ORIGINAL OPEN MEETING AGENDA ITEM

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**MEMORANDUM**

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Arizona Corporation Commission
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TO: THE COMMISSION

FROM: Utilities Division

DATE: July 8, 2011

RE: ARIZONA PUBLIC SERVICE COMPANY - APPLICATION FOR APPROVAL OF PROPOSED ELECTRIC VEHICLE READINESS DEMONSTRATION PROJECT (DOCKET NO. E-01345A-10-0123)

On June 29, 2011, Staff docketed a Memorandum and Proposed Order regarding Arizona Public Service Company's ("APS") application for approval of its Electric Vehicle Readiness Demonstration Project. Subsequent to this filing, Staff became aware of additional factors related to one of the tariffs proposed in APS' application. This event has necessitated that Staff file the attached revised Proposed Order.

The specific revisions to the original Proposed Order are as follows:

1. Staff has revised its recommendation for approval of Experimental Rate Schedule EV-PS (Electric Vehicle – Point of Sale) by stipulating that the fixed and variable costs associated with public vehicle charging infrastructure (i.e. $0.18249 per kWh) be omitted from the final approved tariff rate.

2. Staff has added language regarding the impact of new revenue from the proposed Experimental Rate Schedule EV-PS (Electric Vehicle – Point of Sale) on the Company's fair value determination. Based on revenue projections supplied by APS in response to data requests, Staff has determined that the revenue generated by this proposed tariff will be de minimus when considered in the context of the Company's overall revenue requirement

Steven M. Olea
Director
Utilities Division

SMO:RBL:lhm

ORIGINATOR: Rick Lloyd

**BEFORE THE ARIZONA CORPORATION COMMISSION**

GARY PIERCE
Chairman
BOB STUMP
Commissioner
SANDRA D. KENNEDY
Commissioner
PAUL NEWMAN
Commissioner
BRENDA BURNS
Commissioner

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|---|---|
| IN THE MATTER OF ARIZONA PUBLIC SERVICE COMPANY'S APPLICATION FOR APPROVAL OF PROPOSED ELECTRIC VEHICLE READINESS DEMONSTRATION PROJECT | DOCKET NO. E-01345A-10-0123<br>DECISION NO. _____<br>ORDER |

Open Meeting
July 12 and 13, 2011
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

1. Arizona Public Service Company ("APS" or "the Company") is certificated to provide electric service as a public service corporation in the state of Arizona.

2. Pursuant to Commission Decision No. 71104, dated June 5, 2009, APS was required to conduct a Vehicle to Grid ("V2G") feasibility and cost benefit study ("V2G Study"). Subsequent to completion of the V2G Study, APS was required to propose a V2G program for Commission consideration, no later than April 2, 2010. The V2G Study was docketed on April 1, 2010, along with an overview of the proposed Electric Vehicle ("EV") Readiness Development Program. On October 1, 2010, APS filed its application for the proposed Electric Vehicle Readiness Demonstration Project ("Project").

3. Staff believes that the Company is in compliance with Decision No. 71104 in regards to the V2G issue. However, the proposed Project is not a V2G program. According to the V2G Study, none of the V2G concepts reviewed by the study are presently commercially viable.

The results of the V2G Study are discussed later in this document. Staff agrees that the EV battery and infrastructure technologies are too immature for a meaningful V2G program to be designed and implemented at this time. Therefore, Staff believes that APS has complied with Decision No. 71104.

**EV Readiness Demonstration Project**

Program Overview

4. APS proposes the Project as a two-year demonstration project, effective upon the date of Commission approval. The Company would extend the Project beyond the initial two-year period based on customer participation levels and associated program funding.

5. The Project would consist of the following major components:

- EV charging programs;
- Smart Charging program; and
- Experimental rate schedules.

**EV Charging Programs**

6. The Company's EV charging programs are divided into discrete parts. These include: (1) a residential customer program, which includes incentives for customer-owned charging stations, or in the alternative, the use of an APS-owned charging station offered at a monthly fee; (2) a commercial program, which includes the use of an APS-owned charging station offered at a monthly fee for employee or consumer use; and (3) a public charging program in which APS would install charging stations in selected locations within the Company's service territory that would be available to the general public on a point-of-sale fee basis.

Residential Customer EV Charging Program

7. Most EV models come with a 120-volt recharging cord and battery charging at 120-volts is termed "Level 1 Charging". Recharging times at this voltage are on the order of 12 to 18 hours. Therefore, APS believes that many EV owners may desire a quicker recharge time, thus necessitating the use of a "Level 2" charger operating on 220-240 volts[1].

