



RESOLUTION NO. U-11182

1 A RESOLUTION approving Tacoma Power's Transportation Electrification Plan
2 and authorizing the Power Superintendent to implement the
3 Transportation Electrification Plan.

4 WHEREAS, given the numerous anticipated benefits and positive
5 impacts to Tacoma Public Utilities and the communities within its service
6 territory, Tacoma Power desires to support and promote the electrification of
7 transportation, and

8 WHEREAS, pursuant to Tacoma City Council Resolution No. 40016, the
9 Tacoma City Council has expressed its support of initiatives to foster better
10 conditions for the electrification of transportation, and

11 WHEREAS, Tacoma Power is exploring, creating, and promoting various
12 transportation electrification initiatives and pilot programs, and

13 WHEREAS, RCW 35.92.450 authorizes the Public Utility Board to adopt
14 an electrification of transportation plan that, at minimum, establishes a finding
15 that utility outreach and investment in electrification of transportation
16 infrastructure does not increase net costs to ratepayers in excess of one-quarter
17 of one percent, and

18 WHEREAS, technology, markets, and opportunities associated with
19 electrification of transportation are emerging, cutting edge, and rapidly evolving,
20 and

21 WHEREAS, given these realities, an electrification of transportation plan
22 needs flexibility to allow development of plans and programs that adjust to
23 evolving trends and innovations, and
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1 WHEREAS, to ensure that that Tacoma Power has operational authority
2 and flexibility to take advantage of emerging and evolving markets and
3 technological trends, Tacoma Power requests approval of the Transportation
4 Electrification Plan on file with the Clerk, including the Transportation
5 Electrification Strategic Guidelines (“Guidelines”) that will allow staff flexibility to
6 (1) adjust program research, (2) design programs and initiatives as conditions
7 and opportunities require, and (3) afford operational flexibility to adapt to
8 changing conditions, and
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11 WHEREAS, the Transportation Electrification Plan provides that the
12 Guidelines may be amended over time under the authority of the Power
13 Superintendent, and
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15 WHEREAS, a version of the Guidelines that will allow tracking of
16 amendments to the Guidelines may be created after the Board approves the
17 Guidelines on file with the Clerk, Now, Therefore,
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19 BE IT RESOLVED BY THE PUBLIC UTILITY BOARD OF THE CITY OF TACOMA:

20 Section 1. The Board finds that utility outreach and investment in
21 electrification of transportation infrastructure as detailed in the proposed
22 Transportation of Electrification Plan does not increase net costs to ratepayers
23 in excess of one-quarter of one percent.

24 Section 2. The Transportation Electrification Plan, as currently on file
25 with the Clerk, is hereby approved, and the Superintendent is hereby delegated
26 authority to oversee and implement the Transportation Electrification Plan as



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specified therein and is directed to maintain the Guidelines in a manner that will track changes to the Guidelines.

Approved as to form:

Chair

Chief Deputy City Attorney

Secretary

Clerk

Adopted _____



Board Action Memorandum

TO: Jackie Flowers, Director of Utilities
COPY: Charleen Jacobs, Director and Board Offices
FROM:
MEETING DATE: July 22, 2020
DATE: July 13, 2020

SUMMARY: Seeking Public Utility Board approval for Tacoma Power's *Transportation Electrification Plan* to comply with Senate Bill 1512 (2019) and allow Tacoma Power to actively engage in projects and programs to promote transportation electrification.

BACKGROUND: The *Transportation Electrification Plan* is a document that provides the strategic vision for the utility's role in promoting transportation electrification, it establishes consistency and clarity to utility staff and stakeholders, and sets the guiding principles for utility action to design and deliver programs in support transportation electrification. It also lays out the governance of the Public Utility Board over this plan and addresses compliance requirements of SB 1512.

Transportation electrification benefits electric vehicle owners, utility customers, and our communities and our environment. Tacoma Power can help achieve these benefits by actively engaging in the promotion and by making investments for our customers in transportation electrification.

This document aims to align with the long-term strategic directives of the Public Utility Board now and in the future. The Public Utility Board may, should it decide that it is necessary to meet its' strategic vision, provide new guidance to the utility to direct it to update this Transportation Electrification Plan at any time.

This document does not contain descriptions of specific programs, research, and activities that the utility intends to undertake. Those details are included in the companion report, the *Transportation Electrification Action Report*, also included in this package. The *Transportation Electrification Action Report* is a document, annually updated, for the Public Utility Board to learn about the utility's progress over the previous year and to inform the Public Utility Board of forthcoming research and programs.

With the Public Utility Board's approval of a resolution to adopt the *Transportation Electrification Plan*, Tacoma Power can begin to provide exciting new projects and programs to delight our customers and help them achieve the benefits of transportation electrification.



Board Action Memorandum

ARE THE EXPENDITURES AND REVENUES PLANNED AND BUDGETED? Yes. With adoption by the Public Utility Board of the *Transportation Electrification Plan*, Tacoma Power will design and deliver projects and programs consistent with the guiding principles contained set forth. Descriptions of the categories of projects and programs that planned are in the *Transportation Electrification Action Report*. Tacoma Power is budgeting funds for the 2021-2022 biennium to deliver these projects and programs.

IF THE EXPENSE IS NOT BUDGETED, PLEASE EXPLAIN HOW THEY ARE TO BE COVERED.

In addition to budgeted funds, Tacoma Power plans to seek federal, state, and local grant funding, partner funding, and money from The *Electric Vehicle Charging Station Fund* (not ratepayer funds) to cover the expense of transportation electrification projects and programs.

IF THE ACTION REQUESTED IS APPROVAL OF A CONTRACT, INCLUDE LANGUAGE IN RESOLUTION AUTHORIZING \$200,000 INCREASE IN ADMINISTRATIVE AUTHORITY TO DIRECTOR? No.

ATTACHMENTS: *Transportation Electrification Plan, Transportation Electrification Action Report.*

CONTACT: Cam LeHouillier, Manager, Energy Research and Development, 253-502-8482.
Clay Norris, Power Section Manager.

TACOMA POWER

Transportation Electrification Plan and Strategic Guidelines



TACOMA  **POWER**
TACOMA PUBLIC UTILITIES



I. Purpose

This Transportation of Electrification Plan (“Plan”) is designed to ensure that Tacoma Power is positioned to effectively promote and achieve transportation electrification for the benefit its customers.

Replacing fossil fuels with clean, renewable, and low-cost hydropower increases revenue and helps the utility keep rates low for our customers while helping the environment. Transportation can provide opportunities for us to optimize use of our power system infrastructure, improve electric load management, and expand retail power sales through new service offerings while providing environmental benefits.

Technology, markets, and opportunities associated with electrification of transportation are emerging, cutting edge, and rapidly evolving. A plan that is static and too prescriptive will be unable to provide the flexibility needed to take advantage of this rapidly evolving field. This Plan provides governance and guidance that allows our staff, with the input of the general public, the flexibility and administrative space to develop programs, activities, and initiatives designed to promote, encourage, and accomplish the increased electrification of transportation within our service territory.

The governance and guidance of this Plan is designed to ensure programs, activities and initiatives are effective, efficient, compliant, cost effective, and appropriate to statutory and Tacoma Public Utility Board (“Board”) authorizations.

II. 2030 Goal

The Plan establishes a goal of 10 average megawatts (87,600 MWh annually) of new electric transportation load in 10 years (2030), which is about 10 times our current (2020) estimated electric vehicle load.

III. The Plan

The Board delegates implementation of the Plan to the Superintendent of Tacoma Power. The Superintendent will be assisted by the cross-functional Energy Research and Development Steering Team, the Power Management Section Manager, and by the Transportation Electrification Strategic Guidelines (“Strategic Guidelines”), which are a part of the Plan. The Board will retain oversight of the Plan through its oversight of amendments to the Strategic Guidelines, its review of the annual Transportation Electrification Action Report, and ultimately its biennial decision on the amount to approve for budget of the Transportation Electrification Plan. Nothing in this Plan or the proposed Strategic Guidelines shall alter the requirement that budget proposals shall proceed through regular Tacoma Power budgeting processes and guidelines that are set forward by the Superintendent and management team.

The Board has reviewed the proposed Plan, including the proposed Strategic Guidelines, and finds that our outreach and investment in the electrification of transportation infrastructure, if done consistent with the Plan, will not increase net costs to customers in excess of one-quarter of one percent should the budget request reach that limit on approved proposals by the Superintendent. Budget development shall adhere to the City of Tacoma purchasing guidelines and budget authority approvals the same as all utility requests.

Transportation Electrification Plan

In developing the Plan, we considered the five categories identified in Senate Bill 1512:

1. *The applicability of multiple options for electrification of transportation across all customer classes.*
2. *The impact of electrification on the utility's load, and whether demand response or other load management opportunities, including direct load control and dynamic pricing, are operationally appropriate.*
3. *System reliability and distribution system efficiencies.*
4. *Interoperability concerns, including the interoperability of hardware and software systems in the electrification of transportation proposals.*
5. *The overall customer experience.*

The Plan will be implemented by the Superintendent with assistance from an Energy Research and Development Steering Team ("Team) overseen by the Superintendent.

A. The Energy Research and Development Steering Team

The purpose of the Energy Research and Development Steering Team is to assist the Superintendent by identifying and providing guidance and resources for partnered energy projects that will benefit Tacoma Power, our customers, and, to the extent appropriate, the larger community. The Superintendent will approve the makeup of the cross-functional Team and the guidelines for its operation.

As part of its work, the Team will identify, oversee the development of, and recommend plans, programs, activities, budget proposals and initiatives that (1) promote and achieve transportation electrification (2) work collectively to achieve the Goal(s) stated above, and (3) do not risk unnecessary or imprudent use of customer funds.

