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PROJECT NO. 40000

COMMISSION PROCEEDING TO ENSURE RESOURCE ADEQUACY IN TEXAS	§ § § §	**BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS**

COMMENTS OF THE SOLAR ENERGY INDUSTRIES ASSOCIATION

The Solar Energy Industries Association ("SEIA") offers these comments related to Project No. 40000, a proceeding to ensure resource adequacy in Texas.[1]

OVERVIEW

SEIA applauds the Public Utility Commission of Texas ("PUCT" or "Commission") and ERCOT's recognition that resource adequacy is a serious concern for Texas, and appreciates the opportunity to offer these comments in this docket on how solar can assist in meeting Texas's resource adequacy challenges. SEIA is taking a narrow position on these issues, and provides the following comments for consideration.

First, Texas's energy-only market construct, in its current form, has proven insufficient to support the deployment of new electric generation, including solar, a valuable generation resource with a high coincident peak factor. SEIA recognizes the PUCT and ERCOT are working diligently to address market concerns, and is closely tracking these proceedings.

[1] The comments contained in this filing represent the position of SEIA as an organization, but not necessarily the views of any particular member.

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However, SEIA takes no position on the broader course of action and associated policy options currently under consideration in this docket. That said, in selecting the new market design for Texas, the Commission should not adopt rules that exclude or otherwise prevent solar energy from investing in and participating in future market expansion, and, in fact, should strongly consider the valuable attributes that solar energy resources can bring to the ERCOT market.

The new market structure should also facilitate the execution of contract terms beyond five to ten years. Long-term contracts incent investors to build new generation, and provide needed certainty for low-cost financing. This has proven true for utility-scale solar developments throughout the U.S., the vast majority of which hold contracts of 20-25 years in duration. There are currently 3.4 GW of utility projects under construction in the U.S. and another 6 GW of projects with contracts signed between developers and utilities.[2] Long-term contracts also benefit retail customers because they provide price certainty and lower-priced power over a set number of years. Solar is a resource with zero fuel costs, and long-term contracts have proven an effective hedge against conventional fuel price volatility for end use customers.

In addition, the Commission should continue to recognize the importance of ERCOT's system reliability to all customers. Outages can be caused by transmission and distribution system operational challenges as well as diminished reserve margins. For this reason, it is

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2 "U.S. Solar Market Insight Report: Q2 2012," GTM Research and SEIA at. p. 17 (Sept. 2012) ("SMI Q2 2012"), *available at* http://www.seia.org/research-resources/us-solar-market-insight.

important to consider system quality[3] in addition to resource adequacy when designing ERCOT market solutions to achieve specific reliability objectives.

Finally, ERCOT should review solar's coincident peak factor calculation to ensure the system fully captures solar's peak production profile and how it aligns with ERCOT's system peak requirements—including in years of extreme weather conditions. Due to the relatively small deployment of solar in ERCOT to date, solar energy should have a very high peak capacity contribution factor—nearly 100% in most locations. Moreover, the inclusive family of solar technologies includes both direct energy conversion (as in photovoltaic, or "PV") and synchronous generation (as in concentrating solar power, or "CSP") technologies. Collectively, this diverse range of technologies offers not only high coincident peak generation, but also voltage support, increased transmission utilization, and the ability to shift renewable energy to the highest value hours in the operating day across seasons.

BACKGROUND

Established in 1974, SEIA is the national trade association of the U.S. solar energy industry. Through advocacy and education, SEIA is working to build a strong solar industry to power America. As the voice of the industry, SEIA works with its 1,000 member companies to make solar a mainstream and significant energy source by expanding markets, removing market barriers, strengthening the industry and educating the public on the benefits of solar energy.

As SEIA demonstrated earlier in this docket,[4] with its abundant solar resources, peak generation shortages, and enormous land and rooftop potential, Texas is ripe for solar

[3] "System quality" is defined as the short-term, reliable operation of the power system as it moves electricity from generating source to retail customer by providing balancing and ancillary services.

development. According to both Texas's State Energy Conservation Office[5] and a recent NREL study, Texas has the highest potential for solar in the nation. The state accounts for roughly 14% (38,993 TWh) of the entire estimated U.S. technical potential for utility-scale PV solar and 20% (22,786 TWh) for utility-scale CSP.[6] However, despite this promise, Texas installed only 25.7 MW of solar in Q2 2012, bringing cumulative installed solar capacity in the state to 102 MW.[7] [8]

SPECIFIC COMMENTS

1. Solar Should Be Included in any New Texas Market Re-Design

SEIA members are engaged in wholesale markets throughout the U.S. with dynamic solar portfolios, and are regular participants in FERC proceedings addressing solar grid integration. Currently, SEIA members have only modest investments in ERCOT and have not built merchant facilities financed by participation in ERCOT's energy-only wholesale market. For this reason, SEIA takes no position on the broader course of action and associated policy options currently proposed in this docket and being examined by current ERCOT market participants, regulators, and The Brattle Group. In these early stages, SEIA prefers to offer general guidance on market opportunities and reserves the right to become more directly involved in program design details at a later phase in this proceeding.

