PUBLIC UTILITY BOARD RATES AND FINANCIAL PLANNING WORKSHOP

February 7, 2018

Public Utility Board Rates and Financial Planning Workshop

Message from Director McCrea

At the end of the 2017/2018 rate case, the Public Utility Board expressed a desire for a policy-oriented dialogue with staff well in advance of the next rate development process. The Board also expressed a desire for rates to be considered simultaneously with the budget.

The February 7 Workshop is intended to address concerns and questions raised by Board members and to facilitate policy discussions.

This workbook includes an updated Workshop agenda and more detailed information about financial planning and rate design issues. We hope this material, and the supplemental reading packet, will assist Board members to be well-prepared for the Workshop.

This workbook is intended to provide the Board with a conceptual understanding of the budget and rates process undertaken by Tacoma Power and Tacoma Water.

We recognize the agenda covers a lot of ground, more than can be adequately addressed in one day. To that end, we are planning to keep staff presentations as short as possible, allowing time for your questions and discussions. We will also have a staff facilitator available to help us keep track of time and to capture decisions and action items.

If there are topics you would like to discuss in more detail, we can facilitate those discussions at future Study Sessions. At this time, we will focus on critical policy and process decisions to provide guidance for staff as we conduct the budget and rate process this year.

In addition to the information we are providing, staff is available to provide one-on-one briefings and answer questions you might have.

Linda McCrea

Workshop Agenda

Time	Description	Presenter(s)
8:00 AM	Welcome	Linda McCrea
8:10 AM	Overview of Agenda	Bill Berry & Sean Senescall
8:15 AM	Proposed Budget & Rates Timeline	Bill Berry & Sean Senescall
8:30 AM	Rates Principles Recap	Bill Berry & Sean Senescall
9:00 AM	Tacoma Power Draft Long-Range Financial Plan	Bill Berry
10:00 AM	Break	
10:15 AM	Tacoma Water Long-Range Financial Plan	Sean Senescall & Jodi Collins
11:00 AM	Cost-of-Service Overview	Bill Berry & Sean Senescall
11:15 AM	Lunch	
11:45 PM	Tacoma Water Rate Design	Sean Senescall & Jodi Collins
12:30 PM	Tacoma Water Rates Roadmap	Sean Senescall & Jodi Collins
1:00 PM	Tacoma Power Rate Design, Part I	Ron Amen & Christina Leinneweber
2:00 PM	Break	
2:15 PM	Tacoma Power Rates Roadmap	Bill Berry & Ray Johnson
3:15 PM	Tacoma Power Rate Design, Part II	Ron Amen & Christina Leinneweber
3:45 PM	Recap	Linda McCrea

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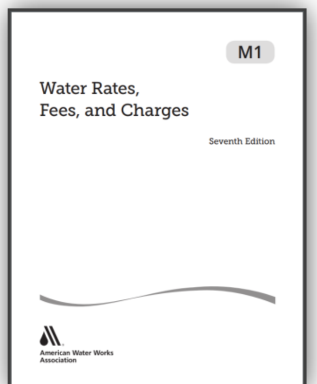
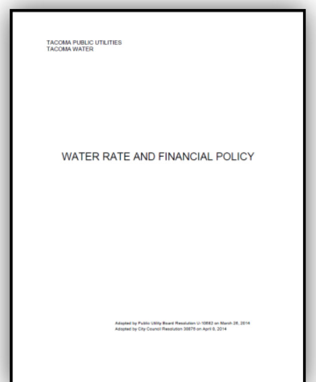
Board Reading Packet – Tacoma Water Materials



AWWA Principles of Water Rates, Fees and Charges

Excerpts that provide an overview of water utility cost allocation and rate structure alternatives and their advantages and disadvantages.



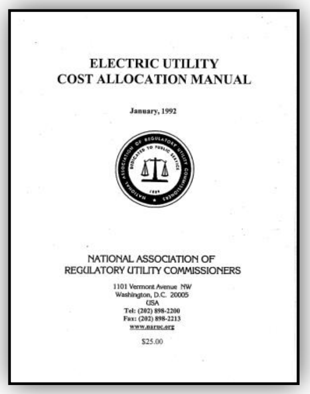
Water Rate & Financial Policy

Current rate and financial policies for Tacoma Water.

Water Rates, Fees, and the Legal Environment

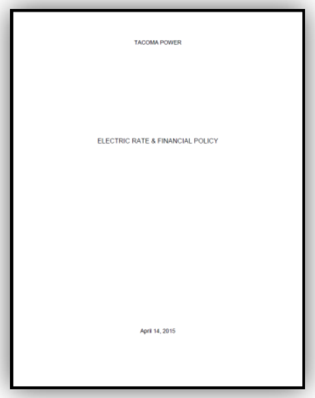
A summary of American case law precedents, legal authorities, and industry standard approaches to legally defensible water ratemaking.

Board Reading Packet – Tacoma Power Materials



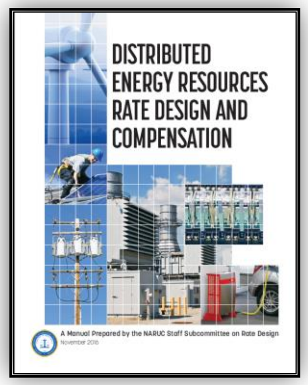
NARUC Electric Utility Cost Allocation Manual

Excerpts that provide an overview of electric utility cost of service studies and summarizes the cost allocation process.



Power Rate & Financial Policy

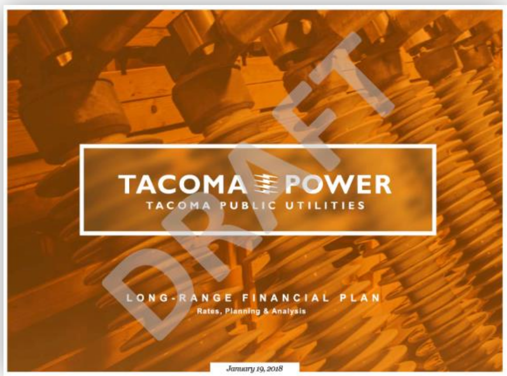
Current rate and financial policies for Tacoma Power.



NARUC Distributed Energy Resources Rate Design and Compensation

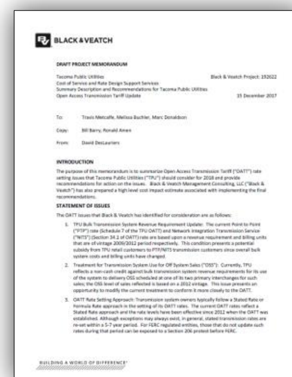
A manual to assist commissions in considering appropriate rate design and compensation policies for distributed energy resources (DER).

Board Reading Packet – Tacoma Power Materials



Draft Tacoma Power Long-Range Financial Plan

A comprehensive and transparent guide to Tacoma power's financial decision making [Updated Version].



Black & Veatch Draft Open Access Transmission Tariff Project Memorandum

Summary of and recommendations for Open Access Transmission Tariff (OATT) rate setting issues relevant to Tacoma Power in future biennia [To Be Provided].

Proposed 2019/2020 Budget and Rate Timeline

Section 2

Overview

Tacoma Power and Tacoma Water are preparing for the **budget and rate process for the 2019/2020 biennium**. The Public Utility Board (PUB) has a preference to consider rates at the same time it considers budget. Accommodating this request requires a number of changes to the existing process and timelines for both budget and rates.

This section is intended to facilitate PUB discussion and agreement on how the 2019/2020 process will occur.

In addition, the PUB has asked to have **policy-level discussions** about Tacoma Power and Tacoma Water rate design before rate proposals are presented.

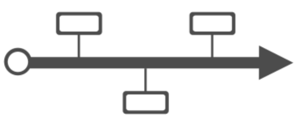
This workbook also presents key concepts and ideas in the areas of cost-of-service and rate design. This should help prepare the PUB to make policy determinations during the 2019/2020 rates period.

Long-Range Financial Plan

Introduce the Draft Long-Range Financial Plan (LRFP) – a document intended to support integrated and informed decision-making in a transparent way through the budgeting and ratemaking process, and beyond.

Rate Policy Workshops

Review proposed timing for, and content of, rate policy workshops requested by the PUB. The purpose of the workshops is to provide information, facilitate discussion and help guide rate design for 2019/2020.



Budget & Rate Timeline

Review the proposed budget and rate processes and timelines required to enable concurrent consideration of budget and rates for the 2019/2020 biennium.

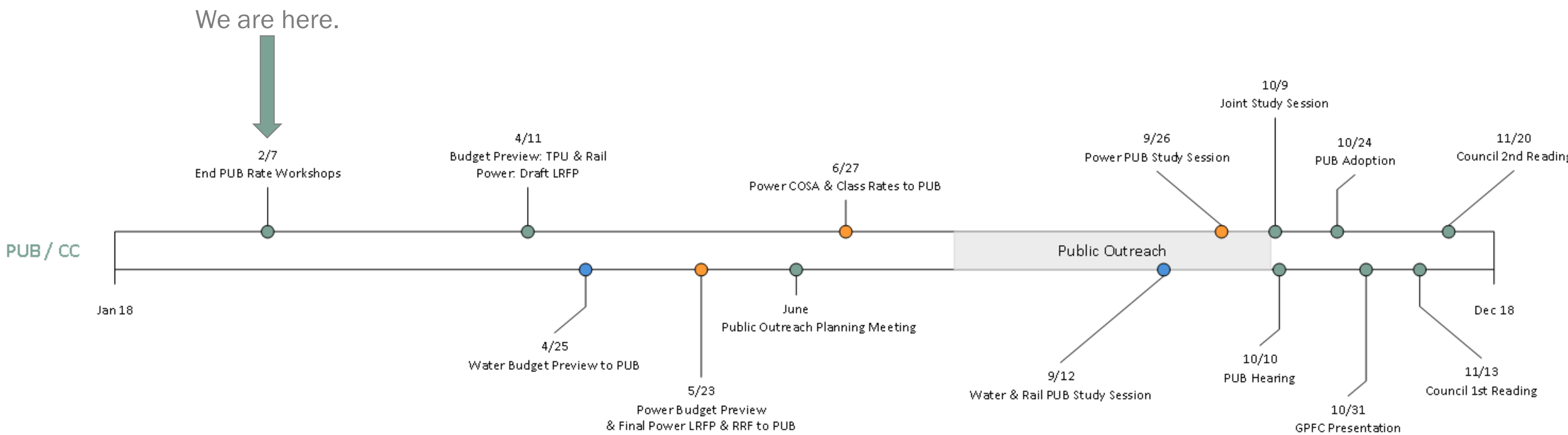
Background

PUB and Council Request For Change

During the 2017/2018 rate case, there was agreement between the Director of Public Utilities and the Public Utility Board that future rates should be discussed and approved concurrent with budget.

This section summarizes staff's proposal to meet the proposed timeline.

Proposed Review and Approval Timeline



McChord Participation Protocol (*Power Only*)

Decoupling the Revenue Requirement from the Official Budget allows sufficient time to complete the McChord Participation Protocol.

What is the McChord Participation Protocol?

The McChord Air Force Base contract provides the base a perpetual right to negotiate rate increases.

In response to a 2003 rate case dispute, Tacoma Power agreed upon a framework, called the McChord Participation Protocol, to facilitate these contracted negotiations.

The participation protocol specifies rate case events and information exchanges intended to facilitate good-faith negotiations.

Timeline & Duration

In the past, participation protocol processes have started in November to enable a rate adjustment with final adoption in March. Under the proposed timeline, these same processes would start in June to enable a rate adjustment with final adoption in November.

McChord Air Force Base has expressed tentative agreement to adjust the dates of Participation Protocol milestones.

Utility Ratemaking Policies and Principles

Section 3

Principles Review

Legal

- Fair
- Just
- Reasonable
- Non-Discriminatory

Industry-Standard

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

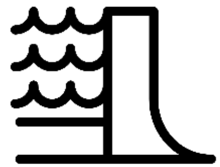
TPU Principles

- Affordability
- Environment
- Public Involvement

Legislative Policy Document: Environment

Protection of the Natural Environment

TPU supports policies for protection of the natural environment, including stream protection, and those that support public stewardship of fishery resources and wildlife habitat.



Clean Hydropower

TPU supports consistent statutory recognition of hydropower as a renewable, emissions-free resource.

Carbon Reduction

TPU supports proposals for greenhouse gas emissions reduction that achieve the most efficient carbon emission reduction at the least cost to utility customers, and are market-based, economy-wide, and coordinated with regional or national strategies.

Greenhouse gas reduction polices should acknowledge and credit hydropower as a carbon-free generating resource and recognize the role the electricity sector could play in reducing carbon emissions in the transportation sector.

Policy changes must be sensitive to rate pressures, especially on lower-income customers.

Tacoma Public Utilities Legislative Policies (dated November 14, 2017)

Electric Rate and Financial Policy

Revenue Requirement	• Studies projected revenue, expenses, and capital improvements for the period to be covered by the rate change • Performed every two years
Cost-Based Rates	• Cost-of-Service Study determines the cost of serving each customer class • Allocates class responsibility for projected expenses of the system • Minimizes cross-subsidies between services or between classes of customers
Financial Metrics	• AA credit rating goal • Projected cash balances at minimum of 90 days of current budgeted expenditures • Minimum Debt Service Coverage Ratio approximately 1.5, based on adverse water conditions
Low-Income	• Special consideration for low-income senior and/or disabled customers
New Large Load	• 8-20 MW • CP Rate + 15% Adder for ten years

Water Rate and Financial Policy

Revenue Requirement	• Regular reviews with full study every two years • Study includes projected revenue, expenses and capital improvements
Cost-Based Rates	• An embedded cost-of-service study will determine the cost of serving each customer class and allocation to recover projected expenses
Financial Metrics	• 60 days of current budgeted expenditures • Capital: $2M minimum in SDC Fund and 1% of original plant in Capital Reserve • Senior Debt Service Coverage above 1.5x • All In Debt Service Coverage above 1.25
Rate Adjustments	• Sufficient to meet Tacoma Water budgets • Minimize long-run costs to rate-payer • Short and long-run rate impacts presented • Revenue collected to maintain financial sufficiency
Low-Income	• Discounted rate consideration for low-income elderly and low-income disabled customers

Commitment to Low-Income Customers

Discount Program

- 30% credit to senior and disabled
- Provides more than $2.1 million in discounts for Power and Water customers

Grant Programs

- Higher bill payment assistance coupled with financial literacy
- Incentives to help customers establish a consistent payment routine
  - Up to $120 credit for voluntary completion of financial education course
  - Higher bill credits (20% of bill) provided monthly for accounts kept current

Benefits

- Aligns with United Way's goal to help families work toward financial stability
- Empowers customers with education to develop critical life skills
- Fewer service disconnections (with the associated costs and issues)
  - Good for both customers and the utilities

Ratemaking Process Overview

Revenue Requirement

"How much money do we need?"

- Identifies revenues needed to sustain operations
- Supported by Long-Range Financial Plan (LRFP)
- Ensures achievement of key policy objectives, namely fund balance & debt-service coverage targets

Cost-of-Service Analysis

"Who pays what?"

- Determines total to be paid by each customer class

Rate Design

"How do customers pay?"

- Design rate structure to collect revenue from customers in class

Tacoma Power Long-Range Financial Plan

Section 4

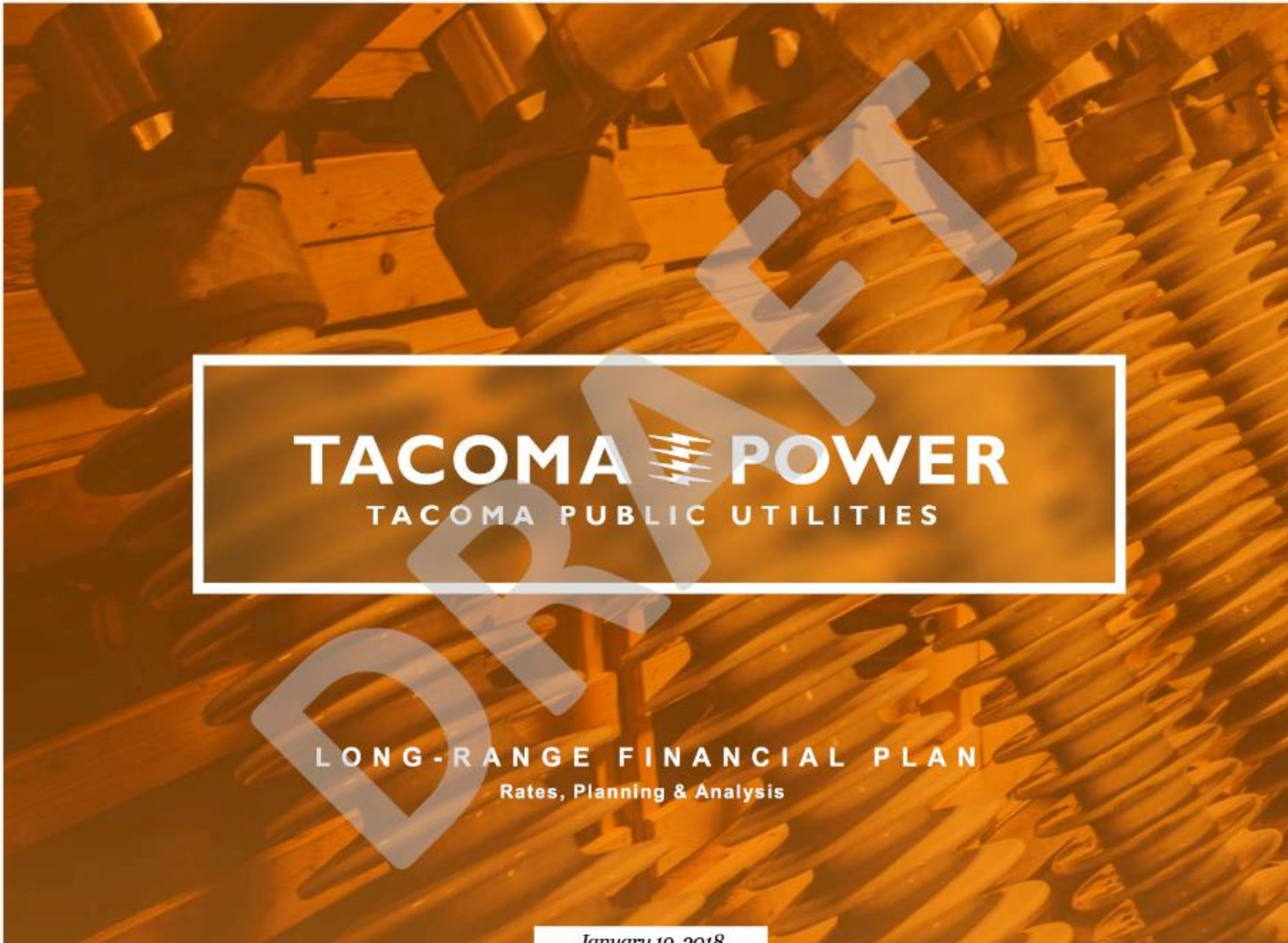
Ratemaking Process

Revenue Requirement
"How much money do we need?"

Cost-of-Service Analysis
"Who pays what?"

Rate Design
"How do customers pay?"

- Identifies revenues needed to sustain operations
- Supported by Long-Range Financial Plan (LRFP)
- Ensures achievement of key policy objectives, namely fund balance & debt-service coverage targets


TACOMA POWER
TACOMA PUBLIC UTILITIES
DRAFT
LONG-RANGE FINANCIAL PLAN
Rates, Planning & Analysis
January 19, 2018

Tacoma Water Long-Range Financial Plan

Section 5

Our long-range plan has remained essentially the same as we have shown you in the past several biennia. This plan has helped us ensure financial stability and sustainably.

Ratemaking Process

Revenue Requirement

"How much money do we need?"

Cost-of-Service Analysis

"Who pays what?"

Rate Design

"How do customers pay?"

- Identifies revenues needed to sustain operations
- Supported by Long-Range Financial Plan (LRFP)
- Ensures achievement of key policy objectives, namely fund balance & debt-service coverage targets

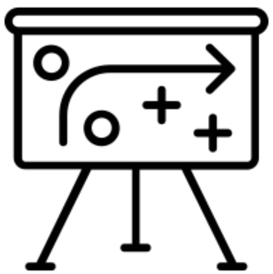
Why is it important to have a financial plan?

- Support proactive, informed financial management
- Provide a long-term view of our financial health
- Plan for and mitigate risk
- Ensure achievement of our policy objectives
- Good financial stewardship

How do we build our financial plan?

Rate & Financial Policies

- Provide the foundation for the financial plan
- Guide consistent financial and rate decisions
- Promote financial stability and avoid rate shocks



Sensitivities & Priorities

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

Revenue Requirement Analysis

- Determine the amount of revenue necessary to meet our obligations
- Evaluate sufficiency of current rates
- Develop a rate implementation strategy

What is the role of our rate and financial policies?

Establish formal agreement between Tacoma Water Management and our policy makers for how we manage the utility

- Provide direction for managing financial performance and budgeting
- Support plan for mitigating financial disruptions
- Foundation for consistent financial and rate decisions
- Ensure an adequate supply of safe, clean water to our customers
- Provide efficiency and reliability at the lowest possible cost

Tacoma Water Rate and Financial Policy: Coverage and Liquidity

Operating Reserve	• Purpose:	Liquidity to accommodate cash flow fluctuations
	• Policy:	60 days of budgeted expenditures
	• Restrictions:	May be used for Capital or O&M, must be appropriated by budget
Capital Reserve Fund	• Purpose:	Fund emergency repairs, unanticipated capital and project cost overruns
	• Policy:	Minimum 1% original plant-in-service
	• Restrictions:	May only be used for Capital, must be appropriated by budget
System Development Charge Fund	• Purpose:	Capital funding for source development, transmission and storage
	• Policy:	Minimum $2,000,000 for unforeseen emergencies
	• Restrictions:	May only be used for Capital, must be appropriated by budget
Debt Service Coverage	• Purpose:	Compliance with debt covenants, maintain credit worthiness
	• Policy:	Senior Debt Coverage above 1.5x All In Debt Coverage above 1.25x
	• Restrictions:	Bond covenant Senior Debt Coverage 1.25x

What is the role of the revenue requirement analysis?

Identify total annual financial obligations

- Basis for 10-year financial plan
- Determine the amount of revenue necessary to meet all utility financial obligations

Evaluate sufficiency of current rates on a stand-alone basis

- Fund adequate reserve balances
- Meet debt service coverage requirements
- Sufficient to meet our budget forecasts
  - Provides for long-range capital improvement plan
  - Provides for responsible operation and maintenance of the system

Develop annual rate implementation strategy in pursuit of long-term financial sustainability

- Long-run approach to mitigate rate shock
- To the extent possible, will not exceed general inflationary trends
  - Phased-in adjustments over a limited time

What is included in the revenue requirement analysis?

O&M Expense Forecast

- Apply budget development decision making tools
- Conduct historical cost review
- Include inflation factors
- Consider strategic initiatives and additional needs or enhancements
- Plan for increasing costs
- Incorporate forecasted assessments and labor assumptions

Capital Expense Forecast

- Capital Budget and 10-year CIP developed with business case evaluations
- Funding assumptions apply existing bond fund sources first, then reasonable spend down of capital and operating reserves then anticipated additional debt funding in 2023/24

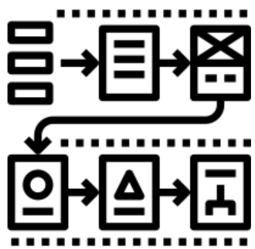
Non-Rate Revenue Forecast

- Miscellaneous fee and charge revenues projected based on recent historical trends and known future changes
- Used to reduce rate revenue requirement

Rate Revenue Requirement Forecast

- Projection of revenue under existing rates using 10-year demand forecast
- Any revenue requirement deficiencies must be addressed by rate adjustments

Revenue Requirement Analysis



Base Case

Forecasts expected financial performance

Incorporates our key assumptions:

- Demand forecast & other revenues and fees
- O&M expenditure budget (labor and other)
- Capital budget and 10-year CIP
- Debt Service payments and taxes
- Other expectations during the planning period
- Other economic and financial factors
    - Inflation and growth
    - Coverage and liquidity

Long-run financial stability and sustainability

Scenario Development

Tests the range of financial outcomes that could occur

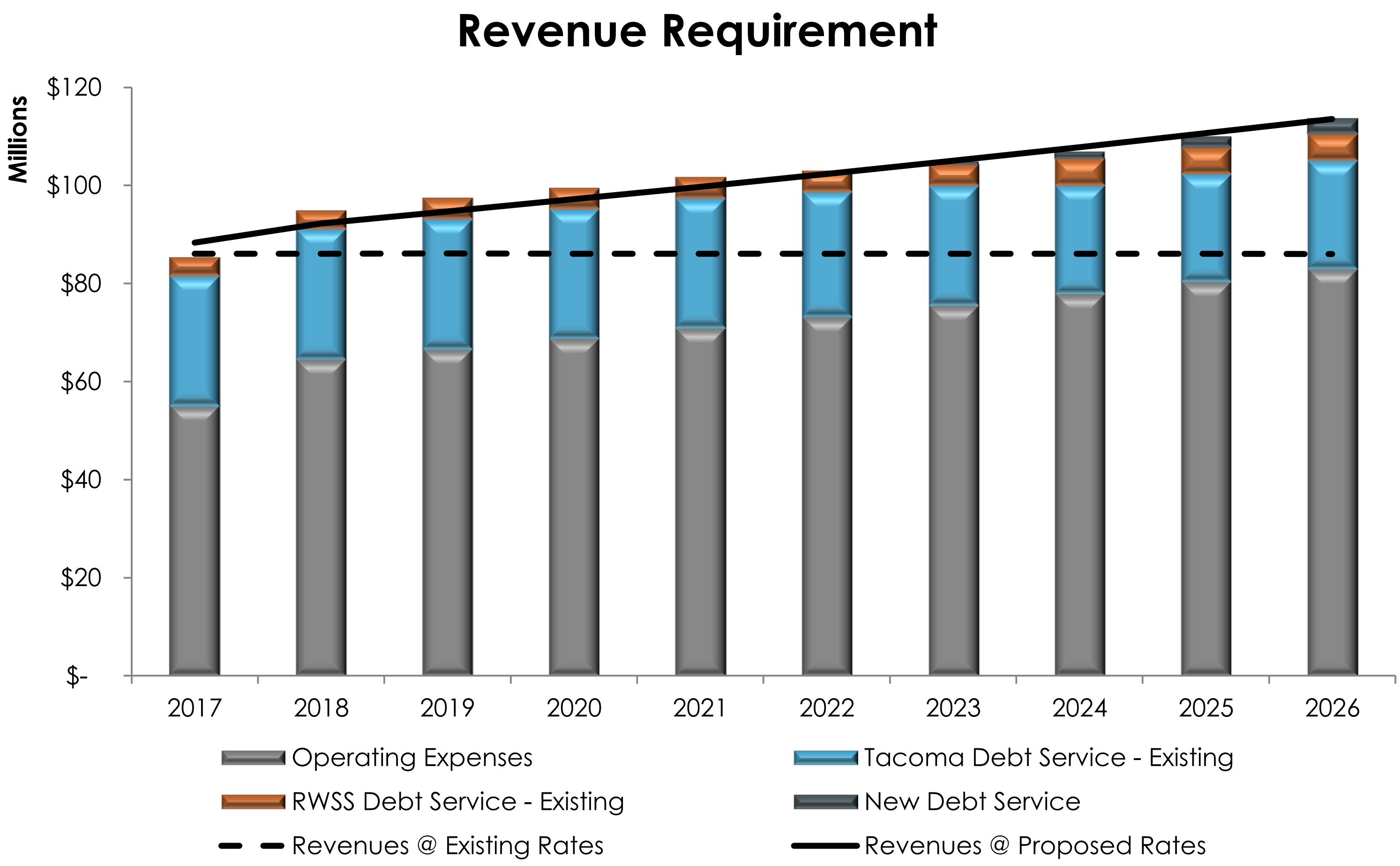
For 2017/18, some of the scenarios we modeled:

- High customer growth
- New large volume customer
- Increased Wholesale revenue
- High case CIP
- WestRock Mill shutdown

We can then develop a range of rate adjustments over the planning period that incorporate uncertainty

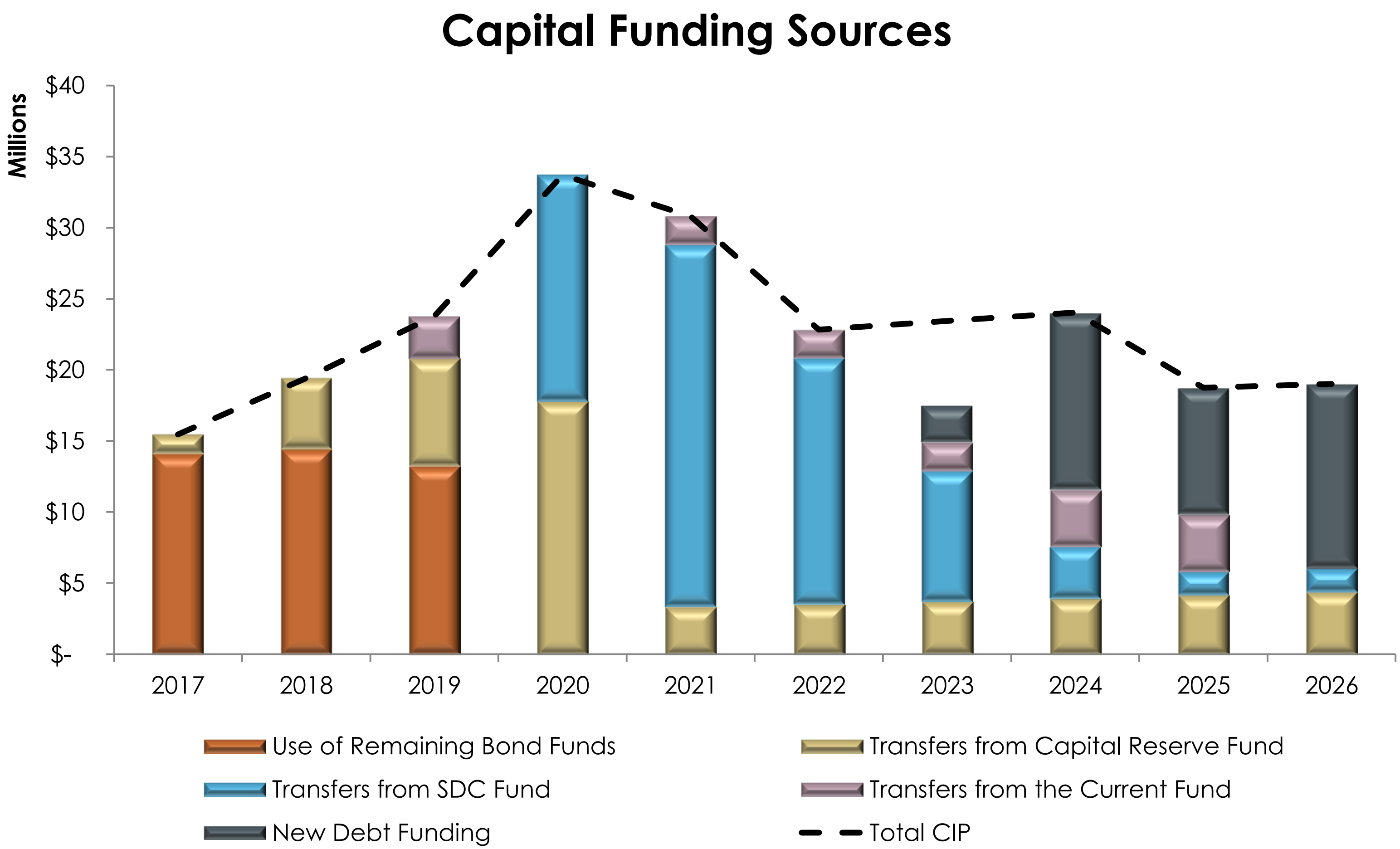
Consider strategic initiatives

Revenue Requirement Analysis: Base Case



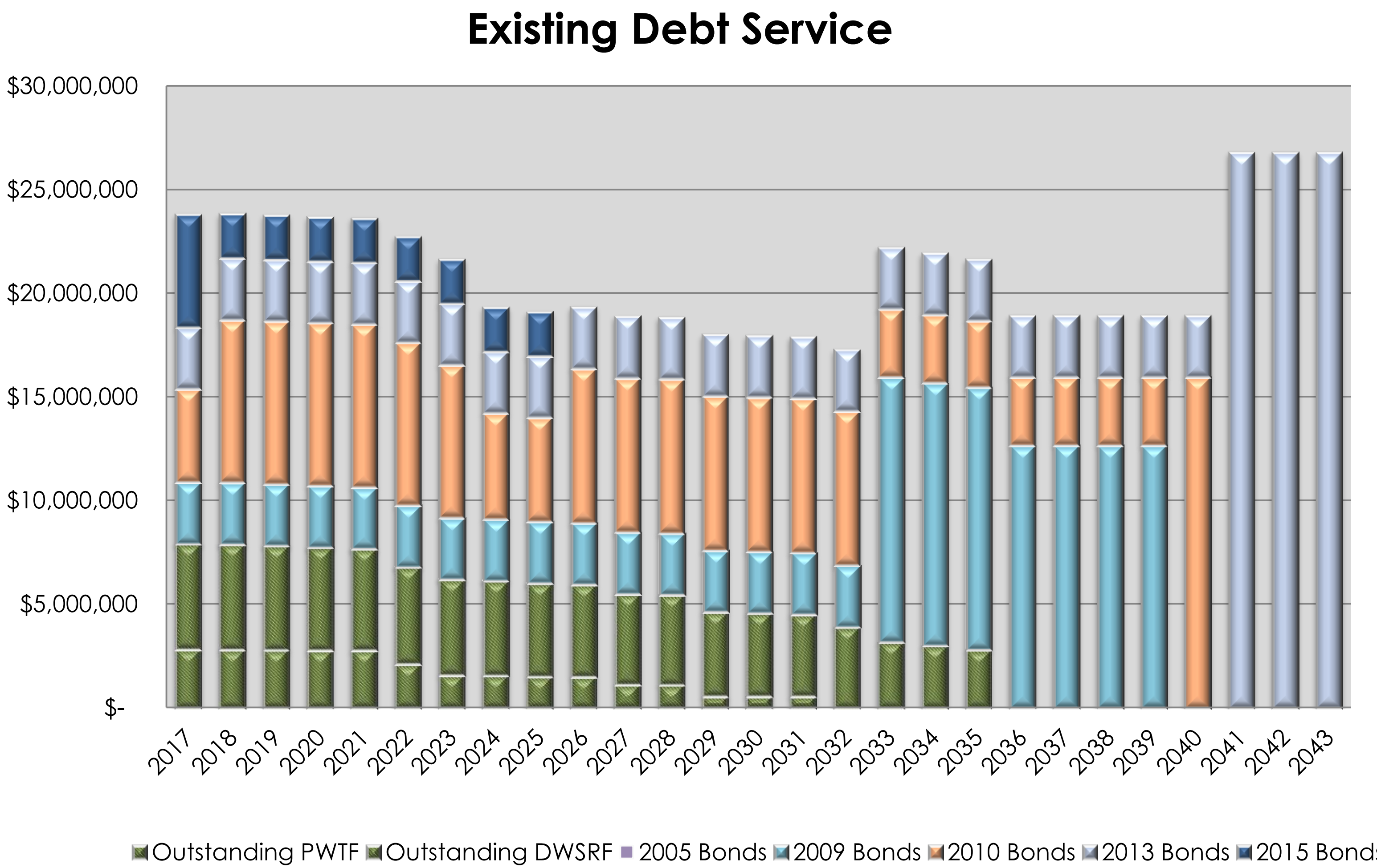
Base Case at 12/31/2016 with projected actuals for 2017

