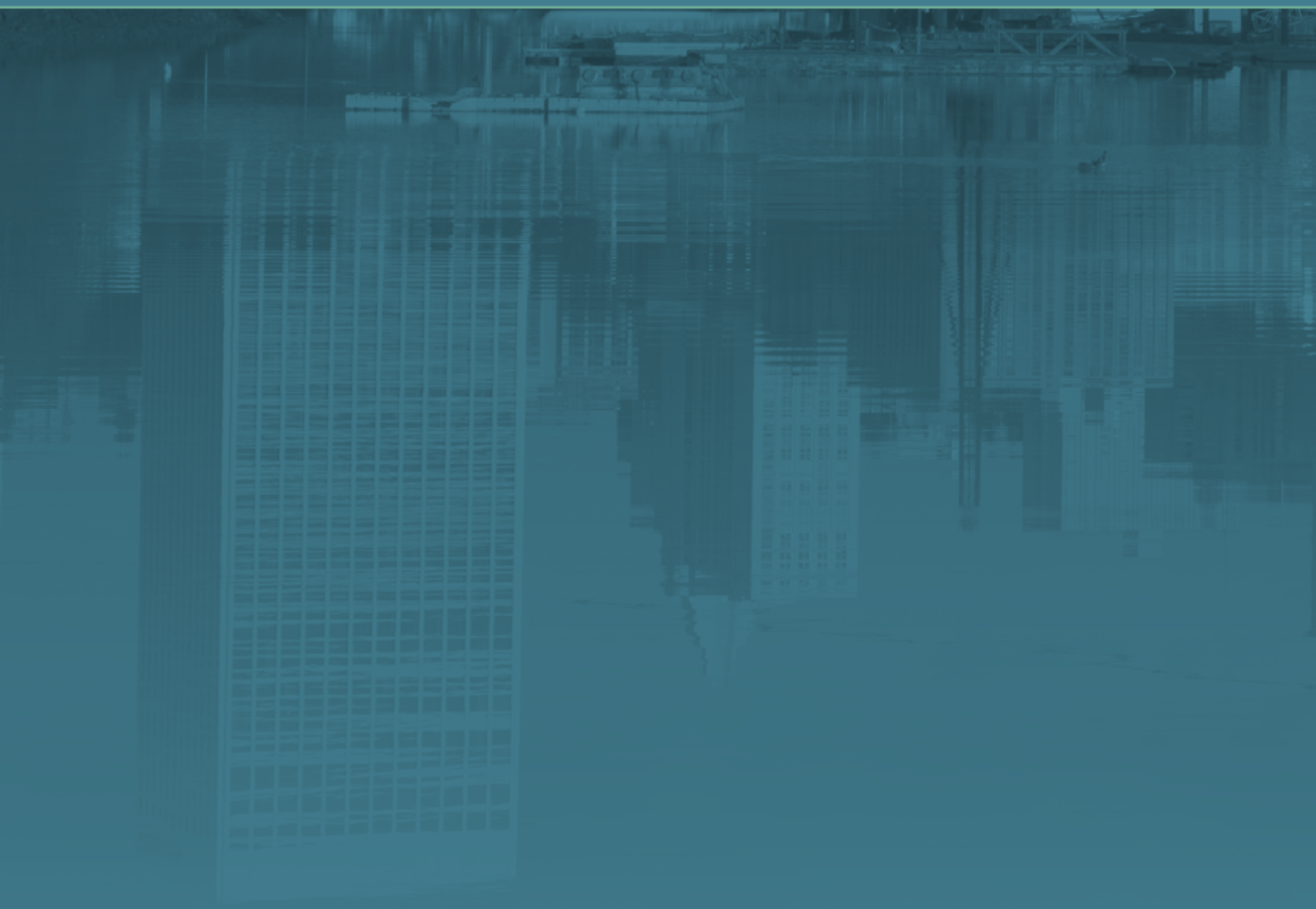
Serving our customers

2018 – 2019
CONSERVATION PLAN

TACOMA POWER
TACOMA PUBLIC UTILITIES



contents

Dear Reader:

Thank you for your interest in Tacoma Power's 2018-2019 Conservation Plan.

What follows is a program implementation roadmap explaining how the Customer Energy Programs group at Tacoma Power intends to acquire its conservation target pursuant to the requirements of Washington's Energy Independence Act.

Tacoma Power relies on two resources to serve about ninety-five percent of its load: clean renewable hydropower and conservation. While hydropower is clean, low cost and renewable, conservation is arguably even better. What kilowatt is better than the one you never need?

The market and regulatory climate affecting our conservation programs is changing. Much of the change is a result of Tacoma Power's past successes in conservation along with national energy efficiency efforts. Almost every new lamp, motor, and appliance is more energy efficient these days. New buildings use a fraction of the power required by older buildings and building owners have made strides in reducing energy consumption. These trends affect our entire portfolio but have the biggest impact on the residential sector. We remain committed to offering a cost effective portfolio of programs to our customers while striving to preserve the programs they value. We have worked creatively to reduce costs, repackage programs and maximize energy savings in order to continue offering most of the conservation measures that have been popular with our customers.

In addition to portfolio offerings from the former biennium, we will be offering incentives for central heat pumps, heat pump water heaters, a commercial strategic energy management program and simplified rebates for some of the most popular lighting measures.

Despite our lower target, we expect to exceed targets in 2018 by a considerable margin due to several large commercial projects already scheduled for completion in 2018. Also, Tacoma Power is working with the City of Tacoma to retrofit 16,000 streetlights to LEDs.

It is my hope that implementing this plan will benefit customers in two ways: by providing a low cost power resource that will help keep future rates lower and by providing products and services that delight our customers and make them proud to be served by Tacoma Power.

I hope you enjoy reading the plan. Please let me know if you have questions not addressed in the following pages.

Steve Bicker

Sr. Manager, Customer Energy Programs and Assistant Power Manager

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What's new for 2018–2019

Differences Between 2016–17 and 2018–2019

The 2018-19 Conservation Plan features significant changes to how Tacoma Power implements energy efficiency programs in Customer Energy Programs (CEP). While the previous 10 years have been marked by programs and engagement strategies that focused on creating a solid low-cost resource for Tacoma Power, programs of the foreseeable future will require more innovation to preserve our market presence in a changing marketplace and increase engagement with all customer sectors.

Lower Target

Tacoma Power's 2018-2027 Conservation Potential Assessment (CPA) is 15.1 aMW lower than the 2014-2023 CPA *(Figure 1)*. Three factors explain the decrease:

- A lower power price forecast has eroded our potential savings overall
- Fewer cost effective residential measures are available
- Accumulated savings from 8 years of aggressive conservation programs are now in the baseline

We believe these factors will persist in the near to midterm. In total, the 2018-2027 potential is 32% less than the 2014-2023 potential.

2018–27 CPA is 15.1 aMW lower than the 2016–25 CPA

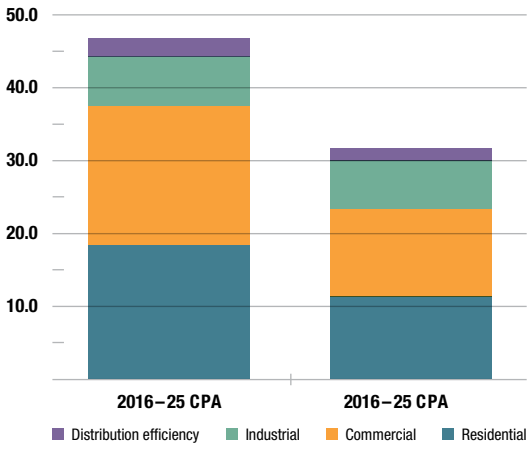


Figure 1

Focus On the Utility Cost Test

In 2017, we revised program and measure cost effective guidelines to allow some programs to continue that would have been deemed non-cost effective based on our traditional Total Resource Cost Test (TRC). We now also consider the Utility Cost Test (UCT) that allows some additional programs to be cost effective simply because they offer net benefits to our customers while helping to keep rates lower. Under these new guidelines, we will offer new measures and programs to increase customer engagement.

Changes to Assumptions and Baselines

During the 2016-17 biennium, the Bonneville Power Administration reduced ductless heat pump (DHP) savings by 48%. In response, we reduced our DHP incentives and will eliminate DHP grants. While we recognize this will reduce low-income program spending, we are finding new ways to engage the low-income community and help our most vulnerable customers.

Capacity and Demand Response

Past Integrated Resource Plans (IRPs) showed Tacoma Power has sufficient energy resources. However, as a growing number of intermittent renewable resources come online, the region is becoming capacity constrained. Tacoma Power, blessed with ample hydro resources in most years, does not believe it will need additional capacity for system adequacy for several years, however, this change in the market provides the utility a unique opportunity to serve its excess capacity to utilities that are already capacity constrained.

For the 2018-2019 Conservation Plan, we've included a capacity value for conserving energy in the price forecast used to evaluate our programs. In 2018, we will begin an in-depth study to determine how to integrate capacity into existing programs and explore whether we could offer standalone programs based on capacity benefits.


TACOMA POWER
TACOMA PUBLIC UTILITIES
3628 S. 35th St. | Tacoma WA 98409
52230000000
Date 10-28-2016
Pay to the Order of PRAXAIR, Inc.
$1,167,756
One million one hundred and sixty seven thousand, seven hundred fifty six Dollars
For Energy-saving improvements
Conservation Resources Management
⑆96430865⑆ 756832910l 5243

CONSERVATION at TACOMA POWER

Tacoma Power's programs provide information, education, rebates and loans to help our customers save energy and money with better products and practices. Our programs reduce loads and over the long run, cost the utility and its ratepayers less than new power supply alternatives.

The Business Case for Conservation

The business case for energy conservation is compelling. Long term, energy conservation programs help Tacoma Power meet future energy needs without acquiring additional supply-side resources, offering real financial savings to our customers and helping us meet regulatory requirements.

Load Resource Balance

Our Integrated Resource Plan (IRP) sets the foundation for the business case underlying the 2018-2019 Conservation Plan. The IRP establishes a resource strategy to ensure we can meet our customers' demand for electricity at a low cost with low risk. Through the IRP process, we identified energy conservation as the only energy resource we need to acquire for the next 20 years *(Figure 2)*. Additionally, energy conservation is available today and costs less than other resources *(Figure 3)*.

Figure 2

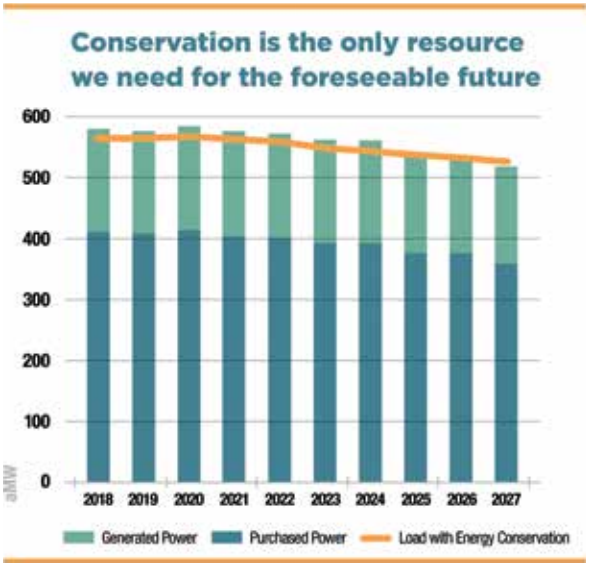
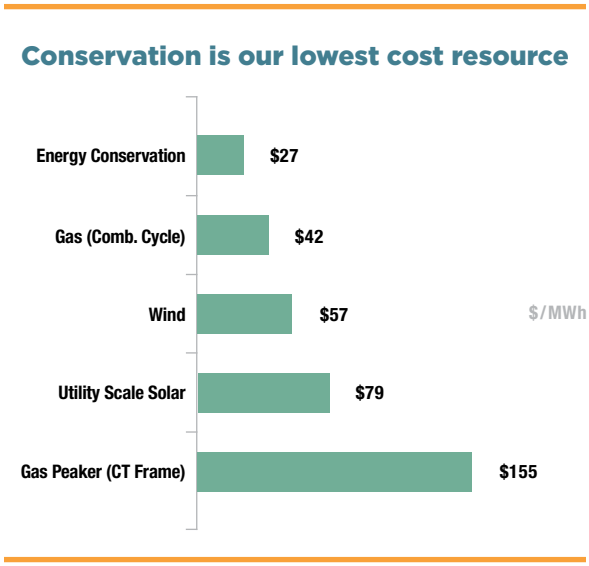


Figure 3



Customer Benefits

While energy conservation programs help keep customers' energy bills low in the long run, program participants receive immediate financial savings and other non-energy benefits such as comfort, safety, or improved worker productivity. The 2018-2019 Conservation Plan has a program for every customer in our service territory. Customers can reduce their electricity costs as much as 30 percent by participating in our energy conservation programs.

