

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the matter of the Application of)	
OHIO POWER COMPANY)	
For authority to establish a Standard)	
Service Offer Pursuant to Section)	Case No. 16-1852-EL-SSO
4928.143, Ohio Revised Code, in)	
the Form of an Electric Security Plan)	
the generation and distribution of)	
electricity and for other relief)	

In the Matter of the Application of)	
OHIO POWER COMPANY)	Case No. 16-1853-EL-AAM
For approval of Certain Accounting)	
Authority)	

**DIRECT TESTIMONY
OF
DR. ABDELLAH CHERKAOUI
ON BEHALF OF
THE ELECTRIC VEHICLE CHARGING ASSOCIATION**

1 **I. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS**

2 **Q: Please state your name and address.**

3 A: My name is Dr. Abdellah Cherkaoui and I reside at 2638 Hyde Street, San
4 Francisco, California.

5 **Q: Please describe your background, experience, and expertise.**

6 A: I am currently the Senior Vice President of Government, OEMS (original
7 equipment manufacturers) & Utilities Market Development for Volta Charging,
8 LLC. In this role, I work directly with utilities, OEMs and federal, state and local
9 governments as well as relevant public agencies to support the broad and effective
10 development of electric vehicle charging infrastructure and accelerate the
11 adoption of electric transportation. I am also a founding Board member, and
12 former Policy Chair of the Electric Vehicle Charging Association (“EVCA” or
13 “the Association”), a not-for-profit organization that brings the collective
14 experience and expertise of leaders in the electric vehicle charging industry to
15 policymakers, stakeholders, and members of the public to promote the critical role
16 of electric vehicle (“EV”) technology, infrastructure, and services and to advocate
17 for policies that will expand clean transportation.

18 Prior to joining Volta, I provided independent advising and consultancy for the
19 development of technology platforms for sustainable electric mobility and energy
20 management in North America and Europe. From 2009 to 2012, I served on
21 Chargepoint’s European management team as CIO and VP in charge of
22 technology and operations, overseeing product management and technical

1 implementation of the ChargePoint network in Europe. I worked directly with
2 municipalities and utilities to develop their strategies and implementation of EV
3 charging solutions. Prior to this, I held applied research and academic positions at
4 the University of California in Santa Cruz and at the University of Washington in
5 Seattle.

6 I hold a Ph.D. degree from the University of Washington in Seattle and a Master's
7 degree in engineering from the Rabat School of Mines in Morocco. I am also a
8 Fulbright Doctoral Fellow and a NASA International Fellow.

9 **Q: On whose behalf are you testifying?**

10 A: I am testifying on behalf of the Electric Vehicle Charging Association. I am the
11 Secretary/Treasurer of the EVCA Board of Directors.

12 **Q: Have you testified before a utility regulatory body in any previous**
13 **proceedings in this state or any other state?**

14 A: No. However, I am scheduled to testify before the Oregon Public Utilities
15 Commission in Case UM1811 on October 10, 2017.

16 **Q: Are you sponsoring any exhibits?**

17 A: No.

18 **Q: What is the purpose of your testimony in this proceeding?**

19 A: The purpose of my testimony is to support the Joint Stipulation and
20 Recommendation from Ohio Power Company ("AEP Ohio" or "the Company")
21 and other Signatory Parties, as submitted to the Commission on August 25, 2017.

1 The Stipulation proposes a rebate program for electric vehicle charging stations in
2 the Company's service territory. Section II of my testimony will summarize the
3 Stipulation's proposed rebate program. Section III of my testimony will detail
4 EVCA's principles of utility investment in electric vehicle charging infrastructure,
5 focused on the foundation of the competitive market for charging equipment in
6 Ohio. Finally, Section IV of my testimony will explore how the Joint Stipulation
7 and Recommendation aligns with EVCA's principles for investment. It will show
8 how the negotiated proposal supports the competitive market for EV charging
9 throughout the State.