Revenue Requirement Analysis: Base Case

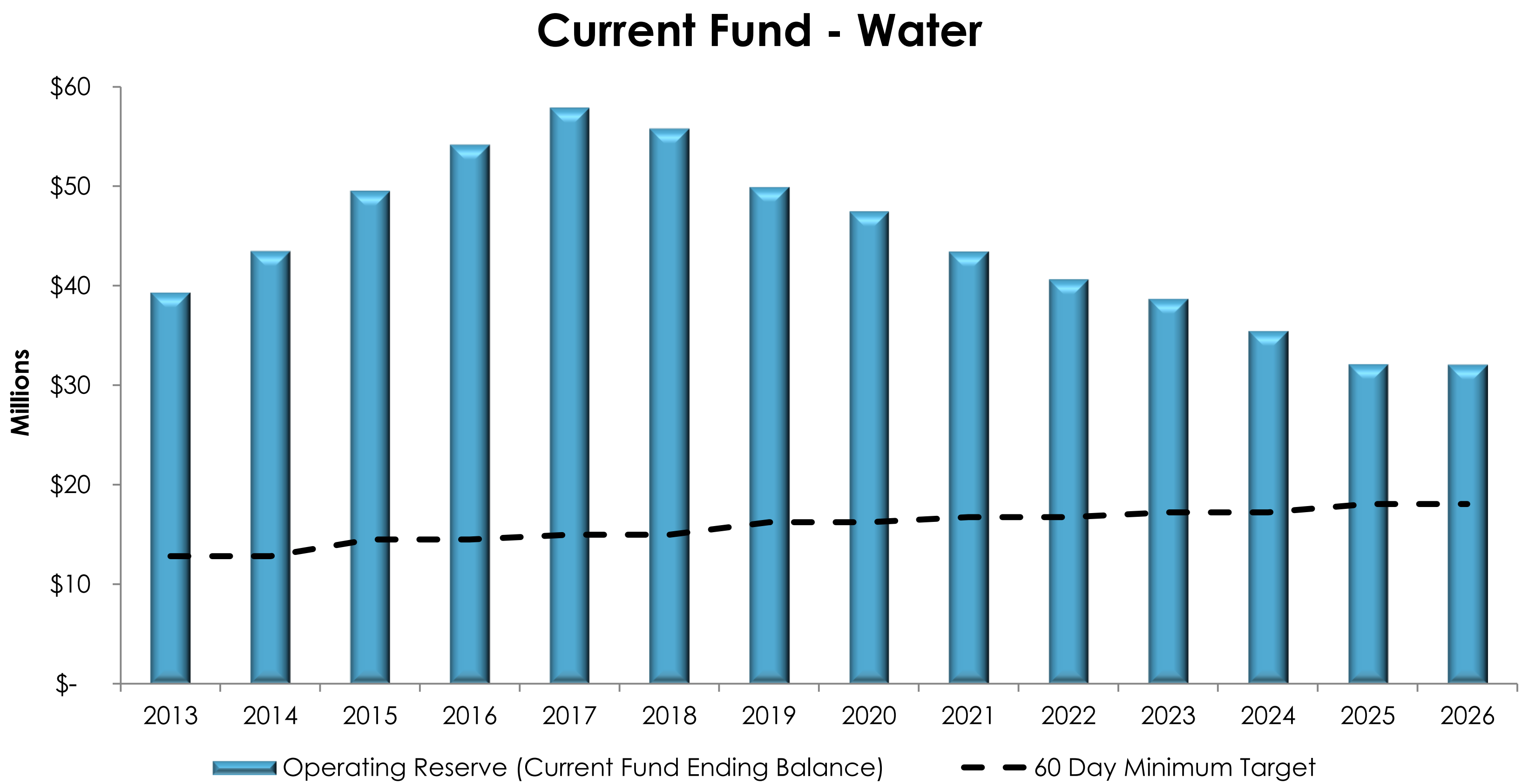


Base Case at 12/31/2016 with projected actuals for 2017

Revenue Requirement Analysis: Debt Service

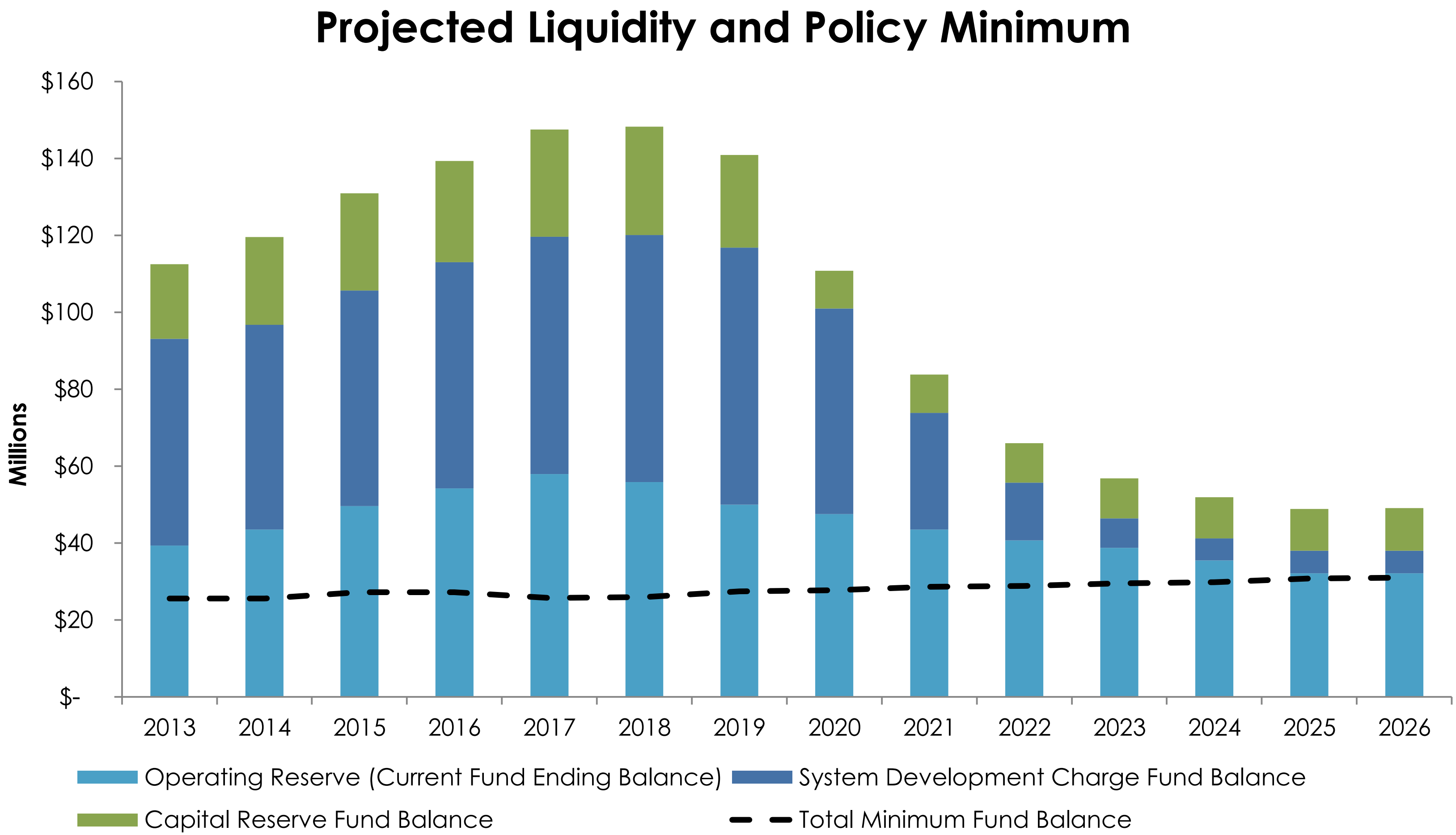


Revenue Requirement Analysis: Liquidity



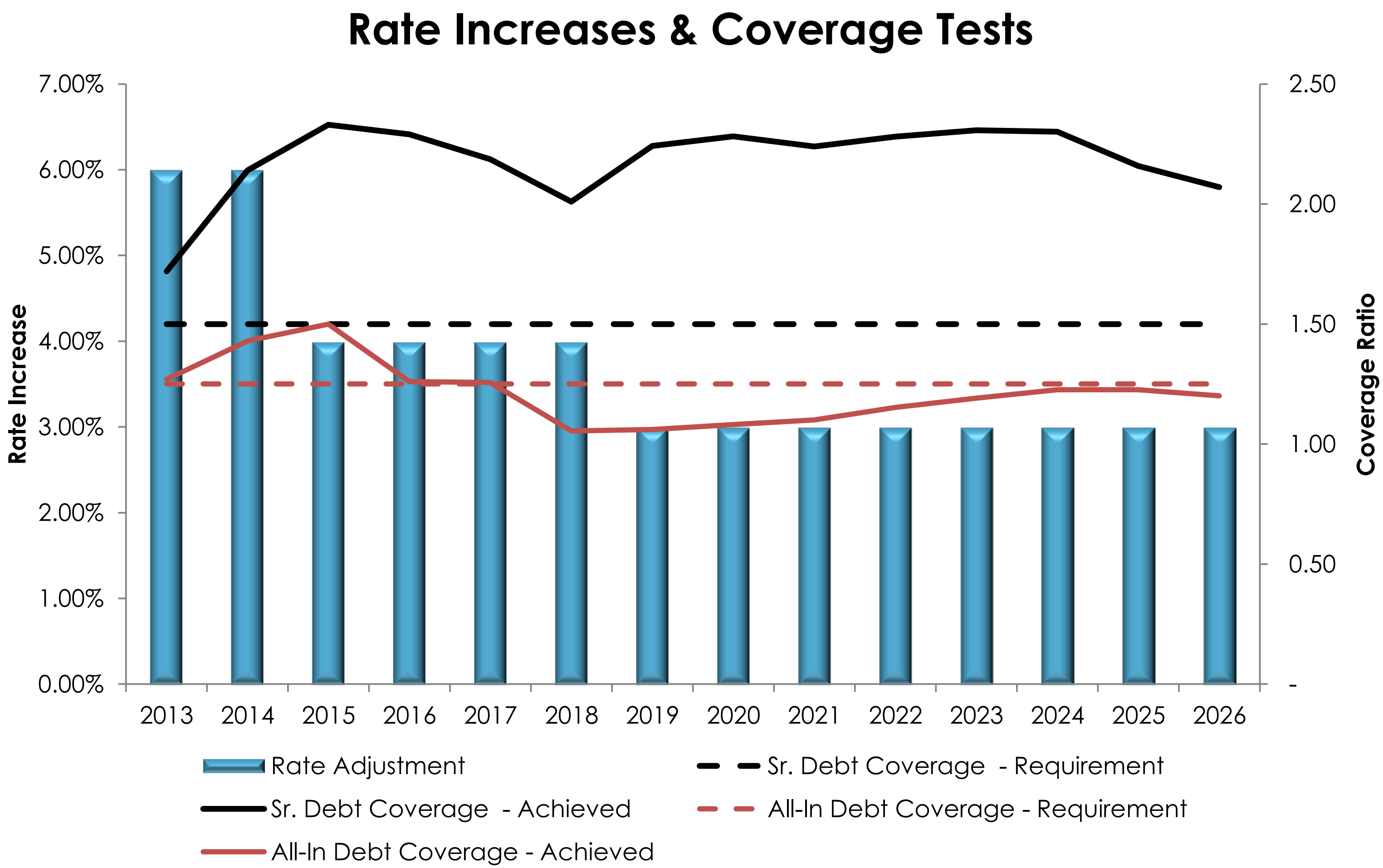
Base Case at 12/31/2016 with projected actuals for 2017

Revenue Requirement Analysis: Liquidity



Base Case at 12/31/2016 with projected actuals for 2017

Revenue Requirement Analysis: Coverage



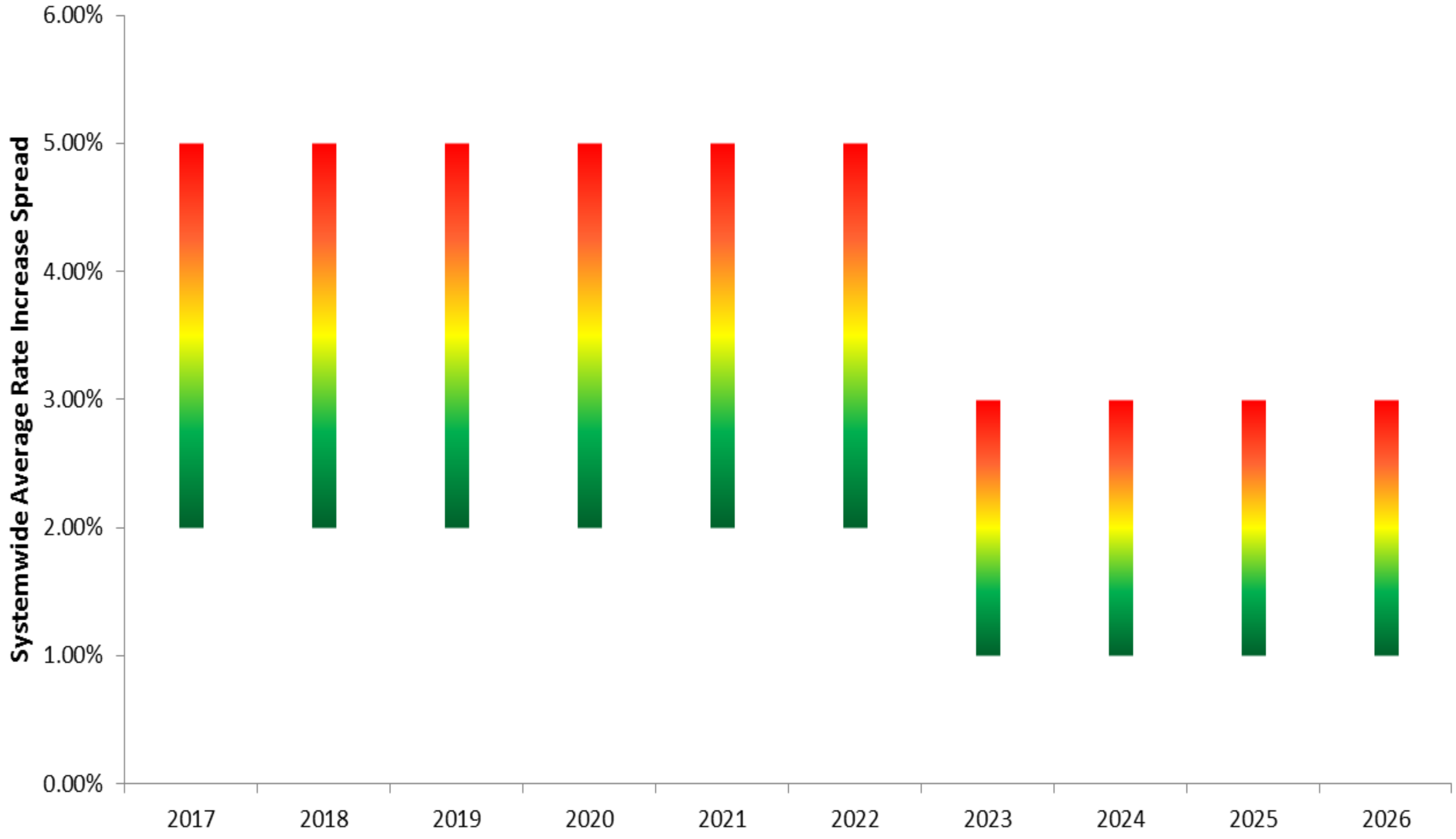
Base Case at 12/31/2016 with projected actuals for 2017

Revenue Requirement Analysis: Scenario Development

Financial Modeling Scenario	Description	Rate Pressure & Relief
2017/18 Base Case	Expected customer growth, base CIP, base O&M	
High Customer Growth	Examine scenario based account growth (Tehaleh, Curran Road) with historical modeling	
New Large Volume Customer	Assume additional 10 MGD, $27.5M SDC, online in 2 Phases (2020, 2023), additional O&M $1.3M per year	
Increased Wholesale Revenue	Expanded wholesale sales through market based and traditional wholesale agreements, assumes additional $1.2M per year additional revenue (could be as much as $12M)	
High Case CIP	Includes high range capital mitigation from Vulnerability Assessment, assumes additional capital of $128M over the next 10 years	
WestRock Mill Shutdown	Models 2017 closure, assumes loss of nearly $6M per year	

Based on scenario development for 2017/18 budgeting process

Revenue Requirement Analysis: Scenario Development



Based on scenario development for 2017/18 budgeting process

Revenue Requirement Analysis

Our Financial Plan

- Supports proactive financial management
- Provides a long-term view of our financial health
- Plans for and mitigates risk where possible
- Ensures achievement of our policy objectives

Cost-of-Service Overview

Section 6

Ratemaking Process

- Determines total to be paid by each customer class

The Three Phases

Functionalization

Arranging costs and plant values according to function, such as production, distribution, administrative & general, and customer service.

→

Classification

Classifying functionalized costs to cost components such as demand (peak), energy (base), and customer cost components.

→

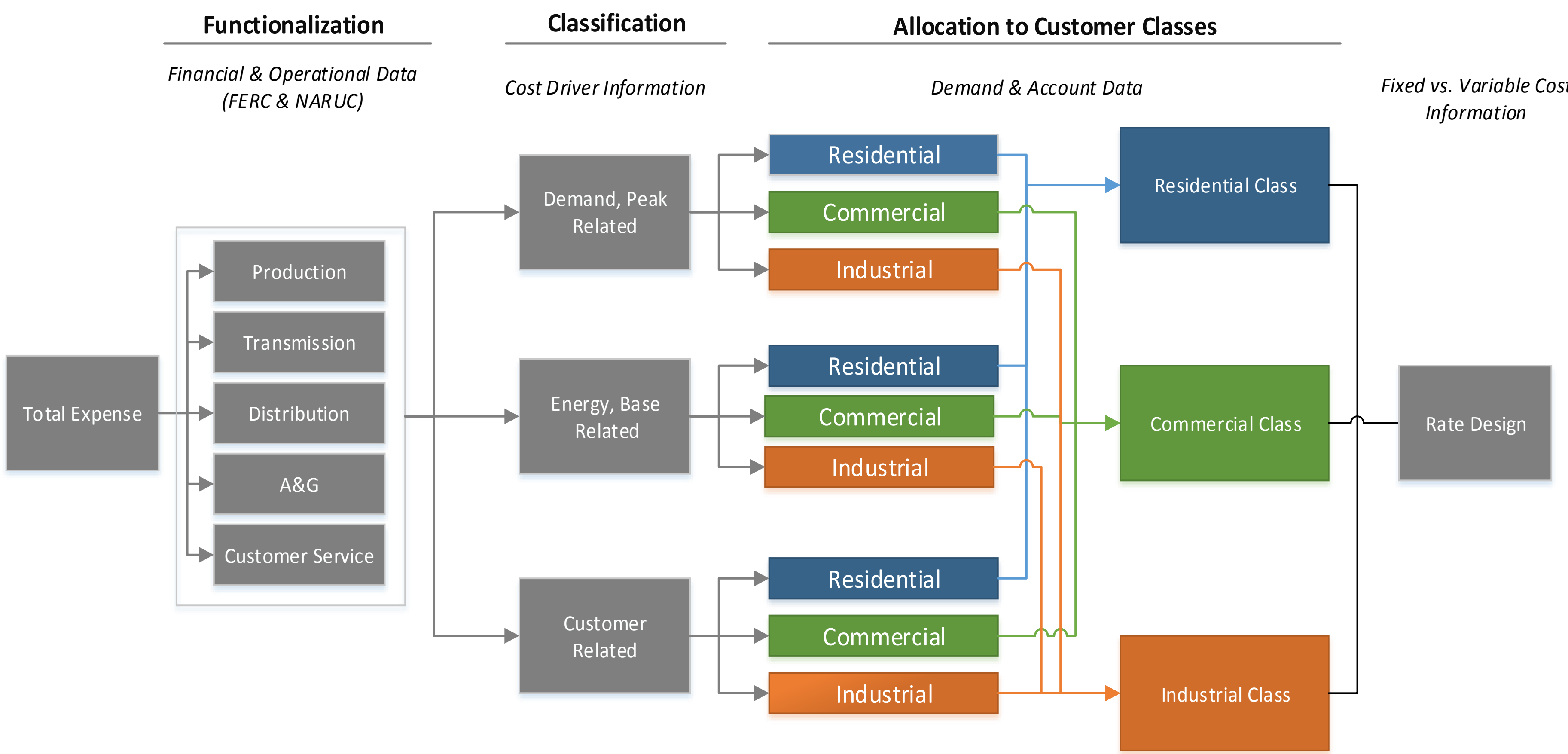
Allocation

The assignment of classified cost to customer classes (Residential, Commercial, Industrial).

Cost-of-Service Overview

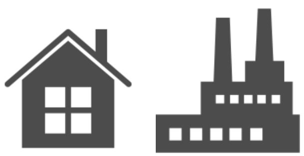
COSA Data-Flow Diagram

This graphic illustrates Tacoma Power's COSA structure. Tacoma Water follows an analogous structure.



Establishing Customer Classes

Grouping similar customers together isolates the specific costs of serving a unique customer or customer group.



Option 1:
End-Use Based

- Residential
- Commercial
- Industrial
- Irrigation
- Fire Protection Service

Option 2:
Consumption-Based

- Small General Service
- Large Volume Service

Option 3:
Combined Basis

- Street Lighting Service

Cost-of-Service Study Results

Residential	Small General	General	High-Voltage General	Contract Power	Lighting (H1 & H2)
$347,824,085	$56,291,995	$210,649,221	$42,625,355	$46,006,952	$5,700,937

Residential	Irrigation	Commercial	Large Volume Commercial	Wholesale	Fire Protection	Pulp Mill
$99,442,660	$6,157,484	$21,392,777	$3,512,136	$4,242,415	$11,752,478	$13,263,201

Policymakers can deviate from these values because of

- ❑ Interclass considerations
- ❑ Range of reasonableness
- ❑ Revenue-to-cost ratios
- ❑ Gradualism

Power COSA results for the time period 1 April 2017 to 31 March 2019. Based on 2017/2018 Budget.
Water COSA results for the time period 1 January 2017 through 31 December 2018.

Tacoma Water Rate Design

Section 7

Ratemaking Process

Revenue Requirement
"How much money do we need?"

Cost-of-Service Analysis
"Who pays what?"

Rate Design
"How do customers pay?"

- Design rate structure to collect revenue from customers in class

Uniform Rate: Description & Illustration

Description

Uniform rate design charges customers a constant unit price for all metered units of water consumed year-round based on customer class.

AWWA Principles of Water Rates, Fees and Charges

Uniform Rate: Advantages & Disadvantages

Advantages

- Simple to understand and to implement
- Generally considered equitable
- Revenue and bill stability

Disadvantages

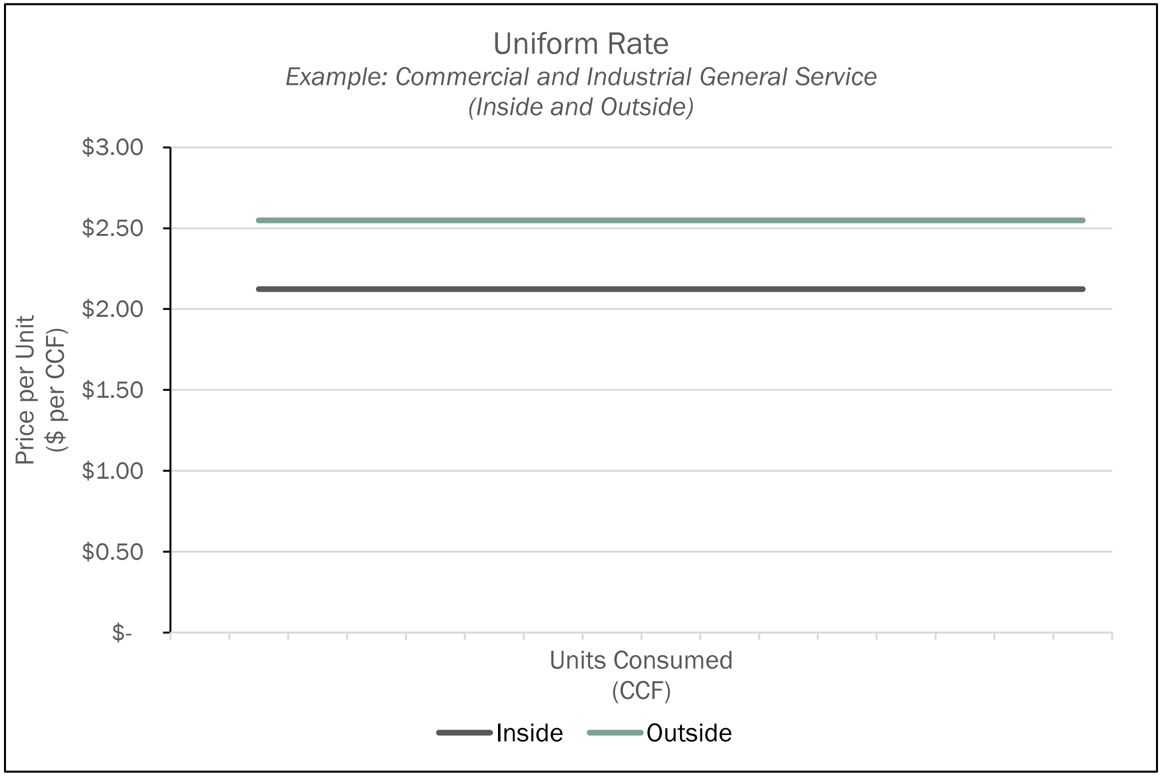
- Uncertain conservation message

AWWA Principles of Water Rates, Fees and Charges

Uniform Rate: Applications by Tacoma Water

Tacoma Water Rates Schedules

Tacoma Water applies uniform rate design to its Residential, Commercial/Industrial – General and Large Volume and Parks and Irrigation services. For this example, we look at Commercial/Industrial –General Service customers currently paying **$2.123 per CCF** inside the City and **$2.548 per CCF** outside the City

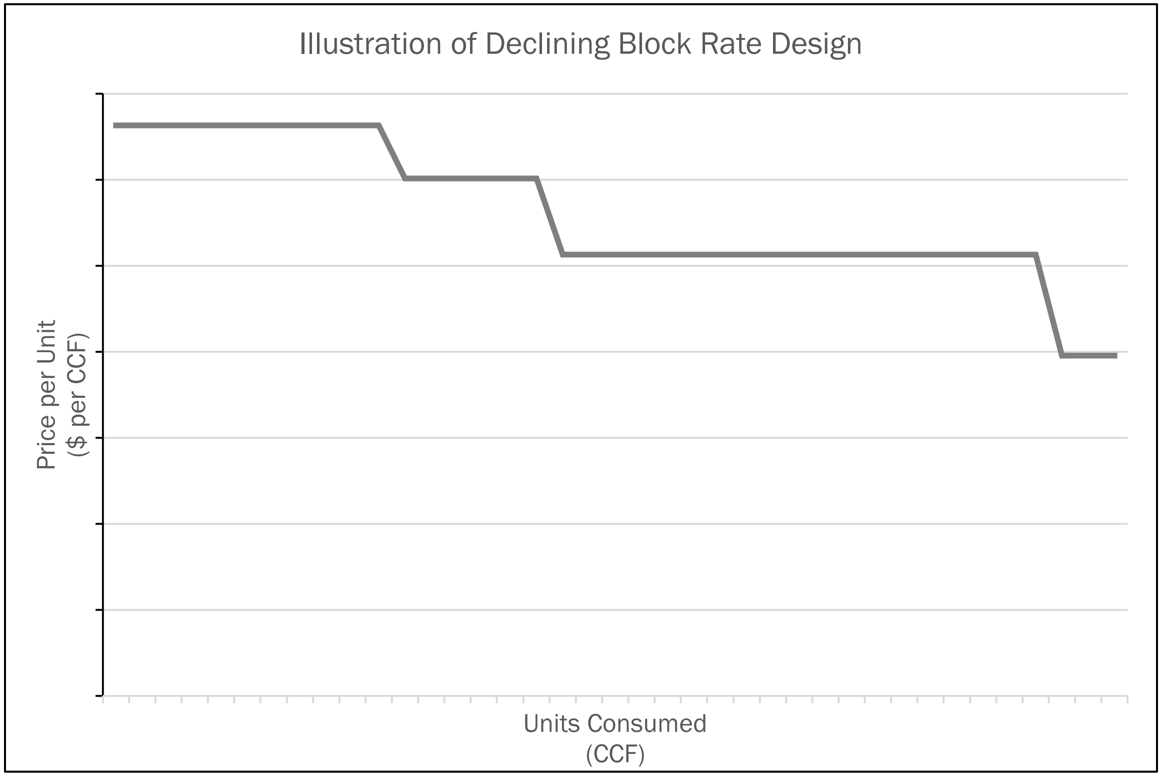


Rates Effective January 1, 2018.

Declining Block Rate: Description & Illustration

Description

Declining block rates charge customers a lower per unit rate as their usage increases within a billing cycle. Declining block rate designs vary in the number, width, and price differential height of blocks.



AWWA Principles of Water Rates, Fees and Charges

Declining Block Rate: Advantages & Disadvantages

Advantages

- Revenue and bill stability.
- Fairly easy to understand and administer.

Disadvantages

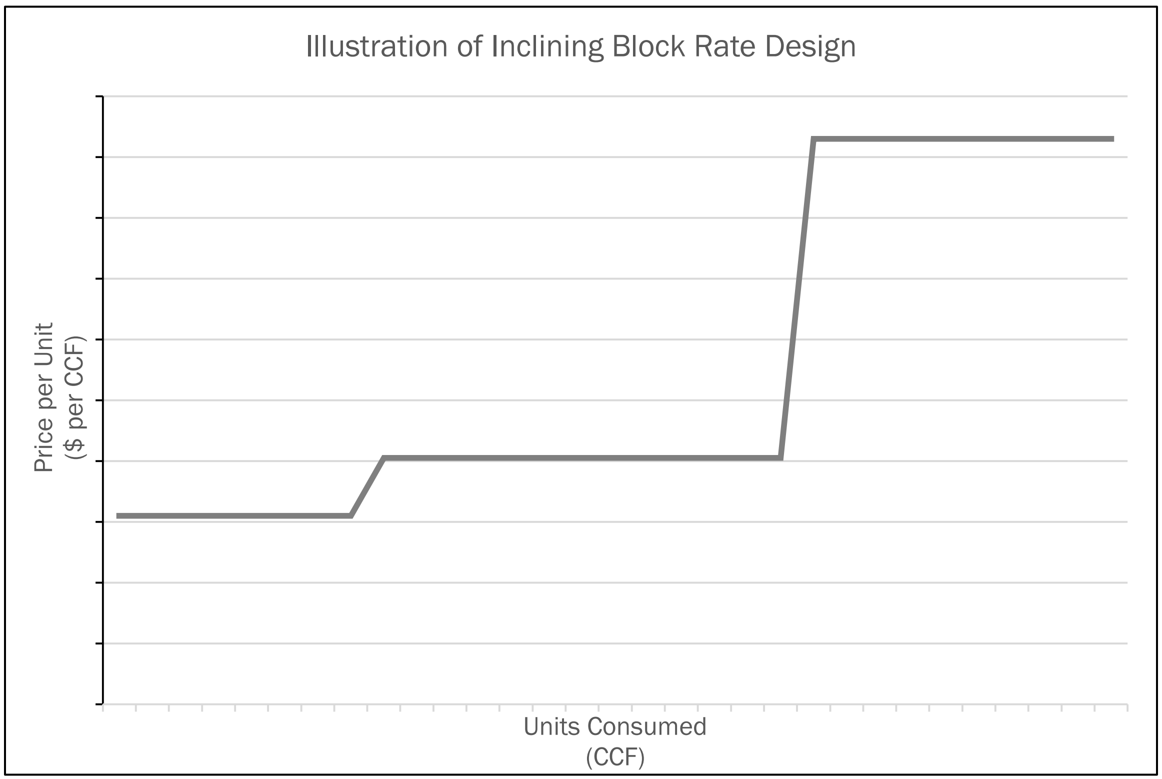
- No incentive for conservation.
- May reward or penalize different family or lot sizes.
- Customer perception.

AWWA Principles of Water Rates, Fees and Charges

Inclining Block Rate: Description & Illustration

Description

An inclining block rate structure is designed to charge customers a higher per unit rate as their usage increases over defined “blocks” within a billing cycle. Inclining block rate designs vary in the number, width, and price differential of blocks.



