TRANSPORTATION ELECTRIFICATION

2020-2025 Strategic Plan and Roadmap

CITY OF BURBANK
Water and Power
Since 1913
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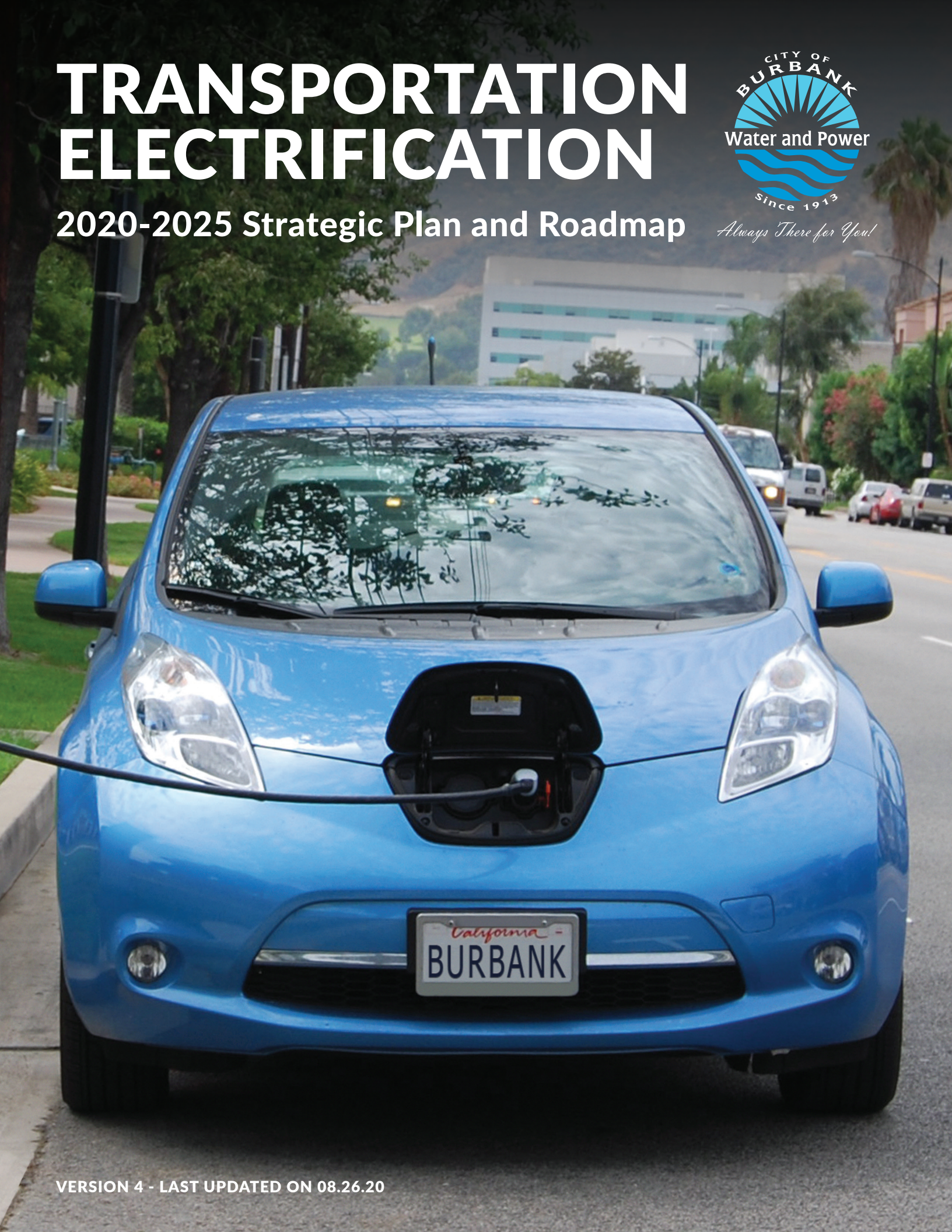

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List of Abbreviations

BUSD	Burbank's Unified School District
CARB	California Air Resources Board
CalEPA	California Environmental Protection Agency
CDD	Burbank's Community Development Department
DACs	Disadvantaged communities, as defined by the California Environmental Protection Agency (CalEnviroScreen tool)
EV	Electric vehicle
GHG	Greenhouse gas
LCFS	The California Air Resources Board's Low Carbon Fuel Standards program
MUD	Multi-unit dwelling
SFR	Single-family residence
TE	Transportation electrification

Chapter 1. Executive Summary

Transportation electrification (TE) comes with many benefits, including a significant reduction of greenhouse gas and pollutant emissions, environmental improvements for disadvantaged communities, the opportunity for greater integration of renewable energy resources, and the integration, and potential downward pressure on rates. This is why the state of California is promoting TE and has set aggressive goals requiring a steep ramp-up in the adoption and deployment of the necessary charging infrastructure. In accordance with state and local policy, Burbank Water and Power (BWP) has developed a comprehensive plan that will guide the utility's investments in TE until 2025.

BWP intends to tackle some of the biggest barriers to the adoption of TE, including the lack of public awareness, the costs of implementation, the lack of fueling infrastructure, and perceived vehicle limitations. BWP's plan also covers all key TE market segments (single-family residences, multi-unit dwellings, workplaces, fleets, and retail/public charging stations), factoring in their respective costs and complexities.

BWP has designed its plan to:

- Improve the lives of Burbank residents and communities;
- Lessen the cost and complexity of TE adoption;
- Focus on bridging adoption gaps, in particular for disadvantaged, low-income, and multi-unit dwelling communities;
- Integrate renewable energy resources;
- Remain cost-effective; and
- Reach every TE market segment.

BWP's TE plans include multiple initiatives designed specifically for the citizens who live, work, and enjoy the many amenities available in the City of Burbank. First, BWP will support deployment of charging infrastructure for light-duty electric vehicles (EVs) by revamping and expanding existing customer rebate programs. These new programs will follow a standardized and flexible operating model across market and customer segments. BWP will also offer advisory services to help alleviate the complexity of deploying commercial charging infrastructure. BWP will also increase its network of owned-and-operated charging stations at public parking sites.

In addition to those efforts, BWP will run a limited number of initiatives to deploy charging infrastructure for medium- and heavy-duty EVs to evaluate customer interest and the grid impact of these more recent technologies. And through two new programs, BWP will offer rebates to increase the affordability of new and used EVs for the utility's residential customers.

Customer test driving a car at BWP's EV Guest Drive Event.

With a view toward developing greater awareness of TE and the benefits of fueling from the grid, BWP will expand its education and outreach efforts, including launching a broad campaign and participating in TE-related events, such as ride-and-drives.

BWP also plans to bundle several strategies and target customers who tend to face more challenges to adopting TE, including low-income and disadvantaged communities as well as residents of multi-unit dwellings.

Last, but not least, BWP will walk the talk and support TE adoption for its own operations and those of other City departments.

