in Washington illustrates the competing public policy objectives around customer-owned generation. On one hand, offering the customer compensation based on the full retail price of energy (*i.e.* net metering) provides a financial incentive to invest in generation. However, retail energy rates almost always exceed the wholesale price of energy, so, for a resource-adequate utility like Tacoma Power, surplus customer generation represents a cost to the utility beyond its value when it is net metered. Because a utility's retail customers ultimately pay all utility costs, this difference in retail and wholesale energy prices is eventually paid by all other customers. Accordingly, by limiting net metering to generators of less than 100 kW in output capability, the State can incent development of small distributed generation while protecting utility customers from the potentially significant new costs of some customers deploying very large generators.

Calculating the financial impact of receiving surplus energy from customer-owned generation is neither easily assessed in advance nor uniform for all types of generators. The customer's business processes and the resulting load will determine when and how much a customer uses the generation output on site. Furthermore, generation patterns vary significantly based on resource type. Certain resources like solar generation have distinctive daily and seasonal production patterns relative to comparably stable output resources such as biomass, small hydroelectric, or cogeneration resources.

Compensation for the customer can be determined using a market-based rate that is set at the time the surplus generation is provided to Tacoma Power. This kind of real-time market pricing is possible by referencing the locational marginal price (LMP) of an Energy Imbalance Market (EIM)[*] selected to be a fair representation of the price of energy at which Tacoma Power buys or sells energy into the wholesale energy market. Accordingly, it would hold Tacoma Power's other ratepayers financially harmless from compensating the customer for surplus generation, since such generation only receives its actual value as defined by the power market.

RECOMMENDATION

Tacoma Power staff proposes to credit a customer for surplus generation at a representative LMP of an EIM. This provides fair compensation to the customer while holding the utility's other ratepayers harmless from adverse financial impacts.

In order to provide this compensation, Tacoma Power requires some of the functionality offered by Advanced Metering Infrastructure (AMI), which will be deployed in the coming months. At present, this application is within the planned metering and billing capability offered by AMI, but some authorization to estimate generation credits is advisable in the case of unforeseen complications or delay in AMI deployment.

[*] An LMP represents the cost to buy and sell power at different locations within the California ISO. LMPs are made up of three components: Energy Price, Congestion Cost, and Losses. Real-time LMPs represent prices in real-time markets which let participants buy and sell power during the day of operation.

RENEWABLE ATTRIBUTES OF GENERATION

BACKGROUND

Under Washington's recently passed Clean Energy Transformation Act (CETA), Washington utilities will become increasingly responsible for demonstrating that their energy originates from sources that do not emit greenhouse gases. As a result, Tacoma Power has a developing interest in acquiring energy together with its non-emitting attributes. Existing rate constructs do not address the issue of ownership of environmental, social, and other non-power attributes of surplus customer-owned generation.

ALTERNATIVES

In some instances, customers with renewable energy also have an interest in retaining the environmental attributes of their generation. This may be driven by regulatory concerns, marketing objectives, or some other consideration. However, if a customer providing surplus generation retains the environmental attributes of its generation, then Tacoma Power will receive energy from an unspecified source for the purposes of environmental reporting and compliance. Eventually, acquiring energy from an unspecified source will be inconsistent with Tacoma Power's obligation to acquire energy from non-greenhouse gas-emitting resources under CETA. Accordingly, it is advisable to establish a requirement for the customer to transfer ownership of the environmental attributes of surplus generation to Tacoma Power as a condition of generation compensation.

If Tacoma Power were to require transfer of environmental attributes of surplus generation, then it could offer additional compensation to the customer for those attributes. A method of determining the amount of this compensation is to value it at the price in which Tacoma Power acquires renewable energy credit (RECs) to comply with the renewable portfolio standards requirements of Washington's Energy Independence Act (EIA).

