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The 21st Century Electricity Challenge: Ensuring a Secure, Reliable, and Modern Electricity System

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Subcommittee on Energy and Power

Question: How does America integrate renewable energy sources in to the energy grid?

To The Honorable Dave Loebsack,

Currently, fifty different regulatory agencies are responsible for establishing the rules that mandate the procurement of renewable energy resources in each State of the Union. Of these States, thirty have existing requirements for a targeted percentage of renewable resources. For example, in California the regulatory requirement is for 33% of all generation to come from renewable resources by 2020. Regulations such as the Renewables Portfolio Standard (RPS) 33% requirement in California have been strong drivers of procurement for renewable resources over the past five years, to the extent that the cost of wind and solar resources has come down over 50% in the same time period due to cost rationalization and economies of scale. That said, we believe within the next five years solar and wind resources will be more economic than traditional fossil resources propagating a substantial transformation of the electrical grid in all fifty States. One byproduct of the rapid transition to intermittent (i.e. solar and wind) resources and away from baseload (i.e. fossil) resources is need to smooth out the variability of intermittent

resources to ensure that generation is coincident with load requirements. Therefore, there is a need for utilities to capitalize on the many solutions that currently exist to integrate renewable resources into the electricity grid.

One common-sense strategy that utilities can undertake at no cost is a balanced approach to procurement. Similar to an investment portfolio, utilities like those in California meet the State's high renewable requirement by diversifying their generation mix (i.e. gas, wind, solar, geothermal, biomass, hydro) of different assets to ensure that supply and demand remain balanced and mitigate the risk of grid instability. To accommodate an unbalanced generation mix, as could exist under significantly higher penetration levels of solar, for example, storage technologies can be deployed to shift solar generation to times in a day when the generation is needed the most and offset any risk of over-generation that may exist. As with solar and wind technologies, we are confident that storage solutions will decrease rapidly in cost over the next several years making these resources readily attainable and economic to utilities across the United States.

Lastly, the technologies utilized in solar systems over the last several years have evolved meaningfully and are now capable of providing grid stability services, thus turning solar into an "asset" to the grid. Solar systems coupled with storage, advanced inverters (i.e. power conversion device) and a distributed communications topology can match generation to demand "seamlessly" and provide "grid support services at a fraction of the cost" than what it would typically cost a utility. That said, these new "smart" solar resources have the potential to save ratepayers hundreds of millions dollars in avoided capital upgrade costs thus increasing the value of solar to the grid.

To conclude, California and other markets such as Germany have illustrated that higher penetration levels of renewable resources can be achieved without the risk of creating grid reliability issues. While every State is different and with its own infrastructure requirements, the integration strategies and technology solutions Enphase recommends can be utilized to satisfy the reliability needs in any market and for any system. As costs come down even further, it is imperative that utilities across the United States adopt the strategies and technologies that exist today. It is also equally important that State regulators mandate the utilization of these technologies to ensure a smooth transition to a new energy economy. Furthermore, the Federal government has the responsibility to ensure the safety and security of the electricity grid and should seek to pursue policy outcomes that harness these same technologies to protect the public and ensure the safe and reliable delivery of energy.

Sincerely,

Paul Nahi
Chief Executive Officer
Enphase Energy