[1] A Level 2 charging station is typically capable of providing between 6-8 kW of power to an EV and can charge an EV in 4 to 6 hours

8. APS estimates the average cost of purchasing and installing a residential Level 2 charging station in a customer's garage at $2,000-$4,000, based on the type and location of the charging station. APS believes that this cost, added to the purchase price of an EV, may create an economic burden to the residential customer. In addition, the customer may also have to manage the integration and installation of the charging system with multiple parties. The subsequent incremental load associated with EV charging could also lead to adverse system impacts.

9. The proposed Project is designed to lower the customer's up-front installation costs for charging stations and to provide APS with advanced notice of EV load impacting the grid. This would be accomplished through two options: Option 1 – a one-time residential incentive towards purchase of a customer-owned charging station; and Option 2 – the installation of an APS-owned charging station.

*Option 1 – Residential Incentive*

10. APS would offer customers a $500 incentive payment towards the installation of a charging station at their home, upon proof of purchase of an EV and the corresponding charging station. Customers would purchase the charging station from the EV dealer or a third party vendor. This offering would be limited to the first 500 qualifying participants. The incentive would lower the customer's initial costs for their charging station and provide APS with information about the location of the charging stations and their load impacts on the electric grid. Such customer disclosure and advanced notice of additional load would help APS proactively manage any potential adverse grid impacts, such as multiple charging stations being located on a specific distribution transformer. Participating customers would be eligible to receive service under the proposed Experimental Rate Schedule ET-EV (Electric Time-of-Use Electric Vehicles).

*Option 2 – APS-Owned Residential EV Charging Station*

11. Residential customers would elect to use a Company-owned Level 2 charging station for home use, again with proof of purchase of a qualifying EV. The Company would arrange for installation and maintenance or equipment replacement. APS would provide a construction allowance of $1,500 toward the installation cost. The customer would be charged a flat monthly fee (to cover the cost of the charging station and expected operation and maintenance

costs), which is based on the term of service agreement the customer chooses. The monthly fee would be $68.33 for a 3-year contract term, or $48.08 for a 5-year contract term, pursuant to the proposed Experimental Rate Schedule EVC-RES (Electric Vehicle Charging – Residential). The customer would have the option to purchase the installed charging station at the end of the contract period, based upon the equipment's remaining depreciated book value.

12. The charging station would be electrically interconnected to the service panel, behind the house meter, such that the usage would be metered through the existing meter. This configuration eliminates the costs associated with providing a separate meter to measure electric energy consumption by the charging station. Upon installation of the charging system, APS' installation contractor would train the residential customer on the operation of the station. Option 2 would be limited to the first 500 qualifying residential participants. Customers selecting this option would be placed on Experimental Rate Schedule ET-EV, a "whole-house" time-of-use rate.

**Commercial and Public EV Charging Programs**

Option 1 – APS-Owned Commercial EV Charging Stations

13. Option 1 would offer the use of APS-owned Level 2 charging stations to non-residential customers. The charging stations would be located behind the customer's meter. The Company would arrange for installation and maintenance or equipment replacement. APS would provide a construction allowance of $7,500 toward the installation cost. Non-residential customers electing to have an APS-owned charging station would pay a fixed monthly fee (to cover the cost of the charging station and expected operation and maintenance costs) of $320.92 for a 3-year contract term or $209.64 for a 5-year contract term, pursuant to the proposed Experimental Rate Schedule EVC-GS (Electric Vehicle Charging – General Service). The customer would have the option to purchase the installed charging station at the end of the contract period, based upon the equipment's remaining depreciated book value. This option would be limited to the first 100 qualifying non-residential Level 2 charging station installations.

Option 2 – APS-Owned Public EV Charging Stations

14. At the request of non-residential customers participating in Option 1, APS would install Level 2 charging stations on the Company's side of the meter. APS would also install ten

Level 3, DC Fast Charging Stations[2] which would be available to the public to charge their EVs, and would be located across the APS service territory. The public charging program would provide customers the ability to charge EVs in convenient and accessible locations outside the home, and to enable longer-distance travel throughout the state. This option may be preferred by host customers or landowners who desire not to have cost responsibility for the energy consumed by EVs utilizing the charging station, but who wish to offer this convenience to their customers.

15. The public EV charging program will be priced on a point-of-sale basis under proposed Experimental Rate Schedule EV-PS (Electric Vehicle – Point of Sale). Under this rate schedule, the customer would render payment for the transaction amount at the point and time of purchase via a pre-paid card, credit card, or other method acceptable to APS. This rate schedule is an energy-only rate and has been designed to recover the fixed and variable costs associated with the purchase, installation, and on-going operations and maintenance of charging stations in a variable manner. The portion of the rate attributable to the charging station infrastructure is calculated at $0.18249 per kWh.