It is well known within the industry that energy efficiency programs improve customer satisfaction. J.D. Power reports that simply offering energy conservation programs raises customer satisfaction scores by about 10 percent.

Environmental Stewardship

In addition to load resource balance and customer satisfaction, Tacoma Power feels a strong obligation to make the best use of our hydroelectric resources. Energy conserved through our conservation programs allows our hydroelectric resources to serve more customers. This continues our tradition of offering customers electricity that is almost entirely from clean, renewable hydroelectric resources.

Legislative Mandate

In 2006, Washington State voters voiced their desire for utilities to provide more energy conservation by passing Initiative 937, also known as the Washington Energy Independence Act (EIA) (RCW 19.285). While primarily a renewable portfolio standard, the EIA requires utilities with 25,000 customers or more to "pursue all available conservation that is cost-effective, reliable, and feasible". To meet this standard we must acquire a pro-rata share for a two year period of our 10 year conservation potential (RCW 19.285.040).

Policy for Conservation Target and Budget Setting

Identifying the Conservation Potential

Prior to setting a target or determining our budget, we must calculate how much energy conservation opportunity remains in our service territory. The Conservation Potential Assessment (CPA) calculates our potential by comparing savings from individual conservation measures to Tacoma Power's avoided cost of alternative power resources. The cost effective potential takes into account the following variables:

Avoided Cost Variables

- Avoided BPA power purchases.
- Line loss savings that occur because less power is transmitted over the grid.
- Estimated value of generation capacity reserves that may be sold to other utilities.
- Estimated value of deferred transmission upgrades.
- Avoided Renewable Energy Credit (REC) purchases – reduced load results in fewer REC purchases to meet EIA (I-937) renewable energy requirements.

Measure Variables

- Initial measure cost and lifetime maintenance costs.
- Expected measure life.
- Time-differentiated pattern when energy savings occur over the course of a year.
- Quantifiable and monetizable benefits resulting from installing the measure.

Regulatory Variables

- 1980 Power Act gives conservation a 10% advantage when compared to generation resources.
- Estimated carbon content of our resource portfolio applied to carbon cost assumptions.

Target Setting

The EIA sets forth three requirements governing how Tacoma Power sets its conservation target.

1. Total Resource Cost methodology must be used to set the target (WAC 194-37-070).
2. The target applies to the compliance biennium – not to individual years (RCW 19.285).
3. The target is a single savings amount – not a combination of individual measure, program, or sector targets (RCW 19.285 / WAC 194-37).

The utility hired Applied Energy Group (AEG) to conduct our 2017 CPA. AEG examined more than 7,000 unique conservation measures using methodology consistent with the Northwest Power and Conservation Council (NWPCC) as required by RCW 19.285. The CPA identified 81.8 aMW of technically achievable conservation in our service territory over the 2018-2027 decade.

The IRP defines Tacoma Power's avoided cost of new marginal resources. The sum of all measures from our conservation potential that cost less than marginal resources becomes the savings target for the biennium. The CPA identified 31.7 aMW of achievable economic conservation in our service territory during 2018-2027.

CEP's 2018-2019 target, a pro-rata share of the 2018-2027 achievable economic potential, is 6.4 aMW. The target was presented and adopted by Tacoma Power's Public Utility Board on November 15th (Resolution U-10970).

To ensure that we do not fail to achieve the EIA target, we set program goals and budgets to achieve more than our target. We plan energy savings beyond our target to manage risk, not as a commitment to acquire additional conservation.

Building the Conservation Plan

The 2018-2019 Conservation Plan is based on CEP's educated estimates of how programs will work in our local market during 2018 and 2019. To build our Conservation Plan, we use program-specific assumptions, including unit energy savings estimates and numbers of units delivered per year, to develope the portfolio.

There is no legal requirement to implement these programs as described. Our Conservation Plan is a risk management tool — individual programs may under or over perform due to the unpredictable nature of the energy efficiency markets. Additionally, some measures in this plan are placeholders for future activity, some of which may never materialize. Conversely, new cost-effective measures may materialize after the plan is written and be swiftly implemented.

Reporting Accomplishments

As required by Washington State statue, Conservation accomplishments are reported to the Washington State Department of Commerce. We document and report the acquired conservation savings using BPA's IS 2.0 reporting system. BPA's Unit Energy Savings (UES, also known as "deemed savings") values and protocols are guided by information from the Regional Technical Forum (RTF), a technical advisory committee to the Northwest Power and Conservation Council established in 1999 to develop standards for verifying and evaluating energy efficiency savings.

Conservation Budget Risk Mitigation

The 2018-2019 Conservation Plan aligns with the state's EIA I-937 reporting biennium. However, Tacoma Power's 2017-2018 budget is based on the City of Tacoma's biennial budget cycles. This supports an accurate planning process and provides some risk mitigation, but somewhat constrains 2018 activity to our approved 2017-2018 budget.

References to 2019 expenditures and budget allocations are estimates. Actual budget will require Public Utility Board approval of Tacoma Power's 2019-2020 capital and O&M budget.

Currently CEP has an approved 2017-2018 budget of $32,869,600. An additional $1,570,000 of support for programs is budgeted in workgroups outside of CEP, including TPU marketing and Energy Resource Planning and Evaluation.

Conservation incentives paid to Tacoma Power customers are the largest expense category, accounting for approximately 52% of planned expenses. CEP staff labor accounts for 30% of planned expenses, with general overhead and costs outside CEP accounting for the remaining 18% of planned expenses.

Our most serious budget risk is overspending our conservation incentive budget.

- Large commercial and industrial projects can receive incentives over $1 million and have lead times up to several years with uncertain completion schedules. When these projects shift into a different budget biennium, it can cause significant budget pressure.
- Despite our market knowledge and use of good research, it is difficult to predict which efficient products will be popular and when new technologies will be available in the market. Some are red-hot sellers while others never make it off the ground.
- Regional and local economic drivers beyond our control may drive participation above (or below) planned levels.

To manage these risks, we maintain a budget reservation system. The system ensures funds are not promised to more than one customer by tracking multiple large commercial projects, as well as forecasts for small projects, to ensure we are not overcommitting funds. If the budget reservation system indicates we could overspend, we respond by ramping programs down, reducing incentives, or asking for additional funds before depleting our budget.

Sensitivity Analysis

Tacoma Power uses a Monte Carlo approach in budget planning. It models multiple program outcomes across the conservation portfolio to ensure planned acquisitions and budgets are adequate to meet regulatory and load/resource needs. This model uses assumption ranges based on program history and staff knowledge to inform 10,000 model runs that predict market outcomes. Figure 4, illustrates the probability of outcomes given program variability for 10,000 combinations of program performance factors.

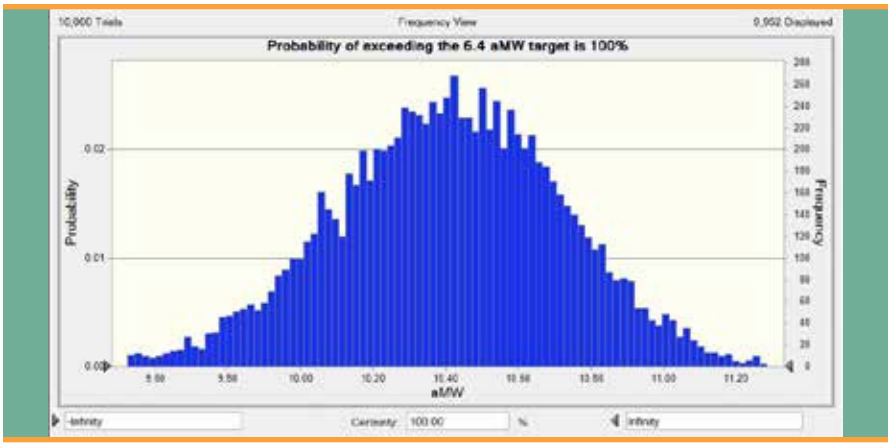


Figure 4—Probability of Outcomes Given Program Variability

Analysis in Figure 4 shows our portfolio met or exceeded the target in all model runs. Based on this analysis, absent a radical policy change or market shift, CEP is confident its portfolio will meet Tacoma Power's acquisition needs.

Figure 5, illustrates Tacoma Power's CEP budget is sufficient to meet the 6.4 aMW target.

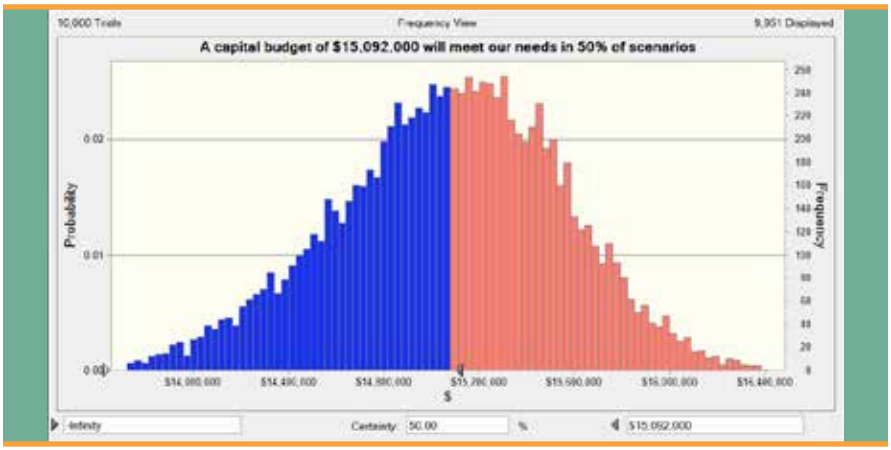
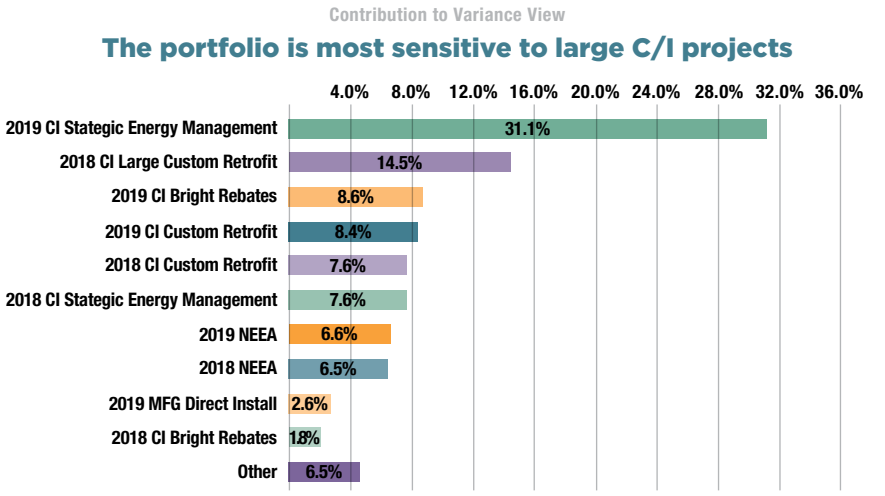


Figure 5—Estimated Expenses Given Program Variability

Based on the analysis discussed above, CEP will reduce its 2019-20 capital incentive budget ask to $15,092,000. This will better align projected spending with our budget. In the event it appears we will exceed our budget we will either ask for additional funds from the utility, reduce incentives, or suspend program enrollment.

