Peninsula Advanced Energy Community (PAEC)

Task 2.10: Final Report on Policy Recommendations and Guidelines for Permitting Energy Storage

Prepared for
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Table of Contents

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Sovereign Energy Storage

Sovereign Energy provides utilities with intelligent and cost effective solutions for integrating renewables, improving system reliability and power quality, and lowering operating costs. Our success will accelerate the adoption and penetration of renewable energy, while modernizing and improving the stability of the grid.

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Clean Coalition

The Clean Coalition is a nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise.

The Clean Coalition drives policy innovation to remove barriers to procurement and interconnection of distributed energy resources (DER)—such as local renewables, advanced inverters, demand response, and energy storage—and we establish market mechanisms that realize the full potential of integrating these solutions. The Clean Coalition also collaborates with utilities and municipalities to create near-term deployment opportunities that prove the technical and financial viability of local renewables and other DER.

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I. Introduction

Sovereign Energy has discussed the distributed energy storage development process with multiple stakeholders across the development value chain manufacturers, integrators, developers, and project financiers.

In this section, we will provide an overview of the outcome from these discussions of permitting experiences with participants across the energy storage value chain. Additionally, we will provide an overview of a synthesized set of recommendations for improving the permitting process. These recommendations are largely based on progress which has been made in California for installing small PV systems.[1]

[1] California Solar Permitting Guidebook 2015, http://energycenter.org/permitting/guidebook

II. Experiences Permitting Permitting Energy Storage in California

Below is a summary of the discussions of permitting experiences with participants across the energy storage value chain.

a. Summary Points

1. Permitting is not a major problem constraining energy storage project developers in California.
2. A standardized permitting process across California county and municipal agencies would decrease the time required for permitting activities for both project developers and agency staff. The permitting process should be based on residential and small commercial PV permitting.
3. The best practice for fire safety and permitting is outlined in the recently released DNV GL study for New York City.

b. Small Project Development in California

The majority of projects installed to date in California are small projects (below 100 kW) installed by Stem, Tesla, Greencharge Networks, Gexpro, and Sharp. These vendors and developers describe a similar process across the state when permitting energy storage projects:

1. Submission of engineered drawings, site plans, and single line drawings to the planning department along with permit fees and administration fees.
2. Questions via phone and/or email from the permitting agency 1 day to 2 weeks after initial submission.
3. Two – eight week waiting period, with sporadic information requests.
4. Delivery of building permit.
5. Post construction, site inspection by either planning department or fire department or both.

In general, developers have described this process as relatively straightforward and do not complain that the permitting process is a major constraint, however they do unanimously suggest that there is room for improvement. The first issue developers run into is that processes across municipalities and counties are not standardized, so a call or meeting is required with each planning department prior to construction of every project. Since developers often have projects across the State (not centralized in one city or county), developers needs to learn a new process for every project they plan to construct. As a secondary issue, there is generally a time lag in receiving a permit caused by each permitting agency developing its own interpretation as to where in the building code distributed storage systems fit. This discretion at the municipal or county level causes

deviations in the process, however, the vast majority of permitting agencies put this in the same classification as commercial Uninterruptible Power Source systems, which have often been permitted many times in each jurisdiction.

Developers of distributed energy storage systems unanimously believe that a formal standardized process would be advantageous to streamline the development process. This process should be modeled after the solar photovoltaic process, with a standardized list of required documents, and where possible, an over-the-counter approval.

c. NGK Participation in PG&E's Vaca Dixon Energy Storage Project

In an extreme case, NGK (a Japanese manufacturer of sodium-sulfur batteries) was in late stage negotiation of a battery contract with S&C Electric for PG&E's Vaca Dixon battery project in Vacaville, Solano County, California, when a NGK installation in Japan had a catastrophic malfunction and caught fire. NGK had developed a protocol with the Japanese fire authorities and got the fire under control successfully. In turn, NGK representatives walked the local Vacaville fire authorities through what happened in Japan, and associated actions by the local fire authorities there which brought the fire under control. NGK was able to use their experience in Japan to convey their fire protection protocols to the Vacaville and Solano County fire, who granted permission for the battery project.

d. Manufacturer Participation in DNV GL – Consolidated Edison Study

Manufacturers take a supporting role during the permitting process. Their primary responsibility is to support the developer with information requests regarding hazards associated with catastrophic malfunctioning of their technology.