16. The energy charges on the proposed Experimental Rate Schedule EV-PS (Electric Vehicle – Point of Sale) rate is as follows[3]:

**Table I**
**Experimental Rate Schedule EV-PS (Electric Vehicle – Point of Sale)**

| May - October Billing Cycles (Summer) | November - April Billing Cycles (Winter) |
|---|---|
| $0.32382 per kWh during On-Peak hours, plus<br>$0.23662 per kWh during Off-Peak hours | $0.30439 per kWh during On-Peak hours, plus<br>$0.23662 per kWh during Off-Peak hours |

17. APS' public EV charging program would complement the Department of Energy's EV Project,[4] which is focused solely on roll-out and testing of charging stations within the

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[2] A Level 3, DC Fast Charging Station typically operates at 480-volts and can provide up to 200 kW of power, charging 50% of an EV's battery in about 15 minutes.

[3] These rates would also be subject to all applicable Adjustment Schedules, taxes and service fees.

[4] The DOE's *EV Project* is a federal project to deploy EVs and EV charging infrastructure in 18 major cities and metropolitan areas across the US. By 2012 the *EV Project* will deploy approximately 14,000 Level 2 charging stations and 300-400 Level 3, DC Fast Charging Stations. The ultimate goal of the *EV Project* is to take the lessons learned from the deployment of the first 8,300 EVs and the charging infrastructure supporting them, to enable the streamlined deployment of the next 5,000,000 EVs.

Phoenix and Tucson metropolitan areas and along the I-10 corridor between those cities, but not in the balance of APS' service territory.

**Smart Charging**

18. APS would require EV customers served under the proposed Experimental Rate Schedule ET-EV to participate in a test Smart Charging program. Smart Charging is designed to reduce energy usage during peak system times or under stressed conditions. APS would send a signal to the customer's electric vehicle charging station to control the amount of energy being used for charging. The events, limited to a maximum of 10 per year, would typically occur during the hours of 5 p.m. and 9 p.m. on weekdays and non-holidays during the months June through September. The customer would retain the ability to override the APS control signal with no penalty to the customer. APS would collect and analyze data related to distribution system performance and the interaction between the EV, transformer(s), grid operations, and the charging station.

**Experimental Rate Schedules**

19. In support of the Project, APS is proposing four new experimental rate schedules: (1) ET-EV; (2) EVC-RES; (3) EVC-GS; and (4) EV-PS. These rate schedules would be available for two years after Commission approval. APS could extend availability at its discretion, with notification to the Commission.

Experimental Rate Schedule ET-EV

20. Experimental Rate Schedule ET-EV is a time-of-use rate schedule that provides residential customers with a "Super Off-Peak" time period designed to encourage off-peak EV charging. However, this rate schedule is a "whole house" rate schedule, meaning that all of the customer's electricity usage would be served under this rate schedule, not just the electricity used to charge the EV. The "Super Off-Peak" pricing period would be from 11 p.m. to 5 a.m. Monday through Friday (excluding qualifying holidays). The Off-Peak period would be from 5 a.m. to 12 noon and 7 p.m. to 11 p.m., and the On-Peak period would be from 12 noon to 7 p.m. These time periods would be the same year round.

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21. The ET-EV rate schedule requires customers to participate in the Smart Charging program, discussed above. This rate schedule is available to residential customers with a qualifying electric vehicle and an Advanced Metering Infrastructure meter.

22. Staff believes that the proposed ET-EV time-of-use rate schedule could be an effective method of shifting electric consumption to non-peak periods through the use of time / pricing signals. However, Staff believes that this "whole house" time-of-use rate schedule should be available to all APS residential customers regardless of whether they own an electric vehicle, since other customers may benefit from a Super Off-Peak rate. Only those customers with electric vehicles would participate in the Smart Charging program.

23. Staff has considered the proposed tariffs in terms of fair value implications. In Decision No. 71448, APS' Fair Value rate base was determined by the Commission to be $7,665,727,000. Although Staff considered this information when evaluating APS' application, the proposed tariffs would have no significant impact on the Company's revenue or rate of return. Based on revenue projections received from APS in response to data requests, Staff has determined that the revenue generated by these proposed tariffs will be de minimus when considered in the context of the Company's overall revenue requirement and rate of return.

Experimental Rate Schedules EVC-RES and EVC-GS

24. Experimental Rate Schedules EVC-RES and EVC-GS are "rider" rates that will provide the use of APS-owned charging stations to residential and general service customers, respectively. Under these rate schedules, APS would charge a flat monthly fee that is intended to recover the revenue requirements of the initial installed cost and ongoing operation and maintenance of the charging stations. These rate schedules have been discussed above in the "*EV Charging Programs*" section.

