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Comments on Workshop addressing need for flexibility in the electric system

Additional submitted attachment is included below.

May 25, 2017

Commissioner Chair Weisenmiller and Energy Commission Staff
California Energy Commission
Dockets Office
Re: Docket No. 17-IEPR-07
1516 Ninth Street
Sacramento, CA 95814-55 12

RE: May 12, 2017 Joint Agency Workshop on the Increasing Need for Flexibility in the Electricity System

Dear Chair Weisenmiller and Energy Commission Staff:

We are writing on behalf of Tesla[1] to share our comments in response to the Electric System Flexibility workshop that took place on May 12, 2017. Tesla commends the California Energy Commission (CEC) for hosting a variety of relevant workshops in order to facilitate the development of the 2017 Integrated Energy Policy Report (IEPR). By focusing on the implementation of Senate Bill (SB) 350 as outlined in the scoping order, the 2017 IEPR includes a number of complex energy policy issues California is currently facing that will continue to impact the state over the next several years.[2] It is therefore critical to ensure that the information used to develop the Report provides an accurate portrayal of the current state of the electric system including the need for more flexible resources to balance supply and demand and maintain system reliability.

The May 12, 2017 workshop introduced several tools that could help ensure system reliability in the face of increased intermittent renewable resources and transportation electrification. These include Demand Response (DR), Time of Use (TOU) rates, day ahead market regional expansion, and storage, among other items. In response to the information presented at the workshop, Tesla focuses its comments below on specific storage capabilities by addressing the following items:

- Scalability of Distributed Energy Resources
- Multiple Use Application of Energy Storage
- Transportation Electrification

Scalability of Distributed Energy Resources

During the workshop, the California Independent System Operator (CAISO) presented an overview of potential operational issues with integrating increasing volumes of renewables as well as potential strategies that leverage existing resources more effectively. Specifically, CAISO pointed to new price signals incentivizing innovation in responsive demand and storage.[3]

[1] Tesla acquired SolarCity on November 21, 2016.
[2] 2017 IEPR Scoping Order, p. 2. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-01/TN216389_20170306T111428_2017_Integrated_Energy_Policy_Report_Scoping_Order.pdf
[3] CAISO presentation at May 12 workshop, p.12. Available at: http://www.energy.ca.gov/2017_energypolicy/documents/2017-05-12_workshop/2017-05-12_presentations.php

Tesla agrees that stand-alone energy storage and storage paired with other distributed energy resources (DERs) presents a significant opportunity to address grid flexibility and is among the most scalable solutions in the near term.[4] DERs have already provided benefits to the grid by driving down costs and improving reliability. For example, PG&E credited a combination of DERs with avoiding the need to make a $196 million investment in transmission in CAISO's most recent transmission plan. [5] Furthermore, a 2016 CEC report found that: "In the San Joaquin Valley Region, the primary benefit is transmission infrastructure deferrals, with an estimated long-term ratepayer benefit of over $300 million."[6]

The viability of storage as a way to quickly address system needs has been further demonstrated through the deployment of a number of utility scale projects. Earlier this year Tesla partnered with Southern California Edison (SCE) to install a storage facility that can store up to 80MWh at the Mira Loma substation to help address reliability challenges resulting from the gas leak at the Aliso Canyon natural gas storage facility.[7] Notably the facility was deployed within approximately 3 months. The Mira Loma substation project provides a compelling example of how storage can be utilized as an alternative to deploying a traditional peaker plant and also demonstrates one of the benefits of using distributed storage versus other forms of storage such as pumped hydro. Distributed storage can function as a modular resource and can therefore be deployed where most effective and valuable to the grid in quantities that match the immediate need and avoid the risk of stranded assets that arises when very large projects are undertaken to meet anticipated needs far in the future. In the case of Mira Loma, there was an immediate need to mitigate the loss of natural gas storage at Aliso Canyon. The modular system that was chosen allows it to be connected to two separate circuits at the substation. During times when there is excess renewable energy on the system, the batteries can charge and then discharge that energy to supply customers during peak hours.

In order for the potential of DERs to meet grid flexibility needs and avoid transmission upgrades to be realized on a wider basis, it is important to acknowledge that regulatory hurdles continue to exist. For example, as highlighted in recent comments by Tesla to the CAISO on the Energy Storage and Distributed Energy Resources (ESDER) Phase 2 April 17, 2017 Revised Straw Proposal, the CAISO has not fully enabled the potential for behind-the meter storage to participate as demand response and provide additional grid services in wholesale markets.[8] At the same time, the CPUC in the energy storage proceeding (R.15-03-011) is just now beginning to discuss multi-use applications (MUAs) of storage to leverage the full potential of these assets and allow them to "stack" and be compensated for providing multiple of services, something that is generally acknowledged as important in unlocking the full potential of storage solutions. While addressing these regulatory issues can open new market opportunities for DERs, ensuring that the Integrated Resources Plans (IRPs) accurately value DERs for the full range of services they can provide is equally important. In addition, the IRP process should consider the time-value of investments that can be made on an incremental basis, compared with large projects whose full benefits cannot be realized until expected load growth materializes some years in the future. Further, the optionality that DERs can provide, in terms of being able to adjust the level of deployment based on more current information regarding needs, is an important factor that should also be considered.