AWWA Principles of Water Rates, Fees and Charges

Inclining Block Rate: Advantages & Disadvantages

Advantages

- Provides flexibility in rate design.
- Sends conservation-oriented price signal.

Disadvantages

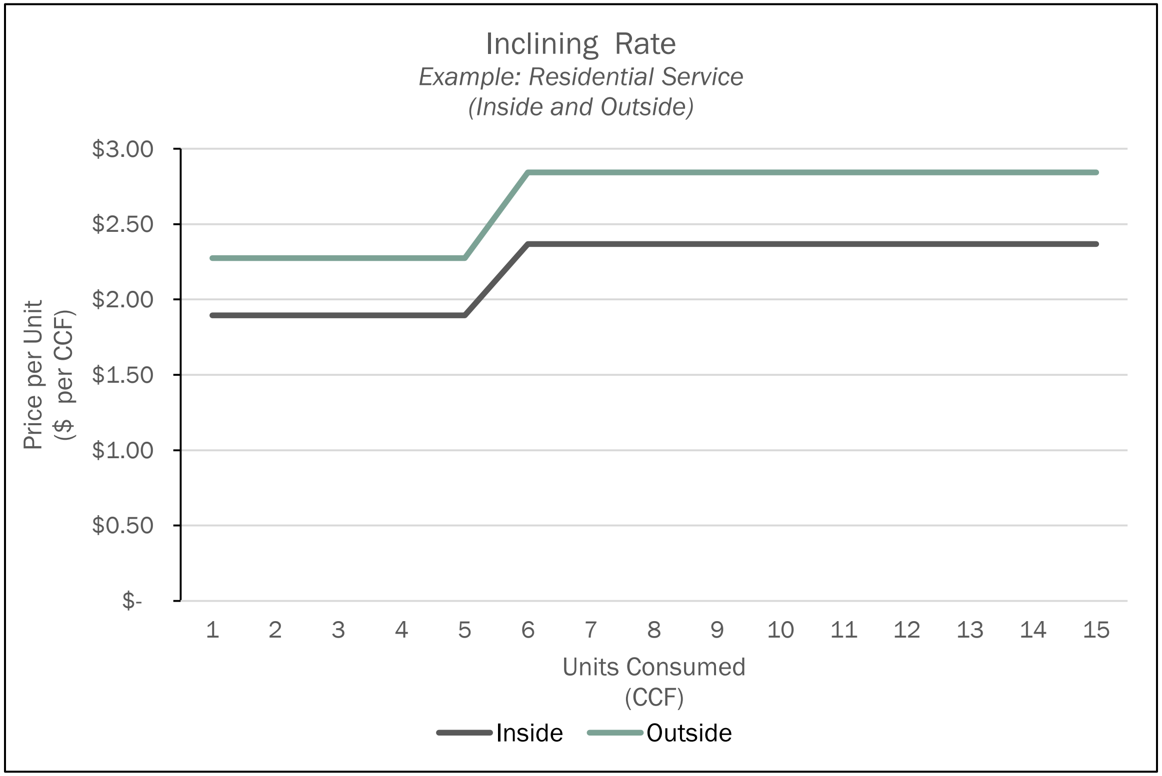
- Can be challenging to design and explain.
- May reward or penalize different family or lot sizes.
- More revenue and bill volatility.

AWWA Principles of Water Rates, Fees and Charges

Inclining Block Rate: Applications by Tacoma Water

Tacoma Water Rates Schedules

Tacoma Water applies inclining block rate design to its residential class in the summer months. While in the winter season residential customers pay a uniform rate of **$1.895 per CCF**, in the summer season residential customers pay **$1.895 per CCF for the first 5 CCF** of water consumption per month and **$2.369 per CCF for all CCF over five CCF**.

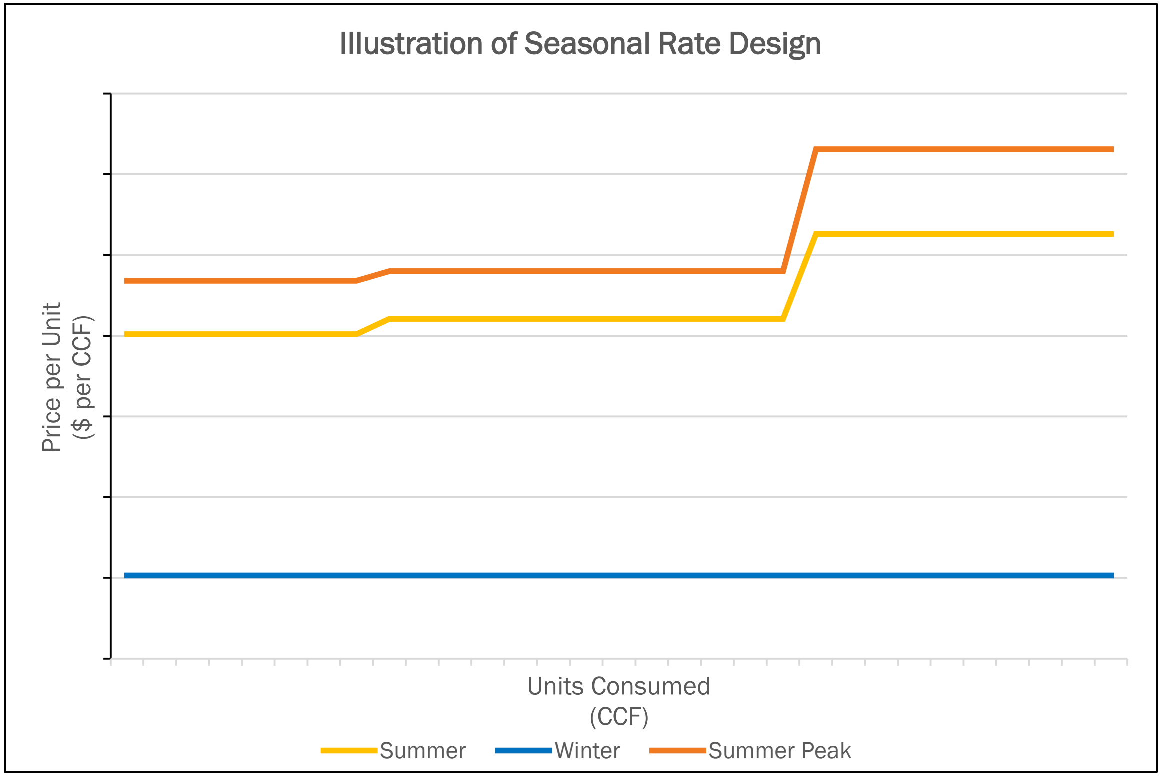


Rates Effective January 1, 2018.

Seasonal Rate: Description & Illustration

Description

Seasonal rates are designed to recognize differences in a utility's cost of service and marginal costs across different seasons. Higher prices are charged over peak seasons and lower prices are charged over off-peak seasons. Seasonal rate designs vary in the number, length, and nested rate design of seasons.



AWWA Principles of Water Rates, Fees and Charges

Seasonal Rate: Advantages & Disadvantages

Advantages

- Several variations are possible.
- Generally considered equitable.

Disadvantages

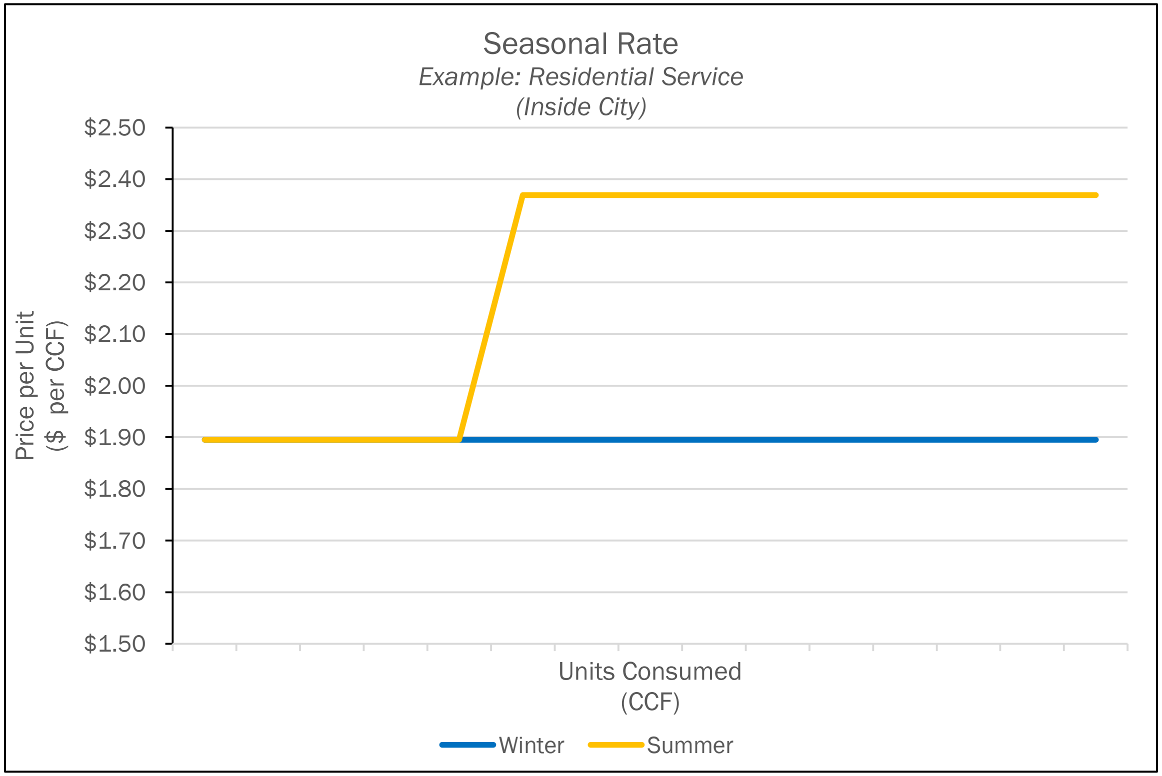
- Can be a challenge to be understandable, customers need to see a clear relationship between usage and bill amounts.
- More revenue and bill volatility.

AWWA Principles of Water Rates, Fees and Charges

Seasonal Rate: Applications by Tacoma Water

Tacoma Water Rates Schedules

Tacoma Water applies seasonal rate design to its residential class. In the winter season, residential customers pay **$1.895 per CCF**. In the summer season, residential customers pay **$1.895 per CCF for the first 5 CCF** of water consumption per month and **$2.369 per CCF for all CCF over five CCF**.



Rates Effective January 1, 2018.

Cost Structure

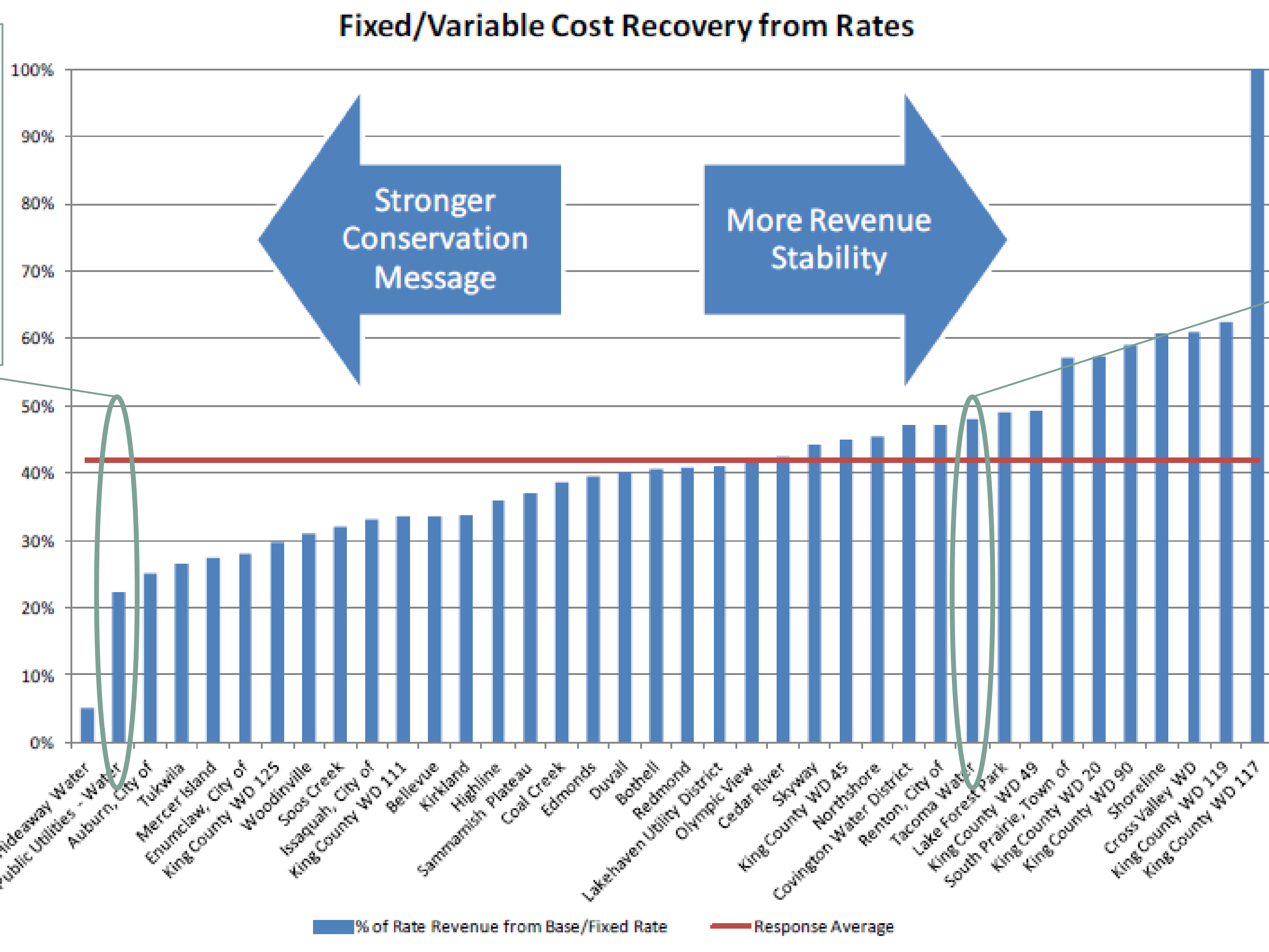
- Water business is "capital-intensive"
- Over 95% of our costs are "fixed" in the very short run (power, chemicals, and solids handling are the only variable costs on this time horizon)
- Fixed rates, at a minimum, must recover those costs that have NO connection to demand – e.g. postage, billing, meter reading, administration and general costs
- These only provide high level bookends for fixed cost recovery
- Beyond those bookends, we use the fixed vs. variable split to effect business objectives (e.g. send a conservation signal, effect revenue and bill stability, and maintain high credit ratings) and to improve equitability of rate design
- Water has one fixed charge schedule for all customer classes, so we strike a balance between these competing objectives differently for each customer class
- "Customer charges may be designed to recover up to 65 percent of revenue requirements for customer classes with strong seasonal consumption patterns." *

*Tacoma Water Rate and Financial Policy

Tacoma Water: Rate Design—Fixed vs. Variable Cost Recovery

Water Utility Comparison

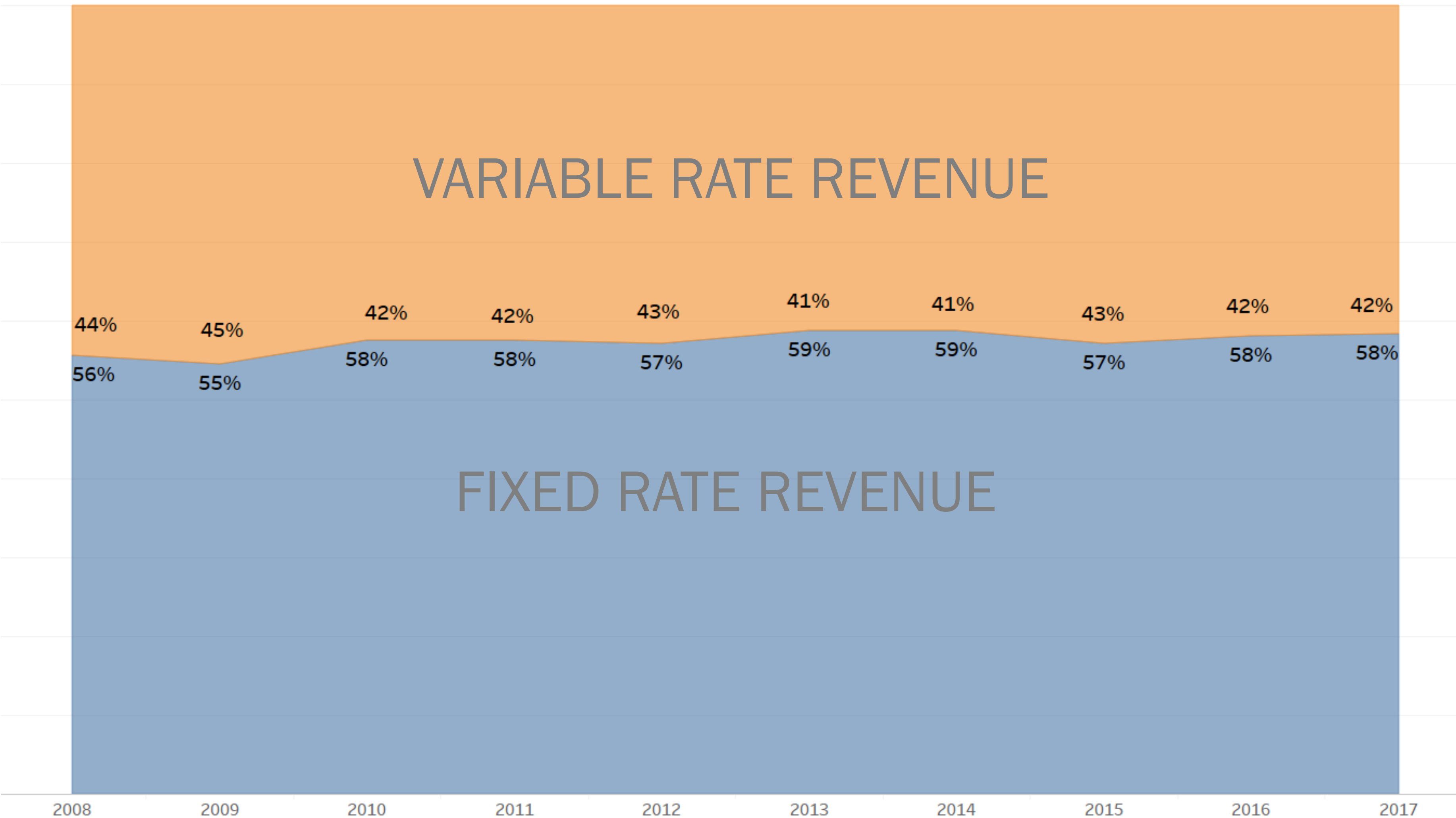
Seattle Public Utilities (SPU) recovers about 25% of system-wide water rate revenue from fixed rates



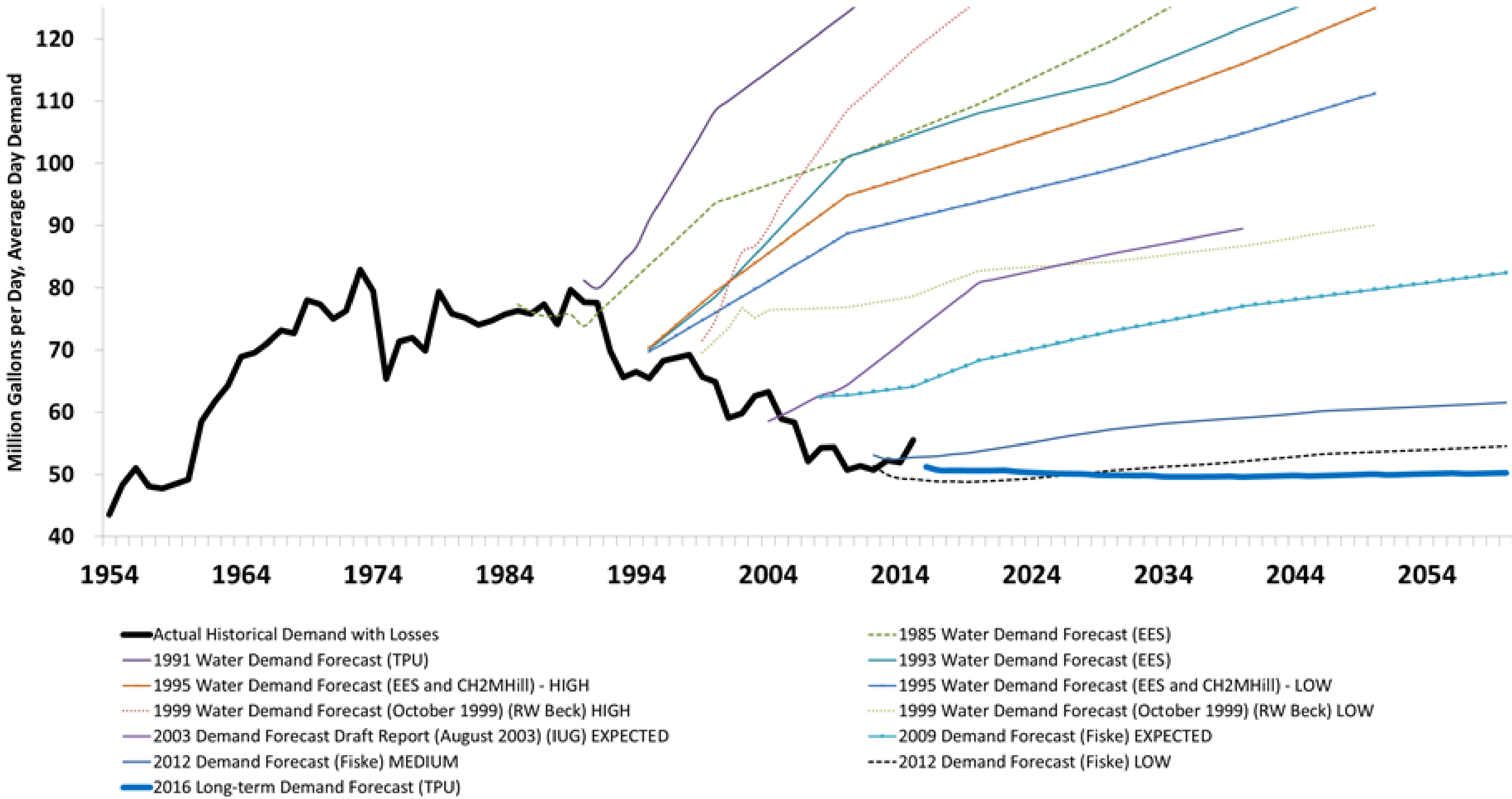
Source: WSF Utility Survey and Seattle Public Utilities Wholesale Purveyor Survey

Tacoma Water recovers about 50% of system-wide rate revenue from fixed rates

Residential Fixed vs. Variable Rate Recovery Ratio



Declining Demands



Tacoma Water: Legal Authority

Section 7.b.

Washington State Law

Revised Code of Washington (RCW) – Titles 35 (Cities and Towns), 54 (Public Utility Districts), 57 (Water-Sewer Districts), and 80 (Public Utilities)

Excerpts:

"…rates charged must be uniform for the same class of customers or service." [35.92.010]

"In classifying customers served or service furnished, the city or town governing body may in its discretion consider any or all of the following factors: The difference in cost of service to the various customers; location of the various customers within and without the city or town; the difference in cost of maintenance, operation, repair, and replacement of the various parts of the system; the different character of the service furnished various customers; the quantity and quality of the water furnished; the time of its use; the achievement of water conservation goals and the discouragement of wasteful water use practices; capital contributions made to the system including, but not limited to, assessments; and any other matters which present a reasonable difference as a ground for distinction. No rate shall be charged that is less than the cost of the water and service to the class of customers served." [35.92.010]

Case Law Precedents

Capistrano Taxpayers Association, Inc. v. City of San Juan Capistrano (CA, 2015)

Struck down tiered rate structures without a clear nexus between cost and the rates being charged.

Excerpts:

The City of San Juan Capistrano's Water Utility failed to demonstrate that "it had complied with the requirement [in Proposition 218] water fees not exceed the cost of service attributable to the parcel."

Proposition 218, or the "Right to Vote on Taxes Act," states in part that "The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel." [California Proposition 218, Article XIII D, Section 6]

Durango West Metropolitan Number 1 v. Lake Durango Water Company (CO, 1997)

Struck down wholesale rates that were above cost of service.

City of Billings, Montana v. County Water District of Billings Heights (MT, 1999)

Arbitration reinforced city's cost of service wholesale rates after 5 years in and out of court.

Tacoma Water Rates Roadmap

Section 8

This section is intended to provide the Public Utility Board with information related to potential projects that may impact upcoming rate development cycles.

Rates Roadmap

Advanced Metering Infrastructure (AMI)

New meter technologies will enable new rate structure tools, and may change how we represent a customer's claim on system capacity that currently determines our fixed charge.

Demand Charges

More granular, real-time demand information from AMI may support (or require) more dynamic rate designs.

Market-Based Wholesale Rates

We are working to develop competitive wholesale rates that deviate from cost-of-service in order to generate additional net revenue.

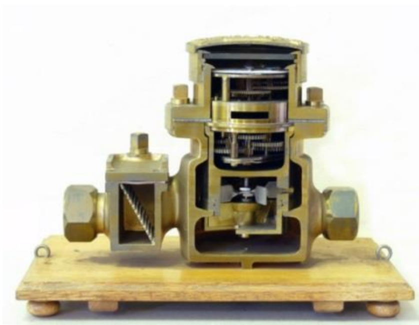
Purely Volumetric Irrigation Rate

Beginning in 2017, Tacoma Water began to transition all Parks and Irrigation customers to a purely volumetric rate design. This transition will continue for 6 years.

Public Fire Protection

Currently, Public Fire Protection costs are recovered through a "Hydrant Service Fee" on customer bills. We are recommending that this practice be discontinued starting in 2019.

Advanced Metering Infrastructure



Traditional Meter

- Currently, nearly all of Tacoma Water's meters measure usage physically, with moving mechanical parts.
- For this reason, the physical size of the meter has a strong relationship to meter capacity, or potential water demand.
- Meter size is used to determine the monthly fixed "Ready-to-Serve Charge." That charge increases with meter size.
- Must be read manually on a monthly or bimonthly basis.

Traditional Meter with Smart Module

- Most existing water AMI deployments are comprised of this technology.
- Consists of a traditional meter with a module attached to provide two-way communication with a fixed network.
- Would not require that we alter fixed charge rate design.
- Could enable demand charge.
- Provides read information as often as every 5 minutes.

Advanced Smart Meter

- These meters do not have moving parts, but instead measure water usage with electromagnetic or other types of sensors.
- Because these meters have a much wider flow range and higher capacity, their size has a weaker relationship to meter capacity, or potential water demand.
- May require that we alter fixed charge rate design.
- Could enable demand charge.
- Provides read information as often as every 5 minutes.

Demand Charges

What is a demand charge?

Just like Tacoma Power's existing demand charge, it is a charge for water service based upon the peak water capacity demanded or required by a customer over a given time period. Because many water facilities are sized to peak hour and peak day system demands, a demand charge can be an effective way to recover associated system costs that are fixed over a medium-term horizon.

Currently Not Feasible

Because most meters are currently read every other month, most versions of a demand charge are infeasible because we don't gather enough information about the peaking characteristics of customers to support such a charge.

Will be feasible, and perhaps necessary, with AMI

With the system-wide deployment of AMI that enables interval reads, we will have information about peak hour and peak day demand that could support a demand charge.

As technology standards evolve away from positive displacement meters and towards magnetic or other types of inferential meters, the size of the meter may no longer be a reliable proxy for system capacity, and demand charges may be necessary to equitably recover fixed costs.

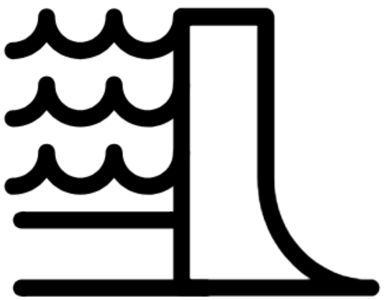
Pros

- Can increase rate equity within customer classes.
- Can increase revenue stability if used to recover costs that were previously recovered through the variable rate.
- Can strengthen and/or refine price signal in order to promote efficient water use, if used to recover costs that were previously recovered through the fixed rate.

Cons

- Complexity increases system and administrative burden and may hamper effectiveness of rate signal.

Market-Based Wholesale Rates

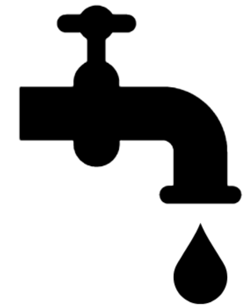


Tacoma Water has excess system and supply capacity

In a normal year, Tacoma Water has about twice as much supply as it is able to sell. While this is excellent for short-term supply resiliency and long-term supply certainty, it fails to make the most use of our valuable system and supply resources.

Changes are needed to develop effective market platform

Gas and electricity markets are good examples of well-developed markets that trade resources competitively on various time horizons, thus making the best use of available resources. Without well-functioning markets, which include dynamic supply and demand visibility, understanding* and management, as well as market-based pricing, the market cannot balance demand and supply.



Supplying water to the wholesale market, and value to Tacoma's retail customers

Market analysis done in recent years identified up to $96 million dollars of additional rate revenue that could be realized over the next 10 years if Tacoma Water is able to supply water to every wholesale customer that needs it at competitive rates.

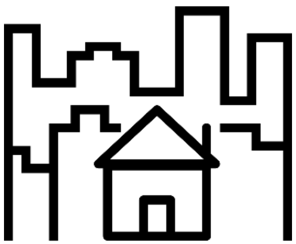
*Tacoma Water's Integrated Resource Plan, which is currently under development, is expected to improve our ability to understand and manage supply and demand

Irrigation Rate Design

Transitioning to a Purely Variable Rate Structure over a six year period

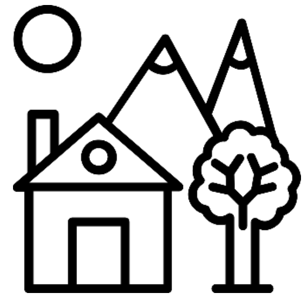
- In 2017, Tacoma Water began to transition to a rate structure that will ultimately consist of only volumetric rates for irrigation customers
- Scheduled to be phased in over 6-year period, from 2017-2022
- Once complete, this change will eliminate the need to roll trucks twice a year per account to turn on/off the meter
- Strengthens signal to use water efficiently during the peak summer months

Public Fire Protection: Hydrant Service Fee Background



Inside City Customers

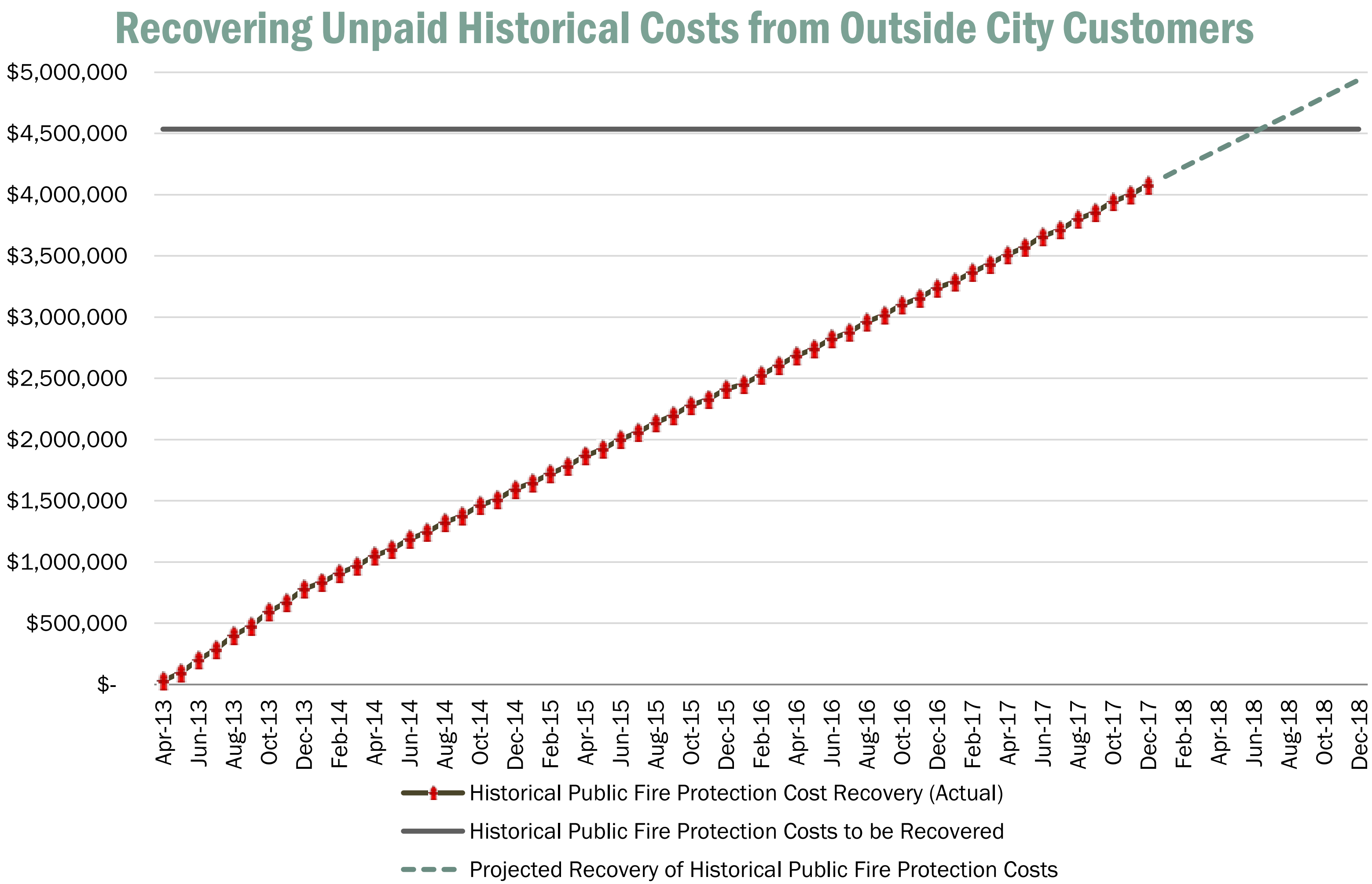
- Until 2015, public fire protection costs were recovered from General Government.
- In 2015-2016, Tacoma Water began recovering these costs directly from ratepayers through a "Hydrant Service Fee" on their bills.
- In 2018, customers inside the City of Tacoma are charged **$2.54 per month** to recover these costs.