Between 2015 and 2016, multiple lithium-ion battery manufacturers were required to work closely with the New York City Department of Buildings (NYDOB) and the New York City Fire Department (NYFD) to get their individual company product and type of battery chemistry approved for installation inside of buildings in NYC. DNV GL partnered with the NYDOB and NYFD to publish an extensive report on the results of the study. An excerpt from the report:

"The main conclusion from the program is that installation of battery systems into buildings introduces risks, though these are manageable within existing building codes and firefighting methods when appropriate conditions are met. This statement comes with caveats. There is a need to clarify a universal finding in this program: in the case of heating by fire or thermal abuse all batteries tested emitted toxic gases. It should also be noted that the average emissions rates of equivalent masses of plastics exceed those of batteries. Every battery tested emitted toxic gases (Table 3 on page 29); however, this can be expected from most fires. The toxicity of the battery fires was found to be mitigated with ventilation rates common to many

occupied spaces. While it was found that all batteries tested emitted toxic fumes, the toxicity is similar to a plastics fire and therefore a precedent exists. The batteries exhibited complex fire behaviors that led to abundant water use; however, it was found that the extinguishing requirements for batteries need not be excessive if an intelligent, system-level approach is taken that includes external fire ratings, permits direct water contact, and implements internal cascading protections. The general outcome of the work is that fire safety considerations are applicable to all the batteries tested in this program, even though vanadium redox and lead acid electrolytes were not observed to be flammable. The data presented in this report supports these findings"

The result of the report included a section with recommendations to project developers in their interactions with Fire Departments and AHJs (page 57):

"DNV GL surveyed several handbooks for fire departments in large cities across the country and found a universal theme in fire fighter training concerning extinguishing. Fire fighters are trained to achieve the following objectives when arriving at the scene:

- *Objective 1: Remove endangered person(s) and treat the injured.*
- *Objective 2: Stabilize the incident and provide for life safety.*
- *Objective 3: Provide for the safety, accountability, and welfare of personnel (this priority is ongoing throughout the incident).*
- *Objective 4: Protect the environment.*
- *Objective 5: Property conservation.*

Note that Objective 5 is often the primary concern of the property owner. It is on the priority list of the first responder, but safety of life at the scene takes precedence. The following recommendations for emergency response specific to batteries refer to these objectives. These are based on the UPS battery system precedent that already exists in New York City.

- *Battery systems should be described in the Building Information Card (BIC) (see example, Figure 33). This greatly aids in first responders meeting Objective 2.*
- *A building should have an assigned liaison who works with FDNY to update emergency response plans. This liaison may be the same as the certificate of fitness (COF) holder for the battery system, or may be a different individual. This Liaison should be listed in the BIC. This aids first responders in meeting Objectives 2 and 3, and also protects the property owner's interest relating to Objective 5.*
- *Battery systems should have a COF similar to what is required for UPS systems. Again, this aids in Objectives 2, 3 and 5.*
- *The recommendations for monitoring and system health display are consistent for codes for uninterruptible power supplies. The method of system health display and monitoring should be proposed by the system integrator or project owner."*

This case illustrates a best practice in partnership across technology providers, developers, independent testing labs, utilities, and government organizations to collaboratively create

solutions to move through permitting issues. It is expected that the NYDOB will soon use the study results to formally approve the installation of energy storage systems in the Borough of Manhattan which will certainly move the market forward.

