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Helping Utilities Make Smart Solar Decisions

PV Grid Integration Workshop

Policy Update – Interconnection Standards & Screens

April 19, 2012

Darren Deffner, Policy Director, ddeffner@solarelectricpower.org , 202-559-2020

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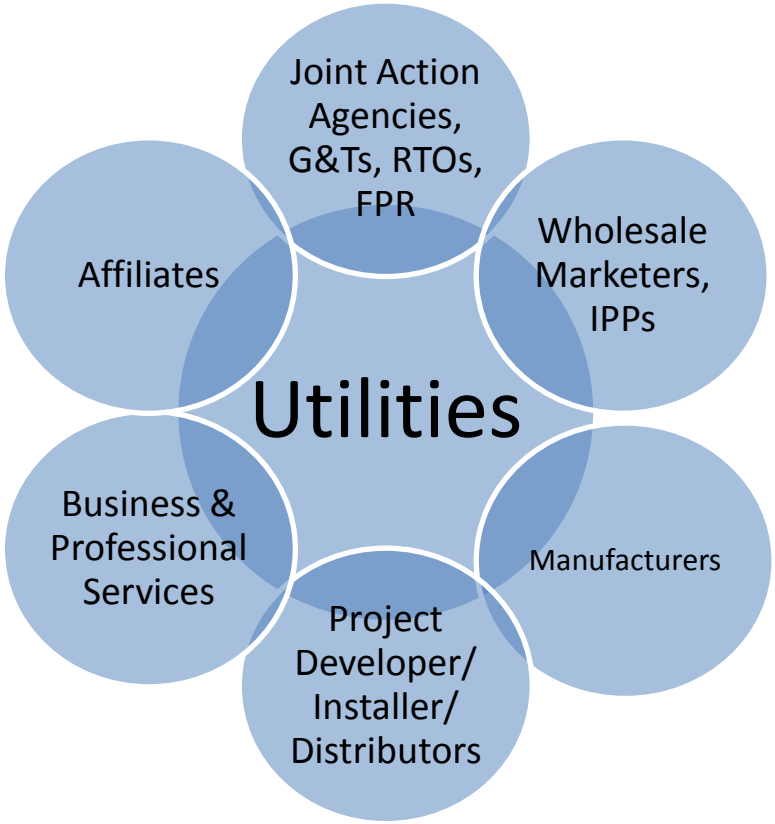
About SEPA

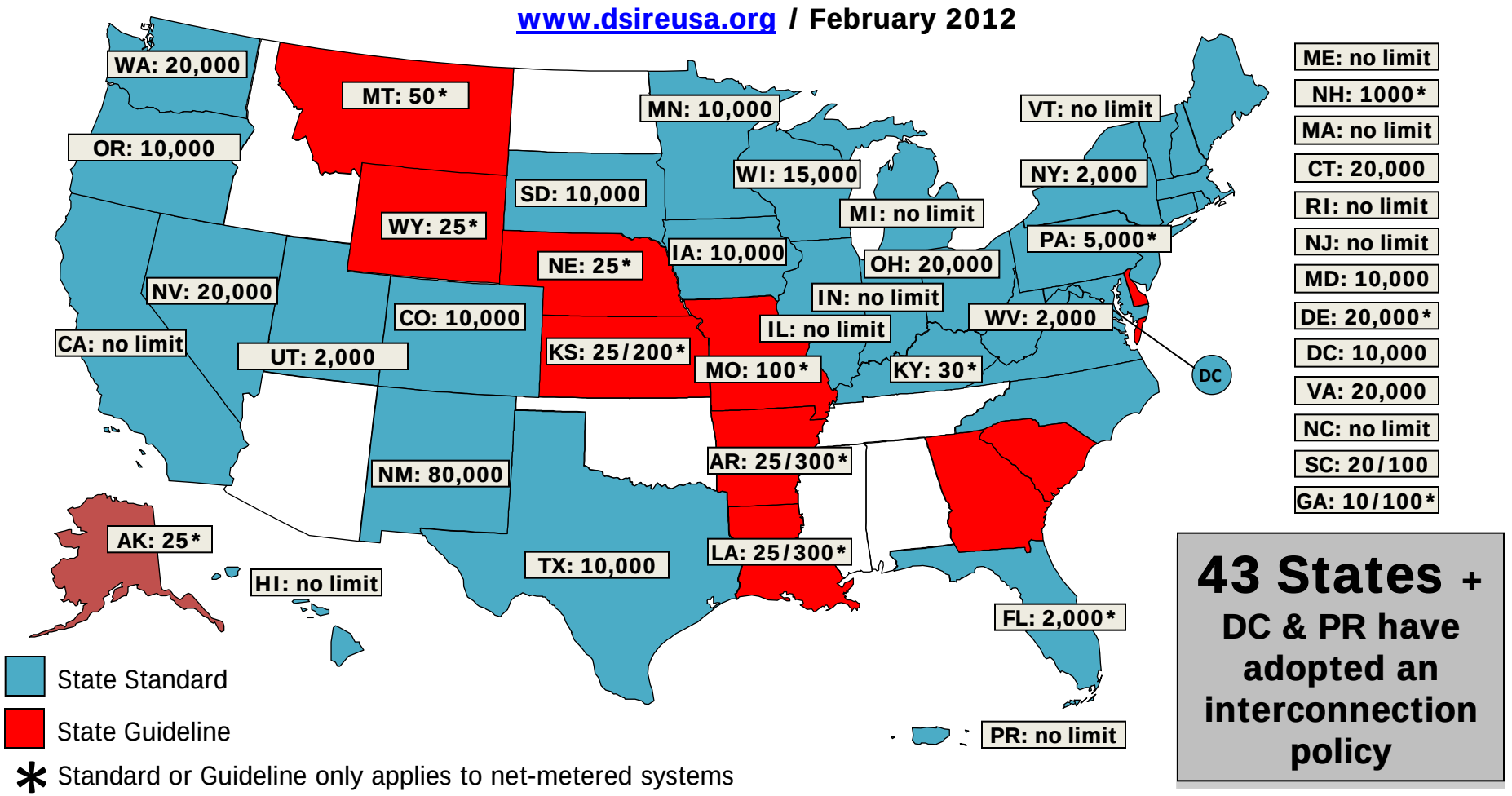
- Formed in 1992 as the Utility Photovoltaic Group
- Educational non-profit organization (501 c 3)
- Provides unbiased solar information, services and events with a utility focus
- 420 Utility Members
  - 52% of the US utility customers
  - 90 % of the installed solar



Benefits of Membership

- **On demand one-on-one research services through Regional Director's**
- **Forums for Peer-to Peer exchanges of information, experience and lessons learned**
  - Fact Finding Missions - International and Domestic
  - Solar Power International
  - Utility Solar Conference
  - Working Groups
  - Regional Workshops
- **Access to webinars, reports, trainings, newsletters, case studies, databases**
- **Research staff that will research questions, track developments and produce information**

Interconnection Policies



Note: Numbers indicate system capacity limit in kW.

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FERC SGIP Process

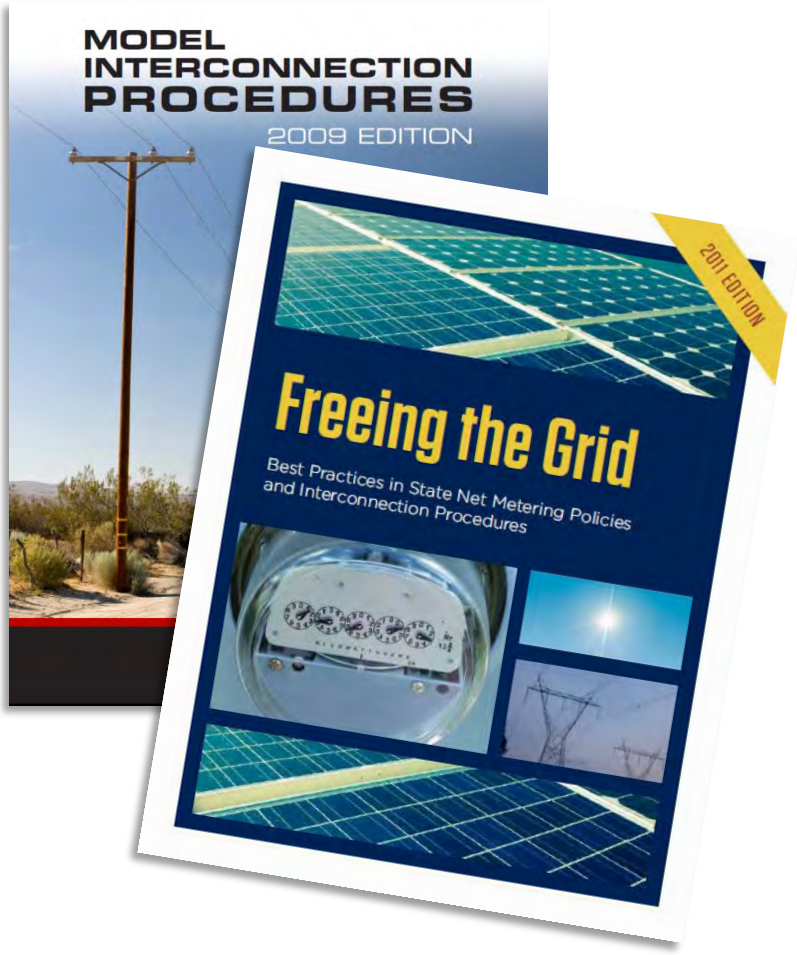
- Current screening criteria for Small Generator Interconnection Procedures (SGIP) process at FERC established in 2005 in Order 2006. (Multi-party stakeholder process.)
- Criteria used to determine whether project can qualify for "fast-track" procedures.
- Used as a "model" by a number of states when they established similar interconnection standards.
- Key "screens" – primarily based on ensuring safety, reliability, and "anti-islanding:"
  - Solar electric project is 2 MW or less.
  - Aggregated distributed generation on circuit (including proposed project) shall not exceed 15% of annual peak load.
  - Timeframe for certain process steps.

