Final Report

DOE Award Number: DE-EE0005696

Recipient: California Center for Sustainable Energy

Project Title: Streamlining Solar Standards and Process: Southern California Rooftop Challenge

Principal Investigator: Tim Treadwell

Date of Report: September 28, 2013

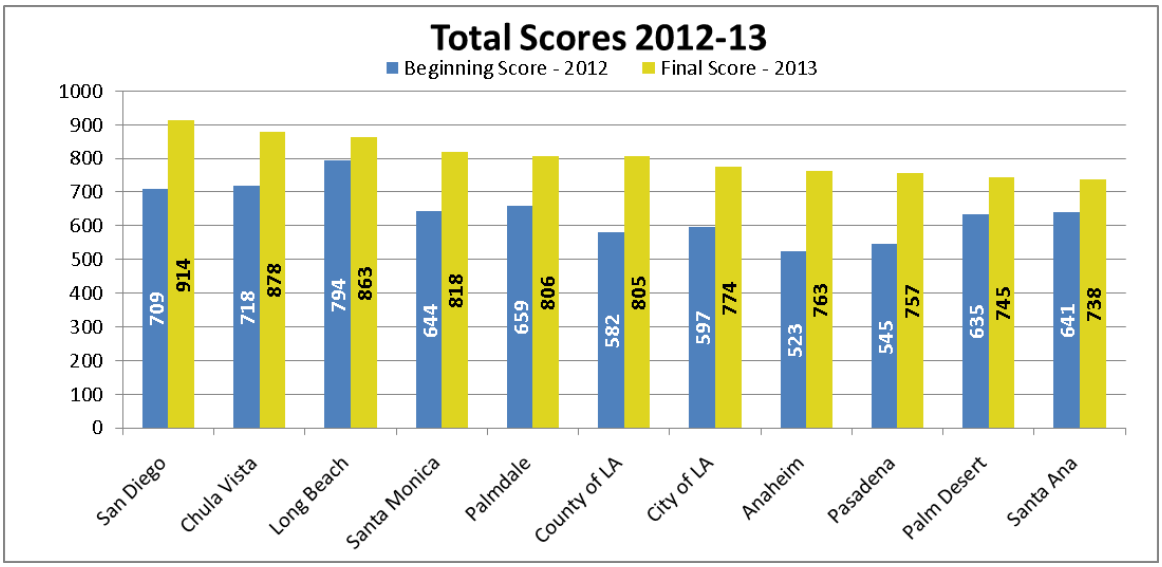
Abstract

The Southern California Rooftop Solar Challenge (RSC) supported the goals of the Department of Energy (DOE) Solar Energy Technologies Program and the SunShot Initiative, which seeks to make solar electricity cost competitive without subsidies by the end of the decade by reducing balance of system costs for Photovoltaics (PV). In order to achieve market transformation, the California Center for Sustainable Energy (CCSE) led a regional Southern California team that focused on expanding financing options for residential and commercial customers, streamlining permitting and interconnection processes, and standardizing net metering and interconnection standards across investor- and municipally-owned utilities in the region. These goals were achieved by fostering cross jurisdictional collaboration culminating in the development of a set of regional best practices. In subsequent phases of the project, the team will build on these best practices and integrate the lessons learned in Southern California with other successful Rooftop Solar Challenge teams in California and beyond.

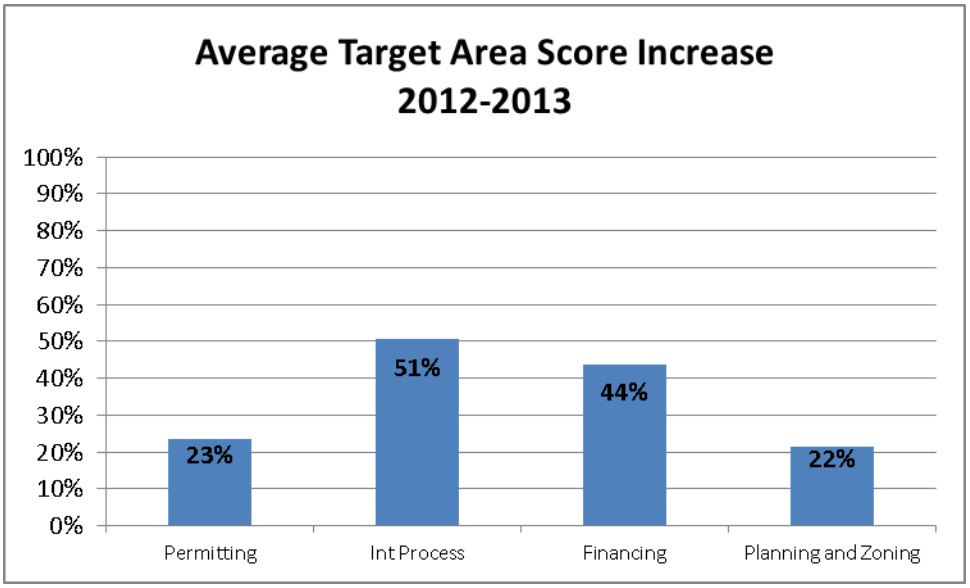
Project Team

Jurisdictions	Utilities	Supporting Partners
• Anaheim • City of Los Angeles • County of Los Angeles • Chula Vista • Long Beach • Palmdale • Palm Desert • Pasadena • San Diego • Santa Ana • Santa Monica	• Anaheim • Los Angeles Department of Water and Power • Pasadena Water and Power • San Diego Gas and Electric • Southern California Edison	• Energy Policy Initiatives Center (EPIC) at University of San Diego • Calbo (California Association of Building Officials) • Energy Solutions

Solar Market Maturity Model (SM^3) Improvements



The Southern California RSC program yielded impressive improvements by both authorities having jurisdiction (AHJs) and utilities. The average team SM^3 total scores at the beginning of the program increased from 641 total points to 806 total points, an increase of 26%. Furthermore, six of the eleven teams achieved scores above 800, and all of the partner teams received a score above 725. The success of these AHJs and utilities can be attributed to the team's collaborative process, which included information-sharing across the region, tracking progress, providing best practices, and guiding implementation.



Additionally, the average scores of every Southern California partner increased from the beginning to the end of the program: permitting scores increased 23% from an average of 293 to 362, interconnection process scores increased 51% from 64 to 96, financing scores increased 44% from 81 to 117, and planning and zoning scores increased 22% from 59 to 71. Both interconnection standards and net energy metering (NEM) standards scores increased as well, respectively 138% and 4%. The average scores in the NEM standards category increased 4% -- from an average of 92 to 96 out of a possible 100 -- demonstrating California's progressive NEM standards. These increasing scores provide evidence that a concerted statewide effort will reap great reductions in solar soft costs in the future.

Summary of Accomplishments

The chart below summarizes the deliverables accomplished during the Southern California RSC program. The following sections of this document will describe how we accomplished these deliverables and implemented soft cost reductions at both Southern California AHJs and utilities.

Local Governments	Utilities	Industry
• Roadmaps • Online Tookit • Best Practices Guides (Permitting, Finance) • PACE Policy Guide • Southern California Financing Guide	• Interconnection portal specification • Roadmaps • Best Practices Guides (NEM, Interconnection) • Online Toolkit • PACE Policy Guide • Southern California Financing Guide	• Interconnection portal specification • GoSolarCalifornia Process maps • PACE Policy Guide • Southern California Financing Guide

Task 1.0– Working Group Collaboration

Task 1.1 – Existing Process Review

The Working Group process launched in January 2012 and began with Existing Policy Review meetings in each of the five action areas (Permitting, Interconnection Process, NEM/Interconnection, Zoning, and Financing). This process ran throughout the first quarter and included a top-down review of existing policies and procedures. The primary deliverable was a regional policy overview document cataloging the current conditions at the 11 jurisdictions and five utilities. The document focuses on areas of high inter-jurisdictional variability as well as policies associated with quick turnaround times and lower costs.

Working Group Meetings:
Eight Working Groups were held in the program's first quarter in the five main focus areas: Permitting, Interconnection Process, Planning/Zoning, Finance, and NEM/Interconnection Standards. An Executive team meeting was also held with high-level staff from each participating partner. These working groups initially identified a framework to outline the current processes used by each participating AHJ and utility in the Southern California team. Furthermore, the working groups allowed CCSE to update AHJ Solar Market Maturity Model (SM3) scores and establish a foundation to track progress in each of the target areas of the program.

AHJ Hot Sheets
Upon updating the SM3 scoring for all AHJs on the team, CCSE created hot sheets tailored to each jurisdiction and utility with recommendations for achieving best practices. The hot sheets made the data easy to read and use, and identified areas where the partner achieved high performance or had room for improvement in each RSC action area.

Through the Working Groups and individual meetings with partners, an inventory of policies was created giving an overview of all solar policies and processes, allowing CCSE to analyze the best practices in the region.

Task 1.2 – Regional Collaboration

The Regional Collaboration Phase consisted of 11 Working Group meetings over a 6 month period. This phase built on CCSE's Existing Policy Review methods and involved deep dives into the underlying processes that lead to high performance by jurisdictions and utilities. The team explored the rationale for the adoption of these processes, and shared lessons learned about obstacles or challenges faced by jurisdictions during implementation. Working Group members were given presentations from regulators on parallel developments happening at the state level that affected RSC area policies. Meeting content was informed by and integrated with the efforts of the Governor's Office of Planning and Research (OPR) and other RSC Awardees. This process culminated in the development of a series of case-studies outlining the processes associated with high performance.

Working Group Meetings
Eight Working Groups were held in Q2 and Q3 in the five main focus areas: Permitting, Interconnection Process, Planning/Zoning, Finance, and NEM/Interconnection Standards. Highlights of these meetings included:

- Utility Working Group (Net Metering and Interconnection)
  - Presentations by five partner utilities on current interconnection practices
  - Presentation from California Public Utilities Commission (CPUC) on changes to Rule 21
  - Deep dive meetings with LADWP and Pasadena Water and Power
- Permitting Working Group
  - Presentation from Keyes and Fox on IREC's "Sharing Successes: Emerging Approaches to Efficient Rooftop Solar Permitting" report
  - Individual meetings with AHJs to focus on permitting processes, enhancing the amount of information available online
- Finance Working Group
  - Presentation from CCSE Building Performance manager on state and local financing programs
  - Presentation from Group Energy on Solar Benefits programs: several AHJs are interested in launching programs
  - Facilitating the coordination of marketing and outreach of the California First and CAEATFA loan loss reserve programs
  - Participation in the San Diego Retrofit Advisory Council Finance/Real Estate Committee Meetings and LA Chamber of Commerce meetings on financing
- Individual Roadmap meetings with each AHJ and utility to identify needs, areas of improvement, and specific implementation goals for the first year of the program.

Regional Policy Overview Document
With assistance from the Energy Policy Initiatives Center at University of San Diego (EPIC), CCSE published and distributed the Regional Policy Overview document, "Streamlining Solar Standards and Processes: Southern California Rooftop Solar Challenge." Building upon the working group and individual partner assessments in Quarter 1 of the program, this document was focused on the current policy landscape for solar installations and areas of high inter-jurisdictional variability as well as policies associated with quick turnaround times and lower costs. The goal of the Regional Policy Overview document was to outline the many policies and procedures that govern solar in Southern California, and to build consensus on a plan for improving and standardizing jurisdictional and utility processes for solar.

- The Regional Policy Overview document can be found at: http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/Sunshot_Policy_Overview.pdf

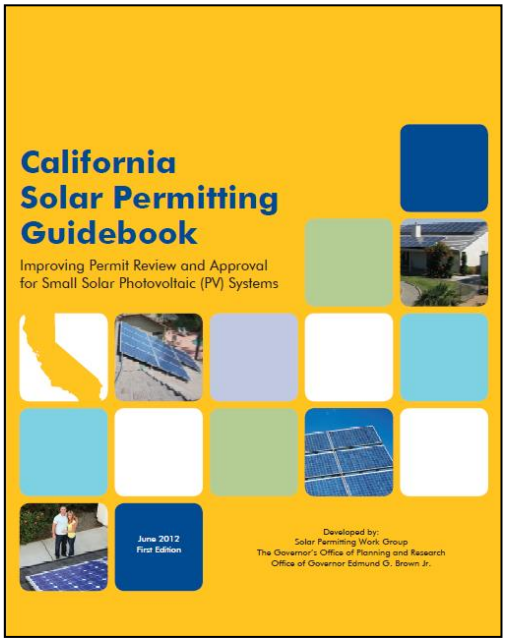
Task 1.3 – Model Rule Development and Implementation

This phase of the project focused on developing standards and processes that further the RSC goals, while respecting the unique political and structural realities of team members. The team engaged with other regional teams to look for the highest level of harmonization in model rule development. Furthermore, CCSE collaborated with other solar stakeholders for expert input to develop the most robust model processes possible. This included permitting collaboration with OPR, information on Rule 21 Interconnection guidelines from the CPUC, interaction with local International Code Council (ICC) chapters on building and zoning codes, and the Retrofit Advisory Council (RAC) for feedback on current and upcoming financing programs. By collaborating with various solar stakeholder groups, CCSE was

able to enhance model process development for the partner members of the Southern California RSC team.

California Solar Permitting Guidebook

The CCSE RSC team participated in the OPR Solar Permitting Working Group meetings. OPR convened stakeholders from local government, the building industry, professional associations, solar companies, utility providers, and state regulatory agencies to tackle the problem of inconsistent permitting practices across California. One result of this collective effort was the California Solar Permitting Guidebook, which provided local governments and solar contractors with information and strategies to improve the permitting process. Improving uniformity among all participating jurisdictions helped streamline the requirements and facilitate timely compliance by installers. The Guidebook was created as a State-endorsed document with the intent of distribution to installers, building officials, and interested solar customers. In coordination with OPR, CCSE created the guidebook design and helped distribute the guidebook to stakeholders across the state.



- The California Solar Permitting Guidebook can be found at: http://opr.ca.gov/docs/California_Solar_Permitting_Guidebook.pdf

International Code Council Permitting Training

A key theme from the Southern California team was that a lack of training contributes to inspection inconsistencies and errors from contractors. For this reason, CCSE and the Southern California Rooftop Challenge partnered with three local ICC chapters – San Diego, Orange County, and Los Angeles – to provide training for local code officials and contractors. The trainings were three 8-hour sessions, presented by John Wiles of New Mexico State University, covering the National Electrical Code (NEC) requirements for designing and installing PV systems, including conductor selection, ampacity calculations, and over-current devices and disconnects. The ICC-sponsored training was held over three days in Los Angeles and San Diego on September 25, 26, and 27th. The trainings were attended by over 400 electrical inspectors, customers and contractors.

"How to Go Solar" Guides

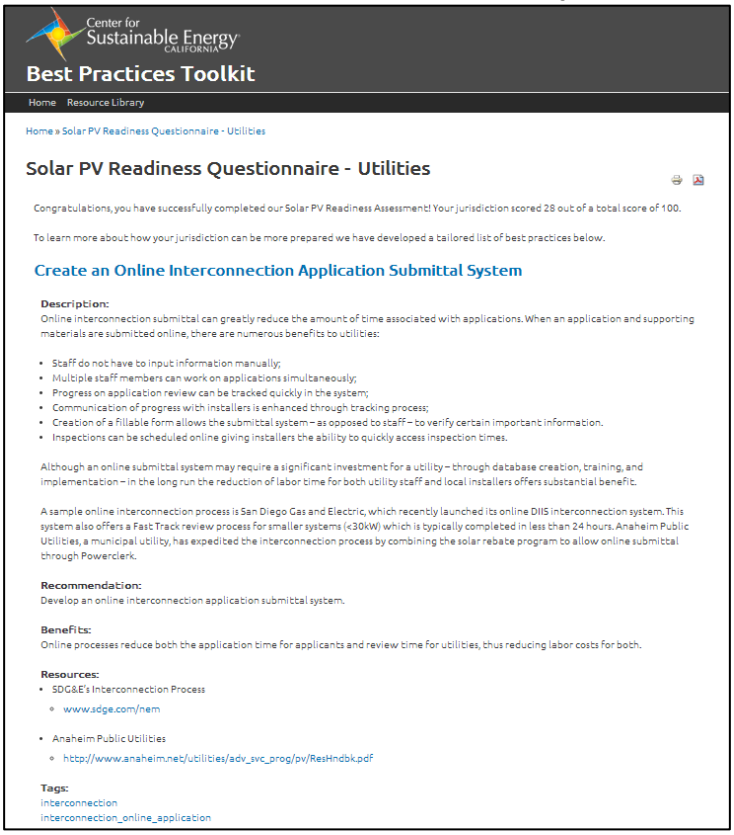
After undergoing deep process analyses with each partner AHJ and utility, CCSE created detailed "How to Go Solar" guides for solar PV consumers and installers including information on how to find an installer, available financing and rebate programs, and local permitting and interconnection processes. These guides are intended to facilitate the understanding of the process, requirements, and guidelines for installing a solar PV system in these municipalities and their associated electric utilities, in addition to providing links to download all required documents needed in the application process. A "How to Go Solar" guide was developed for all 11 AHJs on the team (and their associated utility).

GoSolarCalifornia

Upon completion of the "How to Go Solar" guides CCSE partnered with the California Energy Commission and Public Utilities Commission to host the guides on the jointly-managed www.GoSolarCalifornia.com, the California state clearinghouse for solar information. A page was created for the Southern California Rooftop Solar Challenge that provides links to each AHJ's detailed solar process and interconnection requirements. The goal of the collaboration with GoSolarCalifornia is to make information about solar PV financing, permitting and interconnection processes easily accessible online to solar stakeholders. By hosting this information online, CCSE hopes to facilitate the ability to understand the solar process for solar stakeholders in the participating Southern California jurisdictions. A sample "How to Go Solar" guide from GoSolarCalifornia is below in Attachment A.

- The Southern California Rooftop Solar Challenge page on GoSolarCalifornia can be found at: http://www.gosolarcalifornia.ca.gov/resources/socal_jurisdictions/index.php

Best Practices Toolkit and Resources Library


Center for Sustainable Energy CALIFORNIA

Best Practices Toolkit

Home Resource Library

Home » Solar PV Readiness Questionnaire - Utilities

Solar PV Readiness Questionnaire - Utilities

Congratulations, you have successfully completed our Solar PV Readiness Assessment! Your jurisdiction scored 28 out of a total score of 100.

To learn more about how your jurisdiction can be more prepared we have developed a tailored list of best practices below.

Create an Online Interconnection Application Submittal System

Description:
Online interconnection submittal can greatly reduce the amount of time associated with applications. When an application and supporting materials are submitted online, there are numerous benefits to utilities:

- Staff do not have to input information manually;
- Multiple staff members can work on applications simultaneously;
- Progress on application review can be tracked quickly in the system;
- Communication of progress with installers is enhanced through tracking process;
- Creation of a fillable form allows the submittal system – as opposed to staff – to verify certain important information.
- Inspections can be scheduled online giving installers the ability to quickly access inspection times.

Although an online submittal system may require a significant investment for a utility – through database creation, training, and implementation – in the long run the reduction of labor time for both utility staff and local installers offers substantial benefit.

A sample online interconnection process is San Diego Gas and Electric, which recently launched its online DIIS interconnection system. This system also offers a Fast Track review process for smaller systems (<30kW) which is typically completed in less than 24 hours. Anaheim Public Utilities, a municipal utility, has expedited the interconnection process by combining the solar rebate program to allow online submittal through Powerclerk.

Recommendation:
Develop an online interconnection application submittal system.

Benefits:
Online processes reduce both the application time for applicants and review time for utilities, thus reducing labor costs for both.

Resources:
- SDG&E's Interconnection Process
  - www.sdge.com/nem
- Anaheim Public Utilities
  - http://www.anaheim.net/utilities/adv_svc_prog/pv/ResHndbk.pdf

Tags:
interconnection
interconnection_online_application

CCSE completed an online resource for AHJs and utility interconnection staff to access information and share best practices to streamline the installation of small scale solar (<30kW) in their territories. The goal of the online tool is to create tailored best practice guides for municipalities and utilities and understand their current level of preparedness for solar PV installations. This tool utilizes a series of binary (yes/no) questions in survey format – with a "no" answer triggering a suggested best practice resource description – to indicate where a participant's current processes are lacking in relation to the model practices. At the end of the survey, a webpage is generated that includes the participant municipality/utility's overall score, a description of their readiness level, suggested best practices in each category, and links to informational implementation strategies. This survey can be used by

municipalities and utilities outside of the Southern California team to gain a stronger understanding of the best practices in solar PV processes, and will give personalized resource guides in PDF format to assist them in implementing these practices.

CCSE also created a Resource Library as an online repository for information on best practices and guides on solar PV permitting, interconnection process, zoning and financing. The Resource Library is intended for use by not only AHJs and utilities but also for research on policies and practices in the reduction of solar soft costs.

- The Best Practices Toolkit can be found at: http://bestpractices.energycenter.org/

Best Practices Guides

As a result of the Working Group meetings with partner AHJs and utilities, CCSE, in coordination with EPIC, developed and released three Southern California Best Practices Guides: Permitting Processes, Interconnection/Net Energy Metering Standards, and Interconnection Processes. These guides built upon the Policy Overview documents developed in Q2 and Q3 to identify the best practices amongst Southern California Rooftop Solar Challenge partners. The guides focused on the DOE's RSC best practices in the categories of Permitting and Interconnection Application and Information Access, AHJ and Utility Processing Time, Fees, Utilization of Model Processes, and Inspections. The guides were distributed to partners to develop a better understanding of the best practices in Southern California and create a dialogue to help share implementation ideas with lower performers.

- The guides can be downloaded here:
  - Permitting
  - Interconnection/Net Energy Metering Standards
  - Interconnection Processes

Supplementary Implementation Projects

In addition to the previously mentioned process improvements, tools, and guides developed in RSC I, CCSE also assisted its partners on other implementation projects to improve processes and reduce soft costs. The following are just some examples of our efforts.

CCSE completed a deep redesign of Pasadena Water and Power's Pasadena Solar Initiative website, assisting with content, layout and organizational changes to facilitate readability and navigation of information for the website's three primary audience segments: contractors, homeowners and businesses.

- The website can be visited at: http://cityofpasadena.net/waterandpower/Solar/.

Further implementation assistance was given to CCSE's five partner utilities by outlining the differences and similarities in the utilities' interconnection rules and guidelines and net metering processes. The goal

of this document was to provide all interconnection and net metering guidelines in one document for ease of reference. This document also helped shed light on the differences between investor owned and publicly owned utility processes, which can vary dramatically in California.

CCSE also assisted the City of Chula Vista with suggested website changes to its "Solar Powering Chula Vista" page. Chula Vista implemented the changes to its website to ease access to information about renewable energy, available incentives and financing programs.

- Chula Vista's website changes can be viewed at: www.chulavistaca.gov/clean/conservation/climate/Solar.asp

Final Assessments and Roadmaps

Expanding on the Best Practices Toolkit, Best Practice Guides, and individual Roadmap meetings with each AHJ in Q2 and Q3, CCSE created and distributed final assessments to each partner AHJ and utility. These assessments served to spur continued streamlining beyond the Rooftop Solar Challenge by highlighting the specific areas where the partner performed well and areas where it could continue to improve processes and policies. The AHJ or utility is compared to the other model performers in the Southern California region as outlined in the Best Practices documents. The individual assessments provide a summary of the major categories in which the partner does not meet the regional best practice. In each category, the City's practices are compared and analyzed to target specific areas of need. In addition, the final assessment includes a roadmap that outlines the estimated difficulty for the implementation of best practices. These assessments are most useful when utilized in conjunction with the Best Practices Toolkit and Resources Library which provide further resources and implementation strategies. These roadmaps will assist the jurisdiction in planning further improvements to their solar process. An example of a roadmap is below in Attachment B.

Interconnection Software Requirements Specifications

The trend for electric utilities nationwide is to automate and provide for online electronic submission of interconnection applications. Furthermore, many of the solar incentive programs across Southern California are coming to an end, bringing into question the public availability of data on solar technology adoption for policy use by researchers and regulators. Through the Rooftop Solar Challenge Utility Working group meetings, CCSE engaged the five partner utilities about online interconnection options and the possibility of aligning on a coordinated, multi-utility solution. CCSE included both the reduction in processing times and solar data information sharing as central points in discussions on a unified multi-utility system. In Q4, CCSE contracted with Energy Solutions, a program developer and the database system integrator for the both the California Solar Initiative (CSI) General Market and Thermal Incentive Programs, as well as the developer of California Solar Statistics, to develop a detailed software requirements specification (SRS) for a multi-utility online interconnection and data portal. In the first quarter of 2013, the project team held weekly meetings to gather the information to create a specification for development of the portal.

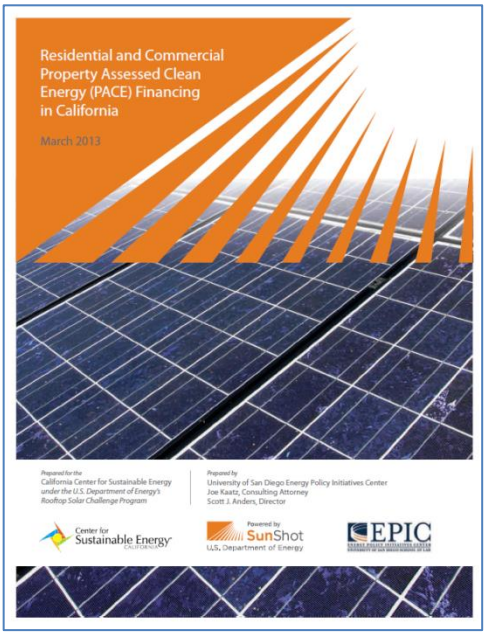
CCSE and Energy Solutions were deeply involved with staff from each utility in order to understand their unique perspectives on the issues and opportunities associated with an online interconnection system. Additionally, Southern California Edison (SCE), the Los Angeles Department of Water and Power (LADWP) – two of the largest utilities in the state – and Pasadena Water and Power worked with Energy Solutions and CCSE to design and specify a unified online interconnection portal to address the common needs of all stakeholders. CCSE, Energy Solutions, and these three utilities underwent deep process analysis to understand how an interconnection portal could improve processes as well as integrate with existing databases. At the end of the fifth quarter of the RSC program, a detailed specification for an

online interconnection and data portal were created with the intention of allowing for adoption by utilities in our regional team. Furthermore, the portal was designed to be scalable across the state (and nationwide) so as to interface with existing utilities' online interconnection portals and to be adopted by those utilities that have not created an online system to date.

Additionally, the development of the SRS is particularly timely given decisions by the CPUC regarding data collection, net metering and interconnection. The Rooftop Solar Challenge team has regular meetings with regulators and state legislators to update and inform them on the progress of the interconnection data portal, and CCSE made comments on the CPUC's most recent decision regarding the creation of online interconnection portals to share solar interconnection data.

The Interconnection Software Requirements Specifications are below in Attachment C.

PACE Policy Document



Released in March 2013, the Southern California RSC team released "Residential and Commercial Property Assessed Clean Energy Financing." This peer-reviewed policy document identified and described the current state of residential and commercial Property Accessed Clean Energy (PACE) in California, with an emphasis on the Southern California region. The report discussed the two enabling statutes for PACE – AB 811 and SB 555 – in California, the different philosophies cities have adopted in implementing PACE financing, and various PACE program structures. While this report focused on PACE as a mechanism to increase the amount of rooftop solar systems installed, these programs also provide an effective means to finance energy efficiency projects. Specifically, the report included the following:

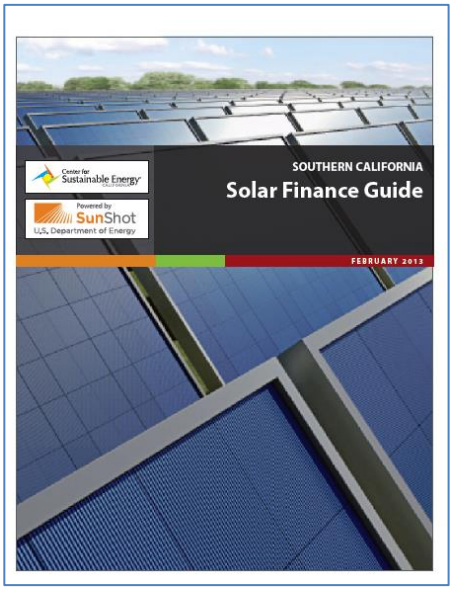
- A brief background on PACE, including how it supports California's energy and environmental policy goals, the two pieces of legislation that enable creation of PACE programs, and a summary of the actions of the Federal Housing Finance Agency (FHFA) that have affected implementation of PACE in California.
- A detailed discussion of AB 811 and several programs created under its provisions, including Sonoma County's Energy Independence Program; City of Palm Desert Energy Independence Program; Western Riverside Council of Governments' Home Energy Renovation Opportunity (HERO), Commercial HERO, Large Commercial programs; California FIRST; and, the California PACE Program.
- YGRENE's Clean Energy Sacramento Program, the only PACE program created under SB 555.
- A summary of other PACE programs operating in California.

The PACE document is useful for communities considering launching their own PACE program as it compares the different options for implementation. The document received a lot of attention from state regulators and was distributed to over 125 members of the Retrofit Advisory Committee. CCSE issued a

press release and distributed it through our newsletter which reaches over 10,000 subscribers across California.

- The PACE Policy Guide can be found here: http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/PACE%20in%20California.pdf

Southern California Solar Finance Guide



In the fourth quarter of the RSC, CCSE published the Southern California Solar Financing Guide. This guide includes information on financing programs, eligible AHJs, project eligibility criteria, property owner eligibility criteria, financing requirements, and program administrator contact information for all available financing tools in the region. The guide shows information on each of the 22 financing programs currently available as well as reaching out to additional Los Angeles County utilities including Asuza, Glendale, Burbank, Long Beach and LADWP. The goal of the guide is to help clarify the complex process of finding and understanding the differences in available solar financing programs in the Southern California region. The guide was distributed to partners, made available on CCSE's website, and distributed by the Southern California Regional Energy Network (SoCal REN). The guide will be replicated by the City of Pasadena for assisting with financing renewable energy, energy efficiency, and water projects in the jurisdiction.