Experimental Rate Schedule EV-PS

25. The fourth EV rate schedule proposed by APS is the Experimental Rate Schedule EV-PS, which provides the prices for energy that is purchased at public charging stations on a point-of-sale basis. This rate schedule has been discussed above in the "*Commercial and Public EV Charging Programs*" section.

**Analysis**

V2G Study Findings

26. Under terms of Decision No. 71104, APS was required to prepare a report on the feasibility and cost benefits of a Vehicle to Grid ("V2G") program. Accordingly, APS contracted with Navigant Consulting, Inc. ("Navigant") to prepare a study. APS asked Navigant to assess the potential for the emergence of a plug-in hybrid electric vehicle ("PHEV")/EV fleet and how it might affect utilities in general and APS in particular. Navigant also examined the potential for using PHEV/EV as energy storage devices to redeliver energy in V2G or Vehicle-to-Building ("V2B") applications. APS filed the "*PHEV/EV*[5] *and V2G Impacts and Valuation Study*", dated March 10, 2010 ("V2G Study") in this docket on April 1, 2010.

27. The V2G Study concludes that the market penetration of PHEV/EVs is likely to be gradual, especially within the next 15 years. PHEV/EVs are likely to comprise about 2 percent of motor vehicle sales in the APS service territory by 2018. After 2025, however, sales are expected to increase substantially, and by 2035, PHEV/EV could account for about 17 percent of sales. This equates to sales of about 29,000 EVs and 12,000 PHEVs in 2035 for a total PHEV/EV population of about 174,000.

28. The V2G Study states that the case for V2G services, defined as utility customers selling energy stored in vehicle batteries back to the grid is less optimistic than for PHEV/EV market penetration. V2G is currently at the research and pilot stage, and none of the V2G concepts reviewed by the study are presently commercially viable. V2G services are not forecast to be economic for the utility until vehicle batteries achieve a much higher level of battery cycle life and affordability.

29. The V2G Study concludes: "Overall, PHEV/EV will have relatively minor impacts on the APS system in the next 10 years with the exception of the local distribution system. Impacts in the next 20 to 30 years, although growing, will also be relatively minor. V2G/V2B

[5] "PHEV/EV" is an acronym that stands for Plug-in Hybrid Electric Vehicle / Electric Vehicle. The V2G Study makes a distinction between PHEVs that contain an internal combustion engine in addition to a battery driven electric motor, and EVs which contain only a battery and electric motor. Both PHEVs and EVs have the capability to recharge their batteries from the grid. Unless otherwise noted, the term "EV" as used in this document refers collectively to both PHEVs and EVs

services will play only a minor role within the next 20 to 30 years in providing energy services within the APS service territory."

EV Market Development

30. Several programs at the national level are working in concert to stimulate the rapid adoption of EVs and their attendant infrastructure. The Department of Energy's *EV Project*, in partnership with General Motors and Nissan, and through their implementation contractor, ECOtality, will deploy approximately 14,000 chargers in 18 major cities and metropolitan areas located in six states and the District of Columbia. Both Chevrolet Volt and Nissan LEAF drivers who qualify to participate in the *EV Project* will receive a residential charger at no cost. In addition, most, if not all, of the installation cost will be paid for by the *EV Project*. The Phoenix and Tucson metropolitan areas are designated deployment communities in the *EV Project*. The ultimate goal of the EV Project is to take the lessons learned from the deployment of the first 8,300 EVs, and the charging infrastructure supporting them, to enable the streamlined deployment of the next 5,000,000 EVs.

31. *ChargePoint America* is another national program designed to quickly roll out EV charging infrastructure. The program is sponsored by Coulomb Technologies to provide electric vehicle charging infrastructure to nine selected regions in the United States. The program is made possible by the American Recovery and Reinvestment Act through the Transportation Electrification Initiative administered by the Department of Energy. The objective is to accelerate the development and production of electric vehicles to substantially reduce petroleum consumption, reduce greenhouse gas production, and create jobs. To build the electric vehicle-charging infrastructure, Coulomb Technologies will provide a total of nearly 5,000 fully networked Level II charging stations at no cost in the participating regions. There are two types of networked charging stations being offered through the program: home and public/commercial. Installation of these charging stations in most cases will be paid by the station owner (host) or the individual.