"Freeing the Grid"

- Grades for states reflecting "model" interconnection standards.

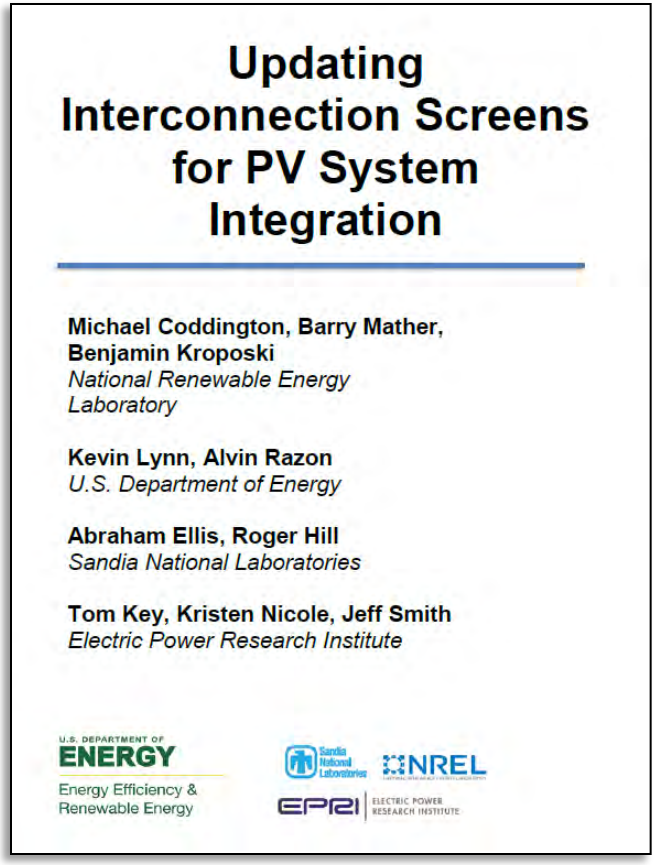
- Ratings on (partial list):
  - Individual system capacity
  - Timelines
  - Interconnection charges
  - External disconnect switch
  - Certification
  - Technical screens
  - Insurance requirements

- Effective for policy advocacy but may not reflect preferred utility practices.



NREL Study

- January 2012 study provides updated technical analysis of interconnection screens.
- Review of 15% threshold:
  - Unintentional islanding
  - Voltage control
  - Protection coordination
- Short-term solutions:
  - Screen based on minimum daytime load
  - Supplementary screens
  - Utility identified zones of penetration levels



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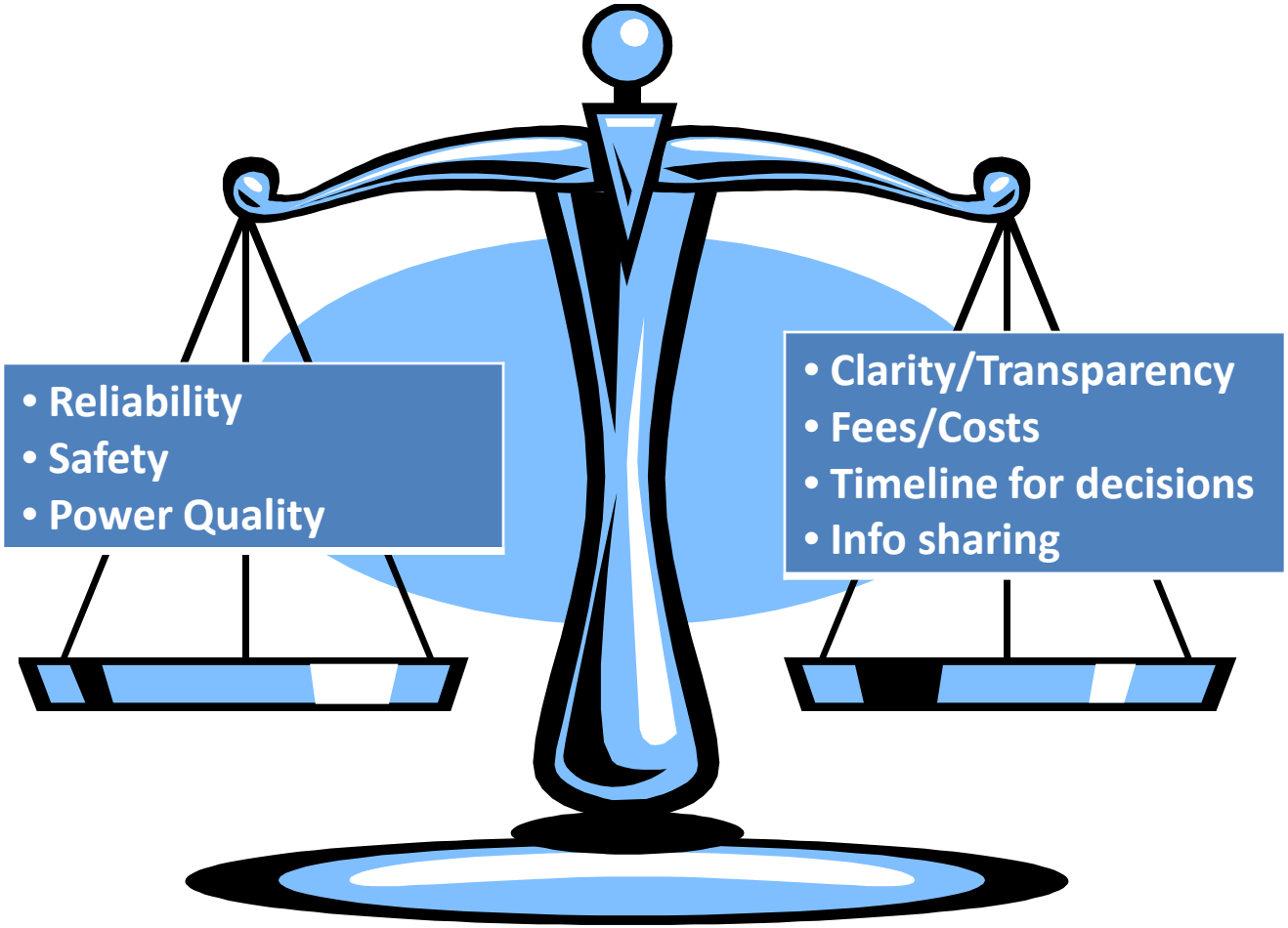
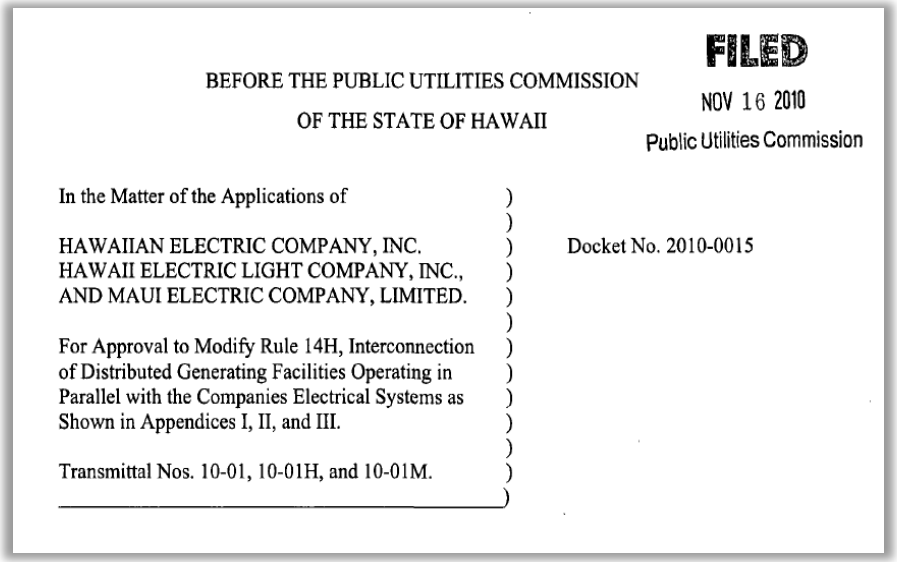
Balancing Act



Action Throughout the U.S.

- Increased attention to interconnection processes of distributed solar is occurring in multiple arenas.
- Select examples include:
  - HI: “Rule 14H” Commission Decision
  - CA: “Rule 21” Settlement Negotiations
  - IEEE 1547
  - SunShot projects
- Simplifying process is seen as key method to shorten timeframe for deployment, continue growth for solar, and reduce costs.

Hawaii



BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

FILED
NOV 16 2010
Public Utilities Commission

In the Matter of the Applications of)
)
HAWAIIAN ELECTRIC COMPANY, INC.) Docket No. 2010-0015
HAWAII ELECTRIC LIGHT COMPANY, INC.,)
AND MAUI ELECTRIC COMPANY, LIMITED.)
)
For Approval to Modify Rule 14H, Interconnection)
of Distributed Generating Facilities Operating in)
Parallel with the Companies Electrical Systems as)
Shown in Appendices I, II, and III.)
)
Transmittal Nos. 10-01, 10-01H, and 10-01M.)

Commission opened proceeding and issued decision on November 29, 2011, and additional clarifications thereafter.