BWP's TE plan will be implemented in four phases between 2020 and 2025, with an estimated budget of about $12 million, anticipated to result in the addition of about 2,000 charge ports and 5,000 more EVs registered in the City of Burbank. Funding for implementing BWP's TE plan will mostly come from the California Air Resources Board's (CARB's) Low Carbon Fuel Standard (LCFS) program, third-party grants, and some support from public benefits.

Chapter 2. Introduction

Transportation electrification comes with many benefits that are attractive to policymakers, utilities, and their constituents and customers. While TE adoption is increasing, it's still considered to be in its infancy and much remains to be done to meet the ambitious goals of the state of California. Widespread TE will require customer- and market segment–specific solutions to overcome barriers to adoption.

As the second largest emitter of greenhouse gas (GHG) emissions in the United States — and one of the largest emitters in the world — California must act now to reduce emissions. Acknowledging the effects of climate change, California has adopted a wide variety of legislation aimed at reducing the state's GHG emissions, including a goal of a 40% reduction by 2030.

The City of Burbank is responding to this call to action with a variety of new plans and policies, including the Burbank2035 General Plan[1]. This plan includes specific reduction goals of 15% by 2020 and 30% by 2035. It has identified on-road and other mobile sources as contributing the largest emissions of ozone precursors within Burbank. On-road sources include passenger vehicles, trucks, buses, and motorcycles, as well as off-road vehicles. Major highways and freeways in and near Burbank include Interstate 5 and State Route 134.

BWP's energy future includes providing reliable, affordable, and sustainable services to customers to power their homes and buildings, and increasingly, their vehicles. As the transportation sector is one of the leading sources of GHG emissions, BWP's Integrated Resources Plan[2] included a review of BWP's previous EV charging efforts and an outline of proposed future programs. In order to develop, validate, and measure goals tied to these programs, BWP has developed a plan designed to facilitate TE adoption, integrate renewable energy sources, and reduce GHG emissions. The primary components of the plan are to:

- Facilitate the installation of EV charging infrastructure.
- Promote TE and the adoption of EVs among all customer segments, including low-income and disadvantaged community (DAC) customers.
- Use LCFS credit proceeds to support long-term, cost-effective infrastructure investment.
- Monitor the benefits and costs of TE initiatives, including participation in BWP's customer programs and the load served to charge EVs.

[1] **https://www.burbankca.gov/home/showdocument?id=23448**
[2] **https://www.burbankwaterandpower.com/2019-irp**

2.1. TE Benefits

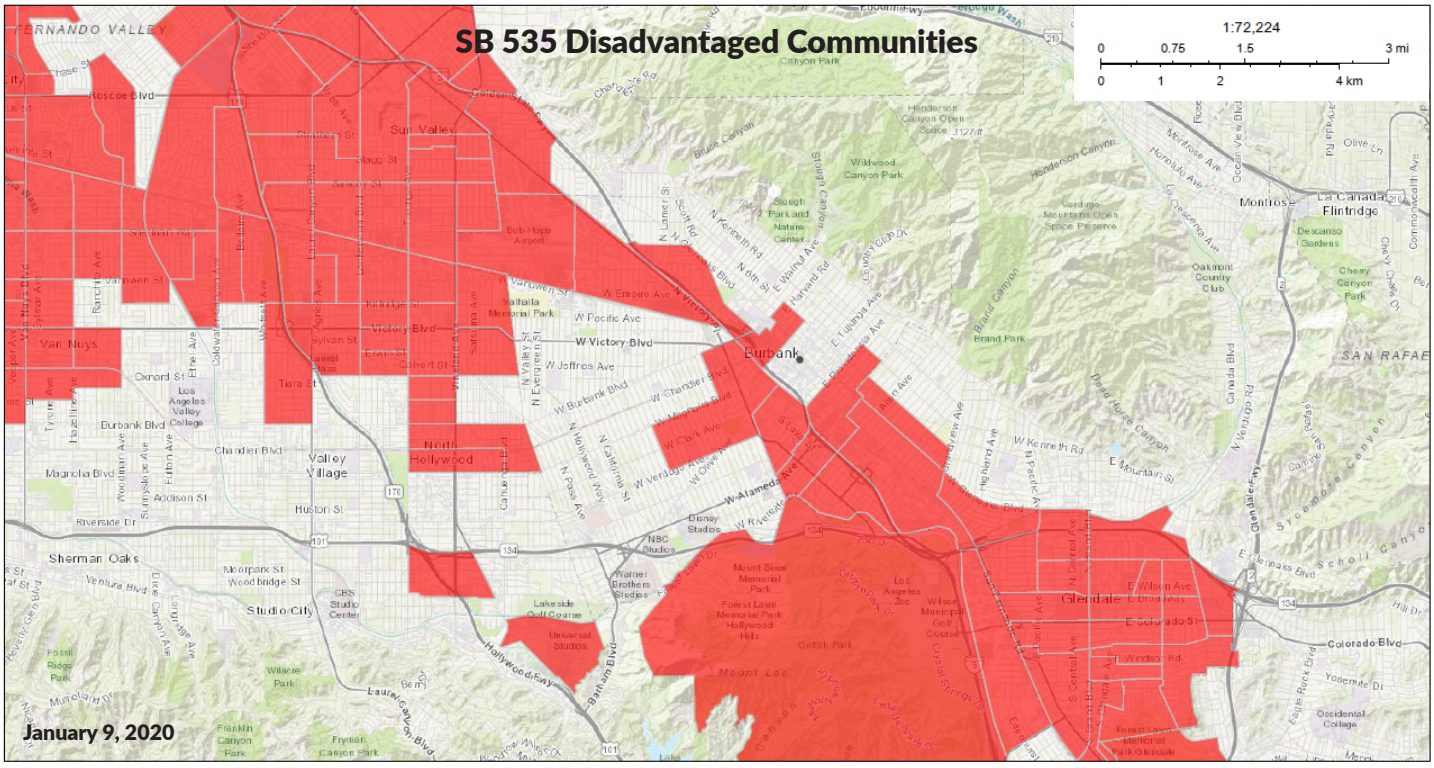
The state of California and leading utilities are focused on supporting TE because of the many benefits anticipated with its widespread adoption.[3]

2.1.1. Significant GHG and Pollutants Emission Reduction

As the Burbank2035 Greenhouse Gas Reduction Plan shows, the transportation sector accounts for about 60% of all GHG emissions in the City of Burbank. Each vehicle with an internal combustion engine replaced by an EV delivers a reduction in GHG and other pollutant emissions. TE is expected to provide significant improvement of air quality for all of Burbank's residents.

2.1.2. Improvement of Disadvantaged Communities

DACs (as identified by CalEPA[4]) face the greatest environmental and economic burden in California. The map below shows CalEPA's designation of DACs within the City of Burbank,[5] created using environmental, health, and socioeconomic information to produce scores for every census tract. Census tracts with a score in the top quartile (i.e., with the highest environmental and economic burden) are considered DACs. More than 25 percent of Burbank residents live in DACs, and improving TE adoption will directly benefit these communities.



[3] For instance, see Senate Bill 350, October 7, 2015, at **https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350**.