The Team will review all proposed plans, programs, activities, budget requests, and initiatives associated with transportation electrification. Upon recommendation by the Team, any such plans, programs, activities, and/or initiatives will be provided to the Superintendent for review and approval. Any recommendations that exceed the budget authority of the Superintendent will require Director review and approval before proceeding to the Board, should that recommendation reach that City of Tacoma budgetary threshold. Expenditures over \$500,000 must have Board approval. Contracts and related expenditures must be procured and approved pursuant to the City of Tacoma procurement policies and the municipal code.

B. Strategic Vision and Guiding Principles

The Team and the Superintendent will be guided in their work, considerations, and approvals associated with transportation electrification by the strategic vision and guiding principles set forth in the Strategic Guidelines.

The Strategic Guidelines will help ensure that programs align with long term strategic directives of the Board now and in the future.

The Strategic Guidelines are attached to this Plan. The Superintendent is delegated the authority to update the Strategic Guidelines. The Board will be apprised of any material changes to the Strategic Guidelines as a part of the annual Report as detailed below.

Transportation Electrification Plan

C. Public Input and Outreach

The Team and Superintendent will ensure that programs, activities, and initiatives benefit from adequate and representative public input or outreach by providing for public outreach or market

research as set forth in the Strategic Guidelines. The annual Report to the Board will include a description of the public input process and/or research findings applied during the previous year.

D. Budget

Expenditures will be consistent with the City of Tacoma Purchasing Policies and Tacoma Power budget development process outlined by the Strategic Guidelines.

The biennial budget may include a line item for electrification of transportation depending on the outcome of the Tacoma Power budget request and Superintendent approval process. The manager

of Rates Planning and Analysis will certify that the proposed budget amount for electrification of transportation supports the Board's finding that the said amount does not exceed or increase net costs to customers in excess of one-quarter of one percent. We anticipate that the budget request will differ annually depending upon project requests or proposed investments.

E. Annual Report

Descriptions of specific programs, research, outreach, and other activities that the utility undertakes and plans to undertake will be detailed in an annual report titled, "Transportation Electrification Action Report" ("Action Report") as described in the Strategic Guidelines.

Further, any material changes to the Strategic Guidelines approved by the Superintendent will be reported to the Board as a part of the Action Report.

TACOMA POWER

Transportation Electrification Strategic Guidelines

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Purpose of This Document



Transportation Electrification Strategic Guidelines serve several purposes:

Strategic Vision

These Strategic Guidelines will help position Tacoma Power to achieve benefits for our customers and the community.

Principles

These Strategic Guidelines provide the principles we will adhere to in our transportation electrification activities. The Energy Research and Development Steering Team ("Team") under the direction of the Superintendent, will ensure we design and execute programs that adhere to the Guiding Principles outlined in this document.

Clarity

These Strategic Guidelines outline the methodology we will use in the development and adoption of transportation electrification programs, activities, and initiatives.

Consistency

These Strategic Guidelines help new stakeholders understand ongoing actions and decisions, and reduce the instinct to start fresh during staff turnover or change.

This document aims to align with the long-term strategic directives of the Board now and in the future. The Board may, at its option, provide new guidance and direct the utility to update the Strategic Guidelines at any time.

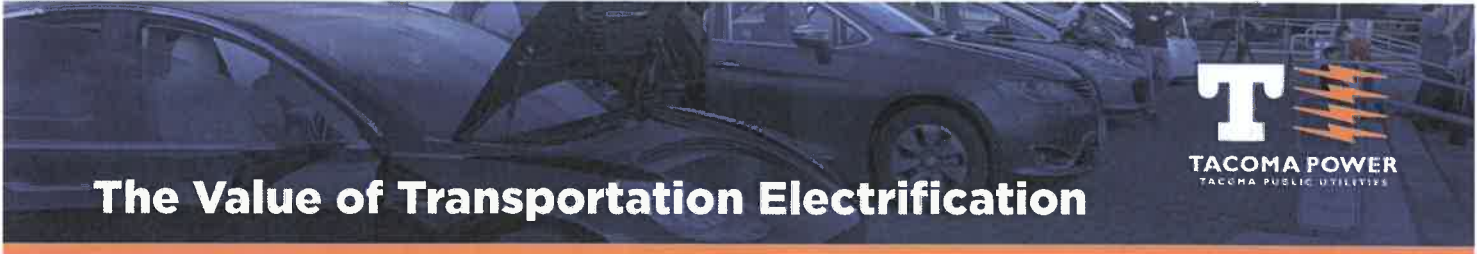
This document doesn't contain descriptions of specific programs, research, and activities that the utility intends to undertake. We share those details in the Action Report.

The Action Report is a document produced and provided to the Board annually to apprise them of progress from the previous year and inform them of future research and programs. We will provide our first annual update to the Action Report in 2021.

Public Input

We value input from our customers. In consultation with the Board, we conducted a public input process that included meetings with key stakeholders and an opportunity for the public to provide online comments about the draft Plan.





The Value of Transportation Electrification

Transportation electrification benefits EV owners, utility customers, our communities, and the environment. We can help achieve these benefits by actively engaging in promoting transportation electrification.

Consumers benefit from a lower total cost of ownership through reduced fuel expense and lower vehicle maintenance costs. The State of Washington offers tax incentives to electric car buyers. By helping our customers save money on their transportation costs, we can help promote customer and community value.

Customers of Tacoma Power can benefit from transportation electrification through lower retail rates. As the number of electric vehicles increases, electricity sales increase, and the contributions of new retail revenue to existing fixed costs effectively reduces cost pressure to customers¹. Our utility has enough surplus generation and infrastructure capacity to serve the additional load that is likely to come from increased electrified transportation². Instances may occur where distribution upgrades may be necessary to accommodate some electrification projects, but overall, our system is ready for the challenge.

Communities and the environment are better off with electrified transportation. Displacing fossil fuels with clean, renewable hydropower significantly reduces harmful emissions into the air that cause public health issues and contribute to global climate change³. Electric vehicles are much quieter than conventional vehicles. Switching to electric vehicles can reduce overall noise pollution. Runoff of oil from roadways is one of the most significant contributors to contamination of water in Puget Sound⁴, affecting marine flora and fauna. The electricity we provide is a locally sourced fuel that does not contribute to global security concerns or encourage global conflict.

Quantifying the value of transportation electrification

In 2016, Tacoma Power and several other Northwest power utilities contracted with Energy and Environmental Economics Consulting (E3, inc.) to identify and quantify the benefits and costs associated with transportation electrification.

The firm studied several forms of electrified transportation, including light-duty passenger vehicles, delivery trucks, transit buses, and industrial forklifts. The firm calculated the potential direct economic costs and benefits of transportation electrification from both a regional perspective and from a utility ratepayer perspective. The firm didn't include indirect costs and benefits in the study, such as human health improvements from particulate matter reduction,

energy security, or macroeconomic changes, nor the effects on certain types of employment.

E3 based their analysis on several critical determining factors, including electric vehicle adoption rates, wholesale electric prices, fuel prices, generation capacity prices, distribution system costs, and electric vehicle and charger costs. Many of these factors evolve quickly, and less predictably, therefore the study looked at high and low ranges of each of these factors to see how each one could affect the overall direct costs and benefits. Thus, the study results are illustrative and not necessarily predictive. This study is an important and meaningful first step of an ongoing learning process to inform utility preparation for transportation electrification.

¹ Assuming the current trend of a positive difference between retail revenue and wholesale revenue persists.

² E3 Study

³ Emissions from transportation are the single largest source of greenhouse gases in the State of Washington (Ecology.wa.gov, Air-Climate, Climate-change, Greenhouse-gases, Reducing-greenhouse-gases).

⁴ Ecology.wa.gov, Water-Shoreline, Puget-Sound, Issues-problem, Toxic-chemicals

The Value of Transportation Electrification

Themes of the E3 Study

Utility Costs and Benefits

Utility benefits of electrifying transportation were positive in nearly all economic cases evaluated, indicating utilities would likely see a total benefit from increased retail sales net of the sum of projected costs. For customer-owned utilities like Tacoma Power, the total net benefit from increased retail sales for electric vehicles applies to all costs borne by all customers. The adoption of electric vehicles by some can provide financial benefits to everyone.

The study also noted that the estimated benefits to individual customers and society were more significant than the financial benefit to the utilities. Reduced fuel costs and maintenance savings benefit drivers. At the same time, utility-specific results depend on the assumed value of generation capacity, wholesale energy prices, utility resource mix, rate structure, and expected retail loads. Therefore, a strong case exists for society, in general, to invest in the electrification of transportation through federal and state grants and other incentives to increase adoption. As a trusted advisor, utilities have a role in providing reliable and impartial information to help customers understand the technology and see the benefits of transportation electrification.

Utility System Impacts

The energy delivery systems of the participating utilities can generally accommodate near-term forecasts of incremental load likely to come from transportation electrification. With increasing adoption, distribution system improvements may be necessary at specific locations. The study also determined that it is possible to manage capacity upgrades with programs that effectively delay charging away from peak demand periods into periods where system demand is lower.

Regional Costs and Benefits

There are likely to be significant benefits for customers, utility ratepayers, and the environment from transportation electrification. Utility impacts were generally positive, but the degree varied depending on each utility's specific circumstance. As such, each utility should define its role for transportation electrification appropriate to its service territory and customer base.

