Transportation Electrification

2021 Annual Report

Submitted to the Washington Utilities and Transportation Commission

March 31, 2022

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About Avista

Avista Corporation is an energy company involved in the production, transmission and distribution of energy as well as other energy-related businesses. Its largest subsidiary, Avista Utilities, serves more than 600,000 electric and natural gas customers across 30,000 square miles in eastern Washington, northern Idaho and parts of southern and eastern Oregon.

Avista's legacy begins with the renewable energy we've generated since our founding in 1889 – and grows with our mission to improve customers' lives through innovative energy solutions.

Avista – Better Energy for Life!

I. Executive Summary

Avista successfully launched new customer programs and planned activities in 2021, consistent with the Transportation Electrification (TE) Plan[1] and tariffs 077, 013 and 023 that went into effect on April 26, 2021. Significant challenges related to ongoing COVID-19 restrictions and supply chain disruptions persisted throughout 2021 and continued to limit activity levels, as well as vehicle availability and customer adoption. Despite these challenges, positive momentum has been established with a broad foundation of supportive utility programs and activities. Key metrics for the calendar year ending December 31, 2021 are as follows:

2,435	Number of light-duty passenger and truck EVs registered in Avista's service territory in Washington State
$3.6 million	Regional transportation cost savings
9,740	Avoided CO_2 emissions (tons)
7,678	MWh charging consumption
1.9	MW charging peak load
$662,184	Revenue from EV charging
$1,466,413	TE Capital investments
$501,745	TE Operating expenses
274	Residential AC Level 2 (ACL2) ports in service
291	Commercial ACL2 ports in service
7	DC Fast Charging (DCFC) ports in service
98%	ACL2 equipment uptime
95%	DCFC equipment uptime
96%	Customer satisfaction with Avista TE programs
17	Electric forklift incentives
10	Fleet consultation services
1,805	Customer web page visits
5	Active number of Community Based Organization (CBO) partners
13,837	Travel services provided by CBO partners (passenger-miles)
61	Charging ports in Named Communities and CBOs
35	Community and stakeholder education and outreach engagements

Table 1: 2021 Key TE Metrics

[1] See www.myavista.com/transportation for a web link to the TE Plan.

Other details are included in respective sections of this report. As data becomes available, future reports will include adoption of other vehicle types, forecast analyses, and net benefit estimates including environmental credits and load management activities.

Despite the many challenges encountered during 2021, Avista's charging installations and costs are meeting expectations, equipment uptime was significantly improved, programs are growing successfully in the areas of education and outreach, community and low-income support, and fleet services, stakeholder engagement is gaining momentum, and customer satisfaction levels remain high. Industry investments, technology trends and strong policy support continue to point to improved market conditions and accelerating adoption in the 2023-2024 timeframe for light-duty passenger vehicles, as well as early adoption in other segments including medium and heavy-duty vehicles. Avista's programs and activities will continue to support robust future growth benefiting all customers in terms of transportation cost savings, reduced emissions, and grid benefits. In 2022, the Company intends to expand programs and carry out the TE Plan without major changes, providing the next annual report no later than March 31, 2023.

II. AC Level 2 Charging Infrastructure

Avista's AC Level 2 (ACL2) charging infrastructure programs launched for residential and commercial customers in May and July of 2021, respectively. Avista provides residential customers with an Avista owned and maintained charger, pays the direct installation costs and 50% of the premises wiring costs, up to $1,000. Customers receive a non-networked charger, typically 24 amps, capable of providing 19 miles of range per hour of charging. Customers agree to ongoing load management experiments, currently involving programming their EV to charge overnight with the ability to override and provide an immediate charge when necessary. They also agree to participate in periodic surveys and provide feedback about their experiences related to electric transportation and electric vehicle charging. Similarly, Avista provides commercial customers with Avista owned and maintained chargers, pays the direct installation costs and 50% of the premises wiring costs, up to $2,000 per port installed. Commercial customers also agree to participate in load management efforts and provide feedback through periodic surveys. Commercial ACL2 may be used for variety of purposes, such as fleet, workplace, public, or multi-unit dwellings (MUDs). For the commercial program, discussions occur with the customer to identify the primary use of the charger and charging requirements, including power output, appropriate number of chargers, and future expansion planning. When payment is not required, non-networked chargers are desirable to mitigate risks of downtime, high

operational costs, and provide ease of use for drivers and site hosts alike. As of the end of 2021, all commercial installations utilized non-networked chargers. A relatively small number of networked chargers are expected in the future, to allow for processing user fees in certain applications, for example where high utilization of public ACL2 is expected.

Installations and Costs

	Residential ACL2	Commercial ACL2
# Ports Installed	91	54
Total # Ports In-Service	274	291
Installation Cost per Port including charger	$1,840	$5,828
Lead Time	3 weeks	11 weeks

Table 2: Charging Installation Results for 2021

The following chart shows the status of closed residential applications as of December 31, 2021, by categories of Battery Electric Vehicles (BEV) Commuter, BEV Non-Commuter, Plug-In Hybrid Electric (PHEV) Commuter, and PHEV Non-Commuter:

