

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Implementation of Section 224 of the Act

A National Broadband Plan for Our Future

WC Docket No. 07-245

GN Docket No. 09-51

COMMENTS OF PETRA SOLAR, INC.

Petra Solar, Inc. herein responds to the Commission’s Further Notice of Proposed Rulemaking in the above-referenced proceedings.¹ Petra Solar is a clean energy technology company that provides integrated solar and Smart Grid solutions for utility, commercial and residential applications. As the Commission considers new pole attachment rules, Petra Solar writes to inform the Commission about the impact of the pole attachment regime in areas beyond broadband infrastructure.

For Petra Solar, the pole attachment rules have become tightly tied to other national concerns recognized by Congress and discussed in the National Broadband Plan² (the “Broadband Plan”): the Smart Grid³ and the conversion of telecommunication carriers and

¹ Implementation of Section 224 of the Act and A National Broadband Plan for Our Future, Order and Further Notice of Proposed Rulemaking, WC Docket No. 07-245, GN Docket No. 09-51 (rel. May 20, 2010) (the “*Further Notice*”).

² Omnibus Broadband Initiative, Federal Communications Commission, Connecting America: The National Broadband Plan (2010), *available at* <http://download.broadband.gov/plan/national-broadband-plan.pdf> (the “Broadband Plan”).

³ The National Institute of Standards and Technology defines the Smart Grid as the “two-way flow of electricity and information to create an automated, widely distributed energy delivery network.” *See* Broadband Plan, Chapter 12, Section 12.1 n.4.

utilities to sustainable energy sources. As the Broadband Plan recognized, telecommunications and broadband infrastructure will play important roles in achieving these national goals.⁴

Petra Solar's Innovative Solution to Green Energy and the Smart Grid

The vision articulated by the Broadband Plan is a modern grid that enables energy efficiency, that reduces the dependence on fossil fuels and foreign oil through the widespread use of renewable power, and that makes the energy system more resilient from natural disasters and terrorist attacks by intelligently detecting problems and re-routing power around localized outages.⁵ Petra Solar is making each of these goals reality.

Petra Solar has directly addressed these national energy and environmental priorities by marrying green technology and Smart Grid technology in a single device. Petra's SunWave UP Series (the "SunWave") is a Smart Grid-interactive solar power generator that feeds green energy directly into the power grid while monitoring power levels and using wireless communication to report problems to the utility in real time. The devices can be mounted just about anywhere – on buildings, on homes, and, as relevant to this proceeding, on utility poles. When the devices are deployed in large numbers throughout a region, as is happening today in New Jersey, they create a "virtual distributed power plant" that enables a utility to generate significant amounts of power through a geographically-widespread system installed onto existing infrastructure.

The product itself combines a solar panel with Smart Grid technology, including a wireless communications device, and is mounted directly to a utility pole. The final device is just the size of a solar panel alone, as pictured below.

⁴ Broadband Plan, Chapter 12, Introduction.

⁵ See Broadband Plan, Chapter 12, Section 12.1.



Each SunWave device is a self-contained energy generation system: the solar panels generate AC power, which they deliver directly into the grid. Each device monitors, in real time, the voltage and current at the pole. The can alert utilities about impending circuit overloads, power outages, and other problems. In addition the device has the capability to change inject reactive power into the grid under command from the utility. Greater grid efficiency is achieved through this dynamic reactive power as well energy generation close to the load rather than through long transmission lines..

In New Jersey, the state's largest utility, PSE&G, signed a \$200 million contract with Petra Solar to install the smart solar panels on 200,000 poles in the state's six largest cities and in 300 rural and suburban communities.⁶ The panels will generate 40 megawatts of power – enough to power 6,000 homes for a year. The SunWave system is an extraordinarily practical solution, as it requires only that a small device be installed onto existing infrastructure to create

⁶ Petra Solar's \$200 Million Contract With PSE&G Will Result In Largest Pole-Attached Solar Installation In World, Press Release, (Jul. 29, 2009) *available at* <http://www.petrasolar.com/petra-solar-news-and-events-news-07292009.php>.

this power. By comparison, it would require a solar farm of about 100 acres to generate the same amount of solar power.