Finally Figure 6, shows which programs in our portfolio have the most significant budget variability.

Figure 6 - Programs with Highest Variability



Portfolio Design Principles

CEP considers three key principles in designing the conservation portfolio:

1. Conservation programs are based on solid analysis.
   - Update assumptions to ensure to ensure they are current.
   - Plan to meet or exceed EIA targets.
2. Conservation programs must satisfy customers.
   - Work to be certain that products will be embraced by customers.
   - Confirm that incentive options are appropriate to customer needs.
   - Understand how customers use programs.
   - Promote our programs with crosscutting marketing strategies.
3. Conservation spending must be equitably distributed
   - All ratepayers fund conservation and should have an opportunity to participate in one or more of our programs.

We strive to create a portfolio that addresses all of these design principles in reasonable balance.

Conservation is Analysis Driven

Tacoma Power evaluates cost effectiveness using the same cost curves that were used in developing the IRP. While the Total Resource Cost Test (TRC) alone is used to set the EIA target (WAC 194-37-070), we have begun using the Utility Cost Test (UCT) to admit some programs to the portfolio that would fail under the TRC which doesn't recognize non-monetized energy benefits to customers. To be recognized as "cost effective," programs must have a positive TRC benefit-to-cost ratio or a positive UCT benefit-to-cost ratio.

Total Resource Cost Test (TRC)

The TRC compares the present value of total benefits to the present value of total costs paid by Tacoma Power and program participants over the life of the measure. The TRC is indifferent to who pays for the measure, focusing only on total measure cost. Additionally, the test considers monetizable non-energy benefits (NEBs), giving them equal weight as the value of energy benefits. We express the TRC as a benefit-to-cost ratio, known as the TRC B/C ratio. Measures and programs with a TRC B/C ratio greater than 1.0 are considered cost effective.

TOTAL RESOURCE COST	
ADVANTAGES	**DISADVANTAGES**
■ Recognizes utilities need to serve the public good ■ Limits impact of free-riders	■ Ignores non-energy benefits that are often critical to market acceptance of energy efficiency measures ■ Does not accurately compare utility costs with supply side alternatives

Utility Cost Test (UCT)

The UCT forecasts the financial impacts of conservation programs on Tacoma Power. The UCT compares the costs of offering a program, including utility-paid program costs, to the benefit of avoided power purchases over the life of the measure. We express the UCT as a benefit-to-cost ratio, known as the UCT B/C Ratio. Measures and programs with a UCT B/C ratio greater than 1.0 are considered cost effective. Additionally, we express the UCT as a $/MWh cost for comparison to supply side resources. It's important to note that in a public utility, benefits to the utility translate to ratepayer benefits.

UTILITY COST TEST	
ADVANTAGES	**DISADVANTAGES**
■ Accurately compares utility costs with supply side alternatives ■ Allows the utility to promote higher cost conservation measures desired by customers ■ Focuses the utility on keeping costs low	■ Admits more programs and measures to the portfolio that are affordable only to higher income customers ■ May encourage customers to purchase equipment that is not in their financial interest

Participant Test (PT)

The PT ensures program participants are better off financially for participating in our energy conservation programs. The PT compares the customer's out of pocket cost to purchase and install energy efficiency measures with the reduced energy expenses and quantifiable non-energy benefits, such as maintenance, over the measure's life. We express the PT in terms of simple payback – how long after installation it takes the customer to recover their investment. While the participant test is not used as an economic screen, it is an important perspective in gauging if a program or measure is good for our customers.

PARTICIPANT TEST	
ADVANTAGES	**DISADVANTAGES**
■ Best test of economic value to customer	■ Does a poor job of valuing non-energy benefits, which are often major drivers behind purchasing energy efficient equipment

Conservation Programs Must Satisfy Customers

Simple financial incentives do not change the market by themselves. We compete with other home improvement investments, such as granite countertops, for consumer dollars.

To compete, we must market programs to capture the customer's attention and motivate them to take action. This is done by observing what has been referred to as the 4 P's of marketing:

- Price — we leverage a combination of rebates, grants, instant markdowns, and loans to buy down the cost of energy efficient products. To avoid negatively impacting rates, incentives should be just large enough to affect customer purchase decision and no larger.
- Product — energy efficient products in our portfolio must satisfy customers. Customers don't soon forget programs that disappoint which affect the success of future programs.
- Promotion — customers need to understand why they should invest in energy efficient products. Residential marketing efforts need to promote home comfort, as well as lower energy costs. Commercial-Industrial programs need to promise and deliver reduced overhead cost making companies more profitable and competitive.
- Place — intersecting with customers where they interact with the market through market actors already serving our customer. We call them trade allies — third-party companies and contractors who design, sell or install high-efficiency equipment or offer solutions that qualify for our incentive programs. Working with qualified "trade allies" allows us to reach more of our customers than our staff could do alone.

Conservation Must Be Distributed Equitably Among Customer Groups

Conservation programs at Tacoma Power are funded through power rates. Since all customers pay rates, it is important all customers have access to our energy conservation programs. While large commercial and industrial projects are more cost effective, residential customers also have an equity stake in our programs.

Low-income customers pay a significant share of their household budget to heat older, poorly insulated homes. Providing energy conservation assistance helps customers lower their utility bills, which in turn improves the likelihood they will pay their bills on time.

Conservation Resources 2018-2019

CEP proposes to acquire 9.99 aMW of conservation resources at a cost of $28,187,900 for the 2018-2019 biennium. Table 1 below provides a broad economic analysis of sectors. Table 2 provides a detailed economic analysis of proposed programs.

Table 1, below;
Table 2, following page

Conservation Portfolio	TRC B/C	UCT B/C	RESOURCE COST [$/MWh]	SAVINGS [aMW]	SHARE OF SAVINGS	BUDGET	SHARE OF BUDGET[1]
Commercial / Industrial	1.9	2.3	$21.97/MWh	6.20 aMW		$13,360,900	
Residential	1.0	1.5	$33.54/MWh	1.49 aMW		$5,331,200	
Low-income / Hard-to-reach	1.0	1.0	$50.94/MWh	0.44 aMW		$3,657,000[2]	
External energy conservation	1.6	9.7	$5.12/MWh	1.87 aMW		$1,019,300	
Conservation totals and averages	1.4	1.9	$27.15	9.99 aMW		$28,187,900[3]	

[1] Pie charts do not include administrative overhead; only costs directly associated with the sector and its programs. Numbers and visuals rounded to the nearest hundredth.

[2] Low-income / Hard-to-reach administrative overhead included in the residential sector.

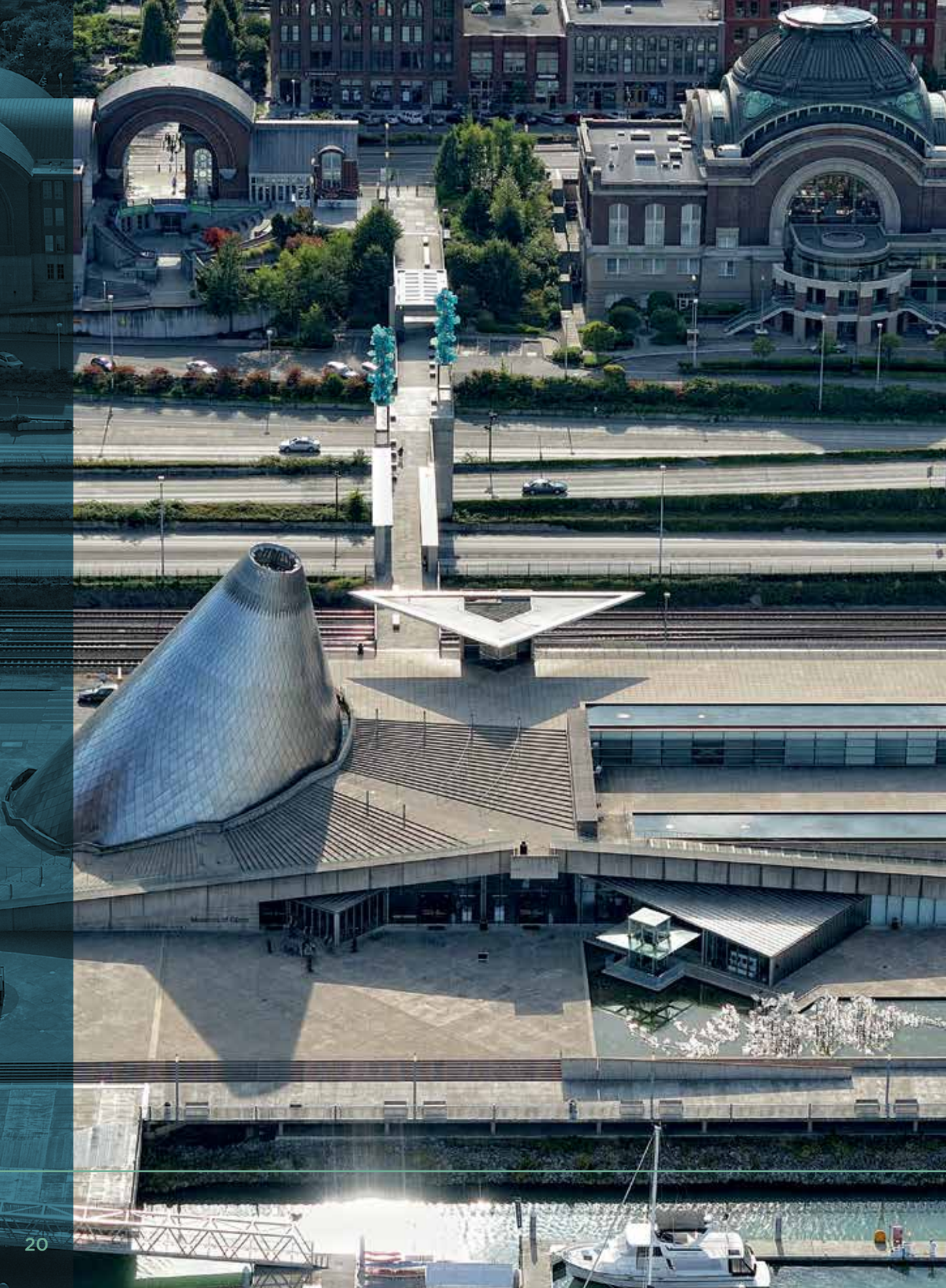
[3] Includes $3,249,500 conservation overhead, $1,220,000 evaluation and planning overhead, and $350,000 marketing and communication overhead.