Environmental Benefits

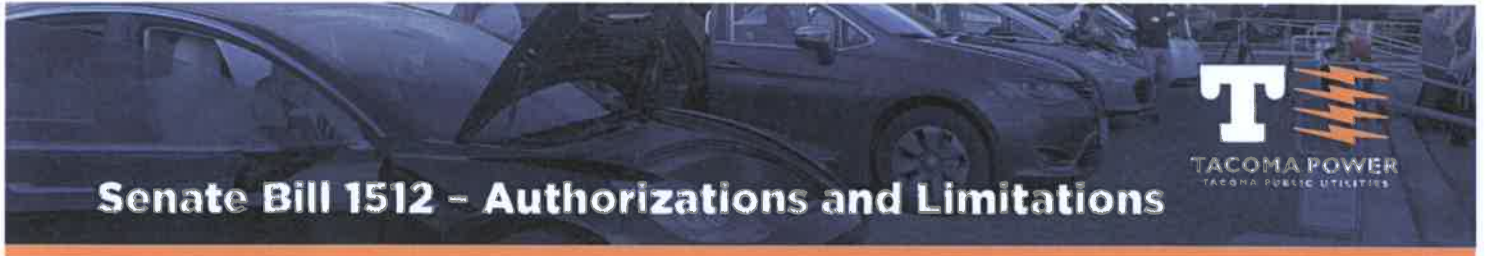
The study looked at a range of future vehicle and utility emission rates to understand the possible environmental benefits and attempted to put the carbon costs into a financial value. Electrifying transportation in the Pacific Northwest region will yield a significant overall net reduction in CO₂ emissions due to the relatively clean nature of power supply.

There are many other environmental benefits from electric vehicle adoption, aside from improved air quality, improved public health, reduced water, and noise pollution. This study only assessed the monetized value of carbon emissions. The impact of more localized emissions, including NO_x, SO_x, and particulate matter, weren't recognized as costs. Still, we should know them as significant societal outcomes that improve the health of the communities, often located near transportation corridors.

The most significant effects of transportation emissions disproportionately fall to communities that have the least resources to deal with the issue, and these effects often compound with other challenges. From an environmental justice standpoint, broad electrification of transportation is likely to provide tremendous benefit to disadvantaged communities, usually located along major transportation corridors.

³ Most notably the difference between retail and wholesale revenues and the assumed value of flexible generating capacity determines incremental utility value.

⁴ All utilities assumed the global Social Cost of Carbon (Interagency Working Group, 3% discount rate assumed).



SB 1512⁷ provides that customer-owned utilities can create their own Transportation Electrification Plan and, with the adoption by their governing body, promote transportation electrification through programs, advertising, and direct incentives. The language states:

“The Legislature finds that legislative clarity is important for utilities to offer programs and services, including incentives, in the electrification of transportation for their customers...The governing authority of an electric utility formed under this chapter may adopt an electrification of transportation plan that, at a minimum, establishes a finding that utility outreach and investment in the electrification of transportation infrastructure does not increase net costs to ratepayers in excess of one-quarter of one percent.” (RCW 35.92.450)



SB 1512 was a compromise of perspectives that allows utilities to promote electric vehicle adoption but seeks to uphold traditional utility principles that protect customers from program-related spending that could lead to significant rate increases. The restriction on use of utility funds in SB 1512 is consistent with other state laws intended to protect the public from the misuse of public funds⁸.

We intend to use a Ratepayer Impact Measurement (RIM) test to ensure that program spending adheres with state laws governing the use of utility funds⁹. This test assesses whether a program is a useful utility investment. It divides the net present value of lifetime utility benefits, including new retail revenue, by the net present value of the program cost, including incentives, marketing, staff labor, and wholesale electricity costs.

The following describes this test:

$$NPV [\sum \text{utility benefits}] / NPV [\sum \text{utility costs}] > 1$$

We express the RIM as a benefit-to-cost ratio, known as the RIM B/C ratio. Products or programs with a RIM B/C ratio greater than one are deemed “cost-effective” and considered to have no direct rate impact to customers¹. We intend to apply a RIM test to each project or program individually and not to our broad portfolio of transportation electrification initiatives. The test is consistent with the methodology we use to evaluate our energy efficiency programs, provides an objective assessment of cost-effectiveness, and reduces opportunities for program cross-subsidization. The utility may substitute the RIM test for another future test that adequately protects against cross-subsidization and otherwise maintains compliance with applicable law.

⁷ Codified at RCW 35.92.450.

⁸ See Washington State Constitution VIII Section 7. There is an exception for programs providing assistance for the “necessary support of the poor and infirm.” Further, there is an exception to the gifts of public funds prohibitions in the Washington state constitution for energy conservation programs, which does not apply to transportation electrification.

⁹ Early versions of SB 1512 proposed that utilities identify an industry-standard test that will ensure compliance with gift-of-public-funds prohibitions, but this language was left out of the final bill as passed.

¹⁰ In an emerging market like electrified transport where technology is still developing and competition is fierce, the utility is required to make predictions about future electric vehicle adoption and program outcomes. For the purposes of calculating the Ratepayer Impact Measure to decide on a programs adherence to gift of public funds prohibitions, the RIM B/C ratio calculates “deemed” or estimated benefits and costs using the best data and most reasonable estimates available. Actual results may vary from these estimated benefits and costs and should not be used to retroactively charge the utility for acting beyond its authority. It is advisable that utility staff document and keep all program assumptions in the event that future courts may need to be convinced that the utility utilized prudent assumptions and estimation techniques in program design to meet a “reasonable” test.

Senate Bill 1512 – Authorizations and Limitations

“Increase in Net Costs to Ratepayers” – The Cost Cap Constraint

SB 1512 requires that spending on transportation electrification “does not increase net costs to ratepayers in excess of one-quarter of one percent” but does not clarify how revenues and expenses related to transportation electrification should be treated.

In addition to the Budget guidelines we outline in the Plan and as otherwise established by practice and procedure, we will adhere to the following guidelines to ensure we comply with the SB 1512 cost cap:

- We will apply the cost cap to the portfolio of individual projects and programs plus any spending on general expenses explicitly used to support transportation electrification programs. In this way, Tacoma Power seeks to be consistent with other types of customer programs, namely energy efficiency programs.
- General expenses that tangentially deal with transportation electrification won't count against the cost cap.
- One-time general expenses that deal with transportation electrification but are of de minimus value (less than \$1,000) also won't count against the cost cap.
- We will measure an “increase (in) net costs to ratepayers” to determine whether our spending on transportation of electrification causes an explicit rate increase, which traditionally happens once per biennium, except under specific emergencies when a surcharge is required to fund unforeseen operational expenses.
- Utility rate adjustments occur once per biennium based on the biennial projected revenue requirement. In Tacoma Power's case, the retail revenue requirement is the retail revenue the utility must collect to meet its policymaker-approved financial targets given projected expenses and non-retail revenue.
- We do not include an explicit projection of increased retail sales from transportation electrification programs in our calculation of projected revenues. To comply with the cost cap, we will include the present value of projected retail sales in the calculation of net benefit for transportation electrification program spending.
 - For example: If the 2020-2021 biennial projected retail revenue requirement was \$930 million, the maximum allowable budgeted expenditure (net of projected additional retail revenue from programs) on transportation electrification projects equals \$2.32 million.
- SB 1512 refers to “net costs,” meaning that the reasonably expected revenues from transportation electrification must net against program costs. Grant funding we secure and apply to program costs will also reduce total “net costs.”
- As with most technology or market transformations, upfront capital costs are likely to be significant barriers to investment, even if the long-term financial benefits are positive and compelling. We will conduct a RIM test that is greater than 1.0 on a project as a way to provide a simple proof that a specific program does not increase rates.



Senate Bill 1512 – Authorizations and Limitations

Five Categories for Consideration Under Senate Bill 1512

SB 1512 identifies five categories that a governing board may (at their discretion) consider in a transportation electrification plan. We will update our annual Action Report to consider these five issues for Board review.

The five sections are included below with responses appropriate for current conditions:

1. The applicability of multiple options for electrification of transportation across all customer classes

The Action Report describes categories of projects and programs that the utility will consider to promote the adoption of electrified transportation that serves multiple customer classes. It's essential to the utility and its Board to uphold values of equity and inclusion and to find opportunities that effectively increase electrification for the benefit of all communities, classes, and categories of customers.

2. The impact of electrification on the utility's load, and whether demand response or other load management opportunities, including direct load control and dynamic pricing, are operationally appropriate

The 2016 Transportation Electrification Study estimated the cost of our distribution upgrades on a feeder-by-feeder basis. The estimate bases forecast assumptions consistent with the State of Washington electric vehicle adoption goals, recent industry data, and our distribution system data.

The study concluded that even under aggressive adoption scenarios, estimated distribution upgrade costs for the next ten years are low. The research also suggests that utilities are likely to benefit significantly by offering customer programs that include managed charging and time-of-use rates. Encouraging customers to delay charging to avoid periods of peak demand will reduce generation and distribution costs.

3. System reliability and distribution system efficiencies

We are currently researching the application of vehicle-to-grid and stationary battery technologies to prepare for a future of increased grid connectedness. Heavy-duty vehicles with large battery-electric systems may be well suited to participate in a partnership program with us to improve grid stability. With bi-directional charging equipment, enhanced load-control software, and a contractual arrangement that outlines the conditions of service and compensation to the vehicle owner, both partners may see mutual benefit. Specific sites for planned EV charging infrastructure may lend themselves well to the application of this type of technology. We will continue to seek opportunities to research and deploy it.

4. Interoperability concerns, including the interoperability of hardware and software systems in the electrification of transportation proposals

As is typical in technology-driven market transformations, after a period of significant adoption, a challenger technology will begin to standardize product offerings and the overall business model. We support establishing standards when appropriate to improve the overall customer experience with electrified transport and to reduce infrastructure deployment costs. Through our purchasing and investment choices and participation in legislative and regional policy, we will promote the interoperability of hardware and software systems.