[4] For more information on CalEPA's definition of DACs, see **https://calepa.ca.gov/envjustice/ghginvest/**.

[5] Information on the CalEnviroScreen 3.0 mapping tool is available at **https://oehha.ca.gov/calenviroscreen/sb535**.

2.1.3. Opportunity for Greater Renewable Integration

As deployment of solar photovoltaics increases, BWP's grid will face more-volatile energy generation and likely an energy surplus.[6] The incremental load from TE charging, if properly managed, will provide an opportunity to offset some of these impacts. It has the potential to absorb some of the energy surplus and limit sharp evening increases in demand for power. Workplace charging infrastructure and appropriate price signals (including time-of-day rates and demand-response programs for both residential and commercial customers) may play an important part in future load management and the integration of renewable energy resources.

2.1.4. Higher System Utilization and Downward Pressure on Rates

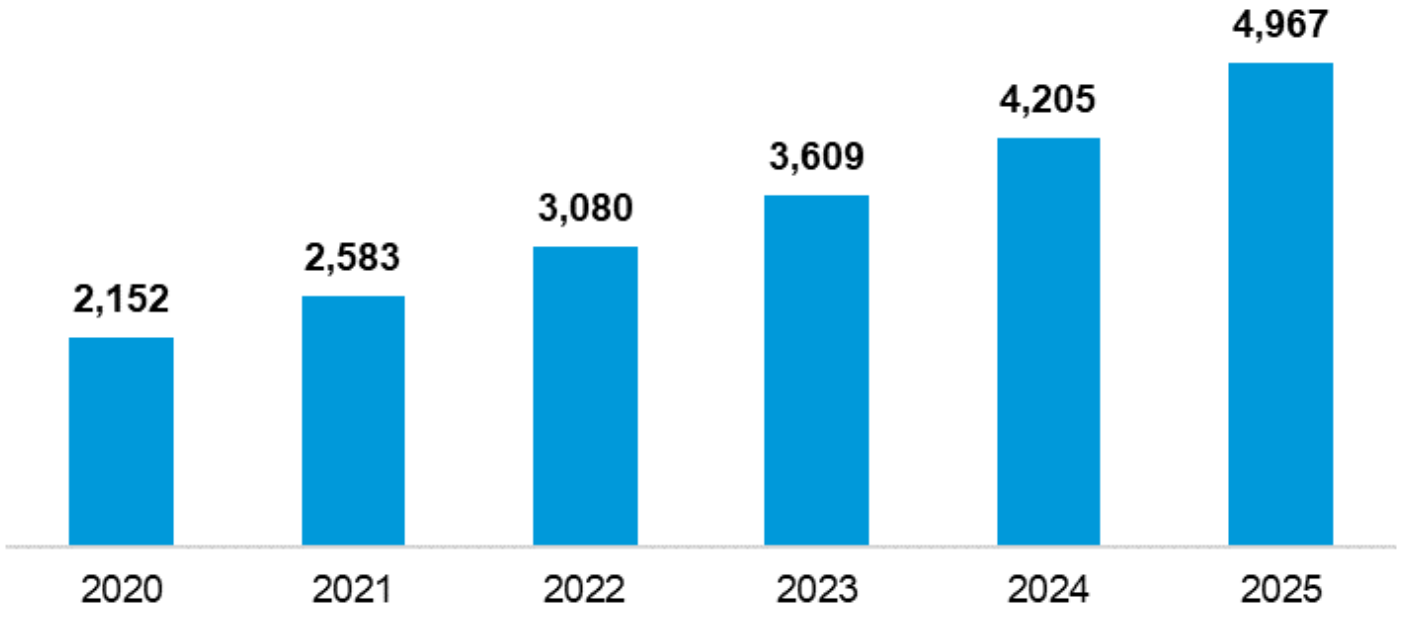
While providing significant environmental benefits, customer-generated renewables and energy efficiency may contribute to reduced energy sales by utilities. But each utility will still have fixed costs to maintain their grid and manage its capacity. This combination could result in higher energy costs for customers. However, TE load may enable us to reverse this situation, given its incremental nature. EV charging may occur at different times of day and energy-use behaviors can be influenced (through demand-side management and customer education) to ensure that charging takes place when system utilization is low (i.e., on nights and weekends) or when an energy surplus exists. If successful, TE load management may actually increase system utilization, potentially exerting downward pressure on rates.

[6] For See the Duck Curve, IRP, p. 43.

2.2. Technology Adoption and Forecasts

TE adoption is still in its infancy, and more efforts will be needed to meet the state's ambitious goals of helping to bring 1.5 million zero-emission vehicles to the roads by 2025 and 5 million by 2030, as well as installing about 250,000 public charging stations.[7] Based on Burbank's 0.27% share of California's population, this translates to about 4,000 EVs and about 675 public charging stations in our service territory. Achieving these goals will require a significant ramp-up in the adoption and deployment of local charging infrastructure. As of October 1, 2018, BWP had 1,755 EVs registered in its service territory. The following chart shows the targets that must be met locally for Burbank to proportionally meet the state's goals.

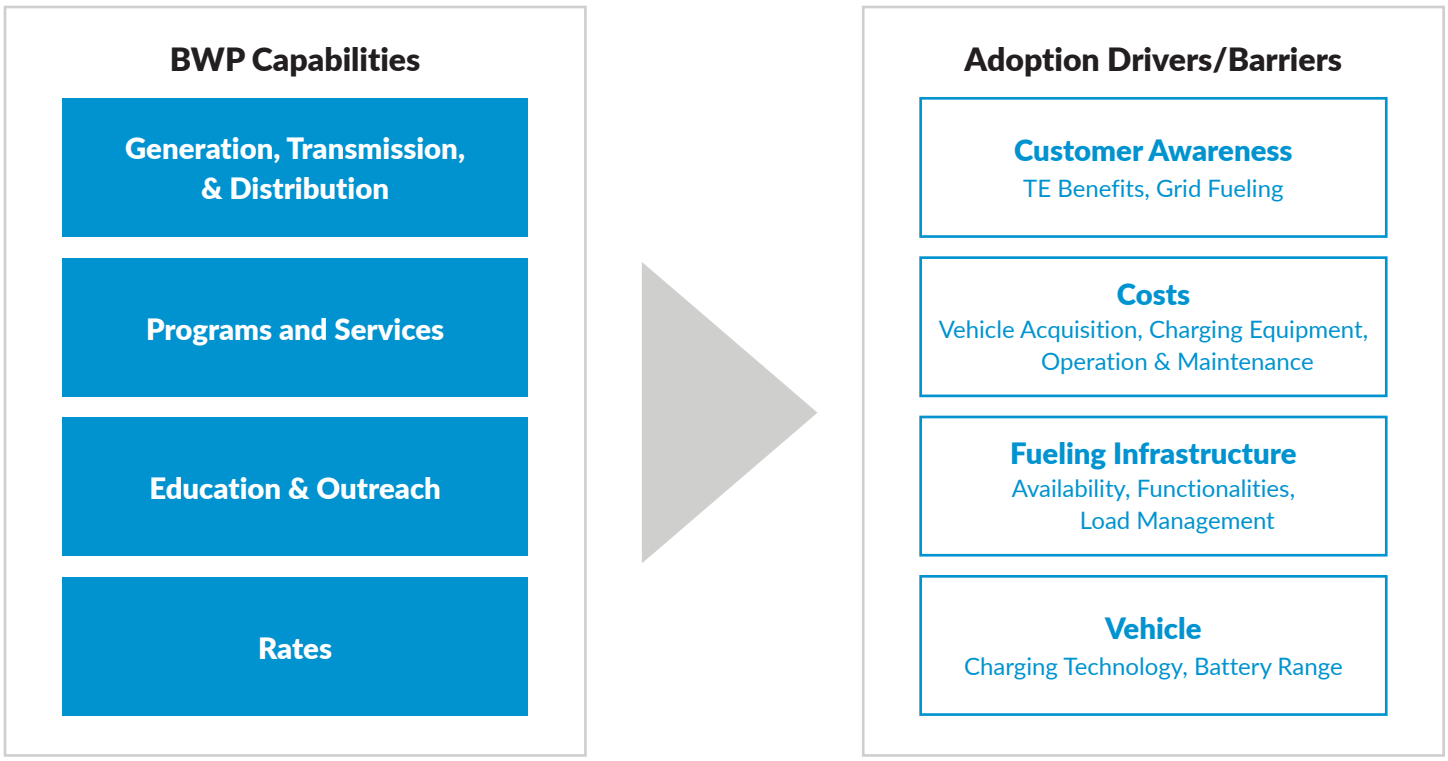
Residential EV Registration Forecast in BWP Service Territory



