Joint Stakeholder Comment on Electric Vehicles


Respectfully submitted this 13th day of December 2018 by:

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Done right with the help of effective state policies, widespread transportation electrification will benefit all utility customers and Arizona generally. The Southwest Energy Efficiency Project (SWEEP) and Western Resource Advocates (WRA) recently commissioned the national consulting firm M.J. Bradley and Associates to perform a cost benefit analysis of significant electric vehicle (EV) adoption in Arizona. M.J. Bradley and Associates estimate that a mass market adoption of light-duty EVs could provide cumulative benefits of $31 billion to the state of Arizona by 2050. Of these total net benefits:

- $9.0 billion will accrue to electric utility customers in the form of reduced electric bills,
- $15.9 billion will accrue directly to Arizona drivers in the form of reduced annual vehicle operating costs,
- $3.9 billion will accrue to owners of public charging infrastructure in the state,
- $2.3 billion will accrue to Arizona residents due to reduced costs of complying with future carbon reduction regulations, and
- $400 million will accrue to society at large, as the value of reduced NOx emissions.

From the perspective of an Arizona utility customer, the average Arizona household will save $176 annually on their utility bills in 2050 with a mass market adoption of EVs. These are the savings for each customer on their utility bill, regardless of whether or not the household drives an EV. Arizona EV drivers would save an additional $590 per vehicle per year in annual operating costs, compared with owning a gasoline vehicle in 2050, due to lower fuel and maintenance costs. In total, an Arizona household with one EV would save almost $770 per year in 2050.

Note that there are additional benefits that would be achieved by also electrifying the fleet of medium- and heavy-duty trucks and buses. In particular, because heavy-duty vehicles have much higher NOx emissions than light-duty vehicles, there could be significantly greater NOx reduction benefits, which would help to reduce smog and ozone levels in Maricopa County and throughout the state.

However, to achieve these benefits EV adoption will need to scale-up significantly. Currently there are about 14,000 EVs registered in Arizona. Achieving the benefits above will require that millions of gasoline and diesel vehicles are replaced with EVs. Specifically, Arizona would need to have one million EVs by 2030, and about seven million EVs by 2050.

The market is moving in this direction, as battery costs decline and as more automakers bring more additional models to the market. For example, Ford is planning to spend $11 billion to bring 40 hybrids and EVs to the market by 2022, while GM plans more than 20 EV models by 2022. Baum & Associates’ tracking of automaker announcements indicates that at least 36 new electric vehicles will be introduced in the U.S. in model years 2018 through 2021, of which 19 will be SUVs or crossover vehicles. Global plans by automakers show that at least 106 models will be Zero Emission Vehicles (ZEVs) by 2025 and 207 by 2030. And electric vehicle categories are also expanding. There are already multiple electric transit buses, school buses and delivery trucks available today. But despite the momentum in the market, there are a number of barriers to widespread adoption of EVs.

There are three primary barriers to rapid adoption:

1) Incremental vehicle cost compared to gasoline or diesel vehicles,

2) A lack of charging infrastructure and the related consumer concern about running out of charge, and

3) A lack of consumer awareness.

Electric utilities are uniquely situated to help overcome these barriers and meaningfully accelerate the adoption of light-, medium-, and heavy-duty EVs. Arizona’s utilities should develop programs and utility rate designs that increase fuel cost savings, speed the deployment of EV charging infrastructure, increase consumer awareness of the benefits of EVs, and improve the utilization of the electric grid to the benefit of all customers. Utility action

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should also be consistent with the need for utilities to provide equitable, universal service. As such, programs should support improved access to clean transportation options for disadvantaged and low- and moderate-income communities and seek to address sources of transportation pollution that often disproportionately impact such communities.

The successful implementation of these EV programs and rate design options can both accelerate transportation electrification and lower the cost of integrating renewable energy by leveraging the energy storage inherent in EV batteries to manage an increasingly dynamic grid and help address system operation challenges such as the duck curve. With effective rates and educated customers, widespread transportation electrification will benefit all utility customers, the electric utility system, Arizona transportation options, and the Arizona economy and environment.