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4 "Comments of the Solar Energy Industries Association," PUCT Project No. 40268 (filed Jul. 24, 2012), available at http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/40000_213_732211.PDF.

5 "Solar Energy in Texas," House Research Organization Focus Report, Texas House of Representatives, No. 81-13 (Jul. 20, 2010).

6 Lopez, Anthony, et. al., "U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis," NREL/TP-6A20-51946 at p. 8 (Jul. 2012).

7 SMI Q2 2012 at p. 20.

8 CPS recently announced that it is partnering with OCI Solar Power to install five solar power projects with a cumulative capacity of 400 MW, but all of these projects won't be constructed and online until 2017.

In selecting the new market design for Texas, the Commission should not exclude or otherwise prevent solar energy from participating, and, in fact, should strongly consider the valuable attributes that solar energy resources can bring to the ERCOT market. For instance, solar generation is able to respond to grid generation needs quicker than any other resource. Solar projects can be deployed in ERCOT in as little as nine to twelve months.[9]

II. The Commission Should Adopt Policies to Facilitate Longer-Term Contracts

As the PUCT evaluates adjustments to the energy-only market, it should support policies to facilitate longer-term contracts in the wholesale market, which will drive valuable new, peak generation deployment. To date, the vast majority of the 100 MW of PV currently deployed in Texas has been facilitated through customer-sited distributed generation ("DG") installations and utility-scale bilateral power purchase agreements ("PPAs") with public entities, such as City Public Service ("CPS") of San Antonio and Austin Energy.[10] New solar generation has not been deployed as a merchant facility in ERCOT's energy-only market due to the perceived investor risk attributed to an energy-only market structure with a history of investment losses and low revenues. This lack of investment in new generation is not a problem unique to solar and is common amongst all types of energy generators.

To encourage generation investment, the PUCT increased the system-wide offer cap to $4,500.[11] SEIA applauds this development, but is not confident that this action alone will

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9 SunEdison's *Webberville* (30 MWac) project with Austin Energy was constructed in approximately 10 months. FirstSolar's *Blythe* (21 MWac) project in California was constructed in approximately 6 months.

10 SMI Q2 2012 at p. 37.

11 "Order Adopting New § 25.508 as Approved at the June 28, 2012 Open Meeting," PUCT Project No. 37897 (issued Jun. 28, 2012), available at http://www.puc.texas.gov/industry/projects/rules/37897/37897adt.pdf.

stimulate sufficient investment in new generation to mitigate the current resource adequacy challenges caused by reduced reserve margins. Policies that facilitate longer-term contracts are needed.

As stated above, existing PV capacity has been contracted through bilateral agreements largely with municipal-owned utilities ("MOU") and co-operatives, with terms ranging from ten to twenty years. Because of PV's unique attributes, such as zero fuel costs and minimal operations and maintenance ("O&M") costs, the buyer (MOU, co-op, etc.) in a long-term contract receives the benefit of a long-term hedge against volatile wholesale pricing as well as valuable coincident peak capacity that uses little to no water.

Without long-term contracts, investment in CSP projects is highly unlikely. But CSP plants can offer the benefits mentioned above, as well as voltage support, increased transmission utilization, and the ability to shift renewable energy to the highest value hours in the operating day across seasons. Today's leading CSP technologies can also be dry-cooled, using only minimal quantities of water for mirror washing. And finally, CSP plants constructed with thermal energy storage ("TES") systems offer capacity factors as high as 90% and greater during peak demand periods.