Outside City Customers

- $4.5 million of public fire protection costs were not recovered from outside city customers during a period from 2009-early 2013.
- In early 2013, Tacoma Water began recovering these historical costs, as well as ongoing public fire protection service costs, directly from ratepayers through a "Hydrant Service Fee" on their bills.
- In 2018, customers outside the City of Tacoma are charged **$5.13 per month** to recover these costs. That includes:
  - Historical Service Component of $1.90 per month
  - Ongoing Service Component of $3.23 per month

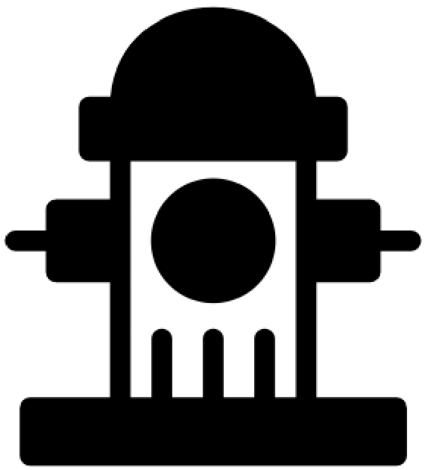
Public Fire Protection



Public Fire Protection

Recommendations for 2019 and Beyond

- Retire "Historical Service Component" for outside city customers effective January 1, 2019.
- Recover public fire protection costs from general rate, and remove "Hydrant Service Fee" from fixed and/or variable components of the rate.



Tacoma Power Rate Design, Part I

Section 9

Tacoma Power Rate Design, Part I:

COSA-to-Rates Process

Section 9.1

Ratemaking Process

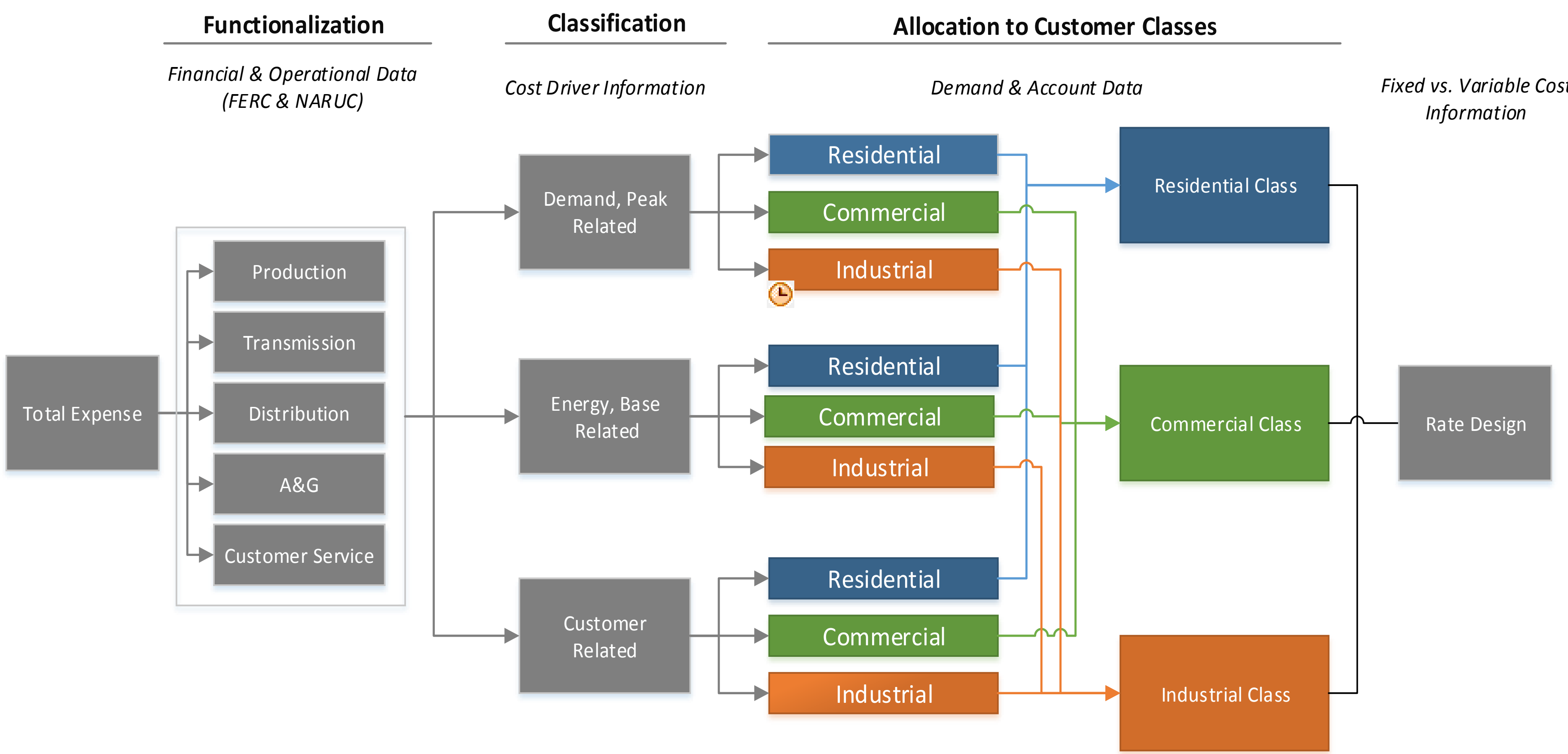
Revenue Requirement
"How much money do we need?"

Cost-of-Service Analysis
"Who pays what?"

Rate Design
"How do customers pay?"

- Determines total to be paid by each customer class

COSA Data-Flow Diagram



Electricity Charges

Customer Charge

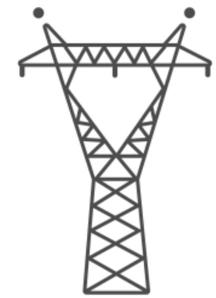
A basic charge added to each customer's bill to cover costs to connect to the system. The charge includes meter reading, customer accounting, and billing. The charge does not vary by the amount of electricity used.

Energy Charge

Charge for electric service based upon the electric energy consumed.

Demand Charge

Charge for electric service based upon the peak electric capacity (kilowatts) demanded or required by power-consuming equipment over a given time period.

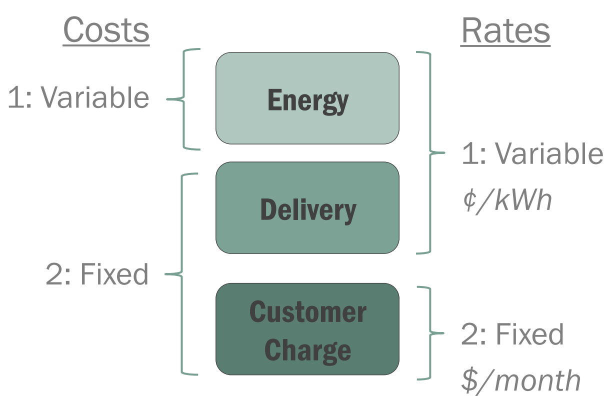


Delivery Charge

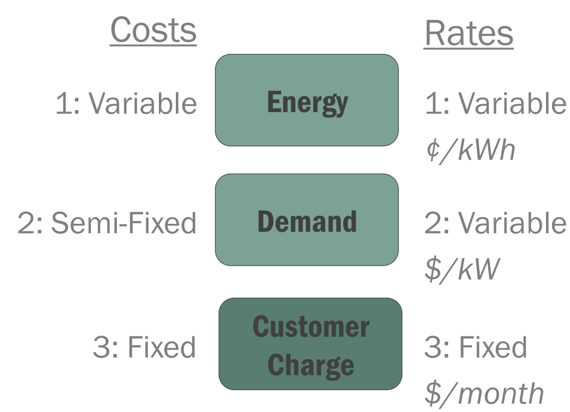
Charge for distribution service based on the electric energy consumed <u>or</u> demand (depending on rate class).

Current Tacoma Power Rate Design

Two-Part Rate
(Requires Simple Meter)



Three-Part Rate
(Requires Demand Meter)



Tacoma Power Two-Part Rate Schedules:

- Residential
- Small General Service
- Street Lighting & Traffic Service (some fixtures only)

Tacoma Power Three-Part Rate Schedules:

- General Service
- High-Voltage General
- Contract Industrial

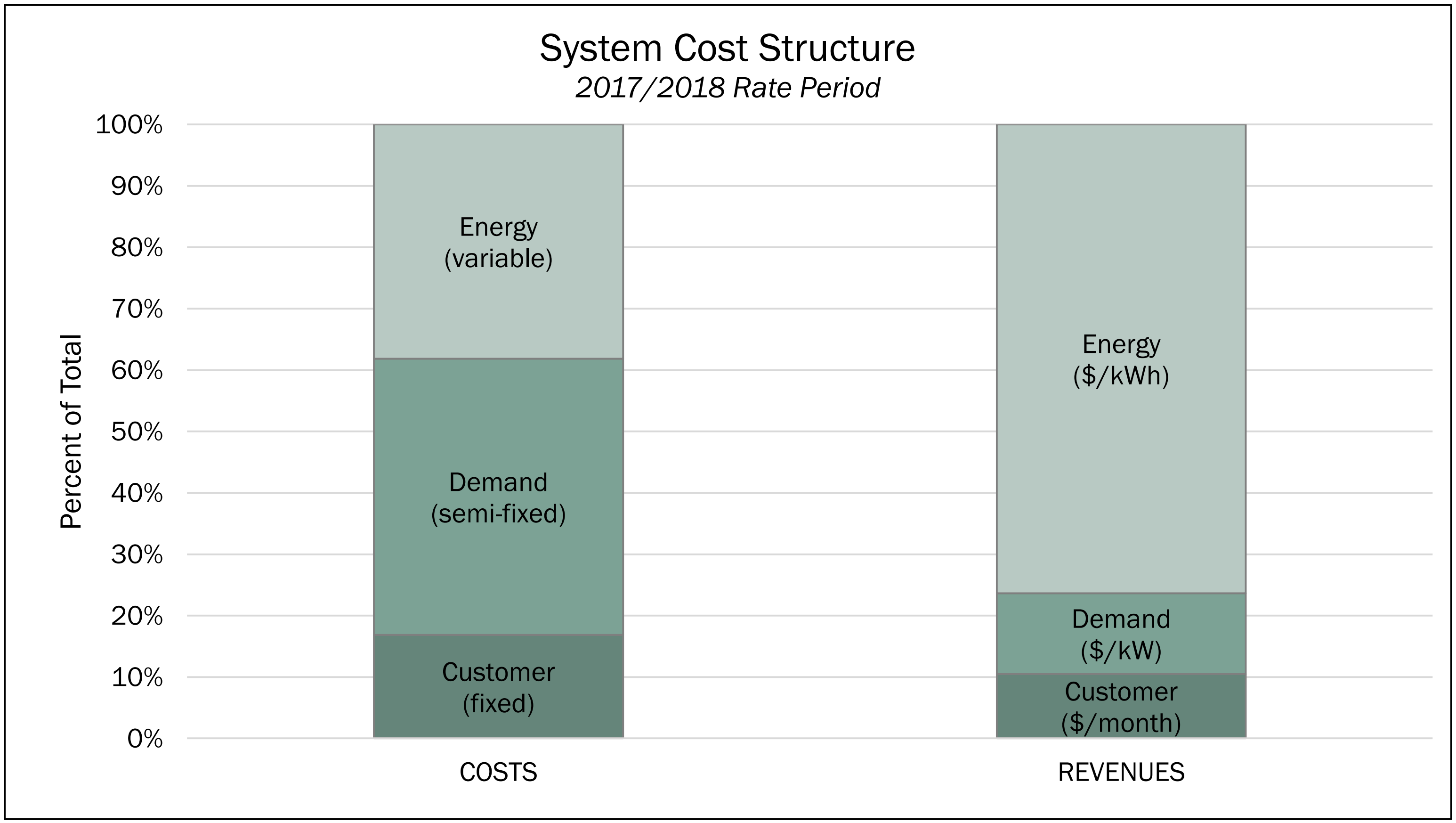
Cost-of-Service Rate Structures

The chart below summarizes the major costs of an electric utility, how they are classified, and the type of pricing (rate) structure which most closely aligns with the cause of the cost.

COST	CLASSIFICATION		PRICING STRUCTURE
	TYPE	CAUSAL FACTOR(S)	
Generation Plant	Fixed, Semi-fixed	Demand	kW Charge
Transmission Plant	Fixed, Semi-fixed	Demand	kW Charge
Distribution Plant	Fixed, Semi-fixed	Demand, Customers	kW Charge, Customer Charge
General Plant	Fixed	Demand, Customers	kW Charge, Customer Charge
Purchased Power	Semi-fixed, Variable	Demand, Energy	kW Charge, kWh Charge
Generation O&M	Fixed, Variable	Demand, Energy	kW Charge, kWh Charge
Transmission O&M	Fixed, Semi-fixed	Demand	kW Charge
Distribution O&M	Fixed, Semi-fixed	Demand, Customers	kW Charge , Customer Charge
A&G Costs	Fixed, Semi-fixed	Demand, Customers	kW Charge, Customer Charge

Fixed & Variable Costs and Revenues

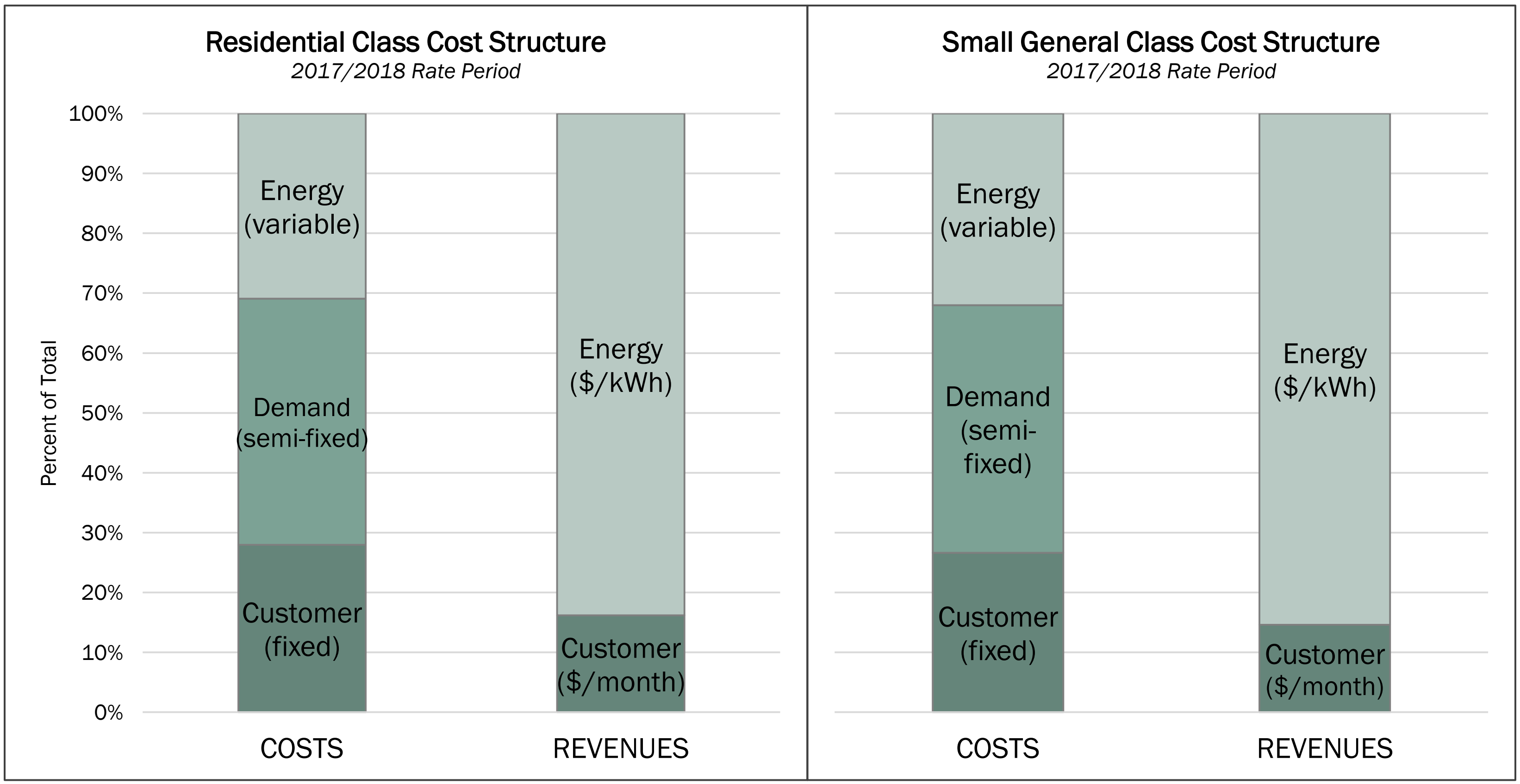
Most of the total Tacoma Power system **costs are fixed.** At the same time, most of the total Tacoma Power **revenues are variable.**



Amounts for Click! underrecovery included as a fixed customer item.

Fixed & Variable Costs and Revenues

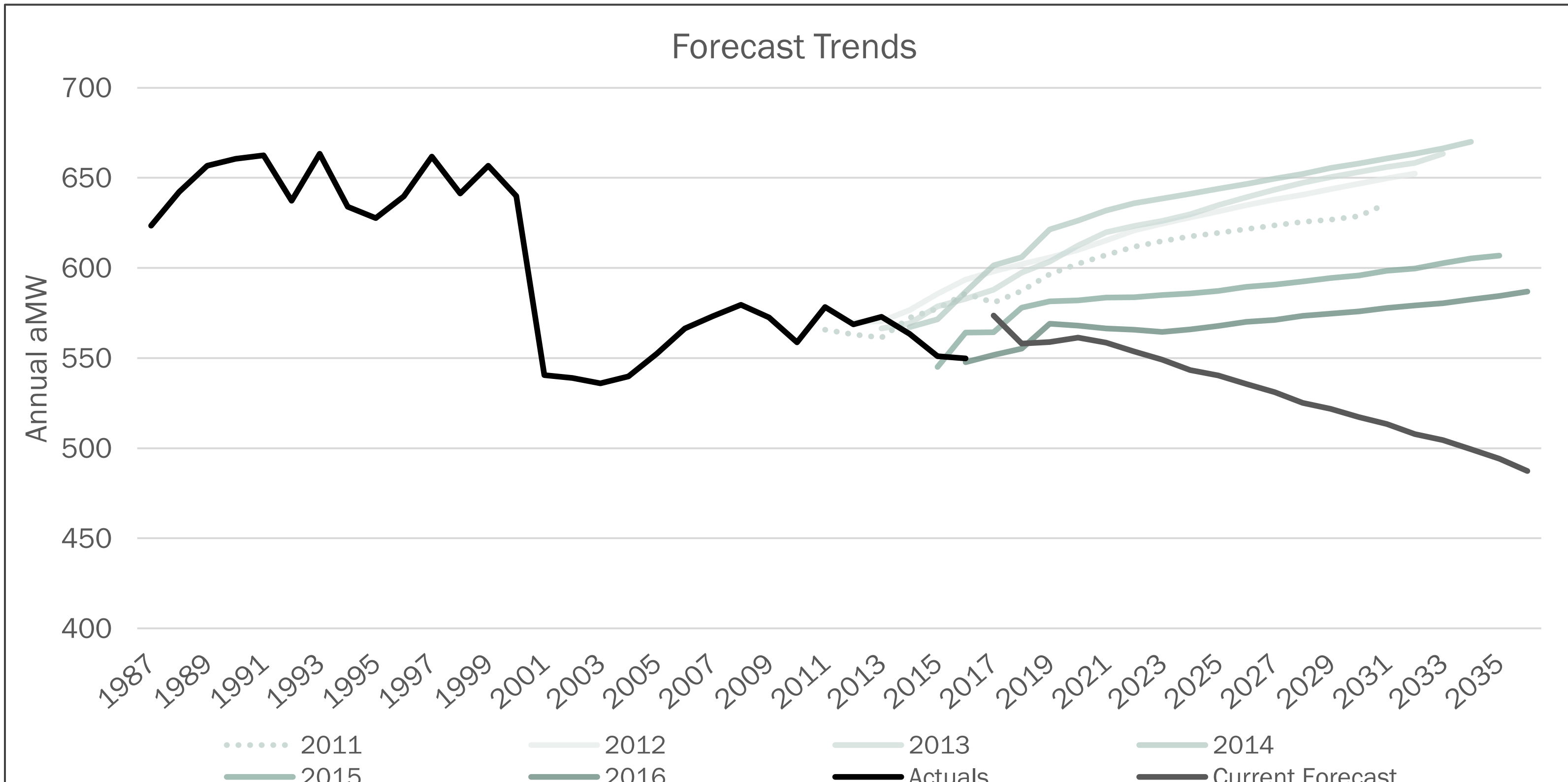
The revenue structure's deviation from cost structure is most marked in the Residential (Schedule A) and Small General (Schedule B) classes. This is because the rate schedules for these classes do not include demand charges ($/kW).



Amounts for Click! underrecovery included as a fixed customer item.

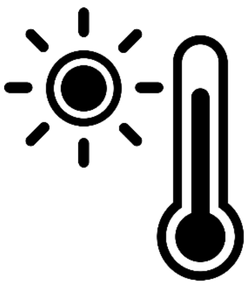
Load Trends and the Recovery of Costs

In the past, utilities relied on expectations of ever-increasing consumption to recover fixed costs in the variable portion of the rate. Now, however, conservation measures, improved codes & standards, and exogenous changes to the energy intensity of economic activity are leading to new forecasts of flat or declining loads.



Unique Features of Tacoma Power

Tacoma Power's mild climate and hydro-dominated portfolio contribute to low variable costs.



No Scorching Summer Spikes

The Puget Sound region enjoys a relatively temperate climate while other regions of the country swing from freezing in the winter to sweltering in the summer.

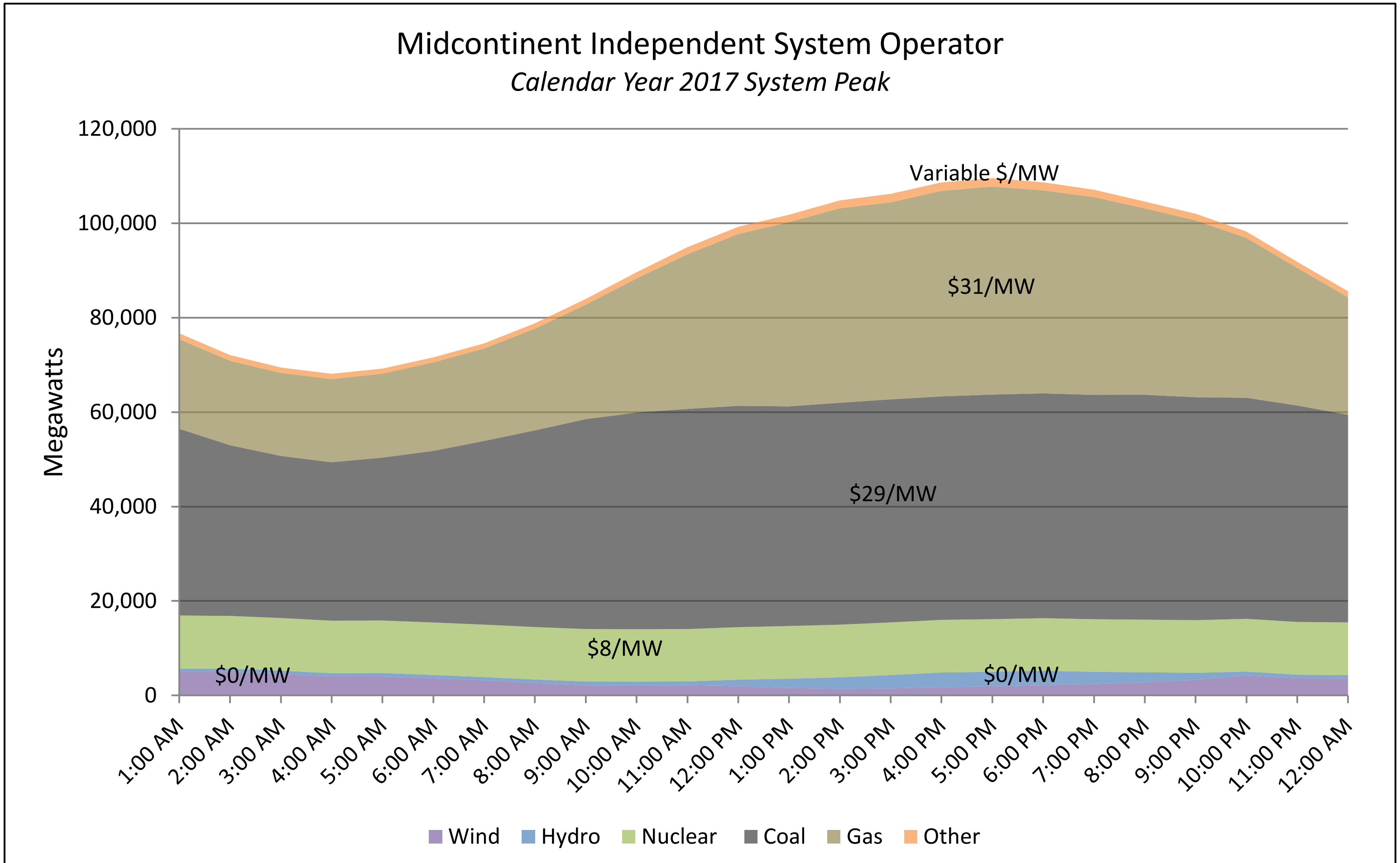
The vast majority of American utilities are "summer peaking" utilities. On hot and sunny summer day, other utilities see system load spike dramatically (sometimes doubling from the lowest load to the highest load of a day). **The "cold snaps" experienced in Tacoma Power's territory do not trigger similar peaking behavior.**

No Expensive "Peaking" Units

Most utilities must operate expensive "peaking" generating plants to meet peak demand. Peaking generation plants have higher operational costs. When peak load is reduced, the need to run expensive peaking plants (or market purchases) is delayed or avoided.

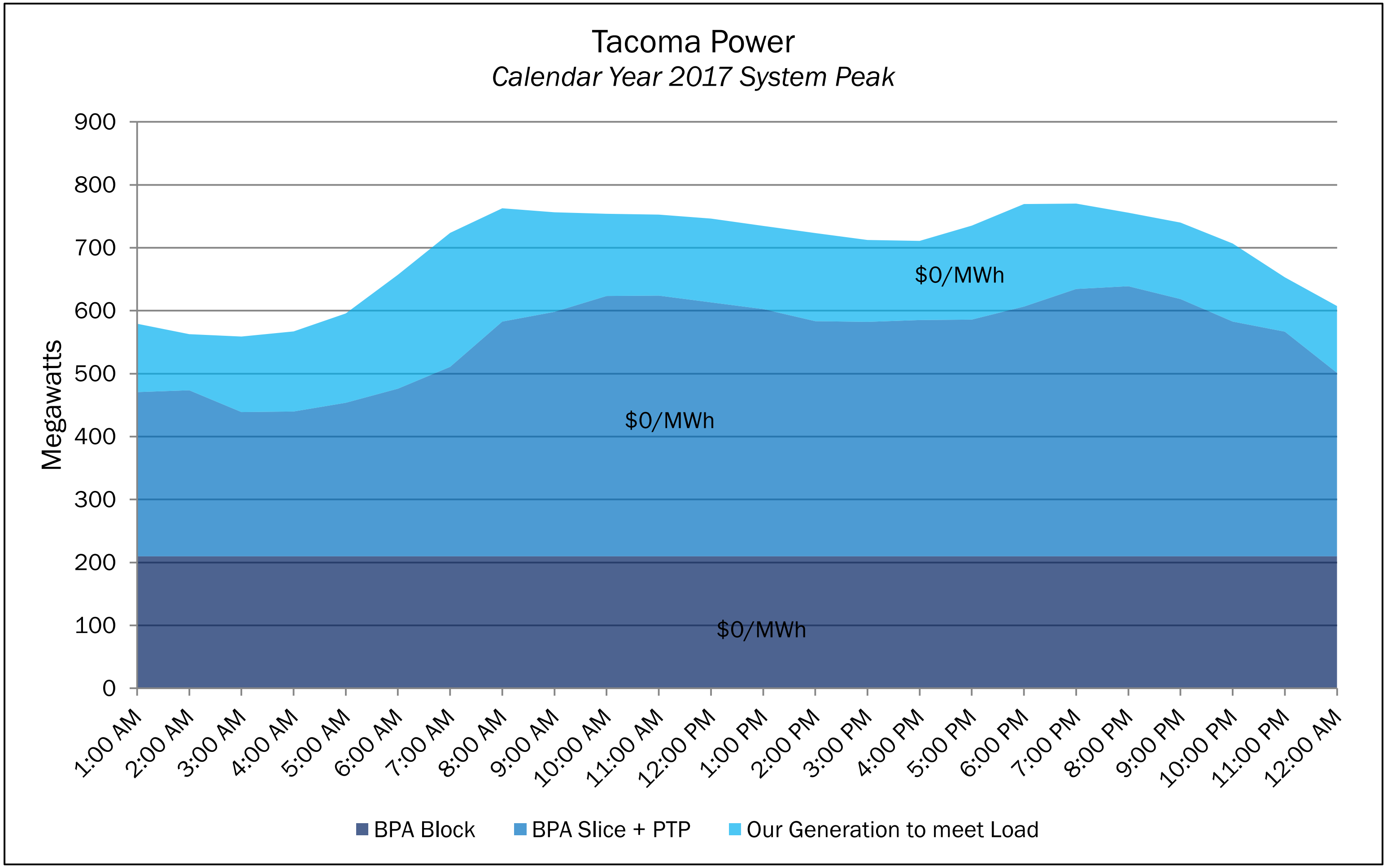
In contrast, Tacoma Power meets its peaks with hydropower. Although fixed costs might be substantial, Mother Nature provides the **fuel for free.**

Typical Resource Stack: Marginal Fuel Cost



Calculated from the NREL Annual Technology Baseline Cost and Performance Summary, $/MW indicate the average marginal cost of each fuel source.

Tacoma Power Resource Stack: Marginal Fuel Cost



Calculated from the NREL Annual Technology Baseline Cost and Performance Summary, $/MWh indicate the average marginal cost of each fuel source.

Tacoma Power Rate Design, Part I:

Traditional Rate Design

(non-Advanced Metering Infrastructure [AMI])

Section 9.2

Ratemaking Process

Revenue Requirement
"How much money do we need?"

Cost-of-Service Analysis
"Who pays what?"

Rate Design
"How do customers pay?"

- Design rate structure to collect revenue from customers in class

Rate Design Section Components

For each rate design, there are the following sections:

Description & Illustration

The rate design is described and illustrated in general terms.

Advantages& Disadvantages

The advantages and disadvantages of the rate design are identified. Many are discussed further in the NARUC Distributed Energy Resources Rate Design and Compensation manual.

Discussion

A bar chart illustrates how the rate design compares to the cost of service across varying levels of energy consumption.

Note the average forecasted consumption for the Tacoma Power 2017/2018 rate period is 11,907 kWh.

Applications by Tacoma Power

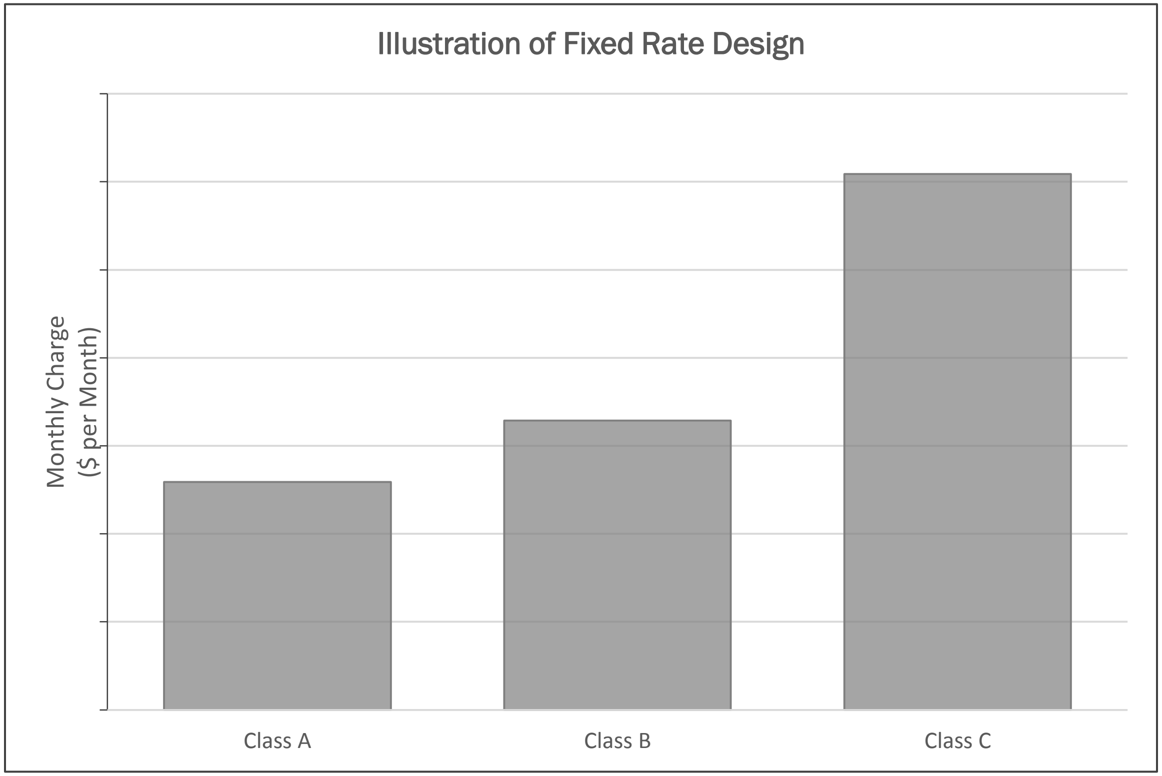
Current applications of the rate design are discussed and illustrated.