Arizona’s utilities should propose programs that make it more likely the state will realize the $31 billion in potential benefits sooner rather than later. The potential $9 billion in reduced electric bills resulting from improved utilization of the grid is squarely within the Commission’s traditional regulatory purview. However, there are other important categories of benefits, including the $15.9 billion in reduced fuel and maintenance costs, which will accrue to EV drivers who are also utility customers.

We believe that the Commission should adopt an initial policy that sets an expectation that the regulated utilities begin programs in 2019 at a pilot level (total capital and program expenditures of about $28 million for Arizona Public Service and $10 million for Tucson Electric Power), propose 2020 programs for Commission review and approval, and develop a joint strategic transportation electrification plan to guide the longer-term investments required to maximize benefits.

We believe that utilities should be authorized to engage in the following activities:

1. Utilities should be authorized to invest in “make-ready” infrastructure for EV charging. The make-ready model typically involves utility participation beyond traditional demarcation of service at the meter but does not include utility ownership of the charger itself. As is already common practice for grid investments to support customer load, the utility will locate, design, build, maintain, own, and operate the infrastructure to serve EV charging loads up to the customer’s meter. A utility should be able to go beyond the customer meter to own and operate infrastructure connecting the customer meter to the charger without owning the charger itself. In an ideal situation to stimulate EV deployment, make-ready investment produces a nearly complete “stub” site that can be quickly interconnected with a customer or third-party charging station, streamlining the charger interconnection process. The diagram below shows what is meant by make-ready infrastructure - the utility distribution system infrastructure to serve the EV loads, and equipment to connect the distribution system to electric vehicle chargers including the utility meter, panel, and conduit.
Utilities should be able to invest in make-ready infrastructure for all customer segments, including:

- Home make-ready infrastructure (existing homes and new construction)
- Workplace and multifamily make-ready infrastructure
- Public charging infrastructure
- Fleets
- Transit
- Fast charging along corridors, including corridors identified in the Regional Electric Vehicle (REV) West Memorandum of Understanding (MOU)
- Light-, medium- and heavy-duty vehicle charging.

2. Utilities should be able to provide rebates or financial incentives to customers to offset the cost of purchasing and installing the chargers in all market segments.

3. Utilities should be able to install and seek Commission approval for cost recovery to own and operate the chargers themselves for market segments that the market will not serve/will be slow to serve, to help ensure equitable opportunities for all customer segments to benefit from EVs, such as:

- Multi-family properties
- Low income communities
- School buses and public transit
- Rural areas and communities.

In addition, utilities should be able to propose turn-key solutions for end users in other market segments, if this can be done in a manner that drives cost efficiencies, supports consumer choice and helps to reach a wide range of utility customers while also supporting a competitive marketplace. This could be accomplished by assuring that any costs that are recovered from ratepayers as a whole are the same as would be recovered by investments in make-ready infrastructure and rebates for a private sector
charger, with any additional cost recovery from the site hosts themselves, and by ensuring that site hosts can choose which chargers will be installed.

4. Utilities should develop rate designs to encourage EV adoption and encourage charging at times with the greatest benefits to the grid. This could be used to discourage charging during periods of peak demand, encourage charging during off peak periods at night, and encourage charging during periods of peak solar generation. This would include:

- Appropriate Time-of-Use (TOU) or other time varying rates for residential, workplace, fleet and transit customers
- Managed charging for some segments.

Utilities should develop appropriate rate structures for fast charging and for medium- and heavy-duty vehicles. Electricity rates that support fuel cost savings relative to gasoline will be important for fleets, including heavy-duty vehicles such as transit buses. Utilities should design rates to encourage fleet operators to charge heavy-duty vehicles during off-peak hours.