To achieve a decarbonized bulk grid as envisioned by SB 350 while maintaining reliability and increasing flexibility, the outstanding regulatory market barriers must be addressed expeditiously. Therefore, Tesla recommends that the 2017 IEPR highlight the currently regulatory landscape when articulating the scalability of DERs as it relates to addressing the need for grid flexibility.

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[4] *Ib*., p. 24.
[5] Cal-ISO Board Approves Annual Transmission Plan." California Energy Markets, April 1, 2016.
[6] "Customer Power: Decentralized Energy Planning and Decision-Making in the San Joaquin Valley," CEC Staff Paper by Matt Coldwell. July 2016. http://www.energy.ca.gov/2016publications/CEC-200-2016-005/CEC-200-2016-005.pdf
[7] http://insideedison.com/stories/innovative-battery-storage-facility-at-sces-mira-loma-substation-allows-for-more-renewables
[8] Tesla Comments May 18, 2017, CAISO ESDER Phase 2 Revised Straw Proposal. Available at:

Multiple Use Application of Energy Storage

The ability for storage resources to perform and stack multiple services is becoming more widely recognized and is particularly important and relevant to any discussion around grid flexibility given that a number of the applications or use cases that storage can address go to the issue of enabling the grid to accommodate increased amounts of renewables. As referenced by AMS during workshop presentation, the Rocky Mountain Institute (RMI) issued a report in 2015 on the economics of battery storage, which outlines the various services batteries can provide to various groups of market participants.[9] A number of the services identified in the report play a key role in increasing grid flexibility, including, energy arbitrage (with storage acting as a sink when wholesale energy prices are low and as a source when energy prices are high), Resource Adequacy (especially flexible RA to address ramping needs engendered by increased renewables, specifically solar), and frequency regulation (to address the growing impacts of intermittent resources on the system). More generally, the full range of services provide a good basis for policy makers and resource planners in the IRP and IEPR process to consider the full range of benefits distributed storage can provide.

Transportation Electrification

While not a key area of discussion for this workshop, the opportunity to utilize electric vehicles to help mitigate the impact of renewables overgeneration was referenced in several presentations. CAISO specifically highlights that EV charging can help address duck curve issue by aligning the incentives EV owners/operators face to charge vehicles during times when there is excess energy on the grid.[10] We recognize the potential for utilizing price signals to incentivize EV charging during times of overgeneration, yet this is also partially dependent on the type and scale of deployment of EV charging infrastructure. For example, as Tesla has stated previously, it will be important to deploy Level 2 charging infrastructure in workplaces[11]and multifamily dwellings to meet increasing EV driver demand. To the degree the midday hours are characterized by overgeneration, workplace charging can be an important means of leveraging EVs as a means to integrate renewables. Currently this need has not been adequately met. Yet as the deployment of workplace charging infrastructure grows, utilizing price signals to encourage charging during times of overgeneration could become a more scalable mechanism to provide flexibility. We therefore recommend that any discussion in the 2017 IEPR in relation to the potential for EV charging to provide grid flexibility recognize the underlying assumption regarding the scale of deployment of various types of charging infrastructure.

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As the CEC continues to develop the 2017 IEPR, Tesla recommends that a discussion on grid flexibility within the report focuses on the following: 1) describe the regulatory hurdles that must be addressed to enable the full potential of energy storage, 2) recognize the multiple services storage can provide to the grid and 3) consider the near term scalability of DERs to meet grid needs.

We appreciate the opportunity to comment on the May 12, 2017 workshop and look forward to continuing to work in partnership with the CEC to provide input in the development of the 2017 IEPR.

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[9] AMS presentation at May 12 workshop. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN217564_20170511T161001_ANATOMY_OF_BTM_BATTERY_OPERATIATIONS.pdf

[10] CAISO presentation at May 12 workshop, p.25. Available at: http://www.energy.ca.gov/2017_energypolicy/documents/2017-05-12_workshop/2017-05-12_presentations.php

[11] Workplace charging should be defined to include traditional office space locations as well retail and service industry spaces such as shopping centers to ensure employees of all industry types have workplace charging access.

Sincerely,

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