



Department of Energy
Washington, DC 20585

August 1, 2018

MEMORANDUM TO THE DEPARTMENT OF ENERGY
ELECTRICITY ADVISORY COMMITTEE

FROM: Bruce Walker, Assistant Secretary
Office of Electricity

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SUBJECT: DOE Response to Electricity Advisory Committee Recommendations on
Enhancing Grid Resilience with Integrated Storage from Electric Vehicles

I want to thank all members of the Department of Energy's (DOE) Electricity Advisory Committee (EAC) for your efforts developing recommendations pertaining to Enhancing Grid Resilience with Integrated Storage from Electric Vehicles.

I look forward to continued discussions on the path of our programs and am committed to ensuring a strong and fruitful working relationship between the Committee and this office. If you wish to discuss this matter further, my staff is available to meet with the Committee, as needed.

Thank you.



Recommendation #1: The DOE should increase support for research to create and harmonize standards needed for EVs to integrate with the grid and participate in the market, particularly with respect to bilateral exchanges.

While the Department is not a standards setting body and does not actively create or harmonize standards, the Department recognizes the important role that effective, harmonized standards play in the adoption of new technologies by industry and consumers. With this in mind, the Department will continue to ensure that data and information resulting from research and development activities funded by the Department are made readily available to appropriate standards developing organizations through reports, briefings, and other appropriate means. This will help ensure that standards are developed based on the most currently available data and technological advances. As the Department continues its work to further the integration of EVs with the electricity grid, through research and development to expand the grid services that EVs are capable of providing, data sharing and communications of project results with stakeholders will be emphasized.

Recommendation #2: The DOE should increase support for research to evaluate the range of possibilities for using EVs for grid services, effects at both the distribution and transmission level, mitigation techniques to avoid negative grid impacts, and impacts of bidirectional charging on the lifetime of EV batteries when used within such systems.

The Department is currently considering proposals received through a laboratory call and a funding opportunity announcement that will expand the Department's research portfolio in the area of grid services from EVs, including the mitigation of potential negative grid impacts from EVs connected to the grid. The activities being considered range from Smart Charge Management to cybersecurity for charging vehicles at rates up to 400kW. The Department anticipates making an announcement of selected projects by September 2018.

Recommendation #3: The DOE should commence a comprehensive economic study that analyzes US EV penetration scenarios, grid impacts and investment requirements to provide charging infrastructure and generation requirements.

The Department is currently funding a project, being jointly performed by five national laboratories that includes an analysis of the impacts of EVs on the road and their interaction with the electricity grid. This project will investigate the ability to defer generation and distribution upgrades, and their associated costs, through the use of coordinated controlled charging approaches. The project will also look into the ability to use controlled charging of EVs as an enabler for further utilization of photovoltaics and other distributed energy resources. In addition, the Department funded two national laboratories (NREL and INL) to assess the national

EV infrastructure requirements for and the costs of DC Fast Charging stations. These reports are publicly available here: <https://www.energy.gov/eere/vehicles/reports-and-publications> and provide a framework for understanding the investments needed to support EVs.

Recommendation #4: The DOE should increase support for research on the range of business models for EV charging infrastructure, policies that create barriers or incentives to each, and provide materials to guide state decision making for ownership, control and rate-basing methodology given the objective of increased reliability and resilience.

The Department agrees that there is a need to better understand the pros and cons of alternative use cases for EVs and charging infrastructure operations that support different business models and provide different benefits for the grid, new businesses (aggregators), and the public. DOE is currently finalizing a report titled “The Future of Transportation Electrification: Utility, Industry and Consumer Perspectives” which informs these issues from three distinct perspectives. In addition, technological advances in charging infrastructure as well as EVs have created the need to re-examine these topics and to incorporate metrics of reliability and resilience in the assessment. Changes to the state and local policy environment that supports or inhibits each business model in different parts of the country must also be re-evaluated. The Department looks forward to discussing this topic further.

Recommendation #5: The DOE should fund additional V2G pilot projects to better understand these challenges, public acceptance, the costs and benefits to vehicle owners, and best practices to best optimize the outcome of electric transportation and grid infrastructure development.

The Department is currently sponsoring two projects that are developing EV bi-directional power flow technologies. These projects both include an evaluation of the potential impacts on the vehicle battery’s life, as well as the benefits to the vehicle owner and the electricity grid. The Department plans to use the results of these projects when they are completed to guide the establishment of future projects to ensure that future research will be focused on the most pressing technical needs. The Department will keep the EAC updated on the progress and results of these projects and to discuss future project plans when the current projects are nearing completion.