Tacoma Power Rate Recommendations

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June 27, 2018



Tacoma Power Rate Recommendations



Policy.	Fixed	Custome



Policy: Fixed Customer Charge



Streetlights



G Class Rate Design



Appendix





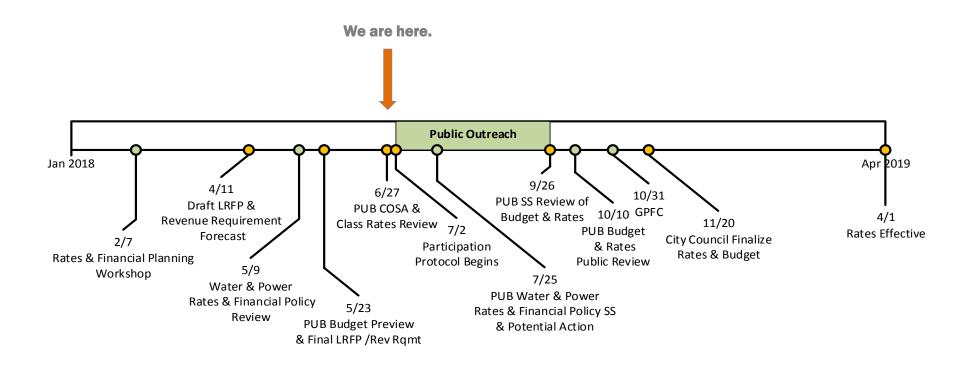
Introduction

Power Rates Section 1



Introduction

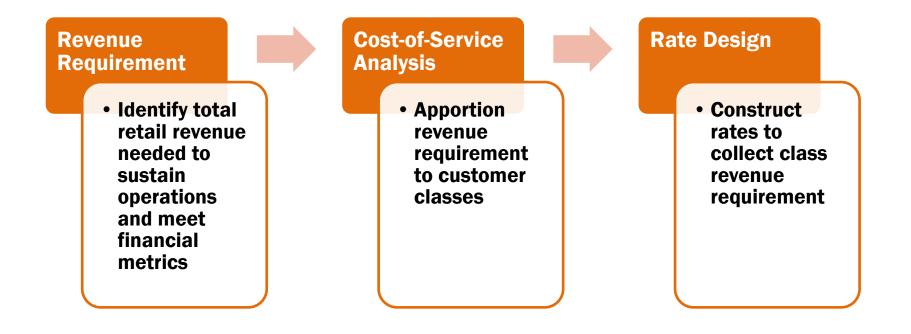
Budget and Rate Timeline





Introduction

Rate Making Process



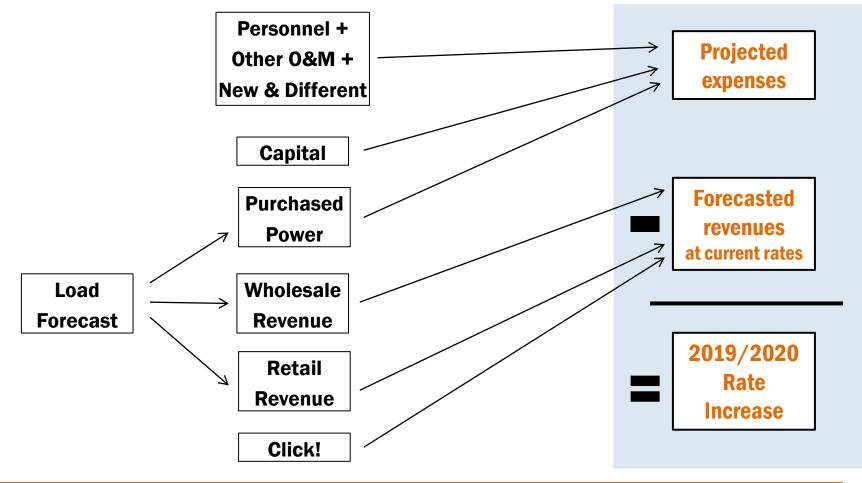


Power Rates Section 1.1



7

Revenue Requirement Calculation



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2019/20 Revenue Requirement Forecast



*Total Expense and Total Revenue values are for the 2019/2020 Calendar Year (January 2019 through December 2020).

The Tacoma Power Revenue Requirement forecast is based on a set of assumptions about future revenues and spending. These assumptions influence our projection of the amount we will need to collect in the next biennium to cover all of the utility's expenses. Some key assumptions made to develop the revenue requirement include:

Continued increased spending on capital infrastructure

Continued flat to declining retail load over time

Continued decrease of wholesale revenues over time

Continued increase of purchased power expenses into the future

Preliminary, subject to change. See Revenue Requirement Forecast Assumptions document from 6/22/2018.