[7] See Governor's Executive Order B-48-18 (signed January 26, 2018) at https://www.ca.gov/archive/gov39/2018/01/26/governor-brown-takes-action-to-increase-zero-emission-vehicles-fund-new-climate-investments/index.html

2.3. Barriers to TE Adoption

Moving away from internal-combustion engine vehicles to EVs is going to require a tremendous effort. TE adoption faces a number of barriers that have been extensively documented.[8] But BWP can play a leading role in helping customers overcome many of these barriers, just as it has led the successful promotion and adoption of energy-efficiency technologies.



2.3.1. Lack of Awareness

Our customers are generally unaware of the benefits associated with TE, and they typically don't fully understand the benefits of fueling from the grid, let alone the difference between battery EVs and plug-in hybrid EVs. Most residential customers are likely unaware of the rate options available to them or they may believe that they're paying for electricity on a time-of-day rate when most of them are actually being billed on a standard — usually tiered — domestic rate.

Leading utilities have been playing an increasingly greater role in promoting TE and its benefits to their customers through large campaigns that often include mass media. BWP can also play a part in improving awareness by educating its customers and Burbank citizens.

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[8] For instance, Transportation Research Board and National Research Council. 2015. Overcoming Barriers to Deployment of Plug-in Electric Vehicles. Washington, DC: The National Academies Press. **https://doi.org/10.17226/21725**. Also, National Renewable Energy Laboratory. 2017. The Barriers to Acceptance of Plug-in Electric Vehicles: 2017 Update, Mark Singer, **www.nrel.gov/publications**.

2.3.2. Costs

Compared to fossil-fueled vehicles, EVs typically have a higher acquisition costs, but they offer lower fueling and maintenance costs as well as a longer lifespan, which results in a comparable, and sometimes lower, total cost of ownership. While it's critical to educate customers about the overall costs of EVs, many customers may not be able to afford the upfront cost of buying one. In addition to the price of the vehicle, there may be related infrastructure costs for deploying charging stations. This is particularly true for commercial customers, for whom the cost of charging stations could negatively impact the business case for fleet electrification. BWP can support the adoption of EVs through programs aimed at reducing the costs of vehicles and charging installations for its customers.

2.3.3. Lack of Fueling Infrastructure

EVs require a reliable charging infrastructure, either at home or away from home. The gas station model simply isn't a viable approach for charging EVs. Depending on the technology, a full charge may take from 30 minutes to several hours. As a result, long-dwell time locations, such like a home garage or workplace parking, are best suited for offering reliable charging. Unfortunately, about half of the population may not have access to an electrical outlet where they park their car at home,[9] and even fewer residents currently have access to charging at their workplace.

The lack of charging infrastructure is particularly exacerbated in multi-unit dwellings (MUDs) where the chicken-and-egg problem exists. That is, customers don't adopt EVs because they don't have access to charging, while building managers won't deploy charging stations because their residents don't have EVs.

In commercial settings, the site operator may face significant complexities. More generally, in commercial settings, the site operator (where charging could be deployed) face significant complexities that may result in customer inertia. For instance, site operators, if they do not manage a fleet of vehicles, may find it challenging to decide how many charging stations they need (since they may not know how many EVs may charge) and where to locate charging stations. They also may not know the right location for installing charging stations. In addition, they may not understand the cost implications of various deployment options or what the long-term operation and maintenance expenses will be.

BWP can provide a trusted and neutral voice to help all of their customers manage the complexities of planning and deploying charging stations. We can also help by providing financial relief to offset some of the deployment costs.

[9] See *The Barriers to Acceptance of Plug-in Electric Vehicles: 2017 Update*, infra.

2.3.4. Perceived Vehicle Limitations

Customers often cite "range anxiety" as one of the key reasons for not purchasing an EV. However, studies have shown that EVs can effectively replace most conventional vehicles for taking drivers to their intended destinations.[10] In a way, range anxiety is analogous to the fear of the unknown. Occasional longer trips can test the range limitations of EVs, but manufacturers and other stakeholders are taking significant steps to overcome that issue. For example, newer EVs have larger batteries that enable longer ranges, fast chargers are being deployed along key interstate freeways,[11] and super-fast charging technologies may eventually deliver an experience similar to today's fueling at the pump.

Again, BWP can educate its customers and potential adopters, enabling them to better understand their commuting patterns and the range that EVs can cover on a single electric charge. BWP can also support the widespread availability of away-from-home charging in its service territory, in particular at workplaces where it can be reliably available on a daily basis, which would help alleviate range anxiety.

2.4. Market Segments

The EV market can be sliced and diced in many ways. Identifying the various market segments has helped BWP develop this strategic plan.

The first priority is understanding the home and away-from-home segments. For EV adopters, nothing can beat the convenience of home charging. It's one of the key advantage of EVs over conventional vehicles, akin to having your very own gas station. Drive home, plug in overnight, and you'll have a fueled-up vehicle ready to go in the morning.

Unfortunately, at least 60% of Burbank residents may live in MUDs and not have their own detached garage. Others may park on the street with no access to an outlet. These drivers would need to charge their vehicles on a daily basis, and the lack of access to charging will likely prevent them from purchasing an EV.

Away-from-home charging, including public/street and workplace charging, would help these customers. It would also extend the electric range for drivers who have a longer commute, offsetting any range anxiety they may have. Finally, it could help tame the duck curve.