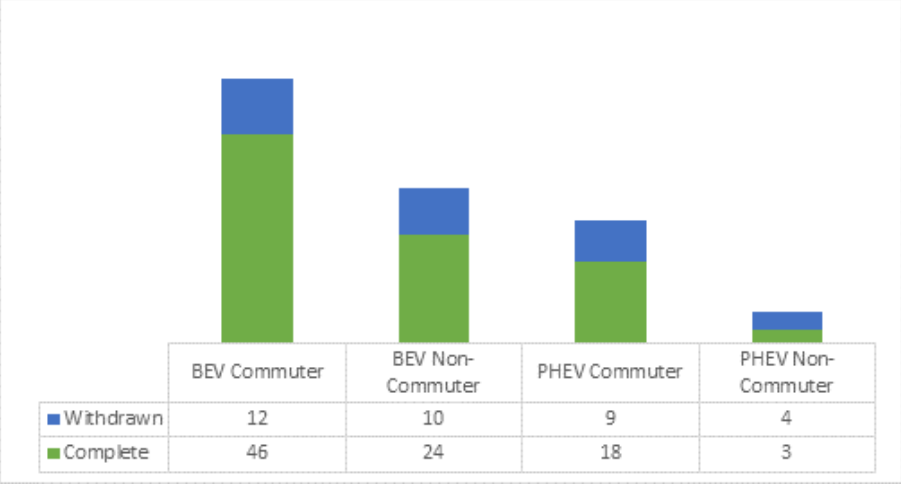

Figure 1: Residential charger installations by driver category

The majority of residential program applicants are those with a BEV, interested in an ACL2 charger for their home. A portion of customers withdrew, typically due to high installation costs for more difficult installations. A limited number of applications were removed due to ineligibility. Average residential installation costs in 2021 were $1,840 including the cost of the charger, in-line with the average install costs of Avista's Pilot

Program[2] at $1,766 for non-networked installs. Supply chain disruptions created significant challenges, with many manufacturers posting equipment lead times of 12 weeks or more. Despite these challenges, with close attention to inventory management, average lead time for residential installations was kept under 20 days.

The following chart shows the status of closed commercial applications as of December 31, 2021, by categories of primary use type:

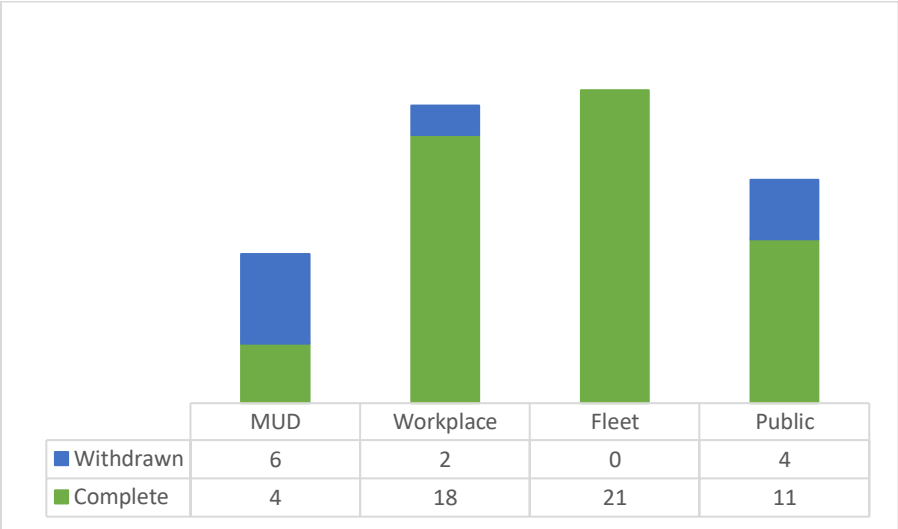

Figure 2: Commercial ACL2 charging installations by use type (ports)

Most of the commercial installations involved workplace and fleet use types, with a notably higher number of fleet applications compared to the pilot program, indicating rising awareness in this category. Interest in hosting public ACL2 was relatively modest, as well as MUD locations. These two segments also showed a higher rate of withdrawals due to installation costs for the customer. Up to 12 public ACL2 charging sites per year are targeted per the TE Plan, or 24 public charging ports assuming an average of two ports per site. This target was not met for 2021, however the program was not available for the entire year and as market conditions improve activity in this area should expand and approach the target for 2022. MUDs present special challenges to determine the best options supporting tenants in a variety of property types and parking. Hotels, condos, and apartments all offer unique situations requiring tailored evaluation, charging and payment solutions. As Avista gains more experience in this segment, appropriate adjustments to the

[2] see www.myavista.com/transportation for a web link to the EVSE Pilot Final Report, filed under Docket UE-160882

program may be proposed in order to best address barriers and effectively meet the unique needs of various customers.

Commercial installation costs averaged $5,828 per port, including the charger. This has increased from the Avista Pilot Program, where non-networked commercial port installations averaged $4,472 per port. One of the major reasons for this was a higher proportion of larger fleet installations requiring significant infrastructure upgrades such as new service panels. Supply chain disruptions presented challenges, with long lead times for chargers as well as common electric equipment.

Reliability and O&M Costs

A strong and dependable network of EV charging equipment is a top priority for EV drivers and critical to support growing adoption. A near term goal of 95% uptime (online and functional), with a longer-term goal of 99% uptime, is a high priority requiring substantial capabilities and coordinated effort between equipment manufacturers, network management providers, owner-operators, local technicians, and site hosts.

Residential ACL2	99.8%
Commercial Non-networked ACL2	99.9%
Commercial Networked ACL2	95.8%
Networked DCFC	94.1%

Table 3: Charger uptime by type

When site hosts do not require user payments or charging session data, networked ACL2 chargers may be configured to provide a charge regardless of network status or connectivity issues. This has been carried out with most of the networked ACL2 in service, resulting in greatly improved uptime to nearly 96%, compared to the 68% - 78% range demonstrated during the Pilot. In addition to these configuration changes, major uptime improvement for all charger types is the result of consistent attention to remote monitoring, on-site inspections, problem identification and resolution, and root-cause analysis. While major improvements have been made, thus far only non-networked ACL2 chargers have demonstrated consistent uptime above the 99% threshold required for mass adoption. In the case of existing DCFC, inadequate support services and the increasing need to repair and upgrade hardware and software make it very difficult to maintain required uptime levels. Equipment manufacturers and network providers – particularly those involving DCFC given their critical importance – must provide improved reliability and cost effectiveness with next generation,

integrated hardware, software, and support services, in order for accelerated EV adoption to occur in the mainstream market.

