

The Legal Barriers To Off-Grid Solar Photovoltaic Systems

Law360, New York (May 5, 2016, 1:17 PM ET) --

Technological feasibility and economic viability of solar plus battery off-grid systems has been improving and those in the energy business are asking what the future of the grid will look like if consumers are able to become wholly self-reliant. If off-grid systems become less expensive than grid connection, will consumers disconnect? Will remaining utility customers be able to afford the upkeep of a less-utilized grid?[1]

Many consumers in Hawaii are already better off disconnecting and California consumers may be at that point in the next few years.[2] Analysts and public utilities commissions have struggled to predict whether a “utility death spiral” will occur due to these technological advances.[3] However, technological innovation is only part of the equation. Another critical factor is whether solar plus battery off-grid systems are legal. This analysis is critical because of the vast sums of money being spent in research and development in this field. Since California is the state with the most solar photovoltaic (PV) systems, by far, this article examines California law for single-family residences.[4]

Under current law, residential solar PV systems in California must meet: (1) the requirements of Title 24 of the California Code of Regulations including, but not limited to, the California Electrical Code; (2) applicable health and safety standards and requirements of state and local permitting authorities; (3) any applicable rules of the California Public Utilities Commission regarding safety and reliability; and (4) the safety and performance standards of the Institute of Electrical and Electronics Engineers, and accredited testing laboratories, such as Underwriters Laboratories.[5]

In an earlier article, this author found that most, but not all, barriers to solar plus battery off-grid systems have been removed from the Title 24 regulations. However, Title 24’s Energy Code does not allow such systems without back-up generation.[6] With only one remaining obstacle in Title 24, the industry should consider whether there are barriers in the other prongs of the Government Code test that need to be cleared away in order for off-grid systems to be legally viable on a larger scale.

Discussion

State and Local Permitting Authorities May Not Introduce Barriers To Installation of Solar PV Systems

Pursuant to California’s AB 2188, adopted on Sept. 21, 2014, the state government required local governments to enact ordinances, by Sept. 30, 2015, regarding the installation of solar PV systems.[7]



Molly L. Zohn

California law prohibits local agencies from adopting ordinances that create unreasonable barriers to the installation of solar energy systems.[8] Instead, local regulations must be tailored to specific adverse impacts on public health or safety and permitting authorities may only review permit applications to determine whether they meet all health and safety requirements of local, state and federal law.[9]

Each local government is required to have a checklist of requirements for solar PV systems that would substantially follow the checklists and standard plans in the California Solar Permitting Guidebook adopted by the Governor's Office of Planning and Research.[10] When a local government denies a solar PV permit, it must make a written finding, based on substantial evidence, that the proposed installation would have a "specific, adverse impact upon [] public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific adverse impact." [11]

The California Solar Permitting Guidebook states that if the system is not utility interactive, it may go through the standard process, not the expedited process.[12] Thus, the Guidebook contemplates that off-grid solar PV systems should, in general, be eligible for permits.

Regulations Regarding Safety and Reliability Could Impact Off-Grid Systems

As stated, solar PV systems must meet applicable rules of the CPUC regarding safety and reliability. However, there are no CPUC regulations that specifically pertain to the safety or reliability of off-grid residential solar PV systems because such systems are likely outside the jurisdiction of the CPUC.[13] While this indicates an update to the California Government Code is necessary, any update would likely include a reliability requirement similar to that required of utilities. Utility reliability consists of three parts: (1) electrical generation, (2) long-distance transmission, and (3) local distribution.[14]

With respect to electrical generation, CPUC regulations require load serving entities to maintain adequate resources to meet demand.[15] However, customer generation located on a customer's site does not render the customer a load serving entity if the customer is not physically interconnected to the electrical transmission or distribution grid.[16] Ultimately, this author believes it is likely that California state law will adopt the standards for reliability of the North American Electric Reliability Corporation (NERC), in particular, the one day in 10-year loss of load expectation in the development of resource adequacy for off-grid systems.[17] The one day in 10-year rule is also regarded as the industry standard.[18]

Although the technology for battery storage is improving, it is unclear if such systems can, economically, meet this standard for very many customers at this time, or even in the next several years. That said, the state may be able to adopt a less stringent standard while still achieving comparable reliability to utility-based services. This is because the utilities face distribution and transmission challenges that an off-grid system would not. While off-grid systems face other challenges, these may affect reliability less than the distribution and transmission issues faced by utilities.

If one were to balance the three components of reliability, off-grid systems may be just as reliable as utility-dependent systems with generation requirements that are less stringent than the NERC standard. From a legal standpoint, since the reliability standard has not yet been set, it could be a barrier to a pure solar plus battery system. Until there is a clear standard, off-grid systems should be designed to either include, or be capable of easily including, a generator.

Safety and Performance Standards are Not a Barrier

The Institute of Electrical and Electronics Engineers has standards for photovoltaic systems, including stand-alone systems which include, but are not limited to, the following:

- IEEE 937: IEEE recommended practice for installation and maintenance of lead-acid batteries for photovoltaic systems;
- IEEE 1013: IEEE recommended practice for sizing lead-acid batteries for stand-alone photovoltaic systems;
- IEEE 1361: IEEE guide for selection, charging, test and evaluation of lead-acid batteries used in stand-alone photovoltaic systems; and
- IEEE 1526: recommended practice for testing the performance of stand-alone photovoltaic systems.[19]

Likewise, Underwriters Laboratories has developed standards for grid-connected and stand-alone systems such as, but not limited to:

- UL 1741: standard for inverters, converters, controllers and interconnection system equipment for use With distributed energy resources;[20] and
- UL 9540: outline of investigation for energy storage systems and equipment.[21]

Since the Institute of Electrical and Electronics Engineers and Underwriters Laboratories have developed standards, there is no legal barrier posed by the lack of a standard. Off-grid inverters and other equipment are available commercially.