Methodology

The Revenue Requirement Forecast represents a more realistic or less conservative estimate of actual expected spending. Said another way, the methodology removes some of the budget conservatism that results in the growth of cash reserves.

Should actual expenditures be greater than the revenue requirement forecast, Tacoma Power will use cash or request an additional rate increase.

The Revenue Requirement Forecast is preliminary and subject to change as the budget process continues.

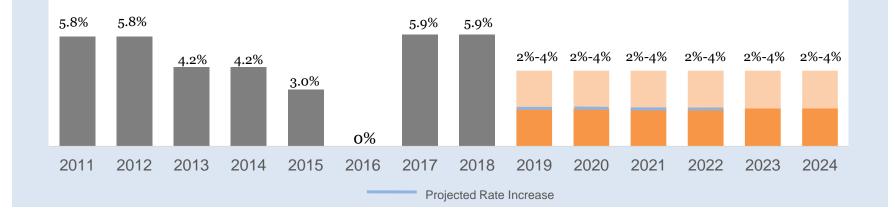


Forecast of Projected Rate Increases

Projected Rate Increases

This forecast is subject to change, and is dependent upon actual financial performance in future years.

Additional shading in future years represents uncertainty associated with revenues and expenses, mostly due to potential for adverse or critical water conditions.





Cost of Service

Power Rates Section 1.2



Cost of Service

Cost-of-Service Analysis

Tacoma Public Utilities is a Cost-of-Service Organization

- Rates set based on cost to serve customers.
- Customer Classes are groups of customers with similar usage characteristics that influence cost, such as infrastructure requirements and consumption patterns
- A cost-of-service analysis (COSA) determines the cost of serving each Customer Class:
 - Standard utility practice
 - Conducted every budget cycle
 - Reviewed by third-party consultant

The COSA calculates the total revenue that should be collected from each rate class.



Cost of Service

Important Notes

The 19/20 rate recommendations are produced from an updated cost of service model.

Legacy Model versus Updated Model

- Updated Model created by consultant Black & Veatch
- Methodological differences
- Use of legacy allocators for load factors, minimum system
- · May make further revisions before next rate process

Next Step: Review by Ft. Lewis (Participation Protocol)

- Department of Defense has the right to retain a rates consultant to review COSA
- Military may make comment to Board on policy matters

Transitioned to Updated COSA Model





Rate Design

Power Rates Section 1.3



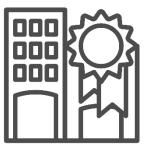
Rate Design

Overarching Principles of Rate Design



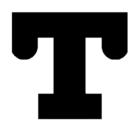
Legal

- Fair
- Just
- Reasonable
- Non-Discriminatory



Industry-Standard

- Revenue Stability
- Cost Causation
- Economic Efficiency
- Equity
- Bill Stability



TPU Principles

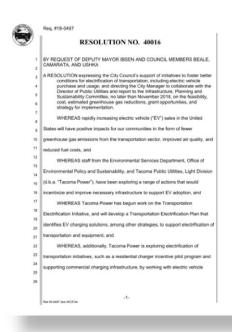
- Affordability
- Environment
- Public Involvement



Rate Design

Policy Direction from City Council

Throughout this presentation, rate recommendations are made in context of their impact on transportation electrification. We do this in light of the Tacoma City Council Resolution in Support of Electric Vehicle Initiatives.



Resolution in Support of Electric Vehicle Initiatives Rapidly increasing electric vehicle (EV) sales in the United States is a trend that will have positive impacts for our communities in the form of

- Fewer greenhouse gas emissions from the transportation sector
- Improved air quality
- Reduced fuel costs

Objective

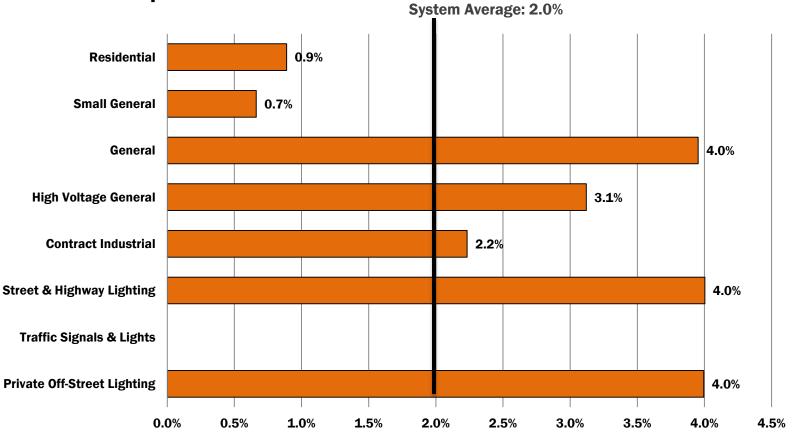
To foster better conditions for Electrification of Transportation, including electric vehicle purchase and usage.