- The Southern California Solar Finance Guide can be found here: http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/SoCal%20Solar%20Finance%20Guide.pdf

Task 1.4 – Engage State Legislature & Regulators

In conjunction with the Southern California regional outreach, CCSE has remained actively engaged with the other RSC I recipients to unify approaches across the western region. This engagement continued through the RSC award period, and included meetings, phone calls and information sharing. CCSE worked with the Governor's OPR to continue developing model practices in permitting and interconnection and to focus on an updated draft of the Solar Permitting Guidebook. Furthermore, CCSE engaged OPR, the CEC, and CPUC to discuss upcoming legislation pertaining to solar soft cost reduction targets, such as the development and adoption of a unified statewide interconnection portal, and strategic discussions relating to implementing widespread permitting best practices. CCSE also participated in the DOE SunShot Summit in Denver, Colorado in June of 2012 and engaged numerous regulators involved in soft cost reduction.

California Energy Commission Electric Program Investment Charge Workshop

Tamara Gishri from the CCSE management team of the Southern California RSC team participated on a panel during the California Energy Commission's Electric Program Investment Charge workshop in Los Angeles, California. The California Energy Commission is providing funding for applied research and development, technology demonstration and deployment, and market facilitation for clean energy technologies and approaches for the benefit of ratepayers. The conference was a great opportunity to talk to state regulators on how to continue and expand the goals of the RSC program after February 2013 as well as understand the state perspective of the RSC initiative.

Cost Status

Table 1 is a summary of the approved budget and costs incurred from the Department of Energy.

Table 1 (Cumulative)	Program Budget	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	Q3 2013
Federal	$700,001	$48,494	$142,283	$249,152	$336,934	$473,882	$629,552	$654,909
Non-Federal	$77,825	$24,677	$48,119	$68,783	$77,463	$362	$0	$0
Total	$777,826	$73,171	$190,402	$317,935	$414,397	$474,244	$629,552	$654,909

CCSE's total federal program budget is $700,001, with a total non-federal match obligation of $77,825. At the completion of the RSC I program, CCSE incurred $654,909 in total costs. CCSE has completed its match requirement remaining. For more information, please refer to the submitted SF-425 budget.

Schedule Status

The table below shows the completed dates of all working groups completed:

Working Group Meetings	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June
Executive	3/28															
Permitting Process		4/3		6/26	7/17		9/25-9/27					Individual meetings with each AHJ				
Interconnection Process		4/25	5/31			8/15	9/19		10/29		Weekly meetings on Portal	Weekly meetings on Portal	Weekly meetings on Portal	Weekly meetings on Portal	Weekly meetings on Portal	Weekly meeting on Portal
NEM/Interconnection		4/25	5/31				9/5		10/26		Weekly meetings on Portal	Weekly meetings on Portal				
Zoning		4/29														
Financing		4/22			7/24		9/13		10/24			2/27				

Product Produced or Technology Transfer Activities

Publications:

1. Press release for PACE and Southern California Financing Guide: http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/SoCal%20Solar%20Finance%20Guide.pdf

2. Best Practices Toolkit: http://bestpractices.energycenter.org

3. GoSolarCalifornia Rooftop Solar Challenge Website: CCSE previously released a press release and the full Southern California Policy Overview Document, which can be found at: http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/Sunshot_Policy_Overview.pdf

4. As part of the Governor's Solar Permitting Working Group, CCSE and the Rooftop Solar Challenge team participated in publishing the Governor's Solar Permitting Guidebook: http://opr.ca.gov/docs/California_Solar_Permitting_Guidebook.pdf

Website

CCSE launched a website specifically for the Rooftop Solar Challenge program at www.energycenter.org/sunshot. The GoSolarCalifornia website also has information on the Southern California RSC Program at: http://www.gosolarcalifornia.ca.gov/resources/socal_jurisdictions/index.php

Networks or Collaborations Fostered

CCSE has fostered collaborations with the following organizations. These partnerships will be conduits to disseminate information and training of the best practices and model rules from our working group meetings.

- California Public Utilities Commission
- California Energy Commission
- Governor's Office of Planning and Research
- CALSEIA
- California Electrical Installers
- San Diego Retrofit Advisory Council
- California Building Officials
- International Code Council
- IREC
- LARC
- American Lung Association
- Los Angeles Chamber of Commerce

- Los Angeles Cleantech Incubator
- Los Angeles Economic Development Corporation
- Local Associations of Governments (SCAG and SANDAG)
- American Planning Association
- California Public Utilities Commission
- Networks with other California Rooftop Solar Challenge awardees
- Clean Power Research
- Southern California Association of Governments
- Vote Solar
- Sierra Club
- Keys and Fox
- Clean Coalition

In Conclusion

As project lead on the Southern California Rooftop Solar Challenge team, CCSE collaborated with a high population region with diverse stakeholders in one of the largest solar markets in the United States. Through continued participation by the eleven partner jurisdictions and five utilities in the region, CCSE reduced soft costs significantly and was able to create a thorough understanding of the solar processes and practices in Southern California. With the development of a comprehensive set of best practices – the Governor's Solar Permitting Guidebook, the Southern California Solar Finance Guide, and the Interconnection Portal Software Requirements Specifications – CCSE has facilitated implementation strategies for jurisdictions and utilities to reduce solar soft costs. Through these advancements and the partnerships and networks established in RSC I, CCSE is primed to complete widespread changes in soft cost reductions throughout the State of California and beyond.

Attachment A: "How to Go Solar Guide" – Chula Vista

City of Chula Vista

This page outlines solar PV incentives, financing mechanisms, permitting process, and interconnection information for the City of Chula Vista and the utility that serves its territory, San Diego Gas and Electric.

To skip directly to each section please use these hyperlinks:

Find an Installer | Financing | Incentives | Permitting | Interconnection

Solar Contact Information

City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 91910

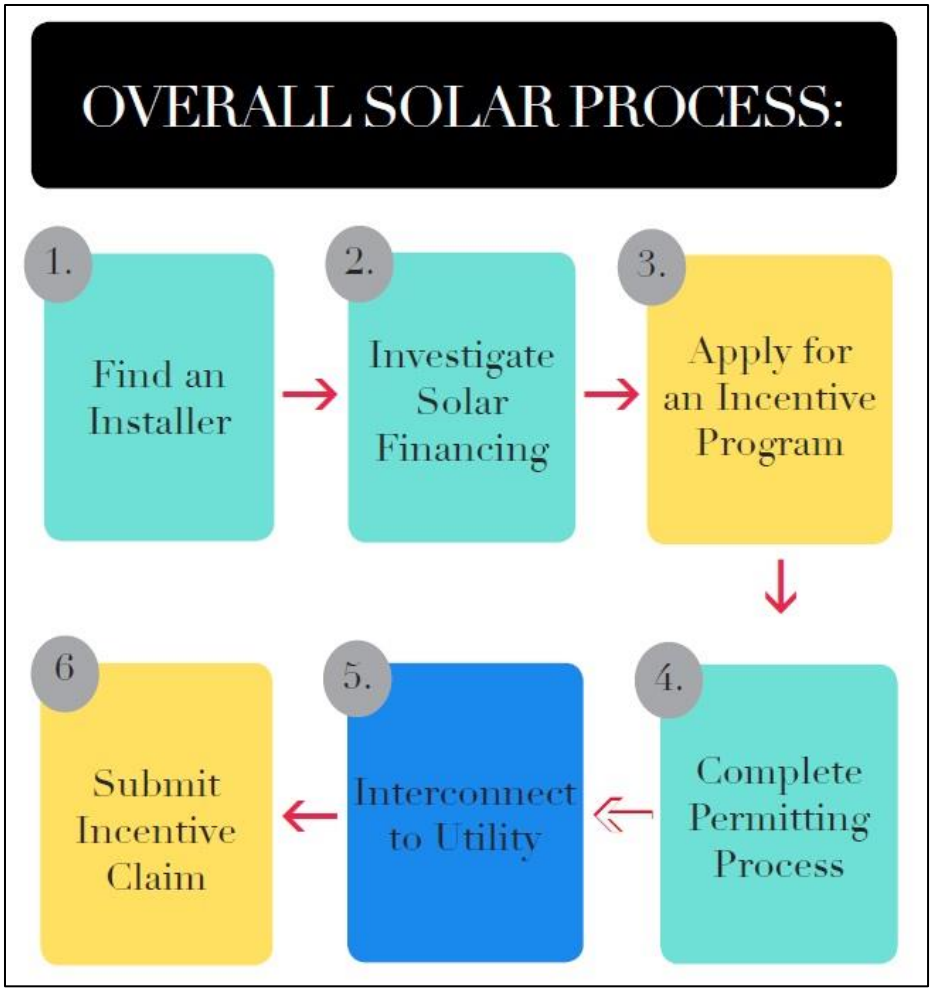
Website:
www.chulavistaca.gov/clean/

Phone:

- *Conservation Section – Public Works*
  Phone: (619) 409-3893, Fax: (619) 476-5310

- *Building Division – Development Services*
  Phone: (619) 691-5272, Fax: (619) 409-5861

Hours:
Monday - Thursday 8:00AM - 5:00PM (General Business)*



Find an Installer

- **Qualified contractors are your key to getting the most productive solar energy system for your home or business.**
    - Typically solar installers will:
        - Locate financing programs to fit your needs
        - Apply for rebates and incentives on your behalf
        - Apply for local permits
        - Install your PV system
        - Arrange for your PV system to be interconnected to your utility's power grid

- **California Solar Statistics provides a searchable/sortable list of Installers, Contractors, and Sellers by area who can help you in the process of going solar:**
    - http://californiasolarstatistics.com/search/contractor/
    - Important Notes:
        - Costs are measured on a per watt basis

- It is important to remember that cost is not the only factor involved in system installation.
- **It is highly recommended to contact *a minimum of three installers* to compare costs, system sizing, and services offered before signing a contract.**

Back to Top

Financing Information

City staff members are available to assist Chula Vista residents and businesses in understanding and accessing financing to support solar photovoltaic installations.

Solar Contact Information
City of Chula Vista
Conservation Section – Public Works Department
276 Fourth Avenue
Chula Vista, CA 91910
Public Services Building 300

Solar Financing Website:
www.chulavistaca.gov/goto/solar

Phone:

- *Conservation Section - Public Works*
  Phone: (619) 409-3893, Fax: (619) 476-5310

Hours:
Monday - Thursday 8:00AM - 5:00PM

- ***Federal Solar Incentives***
  - Residential Renewable Energy Tax Credit
    - A taxpayer may claim a credit of 30% of qualified expenditures for a solar system that serves a residence located in the United States that is owned and used as a residence by the taxpayer.
      - http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US37F&re=1&ee=1
  - Business Energy Investment Tax Credit (ITC)

- This federal tax credit is equal to 30% of expenditures on a solar system, with no maximum credit.
  - http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US02F&re=1&ee=1

- ***Property Assessed Clean Energy (PACE) Programs***
  - *CaliforniaFIRST*
    - The City of Chula Vista is a participant in the CaliforniaFIRST Program, a PACE program for non-residential properties. This program allows property owners to finance the installation of energy and water improvements on commercial, industrial or multi-family (over 5 units) buildings and pay the amount back as a line item on their property tax bill.
      - For more information: www.californiafirst.org

- ***Secured Financing***
  - *Home Upgrade, Carbon Downgrade (HUCD) Community Revolving Loan Fund*
    - The goal of the HUCD Community Revolving Loan Fund is to provide low interest financing for property owners to implement energy efficiency retrofits and/or to install renewable energy systems at their homes or businesses in Chula Vista.
      - For more information: http://www.chulavistaca.gov/clean/conservation/climate/HUCD.asp
  - *Home Equity Lines of Credit (HELOCs) and Home Equity Loans (HELs)*
    - HELOCs are forms of revolving credit in which a home serves as collateral. A HEL is a loan that has a fixed rate and term and also uses a home as collateral. The major difference between these two types of financing mechanisms is that HELOCs are similar to a credit card – you can withdraw money as needed and pay back the debt indefinitely – whereas an HEL gives you a one-time lump sum of cash that is paid off over a fixed amount of time. These types of loans are typically available through banks.
      - Home Equity Lines of Credit: www.federalreserve.gov/pubs/equity/equity_english.htm
      - Home Equity Loans: http://www.federalreserve.gov/pubs/bulletin/1998/199804lead.pdf
  - *FHA 203(k) Rehabilitation Loans*
    - The Federal Housing Administration (FHA) administers various single family mortgage insurance programs. These programs operate through FHA-approved lending institutions which submit applications to have the property appraised and have the buyer's credit approved. These lenders fund the mortgage loans giving a line

of credit to the property owner to make property upgrades, such as solar PV installations.

- For more information: http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/2g/sfh/203k/203kabou

- *HUD Title 1 PowerSaver Loans (Secured or Unsecured)*
  - The PowerSaver program insures loans to finance small or moderate improvements to a home, such as a solar energy upgrade. Loans up to $25,000 will be given to single family homeowners specifically targeting residential energy efficiency and renewable energy improvements.
    - For more information: www1.eere.energy.gov/wip/solutioncenter/financialproducts/PowerSaver.html

- ***Unsecured Financing***
  - *Fannie Mae Energy Loan*
    - Fannie Mae offers a direct, non-recourse consumer loan program that will finance up to $20,000 in energy improvements without putting a lien on your home. Energy Loan is a simple interest, fixed rate loan with longer terms available then typical bank financing.
      - For more information: www.energyloan.net/index.php

- Clean Energy Upgrade Financing Program - ABX1 14
  - ABX1 14 authorizes the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) to administer a Clean Energy Upgrade Financing Program using up to $25 million to finance the installation of distributed generation renewable energy sources, electric vehicle charging infrastructure, or energy or water efficiency improvements on homes or small commercial properties.
    - http://www.treasurer.ca.gov/caeatfa/abx1_14/index.asp

- ***Third Party Ownership***
  - *Solar Power Purchase Agreements*
    - A Solar Power Purchase Agreement is a financial arrangement in which a third-party developer owns, operates, and maintains the photovoltaic system, and a customer agrees to site the system on its property and purchase the system's electricity. This financial arrangement allows the customer to avoid upfront installation costs and usually have lower electricity costs.
  - *Solar Leases*
    - Solar Leases are similar to Power Purchase Agreements in that a third party pays for and owns the system, but with this financing mechanism a customer pays a fixed

monthly fee that is not tied to actual energy use and is responsible for system performance, operations and maintenance.

- For more information: www.energycenter.org/index.php/incentive-programs/california-solar-initiative/csi-latest-news/2167-why-pay-to-install-solar

- ***Other Financing Mechanisms***
  - *Feed-in Tariff (FIT)*
    - Under a feed-in tariff, eligible renewable electricity generators are paid for the generating renewable electricity and feeding it into the utility grid.
    - For more information: SDGE FIT Program

  - *Virtual Net Metering*
    - VNEM is similar to ordinary Net Energy Metering (NEM) but is for multi-metered properties. VNEM is an agreement under which a share of production credits from a single solar system can be distributed to individual ratepayers in a multi-tenant property.
    - For more information:
      - Please call (858) 636-5585 or e-mail Netmetering@semprautilities.com

Back to Top

Incentive Information

Federal Solar Incentives

- Residential Renewable Energy Tax Credit
  - A taxpayer may claim a credit of 30% of qualified expenditures for a solar system that serves a residence located in the United States that is owned and used as a residence by the taxpayer.
    - http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US37F&re=1&ee=1
- Business Energy Investment Tax Credit (ITC)
  - This federal tax credit is equal to 30% of expenditures on a solar system, with no maximum credit.
    - http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US02F&re=1&ee=1

California Solar Initiative (CSI)

- www.gosolarcalifornia.com/csi

Program Administrator

- California Center for Sustainable Energy (CCSE)
- Phone: 858-244-1177
- Email: csi@energycenter.org
- Website: www.energycenter.org/csi

Step by Step Process of getting a CSI solar rebate

- Step 1: Energy Efficiency Audit
  Complete an energy efficiency audit and make sure to take advantage of all the cost-effective ways to save energy and money in your home or business.
- Step 2: Find a Solar Installer
  Qualified contractors are your key to getting the most productive solar energy system for your home or business.
- Step 3: Apply for Rebates
  Qualified contractors will handle the CSI application process for your rebates in two or three steps.
- Step 4: Install Your System
  If you have received your reservation confirmation letter, you're ready to install your system and interconnect to the utility's power grid.
- Step 5: Claim Your Incentive
  When your project is installed and operational you may submit the Incentive Claim Form.

Back to Top

Permitting Process Information

Solar Contact Information

City of Chula Vista
Department of Development Services
276 Fourth Avenue
Chula Vista, CA 91910
Public Services Building 200

Solar Permitting Website:

http://www.chulavistaca.gov/City_Services/Development_Services/Planning_Building/Development_Services_Center/Process_Guides/Solar_Photo_System.asp

Phone:

- *Planning Division*
  Phone: (619) 691-5101, Fax: (619) 409-5861

- *Building Division*
  Phone: (619) 691-5272, Fax: (619) 409-5861

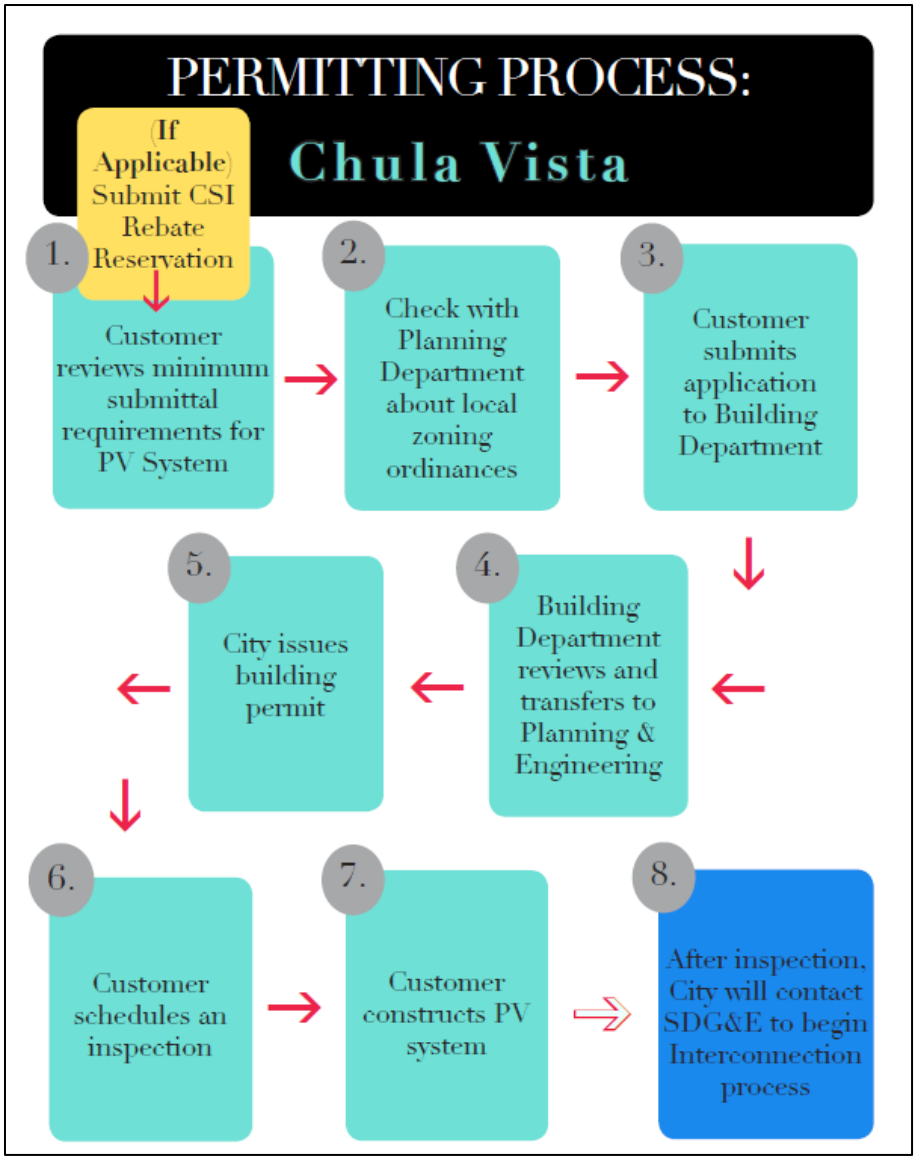
- *Inspection Section*
  Phone: (619) 409-5868, Fax: (619) 585-5639

- *Building Inspection*
  Phone: (619) 409-5434
  - Schedule Inspection: Option 1
  - Inspection Results: Option 3
  - Plan Review Status: Option 4

Hours:

Monday - Thursday 10:00AM - 4:00PM*

*New Building Permit Submittals accepted until 3:00 pm



Step-by-Step Permitting Process:

1. Review minimum submittal requirements **:** Solar PV Systems: Minimum Submittal Requirements (Form 4613)
2. Check with the Planning Division (619-691-5101) to see if there are any specific zoning issues you should be concerned about.
3. Submit Application to Building Department: To apply for a solar photovoltaic system permit, you need to stop at our Building Counter at 276 Fourth Avenue across the street from the library (north-west corner of 4th and F, downtown Chula Vista). For us to accept your permit application, you must provide us with a complete submittal package. A complete submittal package consists of the following:

    - Submittal application Requirements:

- "Residential Addition-Remodel-Patio-Wall/Fence-Pool Worksheet", Form 4562.
- Three copies of a Plot/Site Plan showing the general layout of the existing building site, location of the solar photovoltaic system, and address. Please review our handout, "How to Prepare a Residential Plot Plan", Form 4595, or call (619) 691-5272. Also see the document "Who May Prepare Plans & Incomplete Plans" for more information on residential plot plans.
    - How to Prepare a Residential Plot Plan (Form 4595)
    - Who May Prepare Plans & Incomplete Plans (Form 4610)
- Two copies of construction plans and details including but not limited to: location of existing electrical service(s) and panels, location of all solar equipment including number of modules in series, number of panels (groups or modules) in parallel, roof pitch, spacing and size of roof members, type of roof covering, details for the assembly of the modules and for the connection of the modules to roof members and weather sealing of roof penetrations.
- Pay permit fee is $45.00 which you must pay at time of permit issuance.

4. Plan Check Process
    a) After our Development Services Technicians (DST's) verify that the application package is complete, they will forward a set of plans/documents to each of the three departments/divisions; Building, Planning, and Engineering. Approval from all three departments/divisions is required prior to permit issuance. To contact any of the departments/divisions, please see the contact list shown at the end of this document.
    b) The plan check process is then tracked in our Automated Tracking System and the project is assigned a standard turn-around-time. The standard turn-around-time for an initial review is 7 calendar days. The standard turn-around-time for follow-up reviews (rechecks) is 7 calendar days.

5. Building Permit Issued: After you obtain all the required approvals and pay the Permit Fee, a DST will issue you a building permit. Now you can start construction.

6. Construct PV System

7. Inspection: One inspection is required for a typical solar photovoltaic system:
    - Inspecting the bolting of the panels to the roof structure and inspecting all aspects of the electrical system including grounding, sub-panels and inverter.
    - To schedule an inspection: 619-409-5434

8. Contact SDG&E: After completing your inspection, the City of Chula Vista will automatically contact San Diego Gas and Electric utility initiate your interconnection process.

Back to Top

San Diego Gas and Electric (SDG&E) Interconnection Process

San Diego Gas and Electric (SDG&E) is the local utility for the City of Chula Vista. Upon installation of your solar system and completion of your building permit inspection from the City of Chula Vista, SDG&E will complete your interconnection agreement and connect your system to the electric grid so you can start generating electricity for your home or business.

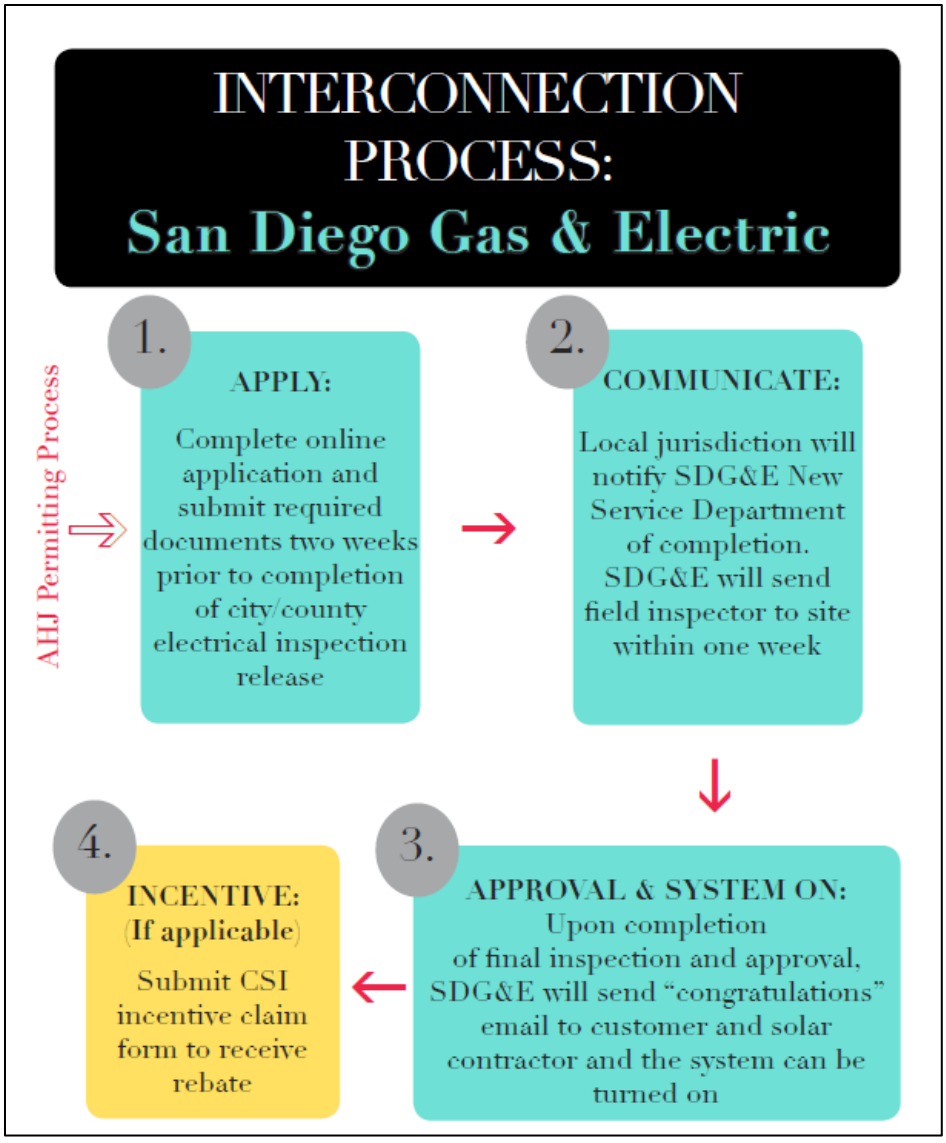
Contact Information

San Diego Gas & Electric
8316 Century Park Court, CP52F
San Diego, CA 92123

Phone:
(858) 636-5585

Email:
netmetering@semprautilities.com

Website:
www.sdge.com/nem



- **Interconnection for PV Systems under 30kW**
  - **Application Webpage**
    - http://www.sdge.com/clean-energy/apply-nem/apply-nem
  - **Interconnection Requirements**
    - http://www.sdge.com/clean-energy/apply-nem/apply-nem-requirements
  - **Interconnection Application Process for PV systems under 30kW:** http://www.sdge.com/sites/default/files/NEM_app_proc_less30kw.pdf?nid=483
    - The interconnection application is submitted online: https://nemapplication.sempra.com/

1. The following documents are needed to complete this form:
    1. Electrical One-Line Diagram Drawing
    2. Electrical One-Line Diagram Drawing (if CSI/PBI meter is present)

- ***Please submit your application two weeks prior to City of Chula Vista inspection being released. Submitting your application within this time-frame will minimize or avoid unexpected delays in the application approval process.***

- **Inspection**
    - Upon completion of your final building permit inspection, the City of Chula Vista will give their electrical inspection release to SDG&E's New Service Department
    - SDG&E's NEM Team sends email to Contractor/Customer that the release has been received.
    - SDG&E's Inspector will inspect the project within one week.
        1. For detailed information on the interconnection inspection:
            - http://www.sdge.com/sites/default/files/NEM_app_proc_less30kw.pdf?nid=483
    - This completes the Field Inspection process and 'initiates' the full completion and approval of the solar project.
    - Your solar installation has not been authorized until you receive a "Congratulations" email from SDG&E. At that time, your solar installation has received SDG&E's approval, and you may turn the solar system on.

• Interconnection for PV systems over 30kW:

- **Application Webpage**
    - http://www.sdge.com/clean-energy/apply-nem/apply-nem-business

- **Interconnection Requirements**
    - http://www.sdge.com/clean-energy/apply-nem/apply-nem-requirements

- **Interconnection Application Process for PV systems over 30kW:**
  http://www.sdge.com/sites/default/files/documents/NEM_app_proc_greater30kw.pdf

    - If you have an interconnection greater than 30kW, your application will have to be completed and returned by mail or in person to Building 6 Security

Desk. Please submit your application two weeks prior to the City of Chula Vista inspection being released. Submitting your application within this time-frame will minimize or avoid unexpected delays in the application approval process.

- Please complete and return the following documents:
    1. Interconnection Application
        - 3 copies
    2. Interconnection Agreement
        - 2 signed and dated copies (wet signature only)
    3. NEM Inspection Report
    4. Electrical One-Line Diagram Drawing
    5. Electrical One-Line Diagram Drawing (if CSI/PBI meter is present)
        - 3 copies of one-line diagram
    6. Sample Bill of Materials for Greater Than 30kW
        - 3 copies of the Bill of Materials

- **Inspection**
    - Upon completion of your final city electrical permit inspection release, the City of Chula Vista will give their electrical inspection release to SDG&E's New Service Department
    - SDG&E's NEM Team sends email to Contractor/Customer that the release has been received.
    - SDG&E's Inspector will inspect the project within one week.
        1. For detailed information on the interconnection inspection:
            - http://www.sdge.com/sites/default/files/NEM_app_proc_less30kw.pdf?nid=483
    - This completes the Field Inspection process and 'initiates' the full completion and approval of the solar project.
    - Your solar installation has not been authorized until you receive a "Congratulations" email from SDG&E. At that time, your solar installation has received SDG&E's approval, and you may turn the solar system on.