Customer Surveys

All program participants receive a post-installation survey and a recurring annual survey that measures customer satisfaction and provides valuable feedback. Response rates are similar to those experienced during the Pilot.

	Response Rate	Net-promoter Score	Satisfied or Highly Satisfied
Residential	47% (42 of 89)	90	97%
Commercial	21% (4 of 19)	100	100%

Table 4: Customer survey results

General comments are very positive, and customers have high rates of satisfaction for both programs. Residential customers have a net-promoter score (NPS) of 90, and 97% of customers are satisfied or highly satisfied with the program. Some constructive criticism was received related to costs, scheduling and communication challenges with contractors. This primarily occurred when the program was first opened and there was a high volume of applications, which resulted in longer lead times. Commercial customers also indicated very high satisfaction levels; however, this represents a small sample of only four responses.

In mid-2021, Avista conducted over 100 follow-up interviews with customers involved in the Pilot Program. Results indicated high satisfaction remained with both EVs and chargers after several years, as well as high receptivity to future load management experiments with Avista. Customers were asked to program their vehicles to charge off-peak, the effectiveness of which may be measured via advanced meter infrastructure (AMI) data.

III. DC Fast Charging Infrastructure

Working with local stakeholders and community leaders including the Spokane Regional Transportation Council (SRTC), a multi-year, regional build-out plan for DCFC was developed in alignment with the TE plan and WSDOT guidance for DCFC within urban population centers and every 30 to 50 miles along major travel corridors. This plan was submitted as part of a comprehensive grant application package led by the SRTC and

awarded funding from the Washington State Clean Energy Fund III, Electrification of Transportation Systems, supported by qualifying match funding from Avista and the Spokane Transit Authority (STA).

A 1 MW standard DCFC site design was developed, allowing each site to be built and expanded in three phases. Phase I includes the installation of a 500 kW transformer on a concrete pad sized for a future 1 MW transformer upgrade, 800A-480V three phase switchgear, step down transformer and 240V single phase panel, one 180 kW dual port DCFC, two 19.6 kW ACL2 chargers as backup, and associated conduit from electrical panels to the chargers (including conduit to future charger locations). Once demand justifies expansion, in Phase II a second 180 kW dual port DCFC is installed at low cost without ground disturbance, by pulling wire through existing conduit and mounting the DCFC at the predetermined location. In the final Phase III, the 500 kW transformer is replaced with a 1 MW unit, 800A switch gear with 1600A equipment, and two 350 kW DCFC are installed. This planning is based on industry trends moving toward higher power output that enables up to 300 miles of range gained in under 15 minutes of charging, thereby closing the gap with the time customers are accustomed to filling up conventionally powered vehicles with gasoline on longer trips. The 1 MW standard design is dependent on grid capacity at each site, in some cases limiting total output to 500 kW. As further detailed in the Load Management section of this report, next generation DCFC will be deployed capable of power output curtailment via demand response (DR), which can help avoid expensive grid infrastructure upgrades as well as protect grid assets during extreme events.

The evaluation of grid limitations begins the design process for all potential DCFC sites. Once a site has been identified, an engineering evaluation confirms the maximum allowable load. A preliminary site layout is then drawn up and presented to the property owner, along with a site agreement that details mutual responsibilities between the site host and Avista. An iterative process is then undertaken to finalize the site layout and site agreement, followed by a property easement to ensure public access. This process is often laborious, taking 6 to 12 months or more to complete as many potential site hosts are unfamiliar with the implications and benefits of siting a DCFC on their property.

Supply chain disruptions have created long lead times of up to 12 months for DCFC and other electrical equipment. Despite this, significant progress was made in 2021, with a goal to install 10 new DCFC sites in 2022.

18	Grid impact site assessments completed
13	Design and contracts in progress
3	Construction sites in progress
7	DCFC ports in service

Table 5: 2021 DCFC siting and construction progress

IV. Community and Low-Income Support Programs

TE programs benefiting communities and low-income customers include partnerships with CBOs, charging infrastructure in underserved locations and at CBO facilities, as well as a number of emerging opportunities such as supporting electrification of mass-transit buses, school buses, ride/car sharing, and micro-mobility. An aspirational goal of 30% of overall TE spending through 2025 is targeted for Community and Low-Income Support Programs. For 2021, the Company invested $715,056 in this category, representing 36% of total spending.

Partnerships with Community Based Organizations

Starting in 2018, Avista engaged a local network of CBOs, soliciting proposals utilizing electric transportation to serve disadvantaged communities and groups. Two proposals were selected, providing a variety of transportation services including non-emergency medical appointments, food deliveries, and shelter transport. In this model, Avista provides resources such as an EV and charging infrastructure and equipment tailored to the needs of the CBO. The CBO is responsible for managing transportation services as well as insurance, fuel and maintenance costs, utilizing volunteer or staff resources as drivers. This model effectively leverages resources of the CBO, providing expanded clean transportation services to disadvantaged groups at lower operating costs. It also provides an added benefit of education and outreach for CBO management, staff, and passengers, increasing positive awareness of electric transportation benefits and support for broader electrification of passenger fleets as well as personal vehicles.

This program was expanded in 2021, resulting in three additional CBO partnerships serving rural communities outside the Spokane region, for a total of five active CBO partnerships to-date. Approximately 14,000 passenger-miles were provided in 2021, expected to grow in the future as COVID-19 restrictions are eased. Engagement with local CBOs has increased to over 70 organizations and will continue in the future. The

program may be further expanded with the potential of using monetized credits from the Washington State Clean Fuels Standard, which may occur in 2023.