Senate Bill 1512 – Authorizations and Limitations

5. The overall customer experience

We are a customer-focused organization concerned with helping people. Promoting transportation electrification is primarily concerned with educating customers about the benefits that can be gained by adopting this new technology and assisting them in this transition. We will only be successful in our objectives by providing customers with the best overall experience possible.

We will achieve positive customer experiences by approaching our customers with thoughtful, professional, factual messages that appeal to their values. We will keep our information up-to-date, clear, and accessible. We will highlight the benefits of electrified transport while

making sure we accurately inform our customers about costs and risks. We will seek to access funding from grants and partnerships to reduce the overall costs and to distribute the remaining costs equitably. We will provide access to EV information sources, and we will be responsive to customers' questions, suggestions, and concerns. We will include programs in our portfolio that delight our customers. We will promote transportation electrification in a way that improves customers' lives and makes them feel good about their choices.



The Transportation Electrification Action Report

SB 1512 specifies that the governing board of the utility adopt the Plan.

The Board provides strategic direction of transportation electrification by adopting the Plan, by adopting the initial Guidance document, by reviewing changes to the Guidance document, and by having a continuous role in directing overall strategy by reviewing future annual updates to the Action Report. In the Action Report, we will report on the success of current programs and future efforts to promote transportation electrification and will provide an update to the five areas of interest, which will include current conditions for consideration of the Board.

As with other new and emerging technologies, conditions are changing. Technology, market participants, customer preferences, policy, and funding opportunities continually shift. For these reasons, specific project and program

design, implementation, and decision-making for transportation electrification programs consistent with these Strategic Guidelines will remain the operational responsibility of the utility.

The Board will approve budget requests to fund transportation electrification. Certain contracts and purchasing requests concerning transportation electrification projects will also come before the Board. The Board will also consider proposals to promote transportation electrification through changes in rate design.

The Guiding Principles describes the utility's process for project and program development for transportation electrification initiatives. We intend to maintain a high level of internal oversight for developing transportation electrification programs to give the Board confidence that our customers are in good hands.

Senate Bill 1512 – Authorizations and Limitations

City Council Resolution 40016

The Tacoma City Council Resolution 40016 is a directive by our municipal authority to engage in activities related to transportation electrification. The resolution broadly supports transportation electrification efforts and aligns with other strategic planning documents that the City has adopted in recent years, including the Environmental Action Plan and the Tacoma 2025 Strategic Plan. In its declarations, the resolution refers to several specific actions supported by Tacoma City Council including:

- Creating of a transportation electrification plan;
- Developing of a residential-charger incentive pilot program;
- Increasing commercial charging infrastructure;
- Working with electric vehicle equipment suppliers;
- Supporting maritime electrification;
- Aligning government-relations advocacy related to transportation electrification;
- Requiring EV charging infrastructure for residential new construction (code changes);
- Providing solutions for residential on-street charging;
- Encouraging City and Tacoma Public Utility fleet purchases to be battery or hybrid electric, and
- Electrification of charging in City-owned parking garages.

Hydrogen and Other Non-Carbon Fuels Made with Renewable Electricity

Washington State Senate Bill 5588 (2019) permits Public Utility Districts to produce, distribute, and sell renewable hydrogen fuel. Renewable hydrogen is an electrofuel created with renewable, zero-carbon electricity instead of fossil fuels. Vehicles, industrial processes, and power generation using 100% renewable hydrogen result in zero carbon emissions. This legislation is pertinent to transportation electrification because hydrogen fuel used by a fuel cell results in electricity commonly used in transportation applications.

We see opportunities to improve utility revenues and reduce rate pressures by providing electricity to customers who may engage in the production of non-carbon fuels while reducing harmful air emissions in our communities. Another potential benefit to producing non-carbon fuels is in its production flexibility because it lends itself to interruptions of its operations.

These fuel-producing facilities could be significant participants in demand-response programs that improve grid flexibility and renewable power generation integration from wind and solar generators. We are researching renewable hydrogen fuels, including other forms of synthetic non-carbon related fuels that could broaden the scope of transportation electrification, and expand to more heavy-duty applications.





Guiding Principles



I. Seek to understand the technology and the state of the industry.

Customers look to Tacoma Power to be their trusted energy advisor – to provide unbiased information about electric vehicles, charging technology, environmental and financial benefits, and rate impacts. To do this competently, we must maintain a strong understanding of industry and technology developments.

Technology

Transportation electrification technology will progress and transform the transportation industry over time. We may identify opportunities to participate with research institutes, private industry, national labs, or other parties for testing and piloting prototypes. We will engage with the goal of customers and community welfare first, keeping the customer experience in mind, protecting utility finances, and managing operational and financial risk. By maintaining a high degree of awareness over the state of technology, we can avoid situations where it is out of step with current trends and possible misinvestment of public funds.

Market Research

Currently, transportation is undergoing a technological transformation. In essence, the market is in the early-adopter phase and may evolve into a mainstream-market phase (>15% of new vehicle sales) in the next five years. We must be aware of the position and pace of market development to make the necessary adjustments in service offerings to meet the emerging needs of our customers.

Sometimes innovation comes from implementing ideas that come from others. We will maintain awareness of other utility programs promoting transportation electrification, learn from their experiences, and share our experiences with them. Through a process of continuous improvement, we will integrate new techniques into program design and delivery, and engage in direct customer research to ensure our programs provide the desired results.

II. Help inform the public through education and outreach.

A recent survey of Americans in the market for a new vehicle revealed that nearly 50% couldn't name a single manufacturer or model of a plug-in electric vehicle. The legislature has tapped power utilities to leverage their role as trusted energy advisors to address this fact and to make customers aware of the benefits of transportation electrification. We will raise awareness and answer questions by providing accurate information across all communication channels at its disposal. Actions may include:

- Maintaining an up-to-date utility website with useful information that engages the customer while providing information on the benefits of transportation electrification.
- Providing customers with direct access to transportation electrification experts at special events (i.e., EV 101 classes).
- Increasing customer awareness by hosting and attending public events (GTSE, Efficiency Exchange, Ride, and Drive Events).
- Training utility customer representatives to provide detailed answers to transportation-electrification-related questions and to give them access to additional information (hardcopy and electronic).
- Using advertising and social media to inform the public of programs and benefits.

Guiding Principles

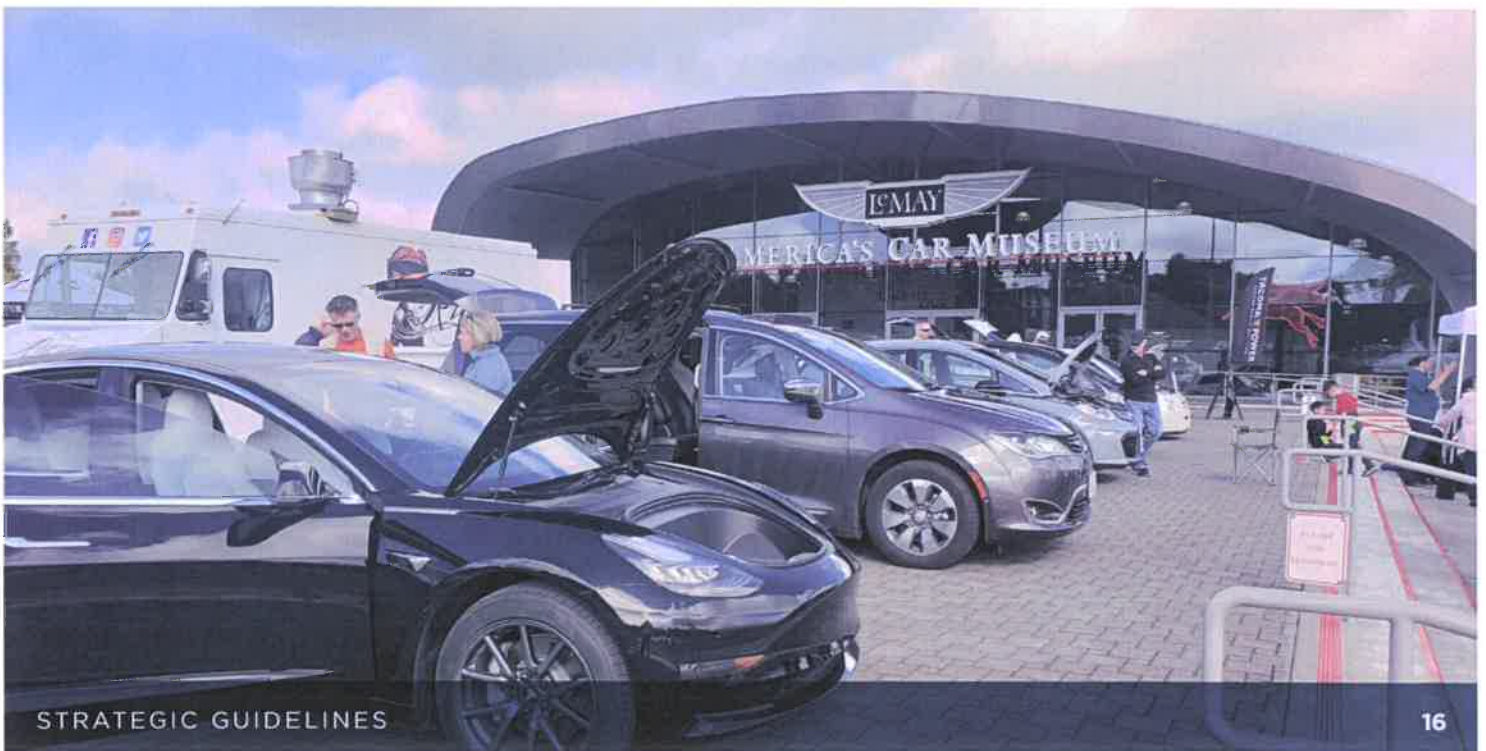
III. Be responsible with utility finances and assets.