2017 Rates effective April 16, 2017. 2018 Rates to become effective April 1, 2018.

Fixed Rate: Description & Illustration

Description

Fixed rates vary by unit of time, as opposed to measured use.



Fixed Rate: Advantages & Disadvantages

Advantages

- Simple to administer and understand
- Stable and predictable bills; prevents high bills during peak periods
- Provides utility revenue adequacy and stability

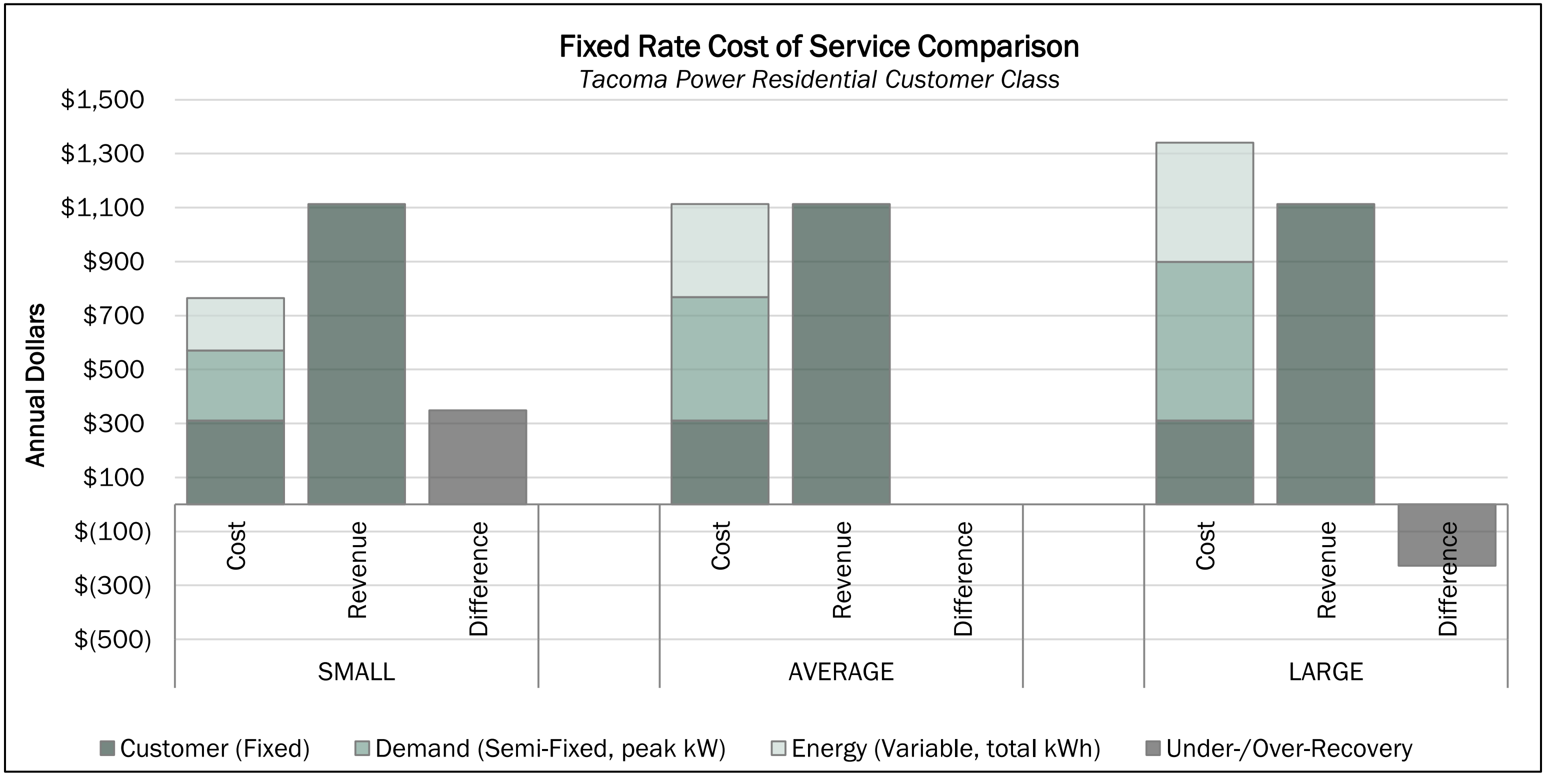
Disadvantages

- Doesn’t reflect actual variable costs to serve in a given time period
- No ability for customers to lower their bills through conservation or energy-efficiency measures
- Disadvantages low users and benefits high users when compared to usage-based rates

Fixed Rate: Discussion

Alignment with Cost of Service

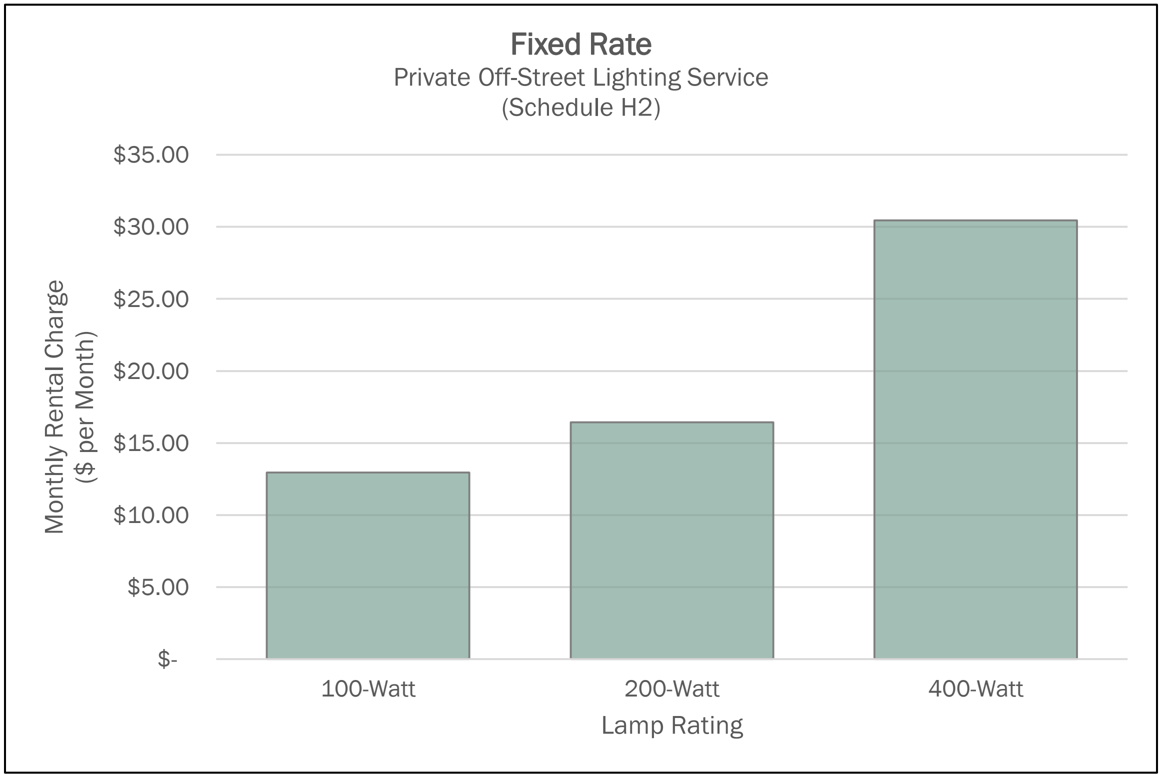
Under a fixed rate design, each residential customer would be charged **$92.73 per month** in order for Tacoma Power to recover the residential class costs. Small consumers would pay more than their true cost to serve and large consumers would pay less than their true cost to serve.



Fixed Rate: Applications by Tacoma Power

Tacoma Power Rates Schedules

Tacoma Power applies a fixed rate design to Private Off-Street Lighting Services (Schedule H-2).

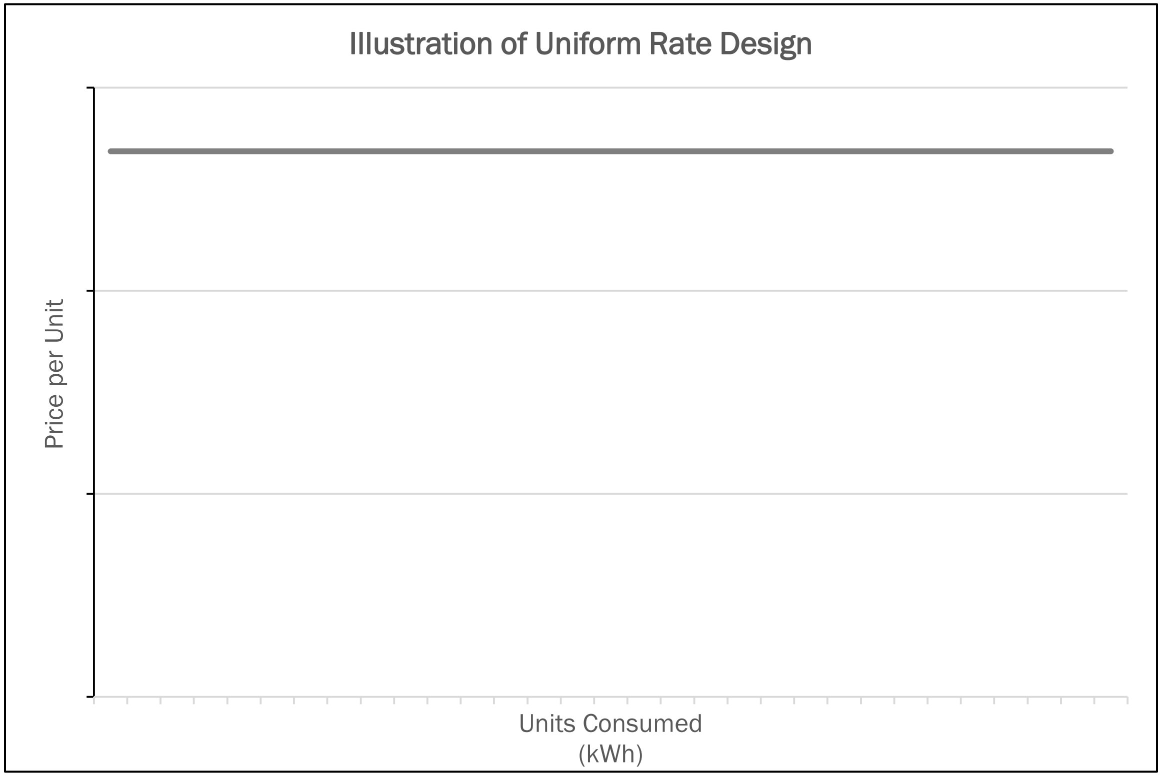


Rates Effective April 16, 2017.

Uniform Rate: Description & Illustration

Description

Uniform rate design charges customers constant unit price for all metered units of power (kWh or kWh) consumed year-round for a customer class.



Uniform Rate: Advantages & Disadvantages

Advantages

- Simple to administer
- Does not require investment in AMI
- Encourages conservation
- Easily understood and accepted by public
- Meets affordability objective for low users

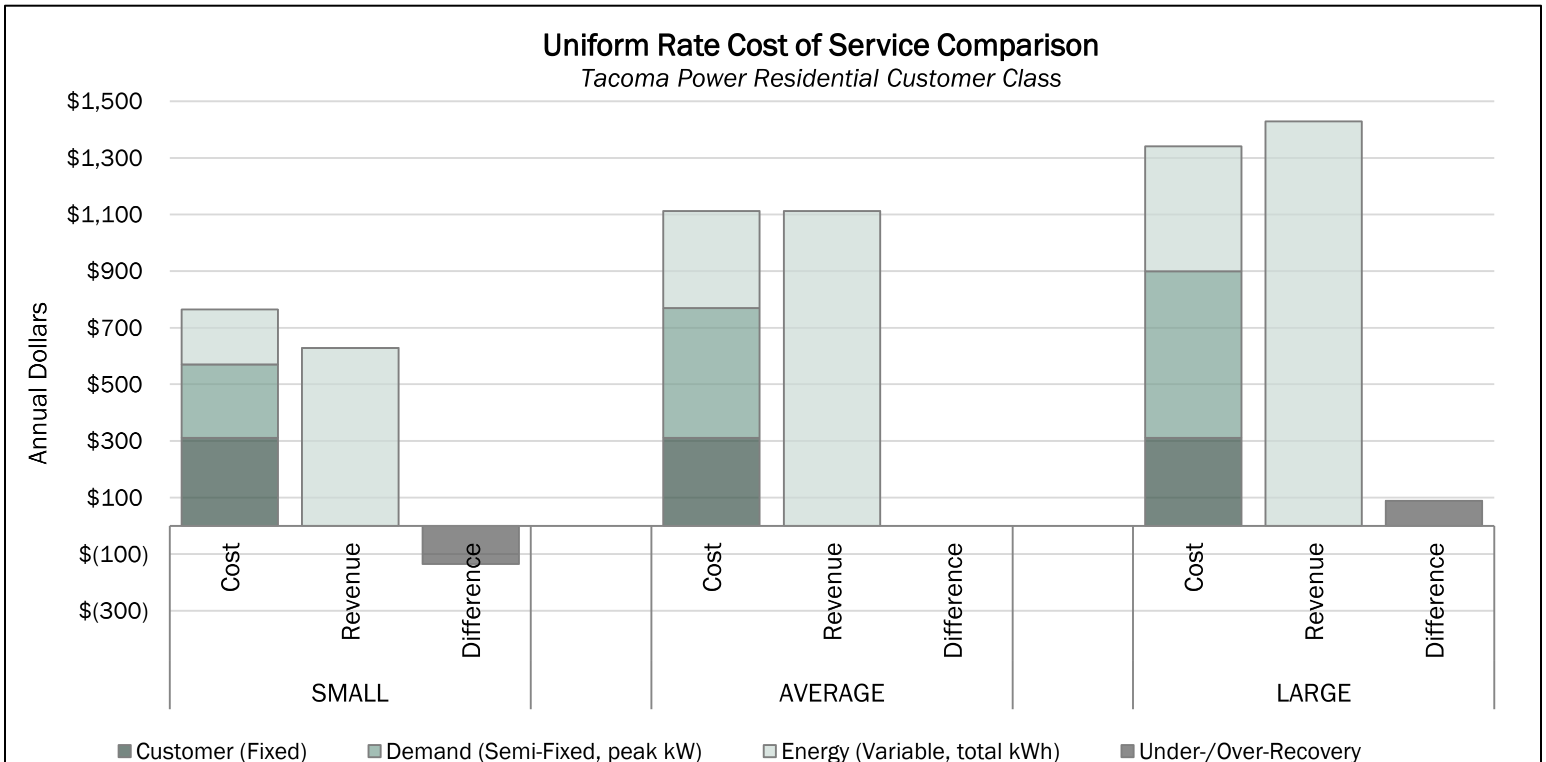
Disadvantages

- If uniform rate is set to recover some fixed costs as well as variable costs, risk to utility revenue recovery if customer load declines
- If uniform rate is higher than true variable cost-to-serve, discourages consumption of electricity that might have net social benefit (e.g. electric vehicle charging, space heating instead of wood stoves)
- Does not meet affordability objective for high users

Uniform Rate: Discussion

Alignment with Cost of Service

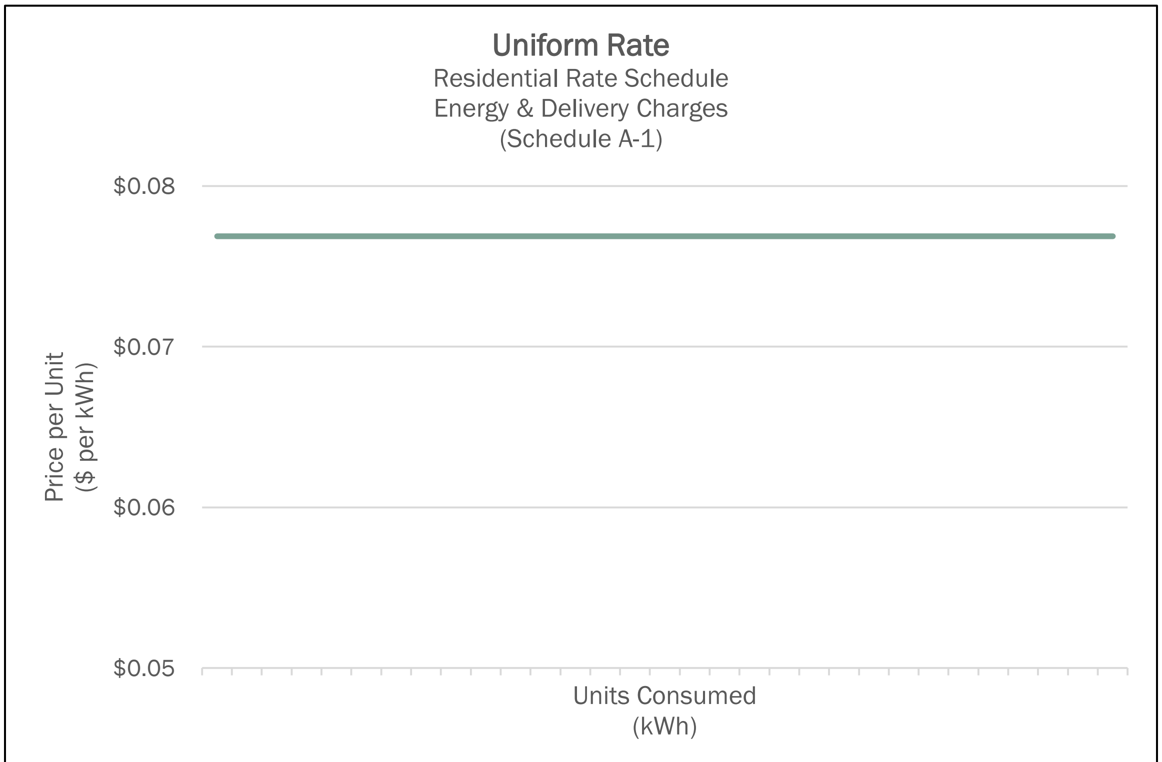
If Tacoma Power wanted to recover all residential costs through a uniform rate design, each customer would have to pay **$0.093455 per kWh**. Small consumers would pay less than their true cost to serve and large consumers would pay more than their true cost to serve.



Uniform Rate: Applications by Tacoma Power

Tacoma Power Rates Schedules

Tacoma Power applies a uniform rate design to the energy and delivery portions of its residential and small general customer classes. Residential customers currently pay **$0.076872 per kWh** ($0.079786 per kWh starting April 2018). Uniform rate charges are incurred **in addition to a $13.50 customer charge** ($16.50 starting April 2018).

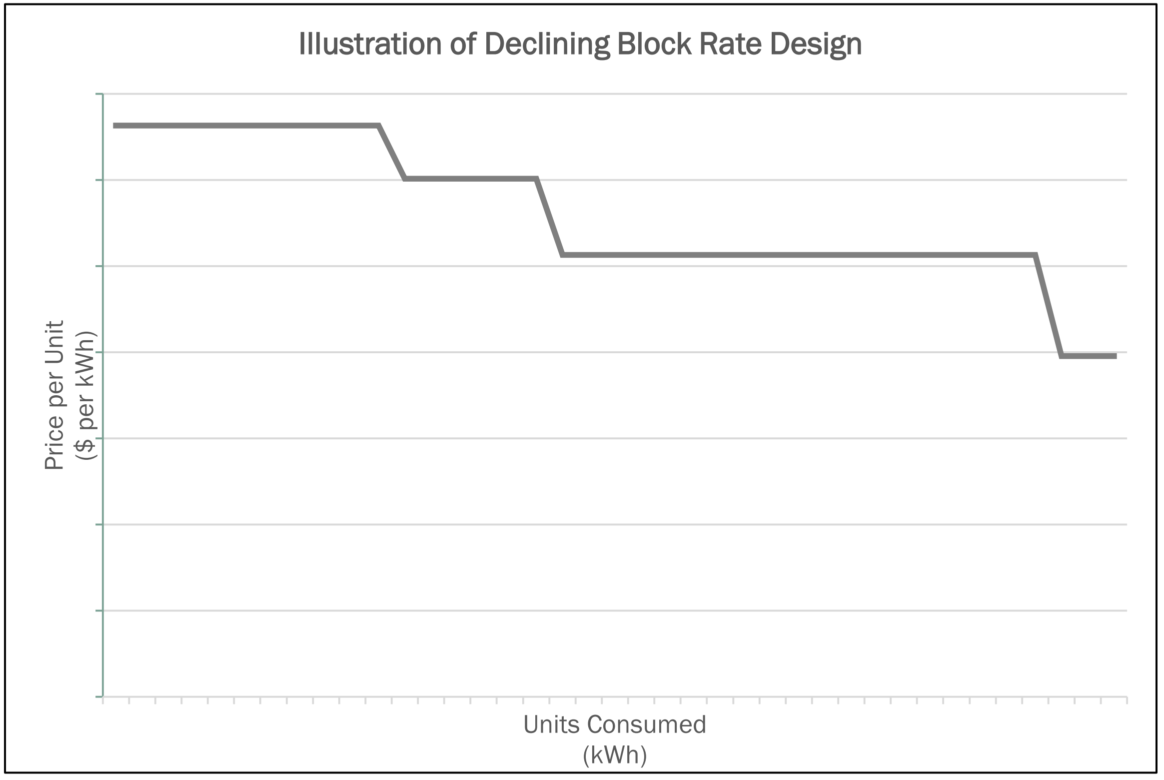


Rates Effective April 16, 2017.

Declining Block Rate: Description & Illustration

Description

Declining block rates charge customers a lower per unit rate as their usage increases within a billing cycle. Declining block rate designs vary in the number, width, and price differential height of blocks.



Declining Block Rate: Advantages & Disadvantages

Advantages

- Recognizes that some costs decrease on a unit basis, as usage increases
- Often reflects actual cost to serve due to economies of scale
- Does not require investment in AMI
- Simple to understand

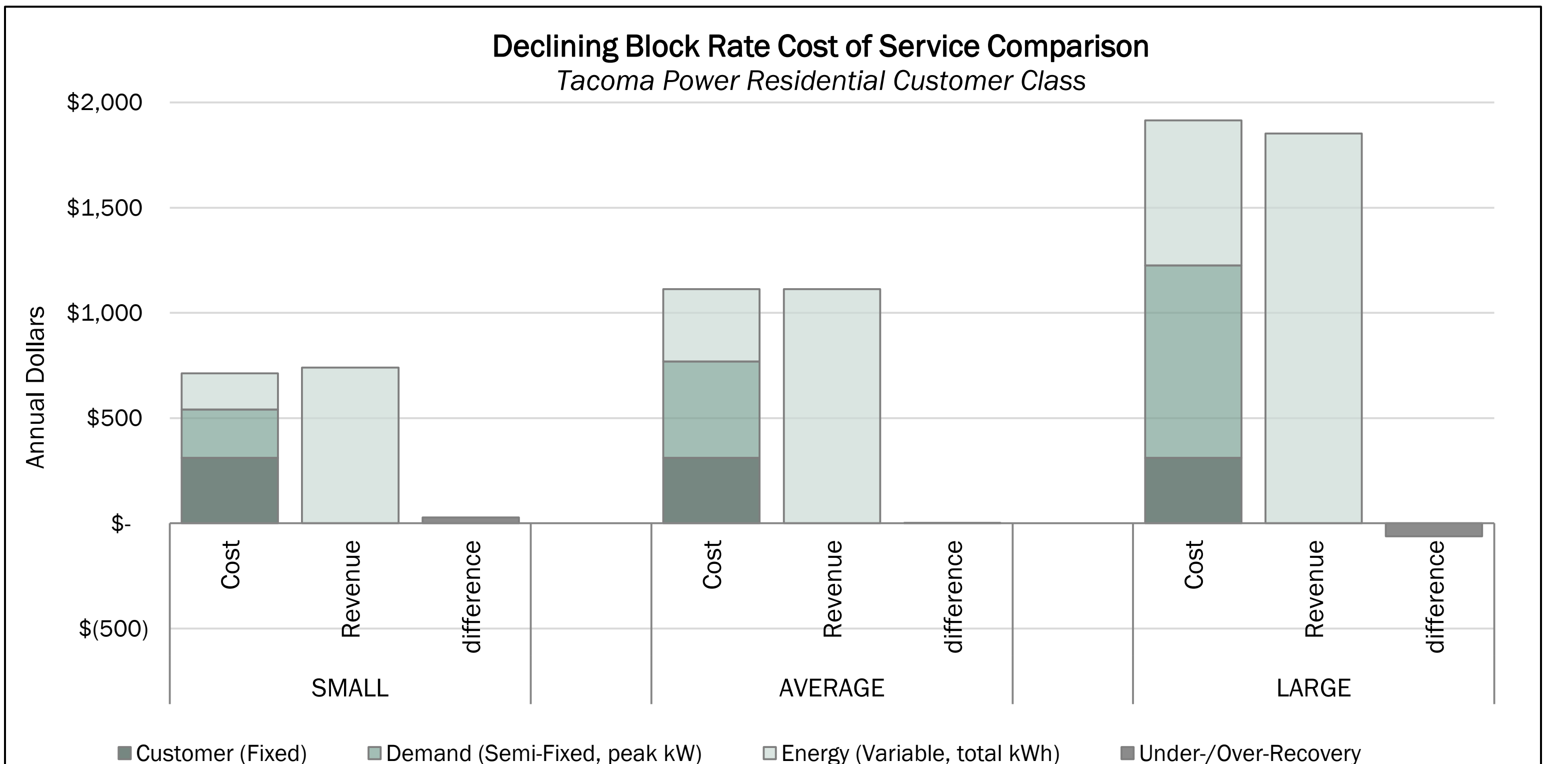
Disadvantages

- Discriminates against users with a high load factor and low volume; favors high-volume users even if load factor is low . Load factor is a measure of the “flatness of a load”, high load factors are generally easier/cheaper for the utility to serve.
- Could encourage unnecessary or wasteful use to obtain a lower average cost
- Discourages conservation
- Negative perception by many members of public, even when the completely justified by cost-of-service analysis

Declining Block Rate: Discussion

Alignment with Cost of Service

Under one application, Tacoma Power might recover residential costs through a **First Tier rate of $0.124283 per kWh and Second Tier rate of $0.06214 per kWh**. Small consumers would pay more than their true cost to serve and large consumers would pay less than their true cost to serve.



Assumptions: First Tier 0-500 kWh | Second Tier 500+ kWh.

Declining Block Rate: Applications by Tacoma Power

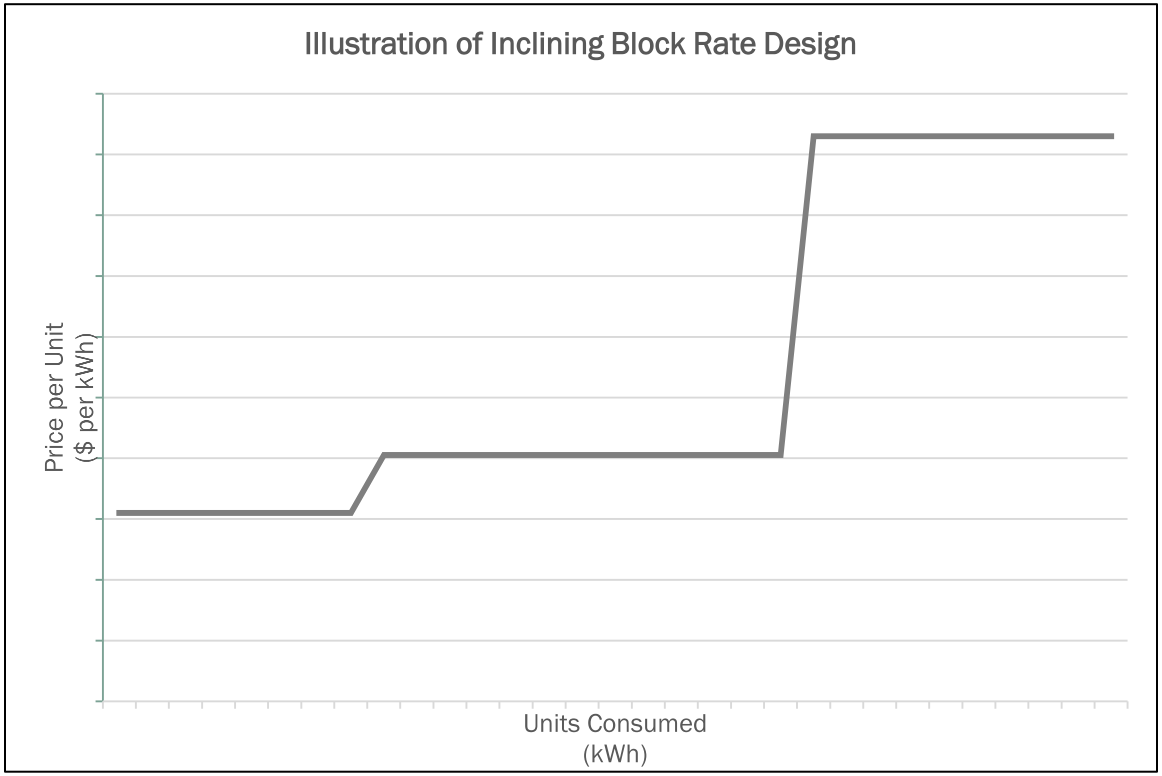
Tacoma Power Rate Schedules

In the past, Tacoma Power offered declining block rates (pre-1970 through 1983) as well as a rate discount for a customer's conversion to electric heat ("all-electric home discount").

Inclining Block Rate: Description & Illustration

Description

An inclining block rate structure is designed to charge customers a higher per unit rate as their usage increases over defined “blocks” within a billing cycle. Inclining block rate designs vary in the number, width, and price differential of blocks.



Inclining Block Rate: Advantages & Disadvantages

Advantages

- Encourages conservation if customers understand rate design
- Does not require investment in AMI
- Meets affordability objective for low users

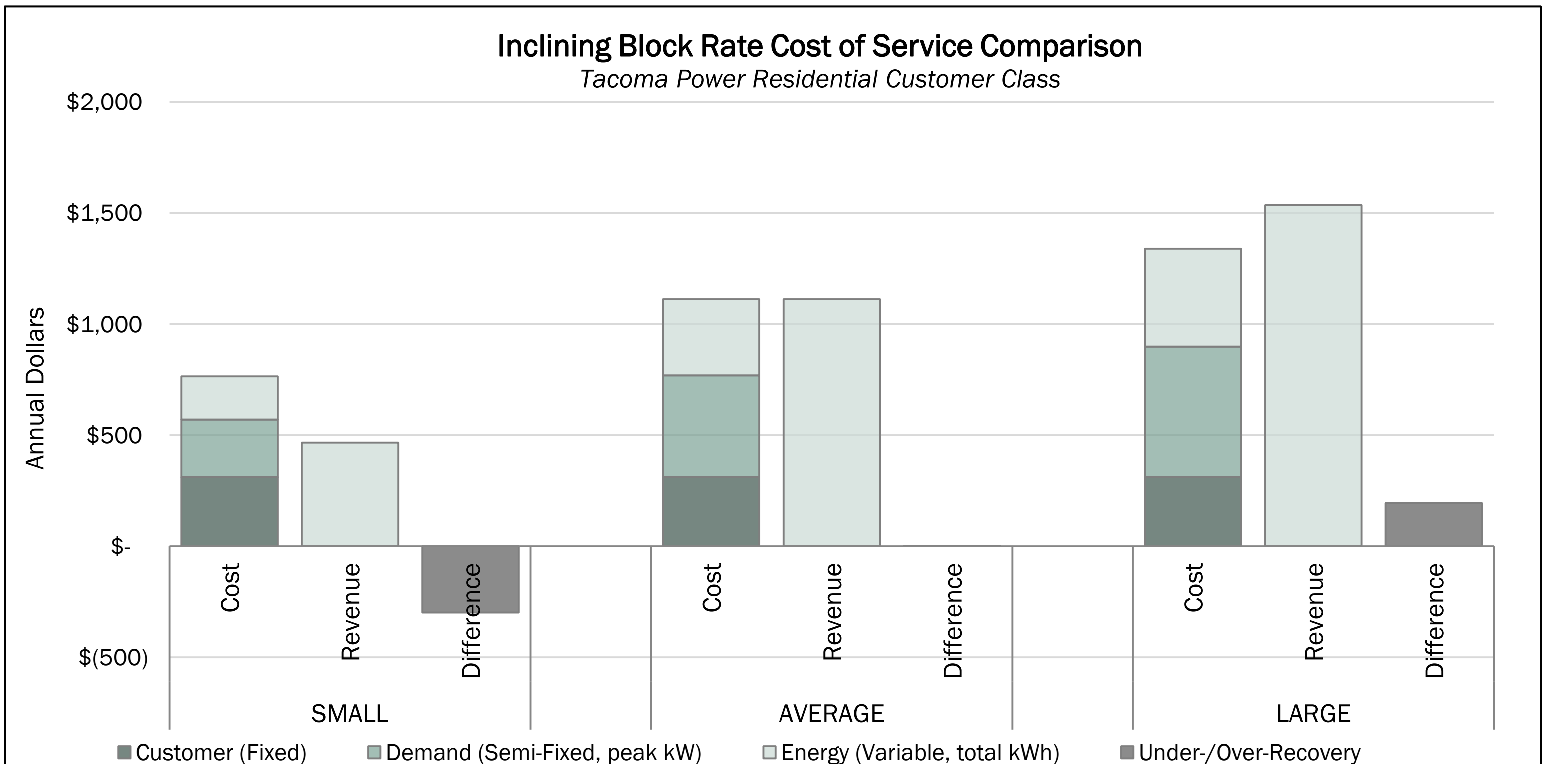
Disadvantages

- More complex and difficult for customers to understand
- If customers do not possess the ability to access their consumption data throughout the billing cycle, they will be unable to adjust consumption to avoid higher block rate
- If high-block rate is greater than true variable cost-to-serve, discourages consumption of electricity that might have net social benefit (e.g. electric vehicle charging, space heating instead of wood stoves)
- Does not meet affordability objective for high users

Inclining Block Rate: Discussion

Alignment with Cost of Service

Under one plausible scenario, Tacoma Power could recover its residential costs through a **First Tier rate of $0.062467 per kWh and Second Tier rate of $0.12493 per kWh.** Small consumers would pay less than their true cost to serve and large consumers would pay more than their true cost to serve.