Additional Interconnection Information

The parallel operation of a PV system requires interconnection with SDG&E's electrical grid. Electric Rule 21 is a tariff that describes the interconnection, operating and metering requirements for generation facilities to be connected to a utility's distribution system, over which the California Public Utilities Commission (CPUC) has jurisdiction. Note that the posted Rule 21 may not reflect updates to the tariff that may be pending before the CPUC:

- SDG&E Rule 21

For comprehensive information on interconnecting to SDG&E's please see the following links:

- General Net Energy Metering Information
- Net Energy Metering Rates
- Net Energy Metering Cap
- Frequently Asked Questions

Back to Top

Southern California Rooftop Solar Challenge
City Assessment: Los Angeles

1. Introduction

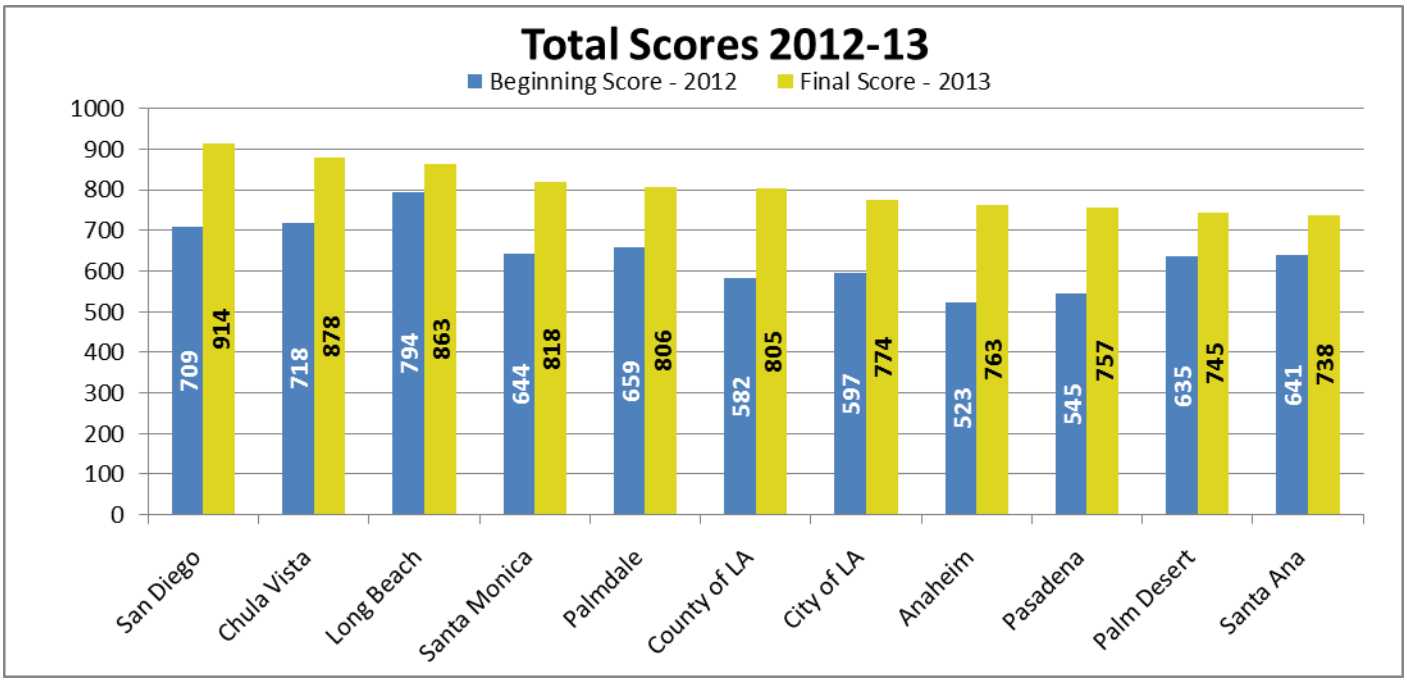
This assessment will highlight the specific areas in which the City of Los Angeles performs well in the Southern California Region and address the specific areas where the city can improve its processes. The City will be compared to the Best Practices found in the Southern California Rooftop Solar Region.

2. About this Report

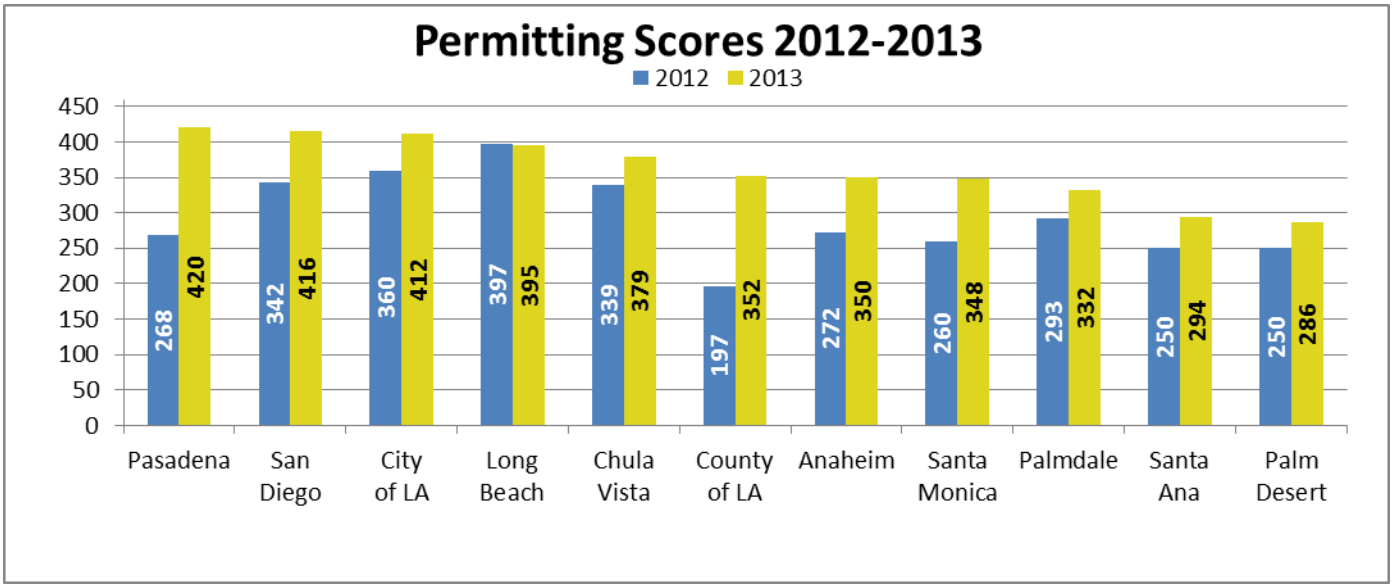
This report follows the Best Practice document for Permitting as well as the latest Market Assessments for Financing and Zoning. The report provides a summary of the major categories in which the City does not meet the regional best practice. In each of these categories, the City's permitting and zoning practices are compared and analyzed to target specific areas. This document should be used with the Model Rule Tool Kit from our region and/or the state to help improve processes.

3. Final Rooftop Challenge Scores

Below are the beginning and final scores for each participating jurisdiction in Phase I of the Southern California Rooftop Solar Challenge from 2012 to 2013 (the utility-based scores for LADWP are incorporated into the City of Los Angeles' score):



4. Permitting: Best Practices



The City of Los Angeles meets the regional best practices in a number of areas. A description of these processes can be found in Table 1.

Table 1 City of Los Angeles Best Practices

Information Access: • Information Accessible Online, In Person, by Email and Mail • Point of Contact with Contact Information Found Online • Application Accessible Online, In Person, and by Email **Application Submission:** • Customer Completes a Residential Application in a half Day or Less • Applicant completes a Commercial Application in a Day or Less • Application Submission Online for Residential Express Permits and In Person for all others **Permit Processing Time:** • Policy to Track Application Residential Process Time • Average process time for residential systems is three days or less • Mechanism exists to expedite Residential Permits Over the Counter	**Fees:** • Information Accessible Online and In Person • Residential Fee of $250 or less • Residential fees calculated on a cost recovery basis **Model Rules:** • A standardized permitting process is used based on the CA Governor's Guidebook **Inspection:** • Information Accessible Online and In Person • Average number of Days between an inspection request and an actual inspection for Residential and Commercial at ≤ 2 days. • A two-hour inspection window given to installers • City contacts Utility automatically for interconnection

5. Permitting: Areas for Improvement Based on DOE Criteria

5.1. Information Access, Application Access, and Application Submission

The goal of this category is to improve the ease with which an applicant can access permit information, and obtain, complete, submit, and track an application.

5.1.1. Information and Application Access

To ensure that information about the permitting application process is easy-to-access, information and applications should be provided through an online information portal, email, in person, or by mail.

While the City of Los Angeles provides information access in all forms, it should address providing informational guides, checklists, and other readily usable documents to expedite submittal of all permits to facilitate application submittal and reduce errors.

The City also provides applications online and in person for residential and commercial. The City should address providing applications by email and by mail. The City may create forms that can be easily submitted by email. Such forms may be simplified for specific types of system sizes and may use fillable PDFs.

5.1.2. Submission of a Permit Application

Allowing applicants to submit an application to a single department online, through email, in person, or by mail serves as the best practice in the region.

The City requires submission to two departments for residential and commercial structures. The City should address the requirement that all residential and commercial applicants must submit an application to two departments. The City may internally route the application from one department to another. This process would reduce the amount of labor hours installers have to spend to move the application from department to department.

The City also only allows submission online for select express permits. The DOE also emphasizes utilizing the internet to save time, money, and resources serves as the major focal point behind creating or adopting online submission of an application. Consequently, it is important for the City to expand its online submission option to include all permits. Additionally, the DOE criterion also seeks to ensure that all available options for submission are in play. This includes using email and mail. The City may use email by creating a fillable PDF application that can be submitted electronically.

5.1.3. Permitting Process Time

The best practices in the region follow a policy that requires the issuance of a decision in three days or less for residential and five days or less for commercial permits. Jurisdictions using this best practice track the number of days required to approve or deny a permit allowing their applicable department to approve or deny a permit in three days or less for residential and five days or less for commercial. Additionally, the best practice in the region uses a mechanism to expedite the PV permit process. An applicant can either pay an additional fee or use preapproved solar plans (generally for small PV under 10 kW) to expedite the permitting process.

The City's policies follow many of region's the best practices. The City of Los Angeles tracks residential and commercial permit processing time. The City uses a policy to issue or deny a permit in four to ten days for residential but lacks a policy to require a decision in a specific time frame for commercial. The City also averages a processing time of three days or less for residential but five days or less for commercial systems under 10 kW. For systems over 10 kW, the city averages four to five days for residential and eleven to fifteen days for commercial. The City uses a mechanism to expedite its residential and commercial permit processes.

To reach all best practices in the region, the City should implement policies that require a process time of three days or less for residential and five days or less for commercial to decrease its average process time for all systems to three days or less for residential and five days or less for commercial.

5.2. Fees – Information Access and Fee Costs and Cost Calculation

Access to fee information, fee rates, and the basis for fee rates are important factors in the overall permitting process. Best Practices include making information available online, through email, in person, and by mail. The residential permit cost of $250 or less, including complete fee waiver paid for by a utility subsidy, represents the best practice for residential systems. The best practice in the region focuses on developing a fee that recovers a jurisdiction's cost for the time and resources expended to review a permit. The calculation for cost recovery should align the services burdened based on the size of the system to ensure that the jurisdiction recovers its cost without adding unnecessary expense.

The City provides fee information online and in person. The City of Los Angeles should address providing this information by email and by mail to ensure easy access to this information. The City also charges $250 or less for residential permits and uses a cost recovery basis for both residential. However, the City uses a value open cost calculation for commercial projects but should consider basing fees on the actual recovery of costs for time and labor burdened by the review process. The City may also investigate using a fee waiver to encourage rooftop solar.

5.3. Inspection

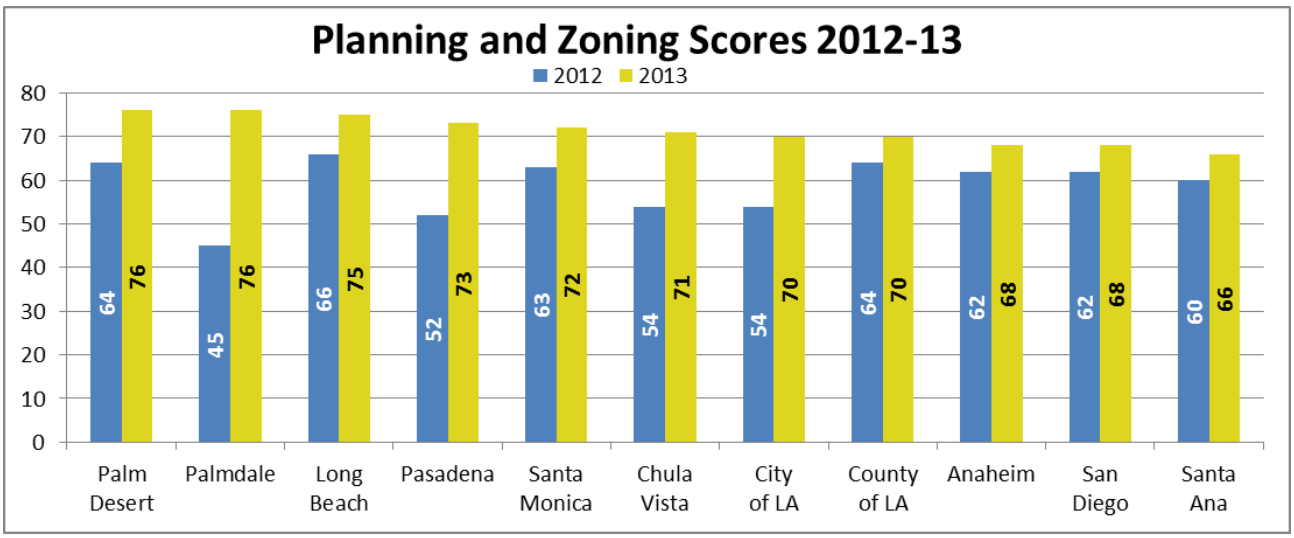
Regional best practices include providing inspection information online, by email, in person, and by mail. Residential installers receive either a specific time or a two-hour window for residential inspections while commercial inspection windows are two hours. Additionally, the best practice in the region utilizes a single comprehensive inspection instead of requiring separate inspections for electrical, structural, and roof penetration.

The City of Los Angeles provides inspection information online and in person. The City should investigate providing information by email and by mail to reach all types of customers. The City performs two inspections for residential and commercial (electrical final and structural final), but it should seek to integrate its inspection process into a single comprehensive inspection. This can be achieved by cross-training inspectors to be aware of what each inspection requires, so city resources can be reduced by having one comprehensive inspection instead of numerous individual inspections of the same system.

5.4.Road Map-Areas for Improvement Divided by Estimated Difficulty

1. Low Hanging Fruit (easy to implement actions)	1. Provide Fee Information by email and mail
	2. Provide inspection information by email and by mail
	3. Ensure that Commercial fee cost calculation is based on cost recovery
2. Medium Difficulty (Greater Capital investment or personnel Hours)	1. Provide Applications by mail
	2. Allowing Application submission by email and mail
	3. Create permit policy to issue/deny permit in three or less days for Residential
	4. Create permit policy to issue/deny permit in five or less days for Commercial
3. Difficult (significant change or investment in capital/personnel hours)	1. Adopt a unified online submission system for residential and commercial projects
	2. Decrease average permitting processing time to three or less days for Residential
	3. Decrease average permitting processing time to five days or less for Commercial
	4. Consolidate inspections to a single comprehensive inspection for Residential and Commercial
	5. Allow single Department permit submissions for Residential and Commercial

6. Zoning



6.1. Solar Rights and Access- Enforcement Mechanism to Support Solar Rights

The use of enforcement mechanisms to protect solar rights is a best practice in the region. The City should investigate creating an agency mechanism for enforcement and a fixed mechanism to enforce these rights. This should decrease the costs to a right holder by keeping any enforcement action out of the court system.

6.2. Solar Rights and Access- Local Process to Register PV System to Protect Access

The DOE seeks to create a state or local process to register PV systems to protect the solar rights associated with these systems. The City of Los Angeles should investigate the creation of this type of process. The City may specifically look to utilize the Los Angeles Solar Map as a process under which rights are recorded, updated, bought, sold, and terminated. This will require continuous updating and potential auditing to ensure accuracy.

6.3. New Construction

Various jurisdictions around the region use standards that decrease or eliminate barriers to solar deployment on new construction. These include east-west street and building orientation, solar ready construction guidelines, and solar easements for new construction. The City of Los Angeles should investigate adopting east-west street and building orientation, solar-ready construction guidelines, and solar easements for new construction for residential and commercial buildings to facilitate the integration of solar on new construction.

7. Finance

Please refer to the two Finance documents prepared as part of the Southern California Regional SunShot project for additional information on financing. The first document, the Southern California Solar Finance Guide, provides information to jurisdictions, contractors, and consumers about available solar financing programs in the region. The Property Assessed Clean Energy (PACE) policy document identifies and describes the current state of residential and commercial PACE financing programs in California and strategies for the implementation of PACE programs.

8. CONCLUSIONS

This assessment addresses the best practices and well as areas that may be improved upon to reduce or eliminate soft costs. Improvements in these areas will help strengthen existing processes while reducing their burden on a city and customer. This should help to mature the overall solar market in the region and standardize the processes across the region.

For updates and more information on the Southern California Rooftop Solar Challenge, please visit our website: www.energycenter.org/sunshot

Energy Solutions

Software Requirements Specification

Online Interconnection Application System

Version 1.00

Prepared by:
Aimee Beasley
Tim O'Keefe

Date: 9/26/2013

Table of Contents

Index of Figures

Index of Tables

Index of Appendix Figures

Executive Summary

California leads the nation in distributed solar generation. The installed cost of DG solar has decreased by over 30% since 2007[1] and many solar installations produce enough electricity to completely pay for themselves within 4-5 years (including incentives)[2]. With additional benefits including increased home value[3], environmental benefits, and protection from rising electricity prices, more and more ratepayers are choosing to install solar systems.

While there are clear financial and environmental incentives for customers to install solar systems, the process of interconnecting to their utility's electrical grid can be challenging. Even though the California Energy Commission's Rule 21 standardized application rules across the state, the interconnection paperwork process still requires significant effort from both applicants and utility staff. A recent study by the National Renewable Energy Laboratory (NREL) cited that it can require up to 80 hours of work for an installer to apply for interconnection for a > 30 kW system in San Diego Gas and Electric (SDG&E) territory[4], which has the shortest average interconnection times of all the California IOUs[5]. The US Department of Energy has suggested that administrative costs associated with permitting and interconnection can account for 30-40% of the total installed cost of solar[6]. This administrative burden on contractors, self-installers, and utility processors must be reduced in order for California to reach its distributed and renewable energy production goals.

This document specifies an online Interconnection Application System intended to simplify the interconnection application process and reduce associated administrative costs for both applicants and utility processors. The specified system is based around a streamlined workflow and clear documentation requirements to improve the clarity and transparency of the interconnection application process. The system also provides a unified process for installers who work with different utilities, fostering predictability and consistency throughout the territories of participating utilities. The Interconnection Application System specified in this document is presented as a viable way to reduce the administrative cost of installing a solar electric system, thereby reducing the overall installed cost of solar in California and beyond.

[1] http://www.californiasolarstatistics.ca.gov/reports/quarterly_cost_per_watt/
[2] http://www.nrel.gov/learning/pdfs/43844.pdf
[3] Ibid.
[4] www.nrel.gov/docs/fy11osti/51814.pdf
[5] http://www.californiasolarstatistics.org/reports/data_annex/
[6] http://energycenter.org/index.php/outreach-a-education/sunshot-initiative/documents/doc_download/1097-streamlining-solar-standards-and-processes

1 Background

1.1 Overview of SunShot Initiative

The SunShot Initiative is a United States Department of Energy (DOE)-funded effort to reduce the installed cost of solar to $2.25-$2.50/Watt. The Rooftop Solar Challenge is one component of this effort, focused specifically on innovative, local-government-level solutions for eliminating market barriers and lowering the non-hardware balance of system costs ("soft costs") of grid-tied photovoltaics (PV). One targeted soft cost is associated with the application process for utility interconnection. This document specifies an online interconnection application portal to be used by contractors, customers, and utilities throughout California. The online tool will decrease costs by improving efficiency of interconnection application processing for applicants (including NEM customers, solar contractors, and 3rd party financiers) and utility processing and management staff by achieving the following project goals:

Unified Portal and Process

- Provides all stakeholders in the interconnection process a single system for submitting applications for different Program Administrators
- Manages a large flow of applications with unified statuses, assignments, and progress tracking
- Indicates the remaining work to be done on a given application
- Notifies users who are assigned to complete remaining work

Facilitated Customer Communication

- Allows for digital document submittal, revision tracking, and re-submittal
- Communicates application status to Processors and Applicants
- Facilitates communication of responsibility across all parties

Automated Data Transfer with Utility and Large Contractor Data Systems

- Interfaces with existing PA processes and systems
- Imports application data directly from Applicants and/or Rebate Processing Systems
- Exports data as needed to other systems (e.g. California Solar Statistics)

Clear and Automated Reporting

- Stores statewide interconnection information in a single system with standard data collection requirements
- Provides reporting and data export options for internal and public purposes

1.2 Process Workflow

The system is designed to work with the customized workflow of any of the Utilities responsible for interconnecting distributed generation projects in California. Initial requirements were gathered prior to specification to identify a basic unified workflow across several utilities in Southern California (Southern California Edison [SCE], Pasadena Water and Power [PWP], and Los Angeles Department of Water and Power [LADWP]. The results of this process are shown in the optimized Process Workflow diagram provided in Figure 1 below.

The figure is formatted as a swim-lane diagram with Applicant actions in the top lane in orange, Processor actions in the middle lane in purple, and Technical Reviewer actions in the bottom lane in yellow. Decision points are shown as green diamonds. In the optimized Process Workflow, the Applicant submits an application; then, the application package is reviewed, potentially sent back for revisions, and eventually approved by the Utility processing team. Approval is tracked by the issuance of the Permission to Operate letter, which triggers the establishment of a NEM Billing Profile for the Host Customer, and completion of the Interconnection Process.

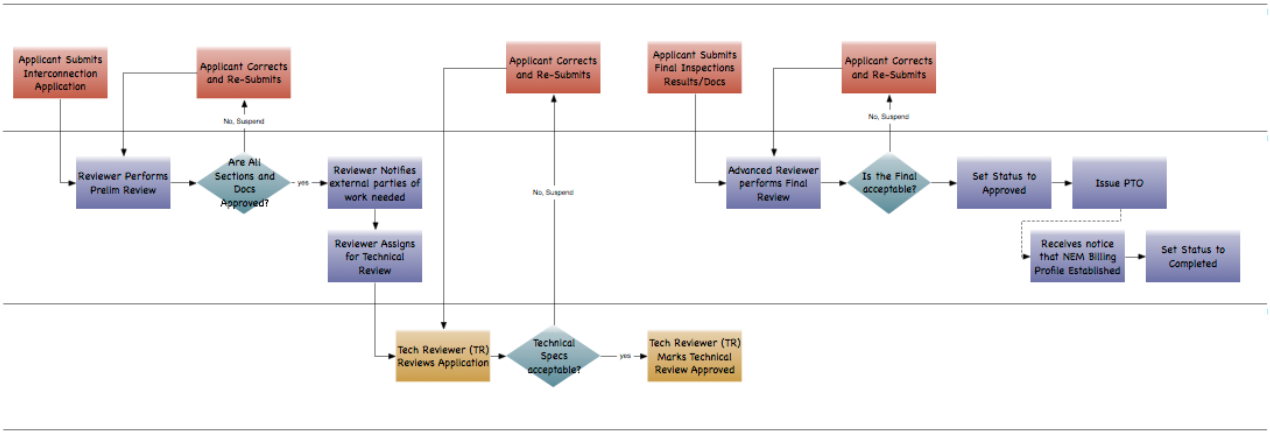


Figure 1: Unified Application Workflow

1.3 System Configuration

The online Interconnection Application system leverages the optimized Process Workflow as the framework for application processing, applying a universal set of statuses to all applications in the system. This supports the project goals of Unified Process and Clear and Automated Reporting.

Another key goal of the system is to create an online application tool that can be adopted by any Utility. Recognizing that the California utilities have unique processes and procedures for interconnection, the system is designed with customizable features to support sub-processes such as specific document requirements, notifications, approvals, and processor assignments. The Utility's program manager and the Technical Support Admins will work together to configure the custom system features at the time of system set-up. These custom features are described in detail throughout this specification.

2 Interface Design

The system interface facilitates the application submission, review, and reporting requirements for all users. The interface design has been based around these permission-based views and the following section describes how each of the user types may interact with the interface.

The system has four main user types: Applicant, Processor, Technical Support Admin, and Regulator. Applicants are professionals or self-installers who complete applications for interconnection. Processors work at one of the participating Utilities where they process applications and only have access to their Utility's applications. Technical Support Admin have access to all applications in the system and all views; therefore those interface views are not described in this section. Regulators only have permission to download reports and do not have access to applications. Within the different user types, there are additional permissions for user management and review.

2.1 Site Map

To meet these process requirements, an online application-processing tool has been designed. The Site Map for Processor users (including Processor Admins) is shown below in Figure 2. The Site Map for all of the User Types is provided in Appendix B.

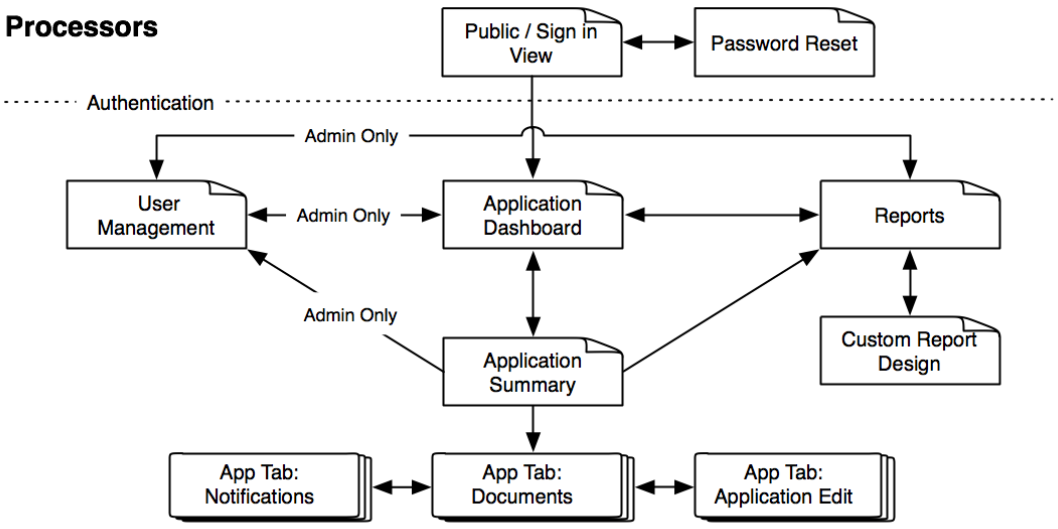


Figure 2: Online Interconnection Application System Site Map for Processors

2.2 Public Home / Sign In View

When the site is accessed, the user is shown the Public Home / Sign In view (Figure 3). From this page the user can register a new account or sign into an existing account to access the online application system.

This view also contains links to download the user guide and instructions for contacting technical support as well as contact information for each of the participating Utility clients.

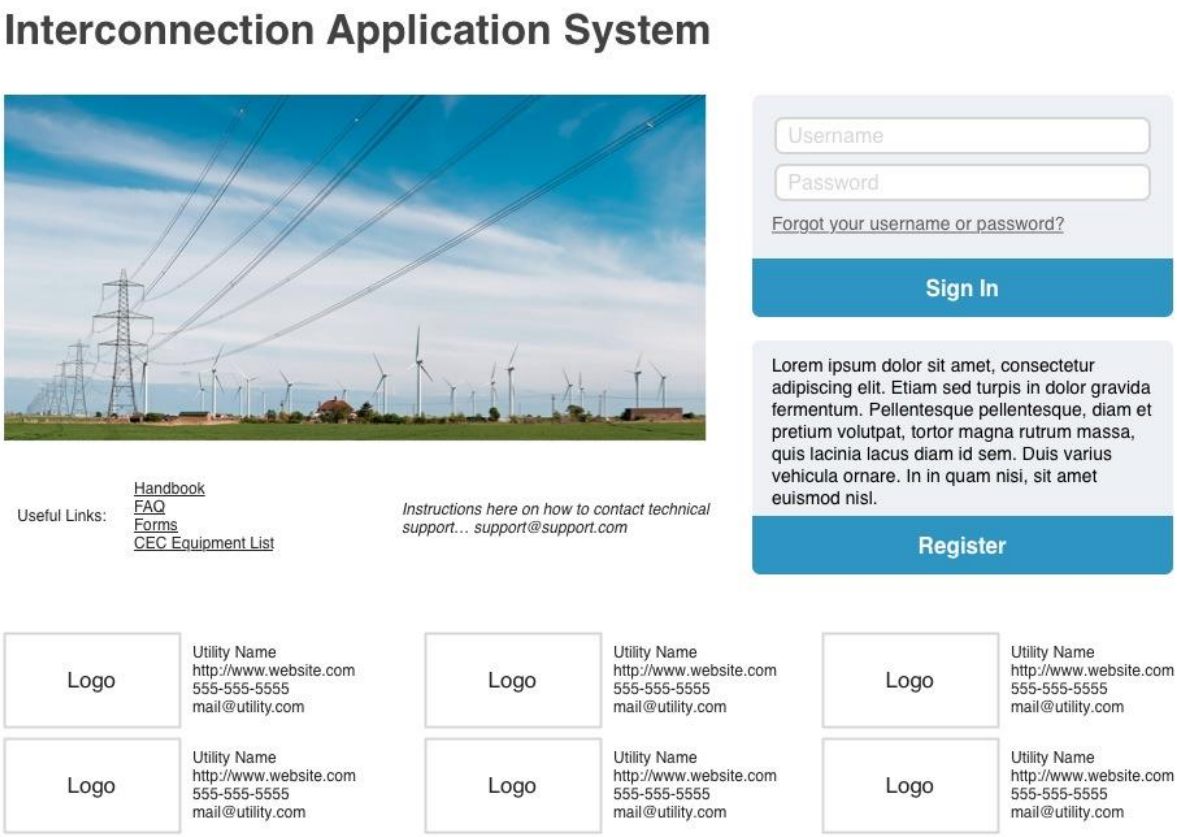


Figure 3: Public / Sign In Interface

2.3 Applicant Interface

This section describes the features of the applicant interface, what each of the views will look like and what available features will be included for the Applicant and Applicant Admin users. Note that the images below are for feature demonstration purposes only and are not intended to represent the final graphic design of the system.