32. Also working at the national level, *The Electrification Coalition* is a nonpartisan, not-for-profit group of business leaders committed to promoting policies and actions that facilitate

the deployment of electric vehicles on a mass scale. The Coalition seeks to achieve its goals through a combination of public policy research and the education of policymakers, opinion leaders, and the public. The Coalition has published several comprehensive "roadmap" guides to electrification of company fleets and private passenger fleets. The Coalition's most recent publication is an analysis of the economic impact of implementing their "*Electrification Roadmap*". The Coalition's analysis predicts numerous societal benefits including job creation, increased federal revenues, increased household income, and decreased oil imports.

33. The primary driver of the expected near term adoption of EVs are federal tax credits and other tax credits and incentives that help offset the price differential between an EV and a comparable conventional vehicle. Presently, the minimum federal credit amount for typical passenger vehicles is $2,500, and the credit may be up to $7,500, based on each vehicle's traction battery capacity and the gross vehicle weight rating. The credit will begin to be phased out for each manufacturer in the second quarter following the calendar quarter in which a minimum of 200,000 qualified plug-in electric drive vehicles have been sold by that manufacturer for use in the United States. The state of Arizona offers a tax credit of up to $75 for EV charging equipment and a reduced vehicle license tax for alternative fuel vehicles. As previously discussed, incentives are also available through the federal *EV Project* for EV charging equipment.

34. Since tax credits and incentives are the main driver of early EV adoption, and because the continuation of credits and incentives is political and uncertain, it is hard to forecast the specific number of electric vehicles that will exist within APS' service territory at any particular point in the future. APS has taken the approach of using multiple forecast scenarios to provide a range of EV adoption figures. These scenarios are labeled "Curve A", "Curve B", and "Curve C" on the following table. Curve A is based on the Navigant V2G Study filed in this docket. Curve B is based on a Credit Suisse report on EVs prepared in 2009, modified with Arizona vehicle sales percentages from the National Auto Dealers Association ("NADA"). Curve C is based on a Deloitte report on EVs prepared in 2010, again modified with the NADA sales percentages for Arizona.

. . .

**Table II**
**Cumulative PHEV/EV Population Within APS Service Territory**

| | Curve A | Curve B | Curve C |
|---|---|---|---|
| **2011** | 406 | 449 | 533 |
| **2012** | 560 | 538 | 629 |
| **2013** | 837 | 694 | 867 |
| **2014** | 1,262 | 957 | 1,344 |
| **2015** | 2,015 | 1,340 | 2,060 |
| **2016** | 3,051 | 2,106 | 3,253 |
| **2017** | 4,993 | 3,682 | 5,161 |
| **2018** | 8,048 | 6,093 | 8,263 |
| **2019** | 8,852 | 8,717 | 13,034 |
| **2020** | 9,329 | 12,037 | 21,049 |
| **2021** | 9,922 | 15,414 | 31,069 |

35. Based on this range of potential electric vehicles within its service territory, APS has calculated the potential additional energy and demand requirements resulting from the adoption of EVs. The design standard for Level 2 charging stations is 6.6 kW. APS has assumed that PHEVs will typically require 12 kWh per day for battery charging, and EVs will require 18.9 kWh per day. To determine the peak load added by electric vehicles, APS has assumed that all charging can occur simultaneously. The calculated ranges of peak loads added by the adoption of electric vehicles within the APS service territory is presented in the following Table III. APS has not included any DC Fast Charging in these scenarios; however, these types of chargers draw between 40-60 kW with a design standard up to 200 kW.

**Table III**
**Electric Vehicle Peak Load Forecast**

| | Curve A | | Curve B | | Curve C | |
|---|---|---|---|---|---|---|
| | MWh | MW | MWh | MW | MWh | MW |
| **2011** | 1,895 | 3 | 2,164 | 3 | 2,561 | 4 |
| **2012** | 2,438 | 4 | 2,525 | 4 | 2,910 | 4 |
| **2013** | 3,395 | 6 | 3,173 | 5 | 3,783 | 6 |
| **2014** | 4,874 | 8 | 4,289 | 6 | 5,557 | 9 |
| **2015** | 7,453 | 13 | 5,934 | 9 | 8,219 | 14 |
| **2016** | 11,121 | 20 | 9,222 | 14 | 12,723 | 21 |
| **2017** | 18,140 | 33 | 16,104 | 24 | 20,080 | 34 |
| **2018** | 29,213 | 53 | 26,700 | 40 | 32,103 | 55 |
| **2019** | 32,218 | 58 | 38,335 | 58 | 50,984 | 86 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2020** | 34,164 | 62 | 53,208 | 79 | 84,303 | 139 |
| **2021** | 36,541 | 65 | 68,353 | 102 | 125,631 | 205 |

**Time-Of-Use Rates**

36. Table III demonstrates that the projected adoption of electric vehicles within the APS service territory will lead to modest increases in energy and demand requirements. While this increase represents an opportunity for increased revenue, APS will be challenged to find ways to integrate the new demand into its existing distribution system while minimizing negative system impacts. APS is largely relying on its proposed time-of-use ("TOU") rate (i.e. ET-EV) to incent home vehicle charging during off-peak hours to minimize distribution system impacts.