Non-renewable generators' cost structures are different from solar; non-renewable generators have up-front capital costs associated with construction, but these generators also incur long-term marginal costs associated with continuous fuel purchase and on-going O&M on the facilities. This difference—the type of costs incurred and the point at which they are

incurred, and not exclusively the total cost of the resource[12]—define the long-term proposition of solar, but has limited solar's ability to compete and attract low-cost financing in an energy-only market. Solar's larger up-front capital costs for materials and construction and low to zero long-term costs (such as fuel and O&M),[13] are not recognized or accounted for in the real-time and day-ahead markets. The ability to execute contracts on a longer-term basis will enable solar's strong economic benefits to manifest in the near-term by amortizing fixed up-front costs, and will increase investor security and certainty, which, in turn, will increase all forms of energy generation investment and capacity.

Furthermore, as demonstrated by the solar projects currently deployed in Texas, solar delivers higher near-term value to retail customers when procured through longer-term bilateral agreements than those currently being executed in the market today. SEIA recognizes that, in some instances, the lack of REPs' appetite to enter into long-term solar contracts or non-solar generation contracts can be attributed to market and regulatory uncertainty as well as dynamic customer base. In U.S. markets where bilateral long-term agreements are more easily executed, solar is highly competitive with conventional generation.

III. The Commission Should Consider Resources that Deliver Both System Quality and Peak Capacity

Independent of the market pillars adopted, bids brought forward by the market can be optimized to deliver a diverse resource portfolio with enhanced system quality attributes. ERCOT's reliability objectives are maintained through resource adequacy and system quality.

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12 Thin-film PV on a single axis tracker is reported at $1.99/MW (capital cost in 2011 dollars) and $2.50/MWh integration costs. Arizona Public Service's (APS) 2012 Integrated Resource Plan. Docket No. E-00000A-11-0113, available at http://images.edocket.azcc.gov/docketpdf/0000135557.pdf.

13 It should be noted that most of solar's long-term costs are associated with the cost of debt service.

Ensuring adequate reserve margins alone does not guarantee a "1-in-10 loss-of-load event" ("LOLE") outcome. As noted by the Brattle Group, ERCOT experienced average annual customer outages well in excess of 100 minutes due to transmission and distribution system issues not attributable to peak resource shortages.[14] While some outages are not preventable (*e.g.*, those caused by Hurricane Ike), other outages, such as those resulting from transmission constraint, are avoidable if the market-based resources are optimized in how they are deployed. For example, ERCOT's market today is agnostic to where plants are located from a system quality perspective; plants are sited where they are most economical for the developers and they are valued for the energy or ancillary services they can deliver to the market. However, if those same plants could be leveraged to also deliver system quality benefits, that resource could deliver greater value to the system's reliability than it did prior to the consideration of the facility's system quality attributes. For example, a plant located in a load pocket with available transmission, as opposed to one in a rural, low-load area, delivers enhanced system quality.

To encourage deployment of projects that can optimize resource adequacy and system quality (therefore delivering optimal reliability), the value projects bring to system quality could also be monetized. For instance, solar can deliver power at the point of demand in typically congested urban areas contributing to greater system reliability. Solar power plants are also optimally productive in West Texas where the solar resource is exceptionally high and where new CREZ lines are being developed to deliver power from these remote regions to urban centers.

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[14] "ERCOT Investment Incentives and Resource Adequacy," The Brattle Group at pp. 24, 101-102 (Jun. 1, 2012) ("ERCOT Brattle Group Report"), *available at* http://www.ercot.com/content/news/presentations/2012/Brattle%20ERCOT%20Resource%20Adequacy%20Review%20-%202012-06-01.pdf

One option the Commission might consider is adoption of a System Quality Scaling ("SQS") mechanism to send market signals to build projects whose primary value is delivering resource adequacy and secondary value is enhancing system quality. An SQS mechanism would allow projects that clear the market through the traditional market-based approach (*e.g.*, energy-only clearing or a centralized forward capacity market) to then be evaluated based on how much additional value the project brings from a system quality perspective. For example, if the PUC adopted a forward centralized capacity market, bids would clear the capacity market based on whatever mechanisms and triggers are designed. Following the "unfactored" clearing of the projects brought forward by the market, those projects would then have the SQS factors[15] applied. More simply put, projects clear based on a free-market approach and the SQS factors are then applied to optimize system reliability by encouraging location-specific generation. Therefore, the final, factored clearing price for projects more accurately reflects the value the project delivers to ERCOT from both a resource adequacy and system quality perspective. This could also allow for more cost-effective operation of the ERCOT transmission system because projects are being leveraged to deliver more than just peaking capacity; they are being leveraged to avoid congestion in heavy load pockets, defer expensive asset upgrades, and mitigate potential effects of outages due to scheduled maintenance on existing plants.