10 **Q: Please summarize your recommendation for the Commission.**

11 A: I recommend that the Commission approve the Stipulation, as it supports charging
12 industry principles detailed in Section III. EVCA is a Signatory Party to the
13 Stipulation. Under the terms outlined in the Stipulation, rebates provided through
14 AEP Ohio will incent development of a smart charging network in a way that will
15 stimulate innovation, competition, and customer choice in the market for EV
16 charging equipment. Rebates for EV charging hardware, services, and installation
17 represent an efficient model for utility investment and will encourage customer
18 investment in competitive charging technologies and electric vehicle adoption.

19 **Q: Please describe EVCA's membership and expertise in the EV charging**
20 **market.**

21 A: The Electric Vehicle Charging Association is a not-for-profit organization
22 comprised of member-companies representing a vast majority of the competitive

1 electric vehicle charging infrastructure market. EVCA’s mission is to educate
2 policymakers, stakeholders, and members of the public about the critical role of
3 EV technology, infrastructure, and services. EVCA advocates for policies that
4 will expand clean, electrified transportation.

5 EVCA’s member organizations develop, manufacture, and deploy electric vehicle
6 charging infrastructure and manage data networks to support EV supply
7 equipment.

8 **Q: What are examples of the products and services that EVCA’s member-**
9 **companies offer to the market?**

10 A: EVCA’s members offer product lines of home and commercial Level 2 (“L2”)
11 and DC Fast Charger (“DCFC” or “DC fast charger”) stations and services, which
12 are designed for different applications, depending on the segment of the market
13 served. For example, companies may offer L2 dual-port stations for public and
14 workplace charging, and may offer a more compact product for residential uses.

15 **Q: Where do EVCA member-companies operate?**

16 A: EVCA’s membership has operations worldwide, with some members currently
17 serving charging stations in all 50 states in the United States, including L2 and
18 DC fast charging stations in Ohio.

19 **Q: Who are typical customers of EVCA’s member-companies’ charging**
20 **stations?**

1 A: Customers include workplaces, governments, hotels, colleges and universities,
2 hospitals, electric utilities and other energy companies, parking garages, airports,
3 multifamily housing, auto dealerships, and other businesses.

4 **II. SUMMARY OF THE JOINT STIPULATION AND RECOMMENDATION**

5 **Q: What do the Signatory Parties propose to do in the EV charging station**
6 **market?**

7 A: On August 25, 2017, AEP Ohio and numerous other Signatory Parties
8 representing a variety of diverse interests filed a Joint Stipulation and
9 Recommendation for Commission consideration to resolve the issues in this case.
10 The Stipulation proposes a 4-year technology demonstration program to support
11 the deployment of charging stations for electric vehicles. Under this program, the
12 Company will create and operate a rebate incentive program for hardware,
13 network services, and installation for 300 L2 and 75 DC fast charging stations in
14 AEP Ohio's service territory.

15 **Q: What is the total cost of the rebate program, and how will costs be**
16 **recovered?**

17 A: The total cost of the program will be capped at \$10 million, with approximately
18 \$9.5 million allocated directly to rebates. It will be recovered through a Smart
19 City Rider.

20 **Q: What is the total amount available in the rebate program for both Level 2**
21 **and DCFC stations?**

1 A: The L2 rebate program will be funded up to \$3.7 million, and the DCFC rebate
2 program will be funded up to \$5.8 million.

3 **Q: Will the utility own and operate EV charging infrastructure under the**
4 **demonstration program?**

5 A: No. The utility will not own or operate charging infrastructure under the rebate
6 program.

7 **Q: Where will the charging stations be located?**

8 A: Level 2 rebates will be available to site hosts at publicly available locations,
9 workplaces, and multi-unit dwellings. DCFC rebates will be available to both
10 government-owned locations and non-government owned locations.

11 **Q: Does the program set aside rebates for low-income geographic areas?**

12 A: Yes. At least 10% of both L2 and DCFC rebates will be set aside for low-income
13 geographic areas. These areas are defined as a site geographically located within a
14 census tract that meets the requirements for a low-income geographic area.

15 **Q: How will Level 2 rebates be allocated among site hosts segments?**

16 A: Level 2 rebates will be allocated to public, workplace, and multi-unit dwelling
17 segments in the following amounts:

- 18 • Government or non-government (must be publicly available): 30% of rebates
- 19 • Workplace: 50% of rebates
- 20 • Multi-Unit Dwellings: 20% of rebates

Q: What is the maximum percentage of coverage of Level 2 rebates?