We take our responsibility to safeguard public trust seriously. Management of finances and assets is at the core of its mission.

Financial guidelines for program design and delivery include:

1. Maintain a portfolio of programs where each program has a Ratepayer Impact Measure test of 1.0 or greater. The exception to this is that spending for administrative and general expenses and general education and outreach spending not related to a specific program won't be subject to the RIM test. It will be applied directly against the cost cap.
2. Limit explicit spending¹¹ on transportation electrification programs to 0.25% of the biennial retail revenue requirement.
3. Seek external funding where possible to reduce program costs on customers. Potential sources include government and private foundation grants, partner contributions, and monetized carbon credits or offsets.
4. Control utility costs and risks by:
 - Mitigating distribution system costs with managed charging or load management.
 - Supporting efforts to install charging infrastructure during construction.
 - Assessing and testing new technology before adoption.
 - Avoiding risky investments in developing technologies.
 - Seeking opportunities to share costs and expand benefits by including project partners such as other utilities and local governments.

¹¹ Cumulative NPV of net benefit (i.e. sum of revenues - sum of costs) plus educational and administrative and general expenses explicitly associated with transportation electrification programs



Guiding Principles

IV. Help Customers Achieve the Benefits of Transportation Electrification

We will assist all customer classes and communities in achieving the benefits of transportation electrification to the extent possible.

Home and Workplace Charging

Market research shows that EV drivers do most of their charging at home or work. Whether our customers are single-family residential, multi-family residential, small commercial customers interested in customer or employee charging, or companies interested in electrifying their commercial fleets — We are interested in finding ways to help select and install the right chargers.

We will research alternative program designs to inform customers about their charging options and may pilot a program to assist with charger selection and installation. Increasing the network of charging available to the public is a priority for us, as it reduces customer range anxiety. We will seek opportunities to incentivize customers to make their private charging infrastructure available for public use through technologies that provide compensation to the charger provider.

Commercial and Off-Road Fleets

Heavy-duty vehicles are responsible for a large portion of petroleum use and harmful air emissions. Electric battery technology is just beginning to reach the point where it can meet the operational requirements of most heavy-duty vehicles. Utility engagement can be crucial in helping customers assess and prepare for their initial efforts to electrify their fleets.

We seek to engage with customers that have considerable commercial fleets and are interested in electrification, including transit, school districts, city, county and utility fleets, package-delivery services, cargo handling equipment, short-haul and long-haul trucking, railyard equipment, and marine transport. The predictability of their duty cycles, the size of the retail load, and the benefit of reducing emissions make commercial fleet electrification an excellent opportunity for partnership. We will continue to seek opportunities to electrify ships in the Port of Tacoma as an alternative to ships' self-supplying with diesel or marine gas oil generators.

Underserved Communities

Everyone can enjoy the direct and indirect benefits of transportation electrification, not just those who can afford to invest in new cars. We will attempt to identify and collaborate on projects that bring direct transportation electrification benefits to underserved communities. Collaboration can include the electrification of fleets that operate within or are adjacent to underserved communities. We could consider fleets such as transit, school buses, city and utility fleets, public charging along Interstate 5, and electrification of the Port of Tacoma.

The indirect benefits of transportation electrification for underserved communities might be difficult to observe at first, but over time may be significant:

1. While the initial cost of electric vehicle technology may be prohibitive for lower-income customers, as electric-vehicle adoption increases, production costs will decrease, resulting in lower prices for future buyers.
2. As electric vehicle adoption increases, air quality will improve. If the focus of adoption efforts are in heavy traffic corridors, like Interstate 5 (which bisects our service territory), the most significant improvement in air quality will be along corridors near disadvantaged communities.

Interoperability

Electric vehicles must be easy to use to meet the needs of potential electric vehicle adopters in the mainstream market. Helping the industry standardize charging hardware and its process will reduce customer confusion and improve the overall experience. We will encourage interoperability and standardization through purchasing and investment choices.

Guiding Principles

Openness to Non-Traditional Rate Design

We are a utility with an obligation to recover costs through non-discriminatory rate design to ensure stable financing for utility operations. In some cases, traditional rate design structures can be a challenge for providers of electric vehicle charging. We will be open to researching and implementing non-traditional rate design to address these challenges to the extent possible. Rate concepts to consider include:

- Time-of-use rates to encourage managed charging which may reduce electrical infrastructure and distribution system costs.
- Reducing or eliminating demand charges while maintaining cost recovery to improve the economics of charger investments during the initial periods of deployment.
- On-bill financing to overcome initially high capital investment costs by spreading those costs over future periods where customers are enjoying maintenance and fuel cost benefits.
- A vehicle-to-grid tariff that compensates vehicle owners for providing grid stability services and defers costly capital additions.
- Permitting public-charging equipment providers to bill by the kilowatt-hour to deliver fairness in public EV charging business models.

V. Maintain Good Governance and Reasonable Process to Reduce Risk and Cost

Since 2016, we have been successful in delivering transportation electrification benefits to our customers through a myriad of innovative projects. To build on this string of successes, and to assist the Board in continuing to feel confident in our efforts, we will abide by the following internal processes:

1. Update the Public Utility Board annually, review the progress of the previous year, and preview planned programs for the upcoming year.
2. Maintain strategic alignment with the City of Tacoma and provide the City with support in matters related to transportation electrification (Tacoma 2025, City of Tacoma Environmental Action Plan, etc.).
3. Help our customers gain the benefits of transportation electrification through the development of program pilots based on market and customer research that will meet the demands of customers.
4. Activate contributions from across the utility through cross-functional teams, under the management and support of the Energy Research and Development (ER&D) team and with the internal oversight of the ER&D Steering Committee.
5. Calculate pilot program benefit and cost estimates with objectivity and precision. Re-evaluate pilot benefits, and costs are at the end of the pilot period to inform the ER&D Steering Committee decision on promoting the pilot to a full project.
6. Collaborate with the City of Tacoma on related efforts to promote transportation electrification.



Public Input

With the adoption of these Strategic Guidelines by the Board, we will design and launch projects of limited duration and on-going programs within its authority designed to benefit customers. We sought the public's perspective and input in developing these Strategic Guidelines to ensure that perspective is well understood.

The public input process consisted of two parts, both are necessary to have a completely outside perspective on our efforts;

- i. An online public input process for customers and other members of the general public to provide their questions and comments on the Plan. A webpage on MyTPU.org explained the purpose of the public input process and contained copies of the Strategic Guidelines and the Action Report along with online comment boxes to provide feedback.
- ii. A stakeholder process solicited input from relevant organizations who are natural partners for future transportation electrification projects. Stakeholders include local and state government, customer advocacy organizations, transportation electrification experts, port and utility representatives, and others. We invited stakeholder representatives to a special meeting where we gave presentations describing the Strategic Guidelines and the Action Report. We facilitated discussions between participants designed to address crucial issues around transportation electrification strategy and planning during the meeting. A variety of perspectives surfaced during the talks for us to hear.

We compiled a summary of the online public comments and the discussion points made during the Stakeholder meeting. We will provide it as an appendix to the initial Action Report for the Board to review. We made several changes to the Strategic Plan and the Action Report based on comments and questions provided during the public input process.

Version Date Change Summary
0.0 - 06/29/20 Initial Strategic Guidelines Document
1.0 - TBD Adopted by the Public Utility Board.

TACOMA POWER

Transportation Electrification Action Report



TACOMA  **POWER**
TACOMA PUBLIC UTILITIES

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This document is a companion to the Transportation Electrification Plan. We will update it annually and make it available to assist the Public Utility Board in understanding Tacoma Power's efforts to advance transportation electrification.

This report contains three core sections:

Section 2: A report on existing programs

Section 3: General description of project categories - areas of research and program

Section 4: A list of priority strategies the utility plans to execute over the next year

Utility efforts described in the Transportation of Electrification Action Report will be consistent with the five guiding principles set in the Transportation Electrification Plan: Appendix A - Transportation Electrification Strategic Guidelines and approved by the Public Utility Board.

The five guiding principles are:

1. Seek to understand the technology and the state of the industry.
2. Help inform the public through education and outreach.
3. Be responsible for utility finances and assets.
4. Help customers achieve the benefits of transportation electrification.
5. Maintain good governance and reasonable process to reduce risk and cost.

The Need for a Transportation Electrification Action Plan

When dealing with a transformational technology like transportation electrification, the utility should retain responsibility for program design and delivery. With decision-making authority over programs, the utility can respond quickly and efficiently to changing conditions, such as changes in technology, state or federal policy, the interest and availability of external partners and funding opportunities that may arrive or change without warning. Utility program flexibility can be an important hedge against misallocation of investment funding and customer dissatisfaction.

A Note About Existing Programs

Tacoma Power has been actively engaged in researching, designing, and launching transportation electrification programs since early 2016. Until 2019, when Senate Bill 1512 (SB 1512)¹ passed into law, our ability to engage the public in efforts to promote electric transportation were restricted by legal ambiguity. SB 1512 clarified that the legislature sees a role for power utilities to play in promoting and providing incentives to the public to advance transportation electrification. The reader should consider the legal constraints on utility actions that predated SB 1512 when reviewing this section on existing programs.