[15] The SQS factors should vary based on the "health" of the ERCOT transmission system. Annually, ERCOT or a third-party would evaluate and prioritize/weight areas of concern within the ERCOT transmission system. Projects that deliver the higher-priority system quality attributes would weigh more heavily (and therefore scale-up their clearing price) than those projects that lack important system quality attributes.

IV. The Coincident Peak Capacity Factor for Solar Should Be Evaluated

Finally, SEIA requests the opportunity, through a workshop or other means, to collaborate with ERCOT and other market participants to ensure that coincident peak capacity value and other value attributes of all resources are being accurately captured by the market. Independent of the market pillars adopted, market transactions should reflect these high-value attributes for solar.

Solar's production profile nearly parallels ERCOT's load profile—load is typically higher when the sun is shining. On August 3, 2011, the ERCOT system reached a peak demand of ~68.7 GW between 4 and 5 p.m. At this same time, PV systems in west Texas were at or near peak production. As indicated by the green line in Figure 1 (below), solar's peak production is closely aligned with ERCOT's summer system demand. Because of this, solar PV has a high coincident peak value of nearly 100% and a capacity factor of 33%.[16] CSP plants with thermal energy storage have capacity values in the range of 90% to 95%, similar to conventional thermal generating plants.[17] This coincidence helps reduce the need to run older, expensive peaking units, reduces the risk of emergency events during high demand periods and reduces the need to drop industrial load. Further, when solar is paired with on-site firming resources such as battery storage, thermal storage or standby generation, system demand and generation can be aligned and the effective capacity value of solar can be improved to be a non-peaking resource, too.

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16 "ERCOT Long-Term Seasonal Assessment," ERCOT at p. 39 (Dec. 2010).

17 *Id.*

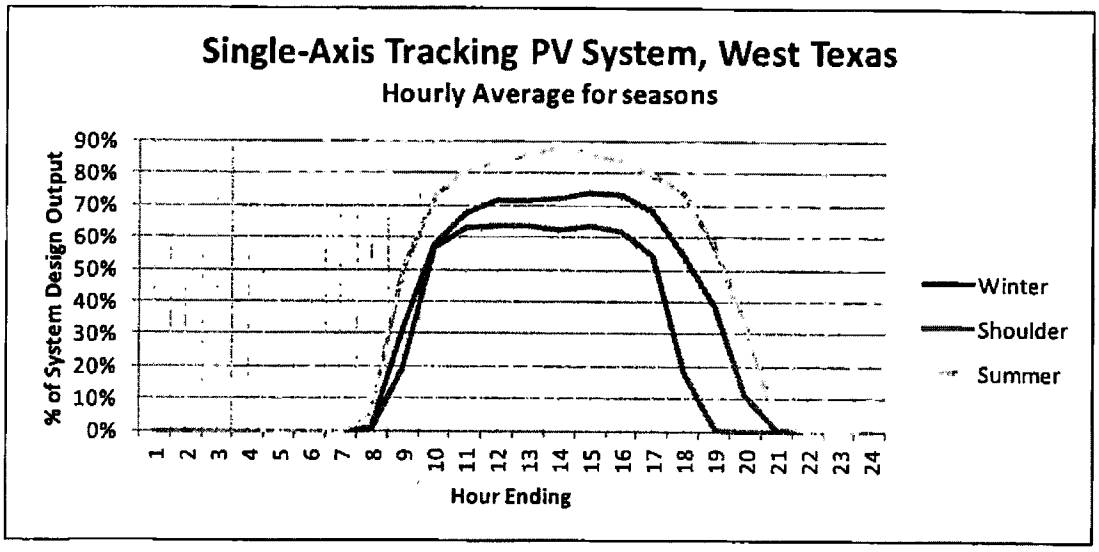


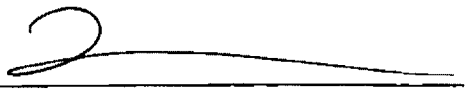
Figure 1

Single-Axis Tracking PV System Plant Production in West Texas

CONCLUSION

SEIA respectfully requests that the PUCT ensure that any new market design not exclude or otherwise prevent solar energy from investing in and participating in future market expansion. Furthermore, the Commission should support policies that promote long-term contracts, which would encourage investment in new peaking generation and thereby improve resource adequacy. Finally, the Commission should continue to recognize the importance of ERCOT's system reliability to retail customers by considering system quality in addition to resource adequacy when designing ERCOT market solutions to achieve specific reliability objectives.

Respectfully submitted,

By: 

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