Power Rates Section 2



Recommended Increase by Class



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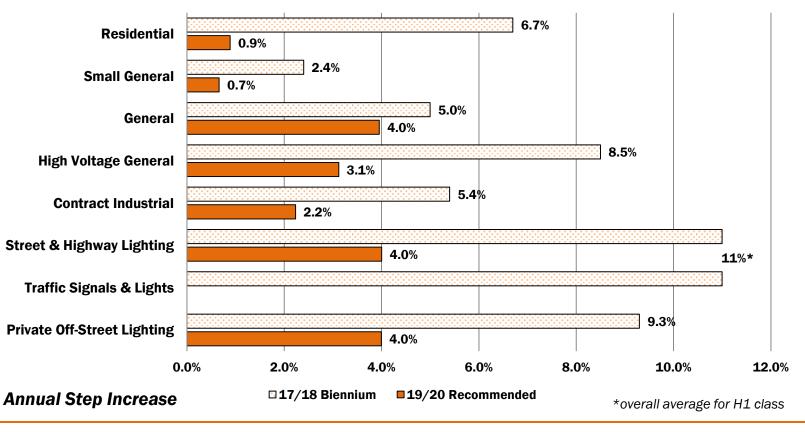
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Annual Step Increase

_ Preliminary, subject to change.

Recommended Increase by Class

The 2019/2020 increase is substantially smaller 2017/2018.



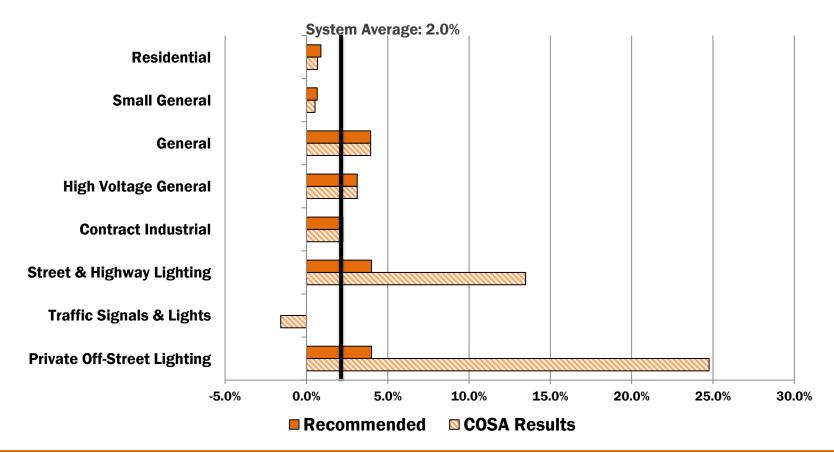
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Preliminary, subject to change.

COSA versus Recommended Increase

Annual Step Increases





Gradualism Recommended for Lighting

Drivers of Streetlight Class Rate Increase

- Data inconsistencies recently highlighted with street and traffic billing units
- Small class → high percent increases can be driven by small dollar changes
- Small class → COSA model/methodology changes have disproportionate impact

Rate Increase Cap Choices

• Level of Cap: 2x system average rate increase

Allocation to Other Classes: shown by meter count—places most burden on residential and small general classes

Other cap limits and allocations possible if desired.

Lighting classes COSA rate increase is 1,578,949 of 21,980,031 rate period increase.



COSA Rate Change Detail

Description	Revenue at Final COSA		COSA Rate Change		Redistribution for		Recommended Rate Change	
	Existing Rates*	Results*	Amount	Annual	— Gradualism Cap — (Increase Cap at 2x System)		Amount	Annual Increase
Residential	\$365,351,989	\$ 369,082,504 \$	3,730,515	0.7% \$	5 1,152,813	\$	4,883,328	0.9%
Small General	57,070,622	57,522,822	452,200	0.5%	115,536		567,736	0.7%
General	207,180,477	219,578,662	2,398,185	3.9%	18,674		12,416,859	4.0%
High Voltage General	45,870,568	48,038,774	2,168,206	3.1%	50		2,168,256	3.1%
Contract Industrial	48,523,303	50,175,279	1,651,976	2.2%	18		1,651,994	2.2%
Street & Highway (H1)	1,834,191	2,217,800	383,609	13.5%	(273 <i>,</i> 005)		110,604	4.0%
Traffic Signals (H1)	168,602	164,663	(3,940)	-1.6%	3,940		-	0.0%
Private Off-Street (H2)	3,005,788	4,205,067	1,199,279	24.8%	(1,018,026)		181,253	4.0%
Total	\$ 729,005,540	\$750,985,571 \$	21,980,031	2.0% \$	\$-	\$	21,980,031	2.0%

Preliminary, subject to change.