Conservation Portfolio

PROGRAM / SECTOR	PLANNED SAVINGS aMW	TRC B/C RATIO	UCT B/C RATIO	RESOURCE COST $ / MWh	PARTICIPANT PAYBACK	MEASURE COST UTILITY : CUSTOMER	PLANNED INCENTIVES	PLANNED OVERHEAD
Conservation Portfolio	**9.99**	**1.4**	**1.9**	**($27.15)**	**n/a**	**57 : 45**	**$14,713,144**	**$13,474,860**
Portfolio Overhead								$3,249,483
EPRE Overhead Est.								$1,220,000
MarComm Overhead Est.								$350,000
Commercial / Industrial	**6.20**	**1.9**	**2.3**	**($21.97)**	**n/a**	**58 : 42**	**$9,026,272**	**$4,334,636**
Bright Rebates	1.85	2.7	3.0	($16.79)	2 Years	53 : 47	$2,754,340	$921,510
New Construction	1.72	2.3	3.0	($17.08)	2 Years	67 : 33	$3,019,728	$367,634
Custom Retrofit	1.44	1.4	2.1	($23.65)	5 Years	54 : 46	$2,816,280	$879,422
Strategic Energy Management	1.08	1.9	1.7	($29.14)	0 Years	100 : 0	$283,824	$454,898
Equipment Rebates	0.10	0.9	1.7	($30.02)	4 Years	36 : 64	$152,100	$117,782
C/I Non-Program Overhead								$1,593,390
Residential	**1.49**	**1.0**	**1.5**	**($33.54)**	**n/a**	**38 : 62**	**$2,453,180**	**$2,878,006**
Retail	1.03	1.6	2.2	($22.49)	2 Years	47 : 53	$1,188,000	$1,002,869
Weatherization and Heating Systems	0.30	0.7	1.6	($32.36)	13 Years	27 : 73	$946,380	$541,970
Multifamily Common Area	0.11	1.9	2.1	($23.78)	1 Years	73 : 27	$166,800	$84,422
Water Heating	0.03	0.9	1.1	($45.66)	2 Years	68 : 32	$100,000	$47,149
Product Promotion	0.02	1.9	1.1	($46.92)	0 Years	100 : 0	$52,000	$30,247
Res Non-Program Overhead								$1,171,349
Conservation Programs sub-total [1]	**7.68**	**1.6**	**1.8**	**($28.59)**			**$11,479,452**	**$12,032,125**
Low-income / Hard-to-reach [2]	**0.44**	**1.0**	**1.0**	**($50.94)**	**n/a**	**76 : 24**	**$2,760,651**	**$896,435**
Manufactured Home Direct Install	0.21	1.2	1.1	($46.25)	0 Years	100 : 0	$1,096,250	$56,308
Rental Housing	0.10	0.9	1.0	($52.58)	5 Years	67 : 33	$749,996	$359,140
Single Family Weatherization	0.09	1.1	1.0	($56.39)	0 Years	100 : 0	$718,136	$353,747
Multifamily Weatherization	0.03	0.5	1.1	($47.71)	22 Years	28 : 72	$196,270	$127,240
External Programs	**1.87**	**1.6**	**9.7**	**($5.12)**	**n/a**	**n/a**	**$473,040**	**$546,301**
City of Tacoma Street Lighting	1.08	1.6	n/a	n/a	6 Years	0 : 100	$0	$0
Northwest Energy Efficiency Alliance	0.45	0.8	1.7	($29.63)	n/a	100 : 0	$473,040	$528,599
T&D Voltage Optimization	0.34	16.2	n/a	n/a	1 Years	n/a	$0	$17,702

[1] Excludes low-income / hard-to-reach, external programs, and costs budgeted outside CEP.

[2] Low-income / Hard-to-reach administrative overhead included in the residential sector.



COMMERCIAL / INDUSTRIAL PROGRAMS

Tacoma Power offers business owners a diverse set of programs to help them save energy. Some programs, such as Bright Rebates and Custom Retrofit, use site specific characteristics and pay incentives based on custom calculations. Other programs, such as the Equipment Rebates program, pay a fixed incentive based on measures with deemed savings.

These programs give us a diverse toolset to help business owners save money while Tacoma Power acquires low cost energy resources.

Bright Rebates

COMMERCIAL / INDUSTRIAL PROGRAM

Percentage of planned 2018–2019 energy savings from the C/I sector

$3,675,850
Planned Capital and O&M expenditures

$16.79 / MWh
Planned levelized costs

3.0
UCT B/C ratio

2.7
TRC B/C ratio

1.85 aMW
Energy savings

Program Overview:

Lighting is one of the best investments customers can make to improve efficiency in their business. The newest LED lighting technology is not only more efficient but requires less maintenance and provides superior light. Measures include, but are not limited to:

- Interior and exterior lighting
- Lighting controls
- Street lighting

How Customers Participate:

Customers typically work directly with our lighting trade allies: electrical contractors, distributors, energy service companies (ESCOs), and manufacturers' representatives allied with our program. Trade allies know what equipment will work best for customer's needs and assist customers with program documentation. Alternatively, customers may contact CEP staff or Tacoma Public Utilities account executives directly.

2018-2019 Planned Changes:

In response to a dramatic reduction of Tubular-Light Emitting Diode (T-LED) cost, we will reduce T-LED incentives to $4 per replaced lamp and screw-in LEDs to $1 per replaced lamp. Additionally, we will reduce our maximum project payout from 70% of total project cost to 60% of total project cost. The declining cost of lighting retrofits, driven by lower LED prices, allows us to make these changes while having minimal impact on our customers.

Risks:

Bright Rebates has been a consistent top performer in our portfolio. This plan assumes program participation will wane in the future because incentives have been stable since 2008 and many projects in our service territory are already done. However, a few large projects remain on the horizon. If these projects materialize and program demand remains strong, available staff resources and incentive funding could be limited.

In 2017, the RTF modified savings calculation to incorporate a duel baseline methodology for lighting retrofit projects. This methodology reduces measure life based on the length of time existing equipment has been installed. We do not feel this approach aligns with conditions observed in the field, with frequent observation of lighting systems operating well past assumed measure lives. However, if this change is adopted by BPA, it would potentially strand low cost, cost effective conservation resources.

Promotion Strategy and Incentives:

We are partnering with the City of Tacoma to replace street lighting with LEDs. This project will provide a unique opportunity to reach small business customers through targeted outreach to business districts as the program moves through Tacoma. Street Lighting outreach is expected to increase program awareness among small business customers. Additionally, the Marketing Communications group has created new brochures that tie into the "There's a Rebate for That" campaign. These efforts will be supported with a bigger web presence.

Tacoma Power pays up to $0.18 per kWh[1] for Bright Rebates energy savings. Some measures, such as T-LEDS and screw-in bulbs, have fixed incentives that average less than $0.17 per kWh. Additionally, the Bright Rebates program offers technical design assistance to help customers meet lighting needs while reducing energy consumption.

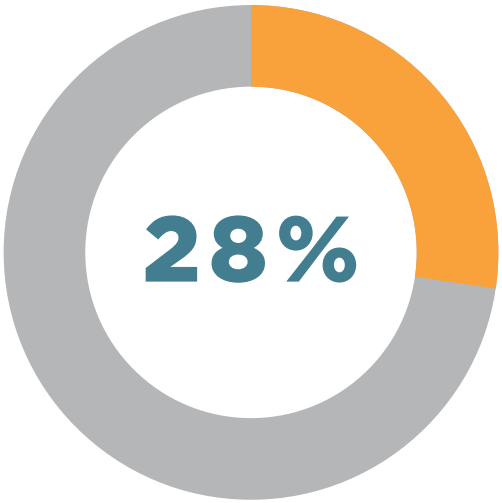
Basis of Analysis:

C/I Bright Rebates were analyzed using "average kWh." Four broad categories representing typical end uses were used to analyze program cost effectiveness. Assumptions came from Tacoma Power's 2017 Conservation Potential Assessment and were reviewed by Tacoma Power's C/I lighting staff.

[1] Payments are based on first year savings, with a maximum payment of 70% of project cost. The cost cap will be reduced in the future. Savings calculated using the BPA Lighting Calculator, which provides a combination of rebates for deemed measures and custom calculations for complex projects.

New Construction

COMMERCIAL / INDUSTRIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the C/I sector

$3,387,400
Planned Capital and O&M expenditures

$17.08 / MWh
Planned levelized costs

3.0
UCT B/C ratio

2.3
TRC B/C ratio

1.72 aMW
Energy savings

Program Overview:

Interest in New Construction increased during the 2016-2017 biennium. The program provides incentives to customers, developers, and design professionals involved in multiple design phases of new construction projects. New Construction projects include all new buildings, and major retrofits where building use changes substantially or a major renovation would require the building to meet new code standards. The program focuses on three primary end uses:

- Lighting
- Heating, Ventilation, and Air Conditioning (HVAC)
- Industrial systems

How Customers Participate:

Customers with new construction projects work through their architecture and engineering firms or through direct contact with CEP staff. Staff members estimate energy savings, ensure projects meet our cost effective standards, and conduct M&V to assure energy savings are realized. New Construction program requirements are designed to be straightforward and flexible, allowing customers to participate at all stages of design.

2018-2019 Planned Changes:

Washington State implemented a new energy code in July 2016. Projects permitted after this time will fall under the new code and will have lower incentives and claimed savings than projects permitted prior to July 2016. The latest code update has complicated the baseline definition by allowing customers to choose from multiple options for compliance. Tacoma Power is working internally to develop processes to standardize baseline definitions and to maximize energy savings.

Risks:

New construction in Tacoma has followed a boom-bust cycle. The current cycle is trending upwards as building in neighboring King County has experienced several years of rapid growth. The spillover effect has created many new opportunities in our service territory, including mixed-use multifamily development. If the trend continues, or new construction begins to mimic activity in King County, staff resources could be strained and incentive funding could be exhausted.

The impact of future code changes could modify how we deliver the program in the future. As code becomes stricter, we will research new methods for incentivizing efficient design, modifying our program as necessary.

However, it's important to note that we support improved energy codes. Capturing savings during construction is one of the least expensive ways to acquire conservation resources. As codes become stricter, it becomes more difficult for the new construction program to acquire energy savings above code.

Promotion Strategy and Incentives:

Tacoma Public Utilities account executives work closely with CEP staff to identify new projects and promote the New Construction program to customers. Our trade ally network is another source of prospective projects.

We pay an incentive of $0.20/kWh (up to 100% of incremental cost) for energy savings that exceed either the Washington State Energy Code[3] or industry standard practice for measures not regulated by code. The program also provides design incentives to engage our customers early on in the design process.

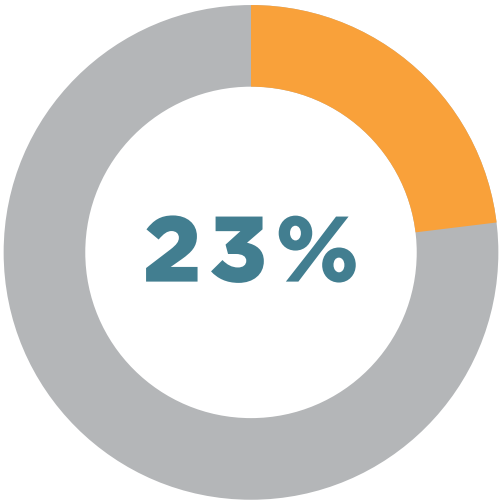
Basis of Analysis:

The program was analyzed on a per kWh basis using three broad categories representing typical end uses: HVAC, lighting, and industrial systems. Assumptions came from Tacoma Power's 2017 Conservation Potential Assessment and were reviewed by Tacoma Power's C/I engineering staff.