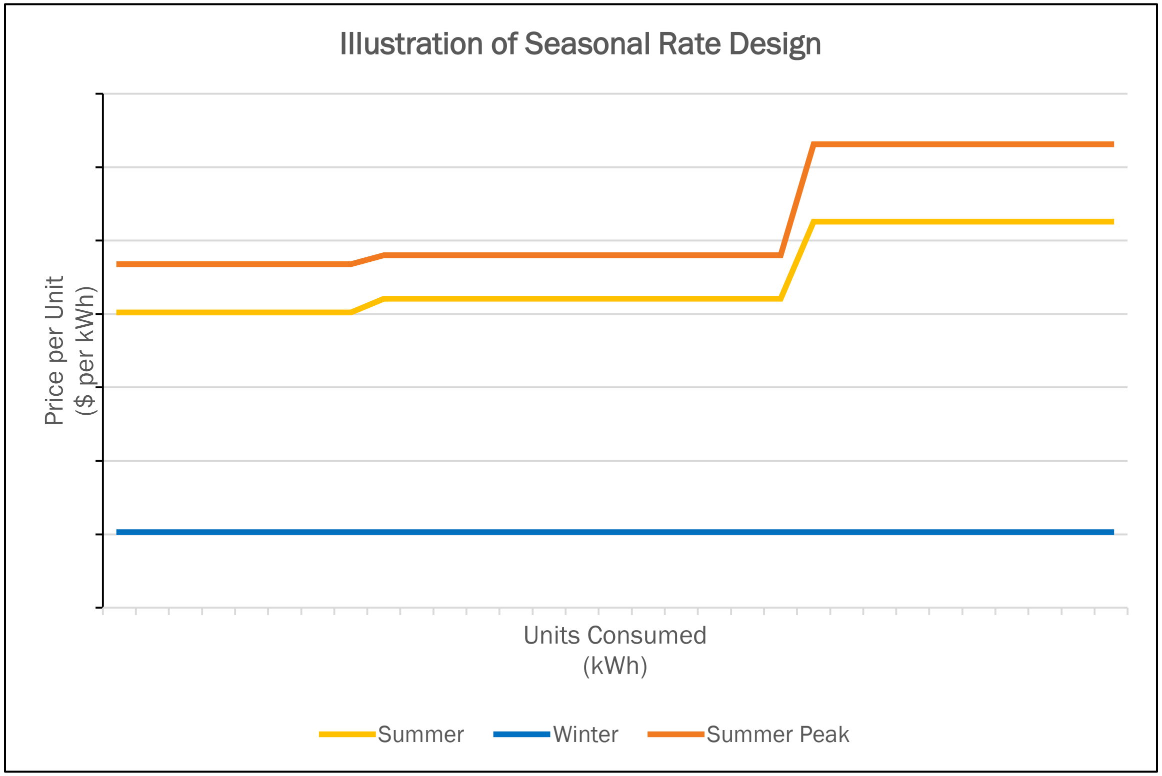


Assumptions: First Tier 0-500 kWh | Second Tier 500+ kWh.

Seasonal Rate: Description & Illustration

Description

Seasonal rates are designed to recognize differences in a utility's cost of service across different seasons. Higher prices are charged over peak seasons and lower prices are charged over off-peak seasons. Seasonal rate designs vary in the number, length, and rate design of seasons.



Seasonal Rate: Advantages & Disadvantages

Advantages

- Easily understood and accepted by public
- Incentivizes conservation during peak season(s)
- May increase customer savings if customer acts in response to price signal via conservation or load shifting

Disadvantages

- Requires a meter capable of measuring the month of a customer's consumption or monthly meter reading
- Harmful to customers whose non-discretionary load aligns with peak season(s)
- Education program required during transition from non-seasonal rates, so customers are aware of new peak seasons

Seasonal Rate: Discussion

Alignment with Cost of Service

A seasonal rate design's alignment with the cost of service depends on the number, length, and rate design of each season. Existing metering infrastructure and bi-monthly meter-reading practices limit Tacoma Power's ability to assess the impact of any plausible seasonal rate design.

Assumptions: First Tier 0-500 kWh | Second Tier 500+ kWh.

Seasonal Rate: Applications by Tacoma Power

Tacoma Power Rate Schedules

Tacoma Power offered seasonal rates from 1983 to 1988. More recently, Tacoma Power investigated seasonal rate design and found it unsupported by the current cost-of-service analysis.

Tacoma Power Rate Design, Part I:

Carbon Impacts of Rate Design

Section 9.3

Tacoma Power Rate Design, Part I:

Carbon Impacts of Rate Design

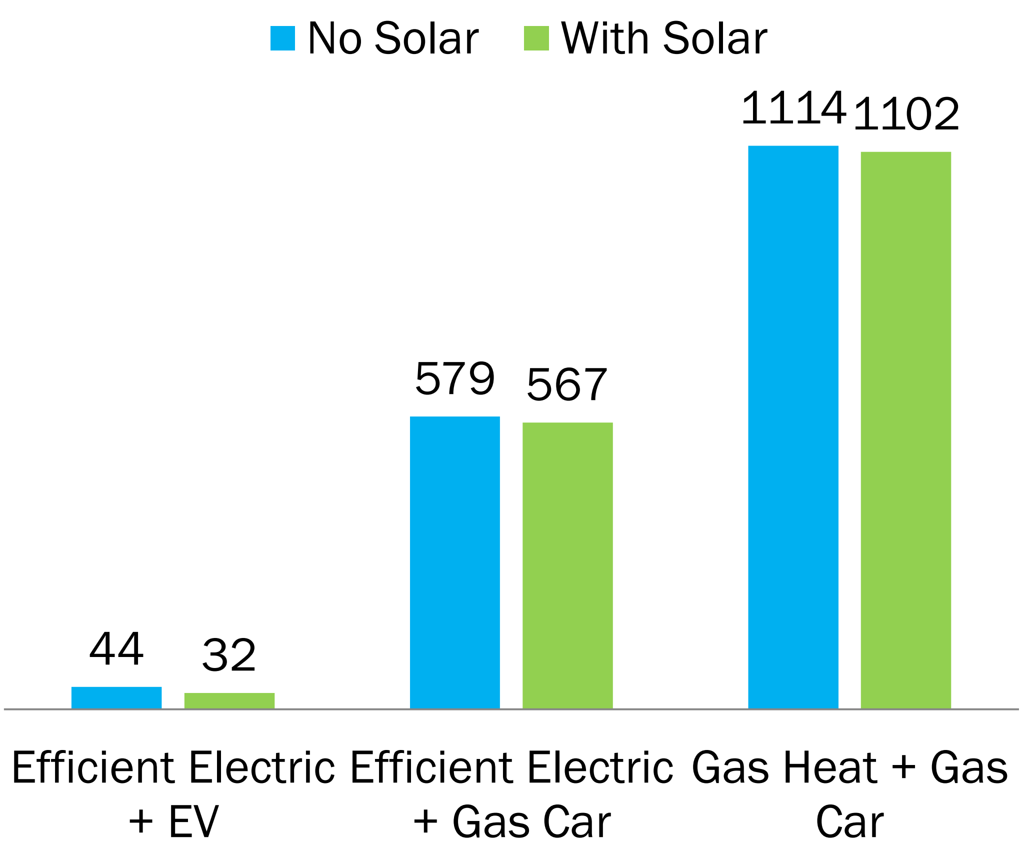
Introductory Facts

Section 9.3.a

Carbon Impacts of Household Choices

Tacoma Household CO2 Emissions

(Pounds per month)



Electrification of household appliances and vehicles provides the greatest amount of carbon reduction.

A Tacoma home with natural gas heat and a gas-powered car emits 25 times more than an all-electric Tacoma home.

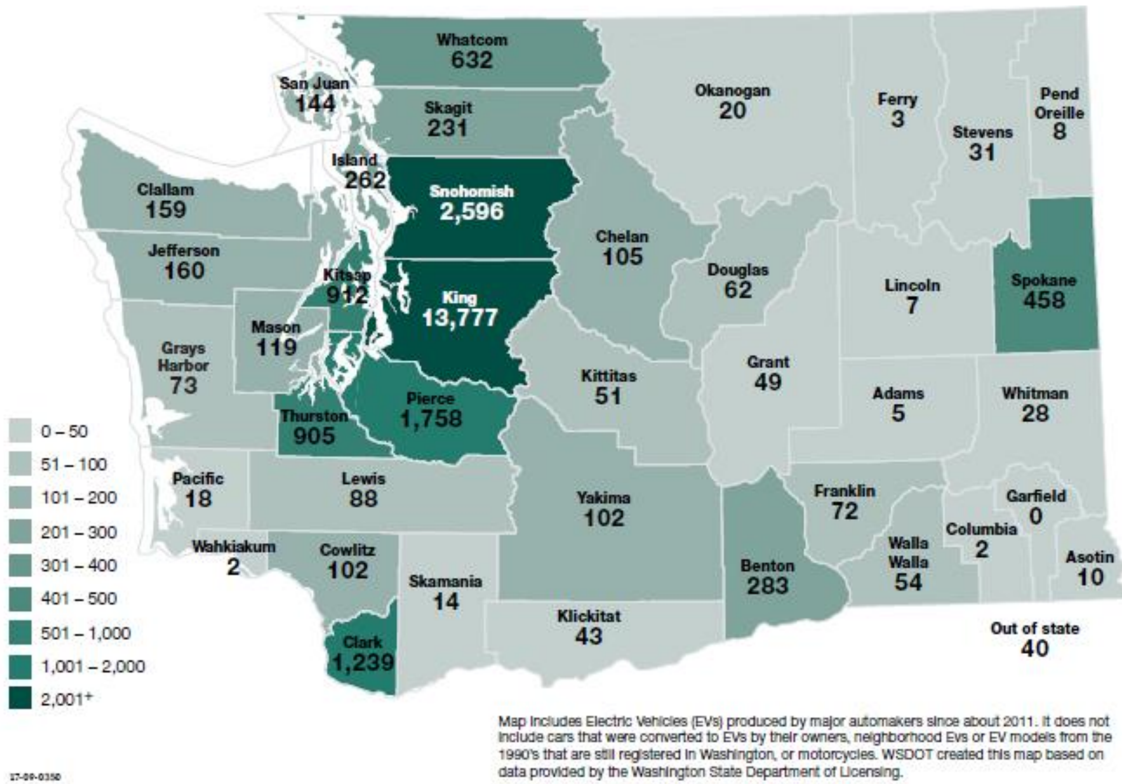
The impact of solar is most meaningful in an all-electric home. Adding solar to a household with efficient electric heat and an electric vehicle reduces emissions 27% (44 lbs/month to 32 lbs/month). For a household with gas heat and a gasoline car, the reduction is only 1.1% (1114 lbs/month to 1102 lbs/month).

Carbon Impacts of Household Choices

Popularity of electric vehicles is increasing.

Plug-In Electric Vehicles Registered in Washington

As of June 30, 2017: 24,624 Registered PEVs



Electrification of transportation is increasing in Washington.

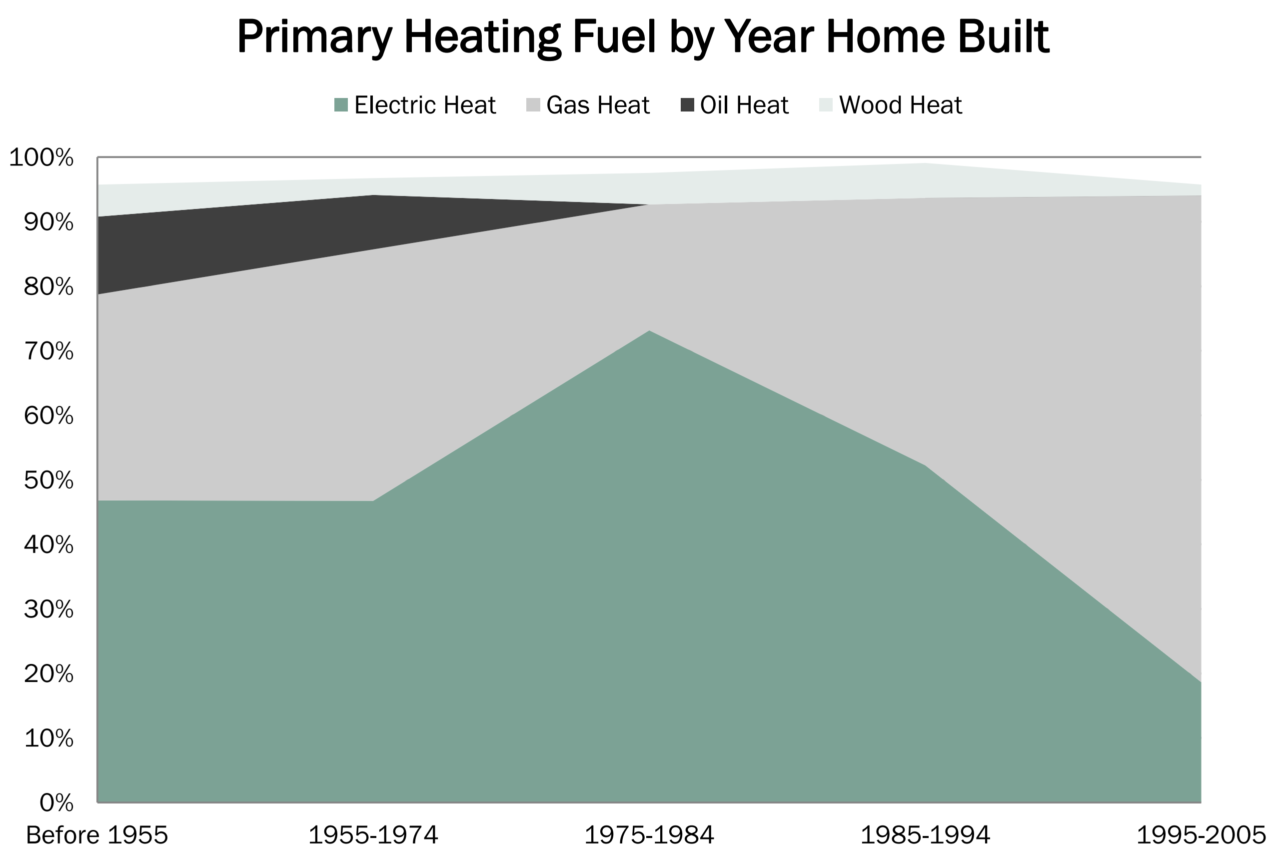
There were **twice** as many electric vehicles in **Washington** in 2017 as there were in 2014.

There were nearly **3 times** as many electric vehicles in **Pierce County** in 2017 as there were in 2014.

Source: http://www.westcoastgreenhighway.com/pdfs/Map_WAEVRegistrationByCounty.pdf

Carbon Impacts of Household Choices

Gas heat has become the fuel of choice for many new homes.



Electrification of housing is decreasing in the service territory.

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

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

Based on data from 2005 Tacoma Power building stock survey

Tacoma Power Rate Design, Part I:

Carbon Impacts of Rate Design

Rate Design and Price Signals

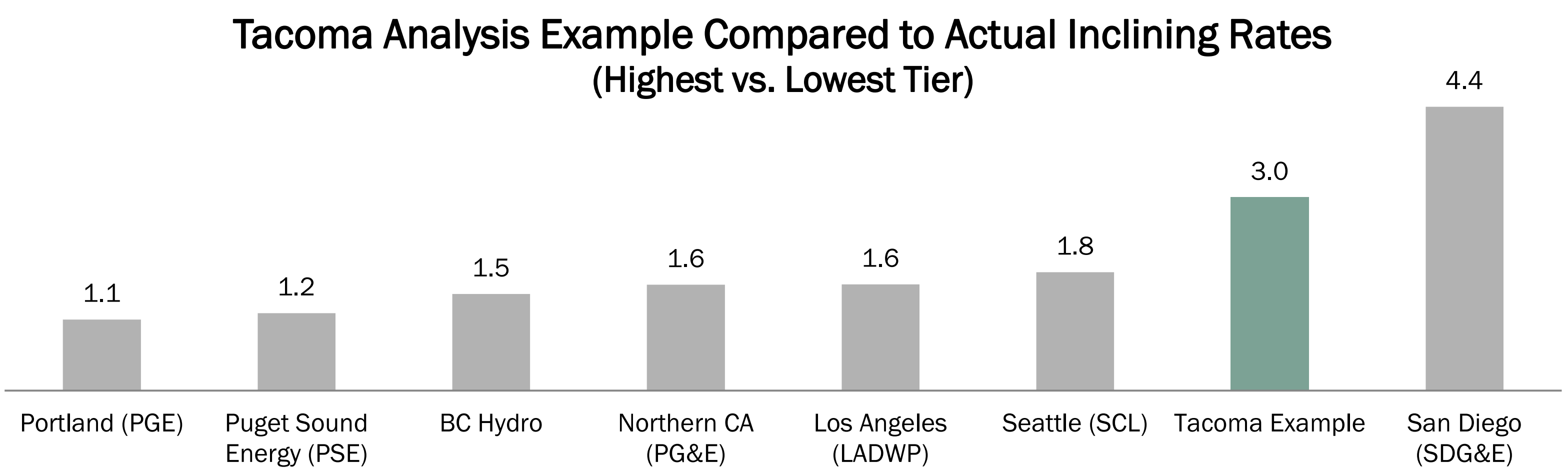
Section 9.3.b

Inclining Block Rate Example

Assumptions

Inclining block structures vary widely in number of blocks and differential between blocks. Tacoma Power constructed a inclining block rate equivalent to the 2017 residential rate for this exercise.

In this example, the highest tier is 3 times the lowest tier. This differential is comparable with other utilities with inclining block rates.



Inclining Block Rate Example

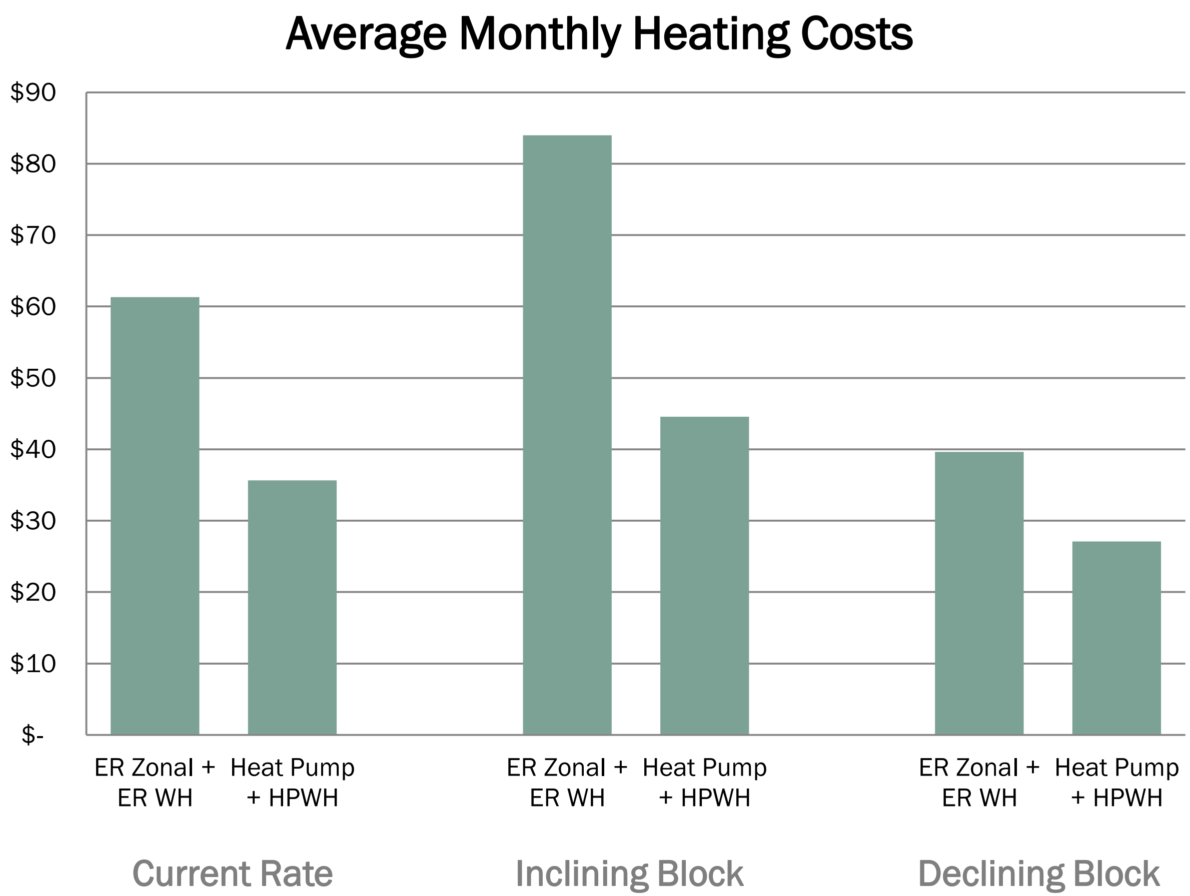
Assumptions

Inclining block structures vary widely in number of blocks and differential between blocks. Tacoma Power constructed a inclining block rate equivalent to the 2017 residential rate for this exercise.

In this example, second tier charges begin at 500 kWh.
This is a common cutoff point.

	Current	Inclining	Declining
Fixed Customer Charge	$13.50	$13.50	$13.50
Tier 1 Variable Charge (per kWh)	$0.077	$0.039	$0.113
Tier 2 Variable Charge (per kWh)	n/a	$0.118	$0.038
Tier 2 Threshold	n/a	500 kWh	500 kWh
Tier 2/Tier 1 Ratio (Tier 2 ÷ Tier 1)	n/a	3	0.33

Conservation Decisions

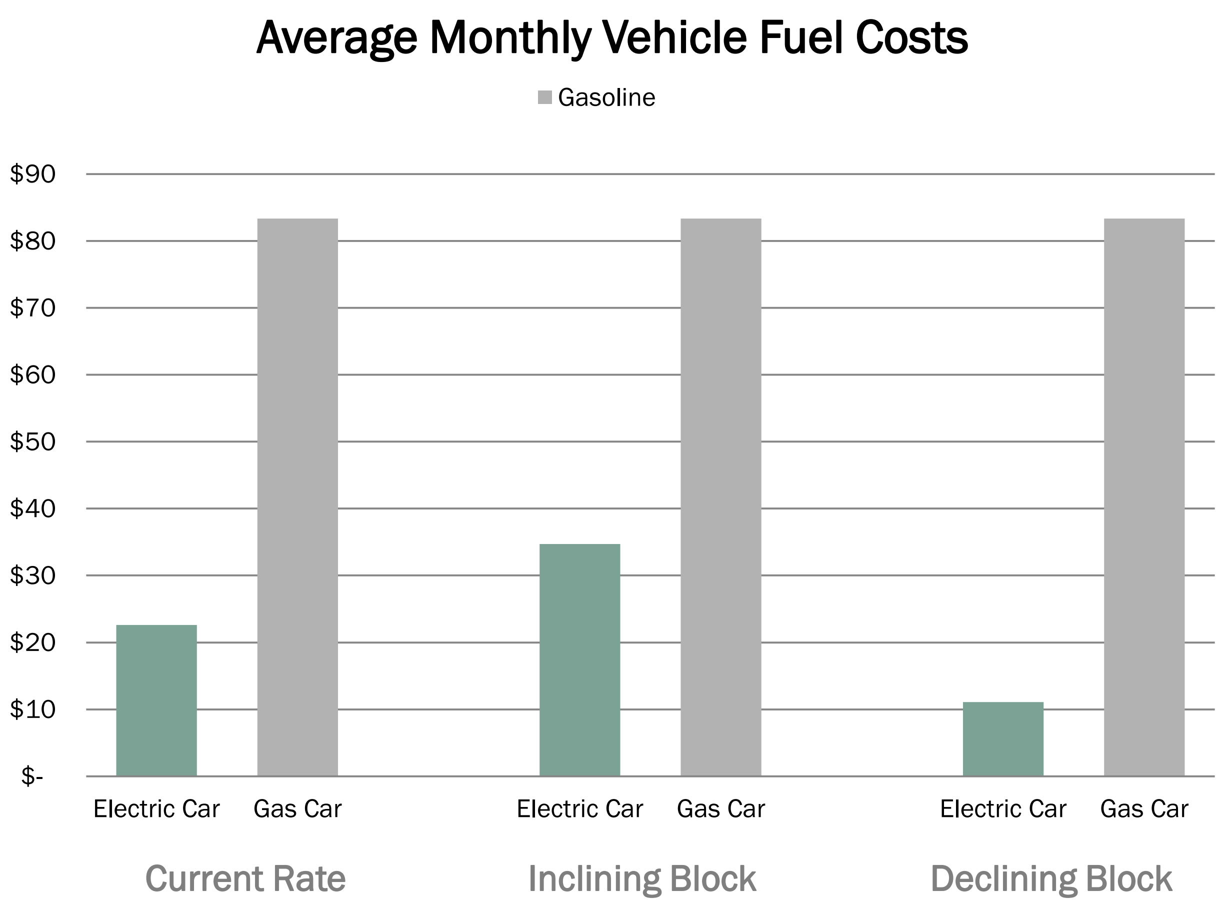


Switching from an inefficient zonal heating system to an efficient heat pump system reduces carbon emissions by about 200 pounds per year.

Even under Tacoma Power's current rate structure, there is a strong incentive for conservation. Inefficient systems cost nearly twice as much per month.

Inclining block rates would increase the economic incentive even further.

Vehicle Fuel Choice

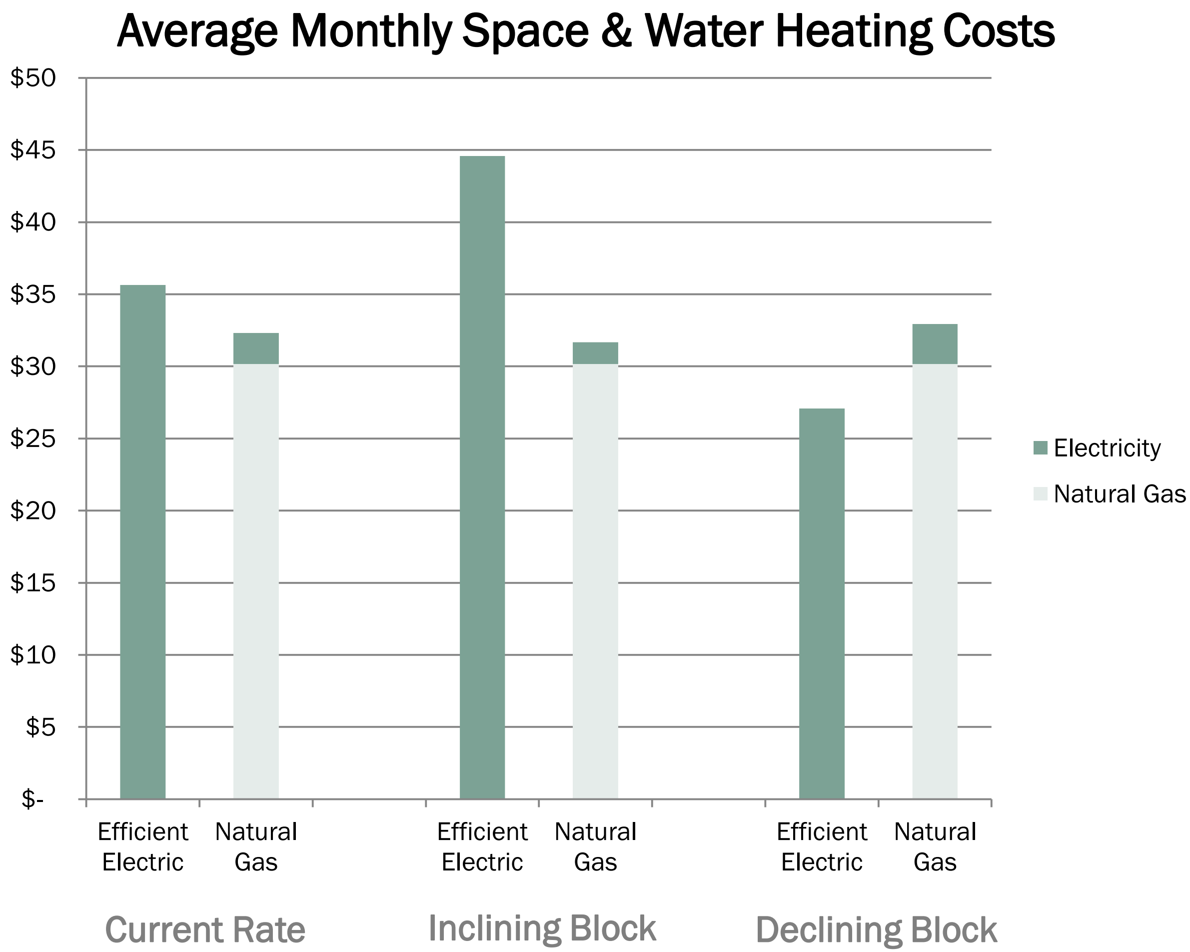


Switching from an inefficient gasoline-powered car to an electric car reduces carbon emissions by about 6400 pounds per year.

Under Tacoma Power's current rate structure, there is a strong incentive for electric vehicles. Power for EVs costs around one-quarter the cost of gasoline to power a traditional car.

Inclining block rates would decrease the fuel cost incentive by around half. However, electric fuel costs would still be lower than gasoline costs.

Heating Fuel Choice



Switching from efficient natural-gas heaters to efficient electric heaters reduces carbon emissions by about 6400 pounds per year.

Under Tacoma Power's current rate structure, there is a not an economic incentive to chose electric. Natural gas heaters cost about 10% less.

Inclining block rates would further discourage heater electrification. Electric heat would become about 30% more expensive than natural gas.

Gas costs assume customer would not otherwise have gas service, and gas fixed charge is included in costs.
Differential in costs is larger when customer already has natural gas service (e.g. for cooking, gas fireplace, etc.)

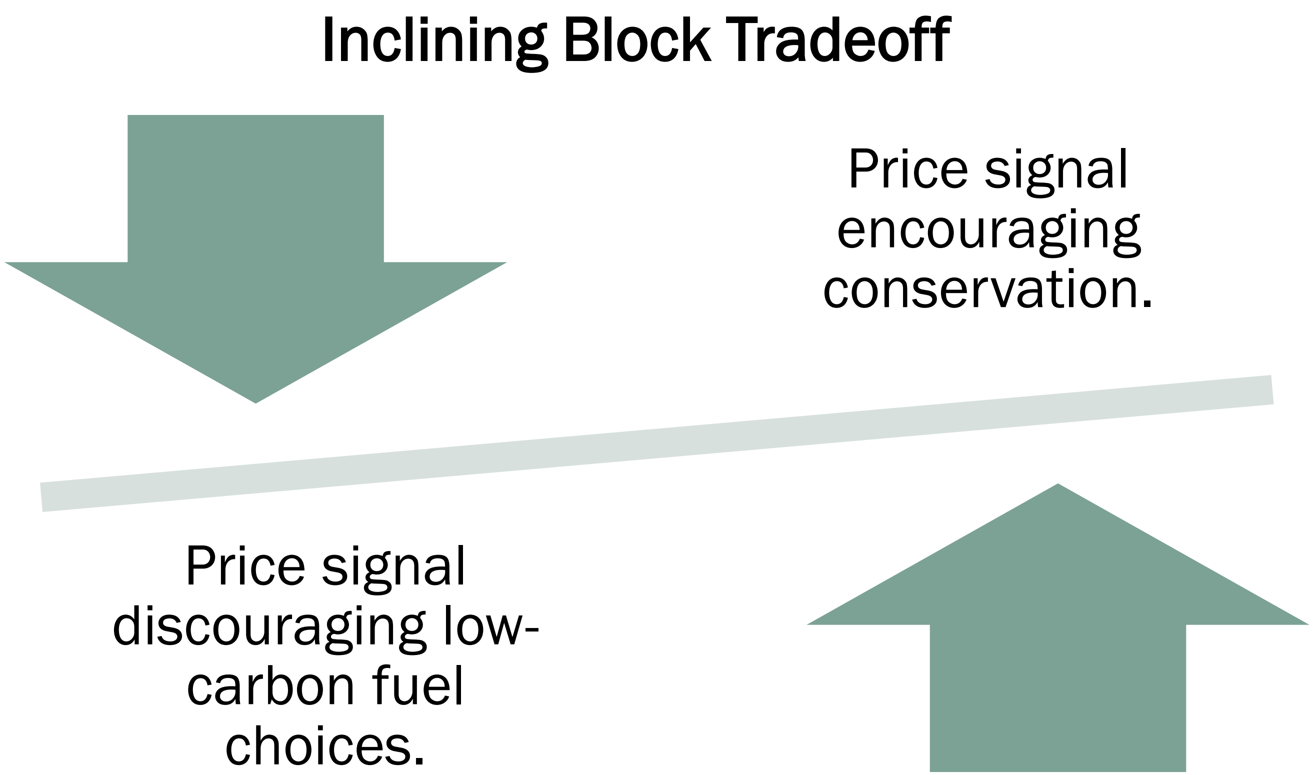
Tacoma Power Rate Design, Part I:

Carbon Impacts of Rate Design

Summing Up

Section 9.3.c

Rate design is full of tradeoffs.