Out-of-home charging may include short dwell time (usually opportunistic) or long-dwell time (for a full battery charge, which may require between 30 minutes with fast charging up to 4 hours at Level 2). Short-dwell time locations have limited benefits as they do not provide a sustainable option to charge EVs unless they offer fast charging. Therefore, long-term charging is the type of infrastructure that's considered to be most effective.

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[10] **https://www.technologyreview.com/s/602174/why-range-anxiety-for-electric-cars-is-overblown/**.

[11] For instance, the West Coast Green Highway from California to British Columbia.

Another important distinction is the relationship between EV ownership and charging station operations. EV fleet managers own (or lease) and operate both the vehicles and their charging stations, as do homeowners with access to at-home charging. These fleet managers can estimate how much charging they will need, determine the appropriate number of charging stations, and identify the optimal charging technology. But most away-from-home charging operators serve vehicles owned by third parties (e.g., a parking lot operation may own charging stations, but the EVs parking there are owned by their customers). Determining the EV population and its growth present significant planning challenges for these charging operators.

Beyond these basic distinctions, EV customers typically fall into five discrete segments.

		Costs	Complexity
Single Family Residences	• Easy access to L1 • Large residential segment • Most EV adopters	L	L
Multi-unit Dwellings	• Large residential segment (retrofit) • Least EV adopters • Challenges similar to energy efficiency	H	H
Retail/Public	• Useful if long-dwell time parking • Often opportunistic and/or infrequent • May support adoption near MUDs	H	H
Workplace	• Largest daytime charging segment • Showroom effect • Inelastic end-user demand	H	H
Fleet	• Large emission sector (MD/HD) • High visibility • Less mature technology	H	M

EV Owner = Charging Operator | EV Owner ≠ Charging Operator | L Low | M Medium | H High

2.4.1. Single-Family Residence (SFR)

The SFR segment is where most EV adopters are found.[12] SFR customers face relatively few challenges, as long as they have a detached garage. They may opt to charge at Level 1 with a standard 110-V outlet and have a fully charged vehicle in the morning. Those who choose to charge at Level 2 will face additional costs for the charging station, the supporting electric infrastructure, and potentially, a panel upgrade. However, electrical contractors are well-experienced for this work, which isn't fundamentally different from adding an electric dryer to a garage.

Cities are also improving their processes to offer expedited permitting for such installations. So far, the electric grid has proven resilient to the additions, with little to no reporting of the apocalyptic incidents feared in the early days of EVs. BWP's grid, with its 12-kV transformers, is particularly well-suited to serve EV adopters. As a result, SFR adopters in BWP's service territory face few challenges other than the cost of installing a charging station.

2.4.2. Multi-Unit Dwellings

Compared to the SFR segment, both residents and managers of MUDs face many challenges that limit EV adoption and the deployment of charging infrastructure. The main issue is arguably the chicken-and-egg problem. That is, residents don't buy EVs because they lack access to charging infrastructure, and MUD managers don't install charging stations because not enough of their residents have EVs. MUD developments also face the traditional principal-agent problem, not unlike the barriers to energy-efficiency upgrades before utilities intervened. Building managers may not see charging infrastructure as adding value to their properties and are therefore reluctant to make the upfront investment or to shoulder the ongoing operating costs. Even in condominium complexes or other types of ownership-based MUDs, residents may find it difficult to obtain approval from their homeowners association for installing charging infrastructure.

In an MUD development, cars may also be parked far away from electric panels, especially if there is a multi-story parking structure. This can result in significant installation costs, thereby preventing residents from deploying their own charging stations and connecting them to their existing home meter. And, when parking is unassigned, building managers may be reluctant to dedicate any parking spaces to EV drivers, especially if EV adoption is currently nonexistent at their site. MUDs that deploy charging infrastructure often do so as part of their sustainability efforts. But without a an understanding of the value added by charging infrastructure, MUD managers are unlikely to pursue any widespread deployment of charging infrastructure.

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[12] For instance, see Clean Vehicle Rebate Project, Final Report Fiscal Year 2015–2016, Center for Sustainable Energy. p. 27 (**https://cleanvehiclerebate.org/eng/content/cvrp-final-report-2015%E2%80%932016**). 78% of respondents to Clean Vehicle Rebate Project lived in a single detached home while only 12% lived in an apartment or condominium.

2.4.3. Public Charging

Public charging is typically defined as offering EV charging to customers at a publicly accessible parking structure during regular business hours. This can include locations that require a fee or that offer free parking to serve other businesses (e.g., government buildings or retail businesses). Public charging may also include street charging. The benefit to EV drivers will vary depending on their vehicle's dwell time. For example, charging at a local neighborhood convenience store (offering only short vehicle dwell time) will provide minimal benefit as compared to a place where customers may spend at least 2 hours (e.g., at a mall or a sports venue) connected to a charging station that provides a full vehicle charge. In addition, public charging can play an important role for EV adopters who don't have access to charging at home (either because of the lack of a detached garage in SFRs or unavailability in MUDs).

Operators of public charging stations also face high costs and complexity. The main challenge is determining how many stations will be needed. Unless most users are "regulars" at the facility, parking operators have to estimate their future EV population, which will be tough if they don't have any existing charging capability. The costs of deploying commercial charging infrastructure are typically high, especially in open parking lots where trenching and distance to the panel are significant cost drivers. Depending on the size of the charging deployment, site operators may also find that they need to upgrade their panel and the underlying utility infrastructure. Such challenges may halt progress on deployment unless these operators receive the proper assistance from a reliable, knowledgeable source.

2.4.4. Workplace Charging

Workplace charging, with employers providing EV stations to their employees, is often considered the most valuable away-from-home market segment. Workplace charging provides reliable long-dwell time charging opportunities to EV drivers every weekday. It may also help support EV adoption thanks to the "showroom effect." When other employees see lines of newer, attractive vehicles connected to charging stations every time they walk to and from their own cars, they may become more interested in buying an EV for themselves.

Workplace charging (unlike home charging) also has the potential to allow for daytime charging, when solar generation is at its peak. This is particularly important in the City of Burbank, where a large segment of the working population does not reside in the City at night.

Of course, the creation of workplace charging infrastructure carries high costs and complexity similar to that for public charging. Employers will need to survey their employees to determine how many charging stations they need to deploy. They will also need to figure out how the current EV population at their sites will grow over time as adoption increases. Again, there may be sizeable costs for trenching and/or distance to the panel to contend with. Depending on the scale of the charging deployment, site operators may find that they need to upgrade their panel and the underlying utility infrastructure. Once again, complexity and potential costs may result in inertia if employers don't receive the proper assistance.

2.4.5. Fleets

The fleet segment is the most heterogeneous segment of the EV market. It includes light-, medium-, and heavy-duty vehicles, on-road and off-road vehicles, people and goods movement. Medium and heavy-duty vehicles are the second largest segment responsible for GHG and pollutant emissions after light-duty vehicles. Technology for medium- and heavy-duty EVs is also less mature than for light-duty EVs. Even so, trucks, transit buses, and school buses are getting electrified in many parts of the state. Improving public transportation through electrification is a highly visible effort that provides immediate benefits to the City's constituents.