In addition to taking very little space and requiring no changes to existing infrastructure or land-use, the SunWave is also extraordinarily fast to deploy. Petra Solar does not have to wait to build a new plant or solar farm to begin generating power. Indeed, Petra began shipping product within a month of signing the contract in New Jersey. Once the product has arrived, it takes a utility crew only 30 minutes to install the device onto a utility pole. Each SunWave device can be immediately linked into the grid and contribute to the power supply chain. But beyond being an efficient and effective power generator, a system of SunWave devices creates a Smart Grid solution for the purchasing utility or telecommunications carrier. The devices therefore enable utilities to address their increasing needs for more localized information about and control over the grid to the benefit of consumers and the nation's energy needs. In the case where the customer is a telecommunication carrier, it reduces their power consumption expenses and allows them to monitor the status of power being delivered to their facilities and the status of their power distribution network.

As the Broadband Plan recognized, the Smart Grid is a national priority because it will increase the reliability of the electric grid, more efficiently integrate renewable energy generation into the grid, and support the widespread adoption of electric vehicles.

First, a functioning Smart Grid can help prevent power blackouts by allowing grid operators to detect, prevent and recover from faults before a blackout occurs. Power outages cost the nation up to \$164 billion per year,⁷ in part because utilities do not have information at the individual street level about where problems in the grid occur, leading to costly investigation

⁷ See Broadband Plan, Chapter 12, Section 12.1.

and delayed repairs. Because the SunWave device provides information about the status of power at the pole itself, it enables fast fixes by providing network operators with pinpoint-accurate information about a problem's location.

Second, the Smart Grid creates new opportunities for energy conservation. For example, when the SunWave is installed on utility poles, the communications function enables the utility to control street lights at each individual pole, with implications for energy conservation, customer service and public safety. The utility can turn off one of every two street lights from the hours of midnight to 6 a.m. and save a tremendous amount of energy that would otherwise unnecessarily be used. And the utility can change which lights are turned off on any given night, ensuring no one area is always dark during those hours. These strategies minimize maintenance costs, as well, by extending bulb life and avoiding unnecessary bulb replacements. The SunWave device would even inform the utility when a street light burned out at a particular pole, enabling a speedy replacement.

Third, Smart Grid functionality will be essential if the nation is to become a leader in the transition to electric transportation, as this functionality will be necessary to maintaining the stability and reliability of the grid. Without a Smart Grid, widespread adoption of electric vehicles would either overload the grid or require massive investment in new infrastructure and power plants. This will be very similar to the advent of air conditioning when more and more homes in neighborhoods began consuming more and more power, and the existing grid infrastructure became insufficient. Likewise in the near future, should thousands of consumers begin plugging in electric cars at a time of high energy use, the existing grid would be

overloaded.⁸ The SunWave, however, addresses this problem in two ways: first, by providing utilities with the information about where circuits are approaching the point of overload, and second, by generating additional power closer to where it is needed, thereby reducing the stress upon the utility's central generation system and transport facilities.

Finally, the manufacturing and installation of SunWave devices is creating new jobs for U.S. workers. Petra Solar's business model is to fulfill contracts through local assembly and deliveries, thus creating local jobs. In the New Jersey project, Petra itself created over 130 well-paying jobs in engineering, marketing and manufacturing. Likewise, the utilities created about fifty new jobs for utility installation workers to install the SunWave devices onto poles. And the project rippled further into the local economy by using other local resources, from raw materials to delivery workers. As Petra Solar expands into more markets, it will duplicate this local sourcing effort in each new market, bringing new jobs and investment to additional communities.