Charging Infrastructure

Support for communities and low-income customers includes charging installed at public libraries and community centers, underserved rural towns, CBO partnerships, low-income MUDs, and for customers receiving low-income assistance. To date, 12 charging ports have been installed at partner CBOs, and 49 charging ports in Named Communities. An estimated 20 or more charging ports are planned for 2022. In the future where feasible, this charging infrastructure will be leveraged with emerging opportunities to support community transportation options including ride hailing, ride and car sharing, and micro-mobility, in addition to a growing network of rural towns and CBOs utilizing EVs for community benefits.

Emerging opportunities

Electrification of public transit buses is underway at STA, with four buses in testing on a new electrified route, as well as at Pullman Transit with two buses in service, with future expansion and fleetwide electrification planning underway. Avista's commercial EV Time of Use (TOU) rates are instrumental in addressing the adoption barrier of high demand charges and enabling fleet electrification, while promoting off-peak charging benefiting all customers. In addition, the Company collaborates and supports transit agencies in grant applications to procure buses, develop fleet electrification plans, and to install charging infrastructure that minimizes local grid impacts. In the future, transit shuttles and carpool vans may be electrified as well as vehicles operated by smaller transit services and Tribes, with Avista's collaboration and support that may include appropriate charging infrastructure investments.

Other emerging areas of opportunity include electric school buses, and a variety of innovative electric transportation options and services such as ride-hailing, ride-sharing, car-sharing, and micro-mobility. Supportive efforts and partnerships in these areas are in early stages and will be further reported as more progress is made.

V. Education and Outreach

A new electric transportation website was created in 2021 at myavista.com/transportation, providing key information about EVs, models and savings, charging, company programs and other incentives, for both residential and commercial customers. Online applications may also be conveniently accessed and submitted from this website, streamlining the signup process for customers. The webpage was visited by 1,805 customers in 2021 and is expected to grow in the future, providing readily available information to customers and reducing the need for customer phone inquiries.

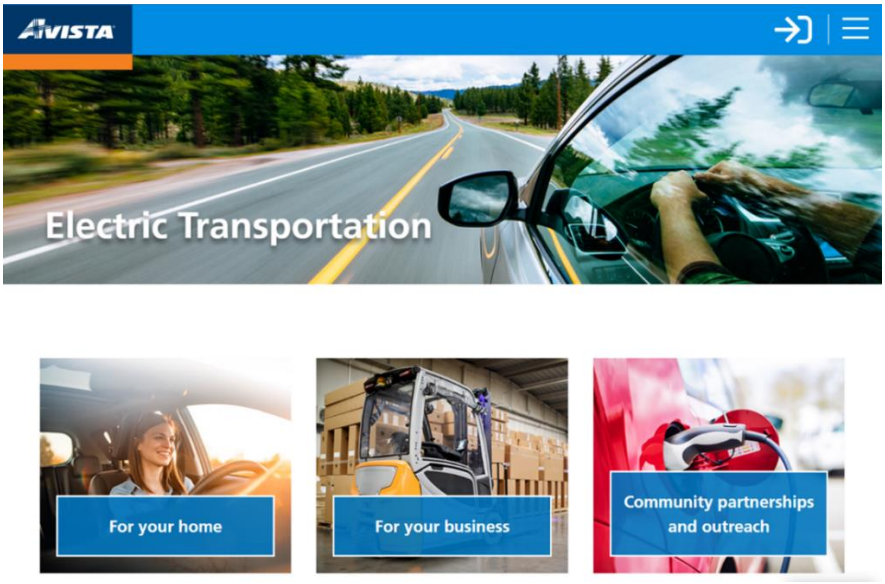

Figure 3: Electric Transportation Website at myavista.com/transportation

A research survey was completed in 2021 measuring customer awareness and perception of EVs and providing insights into customer experience. A total of 802 surveys were conducted. Results showed that only 23% of customers indicated both high awareness and a positive perception of EVs. A goal of 50% of customers in this quadrant by 2025 is desired, in order to sustainably accelerate the transition to a high EV adoption rate. When asked about the main benefits or advantages of EVs, most mentioned being environmentally friendly (50%), followed by being quieter than gas-powered vehicles (34%). A lower percentage mentioned EVs are less expensive to drive (22%) and that they accelerate and perform well (16%). This demonstrates a relatively lower level of awareness of very important factors that may drive future adoption levels in the mainstream customer segment, and an opportunity to focus on these points in future

education and outreach efforts. Short driving range (53%) and purchase cost (42%) were perceived as the main disadvantages.

Dealer engagement efforts included sales staff training on EVs, charging and Avista programs. However due to COVID-19 restrictions, supply chain disruptions, and changing trends in the industry, dealer inventories remain low, vehicle lead times are typically several months from order to delivery, and purchase costs have increased, all of which have negative effects on customer experience and EV adoption. Despite this, a growing number of area dealerships are aware of Avista programs and are enthusiastic to partner in providing customers with accurate and helpful information, and an excellent EV purchase experience.

Other education and outreach efforts include customer testimonials and case studies, webinars, bill inserts, and presentations at a variety of forums such as neighborhood council meetings. These efforts will continue and are expected to increase as COVID restrictions ease. Significant progress has also been made in the design and implementation of an EV Experience Center, in partnership with Spokane Public Libraries, the Spokane Regional Transportation Council and other local volunteers. The EV Experience Center is planned for implementation in 2022, providing the public with a hands-on learning experience about EVs, charging, and the opportunity to check-out an EV for a low hourly rental fee.