[3] Payments are based on first year savings that exceed the Washington State Energy Code. Tacoma will pay up to 100% of the incremental cost of the project above a code baseline solution. Savings calculated by Tacoma Power using standard industry/RTF methods.

Custom Retrofit

COMMERCIAL / INDUSTRIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the C/I sector

$3,695,700
Planned Capital and O&M expenditures

$23.65 / MWh
Planned levelized costs

2.1
UCT B/C ratio

1.4
TRC B/C ratio

1.44 aMW
Energy savings

Program Overview:

When customers have unique energy conservation needs they use the Custom Retrofit program to assess opportunities and identify options. The program is designed to work for a variety of projects, ranging from complex industrial retrofits to relatively simple HVAC projects. The program offers custom tailored incentives for unique — often large — projects. These jobs offer on-site engineering or other expert advice and guidance. Measures include:

- Compressed air systems
- Heating, ventilation, and air conditioning (HVAC)
- Motors, pumps, fans, and their associated controls
- Industrial process
- Measures not covered by other programs

How Customers Participate:

Customers work through trade allies and our conservation engineers. Staff engineers estimate energy savings, ensure projects meet Tacoma Power cost effective standards, and conduct measurement and verification (M&V) to assure energy savings are realized. We leverage BPA's EnergySmart Industrial Program to provide additional technical support and M&V assistance on large industrial projects, providing additional value to our customers.

2018-2019 Planned Changes:

In early 2017, we shifted away from applying the TRC test as the sole metric for evaluating Custom Retrofit projects. Shifting to the UCT increases customer engagement by leveraging customer's willingness to pay and reduces staff time required to calculate project cost relative to baseline.

Additionally, we are exploring revising the maximum project payout from 70% of total project cost to 60% of total project cost.

Risks:

Custom Retrofit projects tend to be large and take a long time to complete. If several new large projects materialized over a short period of time, staff resources could be strained and incentive funding could be exhausted.

Custom Retrofit projects are at a greater risk of having savings reduced by an external audit than other projects. As with all analyses of this nature, analysis is subject to some interpretation. This risk is greater for Custom Retrofit because of the inherent complexity of systems involved and the unique nature of each project.

Promotion Strategy and Incentives:

Tacoma Public Utilities account executives work closely with CEP engineering staff to identify projects and promote the Custom Retrofit program. This work is bolstered by our Strategic Energy Management (SEM) program that has the ancillary benefit of educating customers about energy savings and feeding new projects to the Custom Retrofit program.

Tacoma Power pays an incentive of $0.23/kWh[2] for energy savings from our Custom Retrofit program, up to 70% of the project cost. Additionally, we fund energy studies for complex projects. Study incentives are limited to 50% of study cost and must be performed by a qualified engineering firm.

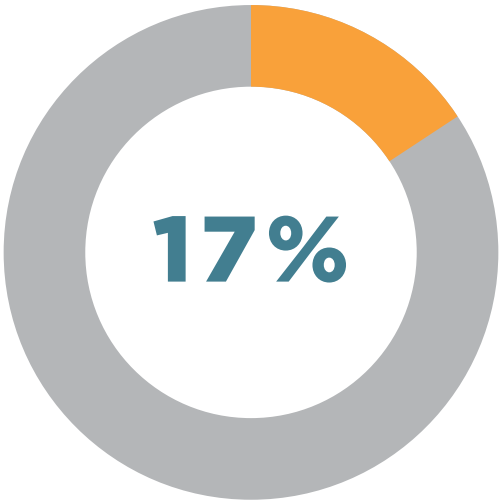
Basis of Conservation Plan Analysis:

The program was analyzed on a per kWh basis using five broad categories representing typical end uses: HVAC/Chiller, Pumping Systems, Controls, Drive/Motors, and Industrial Systems/Compressed Air. Assumptions came from Tacoma Power's 2017 Conservation Potential Assessment and were reviewed by Tacoma Power's C/I engineering staff.

[2] Payments are currently based on first year savings, with a maximum payment of 70% of project cost. The cost cap may be reduced in the future.

Strategic Energy Management

COMMERCIAL / INDUSTRIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the C/I sector

$738,700
Planned Capital and O&M expenditures

$29.14 / MWh
Planned levelized costs

1.7
UCT B/C ratio

1.9
TRC B/C ratio

1.08 aMW
Energy savings

Program Overview:

Large facilities can realize significant energy savings by optimizing how they are managed. The Strategic Energy Management (SEM) effort combines advanced metering, employee engagement, and rigorous analysis to maximize energy savings through improved operations and maintenance

How Customers Participate:

We offer three versions of BPA's Energy Smart Industrial SEM program to customers:

- Strategic Energy Management (SEM) serves large customers seeking ways to save energy through system-wide operations and maintenance improvements. A structured network of participants (a "cohort") is established to share best practices and learn in a group setting. The program includes group meetings facilitated by SEM coaches, where participants learn from peer experience.
- Tune Up also serves large industrial customers, but is not cohort-based. This offer focuses on operations and maintenance improvements achievable through an initial one- to three-day "tune-up" event to identify energy saving opportunities requiring little or no capital investment.

- Refrigeration Operator Certification (ROC) serves large cold storage warehouses and other facilities with ammonia refrigeration systems. Similar to SEM, the ROC Program is cohort-based and includes training and on-site coaching to help onsite staff to save energy and contribute to the bottom line in their plants while maintaining production, product quality and safety. Training and technical support is tailored to the unique considerations of ammonia-based refrigeration plants.

2018-2019 Planned Changes:

We are planning to engage commercial customers by rolling out a Commercial Strategic Energy Management program. This program targets large commercial customers and is expected to start in 2018.

Risks:

SEM programs rely on ongoing customer participation to realize savings. It is possible that participants may fail to engage employees in a manner that results in savings, or drop out of SEM altogether. This has created significant volatility in past estimates of SEM performance.

SEM also uses O&M funds which are paid at the end of the year. Since incentives can be large, and savings estimates are somewhat volatile, this program can create unique pressure on our O&M budget.

Promotion Strategy and Incentives:

Tacoma Public Utilities account executives work closely with CEP engineering staff to identify and recruit customers into SEM programs. Promotion is typically targeted and done on a facility-by-facility basis.

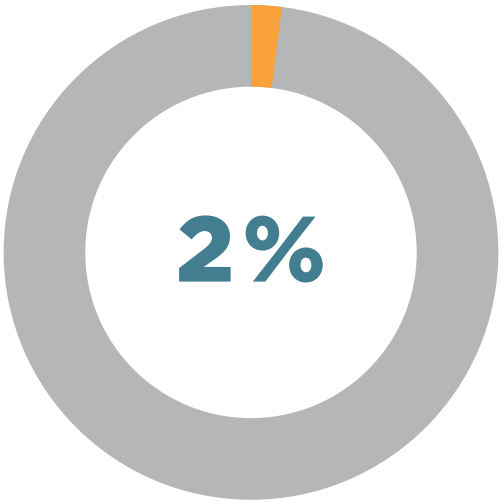
Incentives are based on operations and maintenance savings below a baseline energy model developed for each facility. The current program re-projects their baselines every two years, encouraging customers to find new savings opportunities.

Basis of Analysis:

The program was analyzed on a per kWh basis using savings estimates provided by Tacoma Power's C/I engineering staff. Since savings are behavior based, they are not tied to a specific end use the same way other programs are analyzed. Measure life is assumed to be five years with rapidly depreciating savings in years 3, 4 and 5.

Equipment Rebates

COMMERCIAL / INDUSTRIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the C/I sector

$269,900
Planned Capital and O&M expenditures

$30.02 / MWh
Planned levelized costs

1.7
UCT B/C ratio

0.9
TRC B/C ratio

0.10 aMW
Energy savings

Program Overview:

Tacoma Power has over 40,000 small and medium size businesses, each with diverse needs. The Equipment Rebates program serves these customers by offering packages of measures grouped by business need. Measures include (but are not limited to):

- Engine block heaters
- Heating, ventilation, and air conditioning (HVAC)
- Office equipment
- Food preparation equipment (steamers, ovens, etc.)
- Grocery equipment (display cases, refrigeration upgrades, etc.)

How Customers Participate:

Measures are packaged to align business need with delivery channel; cooking equipment is promoted through cooking equipment retailers, whereas HVAC equipment is promoted through HVAC contractors.

Trade allies within these delivery channels provide education on efficient equipment and promote our incentives. Customers purchasing equipment that meets or exceeds our specifications are eligible for an incentive.

2018-2019 Planned Changes:

Tacoma Power has participated in the Energy Smart Grocer program since 2007. When BPA ended the program in 2015, Tacoma Power partnered with other Puget Sound utilities to continue the program through the end of 2017. When the program ends, Tacoma Power will roll the grocery outreach effort into the equipment rebates program.

In summer of 2017, Tacoma Power introduced a number of new HVAC measures and increased incentives on current offerings. Tacoma Power expects increased participation by customers in response to trade allies promoting the program.

Risks:

The Equipment Rebates program is the smallest program in the C/I sector. While we are optimistic the combination of new measures and rolling the Energy Smart Grocer program under Equipment Rebates umbrella will increase participation, it is unknown if customers and trade allies will follow.

Uptake of grocery measures is expected to be limited due to the success of the prior Energy Smart Grocer program, which reduced the remaining potential. Outreach could focus on past customers, as some installed measures have exceeded their measure life. In these cases, the baseline for energy calculations will be existing equipment.

Promotion Strategy and Incentives:

The equipment rebates program pays fixed incentives without complex energy calculations. This strategy makes the program easy to implement and accessible to small and medium sized businesses. Additionally, the focus on offering programs in the appropriate channel encourages engagement with small and medium size business customers that lack resources to focus on energy efficiency.

Basis of Analysis:

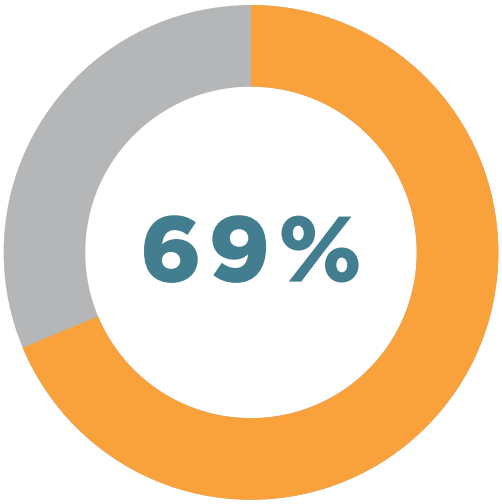
The equipment rebates program was analyzed by estimating unit counts for the top seven types of equipment rebate measures: engine block heaters, HVAC rooftop controls, heat pumps, food steamers, ovens, grocery compressors, and grocery display cases. Assumptions came from Tacoma Power's 2017 Conservation Potential Assessment and the BPA deemed measure list and were reviewed by Tacoma Power's C/I engineering staff.

RESIDENTIAL PROGRAMS

Tacoma Power offers a variety of energy conservation programs that help our residential customers save money and keep their homes comfortable. Our residential programs are organized by market channel: installer and retail. These channels connect our programs to our customers. An additional means of delivering our programs is directly to customers through promotion of efficient products and information.

Retail

RESIDENTIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the residential sector

$2,190,900
Planned Capital and O&M expenditures

$22.49 / MWh
Planned levelized costs

2.2
UCT B/C ratio

1.6
TRC B/C ratio

1.03 aMW
Energy savings

Program Overview:

Interacting with customers at the time and place of a purchase decision is critical to influence buying decisions. By leveraging our relationships with retailers, manufacturers, and distributors, we offer customers rebates at the point of purchase. Rebated products include:

- Lighting (LED bulbs and fixtures)
- Showerheads

How Customers Participate:

Customers visit a participating retailer and purchase products with our "There's a Rebate for That" branding. Retailers discount products at the register, making the experience seamless for customers. There are no rebate forms to fill out and mail in.