2.3.1 Application Dashboard

The Application Dashboard view, shown in Figure 4, is what the Applicant views after they sign in. This shows the current list of applications associated with their User Group, and a snapshot of information on the progress of those applications.

Using the Application Dashboard the Applicant can do the following:

1. Identify who is signed in and the ability to sign out
2. Create a new application or batch upload new applications if allowed
3. Search for a specific application or set of applications and export the search results.
4. View the status of all applications for the company (or individual) and open an application for editing

5. Monitor the progress of applications that the Utility is working on but has not yet Approved
6. Quickly see the status of the Final Inspection Results (Received, Approved, Rejected)
7. Remove New applications that are obsolete

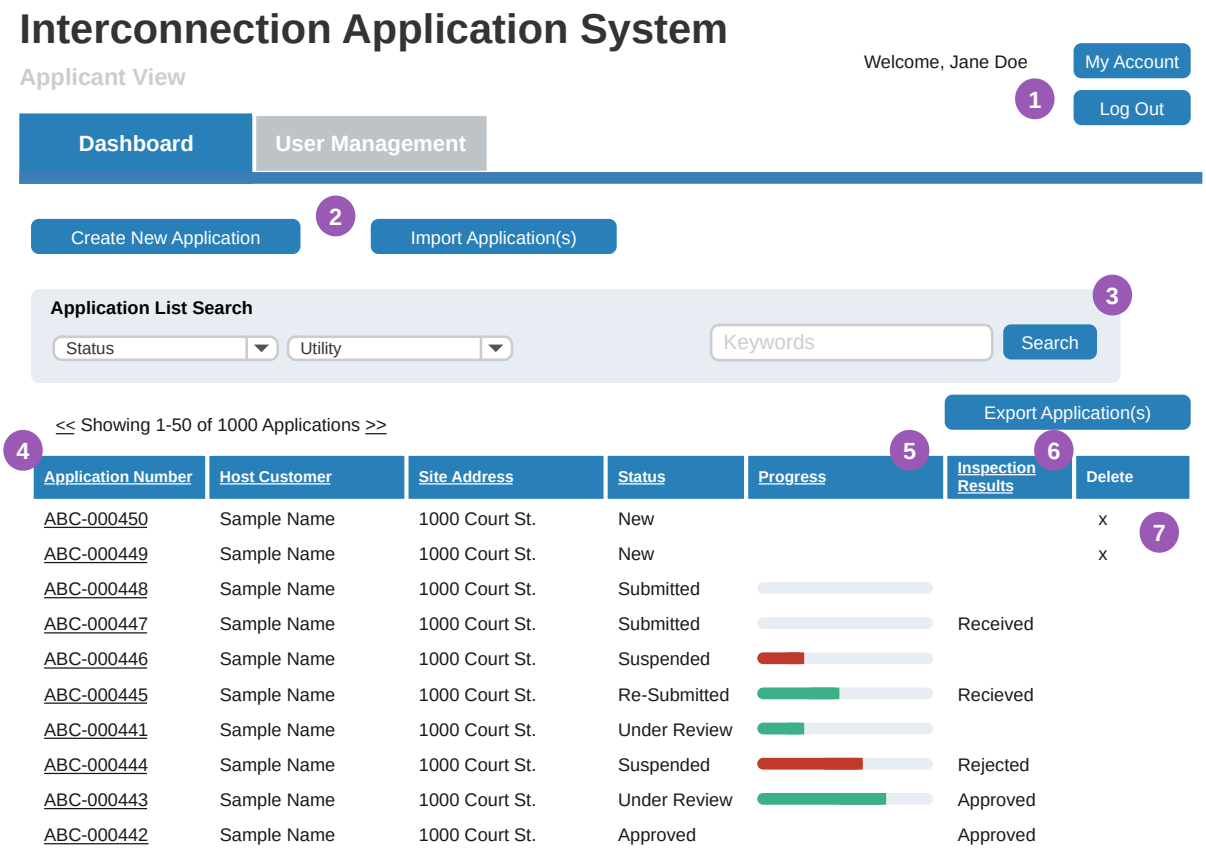


Figure 4: Applicant View - Application Dashboard

2.3.1.1 Application List Panel

The Application List is the main item on the Application Dashboard. The list shows by default all viewable applications sorted by status in workflow order, with New applications at the top of the list and Completed and Cancelled applications at the end of the list. The user may sort by any of the columns by clicking on the column header. The panel shows 50 applications at a time, with the ability for the user to navigate to other pages if needed. Each application is represented as a row in the table, with Application ID functioning as a link to the complete application.

The additional columns of information provided communicate the most critical information to the user at a glance.

- The Host Customer and Site Address
- The application Status, indicating what step in the process the application is in

- A progress bar, indicating how much more work remains on the application (the shaded area indicates the % of items in the application's checklist that have been checked off, as discussed in Section 2.4.2.1.3.)
- A column indicating whether the Final Inspections Results have been received, approved, rejected, or are still pending for the application
- A link to allow Applicants to delete new applications that will not be submitted.

For more information the user can click into a specific application or download a detailed report of multiple applications.

2.3.1.2 Search Feature

Users can use the search panel on the dashboard to filter the Application List by Status, Utility, and/or by keywords taken from the columns (except "Delete") in the Application List. The keyword search matches will be case-insensitive, and will match partial strings, as indicated in the tables below.

To illustrate matching behavior for keyword search, refer to the following tables. If the list in Table 2 is the full list of applications for a Utility "ABC", then

Table 3 indicates the results that are found by searching for several different keywords.

Table 2: Example Applications for Keyword Search

ID	Applicant Company	Host Customer Company	Site Address	Status
ABC-000253	U.S. Solar Distributors	U.S. Solar Distributors	2100 Chicago Avenue Riverside, CA 92507	Completed
ABC-000021	Solaria Technicians	Home Supplies Warehouse	2650 Walnut AVE #A Tustin, CA 92780	Under Review

Table 3: Example Searches and Results from the Table 1 List

Search String	Matching Applications (by ID)	Matching Value(s)
21	ABC-000021	ABC-0000**21** **21**00 Chicago Avenue
2	ABC-000253, ABC-000021	Matches every instance of "2" in the fields shown in Table 1
ave	ABC-000253, ABC-000021	2650 Walnut **AVE** #A 2100 Chicago **Ave**nue
solar	ABC-000253, ABC-000021	**Solar** and **Solari**a are matches
riverside	ABC-000253	**Riverside**, CA 92507
Review	ABC-000021	Under **Review**

2.3.1.2.1 Search Persistence

Search terms will appear in the Search Panel while the user is viewing the list produced by that search. If the user navigates away from the search results, the search will be cleared and the entire list of applications will be displayed the next time the Application Dashboard loads. For search results that are longer than one page, the search will persist if the user navigates through the paging interface, but will be cleared if the user clicks on a link that navigates to a new page.

2.3.1.3 Exporting Application Data

Applicants can download application data using the Export Application(s) button just below the Search panel. This function creates a report for all of the applications that meet the current search criteria. If the search criteria return multiple pages of results, all pages will be included in the report. If no search criteria are specified, the report will generate for all applications in the Applicant's User Group.

The report will be formatted as a .csv file. For more information on report configurations, refer to Section 7.3.

2.3.1.4 Creating New Applications

There are two methods for creating new applications: manual or via bulk upload. The manual method of application creation begins by clicking the "Create New Application" button on the Application Dashboard. This button takes the applicant to a blank version of the Application Type form as described in Section 2.3.2.1.

The second method is application bulk upload. The applicant clicks on the "Import Application(s)" button on the Application Dashboard. The button re-directs the user to the Bulk Upload form described in Section 2.3.1.5

2.3.1.5 Application Bulk Upload

Applicants can create new applications using the Bulk Upload form rather than enter the application data field by field in the interface. A pre-defined data format for application data submission facilitates the creation of multiple applications at a time, further reducing the administrative burden on Applicants with medium to large volumes of applications, such as regional contractors and housing developers. This feature is only applicable for short-form applications, which have identical field requirements across all utilities.

The Bulk Upload standard file format is as follows:

- Each row of the file represents a different application
- Every column of the file represents a specific data field from the application form
- Files shall be formatted as comma separated values (.csv)

The Bulk Upload feature will import and validate the data submitted prior to creating an application for each of the rows in the file. Applications are created in the order they are listed in the file and assigned a unique Application ID. The application type for each application defaults to the short form. After a successful upload, the user is redirected to the confirmation page that displays a list of all the new

applications created. Some Utilities may elect to have this list of Application IDs also sent in an automatic confirmation e-mail to the applicant.

The bulk upload creates but does not automatically submit the applications. The Applicant navigates to the new applications, reviews the application form, attaches documents to the application package, and submits.

2.3.2 Application Edit View and Tabs

The Application Edit view for an Applicant user is navigated using two tabs, the 'Edit Application' tab and the 'Documents' tab. When a new application is created the page defaults to the Edit Application tab. After an application has been saved, opening the existing application redirects the user to the Documents tab. The Edit Application tab contains the form where the Applicant can input data required to complete the application. The information that the Application tab displays does not depend on the application status. However, editing may be disabled for certain users depending on the status of the application.

The Documents tab displays the list of all required and/or attached documentation for the application, including an automatically rendered .pdf version of the Edit Application view in the Utility-specific interconnection application form.

2.3.2.1 Application Edit Tab - Application Type Panel

The Application Type Panel (Figure 5) is the first part of the application form. The blank form is displayed when a new application is created. As the checklist is configurable to the Utility client, the applicant must first select the Utility Territory before the rest of the Application Type Panel can display.

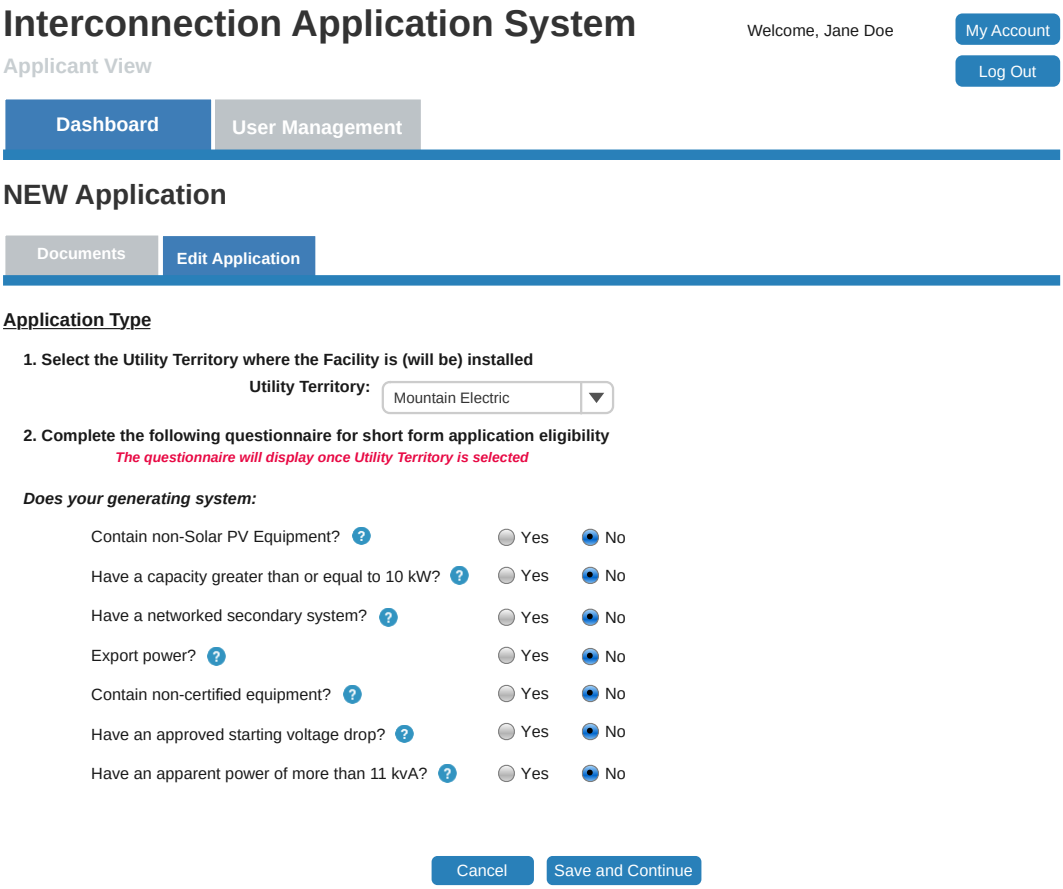


Figure 5: Application Type Panel

The purpose of this panel is to determine which form is required for the application: the Simplified Interconnection Application ("short form") or the Generating Facility Interconnection Application ("long form"). The selection of Utility Territory from the dropdown designates which branding should be displayed on the printable form view in the Review tab, as well as other custom features that have been configured for that Utility.

When the user has completed the Application Type panel and clicks "Save", the system assigns an Application ID. The system also determines whether the short form or long form is required for the application. The Application ID displays in the header section and the applicable form is then displayed directly below the Application Type Panel as shown in Figure 6. In the example below, the short form is displayed.

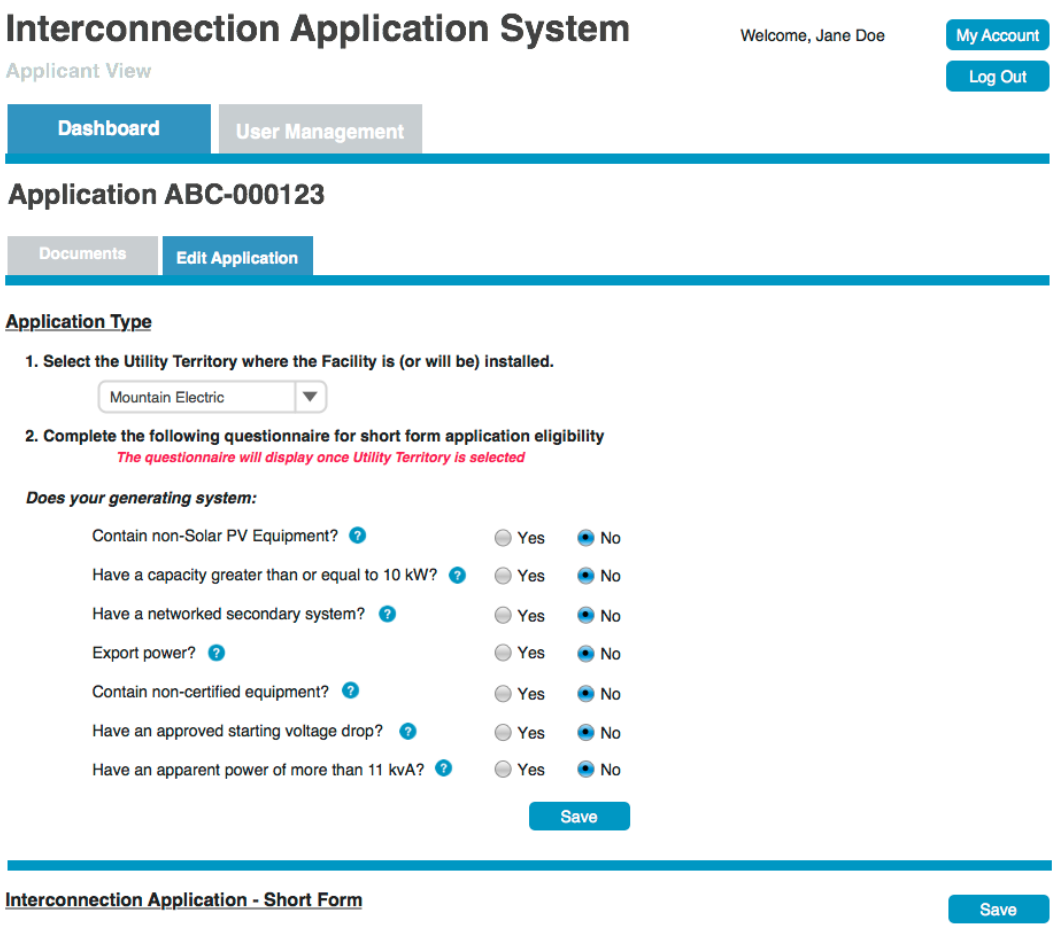


Figure 6: New Application - After the First Save

Once the Application Type panel is saved, it can no longer be changed. If the Applicant has made a mistake, s/he will need to create a new application. Applicants have the ability to delete applications that they have made in error.

2.3.2.1.1 Configuration of Application Type Checklist

The list of criteria for long-form applications will be defined at the time of system set-up for each Utility. A Utility may ask as many Yes/No questions as needed to determine if the short form may be used. The questions will be formatted so that if the Applicant answers “No” to all of the questions then the short form will be used. If the Applicant answers “Yes” to any question, then the long form is required.

2.3.2.1.2 Application IDs

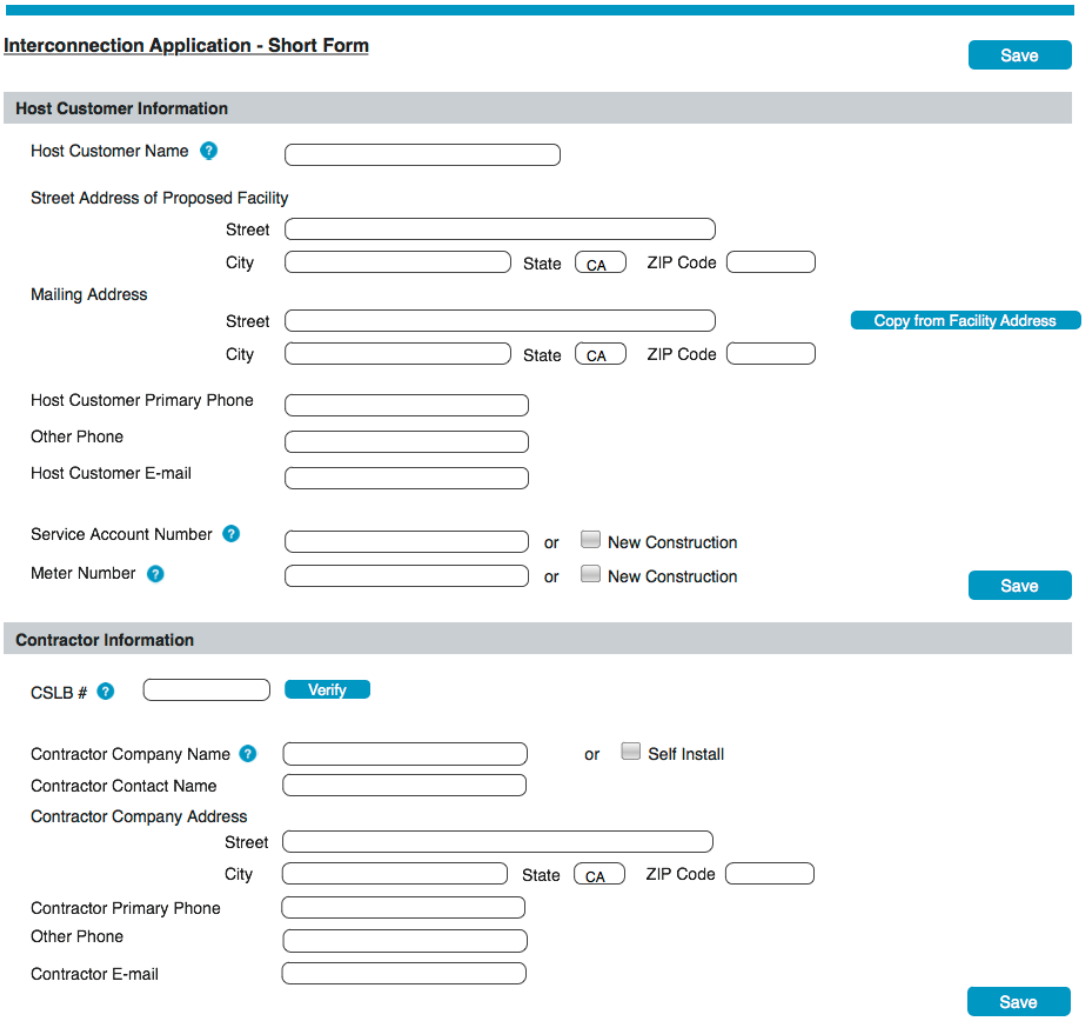
The Application ID is the unique identifier for each application in the Interconnection Application system. Application IDs have the format **ABC-INT-#######**. The first three letters are an abbreviation for the Utility. The second three letters indicate that it is an interconnection application. The following seven digits indicate the order in which applications are received. The seven-digit number is always unique and does not overlap across territories: new Application IDs are always assigned the next highest Application ID across all participating programs. The Application ID is assigned to an application the first

time that the Application Type panel is successfully saved. The Application ID is then displayed in the upper left hand corner of all application pages.

2.3.2.2 Application Edit Tab - Short Form

When the information in the Application Type panel matches the criteria to use the short form (as configured by that Utility), the system displays the short form directly below the Application Type panel on the Application Edit tab. The short form collects key information required to process a simple application. An example is provided in Figure 7 below.

The short form fields are universal across all participating Utility territories but not all fields may correspond to a field on the utility-specific form. When preparing the formatted utility-specific application form, only the required (applicable) fields will be mapped onto the printable application format. Extra data will be accepted and stored in the database but not presented on the .pdf.



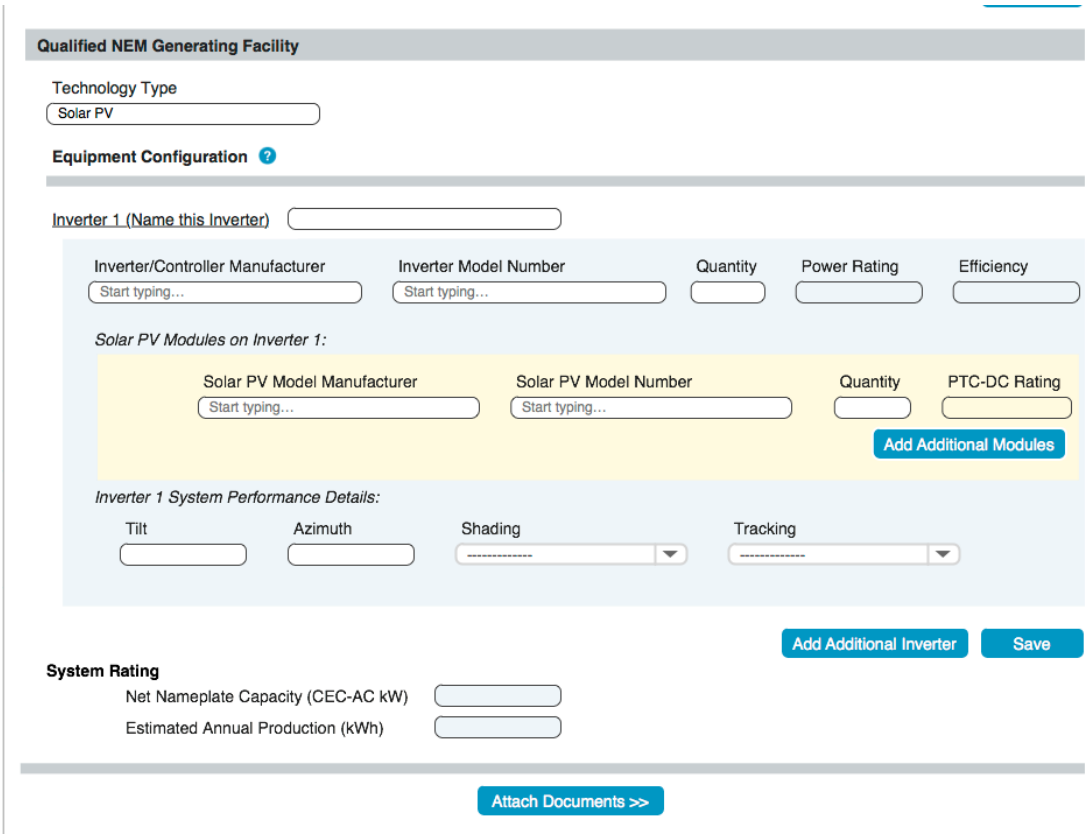


Figure 7: Application Tab - Short Form

The Applicant enters information about the Host Customer and facility address. In the Contractor Information section, the Applicant can use the CSLB verification function to auto-fill the rest of the contractor information or type in the information manually. Finally, the Applicant enters the equipment information, grouped by inverter (see Equipment Section 2.3.2.7). The user can save the progress on the application at any time. Each time the application is saved, form validations are performed. If a validation fails, the form retains the entered data and displays error messages in context to help the Applicant correct the necessary fields. Note that if the user does not correct the errors and successfully save the application, the entered data will not be stored in the database.

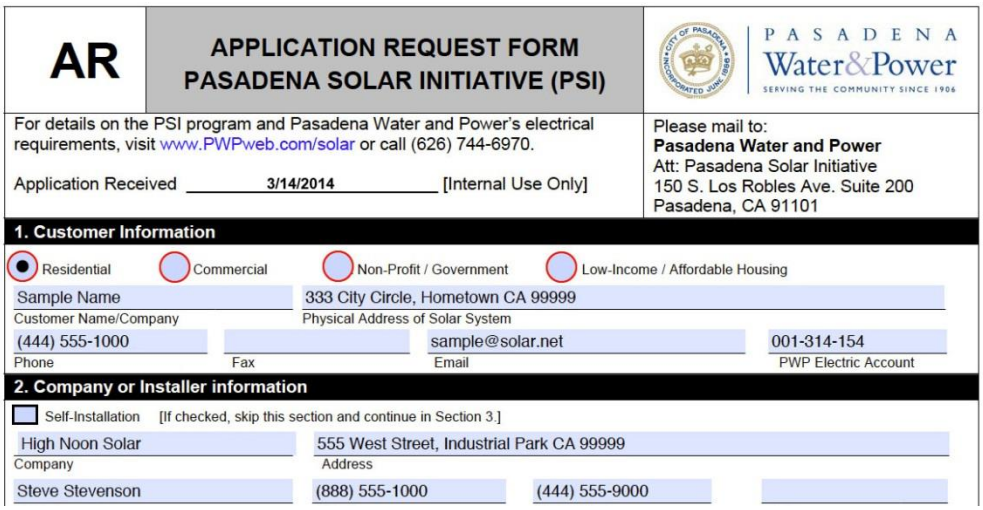
Additionally, each time the form is saved, the latest version of the Application Form in the documents list is updated. Once the Applicant is done, s/he saves the application and continues to the Documents Tab to view their formatted application and to attach the rest of the document requirements.

2.3.2.3 Viewing the formatted Interconnection Application

Each utility controls the display of the individual application review forms to match the legal and branding requirements for the Interconnection Application form submission.

The example provided in Figure 8 below shows how the formatted information displays in the Interconnection_Application.pdf file that can be downloaded from the Documents tab for a PWP

application. Examples of the Interconnection Application forms for SCE and PWP are provided in Appendix C: Utility-Specific Interconnection Application Forms.



AR

APPLICATION REQUEST FORM
PASADENA SOLAR INITIATIVE (PSI)

PASADENA Water&Power SERVING THE COMMUNITY SINCE 1906

For details on the PSI program and Pasadena Water and Power's electrical requirements, visit www.PWPweb.com/solar or call (626) 744-6970.

Application Received 3/14/2014 [Internal Use Only]

Please mail to:
Pasadena Water and Power
Att: Pasadena Solar Initiative
150 S. Los Robles Ave. Suite 200
Pasadena, CA 91101

1. Customer Information

(●) Residential ( ) Commercial ( ) Non-Profit / Government ( ) Low-Income / Affordable Housing

Sample Name	333 City Circle, Hometown CA 99999		
Customer Name/Company	Physical Address of Solar System		
(444) 555-1000		sample@solar.net	001-314-154
Phone	Fax	Email	PWP Electric Account

2. Company or Installer information

[ ] Self-Installation [If checked, skip this section and continue in Section 3.]

High Noon Solar	555 West Street, Industrial Park CA 99999		
Company	Address		
Steve Stevenson	(888) 555-1000	(444) 555-9000	

Figure 8: Formatted Interconnection Application - Short Form

2.3.2.4 Application Tab - Long Form

When a system does not meet the Utility's short form requirements, as specified at system set-up, the system will display the long form directly below the Application Type panel. Concurrently, the system will display a pop-up window that contains a set of instructions for completing the long form.

2.3.2.4.1 Long Form Instructions Pop-up

Many of the hardcopy application forms include a page of instructions for the user. Rather than include the text on the online application form, these instructions are displayed for the user in a pop-up window, which appears the first time the Application Type panel is saved and the long form is loaded onto the Application Tab (Figure 9).