Fleet operators will typically deploy and operate their own charging stations. They don't have the guesswork that public and workplace charging operators may face. They know how many vehicles they need to charge and what their expansion plans are for several years to come. That said, fleet operators considering EVs may face the highest costs for deploying charging stations, in particular for heavy-duty vehicles. They may also face higher vehicle acquisition costs, although many state incentives are available. Deployment planning will likely require close cooperation with the utility, as the demand from large charging installations may require significant grid upgrades.

Chapter 3. BWP's TE Strategy

3.1. Guiding Principles

In developing its TE strategy, BWP followed five key guiding principles:

1. **TE programs and services should improve the lives of Burbank residents and communities.** TE investments by BWP should support and benefit Burbank communities by helping them adopt TE and enjoy the benefit of reduced GHG and pollutant emissions.

2. **TE programs and services should lessen the cost and complexity of TE adoption.** BWP should develop programs and services tailored to the various TE market segments to help customers acquire EVs and deploy charging infrastructure.

3. **TE programs and services should focus on bridging adoption gaps, with a focus on DAC, low-income, and MUD communities.** BWP should provide specific help to DACs, low-income communities, and MUDs to improve adoption levels for TE in these segments.

4. **TE programs and services should integrate with renewables.** BWP's TE programs and services should include appropriate solutions to capture excess generation from photovoltaics and to limit twilight demand ramp-ups for energy use.

5. **TE programs and services should remain cost-effective.** TE provides multiple revenue streams to utilities, through increased load from charging and through the LCFS program. BWP should ensure that its TE investments are funded out of LCFS proceeds, public benefits, and other third-party grants, with little to no impact to its rates.

3.2. Strategy Overview

BWP has designed its TE plan to help lessen the cost and complexity of adopting TE while promoting customer choice. We intend to provide programs and services that truly support customers in their respective market segments. BWP will offer a neutral, but supportive, voice as customers consider TE, helping them with planning and deploying charging infrastructure. BWP's strategy goes beyond distributing rebate checks to eligible customers, because many potential adopters also need help addressing the complexity of deploying charging infrastructure.

In addition, BWP believes that its strategy should cover every TE market segment. As TE adoption is still in its

infancy, every TE market segment needs to develop significantly to create cleaner air and contribute to GHG reduction. Our TE budget will be allocated across programs and services based on BWP's understanding of customer needs in the marketplace.

Certain segments, such as DACs, low-income, and MUD communities, face greater challenges and will require more than a single tactic. BWP will implement a multifaceted approach for these customer segments, combining targeted education and outreach with rebate programs for vehicles and charging equipment as well as combining forces with state and regional government agencies.

Finally, BWP intends to work directly with market participants and offer customer choice while promoting load management. We will not dictate the type of TE technology customers choose, supporting battery EVs as well as plug-in hybrid EVs, while relying on adopted technology standards (e.g., SAE J1772 standard) and established safety requirements (e.g., certification and listing by nationally recognized testing laboratories) for charging equipment. BWP does plan to educate its customers about the different charging options (Level 1, Level 2, and DC fast charging), given that all levels have a role to play based on customer needs. BWP will also offer TE load management options to promote charging when grid utilization is low or when renewable resources are abundant.

	Single Family Residence	Multi-Unit Dwellings	Public	Workplace	Fleet
Charging Infrastructure	✓	✓	✓	✓	✓
Vehicle Rebates	✓	✓			
Education & Outreach	✓	✓	✓	✓	✓
Bundled Strategies	✓	✓	✓	✓	✓

3.3. Charging Infrastructure Initiatives

BWP's TE plan primarily supports the deployment of charging infrastructure. That will include charging stations and the so-called "make-readies" — the underlying electric infrastructure serving the charging stations. Make-readies include transformer and service reinforcements needed to serve the incremental TE load; hardware, including panels, conduits, wiring, junction boxes, and disconnects; and related construction/civil work such as trenching, resurfacing, and associated labor. On average, studies have found that make-ready costs can represent two-thirds of deployment costs, with charging stations representing the balance of those costs. BWP will provide rebates to offset some of these deployment costs for both residential and commercial customers, building and expanding on its existing programs. Rebate amounts will be determined based on market research, including a review of similar programs offered by other utilities, to determine the appropriate rebate coverage and rebate amounts.

BWP's TE plan includes all three charging levels commonly available in the marketplace as follows:

	Level 1	Level 2	DC Fast Charging
Single Family Residence (SFR)	✓	✓	
Multi-Unit Dwellings (MUD)	✓	✓	
Public	✓	✓	✓
Workplace	✓	✓	✓
Light-Duty Fleet	✓	✓	✓

3.3.1. Funding and Cost Management

BWP's TE plan includes multiple safeguards to fund and manage its TE investments, with a focus on protecting the utility and its customers.

First and foremost, BWP will fund its TE initiatives with LCFS proceeds, resulting in little to no impact on electric rates. BWP participates in the LCFS Program from the California Air Resources Board. As a provider of clean (electric) fuel for transportation, BWP receives LCFS credits based on the number of registered EVs and charging stations located in its service territory. LCFS proceeds (resulting from the sales of LCFS credits) will provide the bulk of the funding for BWP's TE plan.

In addition, BWP intends to use $150,000 every year in public benefits[13] and may also apply for third-party grants and other public funding opportunities offered by state agencies to support the adoption of TE.

Funding for each TE program and service will be driven by available cash on hand from LCFS proceeds, public benefits, and third-party grants. BWP will also consider prior years and the results of its earlier TE initiatives to direct future funding where most appropriate and to achieve the goals of each program. BWP will closely monitor its TE spending and may implement wait-lists if customer demand exceeds available funding.

[13] Assembly Bill 1890 requires all California electric utilities to spend 2.85% of annual electric retail rate revenues in at least one of four areas, including (1) low income programs; (2) energy-efficiency and conservation programs; (3) renewable energy; and (4) research, development, and demonstration projects.

Other safeguard mechanisms, consistent with leading practices, include offering rebate programs limited to actual customer costs, with a cap per charge port. The number of charging station rebates will also be limited per site for each customer segment. This rebate structure will ensure that the utility's investments are limited to reasonable customer costs and are spread out among as many customers and sites as possible.

3.3.2. Operating Model

As discussed, BWP's plan focuses a large portion of TE investments on providing rebates to lessen the cost of EV adoption and charging equipment through rebates, while other initiatives will help customers manage the complexity of deploying charging stations. The rebate programs offered by BWP will leverage existing programs and expand them to better serve customer needs.

BWP's charging equipment rebate initiatives will follow a standardized and flexible operating model applicable across market and customer segments, with appropriate customizations (e.g., higher rebate amounts for commercial sites will account for the higher cost of deploying charging stations in those locations).