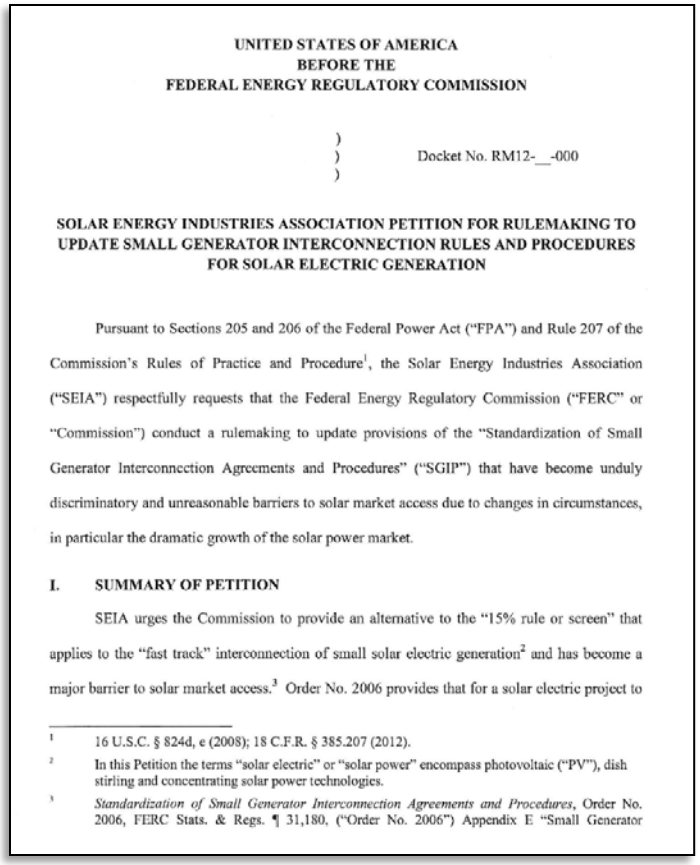
- Bellwether state, given high penetration issues.
- Proposal filed after review of Rule 14H tariff with focus on:
  - Safety, Reliability, Power Quality
  - Restoration
  - Protect utility and customer equipment
  - Protect Generating Equipment
  - Utility System Overcurrent Devices
  - Utility System Operating Efficiency

Commission Decision

- After certain early issues worked out, Commission Decision adds following for HECO to incorporate:
  - Supplemental review process, if aggregate capacity per line section is below 50% min kW load when proposed generation is available.
  - Time limits for certain steps in interconnection process established (e.g. 20 days for supplemental review, 120 days for technical interconnection study)
  - No requirement that SCADA equipment be installed on systems under 250 kW – 1 MW.
  - “Unreasonable cost” is not a sufficient reason to justify authority for denying interconnection

SEIA Petition to FERC

- In parallel with state efforts, the Solar Energy Industries Association (SEIA) filed a petition with FERC.
- The February 2012 petition requests that FERC institute a rulemaking to update certain SGIP provisions that are impeding the growth of solar.
- Key revisions being requested:
  - Additional "solar-only" screen of 100% of minimum daytime load (between 10 AM and 2 PM)
  - Utilities to provide peak and minimum load information.
  - Delete 2 MW cap for fast-track interconnection.
  - Independent third-party review.



UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

)
)
)

Docket No. RM12-__-000

SOLAR ENERGY INDUSTRIES ASSOCIATION PETITION FOR RULEMAKING TO UPDATE SMALL GENERATOR INTERCONNECTION RULES AND PROCEDURES FOR SOLAR ELECTRIC GENERATION

Pursuant to Sections 205 and 206 of the Federal Power Act ("FPA") and Rule 207 of the Commission's Rules of Practice and Procedure[1], the Solar Energy Industries Association ("SEIA") respectfully requests that the Federal Energy Regulatory Commission ("FERC" or "Commission") conduct a rulemaking to update provisions of the "Standardization of Small Generator Interconnection Agreements and Procedures" ("SGIP") that have become unduly discriminatory and unreasonable barriers to solar market access due to changes in circumstances, in particular the dramatic growth of the solar power market.

I. SUMMARY OF PETITION

SEIA urges the Commission to provide an alternative to the "15% rule or screen" that applies to the "fast track" interconnection of small solar electric generation[2] and has become a major barrier to solar market access.[3] Order No. 2006 provides that for a solar electric project to

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1 16 U.S.C. § 824d, e (2008); 18 C.F.R. § 385.207 (2012).

2 In this Petition the terms "solar electric" or "solar power" encompass photovoltaic ("PV"), dish stirling and concentrating solar power technologies.

3 *Standardization of Small Generator Interconnection Agreements and Procedures*, Order No. 2006, FERC Stats. & Regs. ¶ 31,180, ("Order No. 2006") Appendix E "Small Generator

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"I Hate You!"

"SEIA's proposals…are not reasonable or necessary to further…an efficient interconnection process that effectively protects electric system safety and reliability.
- Edison Electric Institute

"The existing SGIP…resulted from an extensive consensus process involving all stakeholders.
- APPA & NRECA

"Contrary to SEIA's allegations, relaxing the SGIP screens for fast track interconnection would present reliability and safety concerns.
- American Electric Power

"…such third party is not in the best position to have access to and expertise concerning a transmission owner's distribution system, specifications, rules, and procedures relevant to evaluating the proposed upgrades.
- Duke

"I Love You!"

"…the Commission should establish technical conference(s) in conjunction with a rulemaking to address the issues raised in SEIA's Petition.
- PJM Interconnection, L.L.C.

"…the alternative to the 15% screen," makes a tremendous amount of sense for solar generation systems."
- Borrego Solar Systems

"The CPUC recommends that FERC consider increasing the size of plants eligible for fast track interconnection…."
- CA Public Utilities Commission

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Point/Counterpoint

Point	Counterpoint
• SGIP provisions have become "discriminatory and unreasonable barriers to solar market access."	• SEIA's proposals are not reasonable or necessary – no credible evidence provided.
• Alternative to "15% Rule" for fast track process – i.e. 100% of min daytime load.	• "15% screen" remains important for reliability and safety – result of stakeholder process.
• Utilities to provide peak and min load information to solar developers.	• Min load info not necessary available – unreasonable to force installation of equipment and cost ratepayers.
• Delete the 2 MW threshold (or, if still necessary, raise to 10 MW).	• "Islanding" conditions can still result if cap is eliminated – 2 MW not overly conservative to justify generic change.
• Allow for expedited independent third-party technical review (at cost of the applicant) of proposed upgrade requirements.	• End result could include delays in the study process and increase possible disputes. Utilities are better positioned to understand their systems.
• Issue NOPR and hold Tech Conf.	• Deny (or consider alt – Order 2006 informal reviews).

NO CONSENSUS

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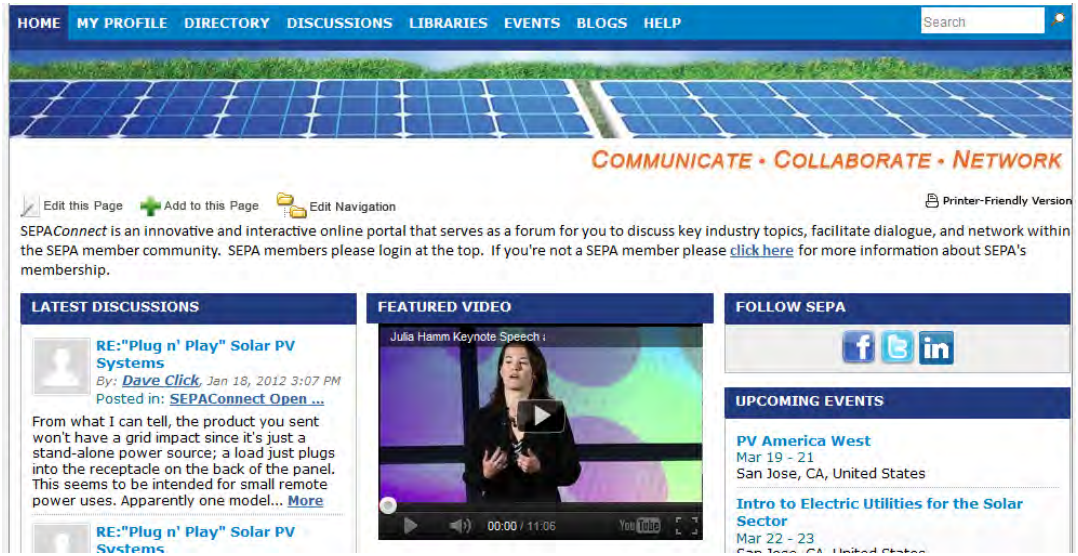
"What's Next?"

- Does FERC act – do a rulemaking? Technical conference to "flesh out" issues? Other consensus-building process?
- How do states respond?
- In what ways will utilities act – with or without new standards being considered?
- How can utilities and solar stakeholders continue the dialog to "find a balance" for effective and efficient standards?

SEPA's Members-Only Online Community



- Communicate with contacts at member utilities
- Collaborate with peers on projects and troubleshooting
- Connect with potential project bidders
- Find information about SEPA events and offerings

SEPA

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Helping Utilities Make Smart Solar Decisions