A: Level 2 rebates will be designed to cover charging station equipment and installation costs up to the following percentages:

- Government-owned sites (publicly available): 100% of costs
- Non-government owned sites (publicly available): 80% of costs
- Workplace: 50% of costs
- Multi-Unit Dwellings: 75% of costs

Q: What is the maximum amount of each L2 rebate?

A: Level 2 rebates will be capped at \$10,000 per port for publicly available locations, \$5,000 per port for workplace locations, and \$7,500 per port for multi-unit dwellings. The maximum rebate total per site will be \$50,000 or 6 ports, whichever is less.

Q: What is the maximum percentage of coverage of DCFC rebates?

A: DCFC rebates will be designed to cover charging station equipment and installation costs up to the following percentages:

- Government-owned sites (publicly available): 100% of costs
- Non-government owned sites (publicly available): 80% of costs

Q: What is the maximum amount of each DCFC rebate?

A: Level 2 rebates will be capped at \$100,000 per station at government-owned property and \$50,000 per station at non-government owned property. The maximum rebate total per site will be \$150,000 or 2 stations, whichever is less.

1 **Q: Do L2 and DCFC stations located in low-income geographic areas receive**
2 **specific rebate amounts?**

3 A: Yes. Stations located in low-income geographic areas will receive rebates
4 designed to cover up to 100% of the costs associated with charging equipment
5 and installation, regardless of the segment (workplace, multi-family, non-
6 government property, etc.) , with at least 10% of both the L2 and DCFC rebates
7 being set aside for low-income geographic areas.

8 **Q: What are the requirements for charging station capabilities under the terms**
9 **of the Stipulation?**

10 A: All charging infrastructure deployed under the demonstration program will be
11 networked, demand-response capable, able to capture data and metrics and
12 support open charging standards or protocols. AEP Ohio will receive data from
13 charging stations installed under the program, which may include usage, grid
14 reliability, load growth, demand response profiles, prices paid by EV drivers, site
15 host pricing, equipment provider information, and outage incidents.

16 **Q: Would EV charging site hosts have a choice of the charging stations installed**
17 **on their premises under the Stipulation?**

18 A: Yes. Site hosts will have a choice of at least three vendors of networked charging
19 equipment and/or software, and the Company will prequalify vendors for the
20 purposes of the rebate program.

21 **Q: Would the EV charging site hosts have control over the charging stations**
22 **installed on their premises under AEP Ohio's proposal?**

1 A: Yes. Site hosts receiving rebates under the demonstration program will have
2 flexibility to set pricing to EV drivers and may determine access to charging
3 assets onsite depending on the segment.

4 **III. PRINCIPLES OF UTILITY INVESTMENT IN**
5 **ELECTRIC VEHICLE CHARGING**

6 **Q: Should utility commissions be considering utility investment in EV charging**
7 **infrastructure?**

8 A: Yes. EVCA believes that there is a need for commissions to consider the full
9 range of roles for utilities that will help support and encourage the near-term
10 accelerated deployment of smart EV chargers, both in Ohio and nationwide.
11 Investments should be thoughtful and deliberate to help develop a robust and
12 sustainable EV market that promotes grid benefits for all ratepayers. EVCA
13 believes that through its consideration of the various models for EV charging
14 station deployment that involve utility investment, commissions can support near-
15 and longer-term goals for wider EV adoption.

16 **Q: Should the utilities be playing a role in the EV charging market?**

17 A: Yes. Utilities are well situated to help address some of the obstacles currently
18 preventing wider deployment of networked EV charging equipment. The
19 Commission should authorize strategic, cost-effective investments that will help
20 accelerate expansion of EV charging and EV adoption. Critically, utilities should
21 engage in program designs that support the diverse and competitive market for

electric vehicle charging infrastructure and site hosts' choice in investing in charging solutions.

Q: Why do charging station site hosts invest in EV charging solutions available in the competitive market?