37. Experimental Rate Schedule ET-EV is a "whole house" TOU rate that provides residential customers with a "Super Off-Peak" time period designed to encourage off-peak EV charging. The "Super Off-Peak" pricing period will be from 11 pm to 5am Monday through Friday, a time period during which APS residential customers traditionally use the least amount of energy, and APS' marginal generation sources are least expensive.

38. The term "whole house" refers to the fact that electric energy consumption for the customer's entire house is measured through a single meter. Therefore, all electric usage within the house is subject to the time/price signals contained in the TOU rate. This approach can be contrasted with a TOU rate established for a separately metered service that feeds only the in-home EV charging station.

39. Several utility companies across the country have instituted TOU rates for separately metered EV charging stations. For example, The Detroit Edison Company ("DEC") has an Experimental Electric Vehicle Tariff that is available to the first 2,550 customers seeking a separately metered vehicle charging station. Under this tariff, DEC will provide and install the required separately metered circuit and the charging station up to a cost of $2,500. Customers are provided with two rate options: a TOU rate with off-peak hours between 11:00 pm and 9:00 am, or a monthly flat fee of $40 per vehicle.

. . .

40. Southern California Edison Company, Pacific Gas & Electric Company, and San Diego Gas & Electric Company all offer separately metered TOU rates for EV charging. These separately metered rates are offered in addition to "whole-house" TOU rates for EV charging.

41. Staff recommends that APS be directed to look into the feasibility of offering a separately metered, non-tiered, TOU rate for EV charging as an additional customer rate option to the "whole-house" TOU rate proposed in this application.

**Metering Considerations**

42. Utility companies essentially have three metering options when considering electric vehicle charging station installations. They can offer a "whole house" tariff that gives customers a special TOU rate that applies to all electric consumption within the single-metered property, or they can separately meter a feeder exclusive to the vehicle charging station. A "submeter" arrangement utilizes a separated meter, but the "submeter" is typically located on the customer's side of the primary meter.

43. Utilities generally resist the installation of separately metered service because of the expense of adding a separate feeder circuit and meter. Several charging station manufacturers incorporate a revenue-grade meter within their charging stations. This opens the possibility of using embedded meters in the charging stations themselves as the revenue meter, negating the need for installation of a separate utility meter. However, the utility should own a meter used for billing.

44. Like other facets of the EV industry, the design, marketing and installation of EV charging stations is evolving rapidly. EV charging station manufacturers envision that their products will become a new class of consumer electric appliances. Charging stations are currently available for retail purchase from EV manufacturers and third party vendors, as well as directly from the charging station manufacturer. The retail electronics chain BestBuy recently announced that it will start selling ECOtality charging stations at its retail stores.

45. As EV charging stations become considered a consumer appliance, they will compete with one another on the basis of features offered and overall charging time and capacity. Many available charging stations incorporate sophisticated sensors and programmable timers that

allow consumers to set their vehicle charging schedules in alignment with TOU pricing signals. Also, several current charging station models offer networking capabilities which users can schedule and start charges remotely using the Web, a Smartphone, or a mobile device.

**Project Budget and Funding**

46. APS is proposing a total Project budget of $4,995,000. APS further proposes that Project costs be recovered through the Demand Side Management Adjustor Clause ("DSMAC"). Details of the proposed budget are presented in the following Table IV and subsequent footnotes.

**Table IV**

**APS Electric Vehicle Readiness Demonstration Project Budget**

| | Component | Quantity | Component | Installation | O&M | Total | Cost Category |
|---|---|---|---|---|---|---|---|
| 1 | APS-Owned Residential EVSEs | 500 | $1,300 | $1,500 | | $1,400,000 | Program Implementation |
| 2 | Non-Res Level 2EVSEs | 100 | $2,500 | $7,500 | | $1,000,000 | Program Implementation |
| 3 | DC Fast Chargers | 10 | $40,000 | $10,000 | | $500,000 | Program Implementation |
| 4 | Customer Incentives | 500 | $500 | | | $250,000 | Rebates & Incentives |
| 5 | Website | | $175,000 | | | $175,000 | Customer Education |
| 6 | IT Systems Upgrades/ Integration | | $900,000 | | | $900,000 | Program Implementation |
| 7 | Fleet (including EVSE & Meters) | 3 | $50,000 | | | $150,000 | Program Implementation |
| 8 | Program Administration | | | | $170,000 | $170,000 | Planning & Administration |
| 9 | Promotion & Signage | | | | $200,000 | $200,000 | Program Marketing |
| 10 | MER | | | | $100,000 | $100,000 | Measurement, Evaluation & Research |
| | | | | | | $4,995,000 | |

**Explanation of Budget Line Items**

(1) "EVSE" means Electric Vehicle Supply Equipment. This budget line item supports Residential Option 2 -APS-Owned Residential Charging Infrastructure. APS proposes to own up to 500 residential charging stations. Based on discussions with multiple charging station vendors, APS estimated the cost of a charging station to be $1,300 and the average installation cost to be $1,500.