Updating Interconnection Screens for PV System Integration

April 19, 2012

EPRI-SEPA Meeting

Tucson, Arizona

Michael Coddington

**Principal Investigator,
Senior Engineer**

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

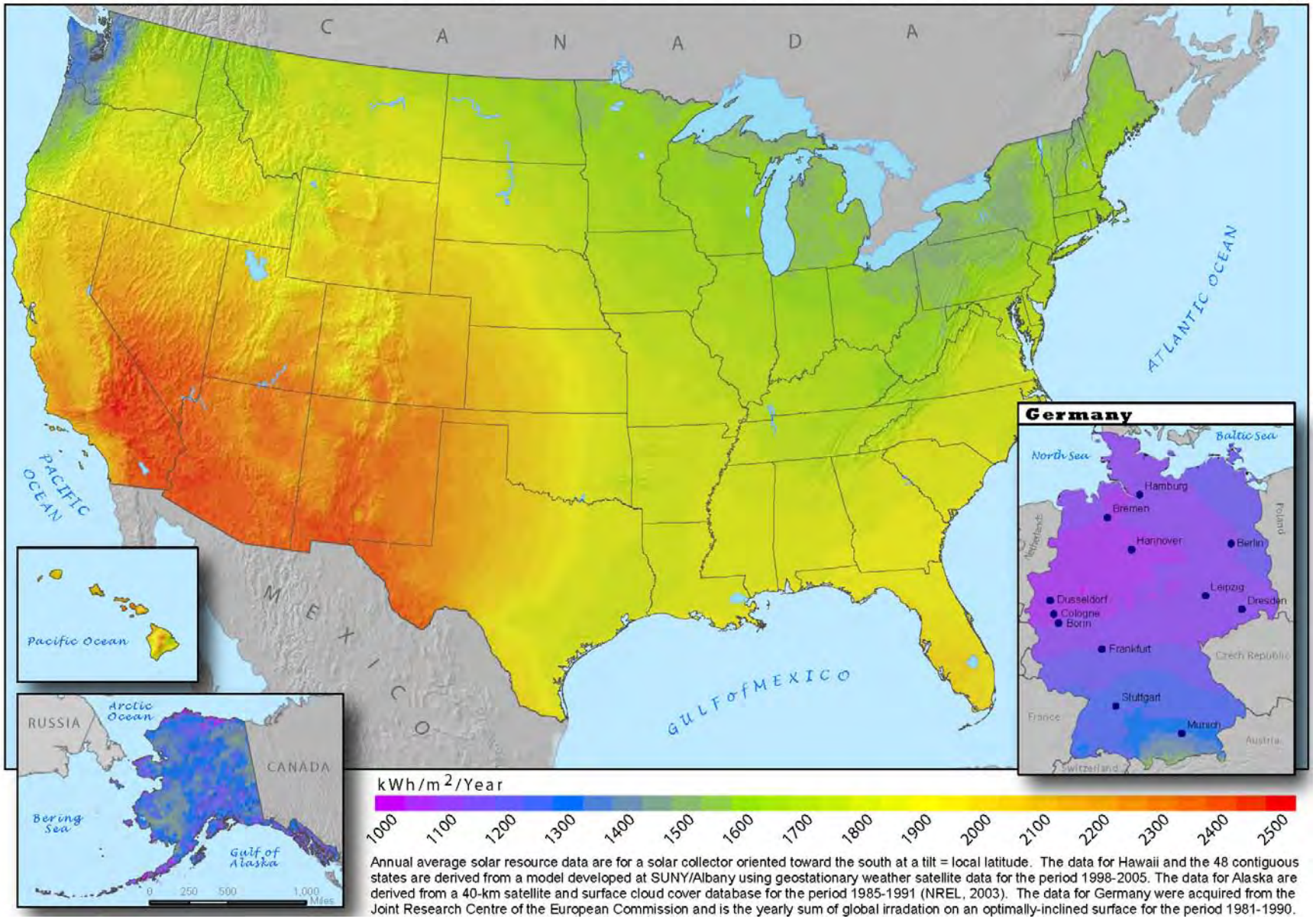
NREL is a national laboratory of the U. S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

Comparing Germany to U.S.

- U.S. is 27.5 times larger than Germany
- U.S. used 6.9 times more energy in 2008[1]
- German PV 17.3 GW; U.S. PV 3.1 GW[2]
- Germany has a goal of 66 GW by 2030

1. Source www.CIA.gov – 2008 estimated energy consumption
2. As of end of 2011 - Source SEIA Annual Report 2012

Photovoltaic Solar Resource : United States and Germany



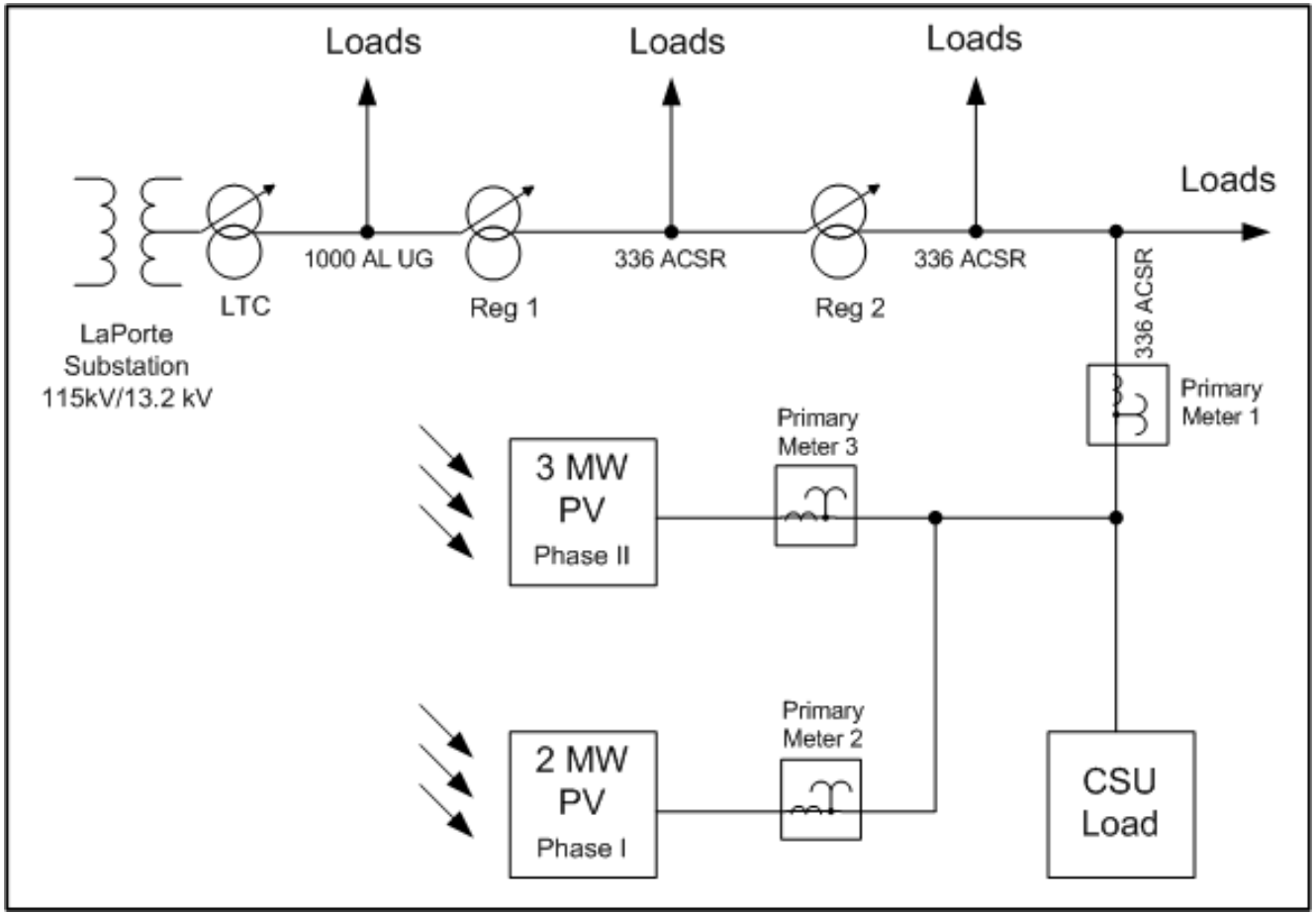
Annual average solar resource data are for a solar collector oriented toward the south at a tilt = local latitude. The data for Hawaii and the 48 contiguous states are derived from a model developed at SUNY/Albany using geostationary weather satellite data for the period 1998-2005. The data for Alaska are derived from a 40-km satellite and surface cloud cover database for the period 1985-1991 (NREL, 2003). The data for Germany were acquired from the Joint Research Centre of the European Commission and is the yearly sum of global irradiation on an optimally-inclined surface for the period 1981-1990.

High Penetration PV Case Study

- Located at Colorado State University
- 5.2 MW_{DC} PV system 6.6 miles from substation
- Installed in 2 phases (2 MW + 3.2 MW)
- Capacity penetration of approximately 57% (Instantaneous penetration can be much higher)

Details of the Utility Distribution Circuit

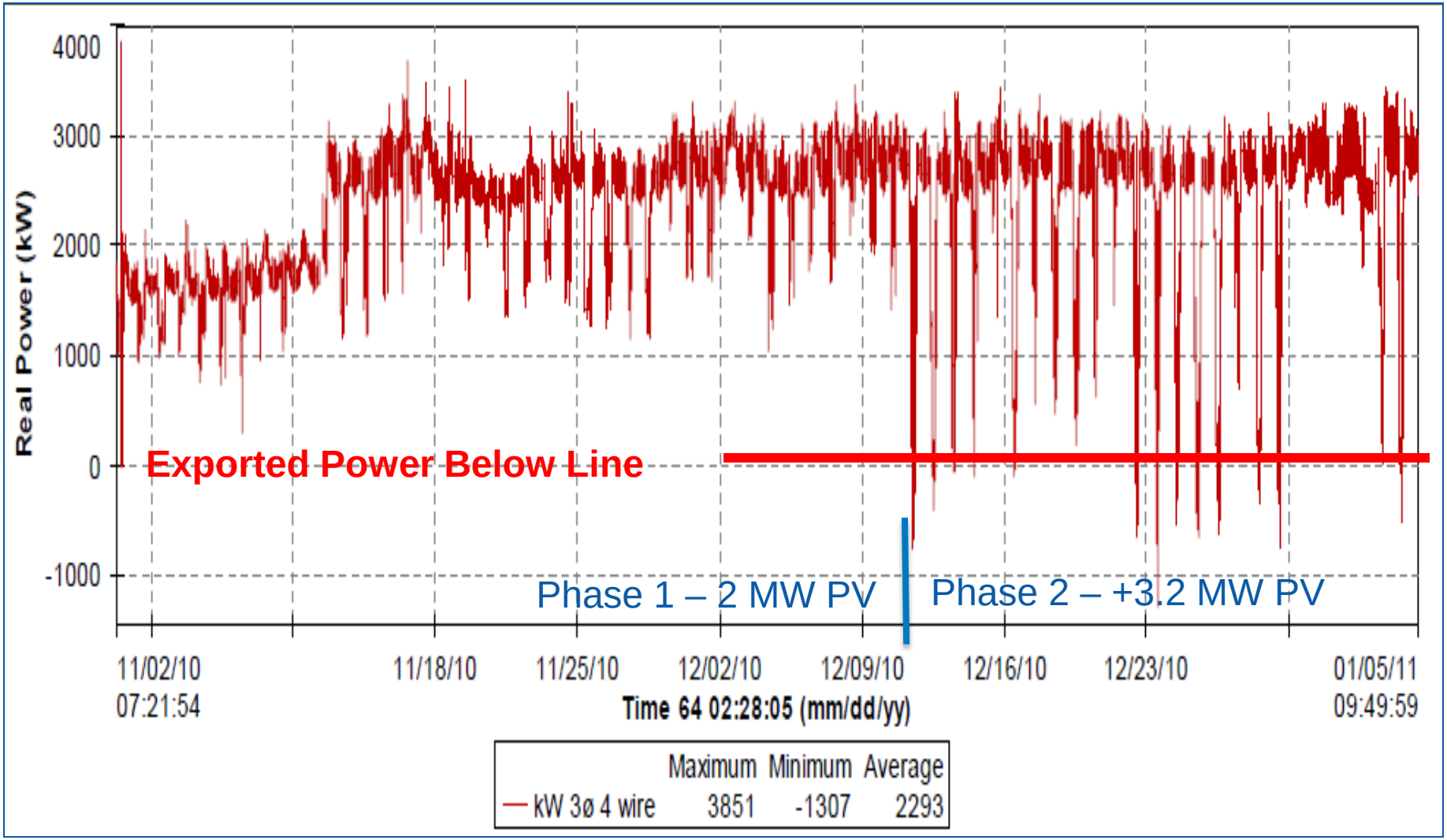
- Interconnection with Xcel Energy
- Distribution Voltage 13.2 kV
- Peak Load on Feeder 9.1 MW