The operating model will include clear and simple customer communications, a repeatable customer experience, and sustainable program operations. The model will also ensure customers have "skin in the game" (e.g., customers will be responsible for costs in excess of the set rebate amounts and will have to maintain the charging stations for a defined period of time). It will also limit the utility's financial exposure and provide increased revenue streams (through the LCFS program) that, in turn, will fund our future TE efforts.

BWP also intends to offer rebate reservations to give eligible customers the assurance that the funding will be available after they complete their charging infrastructure deployment. Rebates are typically paid after the purchase and installation of the rebated product, guaranteeing that customers actually use the rebates as intended and facilitating utility inspections before payment is processed. However, this approach creates uncertainty when popular rebate programs have limited funding or are due to expire in the near future. Customers may defer or avoid the purchase altogether if an "at risk" rebate is part of their purchasing decision. Others may purchase a product believing they will receive a rebate, only to find out after the fact that the rebate is no longer available, resulting in a very unpleasant customer experience.

Rebate reservations allow customers to secure their rebate before doing the work. They know that they will receive the rebate payment after completing deployment in accordance with the program's requirements. This feature helps both residential and commercial customers in their decision process, especially customers facing long procurement and deployment cycles.

TE infrastructure programs will also include load management plans to limit grid impacts and maximize TE benefits. These plans may require charging station operators to pass on time-of-day pricing to end users and to participate in future demand-response programs.

3.3.3. Key Differences Between Residential and Commercial Programs

BWP will offer a similar rebate program to all commercial segments, including workplace, public charging, MUDs, and fleet charging. The rebate program will include Level 1, Level 2, and DC fast-charging stations for light-duty EVs. BWP decided against offering direct install programs to limit its exposure — these programs require construction and electric work on the customer side of the meter — and to avoid high-cost situations. In addition to its rebate program, BWP will offer commercial customers a range of advisory services to help them with planning and deploying charging stations. These services will include increased support for customers to coordinate with utility upgrades, whenever necessary.

SFR customers will be eligible for rebates on safe charging installations at Level 1 and on purchasing and installing Level 2 charging stations. BWP will also increase its education and outreach efforts to encourage the deployment of charging infrastructure, but we will not offer advisory services because these customers typically don't face as much complexity when deploying charging equipment.

MUD customers (i.e., building management, HOAs, or tenants/residents) will qualify for a suite of services tailored to address the specific challenges that these customers face, as explained in Section 4.2 below.

3.3.4. Medium and Heavy-duty EV Initiatives

BWP will develop pilot programs to gain a better understanding of the medium and heavy-duty EV space, while limiting its exposure to the risks associated with relatively newer technologies. We plan to focus our early efforts on charging infrastructure for airport ground-support equipment (GSE), transit and school buses, and delivery trucks.

BWP intends to collaborate with the Hollywood Burbank airport to support the electrification of GSE, including the vehicles that operate on airport aprons providing cargo and passenger loading and unloading operations as well as aircraft towing and ground power services. GSE is particularly well-suited for electrification because these vehicles cover short distances and may operate close to the charging infrastructure. BWP and the airport can work together to leverage funding opportunities, acquire vehicles, and deploy charging infrastructure.

BWP also intends to collaborate with Burbank's Community Development Department's Transport Division to deploy charging stations for commuter buses. Likewise, we will work with the Burbank Unified School District to deploy charging stations for school buses. Electric bus adoption is significantly expanding in Southern California,[14] as these vehicles provide clean air for passengers and communities alike. State and regional agencies are providing important incentives to help cover these higher vehicle costs.

Finally, BWP intends to work with one or two commercial customers to deploy charging infrastructure for delivery trucks.

[14] LA Metro took delivery of the first electric bus in July 2019 as part of an order of 40 vehicles expected by the fall of 2020. Foothill Transit began an electric bus pilot in 2010 and 10% of its fleet is now electrified with a goal of 100% by 2030.

BWP plans to implement these efforts after completion of its broader initiatives, as explained in section 5.1 below.

3.3.5. Alternative Model for Public Charging Sites

In addition to its rebate programs, BWP will continue to expand its network of owned-and-operated charging stations. To date, BWP has deployed 45 charging stations and targets 500 charging stations deployed by the end of its plan. These stations will be located in parking lots operated by the City of Burbank and on public streets for curb access. BWP intends to focus future deployments near residential areas, including MUDs and DACs, to provide reliable charging to communities that may not otherwise have access to home charging.

3.4. Vehicle Rebates

In addition to charging infrastructure programs, BWP will offer two vehicle rebate programs to its residential customers and Burbank residents.

The Clean Fuel Reward Program. The Clean Fuel Reward program is being developed under the auspices of the California Air Resources Board. The statewide program will offer point-of-sales rebates to buyers and lessees of new EVs. BWP has opted in to the program, which will be funded through LCFS proceeds. The program is anticipated to launch by 2020.

The Used EV Rebate Program. BWP intends to launch a rebate program to help customers acquire used EVs. The program will offset the lack of financial incentives on used EVs for the general residential customer population and supplement existing regional programs for low-income and DAC customers. Residential BWP customers and their household members will have the ability to secure a rebate reservation prior to purchasing the vehicle. Eligible applicants will be able to rely on the rebate as part of their purchasing decision. This will also allow applicants to confirm vehicle eligibility before their vehicle purchase.

3.5. Education & Outreach

As noted earlier, the general lack of awareness about TE and the benefits of fueling from the grid is considered a major barrier to widespread TE adoption. BWP's plan includes developing a broad campaign to promote TE to its customers and guide them to the initiatives being provided by the utility. This campaign will include multiple communication channels, including BWP's website, social media, and direct customer engagement.

BWP will also organize and participate in TE-related events, including ride-and-drives, to help customers become more familiar with EVs. These events have proven very successful in getting customers to discover EVs first-hand. BWP also intends to provide resources that will help customers deploy charging infrastructure, learn about the optimal time of the day to charge, and minimize the impact on their bill based on the timing of that incremental load. Finally, BWP's education and outreach efforts will communicate the utility's and the City's long-term commitment to TE, including its walk-the-talk initiatives, as explained in section 5.1.

Chapter 4. Bundling Strategies

BWP plans to bundle several strategies to support TE adoption for specific customer and market segments, as well as for City agencies.

4.1. Low-Income and DAC Customers

A number of BWP customers qualify for low-income programs[15] and may reside in DACs, as defined by CalEPA.[16] These customers face some of the highest environmental, socioeconomic, and health challenges in the state. CARB requires that some of the LCFS proceeds benefit DACs and other low-income customers.[17]

BWP believes that additional efforts are needed to support TE adoption for these customers. Working with other government agencies, we intend to develop targeted outreach, to promote TE adoption, and to maximize participation in the rebate programs we will offer. BWP is also considering increasing rebate amounts for qualified customers for both EVs and charging infrastructure.

In addition, BWP plans to site future public charging deployments near local residential neighborhoods and provide reliable daily charging to customers who may not have access to it, either because they must park on the street or because their MUD does not offer charging.