Rate Design: Customer Charge

Power Rates Section 3





Policy: Residential Rate Design

Rate Recommendation

Place 100% of the residential class 19/20 rate increase in customer charge.

_	Rate Design				
	Current		Recommendation		
	Current	COSA —	2019	2020	Annual Increase
Customer Charge	\$ 16.50	\$ 23.30	\$ 17.35	\$ 18.20	+0.85 step
Energy Charge	0.045351	0.032890	0.045351	0.045351	None
Delivery Charge	0.034435	0.040860	0.034435	0.034435	None
1,000 kWh Bill	\$ 96.29	\$ 97.06	\$ 97.14	\$ 97.99	





Policy: Small General Rate Design

Rate Recommendation

Place 100% of the small general class 19/20 rate increase in customer charge.

_	Rate Design				
	Current	COSA —	Recommendation		
	Current		2019	2020	Annual Increase
Customer Charge	\$ 22.50	\$ 35.21	\$ 23.45	\$ 24.40	+0.95 step
Energy Charge	0.044616	0.032862	0.044616	0.044616	None
Delivery Charge	0.034587	0.038942	0.034587	0.034587	None
2,000 kWh Bill	\$ 180.91	\$ 178.82	\$ 181.86	\$ 182.81	



Policy: Residential & Small General Rate Design

Rationale for Rate Recommendations



Reduces Seasonal Bill Variability

Increasing the customer charge decreases seasonal bill variability. Large fluctuations in bills can be difficult for low-income customers and small businesses to manage.



Enhances Financial Stability

Increasing the customer charge aligns fixed costs and fixed revenues.



Benefits Electrification

Supports adoption of electric appliances and vehicles by keeping "fuel" costs low.



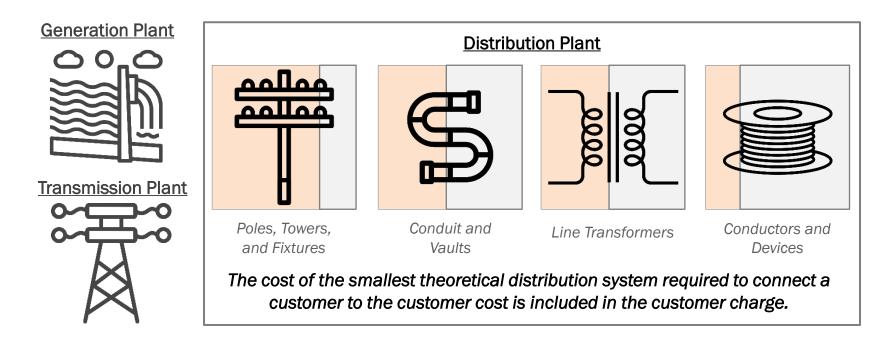
Rate Design: Minimum System Analysis

Power Rates Section 3.1



Description of Minimum System Analysis

Even when only 1kWh is used, the utility makes sizable investments to connect a customer to the system.





Description of Minimum System Analysis

Even when only 1kWh is used, the utility makes sizable investments to connect a customer to the system.







Impact of Minimum System Analysis

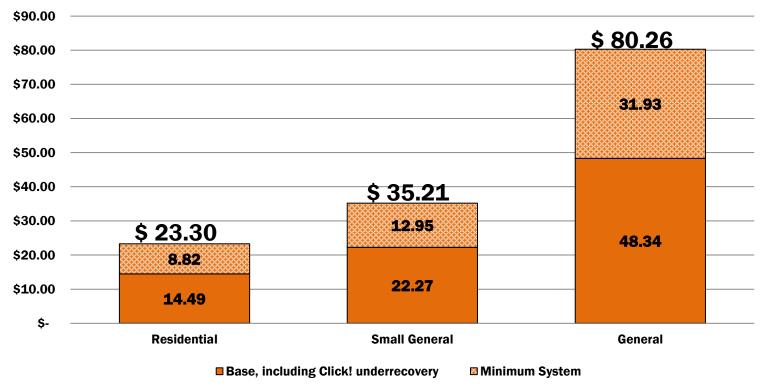
Each rate class's estimated cost-of-service customer charge is derived using Minimum System Analysis.