Conclusion

Neither local permitting requirements nor standards certification requirements pose significant legal barriers when it comes to solar plus battery off-grid systems. However, the requirements for reliability have not yet been developed and the Government Code needs to be updated to provide a standard. Because of the unpredictability of the weather and other factors, it seems unlikely that solar plus battery systems, without grid connection or back-up generators, would meet a reliability standard comparable to that imposed on utilities. As such, systems should be deployed that are either grid-connected or use a back-up generator. Notably, this is the same result that Title 24's Energy Code requires.

—By Molly L. Zohn, Klinedinst PC

Molly Zohn is counsel in Klinedinst's San Diego office. She advises clients with respect to energy, environmental, regulatory compliance, and transactional matters and is chairwoman of the firm's energy and natural resources group.

The opinions expressed are those of the author(s) and do not necessarily reflect the views of the firm, its clients, or Portfolio Media Inc., or any of its or their respective affiliates. This article is for general information purposes and is not intended to be and should not be taken as legal advice.

[1] See Peter Kind, Disruptive Challenges: Financial Implications and Strategic Responses to Changing Retail Electric Business, EDISON ELECTRIC INSTITUTE, January 2013.

[2] Rocky Mountain Institute, Homer Energy, and Cohreznick Think Energy, The Economics of Grid Defection, The Rocky Mountain Institute, February 2014, at 37.

[3] William Pentland, Disruption Detailed: The Utility Death Spiral Myth, Forbes/Energy, Nov. 25, 2015, at <http://www.forbes.com/sites/williampentland/2015/11/25/disruption-derailed-the-utility-death-spiral-myth/>; William Pentland, Why the Utility 'Death Spiral' is Dead Wrong, Forbes/Energy, April 6, 2014, at <http://www.forbes.com/sites/williampentland/2014/04/06/why-the-utility-death-spiral-is-dead-wrong/>; California Public Utilities Commission Policy & Planning Division, Electric Utility Business and Regulatory Models, June 8, 2015.

[4] See Solar Energy Industries Association, Solar Industry Data: Solar Industry Breaks 20 GW Barrier – Grows 34% Over 2013, at <http://www.seia.org/research-resources/solar-industry-data> as of Dec. 14, 2015.

[5] Cal. Gov't. Code § 65850.5(f) (Deering 2016). There may be other areas of law that could affect whether, in a particular situation, an off-grid system would be legal. For example, California Civil Code section 1940.9 presumes that the tenant's dwelling has an electric meter and California Civil Code section 1941.1(a)(4)(5) provides that a dwelling is untenable if it does not have heating facilities and electrical lighting that conformed with applicable law at the time of their installation and are well functioning. Such issues are beyond the scope of this article, however.

[6] Molly L. Zohn, How Title 24 is Keeping California Connected to the Grid, Law360 (February 2016)

[7] 2014 Cal. Assem. Bill 2188(3) (Expedited Solar Permitting Act); Cal. Gov. Code § 65850.5(g)(1) (Deering 2016); Cal. Health & Safety Code § 17959.1 (Deering 2016).

[8] Cal. Gov. Code § 65850.5(a) (Deering 2016).

[9] Id. at § 65850.5(b).

[10] Id. at § 65850.5(g)(1)-(2).

[11] Id. at § 65850.5(c).

[12] Solar Permitting Task Force, Governor's Office of Planning and Research, California Solar Permitting Guidebook: Improving Permit Review and Approval for Small Solar Systems 12 (Spring 2015).

[13] Cal. Constitution, Art. 12, § 3.

[14] See San Diego Gas and Electric Company's Divestiture of Electric Generating Assets: Environmental Review, Chapter 4.12 Utilities and Service Systems at <http://www.cpuc.ca.gov/Environment/info/esa/divest-sdge/chapters/04-12utl.htm>.

[15] Cal. Pub. Util. Code § 380 (Deering 2016).

[16] Id. at § 380(k)(3)(B).

[17] North American Electric Reliability Corporation, Standard BAL-502-RFA-02.

[18] See San Diego Gas and Electric Company's Divestiture of Electric Generating Assets: Environmental Review, Chapter 4.12 Utilities and Service Systems at <http://www.cpuc.ca.gov/Environment/info/esa/divest-sdge/chapters/04-12utl.htm>.

[19] Institute of Electrical and Electronics Engineers Standards Association, Standards at <http://standards.ieee.org/>; see also Solar America Board for Codes and Standards, <http://www.solarabcs.org/codes-standards/IEEE/index.html>.

[20] Underwriters Laboratories, Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741, at http://ulstandards.ul.com/standard/?id=1741_2

[21] Underwriters Laboratories, Outline of Investigation for Energy Storage Systems and Equipment, UL 9540, at <http://ulstandards.ul.com/standard/?id=9540&edition=1&doctype=outline>.

All Content © 2003-2016, Portfolio Media, Inc.