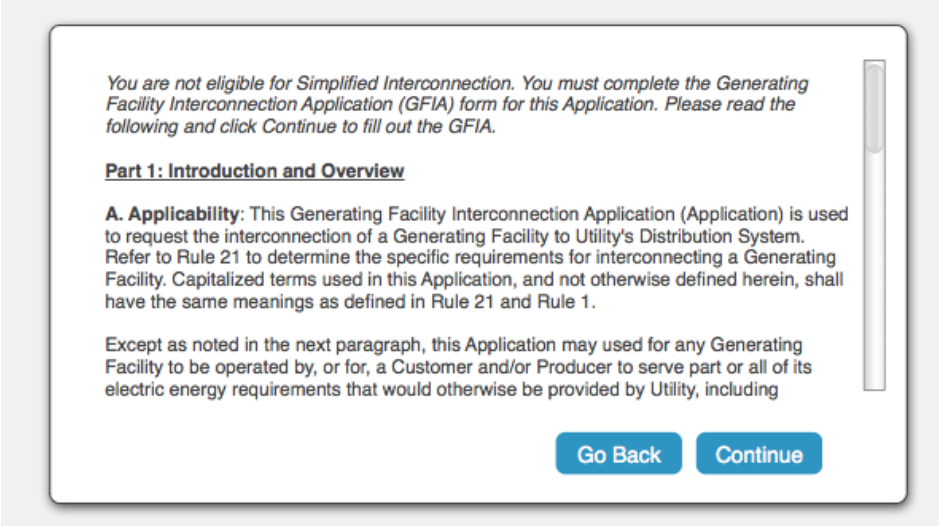


Figure 9: GFIA Instructions Pop-up Window

The user is prompted to read the instructions and close the box to proceed with completing the application. If the user needs to revisit the instructions they click on a link provided in Part 1 of the long form to re-open this pop-up.

The instructions text box is configurable by Utility client and is an optional feature. If no instructions are required this item can be disabled.

2.3.2.4.2 Long Form Details

The long form collects the detailed information required to process a more complex application. An example of the first part of the long form is provided in Figure 10 below.

The list of questions displayed on the long form is the same for all Utility clients; however, during initial configuration the Utility client can designate which fields will be required for their specific long form to be submitted.

When preparing the formatted Utility-specific application form, only the required (applicable) fields will be mapped onto the printable application format. Extra data will be accepted and stored in the database but not necessarily presented on the .pdf.

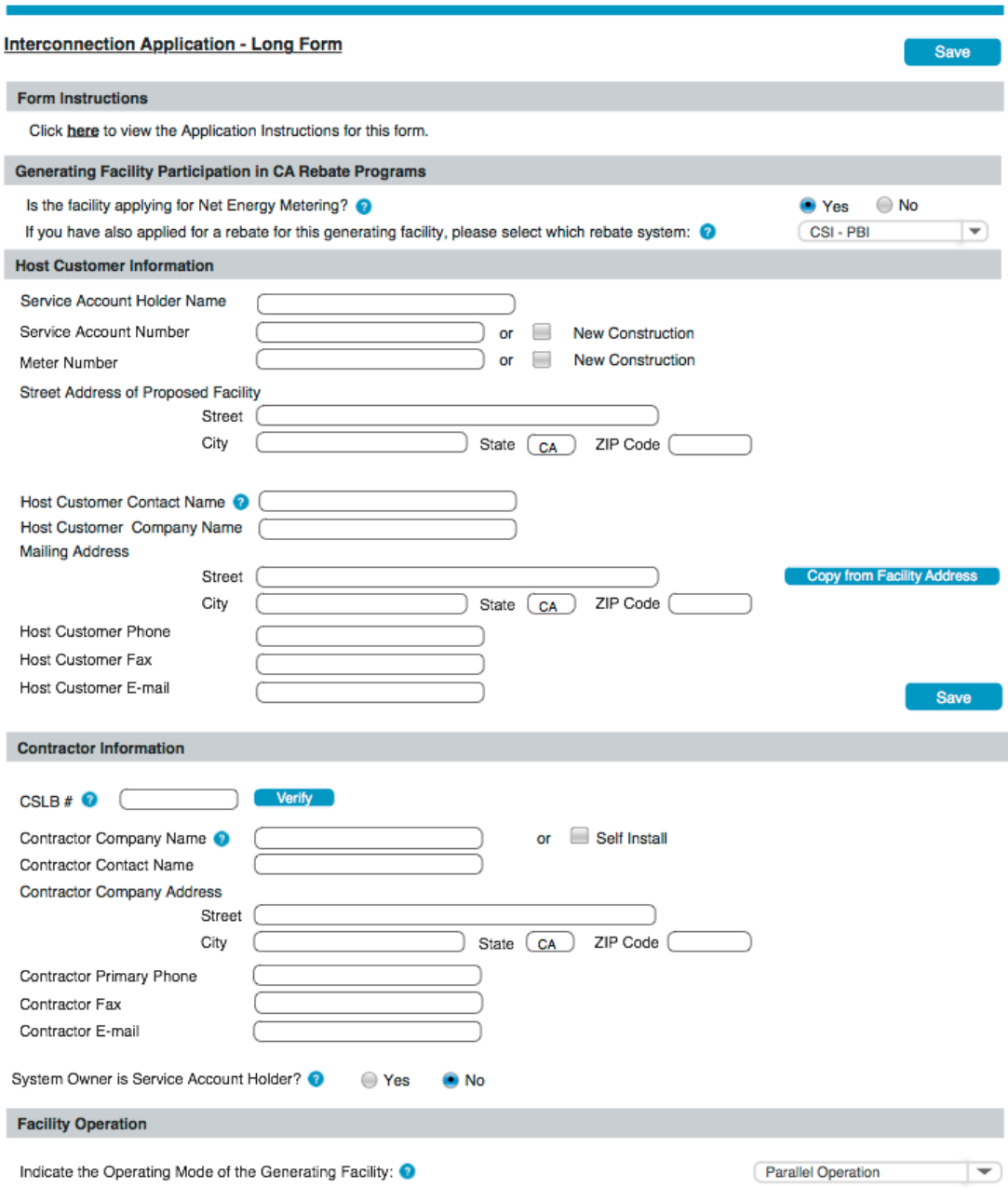


Figure 10: Application Tab - Long Form Excerpt

Supporting information and instructions are provided for the more complicated questions. A question with additional information is marked with a question mark icon. The Applicant can click on the icon and open up a pop-up window can remain open while they answer the question.

The Applicant enters data into the applicable form fields. Once complete, the applicant saves the form and moves on to the Documents tab. Data validations as well as automatic updates to the rendered .pdf version of this form function the same as for the short form (as described in Section 2.3.2.2).

2.3.2.4.3 Configuring the Long Form

A Utility Processor Admin or project manager will work with the Technical Support Admin to establish which of the long form questions are required for their particular long form at the time of system set-up.

A proposed list of long form questions has been provided in Appendix E: Long Form Fields.

2.3.2.5 Revision Tracking

All changes made to an application in the system are tracked in a Revision History. The revision history is not visible to applicants or Applicant Admin users. The detailed description of the revision history feature is provided in Section 2.4.2.4.

2.3.2.6 Form Submission Validations

Regardless of whether the application is using the short form or the long form, there are certain fields and documents that are required before the application can be submitted. Before these requirements are met the Applicant is not able to submit the application.

Before the Submit button is activated, the following validations must pass:

- All Required Fields have been entered
- All Required Documents have an Attachment

If the Applicant tries to submit an either of the validation types fail, the form retains the entered data and displays error messages in context to help the Applicant correct the necessary fields.

2.3.2.7 Equipment Data

The ability to track the installed capacity of distributed generation is one of the key features of the Interconnection Application system. On the short form, the equipment section takes a series of inputs and leverages external resources such as the CEC Inverter and Panel ratings, to calculate the Net Nameplate Capacity and Estimated Annual kWh Production for the equipment on the application.

Equipment entry begins by the Applicant selecting the Inverter Make and Model from the auto-fill dropdown in the Equipment Panel and setting the quantity. The auto-fill dropdown is populated from the CEC list of rated equipment. The system periodically queries the AESC database for a list of approved inverters and panels, keeping the system database in sync with the CEC list.

When an inverter from the list is selected, the system displays the power rating and efficiency as reported by the CEC. The process is repeated for the PV modules associated with the inverter. Once the module information is entered, the PTC-DC rating is imported from the CEC list. The Applicant may add additional modules to the inverter if needed. After the first inverter/module pairing is saved, additional panels can be associated with the inverter and additional inverter/module pairings can be added to the application.

Upon application save, the equipment section runs a calculation of Net Nameplate Capacity and Estimated Annual kWh Production using the following equations:

$$Net\ Nameplate\ Capacity = \sum^{All} \frac{Quantity_{\ PV\ Modules}\ x\ PTC\ DC\ Rating_{PV\ Modules}\ x\ Efficiency_{Inverter}}{1000\ watts}$$

$$Estimated\ Annual\ kWh\ Production\ =\ Net\ Nameplate\ Capacity\ (kW)\ *\ Capacity\ Factor\ *\ Hours/Year$$

2.3.2.8 Non-Rated Equipment

Each Utility will specify at system set-up if non-rated Inverters and Panels can be manually entered in the auto-fill fields of the Equipment Section. If no manual entry is allowed, the Applicant will need to complete the long form. If manual entry is allowed, it will appear as an option in the auto-fill. When a user selects to enter their own equipment, the rating and efficiency fields must be entered before the system rating can be calculated.

2.3.2.9 Equipment Change Requests

Equipment Change Requests occur after initial Submission. The requests are triggered by a change to the quantity or type of equipment that is installed when it differs from what was originally communicated to the Utility.

While the application is in a Processor editing status, the applicant cannot save any changes on the application form. However, an Equipment Change can be requested via the interface. The Applicant updates the equipment information and submits the Request. The Processor interface then alerts the Processor that there is a pending Equipment Change Request on the Application.

2.3.3 Documents Tab

Whenever an existing application is opened from the Dashboard, the page redirects to the Documents tab. The Documents tab is used for managing the application "package" or set of documents, including the Interconnection Application, that constitute a complete application.

During the initial application submission, the Documents tab is used for attaching the required documents. After initial submission the Applicant uses the Documents tab to download redlined files ("Markups") sent by the Utility, upload revisions to documents, track document versions and status, and read notes sent from the Utility.

An example of the Documents tab for a new application that has not yet been submitted is provided in Figure 11 below. The features of the Documents tab are detailed in Section 4.

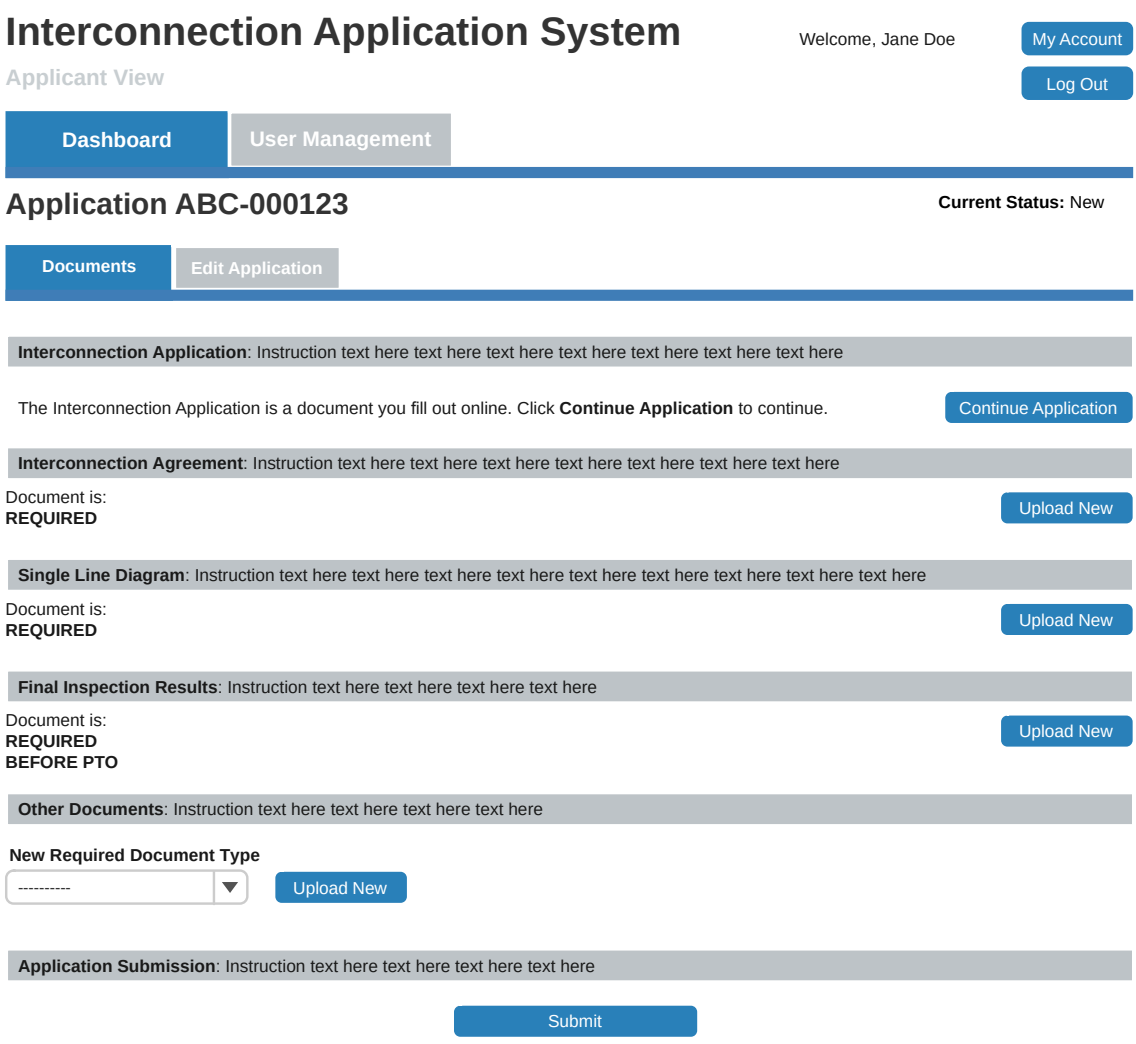


Figure 11: Applicant Documents Tab

2.3.3.1 Configuring the Required and Available Documents List

A master list of Documents is available for use by any Utility. Each Utility will specify at the time of system set-up which of the documents will be required for a short form application and a long form application. They will also specify which other document types should be included in the list of available (but not required) documents in either case.

2.3.4 Application Submission Confirmation Page

The application can be submitted once the Interconnection Application form is completed and a file has been attached to all required Document Types. The Applicant clicks to "Submit" the application from the Documents Tab. If all the validations pass, then the application status is changed from New to Submitted. The Applicant is redirected to a confirmation page indicating that their application is successfully submitted as shown in Figure 12. It is not possible to navigate directly to this page.

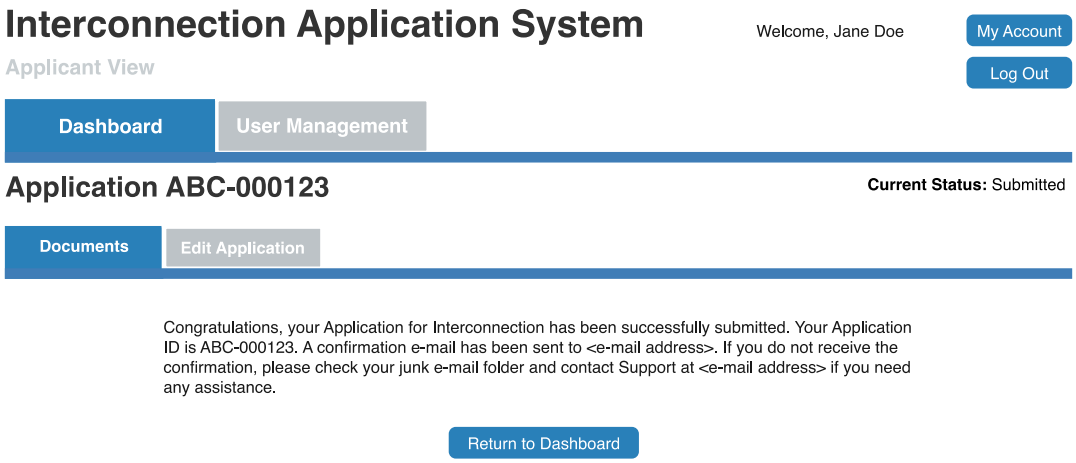


Figure 12: Application Submission Confirmation

After receiving confirmation the Applicant returns to the Dashboard view to work on other applications or to monitor the status of the newly submitted application.

2.3.5 User Management

Applicant Admins have access to the User Management page via a link in the navigation bar on each page. The User Management functionality is described in Section 5.1.3.1.

2.4 Processor Interface

This section describes the information and functionality that Processor and Processor Admin users will use to process applications.

2.4.1 Application Dashboard

The Processor Application Dashboard shown in Figure 13 is the page that any Processor sees after signing in. The Processor has much of the same functionality that the Applicant has with a few additional features.

Using the Dashboard, the Processor can:

1. View a list of applications in their own Utility's territory and open an application for review
2. Search through applications based on Status, Assignee, and keyword
3. View the Status of a specific Application
4. Identify applications that are unassigned and available to be worked on
5. Monitor the progress of applications that the Utility is working on but has not yet Approved
6. Quickly see the status of the Final Inspection Results (Received, Approved, Rejected)
7. View and remove New applications that are obsolete

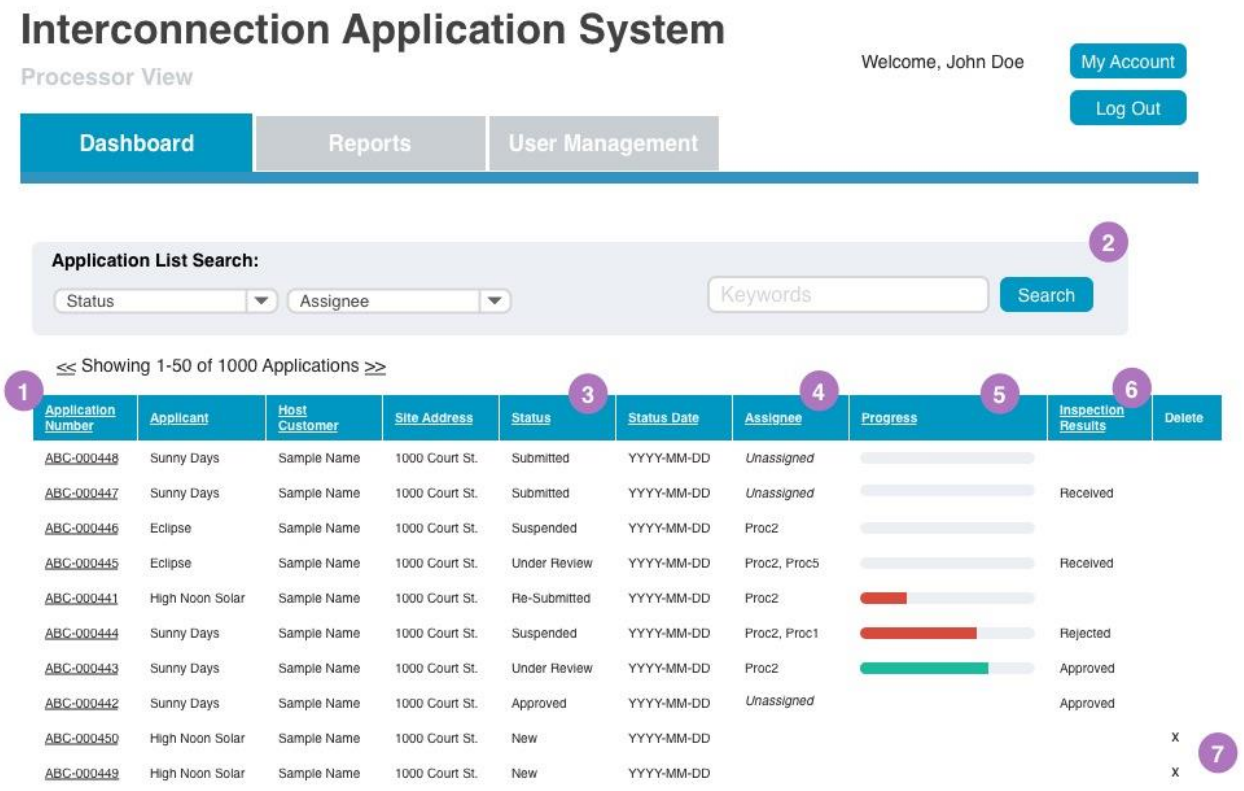


Figure 13: Processor Application Dashboard View

2.4.1.1 Application List Panel – Processor View

The main item on the Application Dashboard is the Application List. The list has the same functionality provided for the Applicant in Section 2.3.1.1, with a few exceptions. The Application List panel for Processors includes the additional columns of Applicant Name, Processor Assignee(s), and the date of the last status change.

The default sort order starts with the Processor Workflow at Submitted status, which is slightly different than the Applicant workflow. Namely, New applications are listed at the end of the sort order since they are of lowest priority for Processors.

2.4.1.2 Search Feature

In addition to the Search functionality described in 2.3.1.2 for Applicants, Processors will be able to search by Assignee. Selecting from the list of available Assignees in their User Group, the Processor can filter the results down to just those that are currently assigned to a particular user.

2.4.2 Application View

The Application View for Processors centers on the Application Summary panel and three sub-tabs. When an application is opened, the top section of the page displays the Application Summary panel. Below the summary are three tabs, with the Documents tab as the default display. The Documents tab is used for managing the document submissions required for the Application including the Interconnection

Application. The Edit Application tab allows the Processor to Review, Approve, and Edit the Application Form data when the application is in a Processor editing Status (not New or Suspended). The Notifications tab displays a history of all the automatic Notifications that the system has sent regarding the Application.

2.4.2.1 Application Summary Panel

The Summary Panel is displayed at the top of the Application (Figure 14). The panel has 5 sections:

1. Summary
2. Assignments
3. Checklist
4. Status
5. Notes

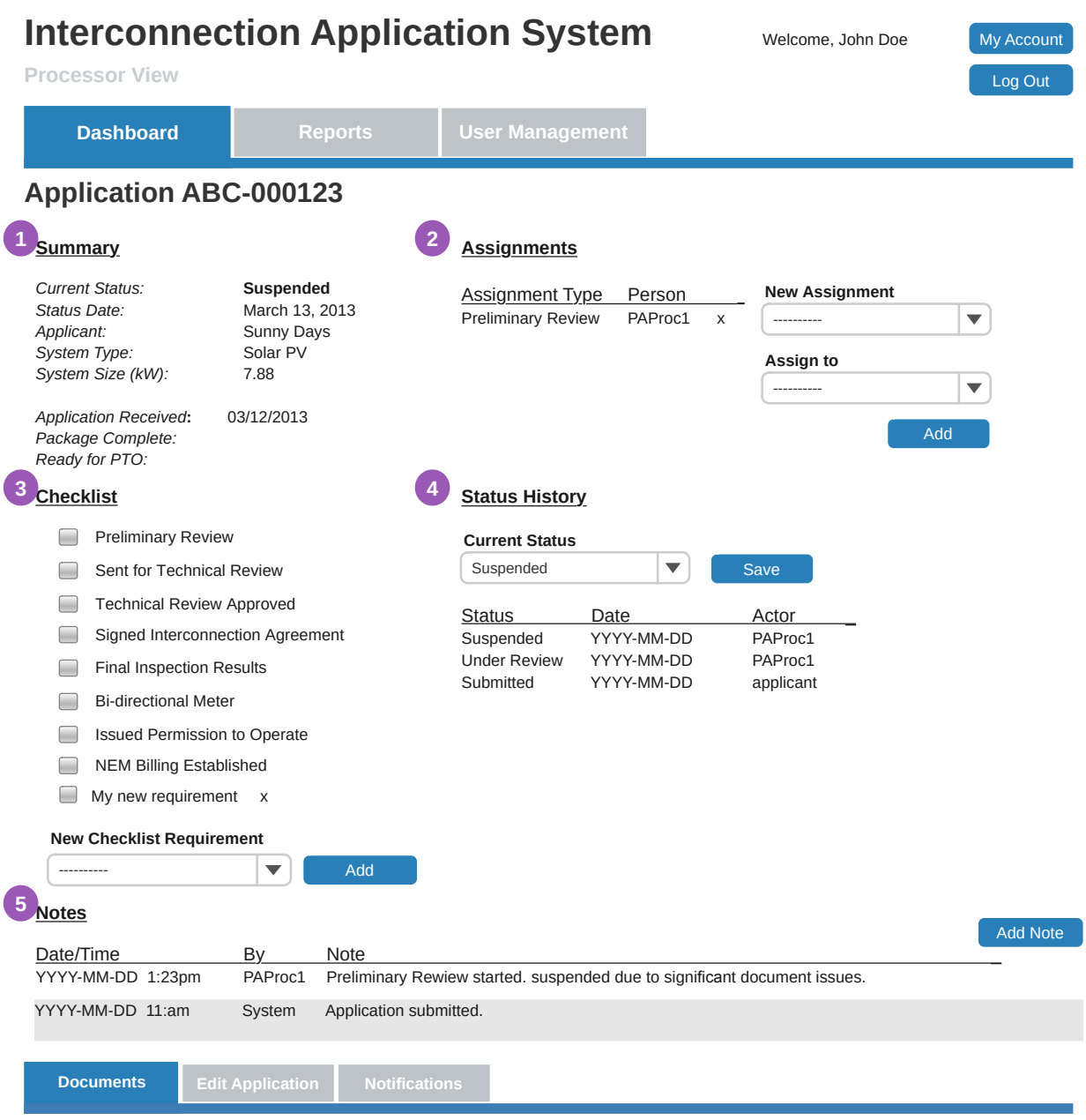


Figure 14: Application Review Panel – Processor View

2.4.2.1.1 Summary

The Summary gives a quick view of key application characteristics, such as equipment type, Applicant name, current status, and system size. The Summary section also displays three key application dates: Application Received, Application Complete, and Ready for PTO.

Application Received is the date that the Application is first Submitted by the Applicant.

Package Complete is the date that the final version of the Application package is received. This is calculated as the submission date of the final document that achieves the Approved status. If an Approved document is later Rejected, the existing date will be removed. The Package Complete date can be manually edited or removed by a Processor.

Ready for PTO is the date that all checklist items up until PTO issued are checked. This date indicates that the PTO letter should be issued.

2.4.2.1.2 Assignments Panel

The Processor assigns the application to another user for review or work using the Assignments Panel. Processors can also use this panel to assign the application to themselves for work.

Once the Processor's work has been completed, they can un-assign themselves from the application.

To assign work to a user, the Processor selects the role of the Assignee and then the username from the dropdown list of users within their User Group that have the permissions associated with that Assignment Type. The dropdown list of Assignment Types will be determined at the time of system setup. New Assignment types can be added as needed to meet a particular Utility's workflow.

The following is an example list of Assignment Types:

- Preliminary Review
- Technical Review
- Contract Executor
- Final Inspections Review
- Bi-Directional Meter Install
- NEM Billing Set-up

A Notification is sent automatically to the Assignee when a new Assignment is added. This can be particularly useful when assigning work to a user who is peripheral to the application review, such as a technical reviewer, or an executor of the Interconnection Agreement.

2.4.2.1.3 Checklist

The Application Checklist is configured to track key process milestones. The default checklist requirements for short and long form applications are specific to each utility, although the master list of checklist items is universal. For further customization, a Processor may elect to add checklist requirements to an application on a case-by-case basis.

Processors check off task items in the Checklist as they are completed. Checklist actions and the date they were completed are both reportable fields. The Review Progress Bar that displays on the Application Dashboard is a direct reflection of how many items on the checklist have been completed in relation to the total number of checklist items. For example, if the checklist for the application contains ten items, and four of those ten have been checked off during processing, then the progress bar will appear to be 40% filled.

The Utility's program manager and the Technical Support Admin configure the default checklist requirements for short and long form applications during system set-up. At that time, the program manager also determines which additional checklist items are available.

2.4.2.1.4 Current Status and Status Table

The Status section of the Summary panel allows the Processor to manually update the status of the application, as well as view the application's status history. The Status panel behaves as follows:

- The "Current Status" dropdown always displays the current status of the application. In order to update the current status, the Processor selects a different status from the dropdown. The status change is saved when the Processor clicks the "Save" button next to the status dropdown.
- The Status Table displays the Status History in chronological order, with the most recent status change at the top (reflecting the "Current Status" and the earliest status change at the bottom).
- When the Current Status is changed, the new status, current date and time, and user who made the change are recorded in the Status Table.

Entries in the Status Table persist and may not be deleted. If an erroneous status change is made, the user can correct the issue by changing the status to the correct status. The erroneous status will remain in the status history. The user may enter a note into the Notes feature if they wish to explain the erroneous status change. If it is imperative that a status change be removed, the user may contact technical support to manually remove it from the application.

2.4.2.1.5 Notes

Processors can track application notes and any decisions that may be outside the scope of normal application processing in the Notes section. Notes are added one at a time in a free form field that appears when "Add Note" is clicked. The notes are saved along with the Date, Timestamp, and Actor and displayed in chronological order with the most recent note at the top.

2.4.2.2 Documents Tab

The Documents Tab is used by the Processors to review the supporting documents on an application. An example of the Documents Tab for an application that is in Under Review status that has already had several document revisions and resubmissions is provided below in Figure 15.