Use of the Minimum System Analysis ensures recovery of fixed costs to provide distribution services.

	Rate Design					
Customer Charge	Current	Recommended 2020 –	COSA with Mir	Impact of Minimum		
			Included	Excluded	System	
Residential	\$ 16.50	\$ 18.20	\$ 23.30	\$ 14.49	\$ 8.82	
Small General	22.50	24.40	35.21	22.27	12.95	
General	76.00	80.00	80.26	48.34	31.93	

Impact of Minimum System Analysis

Cost-of-Service Customer Charge Components





Rationale for Minimum System Analysis

(+)

- Simple to calculate and explain
- Usually results in a higher customer charge, which is advantageous for
 - customers who cannot control their electric usage
 - customers who cannot install distributed generation
 - customers who electrify appliances or transportation
- Ensures full recovery of fixed distribution cost
- **Covers cost** to utility of providing distribution connections to distributedgeneration customers on the grid
- Consistent with 2017/2018 Cost-of-Service Analysis methodology
- Consistent with industry practice



- Requires theoretical analysis with various assumptions to create allocators
- Usually results in higher customer charge, which is disadvantageous for
 - low users
 - distributed-generation owners
- Change from pre-2015 Cost-of-Service Analysis methodology.



Rate Design and Transportation Electrification

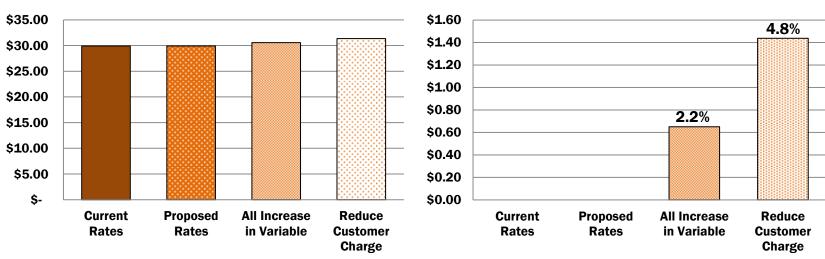
Higher fixed charges lower the cost of electrification.

Charge	- Current Rates	Full Increase in Fixed (Proposed Rates)	Full Increase in Variable	Reduce Customer Charge		
Customer	\$ 16.50	\$ 18.20	\$ 16.50	\$ 14.50		
Energy	0.045351	0.045351	0.036170	0.038268		
Delivery	0.034435	0.034435	0.045351	0.045351		
Average Residential Monthly Bill						
Non-EV	\$ 93.80	\$ 95.50	\$ 95.48	\$ 95.52		
EV Household	123.72	125.42	126.05	126.87		
Monthly Cost of EV	\$ 29.92	\$ 29.92	\$ 30.57	\$ 31.36		
Increase in Cost of	FEV Adoption		\$ 0.65	\$ 1.44		
	o current rates)	0.00%	2.20%	4.80%		
Assumes EV drives 15,000 miles	per year at .30 kWh per i	mile, costing 375 kWh per month; 100	% of vehicle charging occurs at resid	ence.		

Cost of an Electric Vehicle

Rate Design and Transportation Electrification

Higher fixed charges lower the cost of electrification.

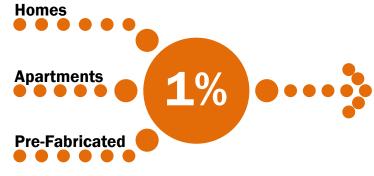


Increase in Cost of an EV

Assumes EV drives 15,000 miles per year at .30 kWh per mile, costing 375 kWh per month; 100% of vehicle charging occurs at residence.



Rate Design and Low-Income Customers



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



Most utilities are summer-peaking, and air conditioning provides a significant portion of load. Low-income customers often forego air conditioning, so their bills may be systematically lower. Few homes are heated electrically.

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, **lowincome housing units tend to be less efficient** than high-income ones.

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



Asset-

Limited

Income-

Ε

Constrained

Employed

Rate Design and Low-Income Customers

Poverty: 11% ALICE: 31%

42%

Vulnerable Households in Pierce County

With rising rents and other cost-of-living expense in the county, regional organizations are increasingly focused on the struggles of working families. Increasing numbers of employed individuals are unable to afford basic necessities. Such families are particularly vulnerable to unexpected bills and are often unable to control electric usage by upgrading their homes to be more efficient. Collecting the rate increase through the customer charge **limits the bill impact** to these customers to 85¢ per month.