RECOMMENDATION

To align with its interests under CETA, Tacoma Power staff recommends setting a requirement that a customer must transfer the environmental attributes of its surplus generation, which must be non-greenhouse gas-emitting resources, to Tacoma Power in order to receive compensation for that generation. So that the customer receives fair compensation for those attributes, Tacoma Power staff proposes that the customer also receive a credit at rate that reflects Tacoma Power's cost of acquiring RECs for compliance under the Washington EIA.

CUSTOMER ELIGIBILITY

BACKGROUND

Many other customer-owned utilities similar to Tacoma Power have programs to compensate customer-owned generators for surplus generation, and these utilities often set limits on the size and type of generation that qualifies for compensation. Though exceptions exist, typically these limits are around 2 or 3 MW for solar or renewable generation. Generators that do not qualify for these programs may seek compensation as a Qualifying Facility (QF) at the utility's avoided cost of energy and capacity under the Public Utility Regulatory Policy Act (PURPA) of 1978.[†]

ALTERNATIVES

Limiting the size of the generator that may receive compensation for surplus generation safeguards the utility from liability to provide over-market compensation for significantly oversized generators. Without some constraints, customers with generators sized far in excess of their associated load could receive substantial compensation while avoiding paying for the elements of the Tacoma Power system that are used to transmit the energy to an eventual consumer (such as the demand charge payment). Requiring such customers to take compensation under a QF tariff, which sets forth a more complex rate to ensure all utility costs and benefits are recovered and compensated, prevents such customers from "gaming" the system by purposefully oversizing generators.

However, establishing an absolute limit for compensation at either 2 or 3 MW may have the effect of excluding certain customers who might otherwise have merited cases for participation. For example, a customer may have a large load (in excess of 2-3 MW) that normally exceeds the output of its onsite generation. When such a customer also has purchased standby capacity from Tacoma Power to provide energy when their generators are unable to perform, the potential that other customers would be subsidizing this customer's generation payment is greatly reduced. Under these circumstances, the customer has provided Tacoma Power with sufficient payment for the use of Tacoma Power's system, so there is far less concern with allowing compensation for surplus generation.

RECOMMENDATION

Tacoma Power staff recommends limiting participation in the program to renewable generators up to 2 MW or to larger renewable generators that procure standby capacity under the terms of their regular retail tariff in contract from Tacoma Power. This will enable all customers who have indicated an interest in using renewable generation to meet their own facility needs to receive compensation for any surplus energy they provide to Tacoma Power.

[†] A companion memorandum to this document describes QFs and PURPA in greater detail and presents a proposal for a dedicated QF pricing methodology.

TACOMA POWER
TACOMA PUBLIC UTILITIES

May 5, 2020

MEMORANDUM

TO: Chris Robinson, Tacoma Power Superintendent/COO

FROM: Erin Erben, Rates & Financial Planning Manager
Christina Leinneweber, Senior Utilities Economist

CC: Bill Berry, Rates, Planning & Analysis Manager
Jeremy Stewart, Power Analyst

SUBJECT: **SHORE POWER BACKGROUNDER**

EXECUTIVE SUMMARY

In order to facilitate beneficial electrification at the Port of Tacoma, Tacoma Power proposes to create a Shore Power rate as part of the 2020 rate process. This rate would be designed to recover equivalent revenue to the Schedule G rate, but would eliminate peak demand and the demand ratchet charges. The costs usually recovered by these rate elements would be recovered in an additional per-kWh portion of the bill. Additionally, the new rate would include specific language to allow the terminal operator to reallocate costs to shipping lines based on energy usage.

HISTORY

WHAT IS SHORE POWER?

Shore power, also called "cold ironing," is the provision of special electrical hookups to ships berthed at ports. If ships are equipped with the resiquite equipment, they are able to shut off their engines and conduct ship operations using the on-shore electricity supply. If shore power hookups are not available, ships must continue to run their engines, usually powered by marine gas-oil (MGO, or "bunker fuel"), while in the port.