Tacoma Power Rate Design, Part I:

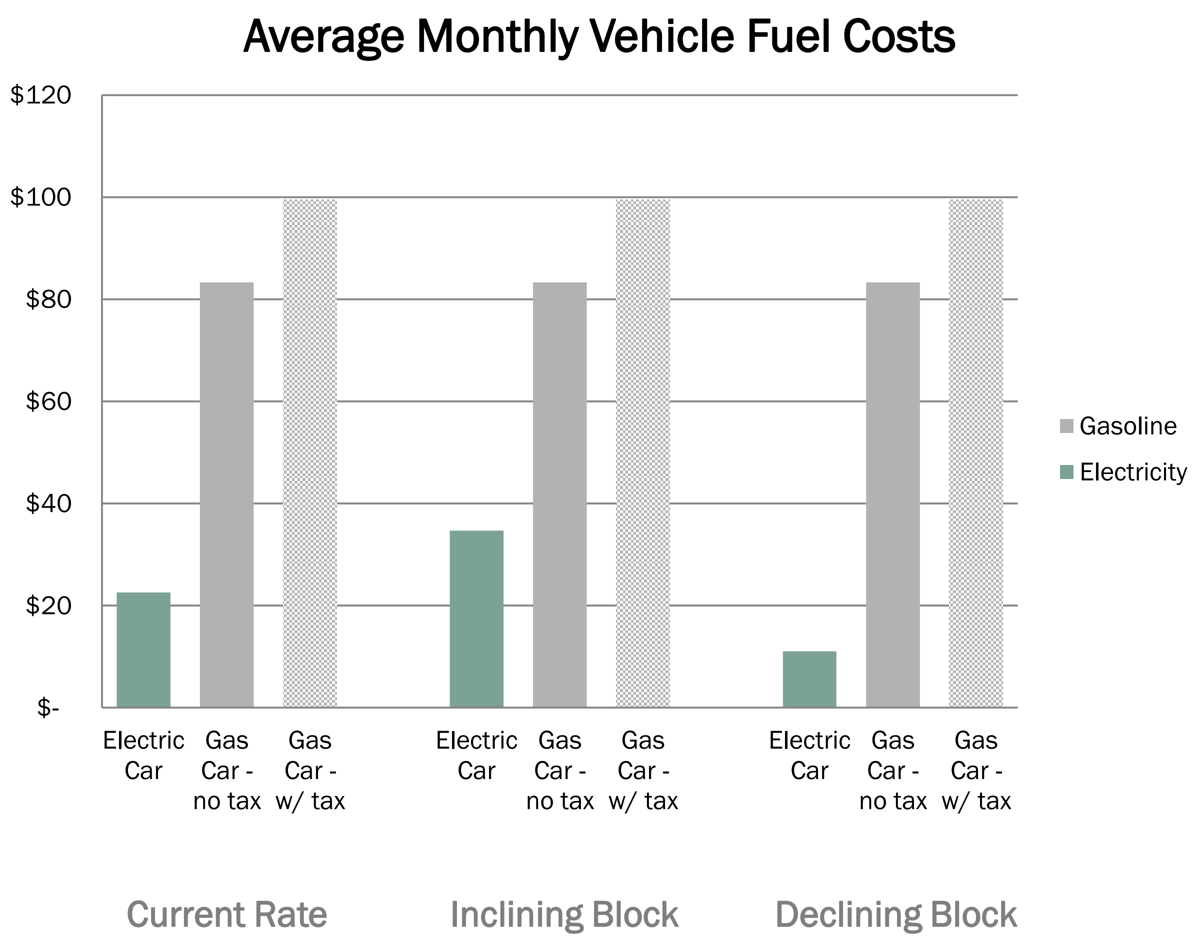
Carbon Impacts of Rate Design

Interaction with Carbon Tax

Section 9.3.d

Accounting for Carbon Tax in Vehicle Fuel Choice

The impact of a carbon tax varies greatly depending on the specifics of the tax.

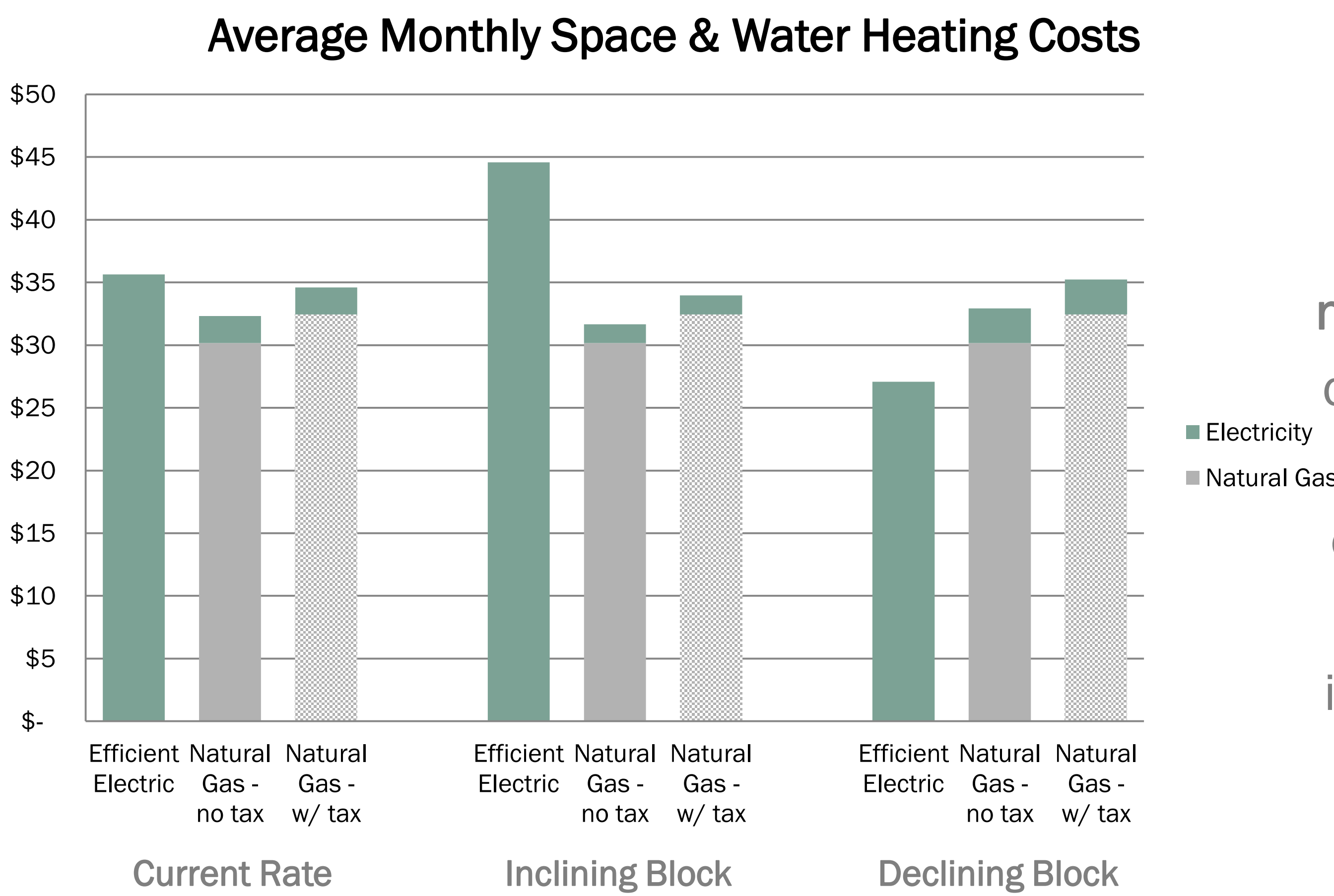


A tax of $24 per ton **would remove** the disincentive to **vehicle electrification** caused by an inclining block rate.

Assumption: Carbon tax of $24 per ton

Accounting for Carbon Tax in Heating Fuel Choice

The impact of a carbon tax varies greatly depending on the specifics of the tax.



A tax of $24 per ton **would not remove** the disincentive to **heater electrification** caused by an inclining block rate.

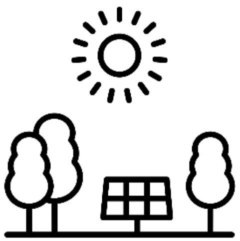
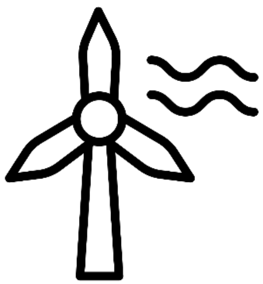
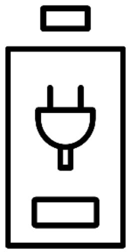
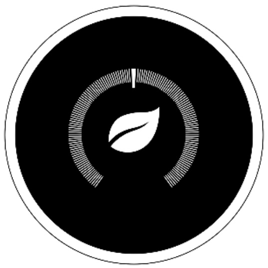
Assumption: Carbon tax of $24 per ton

Tacoma Power Rate Design, Part I:

Distributed Energy Resource Considerations

Section 9.4

What are Distributed Energy Resources?

A DER is a **resource sited close to customers** that can provide all or some of their immediate electric and power needs, and can also be used to provide electricity supply to the distribution grid. The resources are **small in scale, connected to the distribution system, and close to load**.

Examples of different types of DER include solar photovoltaic (PV) generation, wind generation, combined heat and power systems (CHP, also known as cogeneration), energy storage systems, and microgrids.

Distributed Energy Resources are **also known as Distributed Generation (DG)**.

Why does Tacoma Power care about DER?

Safety

Traditionally, **protection and control devices** are engineered and installed on the system **assuming a known flow of power in one direction.** Electricity variables such as voltage and current change in predictable ways as energy moves further away from the generator. As DER resources are added to the system, reducing expected load or even putting energy back onto the grid, these variables become less predictable. Additional safety equipment is needed all along the line, which increases distribution system cost.

Cost Recovery

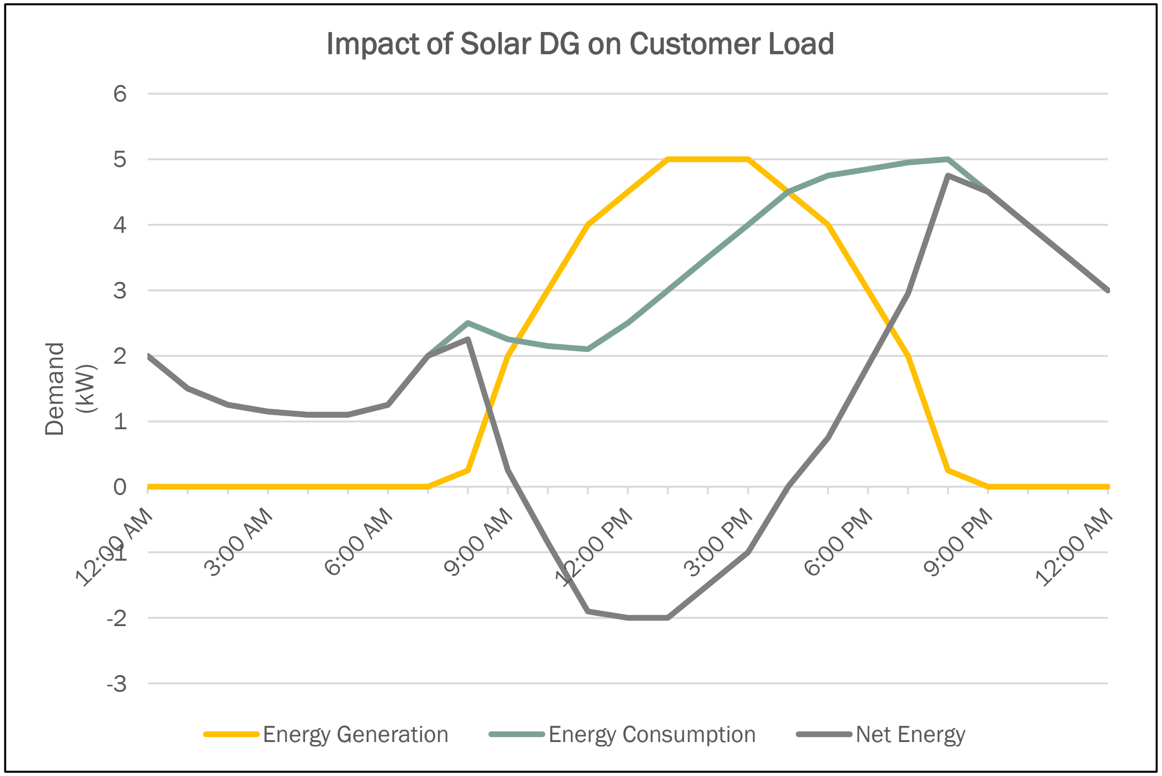
Most customer-owned DER systems only produce power part of the day or year. **The utility must provide power during other times** (at night for solar photovoltaic systems, for example). This requires the **utility to provide the same fixed transmission and distribution infrastructure to the DER customer as to a traditional customer.** If the utility relies on volumetric (energy/kWh) charges to recover transmission and distribution infrastructure costs, then the utility will recover less than the cost to serve the DER customer.

Electric Load Pattern for DER Customers

The nature of load reduction caused by DER is illustrated in this graph of a traditional Full Requirements Customer and a DER (solar PV) Partial Requirements Customer.

Between Hour 8 (8:00 am) and Hour 19 (7:00 pm), the Full Requirements Customer load drops substantially. The **utility avoids any energy-related costs** that would otherwise be needed to serve that customer. However, **the peak load** (Hour 21, 9:00 pm) **is the same** for the Full Requirements Customer and the Partial Requirements Customer.

Therefore, the utility must provide the **same transmission and distribution infrastructure (demand-related costs) to both customers.**



Net Energy Metering: Description

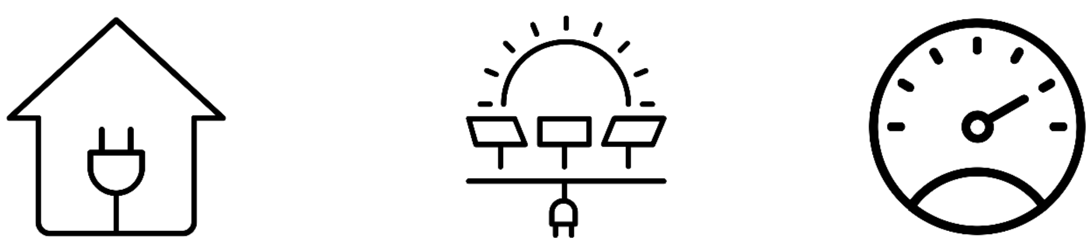
Description

Net Energy Metering (NEM) is a tariff which bills a DER customer based on the difference between the amount of energy the customer generates and the amount of energy a customer consumes **over a standard billing period** (usually one or two months).

If the customer generates more electricity than consumed during the billing period, then the customer receives a "bill credit" for the net excess generation. The customer receives the **full retail rate for the net energy** returned to the grid.

If the customer generates less electricity than consumed during the billing period, then the customer must pay the net energy consumed at the full retail rate.

No adjustments are made to account for customer consumption and generation patterns within a billing period. For example, imagine the case of customer with a solar PV system. **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.** This is despite the fact that the customer did use the utility's generation, transmission, and distribution grid each day.



$$Energy\ Consumed\ -\ Energy\ Generated\ = Net\ Energy$$

Net Energy Metering: Advantages & Disadvantages

Advantages

- Convenient for the customer to generate energy when able and to consume energy when desired; no need for customer to balance own load and own generation
- Utilities are not required to purchase or generate the energy the customers generate and use for themselves
- Reduces system losses on power not transmitted long distances to customer

Disadvantages

- If utility retail rate design recovers fixed or demand costs in the variable energy charge , NEM allows DER customers to avoid paying the cost to serve them by reducing their energy consumption (kWh) without reducing their peak (kW). Recovery of these fixed or demand costs are shifted to other customers
- As a utility’s retail rates change, the compensation to the customer for DER under the NEM tariff changes. This has no necessary connection to changes in the value of the DER generation
- Does not account for time or locational differences in costs or value of energy
- Nonparticipants subsidize NEM participants
- Does not encourage customer to use less electric service overall

Board Reading Packet – NARUC Distributed Energy Resources Rate Design and Compensation

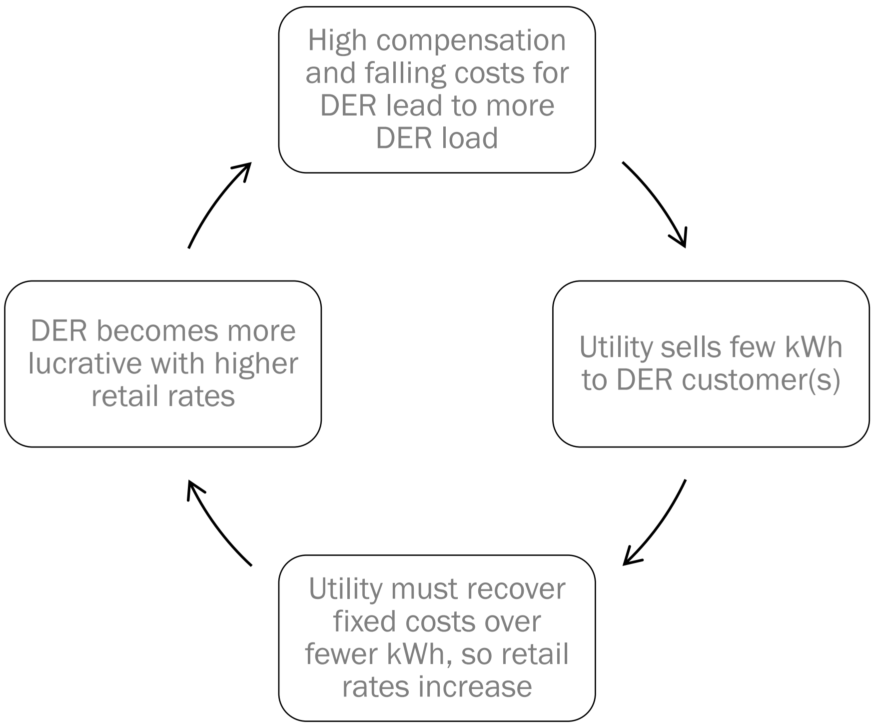
What is Fueling the Debate Today?

DER Adoption Rates are Increasing

- DER-favorable policies are adopted by both state and federal governments
- Improvements in DER technology
- Reduction in DER costs
- Public acceptance

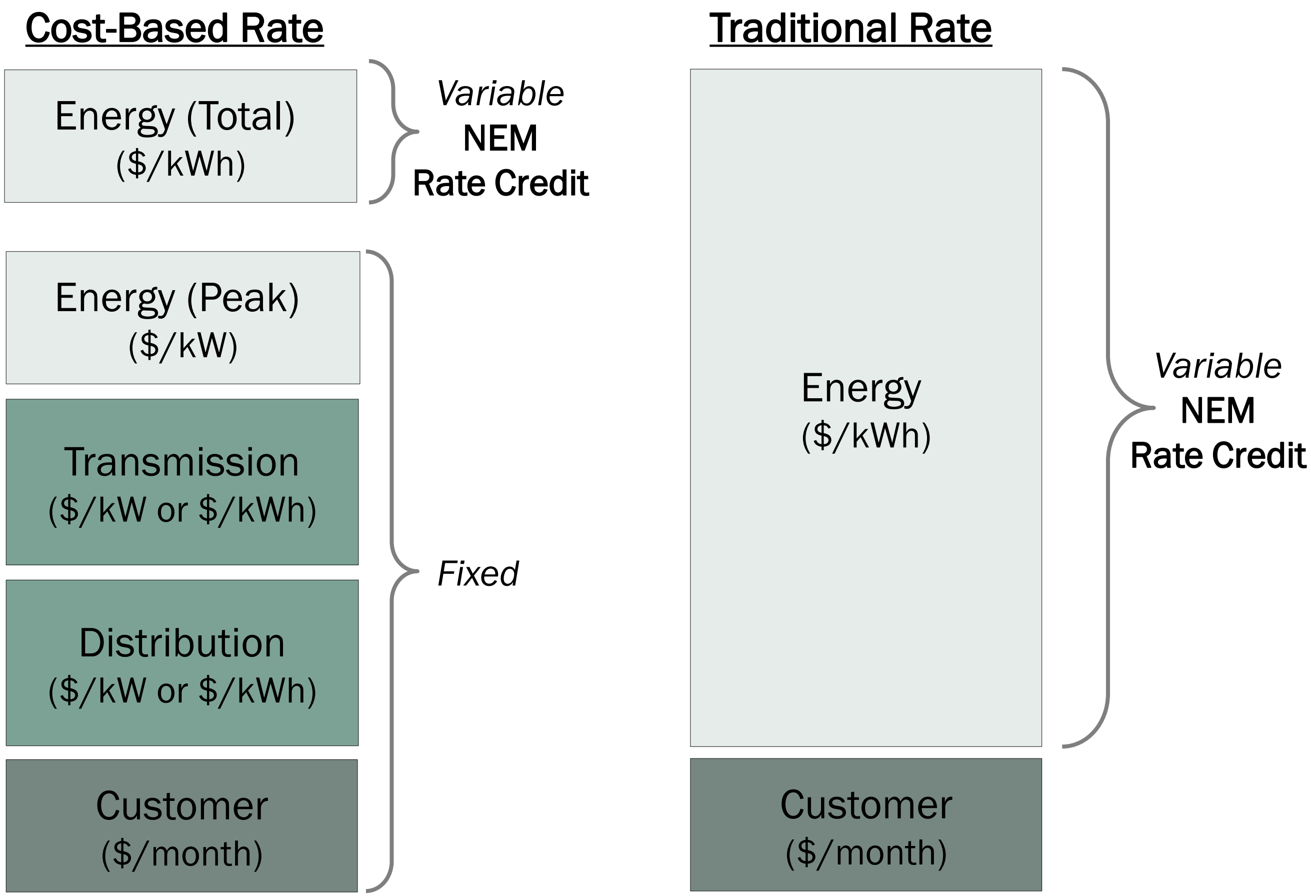
Traditional Utility Service is Changing

- Decreasing energy sales and increasing infrastructure investments require rate increase
- Some utilities are concerned about the potential "death spiral"



Retail Rate Design Drives NEM Debate

Retail rate design—not net energy metering—is the real issue. Cost impacts within a customer class will occur whenever the rate design does not reflect the underlying cost of service.



Retail Rate Design Drives NEM Debate

When rate design does not reflect cost-of-service results, cross-subsidization occurs.

When the value of DER is less than retail rate compensation…
Other utility customers subsidize DER customers
Under-recovery of utility's fixed costs (1)
Upward pressure on utility retail rates

(1) Unless utility is allowed to collect additional revenue through revenue decoupling

When the value of DER is greater than retail rate compensation…
DER customers subsidize other utility customers
Level of DER penetration is reduced
Investment capital may exit the market

Rate Reform Options for DER

Rate Design	Explanatory Comments
Demand Charge	A charge based on a customer's maximum kW demand over a pre-specified time period (maximum demand across all hours or during peak hours of the month)
Fixed Monthly Charge	A flat charge per month assessed to each customer regardless of the customer's load characteristics
Minimum Bill	Payment of a threshold amount each month even if the customer's computed monthly bill is less than the minimum amount
Capacity Charge	An additional charge to DER customer based on its installed capacity (the maximum generating capacity of the system)
DER Output Fee	An additional charge to DER customers based on the total amount of electricity they generate from DER resources
Connection Fee	A one-time fee assessed to DER customers to reflect the cost of the utility's distribution grid not recovered due to the current NEM rate design
Flattened Rate Structure	Higher retail rates increase the benefit of DER. Therefore, uniform or declining block rate structures, which have lower rates for the higher levels of consumption avoided by DER customers, avoid giving extra benefits to DER generators
Buy-Sell/"Value of Solar" Structure	DER customers pay for all electricity consumed at the utility's full retail rate; separately compensated for electricity generated at the "value" of the electricity
Time-Varying Rates	Raise electric rates at the times at which production or market prices are highest in order to reward DER generation that occurs at useful times

Rate Reform Questions for DER

	Net Energy Metering (NEM) Tariff	"Value of DER" Tariff
How flexible is the tariff?	Choice of retail rate design and level mandates DER compensation.	Policymakers are flexible to design DER rates regardless of retail rate decisions.
What drives compensation?	Retail Rate Design: ▪ Traditional ▪ Three-Part ▪ TOU ▪ …et cetera	Studies on the value of the DER generation and the cost to customer of installation
How are rate levels set?	Retail rates are set after study of cost allocations and rate design for the class as a whole. DER costs are borne by all the customers in the class.	Customer receives value for energy, capacity, and other benefits DER provides the utility. The customer buys all power at normal retail rate, which reflects the cost to provide it.
How is the tariff administered?	DER customers are sorted into existing retail rate classes. A DER-only class may also be created.	Special Feed-In Tariff or Buy/Sell transaction

Calculating the Value of DER

Value Component	Computational Basis
Guaranteed Fuel Value	Cost of fuel which would have been needed to meet electric loads but was avoided due to DER resource contribution; this is zero or near zero for Tacoma Power, since hydropower "fuel" is free
Plant O&M Value	Cost of operation and maintenance which would have been needed but was avoided due to DER resource contribution
Generation Capacity Value	Cost of generation capital investment which would have been needed to meet load peaks but was avoided due to DER resource contribution
Avoided Transmission Capacity Cost	Cost of transmission services which would have been needed but was avoided due to DER resource contribution
Avoided Distribution Capacity Cost	Cost of distribution services which would have been needed but was avoided due to DER resource contribution
Avoided Environmental Compliance Cost	Cost to comply with environmental regulations and policy objectives when utility is responsible for generation

Tacoma Power Rate Design, Part I:

Open Access Transmission Tariff Update

Section 9.5

Overview

What is the Open Access Transmission Tariff (OATT)?

The Open Access Transmission Tariff is a charge for one utility to use another utility's transmission lines. Utilities regulated by the Federal Energy Regulatory Commission (FERC) are required to offer other utilities such access. Tacoma Power is not required to offer this service, but has chosen to do so as a "best practice".

Who purchases transmission under the OATT?

Two customers receive this service from Tacoma Power:

1. The Bonneville Power Administration (BPA)
2. Avangrid Renewables (sending WestRock's cogeneration facility production to California)

How much money is involved?

Total revenues amount to about $7 million per year.

Current Status

How did we develop the current OATT?

Transmission rates under the OATT were first adopted in 2012, using data from 2009.

Since 2009/2012, two large changes have occurred:

1. Transmission revenue requirements has increased from roughly $24 million to an estimated $34 million.
2. Additional data is available concerning how Tacoma Power uses its transmission system by virtue of operating a new Open Access Same-time Information System (OASIS).

What steps has Tacoma Power taken?

Tacoma Power Engaged Black & Veatch to develop a recommendation on how to update our rates consistent with the OATT framework.

Transmission Tariff Update Status

How is the OATT expected to change?

The recommended update would result in an estimated rate increase of roughly 24% to our transmission customers.

What is the OATT rate-change process?

Tacoma Power proposes the following approach:

1. Initiate process in January 2019, after completion of the next retail rate case
2. Engage affected customers
3. Consider mechanisms to gradually implement increase

Tacoma Power Rates Road Map

Section 10

This section is intended to provide the Public Utility Board with information related to potential projects that may impact the Rate Study.

Tacoma Power Rates Road Map:

Fixed vs. Variable Cost Recovery

Section 10.1

Evolution of Current Rates

How did Tacoma Power arrive at the current rate design?

2016 COSA Results → Initial Proposal *100% of rate increase in customer charge* → Final Proposal *rate increase split increase between charges*

2016 COSA Results

Residential Class
- 6.7% increase in revenue needed in 2017 and in 2018
- "pure COSA" customer charge $25.96*

Small General Class
- 2.4% increase in revenue needed in 2017 and in 2018
- "pure COSA" customer charge $39.40*

Initial Proposal

Residential Class
- Increase customer charge by $5.75 each year (to $16.25 in 2017, $22.00 in 2018)
- Unchanged per-kWh price

Small General Class
- Increase customer charge by $3.25 each year (to $22.25 in 2017, $25.50 in 2018)
- Unchanged per-kWh price

Final Proposal

Residential Class
- Increase customer charge by $3.00 each year (to $13.50 in 2017, $16.50 in 2018)
- Increase per-kWh price by 3.7% per year

Small General Class
- Increase customer charge by $1.75 each year (to $20.75 in 2017, $22.50 in 2018)
- Increase per-kWh price by 1.47% per year

*includes Click! underrecovery in customer charge

Points of Discussion in 2017/2018

How did Tacoma Power arrive at the current rate design?

Cost-of-Service	• Customer costs are $26 for residential and $39 for small general • 2018 customer charges will be $16.50 and $22.50, respectively
$ or %	• Customer charge changes are large in percent terms but capped in dollar terms
Low-Income	• Fixed increases benefit low-income users in inefficient or large dwellings • Variable increases benefit low-income users in small dwellings
Bill Stability	• Fixed increases are the same throughout the year • Variable increases create spikes in winter, troughs in summer
Equity	• Fixed increases benefit large users, variable benefit small users • Fixed increases benefit traditional users, variable benefits DERs

Tacoma Power Rates Road Map:

2019/2020 Rate Case—Policy Choices

Section 10.2

Focus on Low-Income

Approximately one-third of the customers in Tacoma Power's service territory are low-income.

Many low-income customers live in high-use houses or inefficient apartments. They are large users and benefit from a fixed increase. Many other low-income customers live in efficient houses or small-use apartments. They benefit from a variable charge increase.

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

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

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

Conclusion: Because low-income customer consumption is highly variable, rate design cannot protect low-income customers.

Environmental Incentives

Higher Variable Charges Incentivize Conservation

The higher the per-kWh charge, the greater and faster the payback from conservation measures.

Higher Variable Charges Incentivize Distributed-Energy Resources (DER)

If the DER customer is receiving the retail rate for energy sent to the grid ("feed-in tariff"), the higher per-kWh charge increases the return from the DER system. If the utility has designed rates to recover fixed costs through the per-kWh charge, the DER customer may not be paying the full cost of his or her connection to the grid.

Conservation Measures and Distributed-Energy Resources (DER) are Expensive

Investment in conservation or DERs requires resources. This is not limited to financial resources. For example, many low-income customers are renters. They lack the legal authority to authorize Tacoma Power to install conservation measures in their apartments, even when such measures are at no cost to them or to their landlords.

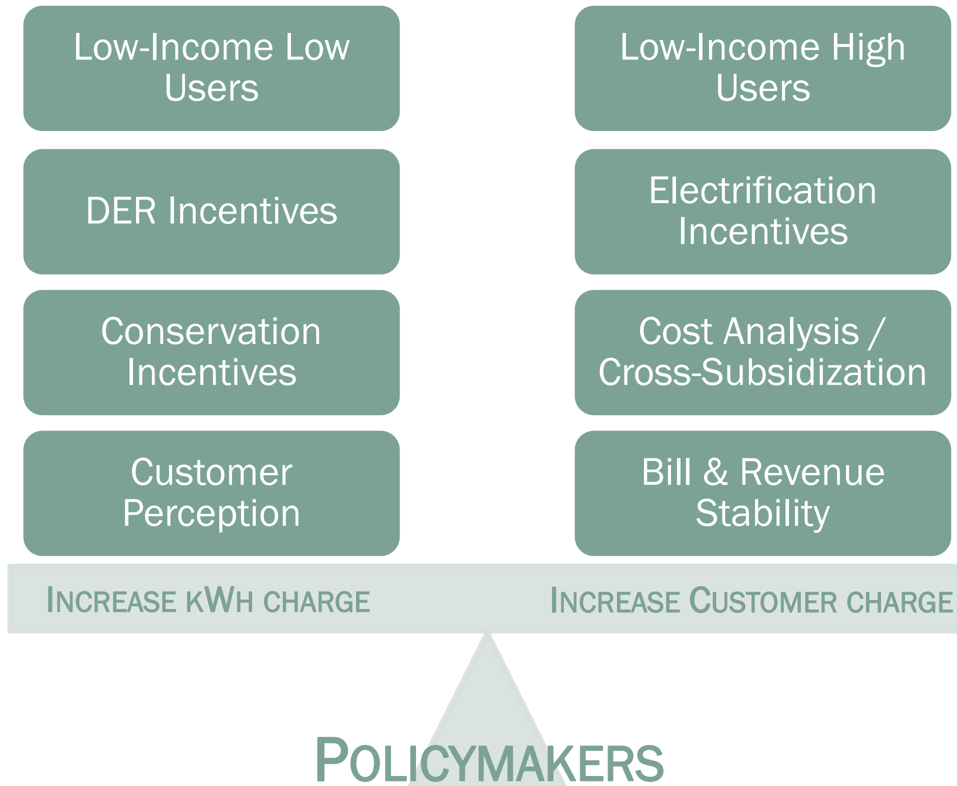
Higher Variable Charges Disincentive Electrification

Electrification of homes and vehicles is a powerful tool to reduce carbon emissions. Increasing the variable charge for electricity makes it more expensive electrified heaters, vehicles, and other equipment

Policy Choices for 2019/2020

The Customer Charge in 2019/2020

Retail rates are anticipated to rise in 2019/2020. Staff anticipates that the cost-of-service analysis will continue to show fixed costs greater than the current customer charge. Management anticipates a proposal to continue to increase the customer charge.



Tacoma Power Rates Road Map:

Future Projects

Section 10.3

Near-Term Project

Load Shaping Pilot Rate

The contract industrial customer Praxair has expressed interest in a load-shaping program. Tacoma Power would provide an incentive for the company to use more power in low-market-price hours and less in high-market-price hours.

There is currently very little difference in Tacoma Power's cost to provide power in "high" hours versus "low" hours. Therefore, the primary value of this program is not anticipated to be economic. Instead, it is a learning opportunity.

Impact Estimates

Strategic	*High*
Environmental	*Low*
Financial	*Low*
Customer	*High*
Staff	*Medium*

Proposal

Develop a daily shifting incentive pilot rate rider.

- Retail price for all demand
- Incentive paid for load shaped inversely to price
- Remove overrun charges
- Exclude low cost hours from Demand Billing

Purpose

- Enhance Tacoma's optimization of sales and purchases.
- Understand value of demand response in organized markets
- Allow customers to exploit plant flexibility to provide opportunity for mutual benefit

Success Metrics

- Demonstrated load shaped inversely to price
- Cost recovery
- Increased revenue
- Demonstration of DR potential for renewable integration

Medium-Term Projects

Improve Rates Website
Work with CMS to improve customer access to rates information.

Shore Power Rate
Develop a rate for the Port of Tacoma to enable the Port's electrification initiative.