Click! Under-Recovery



Click! Under-Recovery Allocation

Click! Under-Recovery Allocation

CLICK! FINANCIALS	2019	2020	2019/2019
Click! Revenue	24,720,180	24,318,280	49,038,460
Click! Commercial O&M	25,117,923	25,930,857	51,048,780
Click! and HFC Capital	1,237,378	1,237,378	2,474,756
Click! Capital A&G Credit	-55,864	-44,909	-100,773
Taxes	3,307,972	3,249,244	6,557,216
Net Cash Flow	-4,887,229	-6,054,290	-10,941,519

Allocation by Meter Count

- Shows Click! under-recovery in customer charge, as in the last rate case
- Decreases from \$3.42 per customer per month in the 17/18 budget projection to \$2.46 per customer per month in this projection

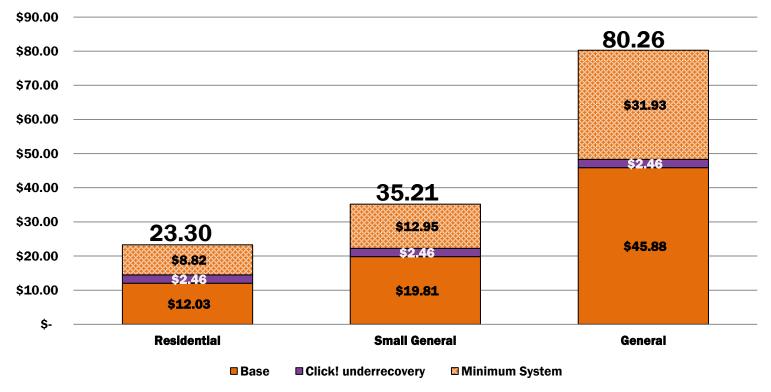
\$ 2.46 per customer per month impact of Click! underrecovery



Click! Under-Recovery Allocation

Effect on Customer Charge

Cost-of-Service Customer Charge Components





Preliminary, subject to change.

G Class Rate Design





Policy: Schedule G Rate Design

Rate Recommendation

Rate Design					
	Current	COSA —	Recommendation		
	Current		2019	2020	
Customer Charge	\$ 76.00	\$ 80.26	\$ 78.00	\$ 80.00	+\$2 each step
Demand Charge	8.35	14.05	8.43	8.51	+1% each step
Energy Charge	0.044813	0.032547	0.047316	0.049959	+6% each step





Policy: Schedule G Rate Design

Rationale

COSA Results in Substantial Demand Charge Increase

- Schedule G serves a large, diverse group of customers
- "Average" COSA results not representative of many class customers
- COSA results will disproportionately impact low-demand Schedule G customers
- · Goal remains to split customer class, requires data not yet available

Recommendation

- Small increase in customer charge to full cost of service
- Small increase in demand charge to avoid disproportionate impact to smaller customers
- · Most of rate increase in energy charge



Policy: Schedule G Rate Design

Illustration of Impacts

	Ourrent	0000	Recommendation		
	Current	COSA –	2019	2020	
Small Customer Bill	\$ 667	\$ 646 -3.1%	\$ 696 +4.3%	\$ 725 +4.3%	
Medium Customer Bill	3,284	3,480 +6.0%	3,413 +3.9%	3,549 +4.0%	
Large Customer Bill	102,081	128,854 +26%	105,134 +3.0%	108,327 +3.0%	
Small Customer billed at 10 000 kWb and 17 kW: Medium Customer billed at 46 605 kWb and 134 kW: Large Customer billed at 1 000 000 kWb and					

Small Customer billed at 10,000 kWh and 17 kW; Medium Customer billed at 46,605 kWh and 134 kW; Large Customer billed at 1,000,000 kWh and 6,849 kW





Context

Proposed pilot rate is one of the Tacoma Power initiatives aligned with the Tacoma City Council Resolution in Support of Electric Vehicle Initiatives.