Xcel Energy Priority: Maintain Voltage Levels

- 336 ACSR conductors serving CSU campus
- Two sets of voltage regulators & LTC
- Voltage at CSU campus maintained to approximately 1% !!
- PV system exports 1.5 MW at times, but most PV generation consumed on campus
- Inverters are capable of sinking VARs if necessary to control voltage
- Capacity Penetration 47% (64% instantaneous)

Load Profile of CSU West Campus



Technical Considerations for PV Location

- Distance to Substation (shorter is better)
- Size of conductor (Larger is better)
- Presence of voltage regulating devices
- Exported power or used locally?
  - Presence of load
  - Types of loads served by circuit
- Size of proposed PV system

Updating Screens for PV System Integration

Updating Interconnection Screens for PV System Integration

Michael Coddington, Barry Mather, Benjamin Kroposki
National Renewable Energy Laboratory

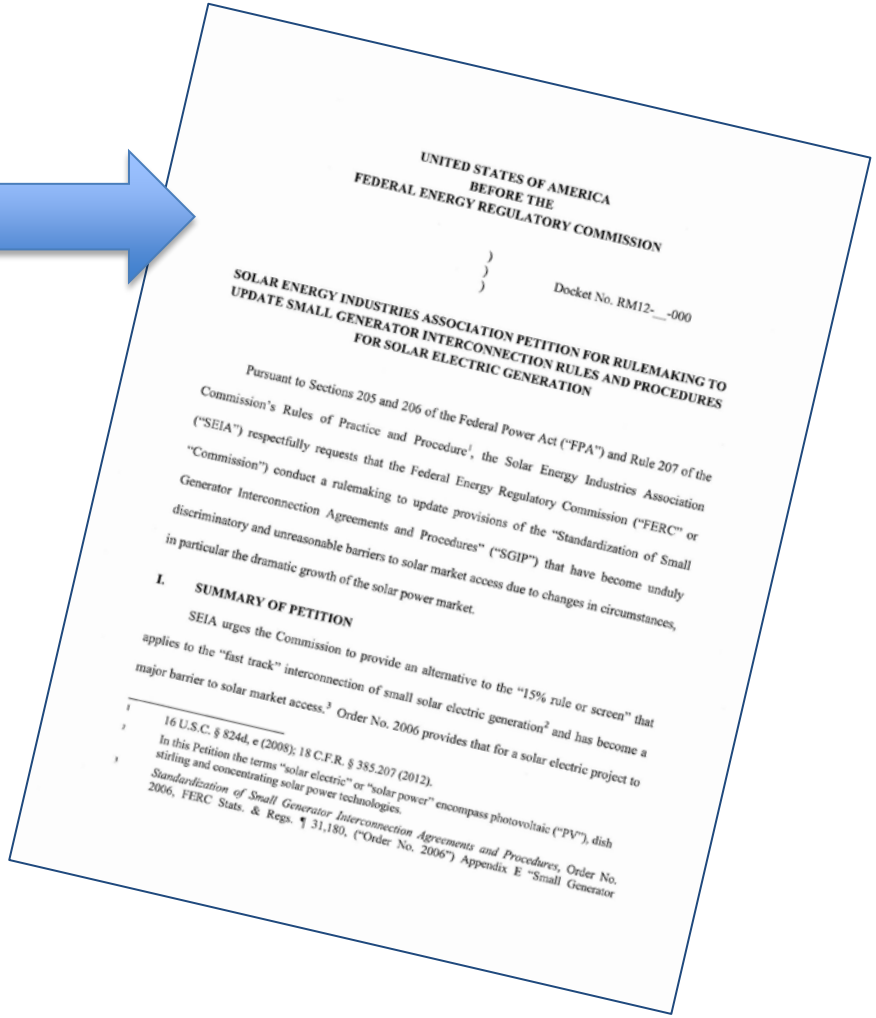
Kevin Lynn, Alvin Razon
U.S. Department of Energy

Abraham Ellis, Roger Hill
Sandia National Laboratories

Tom Key, Kristen Nicole, Jeff Smith
Electric Power Research Institute

U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

Sandia National Laboratories | NREL | EPRI ELECTRIC POWER RESEARCH INSTITUTE



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Origin of the 15% Screening Criterion

Quoting from CPUC Rule 21 Supplemental Review Guide:

The 15% line section peak load screen is meant as a catchall for a variety of potential problems that can occur as the level of penetration of generation within the distribution system increases.

Problem: “One-Size Fits-All Approach”

Why Focus on the 15% Screen?

- Directly relates to the Level of Deployment of PV more than any other screen
- Shows up in the majority of interconnection procedures in the U.S.
- Perceived as a "bottleneck" to PV deployment
- It is a limited metric derived early in interconnection development proceedings
- Field experience challenges the rationale and significance of the 15% screen

Short Term Solutions

"Base penetration screen on minimum daytime load data"

- Use actual data rather than a "rule of thumb" which uses half of 30% of peak load
- Minimum load during 10 AM to 2 PM will capture the window of peak annual PV production

Short Term Solutions

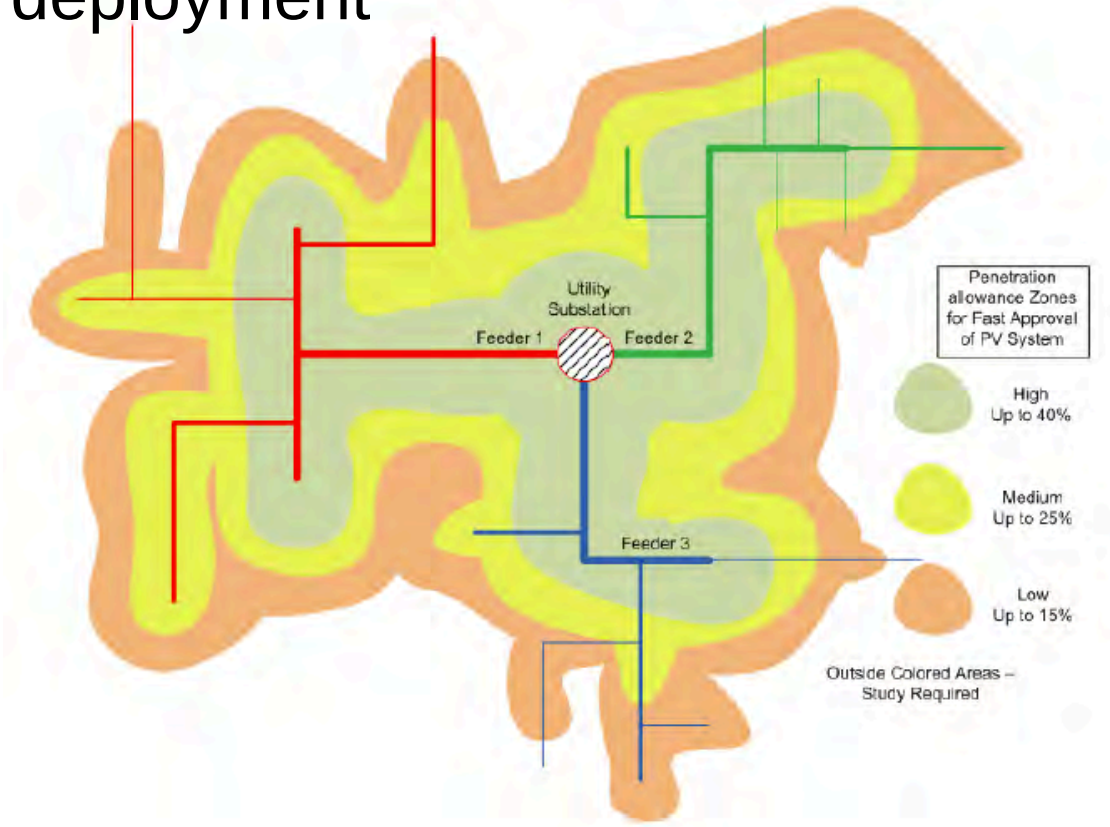
"Apply Supplemental Screens"

- Is the proposed DG a PV system?
- Does the proposed PV pass the quick voltage regulation screen?
- Does the proposed PV pass the quick Anti-Islanding screen?