VI. **Fleet Services**

Incentives for electric forklift purchases showed early success in 2021, confirming research indicating purchase incentives would be an effective way for more businesses to choose or convert to electric forklifts. During the pandemic, most forklift dealers had at least some inventory that could be sold to their business customers. By year-end 2021, 17 purchase incentives were processed among five local forklift dealers for 7 new and 10 used forklifts. Sixteen of the forklifts were powered by lead-acid batteries at $2,000 each, and one with lithium-ion at $3,000. The percentage of lithium-ion units is expected to increase as technologies and costs improve. Customers and distributors indicated high satisfaction with the process. As part of the program, customers participate in data collection and load management experiments demonstrating the costs and benefits of electric forklifts for the customer and the utility, and the degree to which off-peak charging may be utilized to maximize grid benefits.

More general support services are also provided to commercial customers interested in considering fleet electrification. This includes providing information, detailed analysis and consulting services regarding vehicle and charging options, available incentives, long-term planning, utility rates and load management, total cost of ownership (TCO) comparisons, and referrals. Such consultations were provided to 10 commercial customers in 2021. This is an area of increasing opportunity and growth in the light-duty passenger segment, and for other public organizations and businesses utilizing a variety of medium and heavy-duty commercial vehicles as they become increasingly available and viable. For example, the feasibility of electrifying school buses is gaining momentum, and state and federal grants are becoming available to help initiate pilots. Avista is committed to support awareness, fleet electrification analysis and consultation, project design and planning, grant applications, and project management including charging infrastructure investments where appropriate.

VII. **Load Management and Grid Integration**

Residential customers enrolled in the ACL2 program provide a growing pool of participants for load profile studies as well as load management experiments, including enrollment in future TOU rates. The goals of these efforts are to develop seasonal daily load profiles for all EV customers including on-peak charging, monitor the effectiveness of different load management methods, and use results as inputs to economic and grid impact modeling.

Currently, AMI meter data is utilized to develop various load profiles. For each residential customer, an average of two years' energy usage (hourly reads) prior to the charger installation is compared to energy usage after installation. From this data, load profile graphs can be created on a daily, monthly, seasonal, or annual basis. At this point, post-installation data is limited to less than a full year, as the initial pool of customers began charger installations in July 2021. These efforts are ongoing, with a complete winter seasonal profile available in April and summer seasonal profiles following later this year.

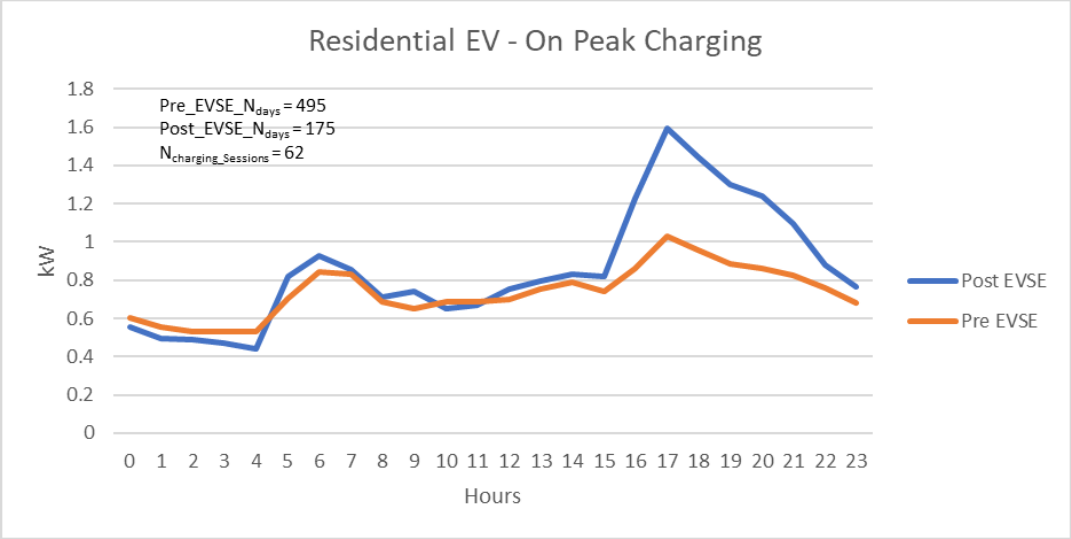

Figure 4: Residential Whole-house Load Profile with EV, no Load Management

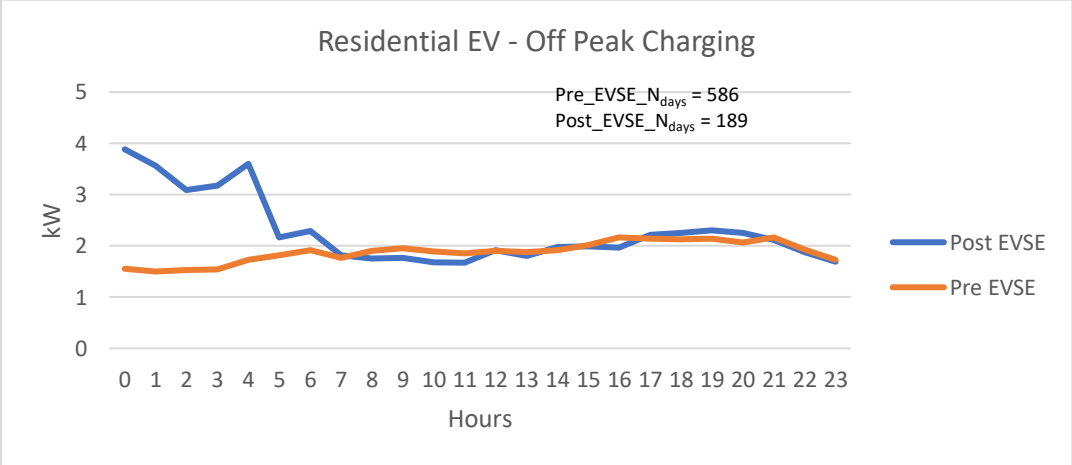

Figure 5: Residential Whole-house Load Profile with EV, and Load Management

The figures above represent the average daily load profile for a customer consistently charging during the evening peak period and another customer charging off-peak in the late evening and early morning hours. The customer with no load management shows an additional average peak load of 0.6 kW at 5 pm due to EV charging, closely approximating the average 0.7 kW peak load per EV from charging data in Avista's Pilot Program. As a condition of the current program, a residential customer agrees to have their EV programmed to charge off-peak by the charger installation technician, with the option to conveniently override when an immediate charge is needed. Further analysis of AMI data will help establish the relative loads of households with EVs compared to those that do not, and the effectiveness of various load management techniques which may be varied over time. Future efforts will include telematics data and associated load management using the EV as a communication hub, which will further validate overall load profiles beyond residential locations