Implications for the Pole Attachment Proceeding

Petra Solar's SunWave solution has already been embraced by utilities and communications providers. AT&T, for example, is partnering with Petra Solar in New Jersey, where Petra Solar is providing New Jersey's largest utility, PSE&G, with SunWave solar systems that will be installed on up to 200,000 poles. As a result of the partnership between Petra Solar and AT&T, these devices will communicate using the AT&T wireless network.⁹

⁸ See, e.g., Broadband Plan, Chapter 12, Box 12-2 (describing a 2008 study explaining that while California's grid has sufficient spare capacity of more than 10 million plug-in electric hybrid vehicles at night, but plugging in the same vehicles at the end of the workday would require 10 gigawatts of new capacity).

⁹ AT&T And Petra Solar Team To Offer Smart Grid Solar System Technology, Press Release (July 20, 2010) available at <http://www.petrasolar.com/petra-solar-news-and-events-news-07202010.php>.

Despite the benefits offered by Petra Solar’s SunWave technology, some ILECs have been reluctant to allow Petra Solar to attach its equipment to their poles. Such resistance can unnecessarily delay the deployment of Petra Solar’s integrated solar and Smart Grid solutions, delaying, in turn, the societal benefits of its green technology. To reduce the likelihood of such delays, Petra Solar asks that as the Commission considers how “to improve access to essential infrastructure”¹⁰ through improvements to its pole attachment rules, it confirm that carriers are entitled to nondiscriminatory access to poles when deploying equipment like Petra Solar’s. Section 224 is clear on this point: it provides that “[a] utility [which is defined to include ILECs¹¹] shall provide a cable television system or any telecommunications carrier with nondiscriminatory access to any pole, duct, conduit, or right-of-way owned or controlled by it.”¹² But while the statute is clear, Commission guidance is nonetheless valuable to prevent claims by ILECs and other utilities that carriers deploying Petra Solar’s technology are somehow not entitled to Section 224 access.

Confirming the applicability of Section 224 when carriers deploy Petra Solar’s technology will also encourage the continued development and deployment of innovative new technologies like the SunWave. Just as Petra Solar has pioneered integrated solar, Smart Grid and communications technology, other innovators should be encouraged to develop new technologies like the SunWave that can combine multiple functions in a single piece of pole-mounted equipment. In addition to increasing the adoption of Smart Grid and solar technology, and adding intelligence, solar power supply, and communications capabilities to pole mounted

¹⁰ *Further Notice* at ¶ 19.

¹¹ 47 U.S.C. § 224(a)(1).

¹² 47 U.S.C. § 224(f)(1).

devices, integrated devices like the SunWave can reduce the number of attachments on a pole, reducing the need for multiple attachments and simplifying pole and attachment maintenance.

Confirming the applicability of Section 224 to carriers deploying Petra Solar's equipment will not impair safety or reliability of the nation's electric plant, as Section 224 expressly allows "a utility providing electric service" to deny access "on a non-discriminatory basis where there is insufficient capacity and for reasons of safety, reliability and generally applicable engineering purposes."¹³ Moreover, Petra Solar's equipment is certified by an independent agency against the applicable standards for safety such as UL1741 and the National Electric Safety Code. Experience in the field, where Petra Solar's equipment has been deployed successfully by PSE&G and other utilities, confirms that the SunWave does not harm safety or reliability.

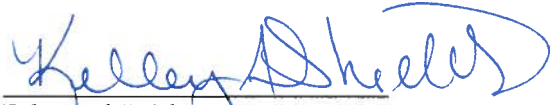
Finally, Petra Solar requests that the Commission clarify that so long as the devices are compliant with applicable safety requirements, that they may be placed in the common zone, and the communication workers safety zone ("CWSZ") of the pole to allow for the maximum placement on existing infrastructure. Such placement permits the solar panels to receive full access to sunlight, while allowing workers to access the telephone and utility lines.

CONCLUSION

Petra Solar's SunWave demonstrates just how technology can offer practical, economical solutions to critical national problems. The Commission should ensure that its pole access regime encourages deployment of technology capable of integrating communications, Smart Grid, and green energy functions by confirming that carriers deploying such technology benefit from Section 224's statutory guarantee of nondiscriminatory pole access.

¹³ 47 U.S.C. § 224(f)(2).

Respectfully submitted,



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