Short Term Solutions

"Zones of Penetration"

– Provide mapped locations that will support greater levels of PV deployment



Mid-Term & Long-Term Solutions

- Study Numerous Feeders with PV
  - Develop screening metrics and formulas
  - Validate technical rationale
- Distribution Design Parameters
  - Larger conductors
  - Voltage Regulators
  - Better communications networks
- Advanced Inverter Technology
  - VAR, LVRT, LFRT, DCI, etc.
- Low-Cost Storage Solutions?

Thank you

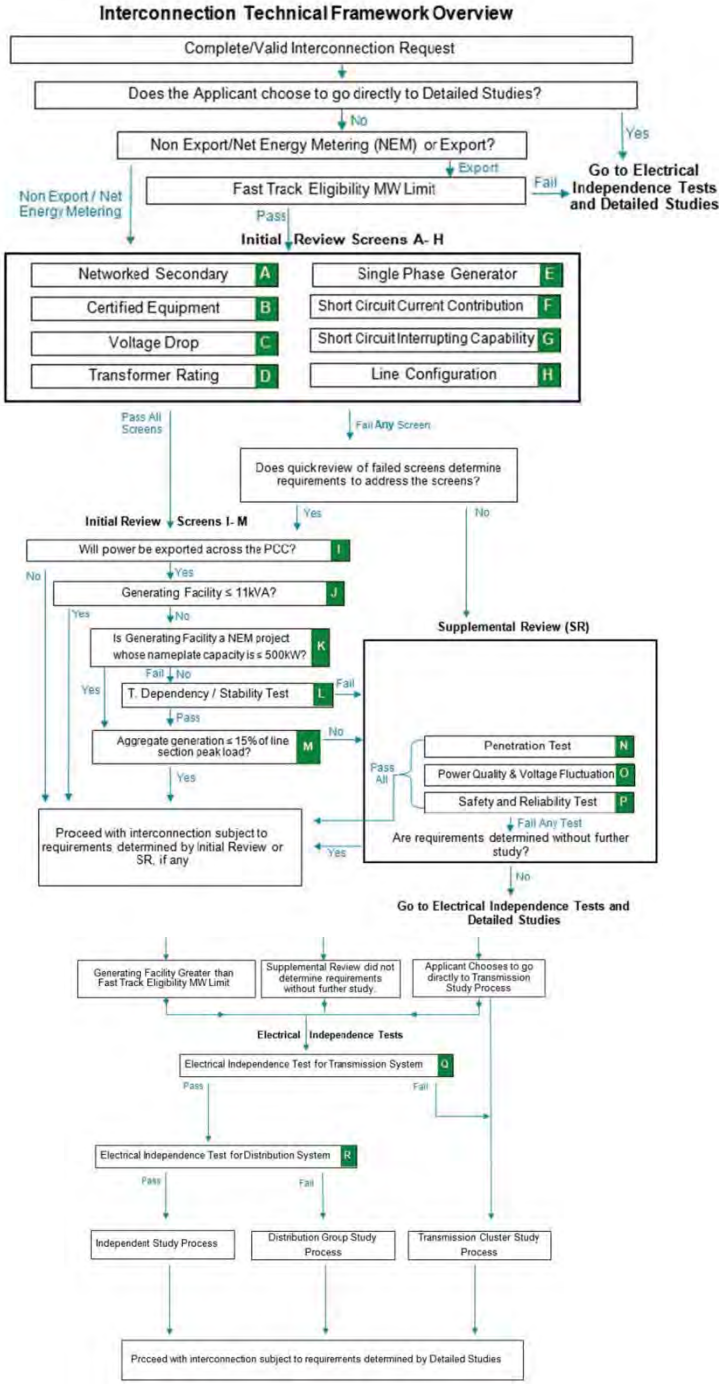
Michael.coddington@nrel.gov

Session 3: Activity in Screening Procedures and Interconnection Standards

California Rule 21 Settlement

Matt Heling
Service Analysis, Planning & Integrated Policy
Pacific Gas and Electric Company

Utility Solar Conference – Hi-Pen PV Workshop
Thursday, April 19, 2012


Interconnection Technical Framework Overview
Complete/Valid Interconnection Request
Does the Applicant choose to go directly to Detailed Studies?
No
Yes
Non Export/Net Energy Metering (NEM) or Export?
Export
Non Export / Net Energy Metering
Fast Track Eligibility MW Limit
Fail
Go to Electrical Independence Tests and Detailed Studies
Pass
Initial Review Screens A- H
Networked Secondary A
Certified Equipment B
Voltage Drop C
Transformer Rating D
Single Phase Generator E
Short Circuit Current Contribution F
Short Circuit Interrupting Capability G
Line Configuration H
Pass All Screens
Fail Any Screen
Does quick review of failed screens determine requirements to address the screens?
Yes
No
Initial Review Screens I- M
Will power be exported across the PCC? I
Yes
No
Generating Facility ≤ 11kVA? J
Yes
No
Is Generating Facility a NEM project whose nameplate capacity is ≤ 500kW? K
Fail
No
Yes
T. Dependency / Stability Test L
Fail
Pass
Aggregate generation ≤ 15% of line section peak load? M
No
Yes
Supplemental Review (SR)
Penetration Test N
Power Quality & Voltage Fluctuation O
Safety and Reliability Test P
Pass All
Fail Any Test
Are requirements determined without further study?
Yes
No
Proceed with interconnection subject to requirements determined by Initial Review or SR, if any
Go to Electrical Independence Tests and Detailed Studies
Generating Facility Greater than Fast Track Eligibility MW Limit
Supplemental Review did not determine requirements without further study.
Applicant Chooses to go directly to Transmission Study Process
Electrical Independence Tests
Electrical Independence Test for Transmission System Q
Pass
Fail
Electrical Independence Test for Distribution System R
Pass
Fail
Independent Study Process
Distribution Group Study Process
Transmission Cluster Study Process
Proceed with interconnection subject to requirements determined by Detailed Studies

Pacific Gas and Electric Company (PG&E)

~5% of U.S. population, but ~30% of distributed PV

Company Facts

- Fortune 200 company located in San Francisco, CA
- $14M in operating revenues in 2010
- 20,000 employees

Energy Supply

- Services to 15M people:
  - 5.2M Electric accounts
  - 4.3M Natural Gas accounts
- Peak electricity demand: 20,000 MW
- Over 50% of PG&E's electric supply comes from non-greenhouse gas emitting facilities

Service Territory

- 70,000 sq. miles with diverse topography
- 160,000 circuit miles of electric transmission and distribution lines
- 49,000 miles of natural gas transmission and distribution pipelines

Background

- **September 2011: CPUC issued a Rulemaking to review the rules governing interconnecting generation to the electric distribution systems that are specified in the IOUs' Rule 21.**

- **Key issues identified include**:

  > Distribution level interconnection process and reporting requirements

  > Engineering standards and qualification for resource adequacy

  > Develop Fast Track interconnection process

  > Upgrade cost allocation rules

- **Does not address transmission level interconnection issues.** Nor does it state that the CPUC claims exclusive jurisdiction over all distribution level generation interconnection arrangements, many of which are now handled under FERC tariffs.

- **"Distributed Generation Interconnection Settlement" (DGIS)**: forum for negotiations

  > Negotiated Settlement Package has been submitted for CPUC approval

Background

A Phased Settlement Process:

Phase 1: Addresses key issues associated with topics in previous slide (presented later in detail)

Phase 2: To begin immediately after a final decision on Phase 1 issues are approved by the Commission. Issues will include:

- Telemetering/other metering requirements
- Reconsideration of Rule 21 requirements: Fast Track size limits, 15% screen, and other criteria
- Cost allocation and certainty
- Study deposits
- Distribution Group Study Process
- Reconsideration of timelines, timeline compliance and remedies

Phase 3: Possible if additional issues are raised by parties and/or if timing limits addressing issues as part of Phase 2

Overview of Settlement Package

- **Settlement Package includes:**

  - Settlement Agreement
  - Revised Rule 21 Tariff
  - Rule 21 Generator Interconnection Agreement (modeled from SGIA)
  - Rule 21 Generator Interconnection Request (modeled from SGIP IR)

Overview of Settlement Objectives and Results

- **Tariff addressing interconnection of CPUC jurisdictional exporting generators under recently approved CPUC FIT programs such as portions of the QF Settlement and AB 1613 CHP generators**

- **Consistent treatment of projects with the WDT**
  - Public queue for Rule 21 Applicants that coordinates with the existing WDT queue;
  - Comprehensive timelines and processes, Fees, Deposits, Technical Engineering Review and Detailed Study, mostly consistent with and expand upon the WDT.
  - Cost responsibility: Allows repayment to Applicants for contributions to the cost of Network Upgrades (Transmission) to the extent the CAISO Tariff provides for repayments, consistent with the WDT process. Otherwise maintains Applicant cost responsibility.

- **Set reasonable expectations of Applicants as they move through the interconnection process**
  - Increase exchange of information through a new pre-application report and optional meetings at appropriate points in the process.