(2) Supports Commercial/Public Options 1 and 2. APS proposes to own up to 100 Level 2 charging stations, either behind a customer's meter (Option 1 APS-owned Commercial Charging Stations) or as a separately metered account on the Point-of-Sale rate (Option 2 APS-Owned Public Charging Stations). Based on discussions with multiple charging station vendors, APS estimated the cost of a Level 2 Non-Residential charging station to be $2,500 and the average installation cost to be $7,500.

. . .

(3) Supports Commercial/Public Option 2 -APS-Owned Public Charging Stations. APS proposes to own up to 10 DC Fast Chargers as separately metered accounts on the Point-of-Sale rate. Based on discussions with multiple charging station vendors, APS estimated the cost of a DC Fast Charger to be $40,000 and the average installation cost to be $10,000.

(4) Supports Residential Option 1-Residential Incentive. APS proposes to provide a $500 incentive to up to 500 Residential customers to help offset the cost of charging infrastructure on customer premises.

(5) APS is developing an EV-focused website (to be available at www.aps.com/cars). Budgeted cost is for enhancements to the website, including the development of a rate analytics tool to allow customers to calculate the bill impact of an EV.

(6) Estimated costs for back office system upgrades, enhancements, and new software that will enable the following: new rate design; monitoring of EV infrastructure; smart charging/demand response communications, signaling, and control; and web-based viewing of publicly available charging station locations (integrated into www.aps.com/cars).

(7) Supports Vehicle-to-Building and Vehicle-to-Grid testing. APS would purchase EVs (PHEV, Battery Electric Vehicle, etc), charging stations, metering equipment, and associated infrastructure to conduct testing at an APS facility. V2B/V2G testing voids the manufacturer's warranty on the vehicle, which requires APS to purchase EVs specific for this purpose.

(8) Supports one full-time person to act as the Project Manager for Electric Vehicles and a portion of other employee time for work such as V2B/V2G testing, processing incentive payments, monitoring installations, reviewing distribution system impacts and necessary upgrades and other related work throughout the two-year project.

(9) Supports Customer Information & Outreach efforts, including hosting events related to Electric Vehicles for interested customers to learn more about charging, rates, and other items; proactive information packets that would be distributed to car dealers to hand out to interested consumers; and other related marketing efforts.

(10) Estimated cost to hire an MER Consultant to analyze the Super Off-Peak TOU rate and associated Smart Charging program, and provide a report on the program to APS and the Commission.

**Note:** *Budget Line Items 1-3 and portions of Item 6 are subject to an RFP for equipment, software, and services. This RFP would be issued upon approval of the Program.*

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47. Approximately 63.1 percent of the proposed Project budget is attributable to EV charging equipment and installation incentives and costs thereof. An additional 23.4 percent is allocated to software, Project administration and MER activities. The balance of the budget is for advertising and research related functions. In total, the budget would be used for the stimulation of the development of the market for EVs and EV charging services.

48. Staff believes that the role of EV market stimulation is being adequately addressed by federally funded incentive programs, therefore, Staff does not believe that utility ratepayer-funded incentives are necessary or prudent at this time. In addition, Staff believes that there may be other, less-costly alternatives available to customers for the acquisition of on-premise charging stations, such as incentives from car dealers. Staff further believes that the introduction of EVs into APS' service territory represents a load and revenue growth opportunity for APS. Therefore, Staff recommends that the proposed Project budget not be approved. If APS wants to stimulate the EV market, it could use non-ratepayer monies for incentives and all investments related to EV and EV infrastructure research and market development.

49. Since EV represents new load and thus is not DSM which reduces or shifts existing load, Staff believes that the DSMAC would not be the appropriate mechanism for recovery of Project costs. Should the Commission elect to approve APS' proposed Project budget, or portions thereof, it would be more appropriate to recover the EV-related costs through the typical ratemaking process in a general rate case.