2018-2019 Planned Changes:

Light Emitting Diodes (LEDs) have officially displaced compact fluorescent lights (CFLs) in the residential lighting market. We expect this trend to accelerate as more fixtures with integrated LEDs enter the market and displace traditional fixtures with screw-in lamp sockets.

During the 2018/19 biennium we are planning to add several new products to our retail program: heat pump water heaters and smart thermostats. It is unknown at this time if reporting requirements will prevent us from providing an instant rebate at the point of sale for these items. However, we are exploring promotion of these products at retailers and having customers submit an online or mail-in rebate application, to allow us to gather reporting data and expedite customer payment.

Risks:

The Retail Program has been our highest performing residential program since it was launched in 2009. Lighting is the backbone of this program, accounting for 99% of savings. The success of this program, coupled with Federal regulations that increased light bulb efficiency, has radically changed the local lighting market. This change has resulted in more efficient products installed in customer homes, resulting in higher baselines and lower claimable savings.

Additionally, a new Federal efficiency standard for lightbulbs is scheduled to take effect in 2020. Once this standard takes place, we anticipate claimable savings will be below our cost effective threshold. The exact timing of this change is not clear, thus the impact on the Retail Program during the 2018/19 biennium is unknown.

Promotion Strategy and Incentives:

We contract with a third-party implementer, Colehour + Cohen (C+C), to deliver the program to our customers. C+C provides field support, enters into promotion agreements with retailers, manufacturers, and distributors on behalf of Tacoma Power, processes rebates, and reports units sold to CEP.

Additionally, C+C assists CEP with the following:

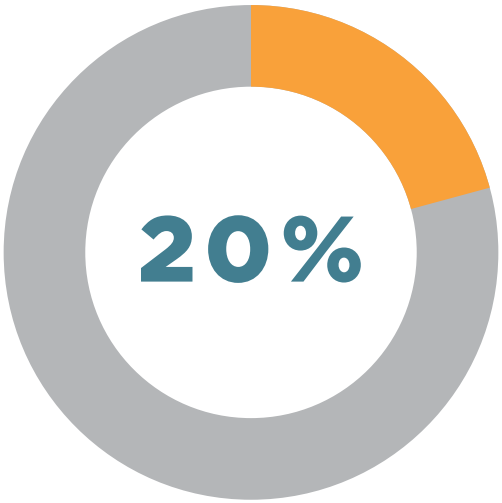
- Advising on product incentive level
- Introducing new technologies
- Identifying participating retail locations
- Ensuring products are on the shelf
- Maintaining point of purchase materials
- Training store sales staff, and
- Planning and implementing in-store events.

Basis of Analysis:

Individual measures deemed by the RTF were modeled into generic lighting measures for the purpose of analysis. Weighting of individual measures started using historical data and was shaped by expected future outcomes. Assumptions were reviewed by Tacoma Power's residential staff.

Weatherization and Heating Systems

RESIDENTIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the residential sector

$1,488,400
Planned Capital and O&M expenditures

$32.36 / MWh
Planned levelized costs

1.6
UCT B/C ratio

0.7
TRC B/C ratio

0.30 aMW
Energy savings

Program Overview:

Improving the efficiency of a home's shell and heating system not only makes our customers more comfortable, but lowers their bills. Our program covers a wide range of measures for customers in electrically heated homes, including:

- Attic, floor, and wall insulation
- Air sealing and pipe insulation
- Windows
- Ductless and central heat pumps
- Duct sealing
- Smart thermostats

How Customers Participate:

Customers work directly with our weatherization and heating trade allies: windows and insulation contractors, HVAC contractors, and duct sealing specialists, allied with our program. Trade allies know our program requirements and can advise what measures work best for each customer. Customers using trade allies on our participating contractor list have the option of assigning their incentive directly to the trade ally, reducing their out of pocket expenses.

2018-2019 Planned Changes:

In the marketplace, we observe customers are willing to pay higher out of pocket costs for measures with significant non-energy benefits, such as heat pumps that increase comfort. Adoption of the UCT will allow CEP to leverage these benefits and increase the number of weatherization and heating measures we offer—engaging more customers and acquiring more cost effective conservation.

To test this, CEP implemented program changes in late 2017:

1. Rolled out new central heat pump and smart thermostat measures.
2. Lowered DHP incentives to align with reduced savings assumptions.

The impact of these decisions will not be realized until mid-2018. If customer participation remains strong, we will apply these lessons to future program designs.

Risks:

In our analysis, many weatherization and heating system measures are only marginally cost effective. These measures are highly susceptible to changes in deemed savings, with adjustments of less than 10% causing them to fail a TRC or UCT economic screen. Although we participate in regional discussions about deemed measure savings, the ultimate decision to change savings is made by the RTF.

As mentioned above we are experimenting with lowering rebates. The goal is to reduce incentives to the lowest level possible and still influence market adoption trends. It is unknown how customers will respond to these rebate levels.

Promotion Strategy and Incentives:

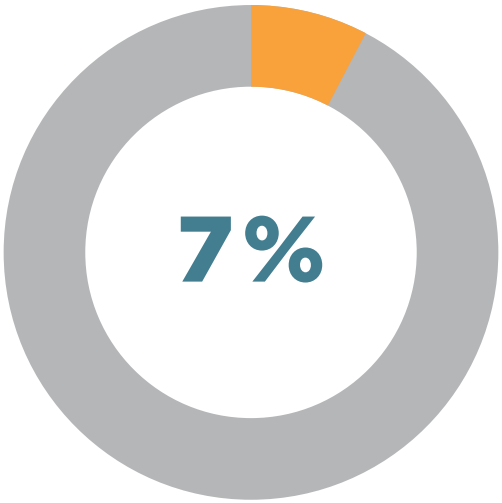
Weatherization rebates typically pay 60% of total project cost. In addition to rebates, we offer customers with good utility bill payment history a seven year, zero interest loan for most weatherization and heating systems measures. By combining the rebate and loan and using a participating trade ally, most customers are able to complete their project with no upfront out of pocket expense. Heating rebates range from $250 - $500, depending on the measure.

Basis of Analysis:

Weatherization measures were analyzed by creating an "average house" model. The model uses historic program accomplishments to create an "average house" with a specified ft^2 value for each measure. Assumptions are further changed by applying a factor to weight HVAC type based on past program experience. Other measures, such as DHPs and smart thermostats, are weighted by past program experience. Assumptions on future performance were reviewed by Tacoma Power's residential staff.

Multifamily Common Area

RESIDENTIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the residential sector

$251,200
Planned Capital and O&M expenditures

$23.78 / MWh
Planned levelized costs

2.1
UCT B/C ratio

1.9
TRC B/C ratio

0.11 aMW
Energy savings

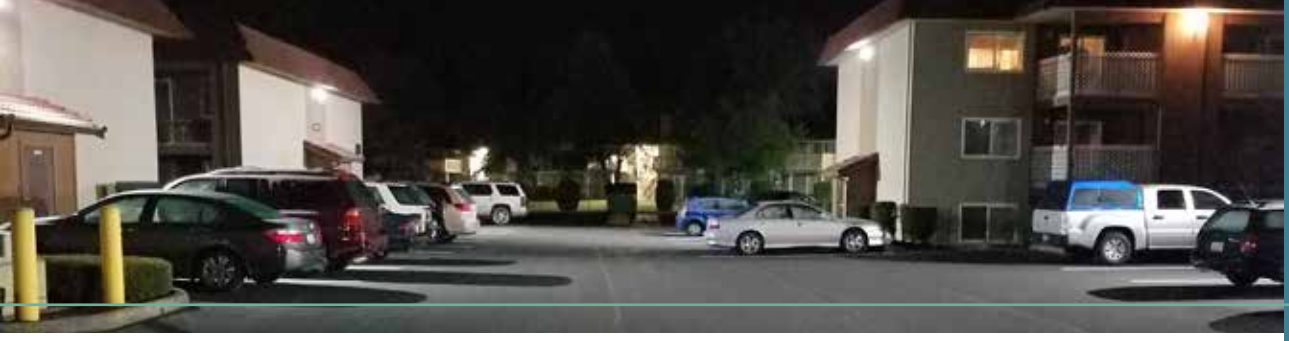
Program Overview:

Increasing the energy efficiency in common areas of multifamily buildings is typically overlooked. Efficiency upgrades not only reduce property owner operating and maintenance expenses, but improve tenant quality of life and safety through the use of improved equipment. CEP supports improvements to common areas in multifamily buildings, including:

- Lighting (LED bulbs and fixtures)
- Custom projects (common HVAC, pool pumps and heaters, etc.)

How Customers Participate:

CEP multifamily staff help property owners navigate our program offers. Staff work closely with trade allies and property owners to ensure customers have a positive one-stop shopping experience. When needed, CEP's commercial engineers are engaged to estimate energy savings, ensure projects meet Tacoma Power cost effective standards, and conduct monitoring and verification (M&V) to assure energy savings are realized.



2018-2019 Planned Changes:

Since we launched our comprehensive Multifamily program in August 2014, trade allies have been our biggest advocates. They generate interest and bring projects to us. To increase participation we plan to collaborate with neighborhood and community groups to identify multifamily complexes with insufficient lighting and potential for upgrades.

Risks:

Large multifamily projects tend to be very complex and involve coordination with property owners, tenants, and trade allies over long periods of time. This can result in long project delays, which leads to dwindling interest. To mitigate this, we assign a single point of contact from CEP to identify all potential energy efficiency improvements and the rebates available. This allows the owner to determine which measures they can afford to do now and which need to be budgeted for in coming years.

Promotion Strategy and Incentives:

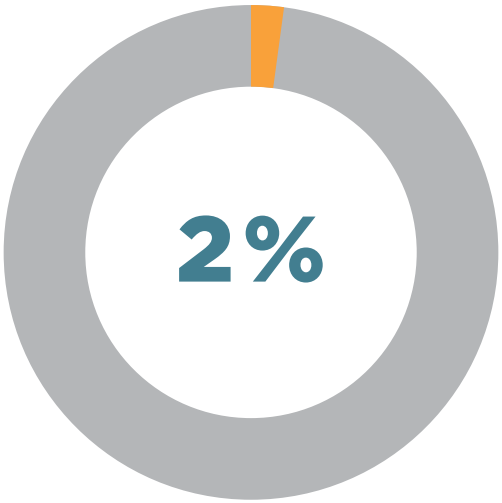
Incentives for lighting and HVAC measures will continue to mirror their commercial counterparts; $0.17 per kWh for lighting savings with a payment cap of 60% of total project cost and $0.23 per kWh for custom calculated measures (e.g. HVAC, pool heating and pumps, etc.), capped at 70% of project cost.

Basis of Analysis:

The program was analyzed on a per kWh basis using three broad categories representing typical end uses: common area lighting, HVAC equipment, and pumping systems. Assumptions came from Tacoma Power's 2017 Conservation Potential Assessment and were reviewed by Tacoma Power's multifamily staff.

Water Heating

RESIDENTIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the residential sector

$147,100
Planned Capital and O&M expenditures

$45.66 / MWh
Planned levelized costs

1.1
UCT B/C ratio

0.9
TRC B/C ratio

0.03 aMW
Energy savings

Program Overview:

The water heating market has dramatically changed in the last five years with the introduction of heat pump water heaters (HPWHs). The newest models have significant improvements to the technology and performance than earlier products and promise to deliver significant energy savings without sacrificing customer comfort and convenience. To introduce these products, CEP will launch a new water heating program in 2018, beginning with a pilot. Products will include:

- All Tier 2 and Tier 3 heat pump water heaters

How Customers Participate:

The 2018 pilot will allow customers to purchase a HPWH through our trade allies or directly from a retailer. If the pilot is successful, it will guide how we deliver the program when it goes to scale in 2019.