and analytics software that may detect households with EVs. The culmination of these studies is intended to inform a new residential program that may scale up in a cost-effective manner, supporting EV adoption while achieving at least 50% reduction in peak-load compared to what would otherwise occur without load management.

Commercial EV Time of Use Rates

Avista's optional commercial EV TOU rate schedules 013 and 023 became effective April 26, 2021. These rate designs replace high demand charges with on-peak and off-peak rates for separately metered EV charging loads. This can be a valuable option supporting investments in public DCFC as well as larger ACL2 installations for workplace and fleet uses, achieving required fuel savings using electricity instead of petroleum for owner-operators.

	Schedule 013	**Schedule 023**
Basic Charge	$20	$550
On-Peak Energy Charge, per kWh	$0.21108	$0.16333
Off-Peak Energy Charge, per kWh	$0.08588	$0.06742

Period	**Morning Peak**	**Afternoon Peak**
Apr 1 – Oct 31	NA	3pm – 7pm
Nov 1 – Mar 31	7am – 10am	5pm – 8pm

Table 6: Commercial EV Rate Parameters

As of December 31, 2021, five customers with a total of nine meters have adopted one of the two optional rates. Two customers operate public transit, one is for commercial fleet use, one is for a third-party owned public DCFC, and the remainder are for public DCFC sites owned and operated by Avista. Six meters use rate schedule 013, and one public transit customer utilizes schedule 023 for three meters, each at separate facility locations.

Early load profile data collection through AMI and analysis indicates the EV TOU rate is very effective in achieving off-peak charging for larger fleets. A load profile is shown below for a customer operating mass transit buses, during the period between August and October 2021.

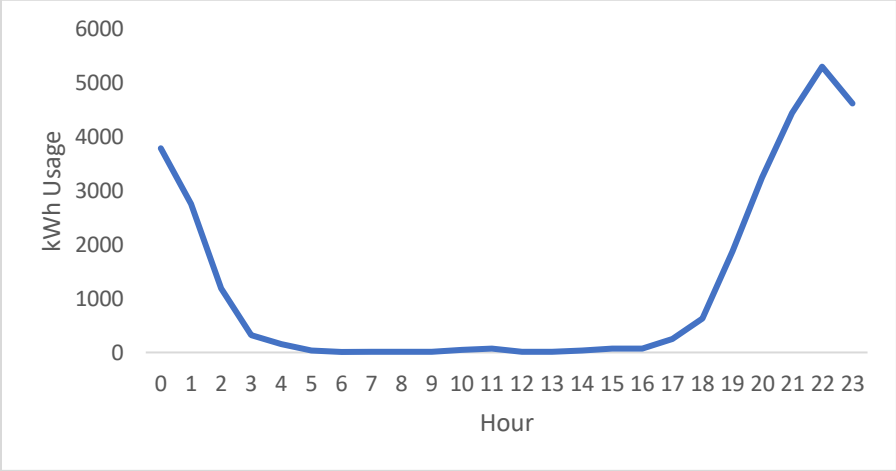

Figure 6: Mass Transit Bus Facility Charging Using Rate Schedule 013

Analysis of the customer's total use shows that 96.5% of the charging occurs off-peak, with only 3.5% occurring during summer on-peak hours between 3 pm and 7 pm. Providing this information to the customer prompted a change in charging behavior and instances of on-peak charging decreased further, to nearly zero. Charging equipment does have a minimal amount of "always on" load, thus 0% on peak usage is not expected. For this customer, monthly on peak "always on" load is currently 0.2%.

While these early results are encouraging, they represent a limited data set that requires more time and a larger number of customers to provide more conclusive insights and any suggested modifications to the commercial EV rates.

Forklift Load Profiles

Customers participating in the forklift incentive program are contacted to enroll in load profile and management studies, assisting Avista to understand loads and the degree to which off-peak charging may be incorporated into various operating environments. Unlike residential load profiling using AMI data, this study isolates the forklift charger by installing a data logger at the electric panel. This provides direct measurement of forklift charging loads, as in most cases the forklift charging loads are relatively small and may not be accurately disaggregated from the meter's overall loads using AMI data.

After an initial logging period of three weeks, the data is downloaded and analyzed. This analysis reveals the frequency of charging events, duration, kW peak demand and kWh consumption, as well as percent of on-peak charging. After the data is analyzed, a report is presented to the customer summarizing charging information and grid impacts during peak periods. A revised charging schedule is also presented, maximizing

the shift from on-peak to off-peak charging based on operating hours and observed charging requirements. The schedule may be implemented by programming the charger or the forklift to initiate charging during off-peak periods. Alternative solutions are currently under consideration utilizing a separate timing device, in some cases where chargers are not capable of programming. Customers use the revised charging schedule on a trial basis for an additional 3 weeks, followed by analysis to determine the effectiveness and feasibility of sustained off-peak charging.