¹ RCW 35.92.450



Existing Programs

The Value of Transportation Electrification Study

In 2016, Energy and Environmental Economics Inc. (E3), in collaboration with seven Pacific Northwest utilities, completed a study to quantify the benefits and costs of transportation electrification. Tacoma Power was one of five utility study cases and actively participated in all aspects of the research and analysis. This report was critical because it made several points clear:

- Each utility's experience with transportation electrification would be different based on individual circumstances.
- For Tacoma Power, transportation electrification was a good investment from the perspective of the consumer, the utility customer, and the environment.
- Programs to promote managed charging and load management systems can reduce utility costs as EV adoption increases.

Education and Outreach

- Education and customer engagement are crucial for informing the public about the benefits of electric vehicles (EVs) and this continues to be an ongoing utility effort.
- Tacoma Power contracted with ChooseEV.com for a website content upgrade, and assisted in the development and testing of content.
- Electric Car Demonstration Events for the Public
 - Tacoma Public Utilities and partners such as the City of Tacoma, LeMay - America's Car Museum, Point Defiance Zoo and Aquarium, Forth, Puget Sound Energy, and Cheney Stadium hosted five events since November 2017.
 - More than 1,000 people participated in these events and over 400 took advantage of rides/drives, providing people with their first experience in an electric vehicle.
- Electric Car Discount Program - We assisted the City of Tacoma in launching the first program of its type in the State of Washington. In exchange for inclusion in education and outreach efforts, car dealers provided discounts on new electric vehicle sales and leases for a limited time (90 days).
 - Electric car charging equipment companies and electric bicycle companies also participated.
 - We attributed 24 to 36 electric car sales to the program. during and after the 90 period
 - Car dealers and the public were impressed with this program.

Electric Vehicle Charging Study

- We conducted a research project to study the charging and driving behavior of over 100 Tacoma Power customers. In exchange for participation in this study and completing all surveys and data collection efforts for two years, customers receive up to \$500 in compensation. The results of this research study will assist us in the design of upcoming transportation electrification programs.
- We contracted with a consultant to provide hardware and software.
- We designed and launched a recruitment campaign to sign up 200 customers and has since expanded the scope to add more customers to the study

Existing Programs

Commercial Charging Infrastructure Support

- To remove economic obstacles to charging station investment in the our service territory, we designed and introduced a new rate tariff: Schedule FC. This tariff temporarily reduces the demand charge from the general rate through an increased energy charge. This tariff will encourage commercial electric vehicle charging companies to invest in Tacoma. While not a long-term solution, this pilot promotes the investment of additional DC fast charging infrastructure and will help raise the confidence of potential electric vehicle drivers that there are sufficient charging facilities for their needs.
- We worked with customers and charging infrastructure providers, including Electrify America, Washington State Department of Transportation, EVgo, Tesla, and SemaConnect. Tacoma Power was able to help bring two DC fast-charging stations and five Level 2 workplace charging stations to Tacoma without spending ratepayer funds.

Electric Vanpool

- Tacoma Public Utilities worked with Pierce Transit to exchange eight gasoline commuter vans to plug-in hybrid electric models.
- We analyzed route selection, installed charging infrastructure, providing driver training and charging account registration.

Campus Charging Infrastructure

- We are expanding on-campus electric vehicle charging to accommodate additional plug-in commuter vans, employees, and customer charging needs by accessing a grant opportunity.

Electric School Bus

- We are currently working to assist multiple school districts in obtaining electric school buses! By helping school districts apply for Department of Ecology grant funding, Tacoma Power will make it possible for schools to purchase electric school buses and necessary charging equipment.
- We assisted Franklin Pierce School District with preparations to put the first electric school bus in operation in Washington State. Preparation included assistance with the design and selection of charging infrastructure and an operational assessment for electric bus route selection.
- Tacoma Public Utilities worked with the Washington State Department of Ecology, TransAlta Coal Transition Board and Franklin Pierce School District to host a ribbon-cutting event to celebrate the first electric school bus in Washington State. Governor Jay Inslee attended the event.

Transit Electrification

- We engaged with Pierce Transit to understand their electrification goals and to understand their integration issues for the first three battery-electric buses into their fleet.
- We have been investigating the need for on-route induction charging infrastructure along Pierce Transit “Bus Rapid Transit” lines and is an active partner in the design and deployment of this important equipment.

Existing Programs

Shorepower at Port of Tacoma

- Tacoma Power and the Port of Tacoma have been exploring the expansion of electric facilities to accommodate shore-to-ship power connections (i.e., shore power) for ocean vessels at berth. This infrastructure will replace the need for on-board generation systems fueled by heavy fuel oil.
- We successfully assisted the Port of Tacoma in seeking grant-funding opportunities from the EPA (DERA) and Trans-Alta Coal Transition Fund to reduce the cost of the infrastructure to terminal operators, the Port of Tacoma and Tacoma Power ratepayers.
- We estimated carbon emission reductions from this project are 3,800 tonnes per year.
- We designed and presented a power tariff for consideration by the Public Utility Board in 2019. The Public Utility Board's favorable acceptance of the proposed tariff demonstrates cooperation between the Port of Tacoma and Tacoma Power to granting organizations. The rate design allows terminal operators to allocate charging costs to docking ships easily, providing benefits to all parties involved.

Low-Income EV Car Share

- We are working collaboratively with the Tacoma Housing Authority, Puget Sound Clean Air Agency, and neighborhood groups to investigate the possibility of a low-income EV car share program. Residents of low-income housing projects would have the option to rent an on-site electric vehicle at an inexpensive rate. Our partnership would increase clean mobility options for people with few transportation alternatives.

Zero Carbon Fuels Research Group

- While battery-electric vehicles have been gaining popularity, the technology may not be sufficient for heavy-duty applications like long haul trucking, railroads, or marine transport.
- We joined the Renewable Hydrogen Alliance and is working closely with several companies on prospective plans to develop a local source of renewable hydrogen made electrochemically and not using fossil fuels.

General Description of Projects and Programs



Customer Education and Engagement

Many people are unaware of or have had limited exposure to the latest electrified transportation technologies². They have questions about technology performance, the costs of installing and operation, the impact of new electrified loads on their utility expenses, equipment and operational safety, permitting requirements, and other areas.

We seek to be a trusted energy advisor to our customers and have a responsibility to assist them with seeing transportation electrification as an option worthy of consideration. We should prepare to inform customers of the benefits and costs, be able to respond to basic questions about the technology, and be ready to provide outside references to address customer concerns.

Now, with clarified legislative authority to promote transportation electrification, we can engage customers to educate them about these benefits better and more directly.

To this goal, we must provide accurate and useful information about transportation electrification. We need to make investments to ensure our website is up to date, that it contains helpful information, and includes interactive features for customers. Our social media and customer communications will consist of regular messages about transportation electrification - encouraging customers to realize how fun, economical, and environmentally -friendly these vehicles are.

We will consider how to help with the development of a local electric vehicle driver group. A similar group exists in Seattle, and their members have been very helpful as key stakeholders and advocates in our current EV program efforts. We thank the Seattle Electric Vehicle Association for their assistance and hope to support the development of a similar group consisting of local EV drivers.

When our staff interact directly with customers, they are the face of Tacoma Power. It is essential to provide them with adequate training and materials to deal with customer questions about transportation electrification. Training should include a general understanding of model availability, charging technology, our programs and incentives, government tax credits, and the impact on rates and the environment.

We will continue to lead by example by investing in campus and fleet electric vehicle charging and adding electric vehicles to its fleet where operationally possible. We joined the City of Tacoma in the West Coast Electric Fleet Pledge that commits the utility to spend at least 3% of new vehicle acquisition on zero-emission vehicles.

To ensure that our programs and messaging are research-based and efficient, we will engage in frequent customer studies and market research efforts. By understanding the evolving electric vehicle market and the preferences of our customers, we can avoid costly mistakes in program design and delivery.

²Electric Drive News 19893 forty-two percent of Americans believe electric cars will be a game-changer, study says

General Description of Projects and Programs

Privately-Owned Charger Program Opportunities

We will consider encouraging customers to make smart transportation electrification investments by providing a rebate to customers for an approved EV smart charger (and perhaps installation) with proof of purchase. The rebate will help customers with the significant upfront cost of switching to an EV and will provide electric charging capabilities for many years.

We will investigate how tariff design can provide an economic incentive to encourage customers to avoid EV charging during peak demand periods. We would also like to explore technologies that encourage

customers to make private chargers available to others in the community with a peer-to-peer EV charging pilot. Through a third-party mobile phone application, EV drivers can search for and access private EV chargers for a modest incremental fee. By offering their chargers for public use, owners can recoup some of their upfront installation investment when they aren't needed. This business model may encourage customers to invest in charging and make it accessible to the wider EV community.

Residential, commercial, and industrial customers are encouraged to make use of these proposed programs.

Car Dealership Engagement

The reason car dealerships hire salespeople is because they are effective at influencing buyers. Making sure salespeople are motivated to sell EVs and are knowledgeable about the latest EV models, charging options, available incentives, and potential electricity cost impacts could significantly influence EV adoption.

We will investigate a variety of dealer engagement programs, which may help salespeople stay current on the benefits of and incentives available for electric transportation. By providing ongoing dealer education and materials that summarize utility offered incentives and government tax credits, we can help dealerships sell EVs. With the most recent information in hand, salespeople can provide the considerable assistance to customers curious about switching to an electric vehicle.