TACOMA ACTION

Tacoma Power has collaborated with the Port of Tacoma since 2014 to support their efforts to install shore power connection points. Tacoma Power, which serves the Port, has infrastructure capable of providing clean, renewable hydroelectricity that is 97% carbon free. On 27 February 2019, the Tacoma Public Utility Board approved Resolution U-11062. This resolution supports the development of a shore power rate that would eliminate peak demand and the demand ratchet charges (per-kW charges); these costs would be recovered in an additional per-kWh portion of the bill, as is the practice in residential and small commercial rates. Additionally, the new rate would include specific language to allow the terminal operator to reallocate costs to shipping lines based on energy usage.

RATE DESIGN

DEMAND AND ENERGY CHARGES

The standard rate for a commercial application that uses more than 50 kVA of peak demand at distribution voltage is the Schedule G rate. This rate consists of three parts:

1. A customer charge consisting of a fixed amount per month,
2. An energy charge consisting of a price for the total units (kWh) of electricity consumed, and
3. A delivery charge consisting of a price for the 15-minute maximal peak (kW) of electricity in the month. If a customer's peak declines, the demand charge has a floor, defined at 60% of the highest peak demand occurring during any of the preceding 11 months ("demand ratchet charge").

The demand-based charge is problematic for shore power success. The billed parties for energy used at the Port of Tacoma include terminal operators and the Port of Tacoma itself. Terminal operators and the Port would like to allocate the bill for this energy to the shipping lines based on the energy consumed per ship. This is easy to do for the fixed charge (which is nominal compared to the bill size) and the energy charge (because the energy used per ship can be easily measured). However, it is very difficult to allocate the demand charge. If multiple ships use the facility at similar peak loads during the month, to which should the demand charge be assigned? If no ships use the facility, who should bear the demand ratchet charge? Therefore, Tacoma Power proposes to recover the costs usually recovered in a demand charge through a per-kWh charge. This is how demand-related costs are presently recovered from residential and small commercial customers.

In general, demand charges are the most equitable way to recover demand-related costs, especially from large commercial or industrial customers who have heterogeneous load shapes. Tacoma Power is able to forgo use of demand charges in this particular instance because of the narrow eligibility criteria for the rate. In a broad rate class (such as the General Class), eliminating demand charges would result in subsidization of low-load-factor customers by high-load-factor customers. In this case, that is not an issue, since only one type of load is eligible for the rate. When combined with Tacoma Power's commitment to support decarbonization, this is enough to justify moving away from the "ideal" of demand-charge rates.

The proposed per-kWh rate is not intendend to be a subsidy or provide a reduced rate for shore power service. The best available data about typical hours in berth and number of port calls per month was used to forecast the total kWh usage and construct a Schedule-G-equivalent rate. For any class, future billing determinants must be estimated to set rates. For the proposed shore power rate, the data source used for making the forecast is unique. While the utility has historical data for existing rate classes, this new rate class is forecast using data provided by the Port of Tacoma and Port of Oakland on ship patterns and characteristics.

Using the data available, Tacoma Power estimates that the **2019 Schedule-G-equivalent Shore Power** rate would be **$0.1115 per kWh** for the energy and the delivery charges combined. This is an economically-competative price with MGO fuel, and is expected to become even more competitive as new regulations for sulpher content in MGO became effective on 1 January 2020.

FUTURE ADJUSTMENTS

At the present time, Tacoma Power proposes making the Shore Power rate equivalent to the Schedule G rate, since that is the otherwise-applicable rate. Over time, the utility will track actual cost and usage data. As appropriate, the utility may separate the Shore Power rate from the Schedule G rate. If that occurs, it will no longer be a "Schedule-G-equivalent" rate, but be an entirely independent rate class, calculated with the same cost-of-service methodology as any other rate. This methodology cannot be used now, because sufficient data is not available.