Overview of Settlement Objectives and Results

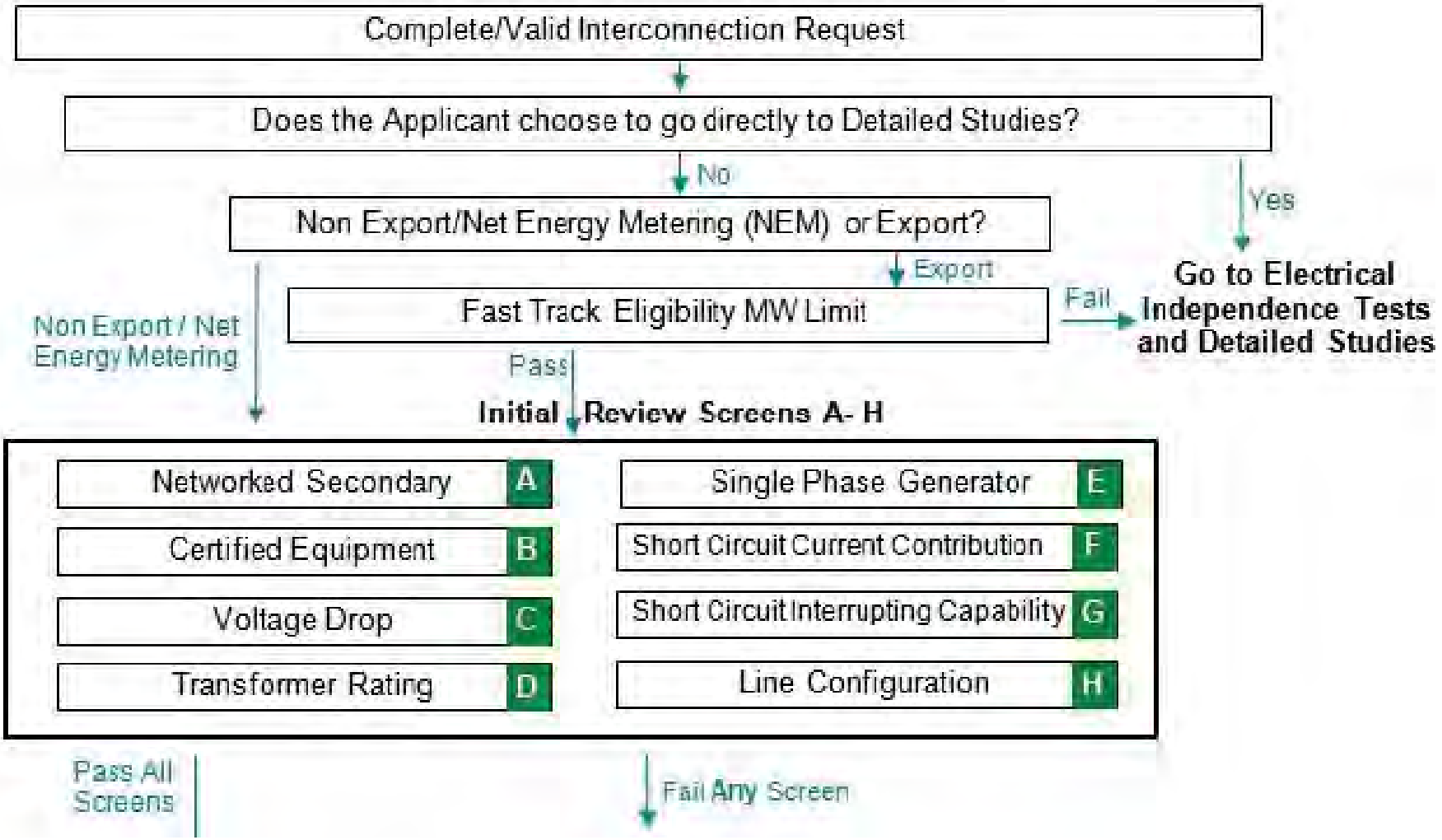
- **Add transparency and structure to the technical engineering study processes ensuring interconnections receive the appropriate level of engineering study required for a safe interconnection**
  - Limits Fast Track (FT) eligibility limited to 3MWs.
  - Supplemental Review screens have been formalized and clarified regarding the issues being addressed by the Distribution Provider. This is a more robust look at site specific impacts of power flow than the initial 15% review Screen M.
- **In place of the proposed penalty provisions, agree to augment existing dispute resolution provisions with new features expected to have future positive effects**
  - Public reporting and monitoring to facilitate informed future timeline and process updates by all parties. Provides opportunities to address issues
  - An ombudsman, a single point person, addressing Applicant questions and issues ensures consistent treatments well as insight into what is working and needs improvement. Customer friendly approach.

Thank you.

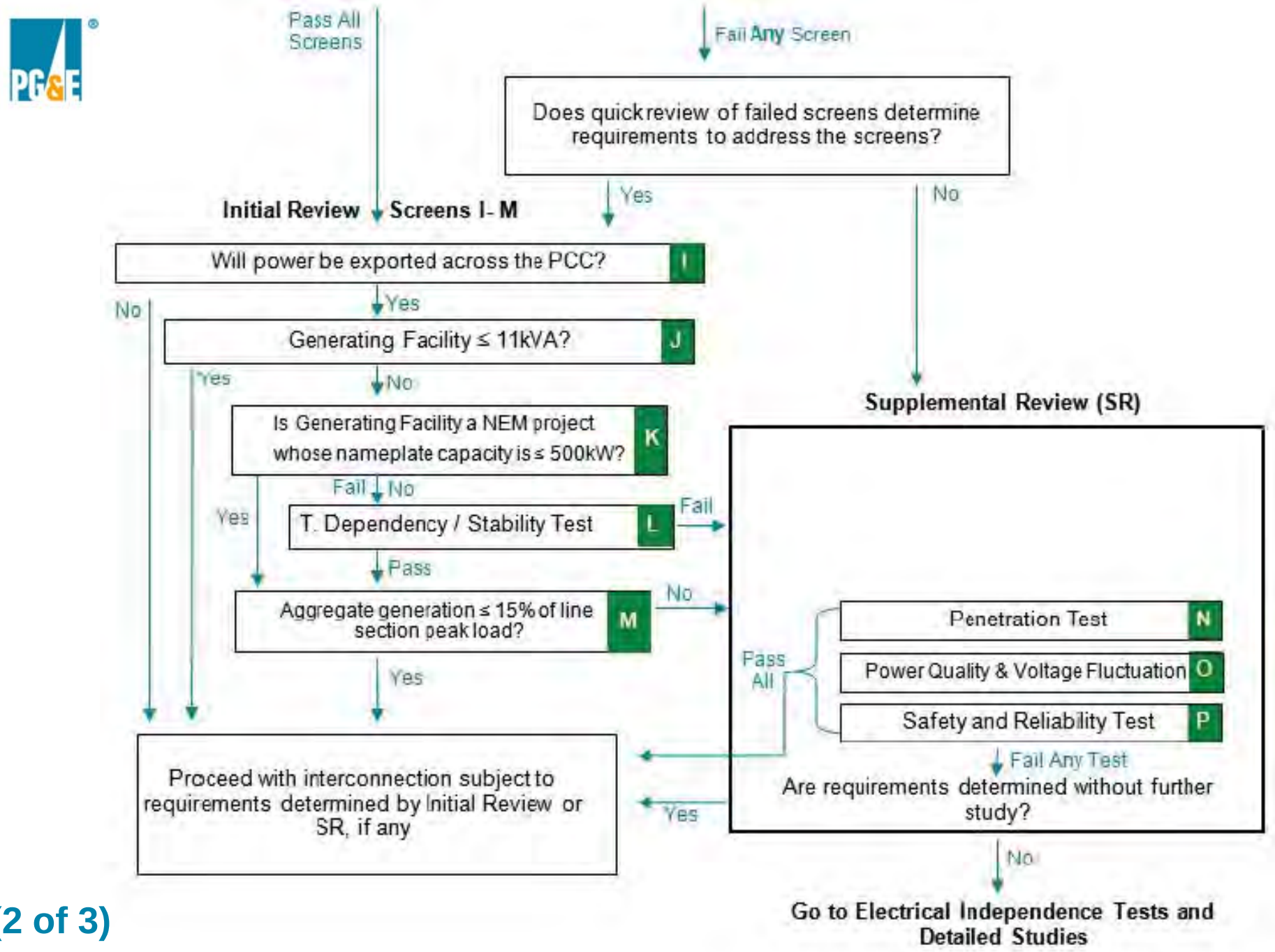
Matt Heling
Pacific Gas and Electric Co.
(415) 973-6996
mgh9@pge.com

Backup Material

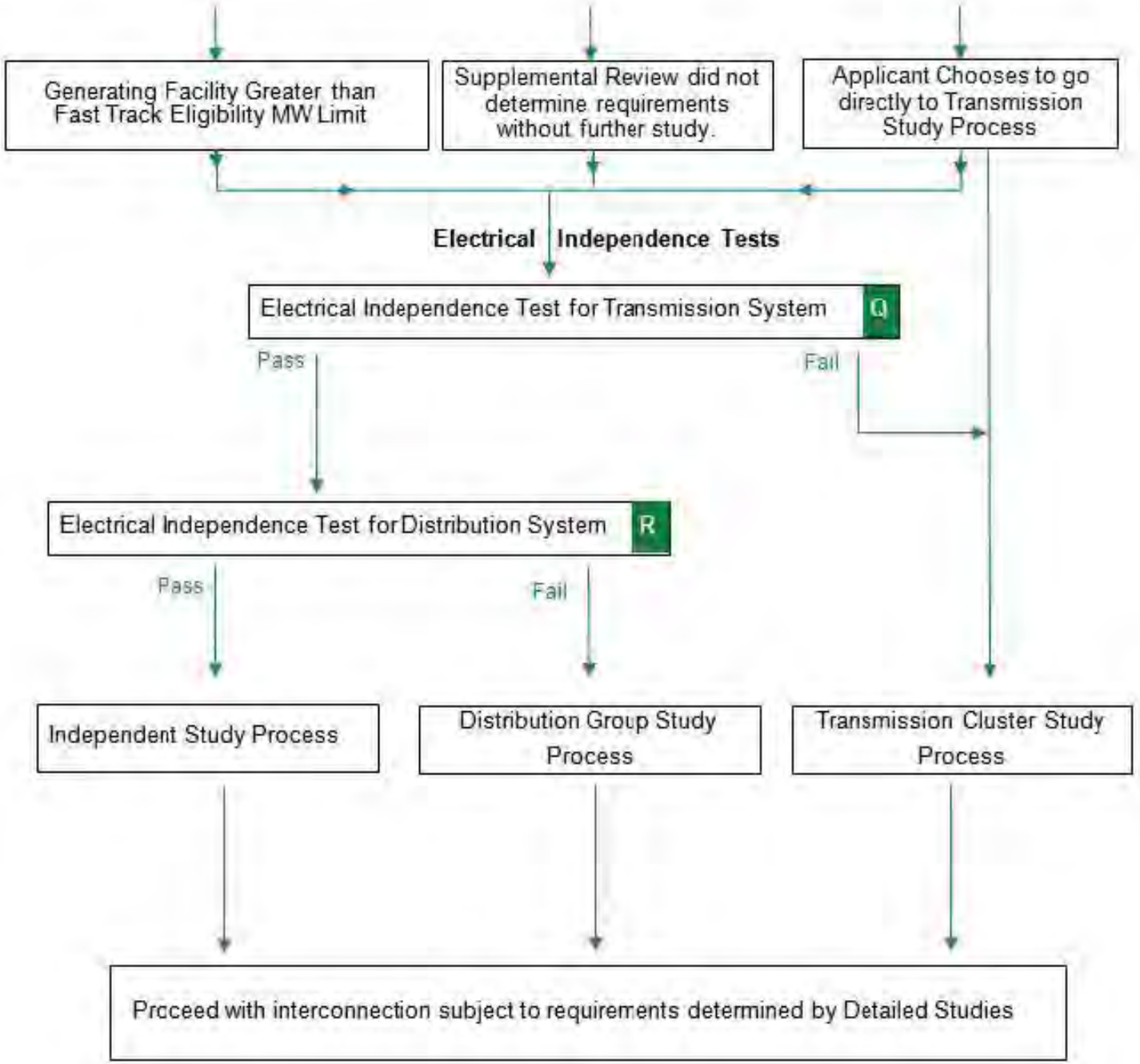
Interconnection Technical Framework Overview