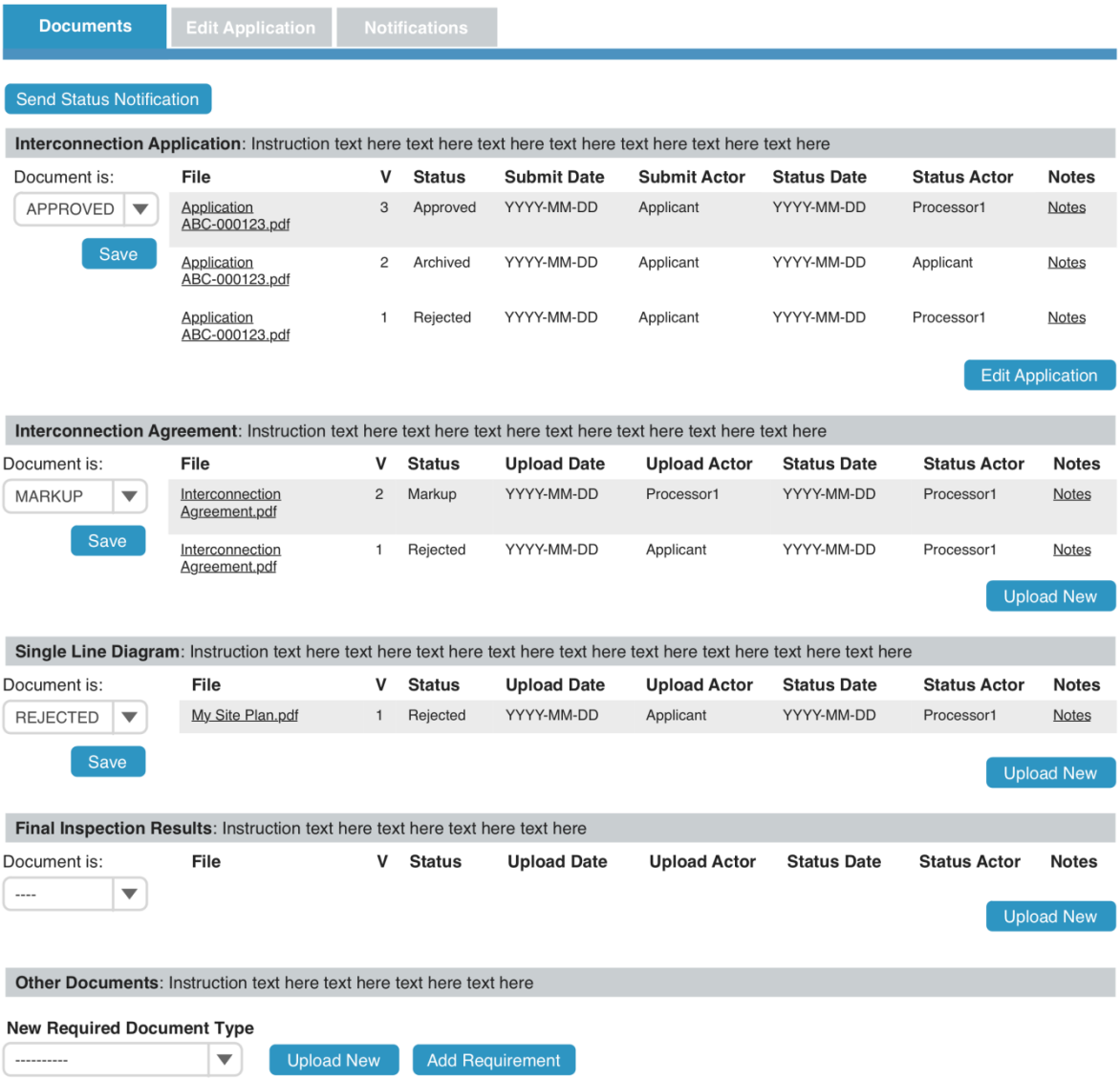


Figure 15: Processor Documents Tab

2.4.2.3 Application Edit Tab

During review the Processor confirms that the data submitted in the Application Form is complete and accurate. To facilitate this process, the application details are displayed on the Application Edit tab in a compressed version of the form as shown in Figure 16.

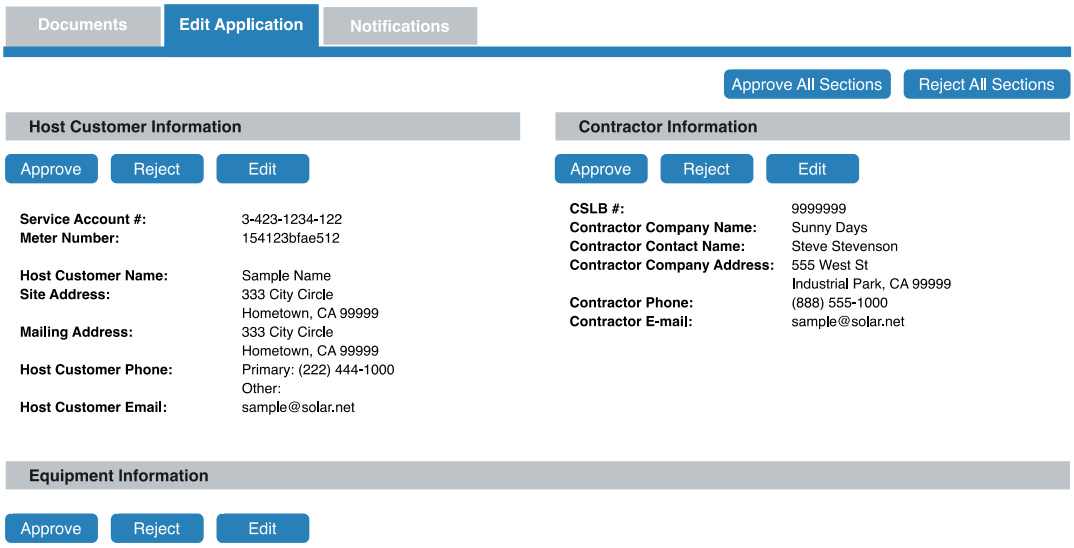


Figure 16: Condensed Application Form View for Review

The form is divided into sub-sections based on the form headers. The Processor is able to Edit, Reject, or Approve each sub-section independently. If sections are rejected, the Processor may then choose to suspend the application back to the Applicant for corrections. If the application Status is changed to Suspended, an automatic notification will be sent to the Applicant. The template of the Notification of Suspension will automatically list which sections of the application form the Processor has selected to reject. Further details on the notification templates are provided in Section 6.

Once every section of the application form is approved, the Preliminary Review of the Application Form would be considered complete and the checklist item is checked off by the Processor.

The default view of this form will not display the editable fields; rather, an "Edit" button is provided in the upper right hand corner of each subsection in case the Processor needs to make an edit. When that button is selected, the form fields in the sub-section appear as editable fields until the form is saved.

When edits to the form are saved by the Processor a revised version of the Interconnection_Application.pdf form is made available on the Documents tab. If the previous version was still in New status, the version will be Archived.

2.4.2.4 Revision Tracking

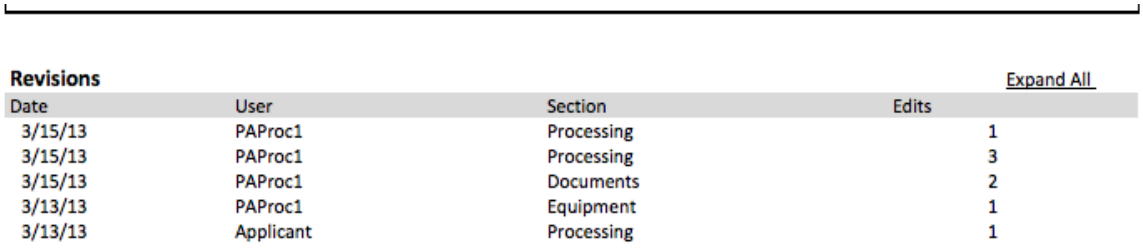
All changes made to an application in the system are tracked in a Revision History at the bottom of the application, an example of which is shown in Figure 17. The Revision History is intended to provide a complete record of changes to an application over the life of an application, and can assist in answering questions about application data by showing when a change was entered and by whom.

For every field in the application, the following information is tracked when the field's value is changed.

- Date and time

- User who made the change
- Field name
- Old value
- New Value

The Revision History for an application is displayed in a readable table format for Processor and Processor Admin users. The revision table is always displayed from newest to oldest. The revision table is collapsed as shown in Figure 17 by default.



Revisions Expand All

Date	User	Section	Edits
3/15/13	PAProc1	Processing	1
3/15/13	PAProc1	Processing	3
3/15/13	PAProc1	Documents	2
3/13/13	PAProc1	Equipment	1
3/13/13	Applicant	Processing	1

Figure 17: Revision History

If the user wishes to see the actual edits made in a revision set, the user can to expand all entries in the collapsed view. Revision entries within a revision set are shown in Figure 18.

- If the field had no value before this revision, the Old Value is blank.
- If the field was emptied in the revision, the New Value is blank.
- If the field was modified, the Old Value and New Value are populated with their respective values before and after the revision.
- Any field that was not revised when an application was saved does not appear in that revision set.

Date	Actor	Change		
June 1, 2013 2:00pm	user1	Field	Old	New
		inverter	inverter1	inverter2
		azimuth	110	108
May 31, 2013 3:00pm	user2	Field	Old	New
		tilt		15
		street		123 Main Street
April 20, 2013 9:31am	user1	Field	Old	New
		state		CA

Figure 18: Revisions Table – Expanded

2.4.3 Notifications Tab

The Notifications Tab displays a record of any Notifications that were automatically generated by the system in response to user action on the application as shown in Figure 19. The record includes the date,

recipient(s), and which user triggered the Notification. Notification types and templates are Utility – specific. Additional details pertaining to Notifications are provided in Section 6.

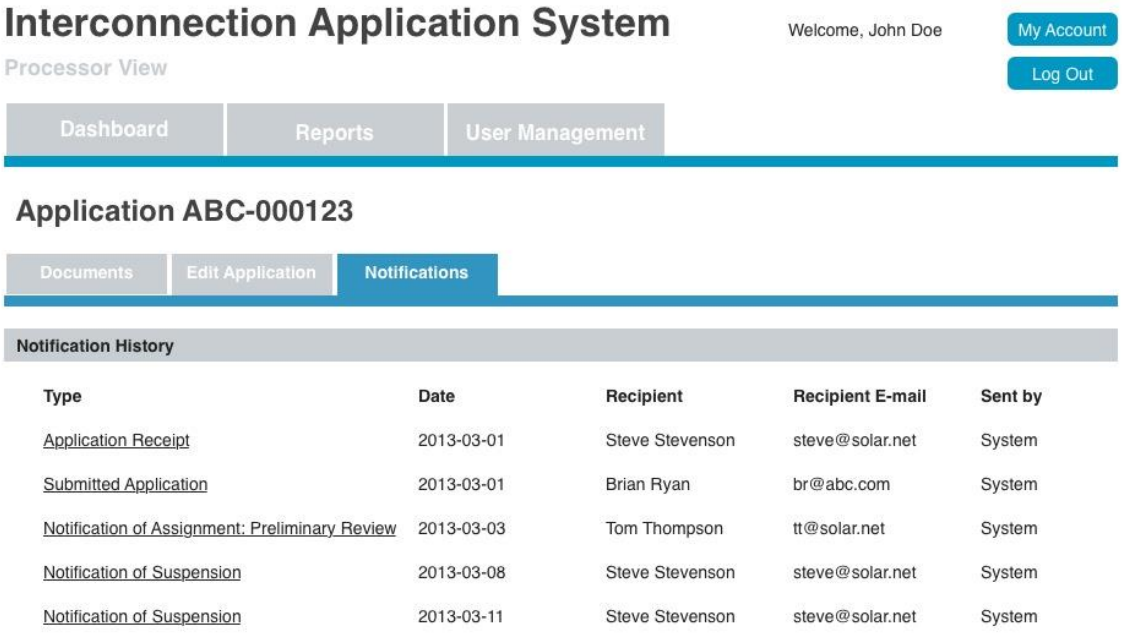


Figure 19: Processor Notifications Tab

2.4.4 User Managment

Processor Admins have access to the User Management page via a link in the navigation bar on each page. The User Management functionality is described in Section 5.1.3.2.

2.4.5 Reports

Processors and Processor Admins have access to the Reports page via a link in the navigation bar on each page. The reports functionality is described in Section 7.

3 Application Statuses

The application process is tracked with statuses that serve to communicate to the Applicant, Processor and to the system whose turn it is to work on the application, what functionality is available, and how the interface should be displayed. Table 4 shows the complete list of statuses, when they occur, how the status change is made, and who has the editing permissions while that status is active.

Table 4: Application Statuses

Status	Duration	Actor	Editing Permissions
New	From application creation until initial submission by the Applicant	system	Applicant/Applicant Admin
Submitted	From initial submission until it is changed to Under Review, manually or based on application changes performed by the Processor.	system	Processor/Processor Admin
Under Review	From the first time the Processor saves it until all necessary review has been completed and the Processor changes the status to Approved Under Review may also be entered from Re-submitted status the first time the application is saved by the Processor	system or manual	Processor/Processor Admin/ and Processor Sub-Roles: e.g. Preliminary Reviewer, Technical Reviewer, Final Reviewer
Suspended	From when the Processor sets the status to Suspended on an Application until it is re-submitted by the Applicant.	manual	Applicant/Applicant Admin
Re-Submitted	From when an Applicant submits a Suspended application with corrections until it is changed to Under Review, manually or based on application changes performed by the Processor.	system	Processor/Processor Admin
Approved	From when the Processor sets the Status to Approved, meaning “Approved for Interconnection” until the Processor sets the status to Completed	manual	Processor/Processor Admin
Completed	From when the status is changed to Completed by the Processor. As an “end” state, this is the final status for the application	manual	Processor/Processor Admin
Cancelled	From when the status is changed to Cancelled by the Processor. As an “end” state, this is the final status for the application	manual	Processor/Processor Admin

When a status change is listed as “manual”, the Processor must use the Status Panel to directly update the status of the application. The other status changes listed as “system” are triggered by the user executing a characteristic action that signals the system to make a status change. The Under Review

status is automatically set from the Submitted and Re-Submitted statuses upon first application save, but can also be manually changed using the Status Panel.

3.1 Automatic Status Changes

Automatic Status changes may be initiated by either Processor or Applicant actions. The following characteristic actions change statuses:

- Saving the Application Type panel for the first time sets the status to New
- Submitting an application in New status changes the status to Submitted
- Saving an application in Submitted status changes the status to Under Review
- Submitting an application in Suspended status changes the status to Re-Submitted
- Saving an application in Re-Submitted status changes the status to Under Review

3.2 Manual Status Changes

Manual Status Changes are executed on the Application Review Panel. The user selects the future status from the dropdown and saves the application. Only Processors and Processor Admins can execute manual Status changes.

The system updates the interface display and functionality accordingly. Figure 20 demonstrates all of the available manual and automatic status changes for an application. The manual transitions are shown as dotted lines and the automatic transitions are shown as solid lines. The status box color indicates which user type has editing permissions during that status.

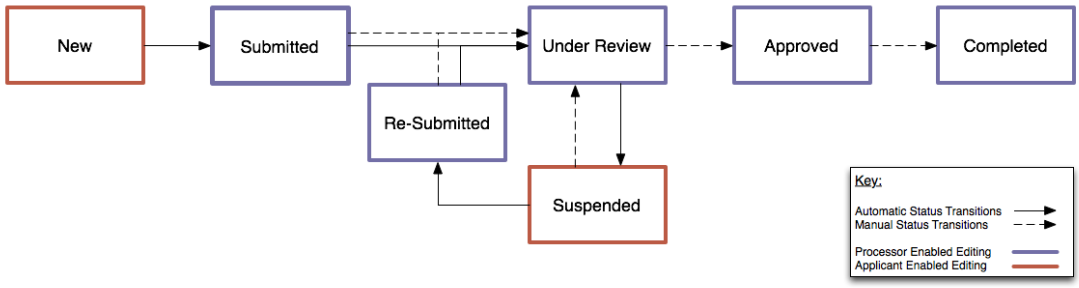


Figure 20: Automatic and Manual Status Transitions

3.3 Status Dates

The date that an application enters into a status is the “Status Date”. This date is recorded and displayed along with a timestamp and record of who made the change as shown in Figure 14.

3.4 Status History

A list of all status changes on an application are displayed on the Application Review panel as shown in Figure 14.

4 Document Management

The majority of Application review revolves around the Documents tab. Processors and Applicants always have access to upload new document files, regardless of the Application Status. In addition to shared functionality, Processors can add document requirements, change statuses, upload mark-ups, and add notes. Figure 21 shows the Documents tab of an application undergoing document review and Submission of Final Inspection Results by the Applicant.

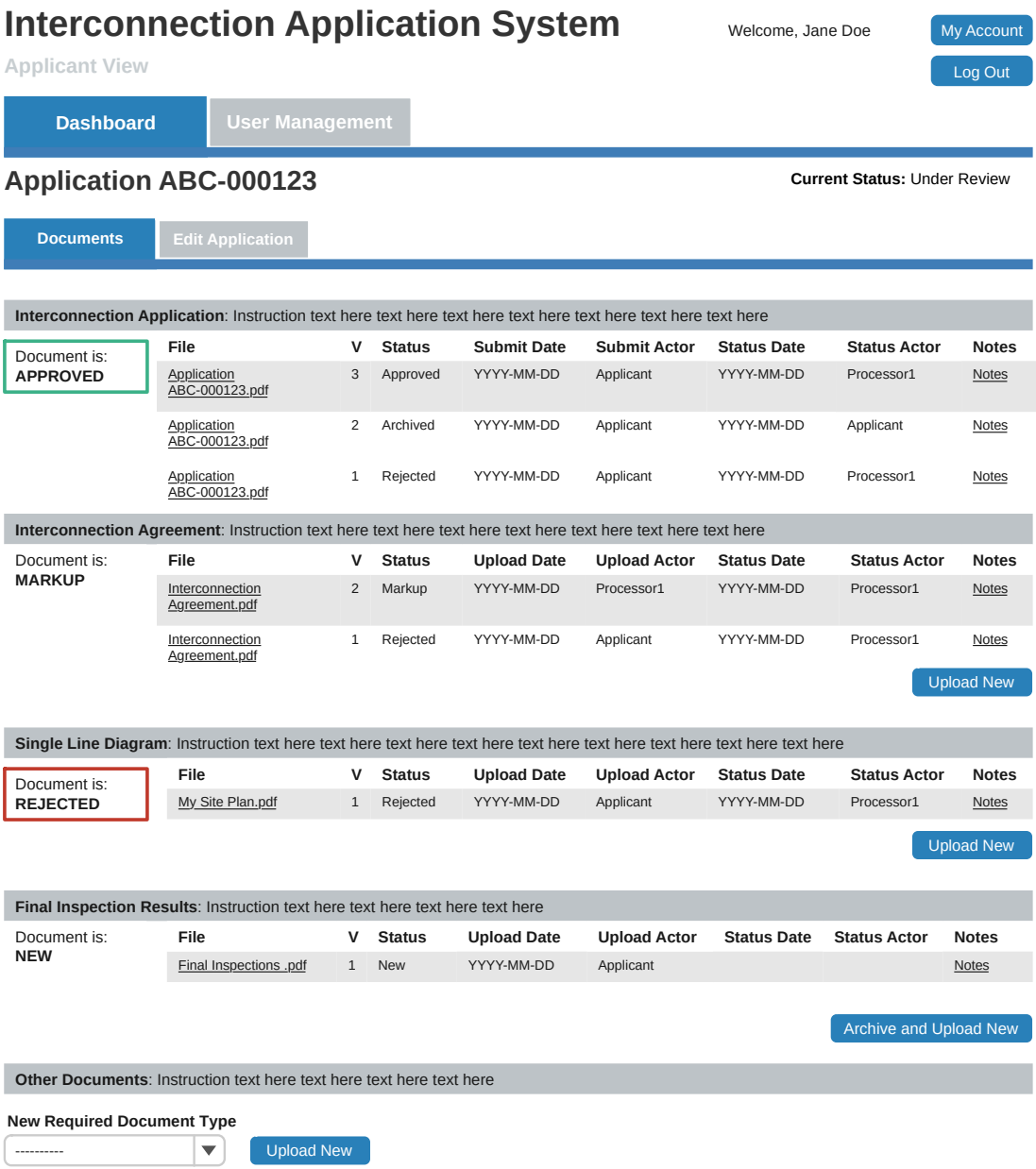


Figure 21: Documents Panel - Applicant View

4.1 Required Documents

When the Application Type panel is saved, the system determines the minimum document requirements based on the Utility client's settings and displays those document types in the Documents tab. There are two milestones for when a document may be required, prior to initial submission and prior to the issuance of PTO. If an application does not meet these requirements, certain functionality is not available. "Required" documents must have a file attached before the application can be submitted. "Required before PTO" documents must have a file attached before the application can be approved.

While the list of document requirements will be configurable per-application and per-Utility, at a minimum the subsequent documents are required at the following stages for all applications.

4.1.1 Required at Initial Submission

4.1.1.1 Interconnection Application

A copy of the Interconnection Application form is a document attachment for all applications. However, the Applicant does not need to upload a copy of this form if no signature is required. Rather, when the information on the Application Edit view is saved, a version of the data is rendered as .pdf and shown as an attachment in the Documents panel. When the Application is submitted, the version is stored as a historical record of the submitted file. If changes are later made to the Application Edit form, the system will save those changes as a new version (V2). If the user needs to upload a signed copy of the form, they may do so using the "Archive and Upload New" button.

4.1.2 Required before PTO

4.1.2.1 Interconnection Agreement

The Interconnection Agreement, with all signatures, is a required document attachment for all applications prior to issuance of PTO. It will be accepted at the time of initial submission, but is not required. A missing attachment for this document will not stop the Applicant from being able to submit revisions for other documents.

4.1.2.2 Final Inspections Results

The Final Inspections Results is a required document attachment for all applications prior to issuance of PTO. However, it is not required at the time of initial submission. A missing attachment for this document will not stop the Applicant from being able to submit revisions for other documents.

4.2 Uploading a Document

To attach a document, the Applicant selects the "Upload New" or "Archive and Upload New" button to the right of the document type section and uploads a file from their computer.-Successfully uploaded files are automatically saved to the application. The attached document status defaults to "New". When "Archive and Add New" is selected the system also changes the status of the current document to "Archived" before attaching the new document.

4.3 Document Versioning

The document version is assigned by the system when the document is uploaded. Attaching a new file to a Document Type with existing attachments increases the version count by one. The highest version number indicates the current version and is always displayed directly below the Document Type header.

4.4 Document Status

The Document Status indicates whether there is further work to be done on a document or if it is approved. The default status for new uploads is New. A document may also be Approved, Rejected, Markup, or Archived. A document is Archived if a newer version is uploaded while the previous version was still in New status. Only Processors and Processor Admins may actively change the status of a document to Rejected, Markup, or Approved using the dropdown.

Table 5 shows the actions required and available status changes for the current version of a document. The table also shows the upload options that will be displayed during that status.

Table 5: Document Status Actions and Transitions

Current Status*	Action Required	Available Status Changes		Upload Options	
		Processor	Applicant	Processor	Applicant
New	Review by Processor	Rejected, Markup, Approved, Archived	Archived	Archive and Add New	Archive and Add New
Rejected	Revision by Applicant	Approved, Markup	N/A	Upload New	Upload New
Markup	Revision by Applicant	Approved, Rejected	N/A	Upload New	Upload New
Approved	N/A	Rejected, Markup	N/A	Upload New	N/A

* Since the Archived status can never be applied to the current version, it was excluded from this table.

4.4.1 Archiving a Document

A Processor or Applicant may archive the current version of a document if the status is currently New and they upload a new file. An Archived document signifies that the document was not reviewed but rather replaced by a more recent version.

4.4.2 Rejecting a Document

The Processor sets the document status to Rejected if the file must be corrected and re-submitted by the Applicant. The system will highlight any rejected document types with a red box. The application cannot have an App Completed Date or be set to Approved status while any documents are in Rejected status.

4.4.3 Uploading a Markup

The Processor may elect to provide a markup of the document, indicating what changes need to be made by the Applicant. In that case the Processor completes the process for uploading a document and then changes the document status from New to Markup. This indicates to the Applicant that they should review the markup before submitting a revised document.

4.4.4 Approving a Document

The Processor changes the document status to Approved once no further revisions to the file are required. Approved documents are highlighted with a green box. Once a Processor has approved a document it is no longer possible for the Applicant to attach a revision.

4.4.5 Adding a Document Requirement

The Processor may assign additional document requirements to the Application based on the information provided in the Application Form. When a document requirement is added, no file is attached. The Processor then notifies the Applicant of the requirement change.

4.5 Providing Additional Documentation

The Applicant or Processor may upload supporting documentation as needed by using the form at the bottom of the Documents Panel to upload a new Document Type from a list of available options.

4.6 Document Notes

Processors can add notes to any document version that has been uploaded. Processors and Applicants can view all document notes added by Processor staff.

4.7 Document Notifications

Document Notifications update the Applicant on status of the documents on their Application. These notifications are not triggered automatically. Rather the Processor uses the “Notify” button on the Documents panel when they want to update the Applicant on the status of some or all of the application documents. After the Notify button is clicked, the Processor is prompted to select which Document Types to include in the email. An example of the Document Status Notification is shown in Figure 22 below.

From: NOREPLY@onlineinterconnectionapps.org
To: "Steve Stevenson" <interconnect@solar.net>
BCC: UtilityABC@onlineinterconnecitonapps.org
Sent: 3/28/2013 3:45 PM

SUBJECT: Document Status Notification for [Application ABC-000123, High Noon Solar]

Hello,

This is an automated message from the Online Interconnection Application system regarding Document Status for application ABC-000123. The table below indicates the status on your document attachments for this application.

Document Type	Status	Status Date
• Interconnection Application	Approved	03/20/2013
• Interconnection Agreement	Approved	03/25/2013
• Single Line Diagram	Markup	03/20/2013
• Final Inspections Results	Rejected	03/28/2013

To make any document updates, please sign-in here www.examplewebsite.org

Thanks,
Online Interconnection Application System Support
Support@supportemail.com

Figure 22: Document Status Notification Template

5 User Types and Management

Every authenticated user of the system is assigned to a User Type, which dictates the features and functionality available to the user. Some User Types have the permission to manage the rest of the user accounts within their User Group. The details of the User Types and their associated permissions are included in this section.

5.1 User Types

There are six distinct user types in the Online Interconnection Application system.

Applicant	Applicant users are responsible for submitting applications for interconnection and responding to requests for information from Processor users. Applicants are typically contractors or homeowners who have installed their own PV system.
Applicant Admin	Applicant Admin are a subset of Applicants who are assigned to a specific contractor company. These users have the ability to manage the user accounts that are associated with the contractor company.
Processor	Processors belong to a specific Utility User Group. Processors manage the flow of applications through the interconnection process. They are responsible for reviewing applications and helping the Applicants. Processor users may be assigned various levels of permissions which determine what aspects of the application they may review and/or approve.
Processor Admin	Processor Admins are a subset of Processor users who have permission to view all applications for their Utility. They are also able to manage any of the user accounts associated with their Utility. Processor Admin users are responsible for customer support and helping Applicants and Processors through the interconnection process.
Regulatory	Regulatory Users have access to the Reporting features of the system.
Technical Support Admin	Technical Support Admin users are typically Software Project Managers for the system. Technical Support Admin accounts can see data from all Utilities and can view both the Applicant and Processor views. Technical Support Admin users are responsible for customer technical support.

5.1.1 User Groups

User Groups are identified by a common assignment either to a contractor company or to a Utility. Users within the same group have access to the same applications. Additionally, membership within a group is managed by the administrative user(s) of the group.

Users with permissions to manage User Accounts can do so only for their User Group. Within their group they can add new users, remove or deactivate old user accounts, and update permissions on user accounts.

Regulatory and Technical Support Admin users are not assigned to a company or a Utility and are thus not associated with User Groups.

5.1.2 User Management

The database has User Management features to process new user registrations, password resets and more. This section outlines how these features work for new users, companies, utilities, and for existing users whom may need password support.

5.1.2.1 Applicant/ Applicant Admin Registration

The first Applicant to register for a particular company must also include company information. This will establish the Applicant user as the Applicant Admin for that company.

Some Applicants will not be associated with a company, as they may be Host Customers or Self-Installers.

Multiple Applicants may be assigned to the same company. However, Applicants may not be assigned to multiple companies.

5.1.2.2 Applicant Contact Requirements

The following fields are required to create an Applicant user. An Applicant may be a Contractor or Host Customer. In some cases the Host Customer will also be a self-installer. In others, the Host Customer may have had a licensed installer, but be submitting the Interconnection Application. Therefore the basic Applicant Contact information may or may not be associated with a Contractor Company Name.

- First Name
- Last Name
- Phone Number
- E-mail
- Contractor Company Name (if Applicable)
- Contractor License Number (if Applicable)

5.1.2.3 Contractor Company Information from CSLB

When an Applicant registers a new company, the following contact information for the company is pulled from the CSLB database using the contractor license number.

- Business Name
- Street Address
- City
- State
- ZIP Code

- Entity (business type)
- Issue Date
- Expire Date
- License Status
- Classifications (license type)

Prior to creating the new company record, the system will verify that the company has not already been created in the system. If a duplicate record is found, the new user will be directed to contact their Applicant Admin to request a new user account.

5.1.2.4 Processor Admin Registration

The first Processor Admin account for each utility is created by a Technical Support Admin user and is set up as a Processor Admin which grants the user permissions to modify the user accounts for the Utility. Subsequent Processor Admin accounts may be created by any Processor Admin(s) at that Utility.

5.1.2.5 Processor User Registration

Processor accounts will be set up by either Processor Admin or Technical Support Admin users.

5.1.2.6 Processor Contact Requirements

The following fields are required to create a Processor or Processor Admin.

- First Name
- Last Name
- Utility
- Phone Number
- E-mail

5.1.2.7 Regulatory User Registration

Regulatory User Accounts are set up by the Technical Support Admins.

5.1.2.8 Regulatory Contact Requirements

The following fields are required to create a Regulatory user.

- First Name
- Last Name
- Company/Sector
- Phone Number
- E-mail

5.1.2.9 Technical Support Admin Registration

Technical Support Admin accounts can only be created by other Technical Support Admins.

5.1.3 User Management Interface

5.1.3.1 User Management for Applicant Admins

When a new company account has been set up, the Applicant is established as the Applicant Admin. This user has access to the User Management page where they can add other users to or deactivate old users from their company at will. The user will also be able to promote other users in their group to Admin status so as to transfer the responsibility of User Management as needed.