2018-2019 Planned Changes:

Our water heating program is new for 2018. We'll launch it using an adaptive management strategy, and anticipate program changes during the 2018/19 time period based on customer feedback and market conditions.

Risks:

Heat pump water heaters have several unique customer acceptance barriers. The heat pump creates cold air during operation that is cycled into the living space (unless ducted to the outside), and compared to a standard electric water heater, the units produce low-level noise and vibration which could impact customer satisfaction. Additionally, we anticipate concerns over hot water recovery time and willingness of customers to interact with water heater controls.

Finally, HPWH's are taller than traditional electric water heaters. It may be challenging to fit the larger units in older homes. With almost 25% of homes in our service territory built before 1940, and over 65% of homes built before 1980, there is concern that replacing an electric resistance water heater with a HPWH will present a challenge with regards to to available space.

Promotion Strategy and Incentives:

We are exploring several promotion options for 2018, including direct mail outreach to net metering customers and past program participants. These customers are much more likely to be early adopters and try something new.

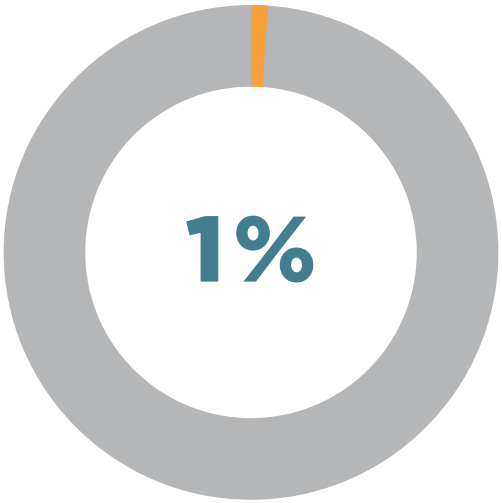
Initial incentives will be set at $500 per HPWH. We will adjust incentives based on lessons learned during the pilot.

Basis of Analysis:

The program was analyzed using RTF's deemed measure for Tier 2 HPWHs replacing any size water heater in any location. 2018/19 goals were reviewed by Tacoma Power's residential staff.

Product Promotion

RESIDENTIAL PROGRAM



Percentage of planned 2018–2019 energy savings from the residential sector

$82,200
Planned Capital and O&M expenditures

$46.92 / MWh
Planned levelized costs

1.1
UCT B/C ratio

1.9
TRC B/C ratio

0.02 aMW
Energy savings

Program Overview:

Customers enjoy getting free efficient products from Tacoma Power. This program builds considerable good will with our customers, allows skeptical customers to sample efficient products, and provides energy savings that yield financial benefits.

Products typically distributed include:

- Lighting (LED bulbs and fixtures)
- Showerheads

How Customers Participate:

Customers primarily interact with our staff at local community events and at the Energy Savings counter in the TPU lobby. Additionally, customers may receive products through direct mail outreach or through our partnerships with low-income agencies and community advocates. These efforts enable us to distribute products to our hard to reach customers.

2018-2019 Planned Changes:

The program will continue to focus on customer interaction and engagement at local community events and in the TPU lobby. This trend continues a shift away from direct mail outreach that began in 2016. As a result, fewer products will be distributed than in past biennia.

Risks:

Distribution is a low risk activity for the utility. The cost of products is relatively inexpensive and justified by the savings accrued when customers use the products.

Promotion Strategy and Incentives:

Products will continue to be distributed to customers at no charge at local community events, in the TPU lobby, by utility contractor, and through community partners.

Basis of Analysis:

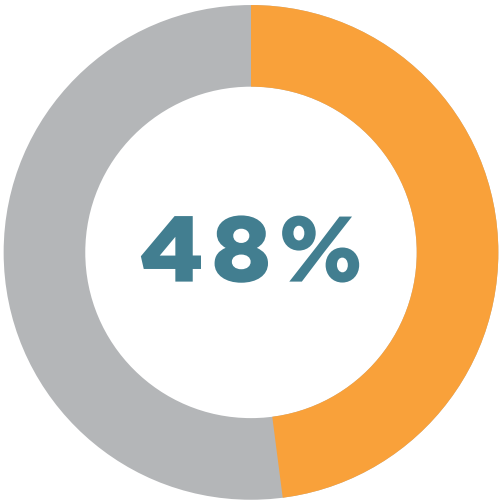
Individual measures from the most recent RTF analysis representing estimated 2018/19 program activity were analyzed. Our residential conservation staff reviewed program performance estimates to ensure they were appropriate.

LOW-INCOME / HARD-to-REACH

Tacoma Power is proud to be a regional leader in serving low-income and hard to reach customers. To help those most in need, incentives will be above those offered in our standard heating and weatherization program. Our targeted offers help low-income customers living in their own homes, renters in single family homes, renters in two, three, and four plexes, large multifamily complexes, and those living in manufactured homes.

Manufactured Home Direct Install

LOW-INCOME / HARD-TO-REACH



Percentage of planned 2018–2019 energy savings from the low-income / hard-to-reach sector

$1,152,600
Planned Capital and O&M expenditures

$46.25 / MWh
Planned levelized costs

1.1
UCT B/C ratio

1.2
TRC B/C ratio

0.21 aMW
Energy savings

Program Overview:

Outside of duct sealing, manufactured homes have historically been difficult to serve with conservation programs for a variety of reasons: owners are typically low-income, manufactured homes have complicated ownership arrangements, and a limited availability of traditional cost effective measures. To address these challenges, we have assembled a package of measures that are cost effective when installed on a large scale. This model works well in manufactured home parks where most homes are of similar vintage and in close proximity. Measures include:

- Ductless Heat Pumps (DHPs)
- LED Lighting
- Showerheads
- Pipe Insulation
- Duct Sealing

How Customers Participate:

Trade allies work with park management to identify parks that would benefit from this program. Parks are submitted to us for review and approval. The trade ally then works with park management to contact home owners. Home owners contract with the trade ally for installation and assign the grant to the trade ally, resulting in no out of pocket cost to the home owner. Trade allies are also responsible for implementing a pre-installation home owner survey and providing education on how to most efficiently use a DHP.

2018-2019 Planned Changes:

Upon successful completion and evaluation of our 2017 manufactured home pilot, we will launch a full scale program in 2018. It will be launched using an adaptive management strategy. We expect to make program changes during the 2018/19 time period based on customer feedback and market conditions.

Risks:

The program relies on leveraging economies of scale to reduce DHP costs. If contractors are unable to meet expected cost thresholds, the program will be unable to cover 100% of the DHP cost. Under this scenario, uptake will be significantly lower than planned.

Promotion Strategy and Incentives:

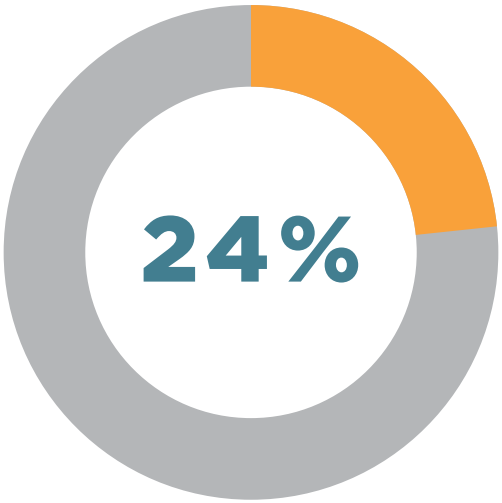
Incentives are set to cover 100% of expected cost. The program will be promoted by trade allies, word of mouth, and direct outreach to manufactured home park managers.

Basis of Analysis:

Units are analyzed using savings assumptions from the RTF.

Rental Housing

LOW-INCOME / HARD-TO-REACH



Percentage of planned 2018–2019 energy savings from the low-income / hard-to-reach sector

$1,109,100
Planned Capital and O&M expenditures

$52.58 / MWh
Planned levelized costs

1.0
UCT B/C ratio

0.9
TRC B/C ratio

0.10 aMW
Energy savings

Program Overview:

Rental housing suffers from a unique split incentive. Property owners do not pay the electric bill, and therefore not motivated to make energy improvements, Tenants do not own the property and so are not interested in making energy improvements. Our rental housing weatherization and heating program attempts to bridge this gap by offering compelling incentives without income certification paperwork or restrictive participation guidelines. Measures include:

- Attic, floor, and wall insulation
- Air sealing and pipe insulation
- Windows
- Ductless Heat Pumps
- Central Heat Pumps

How Customers Participate:

Property owners work directly with our weatherization and heating trade allies: windows and insulation contractors, HVAC contractors, and duct sealing specialists allied with our program. The program piggybacks on our existing single family and multifamily weatherization programs, making the process seamless for the customer and reducing delivery costs.

2018-2019 Planned Changes:

This program offer is new for 2018. We'll make incremental program changes during the 2018/19 time period based on customer feedback and market conditions.

Risks:

While the program has been redesigned with property owner feedback, it is unknown if property owners will be willing to contribute to the cost of window installation or ductless/central heat pumps.

Promotion Strategy and Incentives:

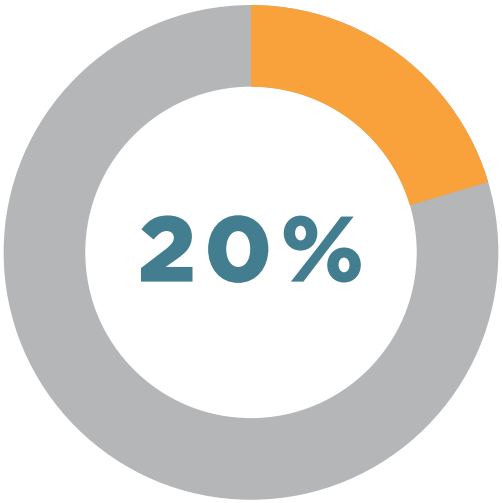
Weatherization rebates typically pay 100% of total project cost, with window rebates paying between 50% and 25% of project cost. In addition to rebates, we offer property owners with qualifying credit a seven year, zero interest loan. By combining the rebate and loan, and using a participating trade ally, most property owners are able to complete their project with no out of pocket upfront cost.

Basis of Analysis:

Weatherization measures were analyzed by creating an "average house" model. The model uses historic program accomplishments to create an "average house" with a specified ft2 value for each measure. Assumptions on future performance were reviewed by Tacoma Power's residential staff.

Single Family Weatherization

LOW-INCOME / HARD-TO-REACH



Percentage of planned 2018–2019 energy savings from the low-income / hard-to-reach sector

$1,071,900
Planned Capital and O&M expenditures

$56.39 / MWh
Planned levelized costs

1.0
UCT B/C ratio

1.1
TRC B/C ratio

0.09 aMW
Energy savings

Program Overview:

Improving a home's shell and heating system not only makes customers more comfortable, but lowers their bills. Our program provides grants to cover 100% of the cost for the following measures:

- Attic, floor, and wall insulation
- Air sealing and pipe insulation
- Single Pane Windows

How Customers Participate:

Customers must meet program income guidelines to be eligible for conservation grants. Qualifying customers contact trade allies who provide bids on weatherization projects. The trade ally walks the customer through the application process, assisting them with required project documentation and income verification. After staff approval of the project, the trade ally deducts the grant from the customer's invoice, resulting in no out of pocket expense for the customer.

