TESTIMONY OF

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BEFORE THE

HOUSE SUBCOMMITTEE ON ENERGY AND POWER

LEGISLATIVE HEARING ON
DISCUSSION DRAFT ON ACCOUNTABILITY AND DEPARTMENT OF ENERGY
PERSPECTIVES ON TITLE IV: ENERGY EFFICIENCY

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Mr. Chairman, and Members of the Subcommittee,

Thank you for the opportunity to provide testimony on the Discussion Draft on Accountability and Department Of Energy Perspectives On Title IV: Energy Efficiency. I am Christopher Cook, President of Solar Grid Storage and a co-founder of the Company. Solar Grid Storage (SGS) was formed in 2011 by a group of solar veterans who have developed an innovative financing solution that allows batteries to be added to solar PV installations. Our focus is providing grid services from storage batteries to facilitate increased resiliency of the grid while also addressing impacts from multiple intermittent distributed generation sources. We service commercial scale customers with our PowerFactor ® 250kilowatt and 500kilowatt inverter/battery systems co-located at a PV customer's site. SGS's financing model integrates energy storage systems into new solar installations reducing up-front costs, enhancing grid stability, and providing additional host customer benefits -- most importantly continuous backup power. The ultimate goal of our novel energy storage application is to make affordable, solar energy a reality throughout the U.S.

SGS's business focus is in the PJM Independent System Operator service territory. We have 4 operating storage projects providing service to the PJM in its fast frequency regulation market established by PJM in response to FERC Order 755. Our pilot project at the Philadelphia Navy Yard is a stand alone battery system as part of the grid star project in Philadelphia. We also have 2 projects in New Jersey co-located with PV projects at a commercial customer's site. Our flagship project is a solar microgrid at the Konterra Headquarters in Laurel, Maryland. That 500kW project provides not only the PJM frequency regulation services but also backup power for the customer's 400kW PV parking lot canopy allowing the system to provide continuous

backup power to the commercial office building. Future plans will tie in the customer's on-site emergency backup diesel generator to provide more efficient use of the generator while also enhancing the duration of operations for our storage system.

In January of 2015, Solar Grid Storage solar sold its project pipeline and the four operating projects to SunEdison, an 8 billion dollar global leader in renewable energy development and finance. Solar Grid Storage is working in conjunction with SunEdison for future project development.

I. Introduction and background on the U.S. Solar Industry: Highlights & Future Prospects

SGS focuses on providing inverter/battery solutions for new commercial solar installations. That is because even though solar energy is a young industry, it is growing fast. In 2014, solar comprised 32% of all of the new electric capacity in the U.S.[1] Solar capacity in the U.S. now exceeds 20 gigawatts[2] which is enough to power 4 million homes.[3] The following graph illustrates solar's remarkable growth since 2000, including anticipated installations this year:

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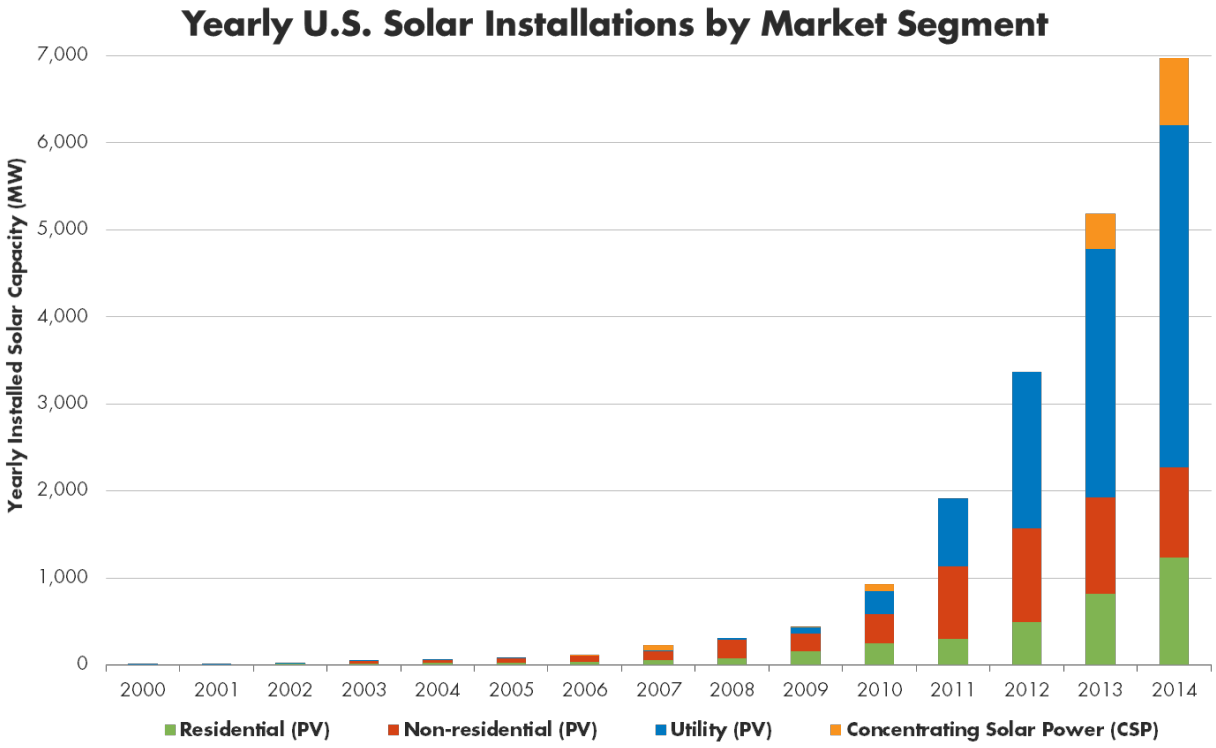
[1]SEIA, "Solar Data Cheat Sheet" (March 2015), a copy of which is included as Attachment 3.