Figure 23 demonstrates the User Management page features for Applicant Admins. At the top the user can view their company profile information which applies to all users in their company. In the Manage User Accounts section below, the left panel displays all of the user accounts associated with the company. The right panel displays the details of the user account that is highlighted on the left. The Applicant Admin can modify the user's contact information and grant/restrict user permissions using this panel. The Applicant Admin can also add a new user from this page.

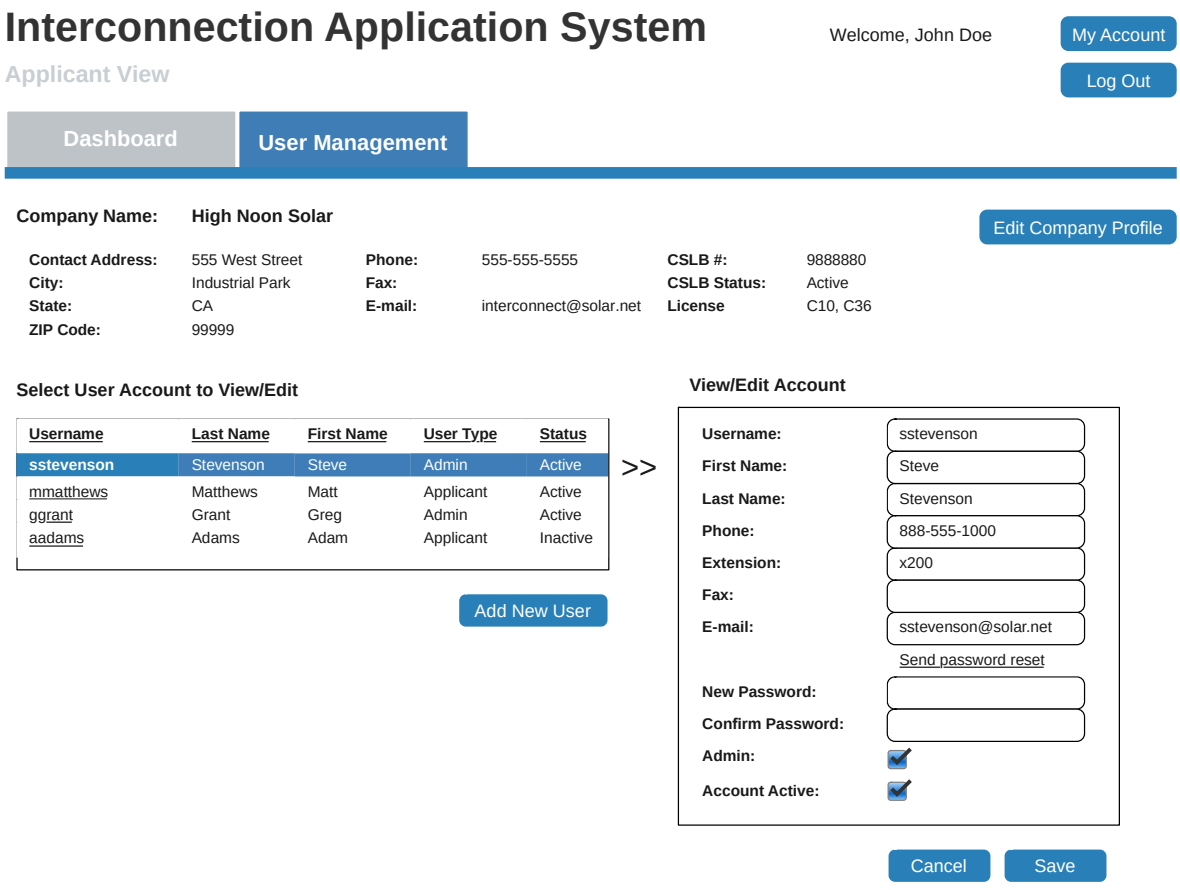


Figure 23: User Management Panel for Applicant Admins

5.1.3.2 The User Management interface for Processor Admins

The User Management functionality for Processor Admins will be more complex as the individual user types can be assigned a variety of permissions. The User Management page is formatted in the

same manner, with the company profile information at the top and the list of users in the left panel and an option to add new/ modify existing records in the right panel. The primary difference is that Processor users have a list of possible "User Type Permissions" that can be assigned on their profile as shown in the right panel in Figure 24 below. These permission types dictate what the user may be assigned to, whether they are able to approve applications, and what reports the user has access to.

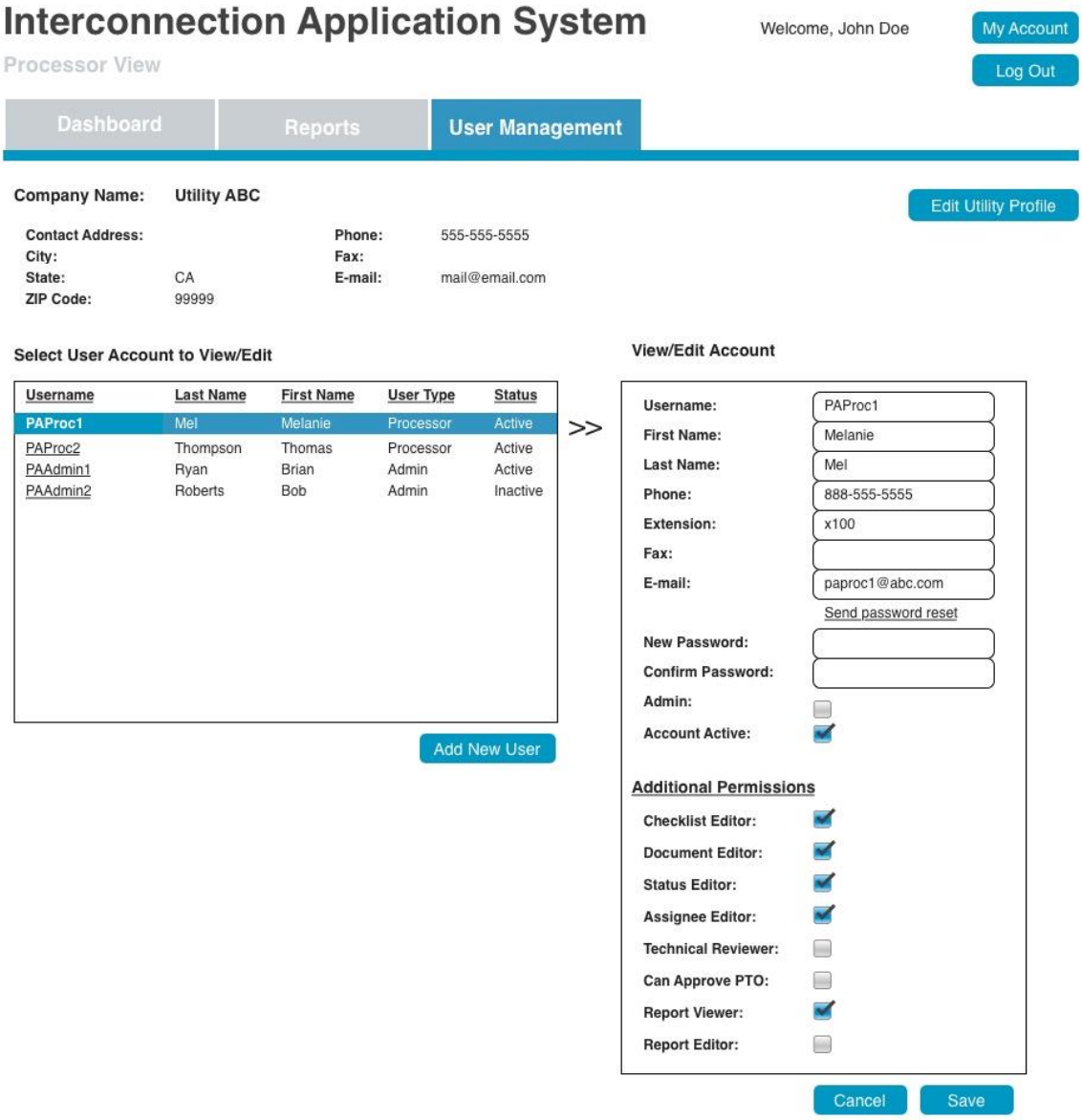


Figure 24: User Management Panel for Processor Admin

5.2 Account Confirmation and Password Set-up

When a new user account is registered, the system automatically notifies the new user via the e-mail provided on their registration form. The email will confirm the username and provide a secure link by which they can set their password and sign into the system. An example of this email text is provided in Figure 25 below.

From: NOREPLY@onlineinterconnectionapps.org
To: "New User" <newuser@solar.net>
BCC: support@supportemail.com
Sent: 1/01/2013 3:45 PM
SUBJECT: Account Registration Confirmation

Hello,

This is an automated message from the Online Interconnection Application system.

A new account has been created for you on the Online Interconnection Application system. Your account login is **username**.

Please use the following secure link to set up your password and complete registration

<secure reset password link>

If you have any questions or issues accessing your account please contact support during regular business hours.

Thanks,
Online Interconnection Application System Support
Support@supportemail.com

Figure 25: Account Registration Email Template

5.3 Forgotten Sign In Support

Within the Username/Password input area of the Public/Sign In page, a link titled "Forgot Password?" brings the user to a simple form asking them to enter their email address. When the user submits the address, the system sends a password reset email message with their username and a link to reset their password. An example of this email text is provided in Figure 26 below.

From: NOREPLY@onlineinterconnectionapps.org
To: "New User" <newuser@solar.net>
BCC: support@supportemail.com
Sent: 1/05/2013 3:45 PM
SUBJECT: Password Reset

Hello,

This is an automated message from the Online Interconnection Application system.

We received a password reset request for your user account at <websiteurl>. Your username, in case you have forgotten is **username.**

Please use the following secure link to reset your password

<secure reset password link>

If you have any questions or issues accessing your account please contact support during regular business hours.

Thanks,
Online Interconnection Application System Support
Support@supportemail.com

Figure 26: Password Reset Email Template

6 Notifications

Notifications are automated communications that send an email to pre-set recipients when tasks are completed or an Application changes hands. A Notification Type is a group of templates that have a common trigger based on an action in the system.

Table 6 shows the suggested master list of Notification Types, which actions generate Notifications and who the recipient of the Notification would be.

Table 6: List of Automatic Notifications

Notification Type	Trigger	Recipients:
New User Account	Submit New User Account request	User
Password Re-set	Submit Forgotten Password Request	User
Application Receipt	Submit Application Form	Applicant, Processor Admin
Notification of Assignment: Preliminary Review	Save a Preliminary Review assignment	Processor
Notification of Assignment: Technical Review	Save a Technical Review assignment (Technical Review is internal to system)	Processor w/ Tech Review Permissions
Notification of Review Package	Save a Technical Review assignment (Technical Review is external to system)	Assigned e-mail address
Notification of Assignment: IA Processing	Save a Contract Execution assignment	Assigned e-mail address
Notification of Assignment: Final Review	Save a Final Review assignment	Processor w/ Final Review Permissions
Document Status Notification	Click "Send Notification(s)" for document(s) in the Document Panel	Applicant
Notification to Utility Services	Save a Meter Change-out assignment	Assigned e-mail address
Notification of Suspension	Save Status to Suspended	Applicant
Application Approved	Save Status to Approved	Applicant, Host Customer
Application Cancelled	Save Status to Cancelled	Applicant, Host Customer

The automatic communications are sent out by the system using a generic Interconnection Application system email. The template text will either notify the recipient that an action has been completed or provide guidance for the recipient to sign into the system and complete an action on the Application.

6.1 Customizing Notifications

The master list of Notification Types is universal across all participating Utilities but the list of active Notifications is configurable. During system set-up the Utility will decide which communications should be activated.

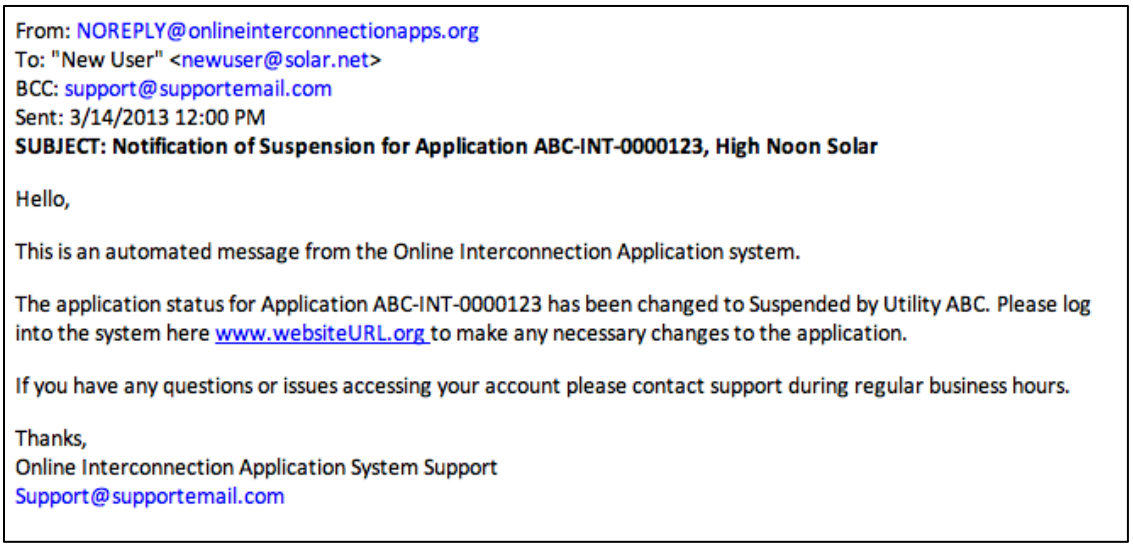
6.1.1 Adding New Notification Types

At Utility request, additional Notification Types can be added if they are associated with a specific trigger. New Notification Types requested by one Utility will be available to all participating Utilities if they choose to activate the new feature.

A Notification Type is a group of templates that have a common trigger. These templates can otherwise be customized by Utility.

6.1.2 Configuring Notification Templates

The template for each Notification Type will be established during system set-up. The recipients, subject line, and basic boilerplate language will be suggested by the Technical Support Admin but can be updated as needed to meet Utility specific language requirements. An example of the notification template for a Suspension Notification is provided in Figure 27.


From: NOREPLY@onlineinterconnectionapps.org
To: "New User" <newuser@solar.net>
BCC: support@supportemail.com
Sent: 3/14/2013 12:00 PM
SUBJECT: Notification of Suspension for Application ABC-INT-0000123, High Noon Solar

Hello,

This is an automated message from the Online Interconnection Application system.

The application status for Application ABC-INT-0000123 has been changed to Suspended by Utility ABC. Please log into the system here www.websiteURL.org to make any necessary changes to the application.

If you have any questions or issues accessing your account please contact support during regular business hours.

Thanks,
Online Interconnection Application System Support
Support@supportemail.com

Figure 27: Example Notification Email Template

Some templates have dynamic template text that conditionally displays details based on other database inputs. For example, the body of the Notification of Suspension template includes a list of any application form sections or document types that are in the Rejected Status at the time the notification is generated. This template function is optional and configurable per Utility.

6.1.3 Notification Receipt Frequency

Notifications are customizable by User Type and may not necessarily be sent at the time of the action. Instead, Notifications may be aggregated into periodic digests, which show all the Notifications that were sent to a particular user over the period. For example, a Processor with Technical Review permissions may only want to receive an email when a specific Application is assigned to them while a Processor Admin may want to view a list of all application processing notifications once a week.

7 Reporting

Clear and Automated reporting to multiple parties is one of the major benefits associated with collecting statewide interconnection information in an online database. The system will have the functionality to export data direct from the database at the time of download for all reportable fields. All users will have access to download standard reports; the extent to which they can customize those reports depends on their User Type and permissions. Table 7 illustrates the reporting features that will be available or restricted for the three User Types.

Table 7: Reporting Features by User Type

Applicants & Admins	*Have*	• Access to the Full Report via the Application Dashboard • Ability to filter the Full Report using the Search feature on the Application Dashboard
	Do not have	• Access to the Reports view • Ability to create custom reports
Processors & Admins	*Have*	• Access to all of their Utility's Standard Reports • Access to their own saved custom reports • Access to custom reports features: field selection and report filters
	Do not have	• Access to custom reports of other users
Regulatory	*Have*	• Access to three Standard Reports: Public Report, Application Performance Report, Installed Capacity Report • Access to public data from multiple utility territories in a single report
	Do not have	• Access to their own saved custom reports • Access to custom reports features: field selection and report filters

7.1 Reports View

Processor and Regulatory users will be able to export reports from the system by navigating to the Reports link in the primary navigation and selecting a report as shown in Figure 28 (Applicants download reports from the Application Dashboard). The page will display the list of Standard Reports that the user has access to as well as any Custom Reports the user may have saved (as applicable). The example shows the Reports view for a Processor user.

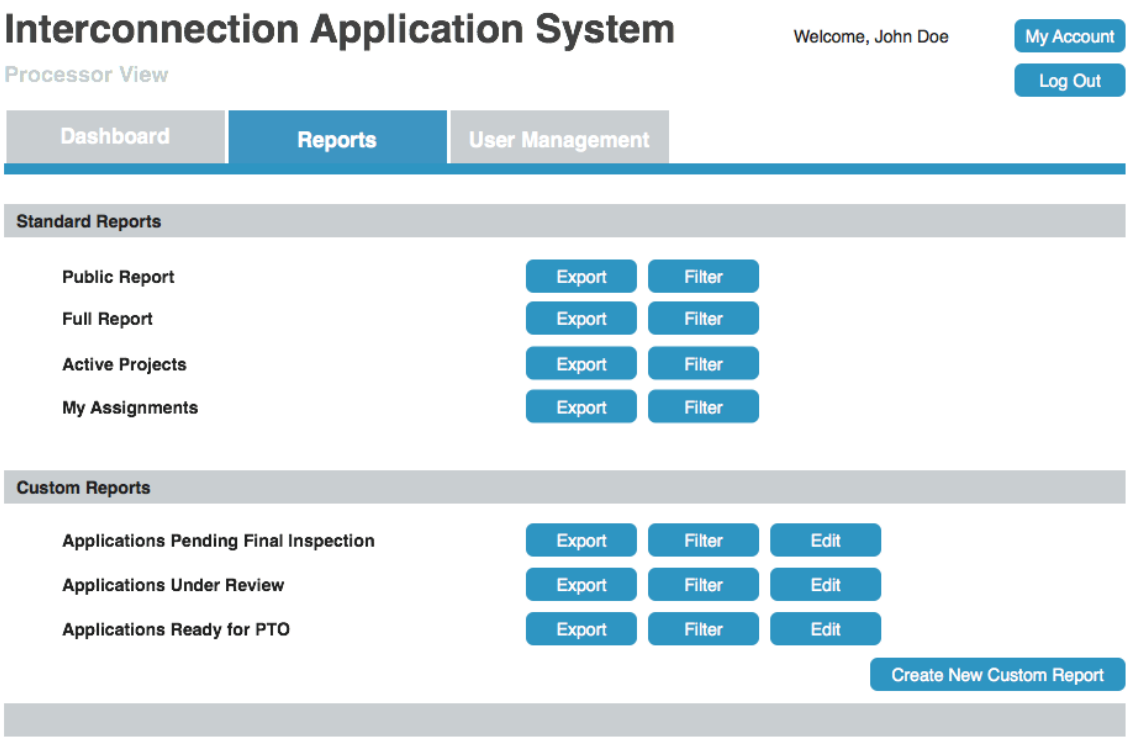


Figure 28: Reports View

7.2 Generating Reports

Standard and Custom Reports can be downloaded by clicking on the Export button to the right of the report title. Custom Reports may also be edited and changes can be saved to the existing report or as a new report.

Reports are generated real-time, however the Regulatory users may request to have certain reports cached periodically to promote consistency in reporting and data analysis.

Filters can be applied to any report prior to downloading if the user would like to see a more specific subset of the data. They may also be saved to custom reports to facilitate faster reporting. Clicking on the Filter button next to a report opens the window shown in Figure 29. From this view the Processor can add as many filters as desired to the report prior to download.

Available Filter Types include

- Date Type - All applications that have the selected date (e.g. status history date, checklist item date). When specified, this can be further limited to within a certain date range.
- Status – All applications with the current status(es) selected.
- Assignee – All applications with the selected username currently listed as an Assignee

Filters do not change the report content (columns); they reduce the set of applications that are reported based on the list of available filters.

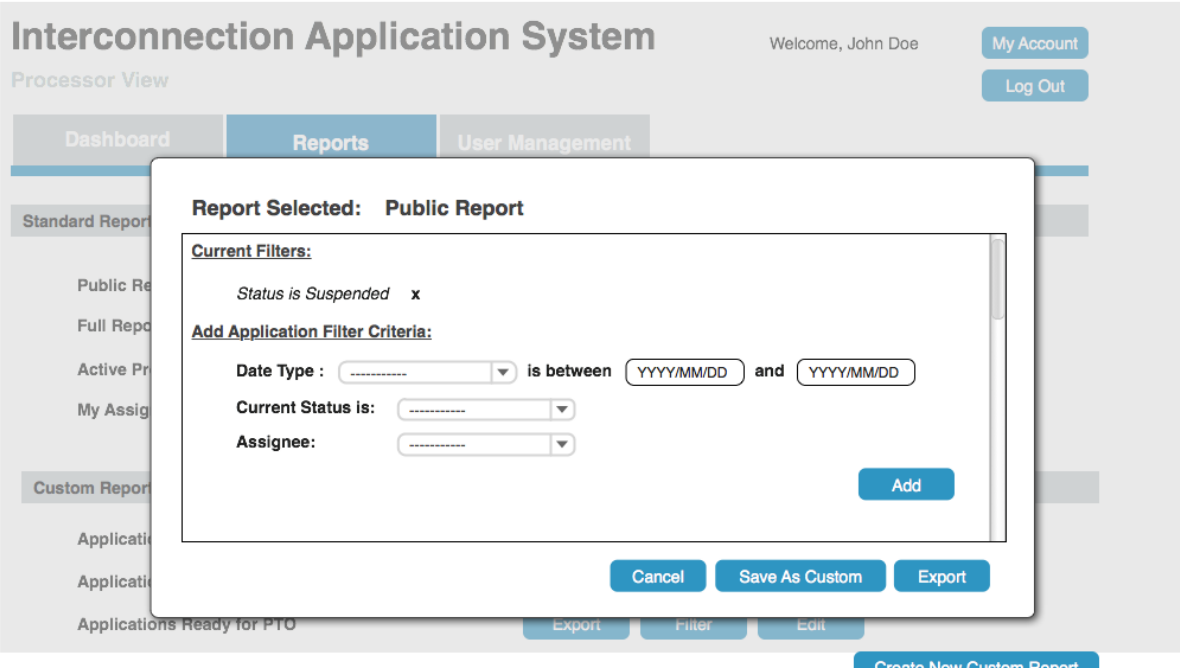


Figure 29: Applying Filters to Reports

7.3 Report Formats

Reports will be exported from the database as .csv files. Each row of the report represents a different application with the first column of every report being the Application ID. The subsequent report columns represent reportable fields from the database. For custom reports, these columns are selected from a list of reportable fields that the user has access to. Standard reports have a pre-set list of columns that cannot be changed, except by the Technical Support Admins.

7.3.1 Standard Reports

The following list of Standard Reports will be provided:

Full	All reportable data fields by application created in a given User Group (Utility for Processors and company for Applicants). The full report contains site and customer specific data that is not included in the Public Export
Active Projects	Subset of the full report, which excludes projects with a Current Status of Cancelled or Completed
Public	All publically reportable data fields organized by application. Processors can download data on only those applications in their User Group, Regulatory users can download data for all applications in the system
App Performance	Reports the key application milestone dates for all applications. Site, Customer, and Equipment information is not included
Installed Capacity	All publically reportable equipment and regional information for Completed applications

7.3.2 Custom Reports

Custom reports can be generated by the user based off of any of reportable fields that the User Type has access to. The Create Custom Reports page is shown in Figure 30. The Processor assigns a report title and then selects each of the fields that should be included in the report from the list. Each field selected corresponds to a column in the report. Once the report is saved, the Processor can also add filters to the new Custom Report.

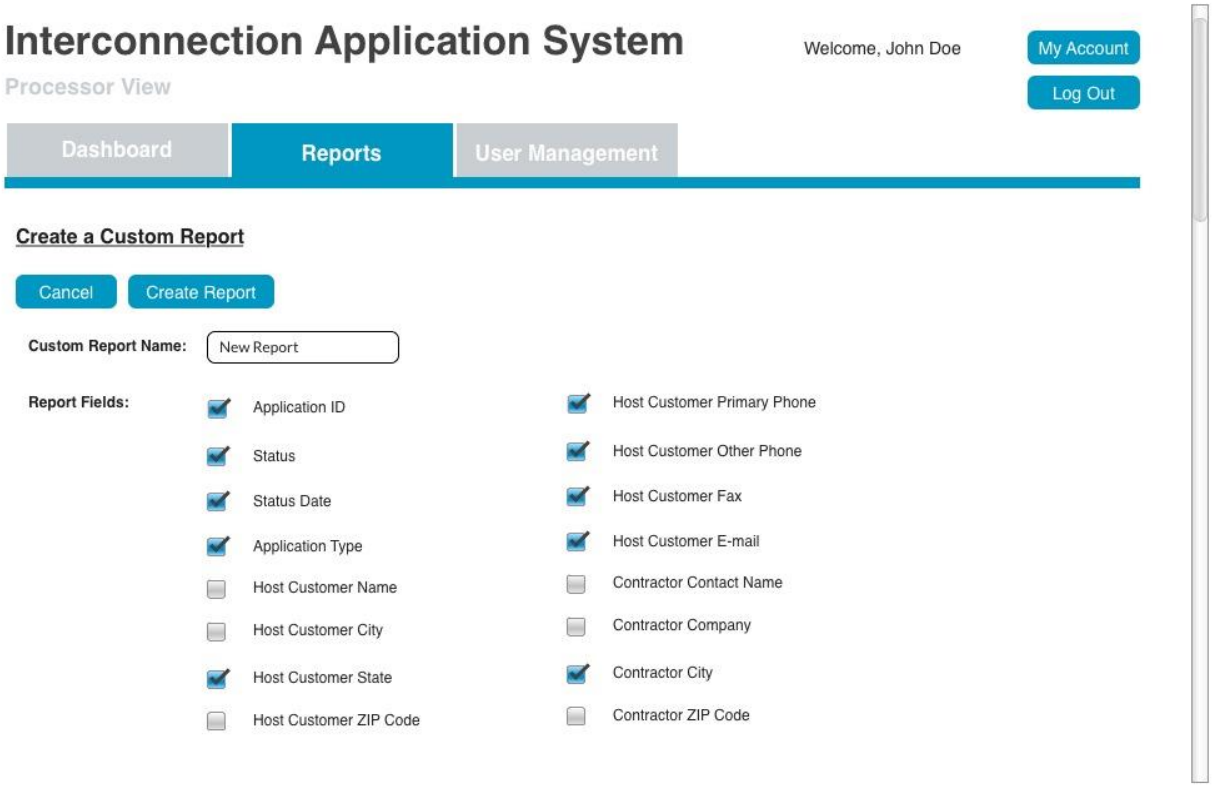


Figure 30: Custom Report Generation

8 Universal Data Transfer Mechanism

The Interconnection Portal supports the system requirement to facilitate the following data exchange functions:

- Exchange interconnection application and processing data with utility data systems
- Import bulk application data from Industry users with many applications
- Import application data from existing Rebate Application Processing systems
- Export data to Regulatory reporting systems such as CaliforniaSolarStatistics

The proposed system interactions and key stakeholders are identified in Figure 31. The four boxes represent the stakeholder groups who may interact with the Interconnection portal. The connectors demonstrate the types of uni- and bi-directional data transfer communications available including those that are already in place with PowerClerk, a Rebate Application Processing system currently in use by several utilities in California.

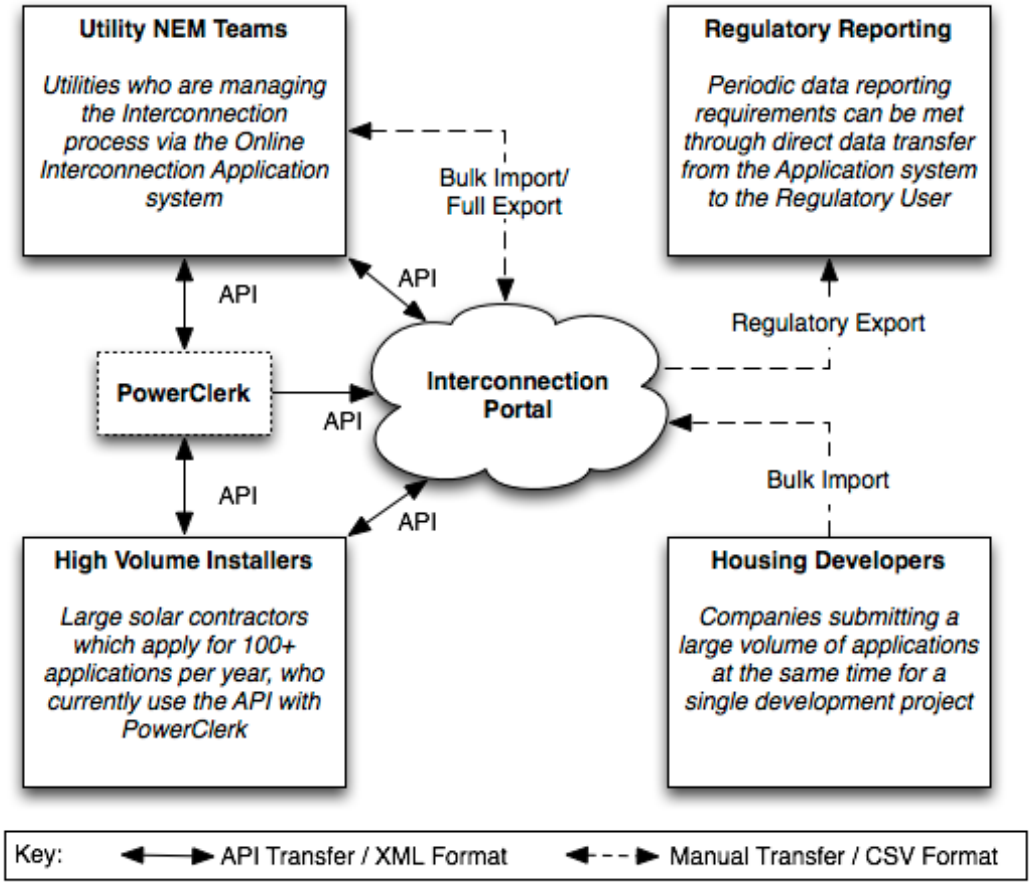


Figure 31: Interconnection Portal Universal Data Transfer Mechanisms

There are two available methods of data transfer

1. API – A direct, authenticated data transfer in XML format between the Interconnection Portal and the stakeholder's systems. This method is automated between systems, and has no explicit user interface.
2. Manual – An authenticated transfer of data in CSV format via the Interconnection Application system interface. This method requires a user to click a link in their browser and upload a file from their computer into the Interconnection Portal.

