Mr. Borkar,

The Solar Energy Industries Association (SEIA) appreciates the opportunity to provide feedback to ERCOT on which scenarios ERCOT should include in its 2014 LTSA study. SEIA is the national trade association for the solar energy industry and represents 1,100 member companies that conduct business throughout the solar energy industry supply chain. Many of SEIA's member companies conduct business in Texas.

SEIA participated in all three LTSA workshops held by ERCOT and The Brattle Group. Based on the workshop discussions and SEIA's own data and analysis, SEIA would recommend that ERCOT include the following scenarios in its LTSA study: (6) Stringent Environmental Regulations; (4) High Efficiency/Distributed Generation; (10) Water Stress; and (5) High Natural Gas Prices.

Scenario No. 6 - Stringent Environmental Regulations

ERCOT should include a scenario with strict environmental regulations and a corresponding increase in solar development in ERCOT in its LTSA study. However, while SEIA appreciates the development of a solar-related scenario, SEIA is concerned with the assumptions related to a solar mandate, solar-CREZ lines, and the potential need for additional new ancillary services that are included in this scenario and how the scenario could be perceived as a result of these assumptions.

Solar offers significant environmental benefits, as it does not emit carbon dioxide. However, due to solar's significant and continuing cost reductions, solar is growing rapidly despite a statewide or federal mandate. Pairing solar with both stringent environmental regulations and a mandate implies that solar's continued growth is tied to those policy changes.

In fact, there were 4,751 MW of new photovoltaic (PV) capacity installed in 2013 in the U.S., representing a 41% increase in deployment over installation levels in 2012. Solar accounted for 29% of all new electric generation capacity added in 2013 in the U.S., up from just 10% in 2012, which made solar the second largest source of new electric generation capacity behind natural gas in the nation. The increased demand for and installation of solar, along with manufacturing efficiencies, has resulted in a steep decline in solar prices. The average cost of a solar panel has declined by 60% since the beginning of 2011, and the average installed residential and commercial PV system prices in Texas alone have fallen by 23% in the last year. In 2013, Texas installed 75 MW of solar electric generation capacity, ranking it 8th in the nation, showing that the solar industry is growing and solar prices are declining in a state without a solar renewable portfolio standard or strict environmental regulations.

This scenario also assumes the need for more solar-CREZ lines. Although new generation could potentially lead to the need for new transmission infrastructure, the targeted deployment of utility-scale and distributed solar generation (solar DG) could actually defer new transmission upgrades or new transmission line construction and further increase the utilization of the CREZ lines.

Finally, the scenario assumes a potential need for new ancillary services to provide fast, flexible resources, given the increase in renewable generation. SEIA cautions ERCOT from automatically

assuming that an increase in solar generation will result in a corresponding need for additional new ancillary services. Today's solar power plants have advanced technical features, such as voltage regulation, ramp-rate power controls, and frequency controls, which enable solar power plants to provide ancillary services that can help maintain the stability and reliability of the ERCOT grid. These advanced technical features allow solar power plants to provide ERCOT with additional system flexibility with solar generation output that is more responsive to ERCOT grid controls. When combined with quick-start gas power plants, solar power plants can provide further operational flexibility to the ERCOT grid. Furthermore, solar power plants, with storage technologies, are dispatchable generation resources with fast ramping capabilities that can provide ancillary services to the ERCOT grid.

In sum, given pending environmental regulations, like CSAPR and EPA Section 111(d), ERCOT should include a scenario to reflect stringent environmental regulations and the expected increase in solar development in ERCOT. However, SEIA strongly recommends that ERCOT take into consideration the concerns stated above about the assumptions related to a solar mandate, solar-CREZ lines, and potential need for additional new ancillary services and modify this scenario accordingly before it is included in the LTSA study.

Scenario No. 4 - High Efficiency/Distributed Generation

ERCOT should include this scenario in its LTSA study because solar DG will only increase in ERCOT as residential and commercial system installation costs continue to decline and solar DG provides a significant amount of reliability benefits to the ERCOT grid.

Distributed generation, whether in the form of solar PV or energy storage, is growing at a rapid pace. On a national level, residential solar has steadily gained steam as homeowner financing options become more widely available, system costs continue to decline, and market participants innovate. 792 MW of residential solar was installed in 2013 in the U.S., representing 60% annual growth. However, most notable about 2013 was the Q4 boom, in which installations jumped 33% over the previous quarter – the largest quarterly increase in recent history. In Texas, almost one-third of solar installations are residential or commercial DG systems, and this number is expected to grow in the future. Over the past four years in Texas, based on reported data, the average price to install a residential system has fallen by 60% (from $6.02/W to $3.63/W) and a non-residential system by 70% (from $5.09/W to $3.58/W).

Solar DG provides many significant reliability benefits to the ERCOT grid. Solar DG can be deployed in stressed, congested areas to meet increased electricity demand in those specific areas. The targeted deployment of solar DG in these congested areas can also defer costly new transmission upgrades or new transmission line construction and can provide relief to the overall ERCOT transmission system. Texas has a rapidly growing urban population and solar DG is highly adaptable to meet the electricity needs of growing urban areas. When installed onsite behind a customer's meter, solar DG can act as a load-side resource that can help residential and commercial customers reduce electricity demand from the ERCOT grid. Further, solar DG is unique in that it can be installed at the same rate as load growth or load growth in a specific area of the ERCOT grid—in as little as 1 month for incremental rooftop solar. As a result, solar DG can go online and meet load faster than any other electric generation resource.

Scenario No. 10 - Water Stress

ERCOT should include this scenario in its LTSA study since water resources are scarce in Texas and water demand is expected to correspondingly increase as water supplies continue to decrease in the future.

On March 14, 2014, Governor Perry renewed the 2011 certification that "exceptional drought conditions pose a threat of imminent disaster in a specific number of counties." Seeing the effects of the ongoing drought, many Texas policymakers have placed water resource management high on their priority list. With sustained economic and population growth and ongoing drought conditions, it will become increasingly vital for ERCOT to rely on power generation that is less-water intensive or that has secured water rights for its water needs in order to maintain system reliability.

Unlike traditional power generation plants that need water for cooling and extraction purposes, solar requires little to no water to produce power. Solar PV plants do not use water to generate power since the PV plants convert sunlight directly to electricity. Some solar PV plants use a limited amount of water for semi-annual panel cleaning. Due to the state's geographic diversity, the areas of Texas experiencing the most extreme drought conditions are also where solar irradiance and production potential are the highest in the state. The installation of solar power plants in ERCOT would help create a drought-resistant approach to maintaining system reliability.

Scenario No. 5 - High Natural Gas Prices

ERCOT should include this scenario in its LTSA study since natural gas prices, like any commodity price, fluctuate up and down. While the shale gas revolution has dramatically driven down natural gas prices, analysts estimate that natural gas prices will rise in the coming years due to a number of factors, including LNG exports to other countries.

Solar power prices have dramatically decreased in the last four years to make solar a cost-competitive generation resource in ERCOT. However, when natural gas prices rise, solar will become even more cost competitive and solar penetration will further increase in ERCOT.

Thank you for inviting SEIA to participate in the LTSA workshops and for providing us with the opportunity to provide feedback on the scenarios that should be included in ERCOT's LTSA study.

Please let us know if you have any questions.

Best,

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