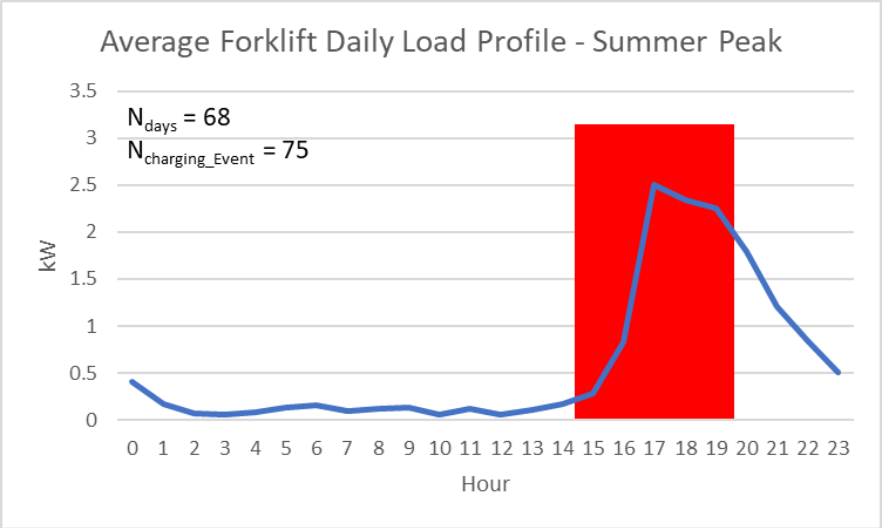

Figure 7: Unmanaged Forklift Load Profile Compared to Summer Peak 3pm - 7pm

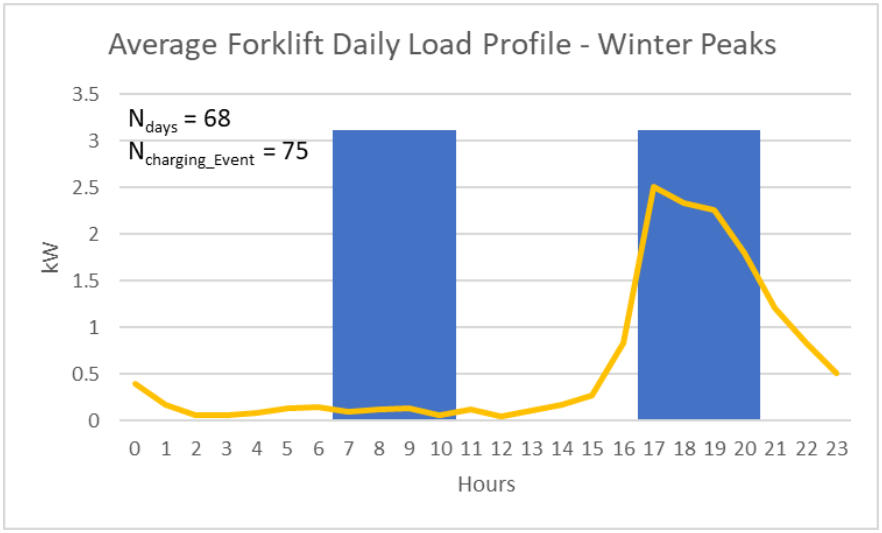

Figure 8: Unmanaged forklift Load Profile Compared to Winter Peaks 7am-10am and 5pm - 8pm

The charts above provide a good example of load profiles where forklifts are plugged in at the end of the work shift, without a programmed delay to charge initiation. Based on the average charging duration, it is

clear these customers can shift charging loads to off-peak periods without affecting operations. Charts such as these specific to a customer's facility, are presented in the report to help demonstrate feasibility and persuade customers to charge off-peak.

Demand Response for DCFC

Grid impact studies evaluate a specific feeder capacity to handle new loads during peak loading conditions. In some cases, DCFC loads of 150kW or more may not be installed without reliable DR capability, i.e. the ability to remotely curtail charger output up to 100%.

Next generation DCFC planned for installation have DR capabilities built-in, which can be implemented in two ways. The first and easiest method to setup initially, uses the network provider's web platform and Open Charge Point Protocol (OCPP) to control DCFC output remotely. This function can be setup for a minimal fee and will give access to all DCFC connected to the providers network. Command signals may be sent manually to individual DCFC and take effect within seconds. The second option is more involved, integrating a dedicated (Avista owned) DR server with the network provider server through OpenADR (Automated Demand Response) protocols. Longer term, the OpenADR option is the preferable solution from an automated capability and security standpoint across the full network of DCFC.

Initial DR testing of first-deployed DCFC is planned in Q2 2022 using the OCPP option. Through this process a number of important concerns will be tested and validated, including DR command response time, effectiveness of powering down the station vs. curtailing output, reliability and time to power up after the DR event, and effective customer communications. Concurrently, Avista intends to develop a dedicated DR server for longer term benefits, allowing Avista's system operators to access and implement DR commands across the DCFC network. The end result is a robust network of public DCFC that avoids costly grid upgrades and protects assets during extreme events, through the use of effective and reliable DR technology.

VIII. **TE Adoption**

Light-duty registered vehicles in Washington counties served by Avista are summarized below for the years 2017 – 2021, as of June 30th each year. This shows a modest increasing growth rate in 2021, tracking to result in approximately 2,435 EVs by year-end, consistent with the baseline EV adoption scenario provided in the

TE Plan. Sales penetration is approximately 2%, and less than 1% of the 567,000 vehicles on the road are EVs in counties served.

As stated in the TE Plan, the transition to the high EV adoption scenario is expected in the 2023-2024 timeframe, due to an anticipated increase in EV model variety, availability, and price points, as well as adequate charging infrastructure investments and positive awareness established through effective partnerships and education and outreach efforts.

Adoption in other segments such as medium and heavy duty on-road vehicles, forklifts, and other forms of electric transportation will be provided in future reports as data becomes available.