8.1 API

An Application Programming Interface (API) is a protocol/interface intended to provide for communication between computer software systems. For software systems operating over the World Wide Web (WWW), an API is frequently specified as a set of HTTP request and response messages in eXtensible Markup Language (XML) format. The API for this Interconnection Portal is defined as a set of XML tags to facilitate communication between the Interconnection Portal and other stakeholder systems.

In 2009, Energy Solutions, Clean Power Research, and the CSI Program Administrators defined an API to be utilized by high-volume installers to transfer rebate application information between the CSI Rebate Processing System (PowerClerk) and the installers' internal management systems. To facilitate immediate usage by industry stakeholders already using the CSI API, the Interconnection Portal API will be based directly on the existing CSI API. Existing tags (as shown in the PowerClerk Application Upload API Documentation[7]) will be re-used to the extent possible, and the tagset will be expanded as necessary to accommodate Interconnection Portal-specific fields not used in rebate processing.

The following sections provide additional detail on the manner in which the various stakeholders may interact with the API feature.

8.1.1 High Volume Installers

The Web API greatly improves efficiency with application submission and management for applicants with large volumes of application and internal advanced data management systems.

High Volume Installers manage hundreds of solar applications at a time with their own internal systems. These advanced system users often have internal programming teams to support data transfer with external systems. Several high-volume installers, including SolarCity and REC Solar, currently use the API to exchange rebate application data between their systems and PowerClerk.

The Interconnection Portal API leverages the industry familiarity with this process to encourage system adoption and to promote application processing efficiencies with the highest volume users.

8.1.2 Integration with Rebate Processing Systems

For utilities currently offering incentives for interconnected distributed generation projects (SB1, CSI, etc.) and utilizing a Rebate Processing System (PowerClerk, SGIP Online Database, etc.), the API can

[7] https://www.powerclerkdemo.com/AppUpload/Schema/ApplicationUpload/ApplicationUpload.aspx

integrate with those systems to allow applicants or processors to enter project data only once, and spawn an Interconnection application at a predefined point in the rebate application process.

The data imported from the Rebate Processing System can create or update applications in the Interconnection Application system, as well as upload and download document attachments between systems. Applicants may still be required to log in to the Interconnection system to complete any information required for the Interconnection Application that is not found in the Rebate Processing System.

8.1.3 Utility

Some utilities also manage Interconnection processes using an internal work management tool. If a utility wishes to utilize the Interconnection API for data transfer between their internal systems and the Interconnection Portal, technical staff at the utility will need to add functionality to their internal system to facilitate this communication. Each Utility has a unique Interconnection application process, and the Interconnection API may also be updated or customized to meet the needs of a participating utility's system as necessary.

8.2 CSV (Manual)

The second data transfer mechanism for data import and export utilizes a formatted CSV file and the Interconnection Application system interface. This process is considered "manual" because it requires the explicit upload or download of a file by a user using the interface rather than the automated information exchange of the API. The CSV/Manual solution provides access to bulk data transfer to those stakeholders for whom it is not cost-effective to program a connection to the API.

The following sections provide additional detail on the manner in which the various stakeholders may interact with the CSV format for data transfer.

8.2.1 Housing Developers

The Bulk Application import is useful for Housing Developers that are submitting multiple applications at the same time (e.g. a new 60-unit housing tract with solar interconnection included). The developer can aggregate the data for multiple applications in an Excel file that can then be easily converted a CSV file. Then, rather than create a new single application, the applicant can use the link on the Application Dashboard to upload the bulk data file as specified in Section 2.3.1.5.

8.2.2 Utility

Utilities that opt for the manual data transfer approach can download the database information in the Full Report or a subset of the database information in a Custom Report. The functionality is also available for the Processor user to bulk import data into the database if needed.

8.2.3 Regulatory

The Regulatory user has access to the Regulatory Export, which can be customized to export a sub-set of the database as needed to meet the Regulatory reporting requirements. This feature reduces admin burden on the Processors by providing data to the regulatory on their behalf. The system has the

functionality to interface with other statewide reporting sites such as California Solar Statistics and to provide links to approved public sub-sets of data that would not require authentication.

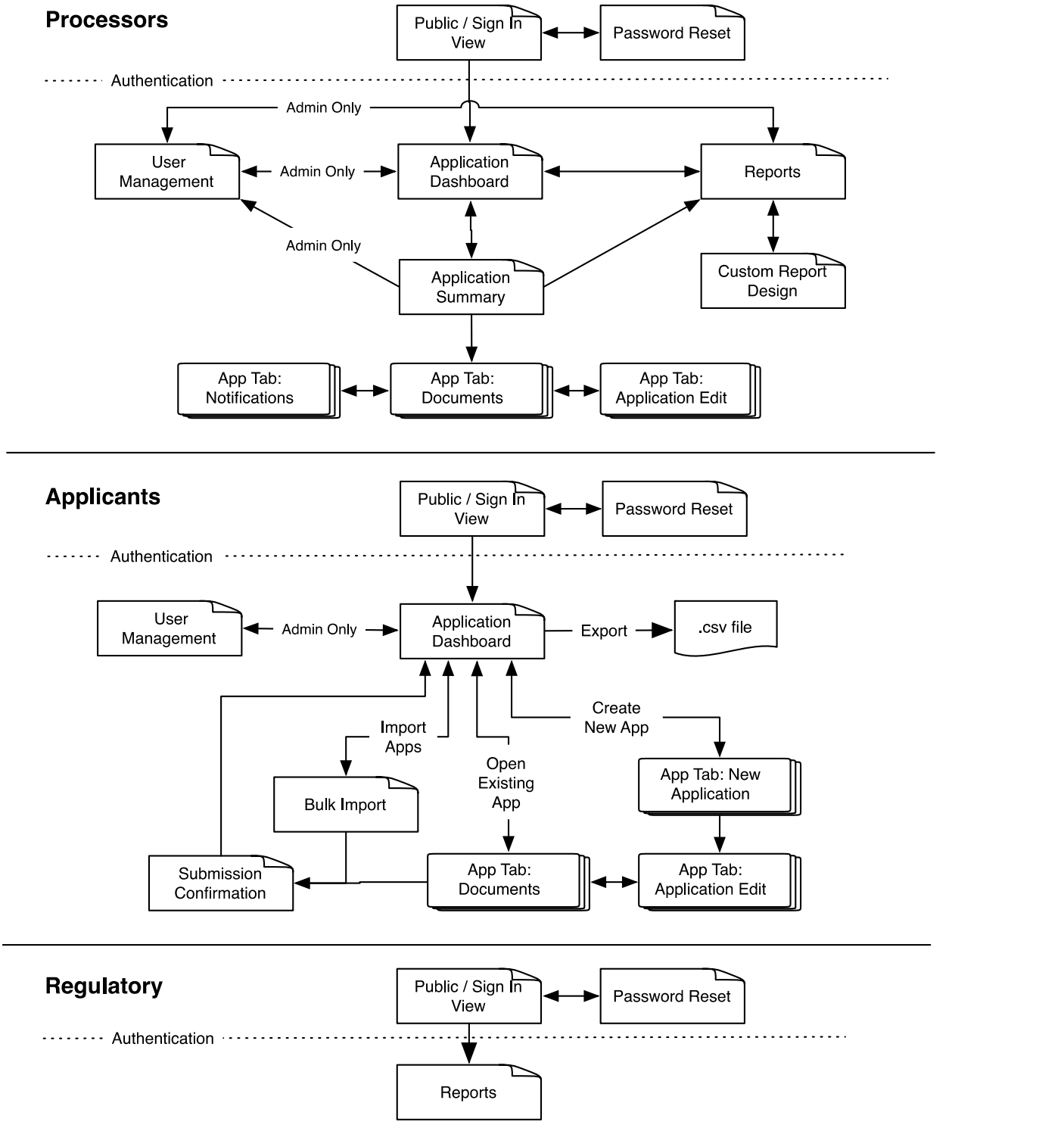
Appendices

Appendix A: Use Cases

The list of use cases has been provided here. The complete Appendix has been provided a second document.

1. Site Access Use Cases
    1.1. Registering for the Site
    1.2. Forgotten password or user name
2. Applicant Use Cases
    2.1. Submitting an application
    2.2. Submitting Documentation
    2.3. Checking the Status of an Application
    2.4. Submitting Final Inspection Results - Applicant
3. Processor Use Cases
    3.1. Account management for Processor Admins
    3.2. Reviewing a New Interconnection Application
    3.3. Assigning the Application for Technical Review
    3.4. Assigning the Application to an External Stakeholder for Action
    3.5. Editing and Requesting Edits to Documentation
    3.6. Making Application Notes
    3.7. Approving an Application for PTO
    3.8. Suspending an Application
    3.9. Cancelling an Application
4. Running Reports / Custom Reporting
    4.1. Downloading a Standard Report
    4.2. Creating a Custom Report

Appendix B: Site Map by User Type



Appendix C 1: Site Map by Permissions

Appendix C: Utility-Specific Interconnection Application Forms

Example output files of the Interconnection Application Forms for Pasadena Water and Power (PWP) and Southern California Edison (SCE). Due to length, only one page of the SCE long form is displayed.

PSI Application Number: PS3 - _____

AR | **APPLICATION REQUEST FORM PASADENA SOLAR INITIATIVE (PSI)** | PASADENA Water&Power SERVING THE COMMUNITY SINCE 1906

For details on the PSI program and Pasadena Water and Power's electrical requirements, visit www.PWPweb.com/solar or call (626) 744-6970.

Application Received 3/14/2014 [Internal Use Only]

Please mail to:
Pasadena Water and Power
Att: Pasadena Solar Initiative
150 S. Los Robles Ave. Suite 200
Pasadena, CA 91101

1. Customer Information

(●) Residential ( ) Commercial ( ) Non-Profit / Government ( ) Low-Income / Affordable Housing

Customer Name/Company	Physical Address of Solar System		
Sample Name	333 City Circle, Hometown CA 99999		
Phone	**Fax**	**Email**	**PWP Electric Account**
(444) 555-1000		sample@solar.net	001-314-154

2. Company or Installer information

[ ] Self-Installation [If checked, skip this section and continue in Section 3.]

Company	Address		
High Noon Solar	555 West Street, Industrial Park CA 99999		
Contact	**Phone**	**Cell Phone**	**Fax**
Steve Stevenson	(888) 555-1000	(444) 555-9000	
Email	**Contractor License #**	**Expiration Date**	
sample@solar.net	85858	12/10/2014	

3. System Install Information (check all that apply)

[ ] Retrofit [✓] New Construction [ ] Lease [ ] PPA [ ] Battery-Backup [ ] Tracker [ ] BIPV [ ] Ground-Mounted

4. Inverter Information *

	Manufacturer	Model	Quantity	Rating (W)	Efficiency (%)
Inverter 1	SunTech	A2420	1	4000	93.5
Inverter 2					

5. Solar Panel Information *

PV Module Mfr.	Model	Qty	Rating (STC)	Azimuth	Tilt	CEC-AC kW	Design Factor	Inverter #
TechSun	P55-V10	8	280	180	30	3.14	%	1
							%	
							%	

6. PSI Incentive Category

(●) EPBB Incentive: $_____ / Watt ( ) PBI Incentive: $_____ / kWh

7. Incentive Calculation (EPBB) [PWP Use Only]

Total CEC-AC Rating _____ W-AC X Design Factor _____ % X Incentive Rate $ _____ / W = Reserved Amount $_____ Reservation Date ____/____/_____

8. Incentive Calculation (PBI) [PWP Use Only]

Estimated Annual Output _____ kWh X Incentive Rate _____ / kWh X # Payments 5 = Estimated Total Incentive $_____ Reservation Expiration Date ____/____/_____

*Attach additional sheets as needed

Continue on Page 2

Appendix C 2: PWP PSI/AR Application Form

Center for Sustainable Energy® CALIFORNIA

Print Form

APPLICATION FOR NET ENERGY METERING OF A NEW SOLAR, WIND OR FUEL CELL GENERATING FACILITY OF NOT MORE THAN 10KW UNDER NEM RATE SCHEDULE

APPLICABILITY

This application is for the interconnection of a new solar, wind or fuel cell Electrical Generating Facility (eligible for Schedule NEM-Net Energy Metering):

- that is located on the premises of an Eligible Customer-Generator, as defined in Public Utilities (PU) Code Section 2827 (b) (4);
- that operates in parallel with SCE's electric system, for the purpose of offsetting part or all of the eligible customer-generator's own electrical requirements;
- with a capacity of not more than 10 kW, using UL-approved inverter(s);
- with a point of interconnection on the customer side of the main circuit breaker (load-side tap);
- that does not require net generation output metering; and
- is the sole generator on site (no back-up generator(s), without battery backup systems, etc.

For all other systems, submit the Generating Facility Interconnection Application (GFIA), Form 14-732, available at www.sce.com/nem.

PREREQUISITES FOR INTERCONNECTION

This document is solely an application. It **does not** authorize you to operate your generating facility in parallel with SCE's electric system. To ensure safety and grid reliability, you **must not** operate your generating facility in parallel with the distribution system until SCE provides you with a Permission to Operate (PTO) letter.

INFORMATION REQUIREMENTS

This application must be accompanied by a **Single Line Diagram** (SLD) of the proposed system showing the generator components and the electrical path from generator to SCE meter, clearly identifying the point of interconnection (a sample SLD is available at www.sce.com/nem). A signed NEM Interconnection Agreement and copy of the final electrical approval issued by the local jurisdictional authority may be submitted separately, and are required before SCE will issue a PTO letter. Visit www.sce.com/nem to download an Application Checklist and required document forms and samples. SCE normally provides Interconnection Agreements within 30 days of receiving all necessary information. For larger installations (>10 kW), or installations not conforming to the requirements of UL 1741, it may be necessary for SCE to request additional information (Form 14-732: Generating Facility Interconnection Application) from you or your contractor to clarify the details of your installation and more time may be required for approval. SCE will notify you if an interconnection agreement cannot be provided within 30 working days. [See SCE's Rule-21 available at www.sce.com].

SCE CUSTOMER INFORMATION

SCE Customer Name	Sample Name
Street Address of Proposed Facility	333 City Circle
City, State, Zip	Hometown, CA 99999
Mailing Address (If different from above)	333 City Circle
City, State, Zip	Hometown, CA 99999
Phone Number	Primary (444) 555-1000 Other ( )
Email Address (optional)	sample@solar.net
Service Account #	3- 013-3141-54 (if permanent SCE service has not yet been established, please write 'New Construction')
Meter #	154123bfae512 (if permanent SCE service has not yet been established, please write 'New Construction')

CONTRACTOR AND/OR INSTALLER

Name of Contractor or Installer	High Noon Solar (CSLB 85858)
Contact Person	Steve Stevenson
Street Address	555 West Street
City, State, Zip	Industrial Park, CA 99999
Phone Numbers	(888) 555-1000
E-mail Address	sample@solar.net

QUALIFIED NEM GENERATING FACILITY

Technology Type	● Solar PV: ○ Wind: ○ Fuel Cell (using renewable fuel source)
Net Nameplate Capacity (CEC-AC kW)	3.14
Manufacturer of Inverter/Controller	SunTech
Inverter Model Number	A2520
Estimated Monthly Kilowatt-hour Production	Example: CEC-AC kW * 720 hours * 0,2 (solar) or 0.15 (wind) or 0.85 (fuel cell) = Estimated Monthly kWh 452.16

When completed, please send this form to: NEM Program, Southern California Edison, P.O. Box 800, Rosemead, CA 91770
Phone: 626-302-9680 FAX: 626-571-4272 E-Mail: customer.generation@sce.com

Form 14-753
Rev 5/2012

Appendix C 3: SCE Short Form

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

GENERATING FACILITY INTERCONNECTION APPLICATION

GENERATING FACILITY INTERCONNECTION APPLICATION

Part 2 – Identifying the Generating Facility's Location and Responsible Parties

Project Name:	*Date Received:*	*Generating Facility ID:*	*Application Expiration Date (Refer to Part 2, Section E)*
SCE-INT-0000123	2013-03-14		2014-03-14

(For SCE Use Only)

NEM Projects Only **(Check one):** **California Solar Initiative - PBI** ☐ **EPBB** ☒
Self Generation Incentive Program ☐
CEC - NHSP ☐ **ERP** ☐

A. Customer Electric Account Information (To what electric service will the Generating Facility be interconnected for parallel operation with SCE? For aggregated electric accounts (under BG-NEM, dairy operations only) provide the primary and all associated accounts/meter information)

Sample Name	3-013-141-54	154123bfae512
Name shown on SCE service account	Service Account Number	Meter Number

NOTE: Customer Service account number must match the customer's utility bill account information.

333 City Circle	Hometown	California	99999
Service Account Street Address	City	State	Zip

Customer Account Contact Information (Who is the customer contact for progress updates and /or additional information?)

Sample Name	
Contact Person	Company Name

(444) 555-1000		sample@solar.net
Phone	Fax	E-mail

333 City Circle	Hometown	California	99999
Mailing Address	City	State	Zip

B. Project Contact Information (Who is the project contact for this Generating Facility?)

Steve Stevenson	High Noon Solar
Project Contact Person	Company Name

(444) 555-1000		sample@solar.net
Phone	Fax	E-mail

555 West Street	Industrial Park	California	99999
Mailing Address	City	State	Zip

B.1. Will the Generating Facility be owned by a (third) party other than the name appearing on the SCE service account in A. above (please check)? _____ Yes __x__ No ☐

Appendix C 4: SCE Long Form (Page 3 of 14)

Appendix D: Short Form Fields

Field Label	Field Type	Field Requirement
Utility	Choice	Required
Host Customer Name	Text	Required
Site Address	Text	Required
Site City	Text	Required
Site State	Text	Required
Site ZIP Code	Text	Required
Host Customer Mailing Address	Text	Required
Host Customer Mailing City	Text	Required
Host Customer Mailing State	Text	Required
Host Customer Mailing ZIP Code	Number	Required
Host Customer Primary Phone	Number	Not Required
Host Customer Secondary Phone	Number	Not Required
Host Customer E-mail Address	Text	Required
Service Account Number	Text	Not Required
Meter Number	Text	Not Required
CSLB Number	Number	Not Required
Contractor Company Name	Text	Required
Contractor Contact Name	Text	Not Required
Contractor Company Address	Text	Not Required
Contractor City	Text	Not Required
Contractor State	Test	Not Required
Contractor ZIP Code	Text	Not Required
Contractor Primary Phone	Number	Not Required
Contractor Secondary Phone	Number	Not Required
Contractor E-mail Address	Text	Not Required
Technology Type	Choice	Required
Inverter Manufacturer	Auto-Fill	Required
Inverter Model Number	Auto-Fill	Required
Quantity	Number	Required
Power Rating	Calculated	N/A
Efficiency	Calculated	N/A
Solar PV Module Manufacturer	Auto-Fill	Required
Solar PV Module Model Number	Auto-Fill	Required
PTC-DC Rating	Calculated	N/A
Net Nameplate Capacity (CEC-AC kW)	Calculated	N/A
Estimated Annual kWh Production	Calculated	N/A

Appendix E: Long Form Fields

Field Name/Question	Field Type	Required?	Available Selections	?*
Is the facility applying for Net Energy Metering?	Choice	Required	"Yes", "No"	?
If you have also applied for a rebate for this generating facility please select which rebate system.	Choice	Required*	"CSI PBI", "CSI EPBB", SGIP", "CEC NHSP", "CEC ERP"	?
Service Account Holder Name	Text	Required		
Service Account Number	Text	Not Required		
Meter Number	Text	Not Required		
Site Street Address	Text	Required		
Site City	Text	Required		
Site State	Auto-Fill	Required		
Site ZIP Code	Number	Required		
Host Customer Contact Name	Text	Not Required		?
Host Customer Company Name	Text	Not Required		
Host Customer Mailing Street Address	Text	Not Required		
Host Customer Mailing City	Text	Not Required		
Host Customer Mailing State	Text	Not Required		
Host Customer Mailing ZIP Code	Number	Not Required		
Host Customer Phone	Number	Required		
Host Customer Fax	Number	Not Required		
Host Customer E-mail	Number	Not Required		
CSLB Number	Number	Not Required		?
Contractor Company Name	Text	Required		?
Contractor Contact Name	Text	Not Required		
Contractor Company Address	Text	Not Required		
Contractor City	Text	Not Required		
Contractor State	Text	Not Required		
Contractor ZIP Code	Text	Not Required		
Contractor Primary Phone	Number	Not Required		
Contractor Secondary Phone	Number	Not Required		
Contractor E-mail Address	Text	Not Required		
System Owner is Service Account Holder?	Choice	Required	"Yes", "No"	?
Name of Person Executing the GFIA	Text	Not Required		?
Title of Person Executing the GFIA	Text	Not Required		

Name of Legal Entity to be entered in signatures section of GFIA	Text	Not Required		
Name of Person Executing the CGA	Text	Not Required		?
Title of Person Executing the CGA	Text	Not Required		
Name of Legal Entity to be entered in signatures section of CGA	Text	Not Required		
Generating Facility Operating Date	Date	Not Required		
Generating Facility Expiration Date	Date	Not Required		?
Detailed interconnection study cost responsibility	Choice	Not Required	"Estimated Cost". "Actual Cost"	?
Interconnection Facilities and distribution system modifications' (if applicable) cost responsibility	Choice	Not Required	"Estimated Cost". "Actual Cost"	?
Indicate the operating mode of the Generating Facility	Choice	Required	"Parallel Operation", "Momentary Parallel (MP) Operation", "Isolated Operation"	?
For Parallel Operation, indicate the type(s) of agreement being requested with this application from the list below:		*Required		
Generating Facility Interconnection Agreement (Non-Export)	Checkbox	Not Required		?
Generating Facility Interconnection Agreement (Inadvertent Export)	Checkbox	Not Required		?
"Qualifying Facility" Power Purchase Agreement	Checkbox	Not Required		?
"Public Water and Wastewater Agency" Power Purchase Agreement (Feed-In)	Checkbox	Not Required		?
"Public Water and Wastewater Agency" Power Purchase Agreement (Excess Sale)	Checkbox	Not Required		?
"California Renewable Energy Small Tariff" Power Purchase Agreement (Feed-In)	Checkbox	Not Required		?
"California Renewable Energy Small Tariff" Power Purchase Agreement (Excess Sale)	Checkbox	Not Required		?
Third Party Owned Generating Facility	Checkbox	Not Required		?

Interconnection Agreement (Non-Export)				
Third Party Owned Generating Facility Interconnection Agreement (Inadvertent Export)	Checkbox	Not Required		?
Third Party Owned "Qualifying Facility" Power Purchase Agreement	Checkbox	Not Required		?
Third Party Owned Customer Generation Agreement	Checkbox	Not Required		?
Net Energy Metering and Renewable Electrical Generating Facility Interconnection Agreement	Checkbox	Not Required		?
Biogas Digester Electrical Generating Facility Net Energy Metering and Renewable Electrical Generating Facility Interconnection Agreement	Checkbox	Not Required		?
Fuel Cell Electrical Generating Facility Net Energy Metering and Renewable Electrical Generating Facility Interconnection Agreement	Checkbox	Not Required		?
Generating Facility Interconnection Agreement (Multiple Tariff)	Checkbox	Not Required		?
Other:	Checkbox & Text	Not Required		?
Estimate of the maximum kW the Generating Facility is expected to export	Text	Required		
Which protection option will be used to prevent energy from being exported?	Choice	Not Required	"Reverse-Power", "Under-Power", "certified Non-Islanding", "<50% of Minimum Site Load"	?
If "Certified Non-Islanding" was selected, provide the continuous current rating of the Host Customer facility's service entrance equipment (service panel rating) (Amps)	Text	Not Required		
If "<50% of Minimum Site Load" was selected, provide the minimum load of the Host Customer facility. (kW)	Text	Not Required		
What is the maximum 3-phase fault current that will be contributed by the Generating Facility to a 3-phase fault at	Text	Not Required		?

the Point of Common Coupling (PCC)? (If the Generating Facility is single phase in design, please provide the contribution for a line-to-line fault.) (Amps)				
Indicate the short circuit interrupting rating of the host Customer facility's service panel (Amps)	Text	Not Required		?
Will the Generating Facility be operated for Combined Heat and Power or Cogeneration?	Choice	Required	"Yes", "No"	?
Will the Generating Facility be operated for Peak Shaving/Demand Management?	Choice	Required	"Yes", "No"	?
Will the Generating Facility be operated as the Primary Power Source?	Choice	Required	"Yes", "No"	?
Will the Generating Facility be operated for Standby/ Emergency/ Backup	Choice	Required	"Yes", "No"	?
Will the Generating Facility be operated with Net Energy Metering?	Choice	Required	"Yes", "No"	?
Is the Generating Facility associated with Multiple Tariffs?	Choice	Required	"Yes", "No"	?
If Multiple Tariffs is "Yes", select the type of Multiple Tariff	Choice	Not Required	"New Adding NEM & Non-NEM", "Existing Non-NEM, Adding NEM", "Existing NEM, Adding Non-NEM", "Existing NEM, Adding different NEM"	?
Does your interconnection satisfy ESR?	Choice	Required	"Yes", "No"	
if No, why not?	Text	Not Required		
Is the currently proposed tie-in point a result of restrictions placed on altering the existing panel or equipment within, as imposed by the local authority having jurisdiction?	Choice	Required	"Yes", "No"	
if No, why not?	Text	Not Required		
Are there existing utility facilities in the vicinity of the proposed point of interconnection?	Choice	Required	"Yes", "No"	
Please indicate if Qualifying Facility Status will be obtained from the FERC for this Generating Facility	Choice	Required	"Yes", "No"	?

(If Co-Gen:) Please indicate if Generating Facility will meet the annual Efficiency and Operating Standards of PUC Code 218	Choice	Required	"Yes", "No"	
Generator Reference Name	Text	Required		?
Generator Status (New or Existing)	Choice	Required	New", "Existing"	?
Number of units of generators of this "type"	Text	Required		?
Indicate the type and fuel used as the "prime mover" or source of energy for the Generator	Choice	Required	"ICE - Natural Gas", "ICE - Diesel", "ICE - Other", "Microturbine - Natural Gas", "Microturbine - Other", "Combustion Turbine - Natural Gas", "Combustion Turbine - Other", "Steam Turbine", "Solar PV Panels", "Solar-Thermal Engine", "Fuel Cell - Natural Gas", "Fuel Cell - Other", "Hydroelectric Turbine", "Wind Turbine", "Other"	
Generator/Inverter Manufacturer Name	Text	Required		?
Generator/Inverter Model Name/Number	Text	Required		?
Generator/Inverter Software Version (Number)	Text	Not Required		?
Is Generator Certified by Nationally Recognized Testing Laboratory (NRTL) according to Rule 21?	Choice	Required	"Yes", "No"	?
Generator Type	Choice	Required	"Synchronous", "Induction", "Inverter"	?
Gross Nameplate Rating (kVA)	Number	Not Required		?
Gross Nameplate Rating (kW)	Number	Required		?
Net Nameplate Rating (kW)	Number	Required		?
Operating Voltage (kV)	Number	Required		?
Power Factor Rating (%)	Number	Not Required		?
Power Factor Adjustment Range Min (%)	Number	Not Required		?
Power Factor Adjustment Range Max (%)	Number	Not Required		?
Wiring Configuration	Choice	Not Required	"Single-Phase", "Three-Phase"	?
if 3-phase: 3-Phase Winding Configuration	Choice	Not Required	"3 Wire Delta", "3 Wire Wye", "4 Wire Wye"	?

Neutral Grounding System Used	Choice	Not Required	"Ungrounded", "Solidly Grounded", "Ground Resistor"	?
Neutral Grounding System Resistor (Ohms)	Number	Not Required		?
If Generator Type is "Synchronous" provide:				?
Synchronous Reactance	Number	Not Required		?
Transient Reactance	Number	Not Required		?
Subtransient Reactance	Number	Not Required		?
If Generator Type is "Induction" provide:				?
Locked Rotor Current (Amps)	Number	Not Required		?
Stator Resistance (%)	Number	Not Required		?
Stator Leakage Reactance (%)	Number	Not Required		?
Rotor Resistance (%)	Number	Not Required		?
Rotor Leakage Reactance (%)	Number	Not Required		?
Short Circuit Current Produced by Generator	Number	Not Required		?
For Generators started as a "Motor" only				?
In-Rush Current	Text	Not Required		?
Host Customer's Service Entrance Panel Continuous Current Rating	Text	Not Required		?
Solar PV Module Manufacturer	Text	Not Required		?
Solar PV Module Model Number	Text	Not Required		?
Quantity	Number	Not Required		?
PTC-DC Rating	Number	Not Required		?
Total Quantity of Generators	Calculated	Not Required		
Total Facility Gross Nameplate Rating (KW)	Calculated	Not Required		

* The symbol “?” indicates that the question would have additional clarification available in the form of a pop-up window that can be opened by clicking on the question mark icon in the interface.