Another vital effort linking interested EV buyers with local car dealerships has been the five Electric Vehicle Ride and Drive Events that we have hosted since 2017. Dealerships, customers, and venue owners have all overwhelmingly appreciated these events where over 400 customers have experienced test rides/drives. We helped customers discover electric bikes, EV charging equipment vendors,

and introduced them to other community programs. Continuing to support local car dealerships with EV focused customer events continues to be a win-win for everyone involved.

In 2018, Tacoma Power and the City of Tacoma partnered to promote Washington State's first "Electric Vehicle Discount Program." Car dealerships volunteered a significant discount on new electric vehicles in exchange for promotional considerations by the City of Tacoma and Tacoma Public Utilities. Available for only a limited time, the promotion was successful at raising the public's awareness of electric vehicles and encouraging car dealerships that had not sold many EVs to increase their efforts. The program was successful in placing over three dozen vehicles in the limited time offer period and taught us valuable lessons about how to improve the program.

With newly clarified legislative authority, we will investigate opportunities to launch a second "Electric Vehicle Discount Program" and possibly combine it with other customer programs to deliver combined benefits.

General Description of Projects and Programs

Heavy-Duty Transportation

Many truck manufacturing companies, including Daimler, E-Lion, Tesla Motors, Nikola Motors, Adomani, and others, now offer vehicles that range from forklifts, daily delivery (Class 4-6) vehicles, off-road cargo handling equipment, and long haul trucking (Class 7-8). With more companies bringing first generation products to market over the next few years, vehicle manufacturers are selectively bringing their trucks to territories where local power utilities can be relied on to be good, supportive partners for customers seeking to transition to electric fleets.

Tacoma's sizeable commercial and industrial customer base provides us with a unique opportunity to lead electrification efforts for heavy-duty applications. With a service area containing the Port of Tacoma, a significant railway yard, Joint Base Lewis McChord, and bisected by Interstate 5, we can help improve local air quality for the communities we serve by helping commercial and industrial customers transition to electric heavy duty vehicles.

The communities we serve, combined with our low-cost clean power and recent transportation electrification efforts, may also make Tacoma a desirable location for start-up companies to test and launch their products.

The Washington State legislature has committed to expanding renewable power generation and curbing carbon emissions. Currently, grant opportunities through state agencies, the Volkswagen Settlement Fund, and the TransAlta Coal Transition fund make these projects possible. Piloting new electric trucks is a great way to address air quality issues in the south sound region, particularly for underserved populations that surround transportation corridors.

Accepting this role, we will seek opportunities to work

with commercial and industrial customers through public-private partnerships and use its talents and role in the community to help bring prototype projects to Tacoma without putting ratepayers at risk.

We can help locate and work with customers interested in transforming their fleets to electric or non-carbon fuels by learning the customer's goals and committing to help achieve them. We can advise customers in the development of their business case to ensure that they include all utility program benefits and available government incentives, and they carefully consider all benefits and costs. We can also introduce customers to economic development professionals and related businesses to help customers find helpful partners.

Distribution system impacts from heavy-duty vehicles can be much more significant than for private light-duty vehicles. We can provide advice to customers as they are designing charging infrastructure and should propose alternative designs for consideration that can improve the reliability of service and reduce costs to customers.

We should prepare to assist customers with the financial obstacles of electric transformation. We can help them seek grant opportunities, designing rates that remove barriers to electric vehicle adoption while recovering all costs, and sharing the costs of upgrading necessary distribution system infrastructure.

To continue as a helpful advisor to customers considering electric fleets, we must continue to research and develop projects and programs in areas of vehicle-to-grid applications, special time-of-use rates, pilot rates for demand charge reduction, and on-bill financing options.

Support Research Into Zero-Carbon Fuels

Recent developments in lithium-ion battery systems have led to significant cost reductions and performance increases that are appropriate for light-duty vehicles. While the improvements in this technology have been impressive, it may not be sufficient for most heavy-duty applications. The availability of materials to construct so many large batteries and the weight of the batteries needed to meet heavy duty vehicle requirements make it difficult to see battery technologies working for heavy duty applications. Other technologies may be needed to electrify trains, ships, transit buses, and other large

vehicles that travel long distances or operate for long periods without stopping to refuel.

To this end, we will support public and private-sector research and development of zero-carbon fuels generated from renewable, carbon-free electricity. Hydrogen, formic acid, ammonia, and other alternative zero-carbon fuels are in the early prototype phases but may emerge as superior alternatives to battery-electric systems for heavy-duty vehicles within a decade.

General Description of Projects and Programs

Including All Communities

The benefits of electrified transportation are economically and environmentally significant for the driver and communities adjacent to transportation corridors. Tacoma Power will make efforts to realize these benefits for all customers through specific actions and programs.

Tacoma Power and partner community organizations are working to investigate opportunities to make electric car-share vehicles available at selected housing projects. Residents could enjoy a more convenient and affordable transportation alternative that aligns with their environmental and financial goals. Electric vehicles as a shared resource make sense financially due to lower fuel costs and less maintenance than gasoline-powered cars. Not to mention that when your car sits unused over 95% of the time, sharing it with your neighbor makes a lot of sense.

In 2019, Pierce Transit took possession of the first three battery-electric transit buses in their fleet of over 100 buses, and they will have three more within a year. Their long-range plan includes a path toward transitioning to one-third of their buses being electric within five years. Having good utility partners to help them to site infrastructure, design charging and electrical support equipment, access grant funding, and develop solutions to avoid significant rate pressures is essential.

The central bus barn for Pierce Transit isn't in our service area, but we can still assist this vital community service provider with opportunity charging on selected routes. It might be valuable for us to help introduce Pierce Transit to renewable

hydrogen fuel cell buses as an alternative to battery-electric buses that might serve their long-term future needs with higher reliability and with less cost.

There may be other forms of transit - from shuttle buses for tribal communities and nursing homes, to e-scooters and e-bikes - that can benefit from our input and support. We will continue to seek opportunities to work with community partners to bring solutions to our shared customers.

We are interested in assisting school districts' transition away from diesel school buses to ones that operate exclusively on electricity. Franklin Pierce School District, a Tacoma Power customer, is the owner of the State's first electric school bus. We plan to convene a workgroup of all school districts in our territory to learn from this early deployment and help prepare for the day when they receive their first electric school buses.

We have been a helpful partner in designing the charging infrastructure and hopes to expand the number of electric school buses in the district. Electric school buses provide an exciting opportunity to explore vehicle-to-grid (V2G) technology, where the sizeable onboard battery systems can be deployed by the utility (with the school district's permission) to assist in peak shaving or grid balancing services. By connecting several buses with V2G-capable chargers, load management software, solar panels, and building electrical systems, a micro-grid can be formed that adds resiliency to school operations, provides additional funding to the district, and helps the utility maintain system reliability.

Port Electrification

The Port of Tacoma is an essential economic engine for Tacoma and the South Sound region. Tacoma Power can help by making it possible to continue operations with cleaner technology. Tacoma Power and the Port of Tacoma secured funding to electrify Husky terminal and provide docked ships with a clean, renewable alternative to onboard diesel generators. Together, the Port of Tacoma and Tacoma Power seek additional funding to extend capital infrastructure expansion at other terminals in the Port of Tacoma to reach other ships at berth.

This project will increase our revenues and be largely grant-funded so that our customers bear no additional cost. We proposed a tariff that provides a power rate removing economic obstacles for terminal operators and shipping lines. We will continue to make efforts to finalize this project and to look for other opportunities for shore power expansion and other forms of transportation electrification. These efforts could include electrification of cargo handling equipment, pool cars, and drayage. We will continue to conduct research and work with groups interested in using zero-carbon fuels in marine and rail transport.

Priority Strategies



Our list of 10 priority strategies for 2020-2021 will help increase transportation electrification. We may adjust this priority list based on changes in the expected outcome, resources available, the existence of partnerships, and the state of the market.

Action 1:

Educate customers on the benefits of transportation electrification.

Desired outcome: The utility, in its role as a trusted energy provider, will inform customers about the benefits and costs of transportation electrification to improve their next transportation investment decision.

Methods:

- Invest in current and accurate website information.
- Train customer-facing staff to provide accurate information in an easily understood way.
- Conduct market research and customer analysis to understand customers' needs and the barriers that exist to filling them.
- Continue to host electric vehicle events and information sessions for customers.
- In conjunction with dealerships, offer a second electric car discount program.

Action 2:

Support DC fast charging infrastructure investments.

Desired outcome: DC fast charging infrastructure is an expensive and somewhat risky investment that the utility would have difficulty funding under the "gift of public funds" prohibitions. We will provide the best customer service to public and private investors seeking to locate infrastructure for our customers. It may assist in providing some electrical infrastructure upgrades to help attract private investment.

Methods:

- Work with local landowners to seek and apply for grant opportunities.
- Provide concierge-level service with utility operations and permitting.
- We already provided a pilot rate that supports the economics of EVSE investments to promote third party investments.
- In certain situations, if the economics of the site and funding restrictions allow, we may offer "make ready" investments at our expense.

Priority Strategies

Action 3:

Expand campus charging and encourage an ongoing fleet transition.

Desired outcome: We will “walk the talk” by demonstrating to customers that the benefits to electric transportation are achievable here and now.

Methods:

- Seek opportunities to prototype and expand the Tacoma Power fleet to include models that are hybrid electric, battery-electric, fuel-cell electric, or run on other low-carbon and zero-carbon fuels.
- Uphold our West Coast Green Fleet Pledge to spend at least 3% of new fleet acquisition spending on zero-emission vehicles, be they battery-electric or zero-carbon fuels.
- Seek grant funding to expand campus employee and customer charging.
- Review current retail charging fees at campus charging stations and explore the cost recovery options of different fee designs.
- Explore options to expand charging infrastructure to locations outside of Tacoma, including the hydro projects and Tacoma Power parks.