9	RESOLUTION NO. 40016
1	BY REQUEST OF DEPUTY MAYOR IBSEN AND COUNCIL MEMBERS BEALE. CAMARATA, AND USHKA
3	A RESOLUTION expressing the City Council's support of initiatives to foster better
4	conditions for electrification of transportation, including electric vehicle purchase and usage; and directing the City Manager to collaborate with the
5	Director of Public Utilities and report to the Infrastructure, Planning and Sustainability Committee, no later than November 2018, on the feasibility,
6	cost, estimated greenhouse gas reductions, grant opportunities, and strategy for implementation.
7	WHEREAS rapidly increasing electric vehicle ("EV") sales in the United
	States will have positive impacts for our communities in the form of fewer
9	greenhouse gas emissions from the transportation sector, improved air quality, and
10	
12	reduced fuel costs, and
13	WHEREAS staff from the Environmental Services Department, Office of
14	Environmental Policy and Sustainability, and Tacoma Public Utilities, Light Division
15	(d.b.a. "Tacoma Power"), have been exploring a range of actions that would
16	incentivize and improve necessary infrastructure to support EV adoption, and
17	WHEREAS Tacoma Power has begun work on the Transportation
18	Electrification Initiative, and will develop a Transportation Electrification Plan that
19	identifies EV charging solutions, among other strategies, to support electrification of
20	transportation and equipment, and
21	
22	WHEREAS, additionally, Tacoma Power is exploring electrification of
23	transportation initiatives, such as a residential charger incentive pilot program and
25	supporting commercial charging infrastructure, by working with electric vehicle
25	
	d.
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Resolution in Support of Electric Vehicle Initiatives

Rapidly increasing electric vehicle (EV) sales in the United States is a trend that will have positive impacts for our communities in the form of

- Fewer greenhouse gas emissions from the transportation sector
- Improved air quality
- Reduced fuel costs







Objective

To foster better conditions for Electrification of Transportation, including electric vehicle purchase and usage.



Direct Current Fast Chargers

Public Direct Current Fast Chargers (DCFC) are anticipated to play an important role in accelerating electric vehicle adoption.

DCFC have high electricity demand relative to total energy consumption.



Current State



DCFC in Tacoma Power Territory

Public Direct Current Fast Chargers are currently classified as General Service, or Schedule G, customers.

Schedule G is a three part rate

- Customer Charge
- Demand Charge
- Energy Charge



Challenge

Because DCFC electricity demands are high, demand charges create a significant barrier in DCFC network development.



Pilot Concept



Potential Solution

Derive a two-part EV Public Charging Station Pilot rate from General Service Schedule G

- Customer Charge
- Energy Charge



What is a Pilot?

A pilot is...

- A test or trial of a concept
- · Limited in scope and duration
- Intended to provide new information about the concept so that it may be evaluated for possible adoption in a new permanent service schedule



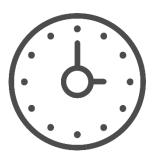
Rate Design

Rate option details will be presented to PUB in the August 8th Study Session.



Availability & Scope

- Available to customers offering charging services for the use of the general public
- Service must be separately metered with an interval meter
- Customer must be under 1MW
- Pilot limited to 25 metered customers



Duration

- 7 years
- Staff will evaluate utilization and potential adjustments after 2 years with gradualism in mind



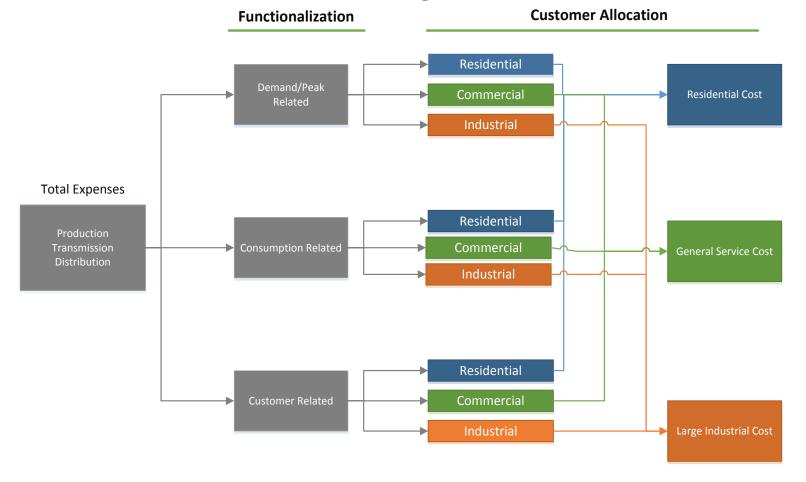
Benefits of EV Charging Station Pilot Rate

- Improves options for Tacoma
 Power customers
- Benefits system planning
 through acquired data
- Informs future rate offerings





Cost-of-Service Study





United Way ALICE Report

How has the number of ALICE households changed over time?

ALICE is an acronym for Asset Limited, Income Constrained, Employed – households that earn more than the Federal Poverty Level, but less than the basic cost of living for the county (the ALICE Threshold). Combined, the number of ALICE and poverty-level households equals the total population struggling to afford basic needs. The number of households below the ALICE Threshold changes over time: households move in and out of poverty and ALICE as their circumstances improve or worsen. The recovery, starting in 2010, has been uneven across the state. Conditions have improved for some families, but with rising costs, many still find themselves struggling.