4.2. Multi-Unit Dwellings

As discussed above, EV adoption in MUDs carries a number of challenges. These challenges are exacerbated for low-income and DAC customers who live in MUDs. BWP has planned a multifaceted approach to help both MUD managers and residents deploy charging stations. BWP's commercial rebate programs for building managers, combined with our advisory services, will facilitate the planning and deployment of charging stations in these developments. BWP will adapt its residential rebate program to provide MUD residents with individual metering options and help with potentially higher installation costs (as compared to SFRs). In addition, BWP's public charging network will provide charging access to residents who cannot get charging at their MUD residence.

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[15] About 2,000 residential customers or 4.3% of BWP's residential customers.

[16] See CalEPA's CalEnviroScreen 3.0 at **https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30**.

[17] About 30% in 2022, 40% in 2023, and 50% in subsequent years.

BWP will also use targeted outreach to help overcome some of the adoption barriers identified above. Our messaging will demonstrate to MUD managers the value of deploying charging equipment as an attractive asset that will appeal to more residents. Our messaging to MUD residents will promote the availability of incentives for buying EVs and deploying charging infrastructure.

While BWP intends to target both older MUDs and new construction, newly-built MUDs constitute low-hanging fruit in the marketplace, as they are already required by the construction code to deploy underlying electric infrastructure (including panels with sufficient capacity and conduits) to serve potential charging stations. Therefore, rebate programs for newly-built MUDs can effectively cover most of the deployment costs, typically limited to the charging stations and their connection to existing electric infrastructure.

Finally, BWP supports the development of construction codes that will accelerate deploying charging infrastructure in older MUDs and will provide their managers with incentives to deploy charging infrastructure.

4.3. Walking the Talk

BWP intends to bundle several of its TE initiatives to "walk the talk" and promote TE adoption, first within the utility, and later within other City departments. These initiatives will include expanding the electrification of BWP's fleet, increasing workplace charging infrastructure for utility employees, and facilitating vehicle acquisition through potential volume discount pricing on new and used EVs from manufacturers. Finally, BWP will provide frequent communications about its walk-the-talk initiatives to demonstrate its commitment to TE.

Chapter 5. TE Roadmap

BWP's comprehensive TE plan will require staging or sequencing the implementation of its many initiatives. It will also require close monitoring to evaluate the impact of each initiative and then adjust funding, program features, and communications based on the findings. BWP intends to implement a continuous improvement process to ensure that our TE efforts are met with success.

5.1. Timeline

BWP's plan will be implemented in four phases, with the aim of fast-tracking implementation.

5.2. Key Planning Assumptions

Each initiative will be implemented using the following methodology.

5.1.1. Design

During the design phase of each initiative, BWP will capture internal (e.g., operational constraints) and external (e.g., statutory or regulatory) requirements, research and document leading practices, then develop program features or improvements to existing programs. The design phase will provide a high-level blueprint for future initiatives and will serve as the foundation to implementation.

5.1.2. Plan

Based on the program design, BWP will develop a specific implementation plan by conducting a high-level organizational impact assessment to identify how the utility's staff (including customer support, service planning, etc.), processes, and technology will be affected by these new initiatives. Projected grid impacts will also be evaluated. Based on these findings, BWP will develop a detailed plan that includes all implementation activities required to launch the new initiatives and mitigate anticipated impacts, including any procurement needs, new or revised roles and responsibilities, revised timelines, and high-level cost estimates.

5.1.3. Implement

After completing an initiative's implementation plan, BWP will seek endorsement by BWP's Board and approval by Burbank's City Council. If the initiative is approved, BWP will map the customer journey and end-to-end process, ensuring that appropriate personnel and technology are ready to serve any incremental workload. BWP will also develop enrollment materials, including terms and conditions and the application forms, as well as a communication plan that includes education and outreach collateral. In parallel, BWP may qualify vendors and procure products and services as needed. BWP will also prepare for any technology integration, assign resources, and train internal stakeholders (e.g., customer service representatives) for all new initiatives. A number of initiatives will also require engaging with external stakeholders, including other local agencies.

5.3. Implementation Management and Reporting

BWP intends to form a cross-functional program management organization to facilitate implementing its plan and managing reporting. BWP will gather direct measurements on adoption of its initiatives and measure impacts through various data sources, including its own customer database as well as data from other organizations and programs (e.g., California Vehicle Rebate Project, Clean Fuel Rewards). As limited data is currently available for the City of Burbank only, BWP will also conduct surveys to develop a baseline that will enable us to measure the local impact of new initiatives.

Chapter 6. Projections

BWP has developed a cost forecast primarily based on LCFS revenue estimates to direct its investments, as shown in the tables below. BWP intends to monitor program adoption and may reassign funding as needed, based on measured program attractiveness and other factors, including developments in the marketplace.

BWP estimates that these costs will be fully covered by LCFS proceeds and public benefits. Although BWP intends to pursue third-party incentives offered by state and regional incentives, we did not include any such funding in the forecast below.

	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	Total
Residential Rebates	$0	$70,145	$83,130	$96,166	$113,741	$134,602	$178,844	**$676,629**
Commercial Rebates	$0	$199,833	$236,351	$274,759	$325,228	$386,177	$511,830	**$1,934,178**
Public (BWP)	$301,577	$603,577	$692,754	$785,025	$828,176	$545,685	$0	**$3,756,795**
Used EV Rebate	$39,993	$82,992	$136,921	$153,943	$164,995	$161,970	$186,986	**$927,801**
Other Rebate	$0	$207,989	$356,565	$535,780	$1,017,625	$1,567,095	$1,096,778	**$4,781,832**
Total	**$341,571**	**$1,164,537**	**$1,505,722**	**$1,845,673**	**$2,449,765**	**$2,795,529**	**$1,974,438**	**$12,077,234**

As a result of these investments, BWP projects the following outcome:

	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	Total	%
Charge Ports									
Residential Rebates	0	70	83	96	114	135	179	**677**	**35%**
Commercial Rebates	0	80	95	110	130	154	205	**774**	**40%**
Public (BWP)	40	80	92	105	110	73	0	**501**	**26%**
Total	**40**	**230**	**270**	**311**	**354**	**362**	**384**	**1,951**	

	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	Total
Used EV Rebates	40	83	137	154	165	162	187	**928**

Chapter 7. Conclusions

Transportation is the largest sector for GHG and pollutant emissions. It is also the last large sector of the economy that hasn't been electrified. While TE faces many challenges, the past ten years have demonstrated the lasting influence of TE adoption policies and the increasing attractiveness of TE benefits for both residential and commercial customers.

Consistent with the state's and the City's policy to accelerate widespread adoption of TE, and in alignment with the IRP and the Burbank2035 Greenhouse Gas Reduction Plan, BWP has developed a comprehensive and sensitive TE plan tailored to tackling the specific challenges that our customers face. The utility has assembled a cross-functional team to ensure implementation of the plan, from Power Supply to Transmission & Distribution, from Customer Service and Marketing to Finance.

As the TE market evolves, so will BWP's plan. The utility will learn from its efforts, frequently reviewing and updating its TE plan as needed to meet its overall objectives.