[2]Id.

[3] SEIA, "Solar Data Cheat Sheet."



This phenomenal growth is the result of private investment, technological innovation, a maturing industry and smart federal and state policies. The federal government has received a strong return on its investment of public dollars, with benefits to our economy that far exceed their costs.

Solar is an energy source available in every U.S. Congressional district. Although Germany's solar resource is the equivalent of Alaska's, which has comparatively less solar potential than most other States, Germany continues to lead the world in solar installations—with a cumulative 35.7 GWp installed through 2013.[4] In June 2014, for the first time, solar

[4] German Solar Industry Association, "Statistic Data on the German Solar Power (Photovoltaic) Industry" (April 2014), *available at* http://www.solarwirtschaft.de/fileadmin/media/pdf/2013_2_BSW-Solar_fact_sheet_solar_power.pdf

production met over half of Germany's peak demand.[5] The United States, with its far better solar resources, could easily become the world leader.

Although solar is growing quickly, the nation has just begun to tap into its solar resources. Solar's potential to serve the nation is far greater than its remarkable success to date. Solar power transforms the endless, free energy we receive from the sun into electric power to drive commerce, industry and our way of life, at decreasing costs; without air, water or any other emissions; and with minimal environmental impact overall. Solar power plants can provide the nation with enough domestic, fully secure energy to meet the entire country's peak needs, using only a fraction of the solar resources available to us. A forecast published by the U.S. Energy Information Administration (U.S. EIA) projects that through 2040, nearly 40 GW of solar capacity will be installed in this country – approximately three times the currently installed solar capacity, and nearly half of the renewable energy expected to be deployed over the same timeframe.[6] Our nation can – and should – depend on its exceptional solar resources to power its exceptional future.

As solar provides increasing amounts of energy to the country, its costs are decreasing dramatically. As shown in the charts below, PV system prices are generally decreasing in every market segment, year-over-year.[7] Solar deployment is paying great