Action 4:

Launch an electric vehicle charger pilot.

Desired outcome: Provide low-cost or free Level 2 charging equipment for customers to install at their homes and businesses. The provision would allow us to specify smart EV charging options. The options would enable us to offer a managed charging program to incent off-peak charging behavior.

Methods:

- Utilize the customer, usage, and charging behavior data collected in the 2019 EV Charging Study, compare it to system load data, and investigate the potential benefits of a time-of-use rate tariff to incentivize customers to set their charging to off-peak periods.
- Invite customers to participate in future EV pilots and programs.
- Seek opportunities to assist customers who are interested in sourcing and installing charging equipment for public or fleet applications.

Priority Strategies

Action 5:

Solve the “split incentive” problem.

Desired outcome: A “split incentive” problem often exists where a property owner is not the user of EV charging infrastructure, but a tenant is. The problem can result in a lack of EV charging infrastructure investment that discourages some customers from purchasing electric vehicles. We will seek opportunities to work with private and public industry partners to solve this problem and expand EV charging through private investment.

Methods:

- Identify situations where property owners and EV charging infrastructure users are not the same, and this is a cause for lack of charger investment.
- Work with private application developers to use peer-to-peer sharing technology as a way to bridge this economic gap.
- Research methods of funding electric vehicle charging equipment allow for retail customers to use chargers provided by property owners that compensate both the utility for power services and the property owner for their capital investment at a rate that is economical to the consumer.
- Design a program to extend this service to homeowners, multi-family building owners, retail businesses, and employers.
- Assist landowners curious about the program in the design and implementation of charging infrastructure.

Action 6:

Expand transportation electrification at the Port of Tacoma.

Desired outcome: Assist businesses in the Port of Tacoma in attaining their environmental sustainability goals by finding opportunities to replace the use of carbon-emitting fuels with clean, renewable hydropower.

Methods:

- Work cooperatively with the Northwest Seaport Alliance, the Port of Tacoma, terminal operators, shipping lines, businesses and logistics providers that operate in the Port area.
- Seek opportunities for grant funding to reduce the cost and barriers to all partners engaged in further electrification.
- Assess the merits of rate tariffs that support the electrification of ships at berth.

Priority Strategies

Action 7:

Assist School Districts in electrifying school bus fleets.

Desired outcome: Assist the school districts we serve with a significant step toward school bus fleet electrification and to advise them about infrastructure design.

Methods:

- Assist school districts in identifying and acquiring financing for electric school buses through grant funding applications and other financial incentives.
- Assist in designing infrastructure to support the school bus duty cycle.
- Organize and operate a workgroup of school districts to share information about initial research and ongoing operational data so other non-participant school districts can make informed decisions about their future fleet investment decisions.
- Seek opportunities to learn about vehicle-to-grid charging applications and how they can support school microgrids.

Action 8:

Assist with transit electrification.

Desired outcome: Collaborate with transit agencies serving our customers to reach their electrification goals.

Methods:

- Collaborate on site selection and charging infrastructure design to support opportunity charging on transit routes within the Tacoma Power service area.
- Propose innovative ideas to reduce obstacles to further electric transportation adoption. Ideas may include seeking grant funding, deploying battery storage infrastructure or load management software, and partnering with other electric charging uses.
- Collaborate on research and explore the use of fuel cell transit buses fueled with renewable hydrogen produced with our clean, renewable, carbon-free electricity.

Priority Strategies

Action 9:

Explore the production of synthetic fuels including hydrogen, formic acid, and other non-carbon compounds as a way to convert heavy-duty vehicles into zero-emission vehicles.

Desired Outcome: Investigate transportation electrification through the use of carbon neutral synthetic fuels.

Methods:

- Identify and understand the benefits, costs, and risks of the production, storage, distribution, and use of zero-carbon fuels to end-users, the utility ratepayer, and the environment.
- Cooperate with transportation end-users, local community leaders, zero-carbon fuel producers, and others to identify obstacles and solutions that are mutually beneficial for achieving benefits, reducing costs, and mitigating risks of zero-carbon fuel production, storage, and use.
- Host a prototype fuel cell project that will test capabilities, and calculate and estimate benefits and costs for a broader scale application of technology.

Action 10:

Assist in commercial and industrial transportation electrification.

Desired Outcome: Expand heavy duty fleet electrification.

Methods:

- Investigate current electric options for trucking, marine, rail, forklifts, and other material handling equipment to find specific applications where electrified transport provides a reduced total cost of ownership over non-electric alternatives.
- Develop programs to incentivize commercial and industrial customers to transition to electric transportation options that do not violate the “gift of public funds” restrictions. Assist customers in locating and applying for grant funding and in designing and siting charging infrastructure.
- Develop customer education and engagement programs to highlight the benefits of transitioning to electrified transportation options. Demonstrate how the total cost of ownership for electric vehicles combined with grant funding can lead to a lower overall cost.

Public Input Process Findings



The following is a list of issues that were raised through the public input process:

1. Stakeholders and members of the public are interested in making the benefits of transportation electrification available to low-income customers. Several stakeholders expressed dissatisfaction that early efforts to electrify transportation in society only provide indirect benefits to disadvantaged communities. While a cleaner environment, reductions in our national dependence on foreign energy, and reduced noise pollution are appreciated, customer advocates were eager for the industry to make the initial cost of electric vehicles more affordable. The consensus of the stakeholder group was that this was not a problem that we could likely influence, but a frustration, nonetheless.
2. Stakeholders and Tacoma Power discussed the prioritization of transportation electrification projects and programs. Addressing climate change through reductions in greenhouse gases (carbon primarily), equity, and cost-effectiveness (as measured by a ratepayer impact measure (RIM test) were raised as possible criteria to help establish priority. We advise that the Public Utility Board, in conjunction with staff, is in the best position for establishing priorities.
3. When cost-effectiveness tests for establishing compliance with the "gift of public funds," prohibitions were described, stakeholders asked about including the benefits of avoiding public health costs from improved air emissions. We explained that cost-effectiveness tests focused solely on those activities related to the explicit authority of customer-owned utilities - that being the sale of power and power services. We hold no legal authority to improve air quality or to promote public health, and therefore cannot include it in an economic cost-effectiveness test. If the state legislated a carbon-free clean fuel standard that provided credits to utilities who sell clean energy for transportation electrification, utilities would have the ability to trade credits for financial benefit and could then include this in a cost-effectiveness test. We have been a strong supporter of statewide clean fuel standards for several years for this reason. Several stakeholders would like to see the legislature expand the benefits we could include in cost-effectiveness tests.
4. Stakeholders recommended that we increase efforts to publicize that the power we provide is inexpensive, clean, and renewable and that transportation electrification contributes to our national security by replacing foreign energy supplies with power produced here in Washington State.
5. Stakeholders were curious if we had any immediate concerns about the distribution system capacity to accommodate transportation electrification. We responded, saying that the only significant concern was related to the success of locating several shore power projects at the Port of Tacoma over the next decade.
6. Stakeholders appropriately reminded us that utility expenditures on programs for the "poor and infirm" are exempt from "gifts of public funds" prohibitions found in the Washington State Constitution.
7. A recommendation was made for us to assist employers in locating electric vehicle charging infrastructure at workplaces for the benefit of employees.

Public Input Process Findings

8. A discussion occurred about the process of utility financing of transportation electrification projects and programs. We discussed the nature of capital financing (bond or debt) and how it intersects with the implied cost cap (0.25% of revenue requirement). Without a legislative rulemaking process, Tacoma Power interprets that if there was a large capital expenditure, the annual debt service cost (principal due plus interest payment) of capital financed program could be counted against the cost cap instead of the total capital expenditure. The on-going accounting of large capital projects would likely become quite burdensome. For simplicity, we may rely on a positive RIM test calculation for the project to demonstrate that the Net Present Value (NPV) of benefits from the program (through increased revenues) exceeds the NPV of costs, thereby not resulting in an increased rate impact to count against the cost cap. Several stakeholders would prefer the utility not be constrained from making large capital investments in support of transportation electrification by a cost cap at all.
9. It was discussed that education and outreach expenses and administrative and general would directly apply directly to the cost cap because there is likely to be no direct, measurable benefit. Still, for practical purposes, the cost cap should be more than sufficient to accommodate these expenses.
10. One stakeholder was dissatisfied with the length and scope of the public input process.
11. Stakeholders advised us to work closely with the City of Tacoma and to align with key City of Tacoma initiatives, including Tacoma 2025, the City of Tacoma Environmental Action Plan, etc.
12. Stakeholders were largely in support of engaging in a diverse portfolio of transportation electrification projects and not to focus too heavily in any one area.
13. Stakeholders asked about our role in owning and operating electric vehicle charging stations and electrolyzer equipment to produce carbon-free electro-fuels (e.g., hydrogen) to electrify heavy-duty equipment further. Staff explained that we would prefer to partner with private entities to deliver these services, but we don't rule out utility ownership entirely.
14. Stakeholders asked that we develop programs to provide direct incentives to car dealerships to sell electric cars and to work with them to help correct a perceived conflict of interest between sales and service of electric cars versus gasoline power vehicles.
15. Stakeholders suggested that we focus more attention on micro-mobility options, including e-bikes and e-scooters. We explained that micro-mobility was a subject better addressed by the City of Tacoma due to their minimal power demand and because City planners can better address issues relating to permitting, siting, and risk associated with their use by the public.
16. Stakeholders were interested in programs to assist "garage orphans" - EV drivers without a dependable off-street location to park and charge. Multi-family property incentive programs are of high interest to some stakeholders.