**Waiver of Rules**

50. APS has requested a waiver of the billing requirements contained in A.A.C. R14-2-210 to accommodate point-of-sale EV charging transactions as contemplated in Experimental Rate Schedule EV-PS. Under the Company's proposed Experimental Rate Schedule EV-PS, Electric Vehicle Point-of-Sale, customers would render instantaneous payment for energy utilized to charge an EV at a public charging station owned by APS. Payment for point-of-sale service would generally be accomplished through the use of either a personal credit card or a specifically targeted pre-paid card. No bills would be rendered to customers for this service, as the customer would be paying for electricity at the time service is rendered.

51. A.A.C. R14-2-210 sets forth billing transaction requirements for electric utilities and their customers. As no bills would be rendered under point-of-sale service, APS believes this entire section would not be applicable to service provided under Schedule EV-PS.

52. Staff believes that point-of-sale recharging of EV batteries would be necessary for the wide-spread adoption of EVs. Therefore, Staff recommends that the Commission approve Experimental Rate Schedule EV-PS, minus the portion of the rate associated with vehicle charging station infrastructure, and grant a waiver of the billing requirements contained in A.A.C.R14-2-210 for this specific tariff.

**Summary of Staff Recommendations**

53. Staff has recommended approval of Experimental Rate Schedule ET-EV, subject to it being available to all residential customers.

54. Staff has further recommended that APS be ordered to investigate the feasibility of implementing a TOU tariff based on a separately metered EV charging station circuit.

55. Staff has further recommended that the Commission approve Experimental Rate Schedule EV-PS, minus the portion of the rate associated with vehicle charging station infrastructure, and grant a waiver of the billing requirements contained in A.A.C.R14-2-210 for this specific tariff.

56. Staff has further recommended that the two proposed EV charging rate schedules (for rental of EV chargers) not be approved, as lower cost alternatives may be available to customers.

57. Staff has further recommended that the proposed Project budget not be approved.

## CONCLUSIONS OF LAW

1. Arizona Public Service Company is an Arizona public service corporation within the meaning of Article XV, Section 2, of the Arizona Constitution.

2. The Commission has jurisdiction over Arizona Public Service Company and over the subject matter of the application.

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3. The Commission, having reviewed the application and Staff's memorandum dated June 29, 2011, concludes that it is in the public interest to approve parts of the Electric Vehicle Readiness Demonstration Project, subject to the Staff recommendations discussed herein.

ORDER

IT IS THEREFORE ORDERED that the Experimental Rate Schedule ET-EV is approved, subject to being available to all residential customers.

IT IS FURTHER ORDERED that Arizona Public Service Company shall investigate the feasibility of implementing a Time-of-Use tariff based on a separately metered EV charging station circuit.

IT IS FURTHER ORDERED that Experimental Rate Schedule EV-PS, minus the portion of the rate associated with vehicle charging station infrastructure, is approved and a waiver of the billing requirements contained in A.A.C. R14-2-210 for this specific tariff is hereby granted.

IT IS FURTHER ORDERED that Experimental Rate Schedules EVC-RES and EVC-GS (for rental of EV chargers) are not approved, as lower cost alternatives may be available to customers.

IT IS FURTHER ORDERED that Arizona Public Service Company shall file in Docket Control, as a compliance item in this matter, Experimental Rate Schedules ET-EV and EV-PS consistent with the Decision in this case within 30 days of the effective date of the Decision.

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IT IS FURTHER ORDERED that the proposed Project budget is not approved.

IT IS FURTHER ORDERED that this Decision become effective immediately.

**BY THE ORDER OF THE ARIZONA CORPORATION COMMISSION**

CHAIRMAN COMMISSIONER

COMMISSIONER COMMISSIONER COMMISSIONER

IN WITNESS WHEREOF, I, ERNEST G. JOHNSON, Executive Director of the Arizona Corporation Commission, have hereunto, set my hand and caused the official seal of this Commission to be affixed at the Capitol, in the City of Phoenix, this _____day of _____, 2011.

_____
ERNEST G. JOHNSON
EXECUTIVE DIRECTOR

DISSENT: _____

DISSENT: _____

SMO:RBL:lhm\CHH

SERVICE LIST FOR: Arizona Public Service Company
DOCKET NO. E-01345A-10-0123

Ms. Alana Chavez-Langdon
ECOtality
80 East Rio Salado Parkway, Suite 710
Tempe, Arizona 85281

Ms. Deborah R. Scott
Pinnacle West Capital Corporation
400 North Fifth Street
Post Office Box 53999, MS 8695
Phoenix, Arizona 85072

Mr. Daniel Pozefsky
RUCO
1110 West Washington Street, Suite 220
Phoenix, Arizona 85007

Mr. Steven M. Olea
Director, Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Ms. Janice M. Alward
Chief Counsel, Legal Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007