

Electric Vehicle Saturation

January 2020

Background

Clark Public Utilities anticipates customer adoption of electric vehicles (EVs), combined with broader transportation electrification efforts will create a new transportation load sector. Clark Public Utilities believes this emerging sector of personal use EVs, corporate and public fleet electrification, plus the potential electrification of mass transit, will drive new incremental load growth in Clark Public Utilities' territory over the coming decades.

Fleet, commercial and mass transit electrification opportunities certainly hold noteworthy potential. However, Clark Public Utilities believes the primary increase in electric load related to EVs will materialize via personal and passenger use electric vehicle adoption.

On average, one passenger EV will consume 3.6 megawatt-hours (MWh) of electricity in one calendar year. This represents a 25% increase in annual consumption for the typical Clark County household. Clark Public Utilities begins 2020 with 2,841 EV's registered within its service territory that represent 10,228 MWh of load, or 1.17 average megawatts (aMW) or ~ 0.2% of the utility's 2020 system load requirements.

Future possibilities

Clark Public Utilities staff ran four different 20-year growth scenarios in an effort to estimate future EV loads the utility may realize. The analysis included a conservative scenario with a 10% annual growth rate, two moderate growth scenarios, and an aggressive scenario with a 25% annual growth rate. On the conservative end, the analysis showed up to 17,375 registered EV's, consuming 7.14 aMW of electricity annually in Clark County, WA by 2039. On the aggressive end, the analysis showed up to 62,389 registered EV's, consuming 25.64 aMW annually in Clark County, WA by 2040. A very aggressive analysis showed, while unlikely, there is potential to see nearly 200,000 EV's in Clark County by 2039; which would add over 80 aMW of transportation sector load to the Clark Public Utilities system.

Transportation Electrification: Growth Analysis					
	2020	2025	2030	2035	2039
Conservative Scenario					
10% Annual Growth					
EV Volume	2,841	4,575	7,369	11,868	17,375
Annual EV Load (MW)	10,228	16,472	26,528	42,723	62,551
Annual EV Load (aMW)	1.17	1.88	3.03	4.88	7.14
Moderate Scenario					
15% Annual Growth					
EV Volume	2,841	5,714	11,493	23,117	40,432
Annual EV Load (MW)	10,228	20,571	41,376	83,223	145,557
Annual EV Load (aMW)	1.17	2.35	4.72	9.50	16.62
Aggressive Scenario					
20% Annual Growth					
EV Volume	2,841	8,670	26,459	80,746	197,134
Annual EV Load (MW)	10,228	31,212	95,252	290,686	709,682
Annual EV Load (aMW)	1.17	3.56	10.87	33.18	81.01

While the forecasted increases to the overall Clark County electric load are manageable they are also potentially quite large. If not properly managed through effective incentive and smart software solutions, the transportation sector has the potential to add significant strain to the Clark Public Utilities distribution grid during peak consumption times. The utility anticipates developing a Transportation Electrification Plan that will address these issues to be presented to the Board of Commissioners for adoption. Attention to potential distribution system upgrades, time of use, and transmission constraints will be among other topics addressed within the plan.

Clark Public Utilities’ Action Plan for Future EV adoption

Clark Public Utilities believes opportunities to collaborate with EV customers abound. Maximizing the benefit for both the EV customers and the non-participating ratepayers is the goal. Over the next several years, the utility aims to test and pilot a variety of tools and programs to encourage smart EV solutions. Additionally, opportunities for new charging infrastructure, customer education, EV promotion and local partnerships will be assertively pursued.