350,000 317,671 302,388 300,554 299.876 300,000 250.000 58% Households 63% 63% 200,000 66% 150,000 100,000 31% 25% 27% 23% 50,000 11% 12% 11% 10% 0 2010 2012 2014 2016 ALICE Above ALICE Threshold Povertv

Households by Income, 2010 to 2016

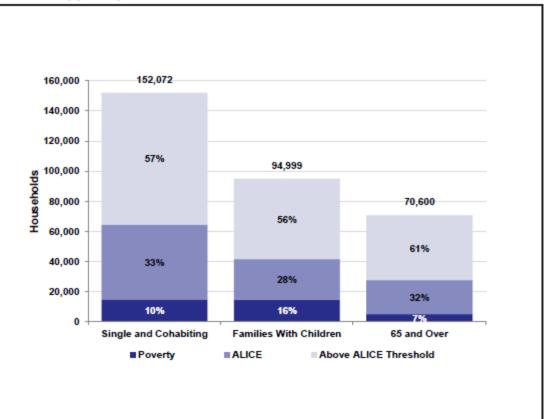
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United Way ALICE Report

What types of households are struggling?

The way Americans live is changing. There are more different family and living combinations than ever before, including more people living alone or with roommates and more adult children living with their parents. Families with children are changing: There are more blended families with remarried parents, more non-married cohabiting parents, and more same-sex parents. The number of senior households is also increasing. Yet all types of households continue to struggle: There are ALICE and poverty-level households across all of these living arrangements.

Household Types by Income, 2016





United Way ALICE Report

Why do so many households struggle?

The cost of living continues to increase...

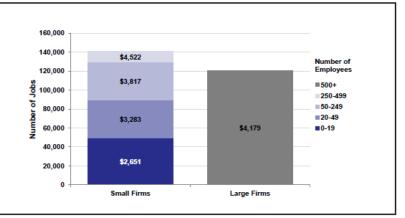
The Household Survival Budget reflects the bare minimum that a household needs to live and work today. It does not include savings for emergencies or future goals like college. In 2016, costs were well above the Federal Poverty Level of \$11,880 for a single adult and \$24,300 for a family of four. Family costs increased by 28 percent statewide from 2010 to 2016, compared to 9 percent inflation nationally.

Household Survival Budget, Pierce County			
	SINGLE ADULT	2 ADULTS, 1 INFANT, 1 preschooler	
Monthly Costs			
Housing	\$742	\$1,126	
Child Care	\$-	\$1,408	
Food	\$177	\$586	
Transportation	\$409	\$818	
Health Care	\$226	\$845	
Technology	\$55	\$75	
Miscellaneous	\$189	\$548	
Taxes	\$286	\$621	
Monthly Total	\$2,084	\$6,027	
ANNUAL TOTAL	\$25,008	\$72,324	
Hourly Wage	\$12.50	\$36.16	

...and wages lag behind

Employment and wages vary by location and firm size, but across the state more than half of newly-hired workers earn less than the cost of the family Household Survival Budget. Small firms (<50 employees) often drive economic growth but their wages tend to be lower, especially in rural areas where they are the largest employers. Large firms (500+ employees) offer higher wages but are concentrated in cities, where the cost of living is also higher. Medium-size firms (50-500 employees) pay more but employ the fewest workers.

Employment by Firm Size and Wage for New Hires, 2016



Sources: 2016 Point-in-Time Data: American Community Survey. ALICE Demographics: American Community Survey; the ALICE Threshold. Budget: U.S. Department of Housing and Urban Development; U.S. Department of Agriculture; Bureau of Labor Statistics; Internal Revenue Service; Child Care Aware of Washington, 2016.

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United Way ALICE Report

2016 Point-in-Time Data

Population: 861,312 • Number of Households: 317,671 Median Household Income: \$64,434 (state average: \$67,106) Unemployment Rate: 6.2% (state average: 5.4%) ALICE Households: 31% (state average: 28%) • Households in Poverty: 11% (state average: 11%)



Average Rates: Current & Proposed

Average per-kWh Rate	Current Rates	Proposed Rates*
Residential	9.68 ¢	9.81 ¢
Small General	9.36 ¢	9.45 ¢
General	7.05 ¢	7.47 ¢
High Voltage General	5.14 ¢	5.38 ¢
Contract Industrial	4.70 ¢	4.86 ¢
Street & Highway Lighting (H1)	5.24 ¢	5.56 ¢
Traffic Signals & Lights (H1)	9.77¢	9.77¢
Private Off-Street Lighting (H2)	21.13 ¢	22.41 ¢
Total	7.84 ¢	8.07 ¢

*average for 19/20 rate period