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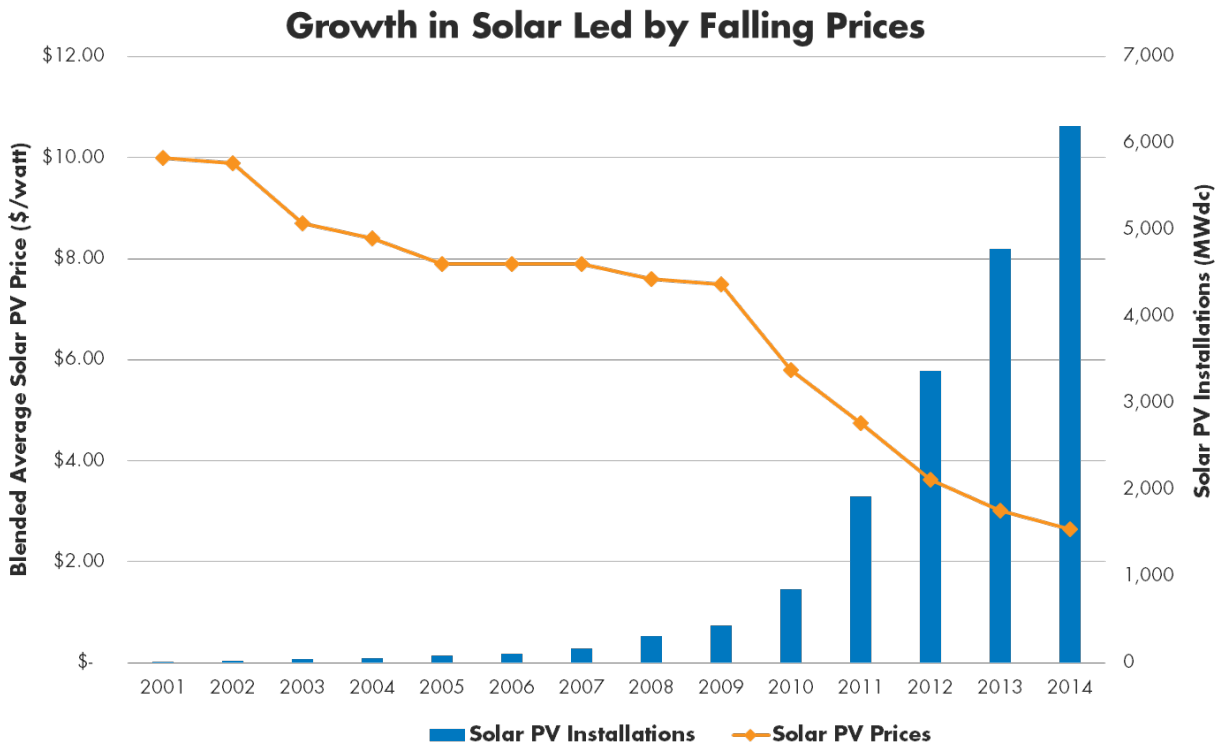
[5] Germany Trade and Invest, "German Solar Breaks Three Records Within Two Weeks" (June 18, 2014), *available at* http://www.gtai.de/GTAI/Navigation/EN/Meta/press,did=1034630.html

[6] U.S. EIA, "EIA Projects Modest Needs for New Electric Generation Capacity" (July 16, 2014), *available at* http://www.eia.gov/todayinenergy/detail.cfm?id=17131 (summarizing U.S. EIA's projection, in its "Annual Energy Outlook 2014," that 39 GWac of the total 83 GWac of renewables in 2040 would come from solar).

[7] SEIA, Solar Data Cheat Sheet

dividends to the American economy and continues to act as catalyst to drive down future costs.



The solar industry relies on an increasing labor force and a host of other domestic industries throughout the country, all of which are sharing in solar's success. With increased solar deployment, both the number of direct and indirect jobs, and companies in solar's supply chain, have grown as well, and now 174,000 Americans owe their jobs to solar.[8]

Solar offers the nation an inexhaustible supply of energy that it can rely on to power the future, while protecting the nation's environment and conservation values. We are grateful for the Subcommittee's support for this emerging, and increasingly important, national asset.

[8] The Solar Foundation National Solar Jobs Census, available at http://www.thesolarfoundation.org/solar-jobs-census/national/.

II. Comments on the Discussion Draft

I would like to focus my testimony and comments on Chapters 2 and 3 of the Discussion Draft. Under Chapter 2, the FERC would be tasked with directing each of the ISO's to review the market rules and practices of the ISO's to look into the proper value differing types of generators provide. Among those are generators that provide service during emergency and severe weather conditions (Sec 4221(b)(2)(B)) and frequency support (Sec 4221(b)(2)(C)).

SGS's storage systems are capable of providing not only backup power for customers with on-site PV systems but also the frequency regulation service for ISO grid functions. SGS fully supports this section of Chapter 2 and we believe it will enhance our ability to offer the types of services we offer to customers in the PJM territory in other areas if other ISOs effectively mirror PJM's market.

Under subsection (b)(4) FERC and the ISO's are directed to promote the equitable integration of advanced grid technologies (SGS's systems are an advanced grid technology) and under subsection (b)(5) to identify and address regulatory barriers to entry.