2018-2019 Planned Changes:

We are removing ductless heat pumps (DHPs) from our single family low-income program beginning in 2018. The RTF has conducted several studies that indicate savings for DHPs are much lower than expected. As a result, this measure is no longer cost effective under a TRC or UCT cost effective screen.

Risks:

We have seen a significant decline in low-income weatherization projects over the 2016 – 2017 time period. We attribute this decline to program changes made in 2016 that removed double pane windows from our low-income program offer and left fewer projects in our conservation potential. We will continue to look for creative incentive options, program design, and partnerships to promote our low-income programs to qualifying customers.

Promotion Strategy and Incentives:

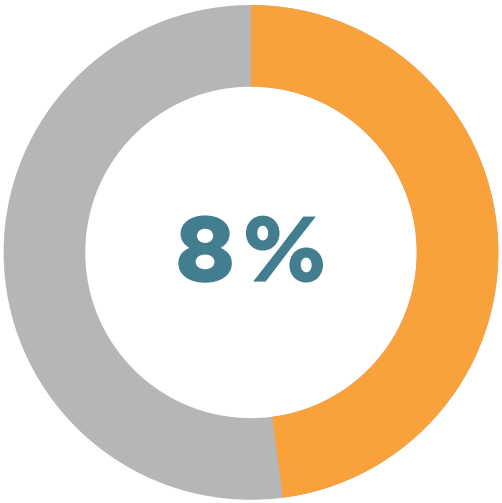
The program is promoted via contractors and referrals from community partners. Our grants pay 100% of the project cost for qualifying customers. In order to qualify, customers must meet income eligibility guidelines determined by household size and income. We allow customers to assign the grant to the contractor, enabling them to get their homes weatherized with no out of pocket costs.

Basis of Analysis:

Weatherization measures were analyzed by creating an “average house” model. The model uses historic program accomplishments to create an “average house” with a specified ft2 value for each measure. Assumptions on future performance were reviewed by Tacoma Power’s residential staff.

Multifamily Weatherization

LOW-INCOME / HARD-TO-REACH



Percentage of planned 2018–2019 energy savings from the low-income / hard-to-reach sector

$323,500
Planned Capital and O&M expenditures

$47.71 / MWh
Planned levelized costs

1.1
UCT B/C ratio

0.5
TRC B/C ratio

0.03 aMW
Energy savings

Program Overview:

Apartments suffer from the same split incentive as rental housing. Property owners do not pay the electric bill, and therefore are not motivated to make energy improvements. Tenants do not own the property so are not interested in making energy improvements. Our apartment weatherization program attempts to bridge this gap by offering compelling incentives without income certification paperwork or restrictive participation guidelines. Measures include:

- Attic, floor, and wall insulation
- Air sealing and pipe insulation
- Windows

How Customers Participate:

Property owners work directly with our weatherization trade allies: windows and insulation contractors, allied with our program. The program piggybacks on our existing single family and multifamily weatherization programs, making the process seamless for the customer and reducing delivery costs.

2018-2019 Planned Changes:

We will add incentives for replacing single pane windows back into the program for 2018/19.

Risks:

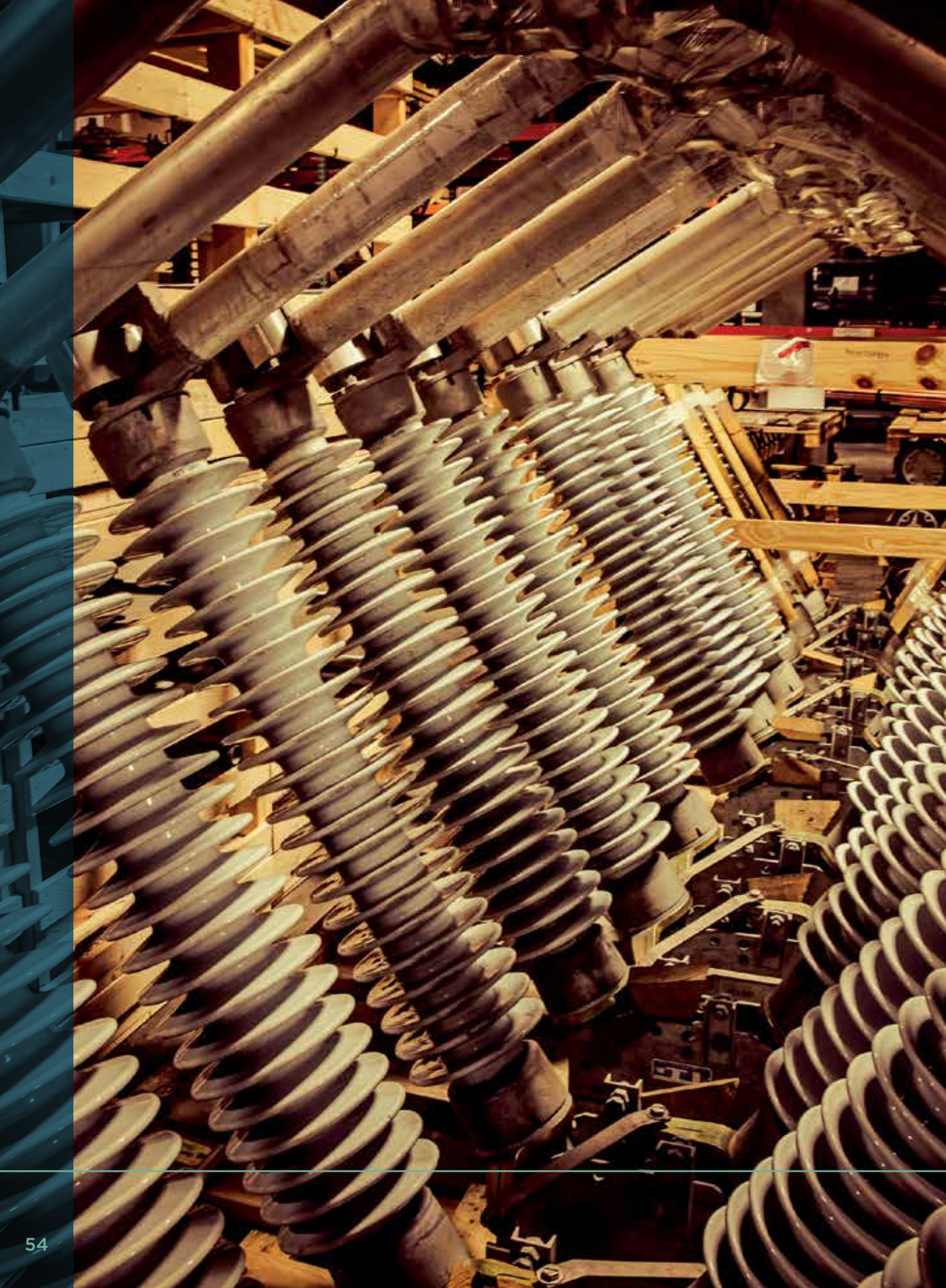
While the program has been redesigned with property owner feedback, it is unknown if property owners will be willing to contribute to the cost of window installation.

Promotion Strategy and Incentives:

Weatherization rebates typically pay 100% of total project cost, with window rebates paying between 50% and 25% of project cost. In addition to rebates, we offer property owners with good credit a seven year, zero interest loan.

Basis of Analysis:

Weatherization measures were analyzed by creating an “average house” model. The model uses historic program accomplishments to create an “average house” with a specified ft2 value for each measure. Assumptions on future performance were reviewed by Tacoma Power’s residential staff.



EXTERNAL
ENERGY CONSERVATION

Tacoma Power partners with other organizations to deliver energy efficiency outside our traditional conservation programs. These "programs" are typically implemented by other organizations, but we contribute funding or technical expertise and are allowed to claim savings. External Energy Conservation represents our lowest cost energy resources, but lacks engagement opportunities our customers.

Northwest Energy Efficiency Alliance

NON-CRM PROGRAM

Program Overview:

We partner with other Northwest utilities to fund the Northwest Energy Efficiency Alliance (NEEA). NEEA helps Tacoma Power save energy two ways:

- NEEA fills the energy efficiency pipeline with new products, services, practices, and approaches at the regional level. Through these efforts, NEEA encourages upstream market actors to bring new energy efficient products to market, giving consumers new efficient options. Past efforts have included front loader washing machines and ductless heat pumps.
- NEEA helps foster regional market solutions that accelerate and sustain adoption of emerging energy efficiency products, services, and practices. By working upstream in the market and encouraging purchase of efficient products, NEEA helps provide customers with more efficient products. Past efforts include working with retailers to encourage stocking practices that make efficient televisions the default choice.

Promotion Strategy and Incentives:

CEP works very closely with NEEA and is represented on its Board of Directors, Regional Portfolio Advisory Committee, and Sector Advisory Committees. Participation ensures our needs and perspectives are represented. Additionally, we directly fund NEEA's work with retailers, distributors, manufacturers, and national organizations that facilitate energy efficiency.

Risks:

NEEA savings may vary significantly due to changes in reporting baseline.

Basis of Analysis:

NEEA savings estimates and performance are based on 50% of NEEA estimates to account for unknown baseline variability.

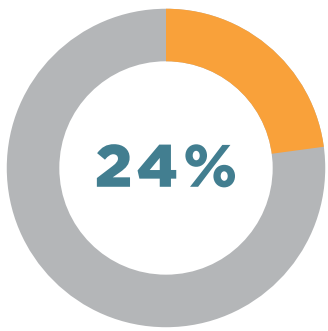
$1,001,600
Planned Capitol and O&M expenditures

29.63 / MWh
Planned levelized costs

1.7
UCT B/C ratio

0.8
TRC B/C ratio

0.45 aMW
Energy savings



Percentage of planned 2018–2019 energy savings from external energy conservation

City of Tacoma Street Lighting

NON-CRM PROGRAM

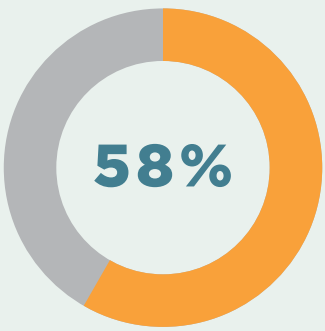
Program Overview:

We are partnering with the City of Tacoma to upgrade Tacoma's streetlights to LEDs. The program is a financial win-win, with Tacoma Power purchasing the new LED street lights and recovering costs through a special street lighting rate. The City of Tacoma will pay less in power and maintenance costs. We are also providing technical expertise and project management support to help expedite the project.

Basis of Analysis:

Savings were estimated by C/I staff using a lighting power density calculation. Costs are estimated based on the cost of money for the 15 year term of the project.

1.08 aMW
Energy savings



Percentage of planned 2018–2019 energy savings from external energy conservation

Tacoma Power Voltage Optimization

NON-CRM PROGRAM

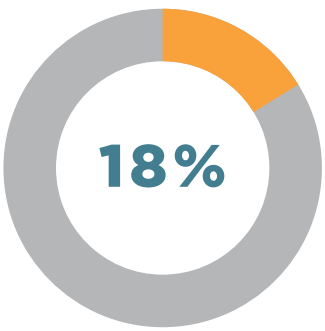
Program Overview:

We partner with Tacoma Power's transmission and distribution group to acquire savings from voltage optimization where we systematically optimize voltage at the substation level to reduce line loss. This effort is part of an ongoing effort to maximize efficiency of our distribution system.

Basis of Analysis:

Savings estimates are based on savings from past voltage optimization projects.

0.34 aMW
Energy savings



Percentage of planned 2018–2019 energy savings from external energy conservation

MyTPU.org/Rebates

TACOMA POWER
TACOMA PUBLIC UTILITIES