5. Public DC fast charging (DCFC) stations for passenger vehicles are necessary to enable a mainstream EV market. As researchers from the U.S. Idaho National Laboratory note, “The availability of public infrastructure provides consumer confidence against ‘range anxiety,’ or the perceived fear by battery electric vehicle drivers of becoming stranded once the battery is depleted; however, this availability means that infrastructure must naturally precede the adoption of PEVs.” The downward pressure on electric rates that could result from widespread EV adoption that improves the utilization of the grid (primarily from overnight residential charging) is not likely to materialize unless a sufficient public charging network is established. Moreover, public DC fast chargers provide an important use case for residents of multi-unit dwellings who do not have a dedicated parking spot or garage where they may be able to charge their cars in the evening. Fast chargers will also be critical as transportation network companies (TNCs) such as Uber and Lyft begin to electrify.

Unfortunately, until there is a mass market for EVs, public charging stations will often have very low load factors. At these low levels of usage, energy charges make up a very small part of the costs of operating DCFC, with demand charges often exceeding 90 percent of the total cost. Traditional demand charges designed for commercial and industrial buildings with much higher load factors that allow for costs to be spread over

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3 See, e.g., PlugShare, New Survey Data: BEV Drivers and the Desire for DC Fast Charging (March 2014) (finding that “lack of robust DC fast charging infrastructure is seriously inhibiting the value, utility, and sales potential” of typical pure-battery electric vehicles.”).
more kilowatt-hours make little sense for such low load factor EV public charger uses and are not cost-reflective.

Utilities in multiple states have developed new rate structures for fast charging, which typically involve shifting more of the cost from demand charges to Time-of-Use volumetric energy charges, or the use of subscription charges. Utilities in Arizona should propose new rate structures that are cost reflective and enable reasonable economics for operators of public fast chargers.

We also believe that the Commission should set an expectation that utilities invest in modest scale EV programs as pilots in 2019. The utilities should also propose programs for 2020, and jointly develop a longer-term strategic transportation electrification plan to provide a framework for future investments. We propose that:

1. Utilities be expected or required to adopt pilot programs in 2019 to obtain valuable information on the deployment of EV infrastructure and charging stations, customer charging patterns, and the need for rate design and incentive programs. Public Service Corporations are also expected to develop and file a joint transportation electrification plan for 2020 by May 1, 2019.

2. Public Service Corporation investments in EV infrastructure and ratepayer funding for EV programs should be reconciled, and cost-recovery should be addressed, in the next rate case for each regulated utility. In the period prior to the next rate case, regulated utility capital costs for EV “make-ready” infrastructure and chargers should be tracked for review and reconciliation in the next rate case. We believe regulated utilities should be able to request an accounting order be utilized.

3. In the period until the next rate case, EV program costs (such as education, customer incentives and other non capital expenditures) should be addressed either through an accounting order with reconciliation and recovery in the next rate case, or through an interim incremental addition to the Demand Side Management (DSM) surcharge, which would result in an incremental increase in the DSM surcharge until reconciliation in the next rate case. Limited income customers on low-income rates should not be required to pay the incremental increase in the DSM surcharge for the EV program since there may be limited opportunities for low income customers to directly own EVs in the early years of the EV market. The mechanism for Commission authorization and cost recovery for EV programs should be addressed in the next rate case for each regulated utility.

4. Utilities should coordinate and jointly develop, with stakeholder input, a long-term comprehensive transportation electrification plan for Arizona, to be filed by May 1, 2019, for Commission review and approval. When evaluating the plan for approval, the Commission should consider whether the portfolio of utility-proposed investments, incentives, programs, and expenditures are reasonably expected to:
a. Provide benefits to electric utility ratepayers and to utility customers who are EV
drivers;
b. Improve the electrical system's efficiency, the integration of variable resources,
the system's operational flexibility, and utilization of the system during off-peak
hours;
c. Increase access to the use of electricity as a transportation fuel, including among
hard-to-reach customer segments and markets;
d. Spur innovation, competition and increased consumer choices in transportation
electrification and related infrastructure and services;
e. Contribute to meeting air quality standards and reduce statewide emissions; and
f. Attract private capital investments.

At a minimum, the comprehensive plan should incorporate goals and metrics for
evaluating success in these and other areas, and the utilities should report publicly on a
semi-annual and annual basis on their progress, achievements, budget, and
expenditures.