Carbon-Free Product
Develop a 100% carbon-free product offering.

Impact Estimates

	Improve Rates Website	Shore Power Rate	Carbon-Free Product
Strategic	*Low*	*Medium*	*High*
Environmental	*Low*	*High*	*High*
Financial	*Low*	*Medium*	*Low*
Customer	*High*	*High*	*Medium*
Staff	*Low*	*Low*	*Medium*

Longer-Term Projects

	EV Rate Development	Commercial Rate Design	CP-HVG Consolidation	Residential Rate Design
	Develop a rate offering that allows deployment of EV charging infrastructure on streetlights	Explore the cost rationale, methodology, and impact of sub-dividing the General Service class into multiple classes	Review the current HVG and CP rates to ascertain the implications of combining those industrial classes	Evaluate impacts of rate design alternatives on various residential demographics (e.g. Section-8 Rate)
Impact Estimates				
Strategic	*High*	*Low*	*Low*	*Medium*
Environmental	*Medium*	*Low*	*Low*	*Medium*
Financial	*Medium*	*Medium*	*Low*	*Medium*
Customer	*High*	*High*	*High*	*High*
Staff	*High*	*Medium*	*Medium*	*High*

Tacoma Power Rates Road Map: Future Projects

Longer-Term Projects

	EV Rate Development	Commercial Rate Design	CP-HVG Consolidation	Residential Rate Design
	Develop a rate offering that allows deployment of EV charging infrastructure on streetlights	Explore the cost rationale, methodology, and impact of sub-dividing the General Service class into multiple classes	Review the current HVG and CP rates to ascertain the implications of combining those industrial classes	Evaluate impacts of rate design alternatives on various residential demographics (e.g. Section-8 Rate)
Impact Estimates				
Strategic	*High*	*Low*	*Low*	*Medium*
Environmental	*Medium*	*Low*	*Low*	*Medium*
Financial	*Medium*	*Medium*	*Low*	*Medium*
Customer	*High*	*High*	*High*	*High*
Staff	*High*	*Medium*	*Medium*	*High*

Tacoma Power Rate Design, Part II

Section 11

Tacoma Power Rate Design, Part II:

Advanced Rate Design

(Dependent on Advanced Metering Infrastructure [AMI])

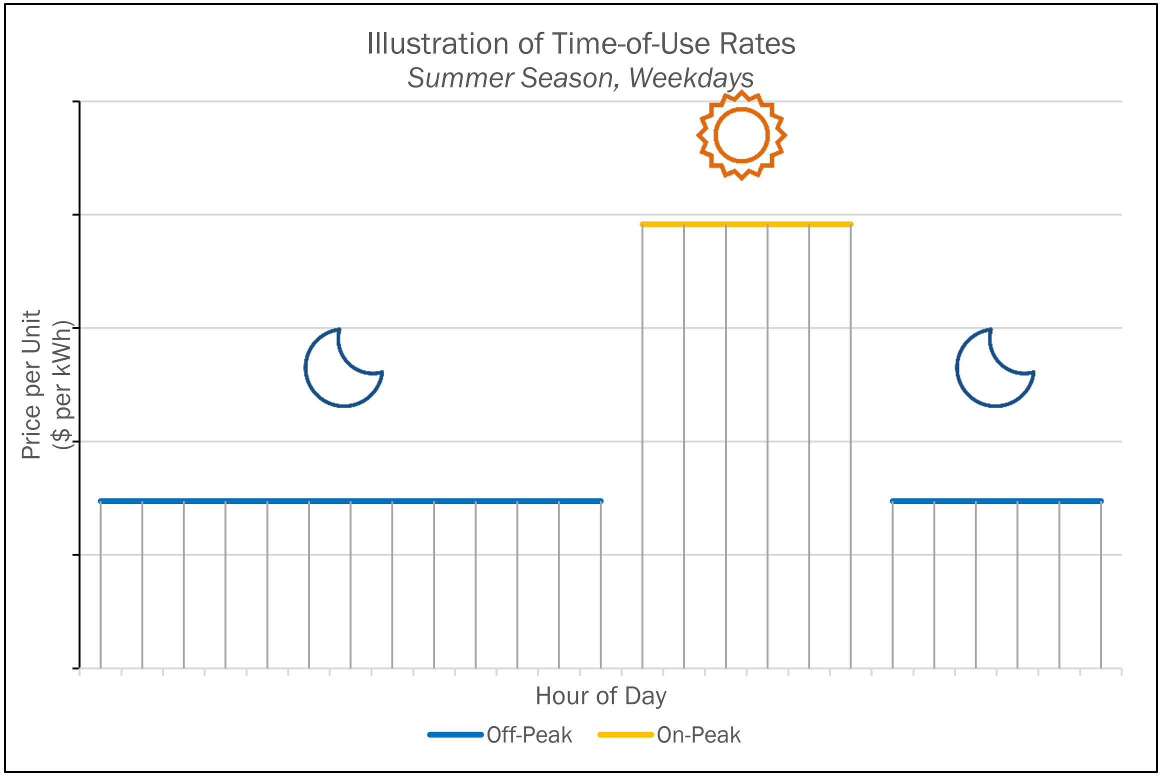
Section 11.1

This section is intended to provide the Public Utility Board with information related to rate choices that will become available after full deployment of AMI.

Time-of-Use Rates (TOU): Description & Illustration

Description

A time-of-use (TOU) rate charges customers **different prices during pre-determined periods of peak and off-peak hours**; it requires metering technology capable of measuring the time of a customer's consumption. Without customer education, consumers are likely to have negative perceptions of the rate and desired behavioral changes (e.g. load shifting to off-peak periods or conservation during peak periods) will not be met.



Board Reading Packet – NARUC Distributed Energy Resources Rate Design and Compensation

Time-of-Use Rates: Advantages & Disadvantages

Advantages

- Incentivizes customers to reduce consumption during high production-cost periods
- Incentivizes customers to shift consumption to lower production-cost periods
- Can help utilities avoid construction of additional generating capacity

Disadvantages

- Better suited to traditional coal and gas utilities; less beneficial for hydro utilities in regions with high amounts of intermittent renewable generation
- Higher electricity bills for customers if they cannot reduce/shift consumption
- High initial set-up costs
- Risk for customer backlash if education and engagement is lacking

Three-Part Rate: Description & Illustration

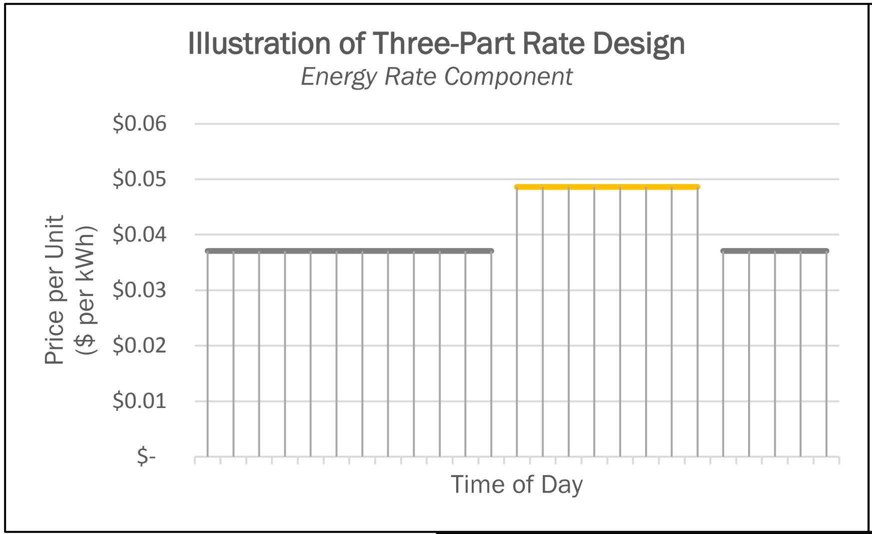
Description

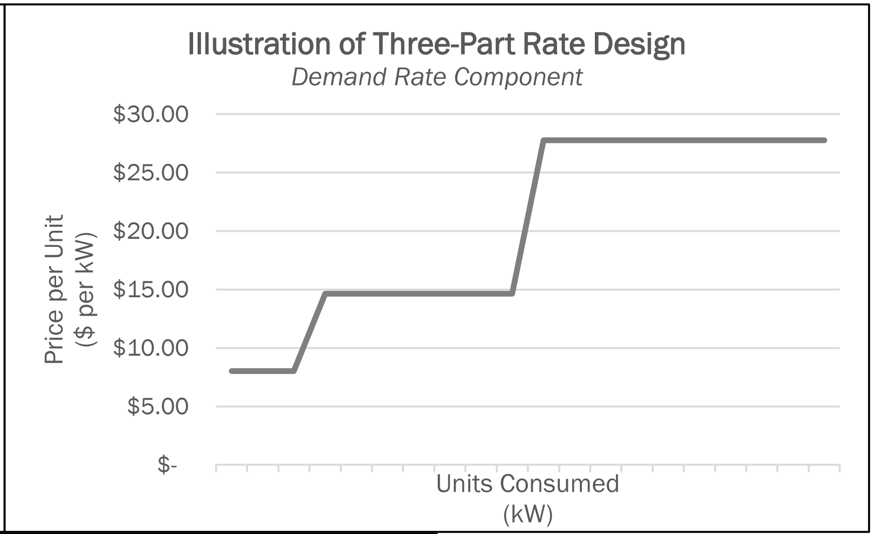
A three-part rate design consists of a **demand charge in addition to the traditional customer charge and volumetric energy rate.** A three-part rate design requires meters capable of registering a customer's peak demand over a given time period. To avoid negative perceptions of the rate, a comprehensive customer education program will be required, since consumers may not fully grasp the difference between energy and demand.

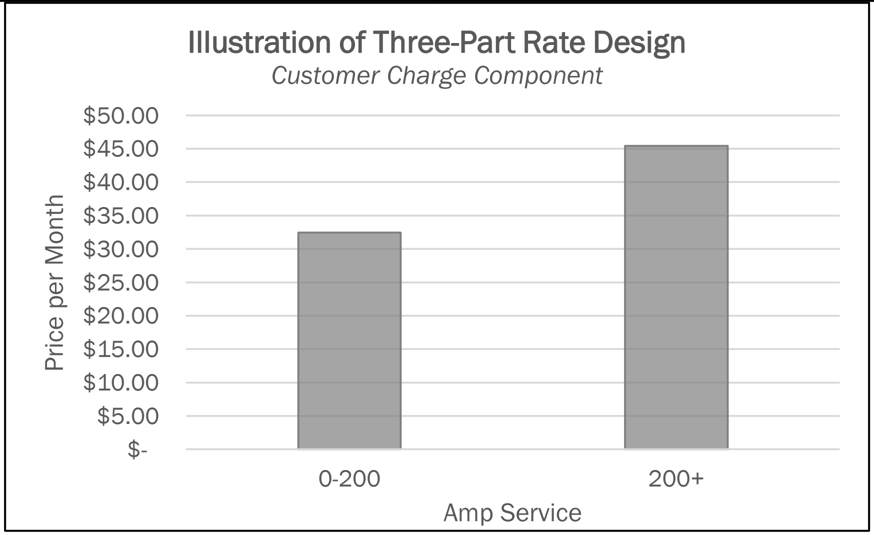
Three-Part Rate Components

1: Variable	**Energy**	1: $ per kWh
2: Semi-Fixed	**Demand**	2: $ per kW
3: Fixed	**Customer Charge**	3: $ per month

Three-Part Rate: Description & Illustration







Three-Part Rate: Advantages& Disadvantages

Advantages

- Sends better price signal versus flat or block rate structures – particularly when combined with time-of-use or real-time pricing elements, as appropriate for market conditions (see below)
- More equitable cost allocation compared to purely volumetric rates

Disadvantages

- More complex for customers to understand
- More difficult for customers to change peaks, which may lead to customers viewing demand charge as a fixed charge

Three-Part Rate: Discussion

Rationale

A utility's infrastructure is built to serve its peak loads. The **magnitude of peak loads drives system costs**. Sufficient infrastructure and generation is necessary to serve customers' peak demands.

Sizing must be based on peaks **not only for the overall system** (built to match system peak during the year), **but also for the sizing of individual customer systems**. For example, if a customer wants to run a 50 kW air compressor for an hour a year, the transformer and other equipment to his or her building must be able to carry 50 kW, even if the average usage is only 30 kW.

Conservation and Price Signal Incentives

Many customers who seek to conserve electricity reduce their overall consumption, but still desire to **occasionally use equipment that requires a high peak capacity**. To address this situation, another rate structure option is the three-part rate, which adds a demand charge to the existing fixed charge and volumetric rate.

This rate recognizes all three of the major contributors to a utility's costs. To the extent that each component of the rate is set at the cost to serve, the price signal to customers **directly reflects the cost** to the utility. **Customers are encouraged to conserve both energy and to reduce peak usage**.

Three-Part Rate: Applications by Tacoma Power

Tacoma Power Rate Schedules

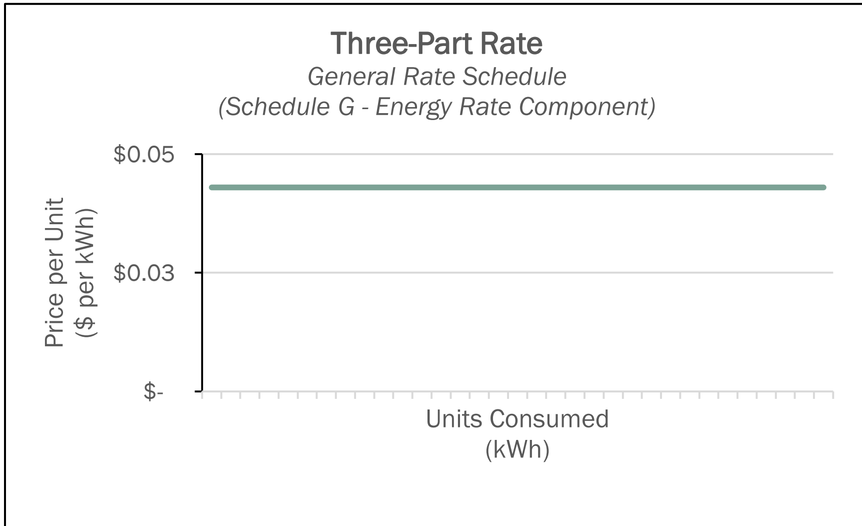
Tacoma Power applies three-part rate design to its general (Schedule G), high-voltage general (Schedule HVG), and contract industrial (Schedule CP) customer classes. These demand-metered customers represent about 1.5% of Tacoma Power's customer count, but about 53% of Tacoma Power's retail customer consumption (kWh).

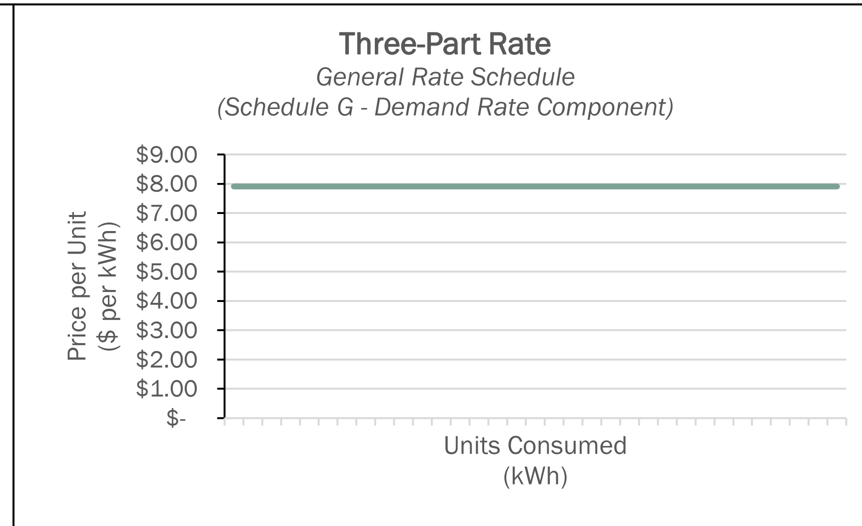
Tacoma Power General Service Rate Schedule (Schedule G)

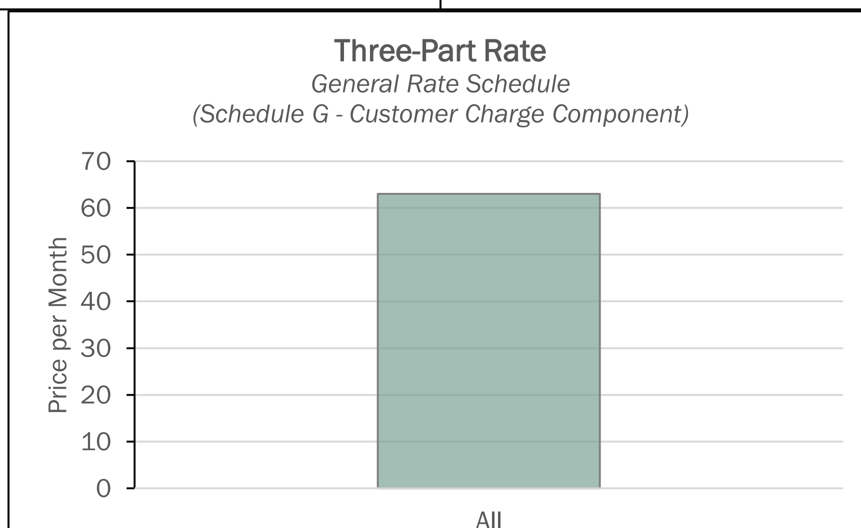
1: Variable	Energy	1: $0.042964 per kWh
2: Semi-Fixed	Demand	2: $7.91 per kW
3: Fixed	Customer Charge	3: $63.00 per month

Rates Effective April 16, 2017.

Three-Part Rate: Applications by Tacoma Power





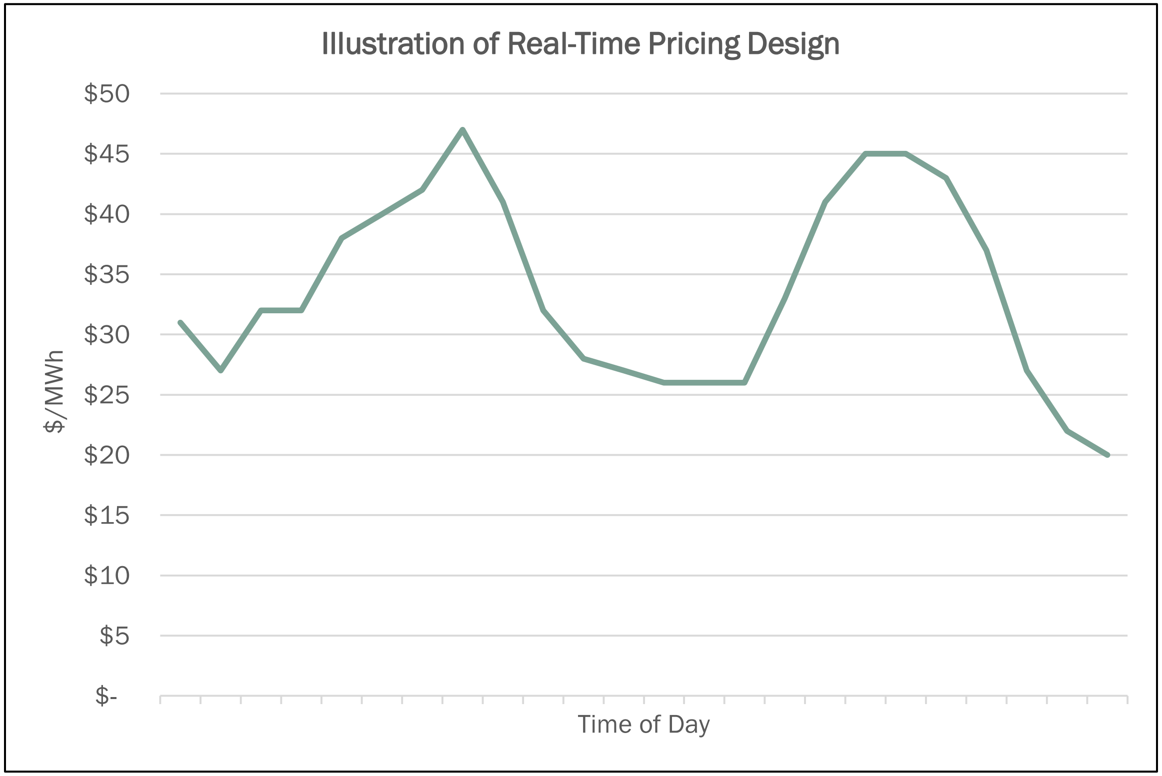


Rates Effective April 16, 2017.

Real-Time Pricing (RTP): Description & Illustration

Description

A real-time pricing (RTP) rate charges customers **the wholesale market price** for the generation-cost portion of their rate. To provide the proper prices to the customers, the utility must be able to ascertain an overall market price every hour of the day. This is best accomplished when utilities participate in organized wholesale markets.



Real-Time Pricing : Advantages & Disadvantages

Advantages

- Incentivizes customers to reduce consumption when the value of the power they are consuming is high
- Sends price signal that enables multiple demand-side programs and technology solutions
- Can be very valuable to certain industrial customers who can easily shift energy-intensive processes to different times of day

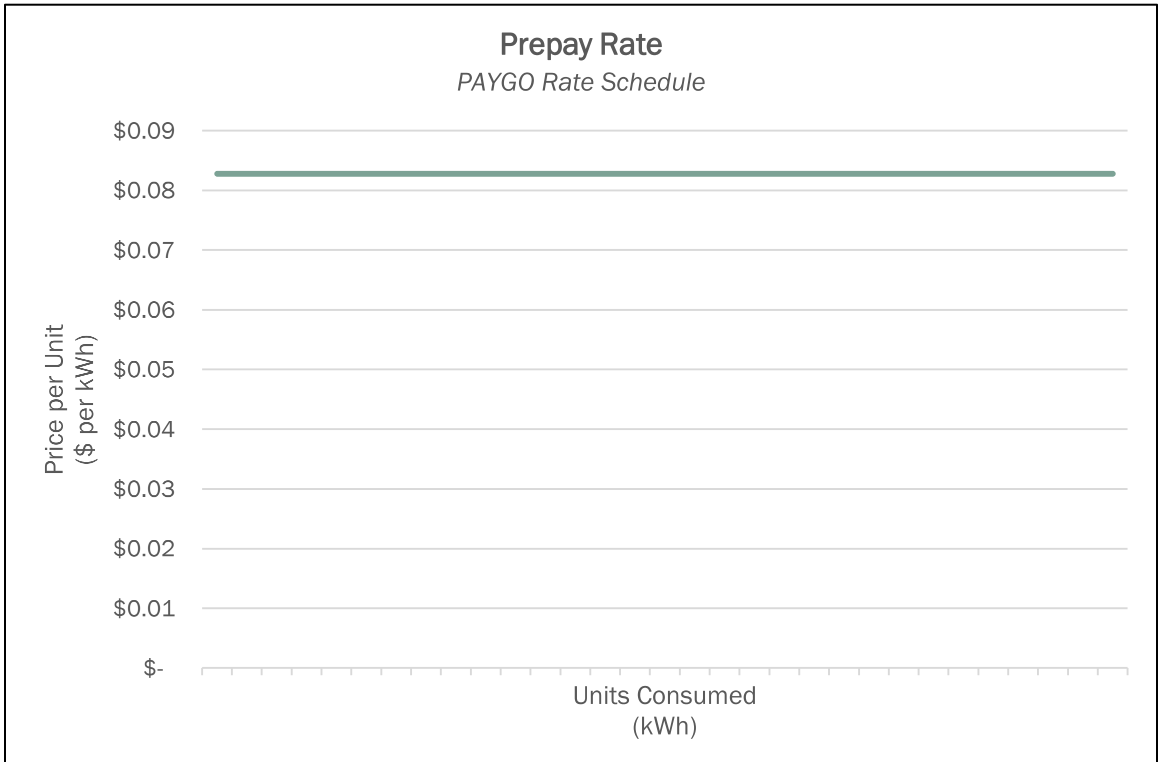
Disadvantages

- Customers exposed to wholesale market volatility and price spikes
- Complex: requires customer to regularly evaluate market prices
- Higher electricity bills for customers if they cannot reduce/shift consumption

Prepay Rates: Applications by Tacoma Power

Tacoma Power Rates Schedules

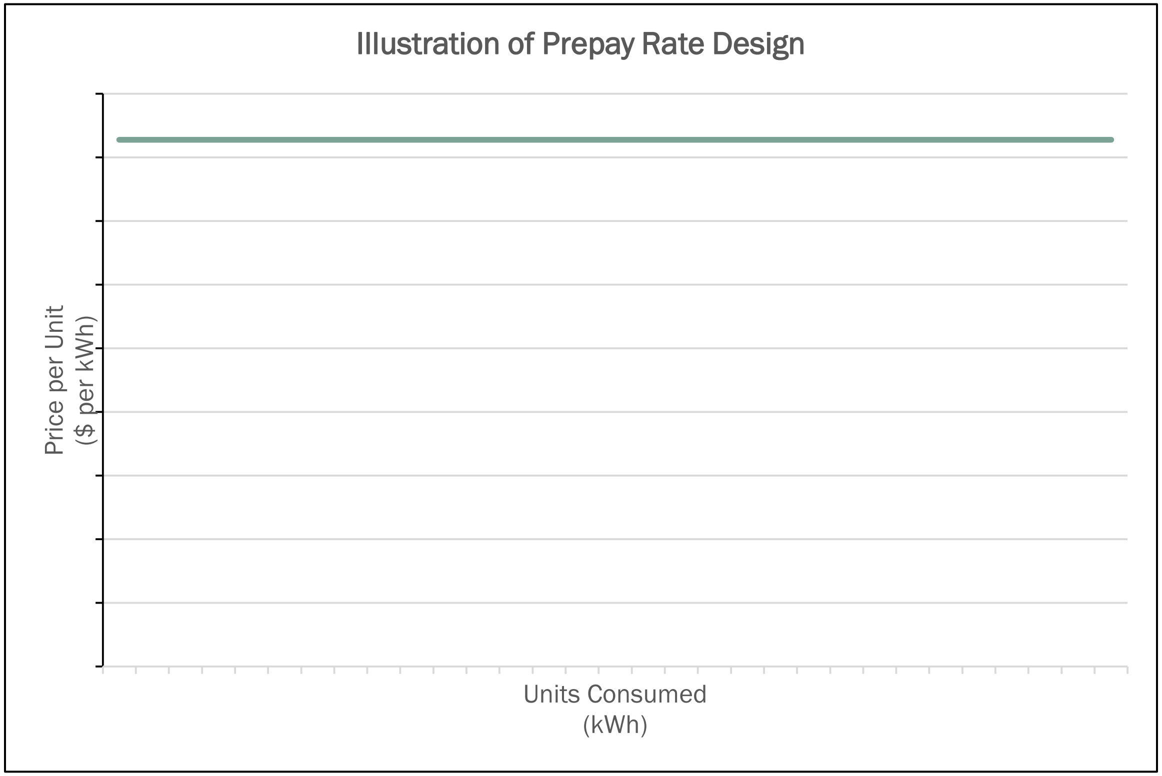
Tacoma Power began a pilot prepay program during a pilot of Gateway meters (wired AMI). Due to the cancellation of the Gateway program, the PAYGO pilot program was closed. The number of current PAYGO customers has since declined to 274. Customer Solutions still regularly receives requests from customers for prepayment options. PAYGO pilot customers currently pay **$0.082781 per kWh** ($0.08778600 per kWh starting April 2018).



Prepay Rates: Description & Illustration

Description

A prepay rate design requires customers to **pay in advance** for consumption. As their balance falls below a certain level, the customer can add funds back into their account. Prepay might utilize any rate design described in the Traditional Rate Design section or a Three-Part rate design.



Prepay: Advantages& Disadvantages

Advantages Advantages

- Provides consumers with greater control over energy budget
- Informs consumers in real time of the energy consumption of various appliances and activities
- Incentives conservation: research indicates effects can be significant
- Eliminates “bill shock” by allowing small payments throughout a billing cycle rather than one large payment every two months
- Eliminates disconnect/reconnect fees
- Reduces number of customer write-offs, resulting in better cash-flow stability and reduced call-center costs

Disadvantages Disadvantages

- Additional program and software costs
- Requires a meter and in-home display capable of providing real-time credit balance, energy consumption, and energy cost reports
- Per-kWh rate does not always align with the cost of service. Utility must decide whether to make the rate entirely volumetric or to also charge a fixed fee at the beginning of each month.

Prepay Rates: Discussion

Rationale

Most items consumers purchase operate on a prepay model. Consumers buy food in the store before they eat it; they buy the gas in the car before they drive away. Under a prepay system, customers pay an amount of their choice toward their account, and when most of that energy is consumed, they need to pay more to “fill up the tank” again.

As long customers never let their accounts or “energy tank” go completely empty, they can pay as little or as much as they like, whenever they like. If the “energy tank” goes empty, the power shuts off until another payment is made. They receive “low balance” and “pending disconnection” notifications before the service is disconnected. Generally, a smartphone app or special device in the home allows real-time monitoring of energy use and account balance. This has the added benefit of educating consumers about how much power is used by various appliances or activities.

Prepay Rates: Applications by Tacoma Power

Tacoma Power Rates Schedules

Tacoma Power began a pilot prepay program during a pilot of Gateway meters (wired AMI). Due to the cancellation of the Gateway program, the PAYGO pilot program was closed. The number of current PAYGO customers has since declined to 274. Customer Solutions still regularly receives requests from customers for prepayment options.

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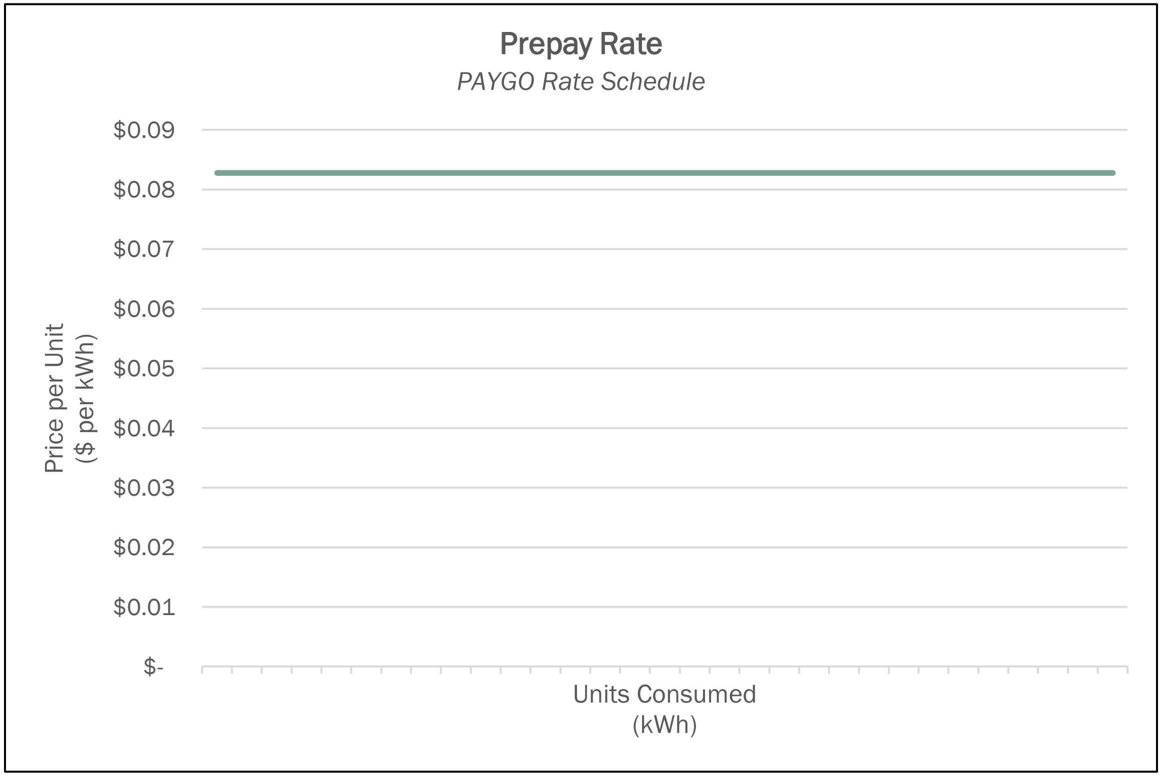

Tacoma Power's PAYGO Experience

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

Tacoma Power Rate Design, Part II:

Revenue Decoupling

Section 11.2

Breaking the Revenue/Sales Link

What is revenue decoupling?

Decoupling is a ratemaking and regulatory tool that is designed to break the link between a utility's revenues and the energy consumption of its customers.

Traditional rate regulation sets a certain price (rate) that a utility is allowed to charge its customers. If customers consume more than expected, utility revenues rise. If customers consume less than expected, utility revenues fall. Therefore, utilities do not have any incentive to promote conservation.

Decoupling sets a certain revenue that a utility is allowed to collect from its customers. If customers consume more than expected, the utility must lower its prices. If customers consume less than expected, the utility is authorized to automatically raise rates.

Breaking the Sales/Revenue Link

Revenue decoupling can align stakeholders' diverse interests.

A properly designed decoupling mechanism:

- Encourages the utility to support conservation. If the utility develops more conservation programs, customers can reduce energy consumption.
- Automatically adjusts customers' bills to reflect the revenue recovery amounts approved by the regulator.
- Guarantees the ability of the utility to recover its fixed costs of providing service, since rates rise automatically if revenues are not recovered.

1 Potentially profits for Investor-owned Utilities.

Decoupling Does Not Control Costs

Revenue decoupling ensures the utility can recover an amount of revenue authorized by the regulator to cover costs during a certain period. If costs increase, the utility must still request a higher revenue recovery authorization.

Absent a Revenue Growth Factor to cover increasing costs, revenue decoupling will not address a utility's need for incremental revenue to fund:

- Utility infrastructure investments.
- Increases in utility operating expenses (beyond the level approved in the utility's last rate case).


TACOMA POWER
TACOMA PUBLIC UTILITIES
TACOMA WATER
TACOMA PUBLIC UTILITIES