III. Suggestions and Recommendations for Improving the Permitting Process

Below is a synthesized set of recommendations for improving the permitting process. These recommendations are largely based on progress which has been made in California for installing small PV systems.

a. Policy Recommendations

1. Develop a central online repository of knowledge on permitting requirements that can be accessed by all stakeholders of the permitting process. The guidelines should be created through a stakeholder process including municipalities, counties, utilities, developers, electrical contractors, and technology providers. The guidelines should be used for reference by municipalities new to energy storage permitting, and by first time installers. The California Center for Sustainable Energy (CSE) has an excellent guidebook for distributed generation PV which could be used as a model for this.
2. Work with stakeholders and the California Energy Commission (CEC) to develop policy around an expedited permitting process. California Assembly Bill 2188 requires cities and counties to adopt an expedited permitting process. A similar process should be possible for storage installations, since the installations themselves are highly modular and there are limited variations across technology and installation.

b. Local Permitting Agency Recommendations

1. Standardize requirements across jurisdictions by using common permitting materials, such as checklists and standard plans, across city and county lines. This will reduce errors from installers participating across regions.
2. Standardize forms across jurisdictions to limit mistakes by installers filling out forms, and also allow for ease of review by city planning and other permitting officials.
3. Provide clear written instructions on the permitting process either on a central repository of permitting guidelines, or on individual city planning websites.
4. Host installer training events to train electrical contractors on standards, forms, and guidelines associated with applying for a permit in a specific jurisdiction.

c. Streamlined Permitting Process Recommendations Based on Existing Small PV Process

1. Use of a simple eligibility checklist to determine whether projects qualify for expedited permitting and requisite written materials.
2. Use of a standard plan to describe the proposed solar PV project in the permit application; a standard plan reduces applicant errors and can simplify review.
3. Permit application materials are made available through the Internet.
4. Application submittals, fee payment, signatures and permit issuance are completed electronically, where capability exists.
5. For eligible projects, plan review and permit issuance are completed "over-the-counter" for walk-in applications or electronic submittals, or automatically through online software. If over-the-counter approval is not offered, a maximum timeframe of 3 days to review the permit application is provided.

d. Streamlined Inspection Process Recommendations Based on Existing Small PV Process

1. A single, final inspection coordinated among the various agencies or for inspections by multiple agencies to occur at the same time. Typically, this involves coordination between the building department and the local fire authority.
2. Use of a concise inspection list that provides permit applicants a clear understanding of what elements of the installation will be inspected before final approval.
3. Enable inspection requests to be submitted online or electronically.
4. Provide for on-site inspection during the next business day after notification that the solar system has been installed. If next business day is not possible, schedule inspection within three business days.
5. Provide a scheduling time window for on-site inspection of no more than two hours, and utilize phone and/or email communication to provide information on anticipated inspection time.

IV. Conclusion & Next Steps

The energy storage industry has many lessons to learn in achieving streamlined permitting from the rooftop solar photovoltaic industry. Business, non-profit advocacy, and policy leaders should interview leaders of the California PV industry to better understand their process to achieve streamlined and standardized permitting regimes throughout the state. A standardized permitting process across California county and municipal agencies would decrease the time required for permitting activities for both project developers and agency staff. The permitting process should be based on residential and small commercial PV permitting.The industry, working through non-profits, can also work to create standardized documentation and processes for local building and planning departments.

Creating a 'behind the meter energy storage permitting tool kit' will save local jurisdictions time and allow them to implement streamlined processes more rapidly.

V. Further Resources

Below are resources provided by the Center for Sustainable Energy for solar photovoltaic permitting. The below resources can be utilized as a rhubric for the development of streamliend energy storage permitting and inspection processes:

1. 2017 California Solar Permitting Guidebook: http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/Solar_Permitting_Guidebook_2017.pdf
    - Relevant Sections:
        - 1) Submittal Requirements Bulletin— Solar Photovoltaic Installations 10 kW or Less
        - 2) Eligibility Checklist for Expedited Solar Photovoltaic Permitting
        - 3) Solar PV Standard Plan — Simplified Central/String Inverter Systems
        - 4) Solar PV Standard Plan — Simplified Microinverter and ACM Systems
        - 5) Structural Criteria for Residential Rooftop Solar Energy Installations
        - 6) MOU Regarding Solar Photovoltaic Plan Review and Inspection Services
        - 7) Inspection Guide for PV Systems

2. Online Workshops & Webinars: https://energycenter.org/permitting/guidebook/workshops

    - Resources for Building Official and Permitting Staff