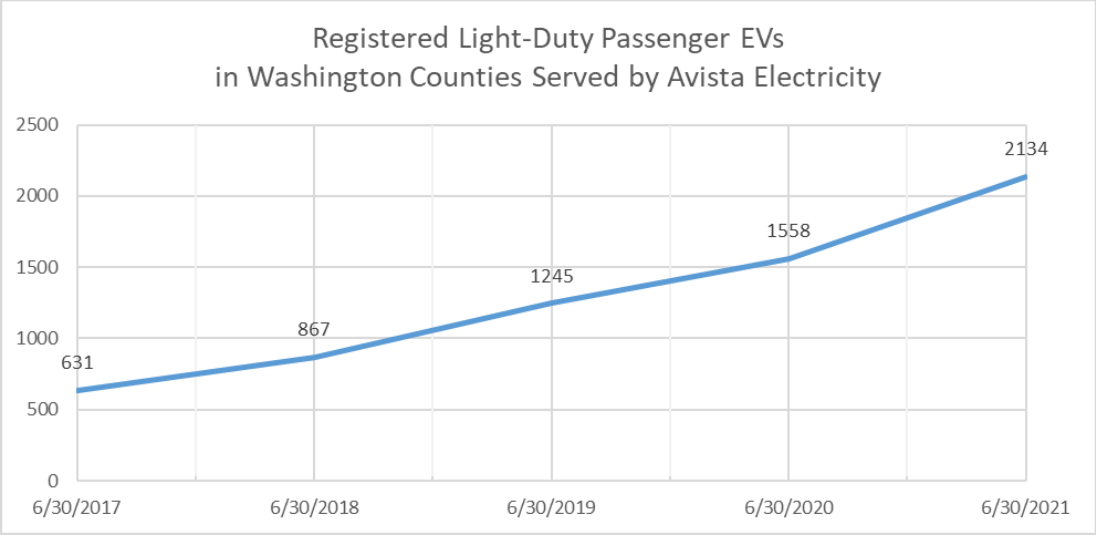

Figure 9: Light-duty Registered EVs in Washington Counties Served by Avista, 2017-2021

	2017	2018	2019	2020	2021
Total Passenger	401,131	408,710	417,567	416,749	417,245
Total Trucks	143,702	146,074	147,845	149,724	149,698
Total All Vehicles	544,833	554,784	565,412	566,473	566,943
Total Electric Vehicles	631	867	1245	1558	2134
% Electric of Total	0.1%	0.2%	0.2%	0.3%	0.4%

Table 7: Comparison of EVs to all Registered Vehicles, 2017-2021

IX. Expenses and Revenues

The following table summarizes TE Capital and Operations and Maintenance (O&M) spending for 2021, referenced to the targeted allocations for each category over the 5-year period of the TE Plan, from 2021 through 2025[3].

	Capital	O&M	Total	% of Total	2021-2025 Target
Residential ACL2 Charging Infrastructure	$79,389	$1,215	$80,604		
Commercial ACL2 Charging Infrastructure	$393,847	$5,529	$399,377		
DCFC Charging Infrastructure	$438,674	$19,092	$457,766		
Total Charging Infrastructure Installations and Maintenance	$819,980	$24,622	$844,602	48%	45%
Community and Low-Income Support	$567,043	$148,012	$715,056	32%	30%
Education and Outreach	$0	$126,935	$126,935	6%	10%
Fleet Services	$0	$53,781	$53,781	3%	5%
Load Management and Grid Integration	$79,389	$21,456	$100,845	5%	5%
Market and Technology Monitoring and Testing	$0	$33,604	$33,604	2%	3%
Analysis and Reporting	$0	$93,154	$93,154	5%	2%
Totals	$1,466,413	$501,563	**$1,967,976**		

Table 8: 2021 TE Capital and O&M Spending

[3] Costs for residential charging installations and equipment maintenance are split 50/50 between charging infrastructure and load management categories

Due to market disruptions, overall spending was less than the estimated $2.25 million in Capital and $650,000 in O&M spending per the TE Plan but is anticipated to increase in future years as outlined in the TE Plan within the range of $2 million to $6 million total spending per year, commensurate with market conditions and increasing customer adoption over time. Planned investments may be used as matching funds to secure additional grant funding from state and federal sources, and monetized environmental credits from the forthcoming Washington State Clean Fuels Standard expected in 2023 may be used to expand the scale of programs including regional charging infrastructure, education and outreach, community and low-income support, and load management programs.

Records indicate Avista provides electricity to 88% of households in the counties it serves in Washington. Taking this percentage of 2,435 light-duty EVs registered in counties served and $304 average utility billing revenue per EV, provides an estimate of $651,411 billing revenue for 2021. In addition, DCFC user fee revenue of $10,773 results in total EV charging revenue of $662,184. As more data becomes available, additional revenue from other types of electric transportation will be included in future reports.

X. Future Direction

The Company plans to expand programs and continue to carry out the TE Plan in 2022, with no major changes or adjustments to plan. Although market disruptions are likely to persist and limit programs and activities to some degree, significant progress can be made building upon the foundation of supportive programs established in 2021. The expectation of steady market growth that begins to accelerate in the 2023 – 2024 timeframe remains, consistent with the TE Plan. Public charging infrastructure including strategic DCFC and rural access sites should be commissioned by the end of the year, representing the beginning of a robust buildout plan using reliable, next generation charging equipment. Efforts in this area, as well as expanded education and outreach and community and low-income support programs, will be coordinated with other supporting partners including the Spokane Regional Transportation Council and the large network of established CBOs in the region. Expanded fleet services and a telematics study will also be undertaken in 2022, with early results expected by the next annual report submitted by March 31, 2023.