A: EV charging station site hosts choose to invest in EV charging for a wide range of reasons, and each site host has its own business model for providing charging services. For many employers, it may be a low-cost benefit provided to employees to encourage adoption of clean transportation technologies that support corporate sustainability. Apartment building owners may provide charging as an amenity and will typically charge for the service as they do for a coin-operated laundry. Cities and counties may deploy charging stations to encourage low-emission driving and support local air quality, and they may charge cost-recovery fees in order to avoid giving away charging services at taxpayer expense.

Q: Why is it important for site hosts to have a choice in the type of EV charging equipment and services?

A: Site hosts have preferences regarding the hardware and services related to EV charging. The Yale Center for Business and the Environment reviewed a range of EV charging equipment and business models and concluded that “[n]o single technology or business model available today is exactly right for all charging scenarios. There are pros and cons to each alternative, depending on the location and the driver base that the charging station aims to serve.”¹ The range of choices

¹ Yale Center for Business and the Environment, 2015, “Financing Electric Vehicle Markets in New York and Other States” page 6, available at http://cbey.yale.edu/files/YALE-CBEY-EVSE%20PAPER_FINAL.pdf.

1 in EV charging goods and services is a strength indicating that the quickly
2 evolving market is meeting the varied needs of its wide range of consumers. Site
3 hosts are able to tailor the particular options for station fees, driver authentication,
4 accessibility, payment collection and other transaction capabilities, advertisement,
5 and data management and output (e.g., energy, station usage, and environmental
6 benefits). Site hosts are also the best suited to make choices about the number of
7 charging stations needed on their site. This is especially true when site hosts
8 participate in the purchase of the charging station, which will help ensure that
9 charging stations are deployed efficiently and in places where they will get the
10 most use.

11 **Q: Do EVCA's members have experience with successful utility programs for**
12 **investment in charging infrastructure?**

13 A: In the experience of EVCA's members, the rebate-based approach has been
14 successfully employed in other utility service territories. Rebate-based programs
15 have the fastest deployments of charging stations, greatest competitive choice for
16 customers, and least administrative burden to utilities and customers.

17 **Q: Explain the rebate-based approach to utility investment in charging stations.**

18 A: In a rebate model, utility investment is directed toward the hardware, services,
19 and installation of charging infrastructure. In incenting hardware, services, and
20 installation, a utility can decrease barriers for private investment in EV charging.
21 For rapid deployment, make-ready work can be performed by a licensed
22 electrician, as scheduled by a site host, and the utility may offset the costs of that

1 installation. The utility rebate is considered a regulatory asset, as it enables a
2 utility to access valuable data regarding grid reliability, load growth, and offers
3 the potential for demand response.

4 **Q: Does the rebate model preserve customer choice and competition in EV**
5 **charging markets?**

6 A: Yes. In this program design, utilities provide a direct financial incentive to site
7 hosts for the installation of the qualified EV charging equipment of their choice.
8 Since utility investment is directed to offset the costs of charging stations to
9 customers, site hosts can choose, purchase, own, and operate charging stations on
10 their properties. This arrangement allows for competitive market participants to
11 continue to meet customer demands and serve the market, while also allowing
12 utilities to invest in charging deployments without the risks of large-scale
13 ownership and operation. Additionally, rebate programs may allow utilities to
14 gain insights into the grid from networked charging, without building and
15 maintaining the complex networking capabilities already offered in the
16 competitive market. Overall, this program design reduces the cost barrier to EV
17 adoption, allows the charging station site host to determine which equipment and
18 services best meet their needs, and builds a sustainable EVSE marketplace.

19 **Q: Does EVCA have a position on the choice between networked and non-**
20 **networked charging stations in utility investments?**

21 A: Yes. EVCA believes it is essential that utility investments include only smart and
22 connected charging infrastructure. Networked charging provides grid benefits

1 over traditional load management, and valuable data can be collected to inform
2 better utility planning decisions and help maintain reliability and affordability.
3 Based on the data collected from smart charging stations, new processes can be
4 created to better integrate electric vehicle charging with the increasing renewable
5 generation interconnected the grid – helping balance intermittent loads and reduce
6 costs of providing clean energy.