On that last point the regulatory barriers for new technologies like storage are myriad. Most of the operating practices and regulations for utility grid service never envisioned that advanced technologies like storage could play a valuable role for grid support. Moreover, the concept that these service could come from customer sited facilities is both unique and contrary to the historic utility business model of central generation and 100 percent of electric services provided by the utility. We are constantly encountering regulatory barriers because our technology doesn't fit into any category historically considered a utility service.

First and foremost among the regulatory barriers is that storage is often

characterized as generation even though it is not technically a generation source. Regulatory rules meant to apply to generators are often applied to storage even though it makes little sense. For example, in the frequency regulation markets if an ISO does not consider that storage will hit a depletion point and must be recharged at that point, its rules can accidentally bar participation by storage units even though they can provide the regulation service with certain accommodations. The PJM ISO "balances" its regulation signal so as not to deplete a battery. It means that for all of the discharges over an hour, the regulation signal will be balanced with charge signals so that a battery providing the regulation service will be neither depleted nor overcharged in any hour. An ISO that does not provide a balanced signal has created a barrier to their market for storage technologies.

I would suggest that it might add clarity to the Discussion Draft to specifically mention storage as a technology anywhere "generation" is referenced.

An overarching theme we promote at SGS is that **customer sited storage** should be allowed open access to any and all ISO markets where the storage can provide an equivalent or better service as either another resource or storage connected directly to the utility grid. In most cases, the storage locate at a customer's site can provide the same level of grid service as for example a substation sited storage facility but when the storage is customer located it provides the critical backup power to the customer during grid outages. A substation based storage system does customers little good when the outage is downed lines between the customer and the substation.

Comments on Chapter 3 of the Discussion Draft

My understanding of the purpose of Chapter 3 is to change the gravamen of FERC

order 688 which determined that certain PURPA requirements for qualifying cogeneration facilities and small power production facilities did not apply where those facilities had access to open transmission markets. In Order 688 the FERC created 3 rebuttable presumptions including the following:

"… the Final Rule establishes a rebuttable presumption that QFs with a net capacity no greater than 20 MW, **do not** have nondiscriminatory access to wholesale markets. Unless an electric utility seeking the right to terminate its requirement to purchase small QF power specifically rebuts this small QF presumption, and that electric utility's request is granted by the Commission, a small QF would be eligible to require the electric utility to purchase its electric energy." [emphasis added]

The language in the discussion draft would take away not only the rebuttable aspect of the presumption -- that smaller generators do not have open access -- but would in fact change the presumption to one of equal access to the markets.

Having worked over the past 12 years to develop small solar projects (all less than 20MW) and now small storage projects, my experience has been that the FERC was correct in its ruling and that these scale of projects do not have open access to wholesale markets. In many of the ISO's there are minimum size restrictions that can block smaller systems from any access to ISO markets. High costs to become members of the ISO, the need to have personnel to participate in the functions of the markets, sophisticated computer equipment to interact with the ISO markets as well as the arcane nature of the ISO rules and even discussions are all barriers to small systems having open access.

FERC struck a proper balance in Order 688 making a rebuttable presumption that larger generators had open access to transmission markets but also a rebuttable presumption that smaller systems did not. That balance includes the opportunity for any utility or ISO to

rebut the presumption with a showing at FERC. Most utilities are well versed in FERC practice and procedure and have the ability to present such a rebuttal if the facts of the situation support the presumption. FERC staff have described the pre-PURPA world in this way: utilities were not generally willing to purchase non-utility output or were not willing to pay an appropriate rate for that output. For SGS and many small generator developers in many jurisdictions, that description of the past sounds very much like the present.

I would urge the subcommittee not to upset the balance of FERC Order 688 and to maintain the rebuttable presumptions regarding access to open transmission markets before jettisoning the protections for small generators available in PURPA Section 210.

III. Conclusion

Thank you once again for inviting Solar Grid Storage to submit this testimony. SGS is grateful for the opportunity to share insights into our business model and our struggles and successes in the utility business. We look forward to working with the Subcommittee to establish the long-term, stable policies needed to make the most of storage as an advanced grid technology and to provide the backup power and resiliency to customers that comes with adding storage to their distributed wind or solar systems. We look forward to participating in the delivery of DG benefits to the nation in the form of large quantities of cost-effective, clean and sustainable power, growing numbers of jobs throughout the country, and outstanding economic opportunity.