7 **IV. SUPPORT FOR THE JOINT STIPULATION AGREEMENT AND**
8 **ALIGNMENT WITH UTILITY PROGRAM PRINCIPLES**

9 **Q: Does EVCA have a position on the AEP Ohio’s Phase I deployment?**

10 A: Yes. EVCA supports the Joint Stipulation and is a Signatory Party to the
11 agreement. EVCA believes that the Stipulation’s proposed rebate incentive
12 program will promote the competitive market for electric vehicle charging
13 stations and significantly advance the adoption of electric vehicles in AEP Ohio’s
14 service territory and throughout Ohio.

15 **Q: Please explain why you support a rebate incentive program for 300 Level 2**
16 **and 75 DC fast charging stations.**

17 A: The Joint Stipulation’s approach to utility investment in EV infrastructure aligns
18 and satisfies the principles laid out in the previous section. As noted above, the
19 rebate-based approach represents an efficient and cost-effective model to deploy
20 charging stations through utility investment. We strongly believe that the program
21 design the Parties advance will foster a scalable and sustainable competitive

1 market for electric vehicles and charging stations in Ohio. Furthermore, this
2 rebate program will promote the goals of Smart Columbus.

3 **Q: Does the rebate program acknowledge the role of site hosts in selecting**
4 **technologies most appropriate for their properties?**

5 A: Yes. Under the Stipulation terms, site hosts will choose among a range of smart
6 charging technologies. In maintaining customer choice, the program supports the
7 competitive market for EV charging solutions and allows site hosts to choose the
8 solution that is best for site circumstances.

9 **Q: Under the Stipulation's EV charging rebate program, can site hosts benefit**
10 **from control, management, or data from assets located on their properties?**

11 A: Yes. Under the terms of the Stipulation rebate program, site host maintain access
12 to data and management tools that could benefit site hosts and potentially all
13 ratepayers.

14 **Q: Does the proposed rebate program's approach to site host pricing align with**
15 **EVCA's principles for utility investment in charging stations?**

16 A: Yes. In maintaining site hosts' ability to set pricing for charging services provided
17 onsite, the program enables site hosts to manage charging assets more effectively.
18 Through pricing, site hosts can motivate EV drivers to visit charging stations
19 onsite and encourage responsible charging behavior. Furthermore, it will improve
20 the quality of data collected and the conclusions drawn about charging
21 deployments in the Company's service territory.

1 **Q: Would AEP Ohio’s rebate program encourage innovation in Ohio’s EV**
2 **charging market?**

3 A: Yes. Site hosts will have a choice among multiple vendors of smart charging
4 technologies, enabling a market that is dynamic, competitive, and innovative. The
5 rebate program will allow for the introduction of new, more innovative products
6 and solutions as they become available to the market and concurrently decrease
7 cost barriers to adoption of those solutions.

8 **Q: Will the rebate program result in the efficient and effective siting of EV**
9 **charging infrastructure?**

10 A: Yes. As the rebates are designed to cover a range of costs of equipment and
11 installation, a majority of site hosts may still be required to invest in EV charging
12 stations in this program. This investment gives site hosts “skin in the game,” or
13 motivation to choose appropriate sites for the greatest utilization. Site hosts
14 receiving rebates will be invested in the management and use of electric vehicle
15 charging stations on their properties, which will increase the overall benefits and
16 success of the technology demonstration program.

17 **Q: Will smart charging station deployments resulting from the rebate program**
18 **provide useful data for future deployments?**

19 A: Yes. In the Stipulation, the Signatory Parties recognize the opportunity and need
20 for reporting valuable data from networked charging stations in the program. As
21 noted in Section III above, networked charging provides grid benefits over
22 traditional load management, and valuable data can be collected to inform better

1 utility planning decisions and help maintain reliability and affordability. The data
2 collected in AEP Ohio's rebate program will include utilization, price signals to
3 drivers, load profiles, and preferred features. These insights will be key to
4 assessing the effect of the program on EV charging markets and advancing EV
5 adoption in Ohio.

6 **Q: Does this conclude your testimony?**

7 **A:** Yes.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the Direct Testimony of Dr. Abdellah Cherkaoui has been served upon the following parties listed below by electronic mail, this 13th day of September 2017.



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Summary: Testimony of Dr. Abdellah Cherkaoui on behalf of The Electric Vehicle Charging Association electronically filed by Teresa Orahod on behalf of Dylan F. Borchers