(1 of 3)


Pass All Screens
Fail Any Screen
Does quick review of failed screens determine requirements to address the screens?
Yes
No
Initial Review Screens I- M
Will power be exported across the PCC?
I
Yes
No
Generating Facility ≤ 11kVA?
J
Yes
No
Supplemental Review (SR)
Is Generating Facility a NEM project whose nameplate capacity is ≤ 500kW?
K
Fail
No
Yes
T. Dependency / Stability Test
L
Fail
Pass
Aggregate generation ≤ 15% of line section peak load?
M
No
Yes
Penetration Test
N
Power Quality & Voltage Fluctuation
O
Safety and Reliability Test
P
Pass All
Fail Any Test
Are requirements determined without further study?
Yes
No
Proceed with interconnection subject to requirements determined by Initial Review or SR, if any
Go to Electrical Independence Tests and Detailed Studies

(2 of 3)


Generating Facility Greater than Fast Track Eligibility MW Limit
Supplemental Review did not determine requirements without further study.
Applicant Chooses to go directly to Transmission Study Process
Electrical Independence Tests
Electrical Independence Test for Transmission System
Q
Pass
Fail
Electrical Independence Test for Distribution System
R
Pass
Fail
Independent Study Process
Distribution Group Study Process
Transmission Cluster Study Process
Prcceed with interconnection subject to requirements determined by Detailed Studies

(3 of 3)

Rule 21 Distribution System Interconnection Settlement- High Impact Changes to Rule 21

Item	Current Rule 21	Reformed Rule 21
Applicability	NEM & Non-Export	Adds exporting at distribution level for CPUC jurisdictional generating facilities. Exporting at Transmission level goes to CAISO.
General, Rules, Rights and Obligations		
-Confidentiality	-All information is currently confidential	-Modified to be similar with the WDT to allow posting of information as part of the public queue and accommodate new reporting requirements that will be determined as part of the Rulemaking.
-Special Provision for Complicated NEM Applicants	- Does not address	- New section informing NEM applicants with non- inverter based or non-certified equipment they need to plan to submit their applications at least 6 months in advance of their planned operating date to allow for expected supplemental review and detailed study.
Interconnection Request Submission Process		
-Pre-application Report		-$300 fee; IOU provide available pre-existing data (12 items; 10 BD)

Rule 21 Distribution System Interconnection Settlement- High Impact Changes to Rule 21

Item	Current Rule 21	Reformed Rule 21
Interconnection Request Submission Process		
-Fast Track Study Process: Initial Review (IR)/ Supplemental Review (SR)	-$800 fee; $400 refundable if withdrawn -$600 fee for SR; provide results only	-Nonrefundable $800 fee for Initial Review -SR fee raised to $2,500 -Eligibility- Up to 3MWs
-Detailed Interconnection Study		-New deposit fees added for ≤ 5MW: $10K SIS; $15k IFS > 5MW: $50,000 + $1,000/MW (Same as WDT) -Similar timeline for posting of interconnection financial security as WDT.
-Interconnection Cost Responsibility		-New section added to the IA for exporting generating facilities providing for repayment to Applicants for contributions to Network Upgrade (Transmission) costs to the extent the CAISO tariff provides for repayments (consistent with current treatment in WDT).
-Interconnection Request Validation and Assignment of Queue Position	- Does not have a Queue.	-New section consistent with the WDT and changed so an applicant is assigned to the Queue either when the application 1) was received, if deemed complete within 10 BDs of receipt, or 2) is deemed complete, if after 10 BDs. - Update monthly

Rule 21 Distribution System Interconnection Settlement- High Impact Changes to Rule 21

Item	Current Rule 21	Reformed Rule 21
Review Process for Interconnection Requests		
-Compliance with Established Timelines		-New section adding options to address compliance with timelines before proceeding to the dispute resolution process. Dissatisfied applicants may now contact the Distribution Providers ombudsman, the Consumer Affairs Branch at the CPUC, and/or request the Chief ALJ of the CPUC for mediation to address timeline issues.
-Fast Track Study Process: Initial Review (IR)/ Supplemental Review (SR)	-IR 10 BDs; SR timeline not specified.	-IR 15 BDs; SR- 20 BDs (both timelines same as WDT); Adds provisions that Applicant is deemed withdrawn if they do not meet certain timelines. -New optional meetings after completion of each review process; -Provide study results reports to Applicants, similar to WDT.
-Detailed Group Study Process	-Does not exist.	-New interim process sending Applicants electrically independent of the Transmission system but electrically dependent with other applicants on the Distribution system, to the WDT to be studied under the Cluster Study process, with limited exceptions. A Distribution Group Study Process to replace this interim procedure is anticipated to be developed on an expedited time frame as part of Phase 2 of the Rulemaking.

Rule 21 Distribution System Interconnection Settlement- High Impact Changes to Rule 21

Item	Current Rule 21	Reformed Rule 21
Interconnection Process for Interconnection Requests		
-Transmission Cluster Study Process	-Does not exist	-Applicants with electrical transmission interdependence must apply under the WDT for FERC jurisdictional transmission cluster study process. Upon completion, CPUC jurisdictional Applicants can choose to execute a Rule 21 or WDT interconnection agreement. -Settlement requires the IOUs to seek FERC approval to the WDT for the limited purpose of accommodating Rule 21 tariff Applicants studied in a transmission cluster study process and choose a CPUC jurisdictional interconnection agreement.
-Engineering & Procurement Agreement	-Does not exist	-New section the same as the WDT. Added to aid IC advance project construction.
Engineering Review Details		
-IR Screens	-10 screens	-Similar to current Rule 21 and WDT screens.
-SR Screens	-Not specified	-Formalized and clarified regarding the issues being addressed by the Distribution Provider. Screen N, Penetration Test compares aggregate DG and considers daytime minimum loads for PV. This is a more robust look at site specific impacts of power flow than the initial 15% review screen M.

Rule 21 Distribution System Interconnection Settlement- Timeline for Approval by the CPUC

- **2/28-3/13/2012** – Settlement Parties determine individual positions on the proposed Settlement.
- **3/13/2012** – Parties inform CPUC Staff and Legal Division of commitment to support and sign Settlement Agreement
- **3/15/2012 –** Signatures of parties supporting the settlement due to PG&E for packaging with Settlement Agreement
- **3/15/2012** – Settlement Conference @ CPUC 10:00 am- 12:00pm
- **Friday, 3/16 or Monday, 3/19/2012** – File motion requesting Commission approval of the Settlement filed in R.11-09-011.
- **4/18/2012** (assuming file 3/19)- Comments on proposed settlement due
- **5/3/2012**- Reply comments on proposed settlement due
- **Proposed Decision (PD):** Although the CPUC's Rules of Practice and Procedure state the ALJ is required to issue a proposed decision within 90 days after submission (5/3), we can expect a much shorter timeline for a PD to be issued. In practice, PDs have taken much longer and shorter to be released by an ALJ.
- **Final Decision:** The PD is placed on the CPUC's meeting agenda for a final decision/vote no sooner than 30 days after the PD is issued. This period of time allows for parties comments that are due 20 days from service of the PD and reply comments that are due 5 days from the last day for comments.
- **Compliance Advice Letter(s):** Immediately following approval of a decision PG&E will file advice letter(s) detailing Rule 21 in official tariff format and the Interconnection Request and Interconnection Agreement. PG&E will request these documents be effective on the date of the decision.

EPRI CSI Project Screening Distribution Feeders: Alternatives to the 15% Rule

Southern California Edison
An EDISON INTERNATIONAL Company
San Onofre Nuclear Generating Station

Pacific Gas and Electric Company

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT
The Power To Do More.℠

SDGE
A Sempra Energy utility

Sandia National Laboratories

CLEAN POWER RESEARCH

NREL

- **Report on Current Utility Screening Practices and Available Tools**
- **Identify Range of Distribution Feeder Configuration for Participating Utilities in CA**
- **Feeder Model Development**
- **High Penetration PV Scenario Assessment for Each Feeder**
- **Develop Practical Screening Method for Handling New Interconnection Requests**
- **Validate Screening Method Using Site Measurement and Specific Feeder Data**

Funding $1,978, 239.

Public Utilities Commission · Eureka · State of California

GO solar CALIFORNIA

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Hosting Capacity Methodology

Funding	$1,978,239

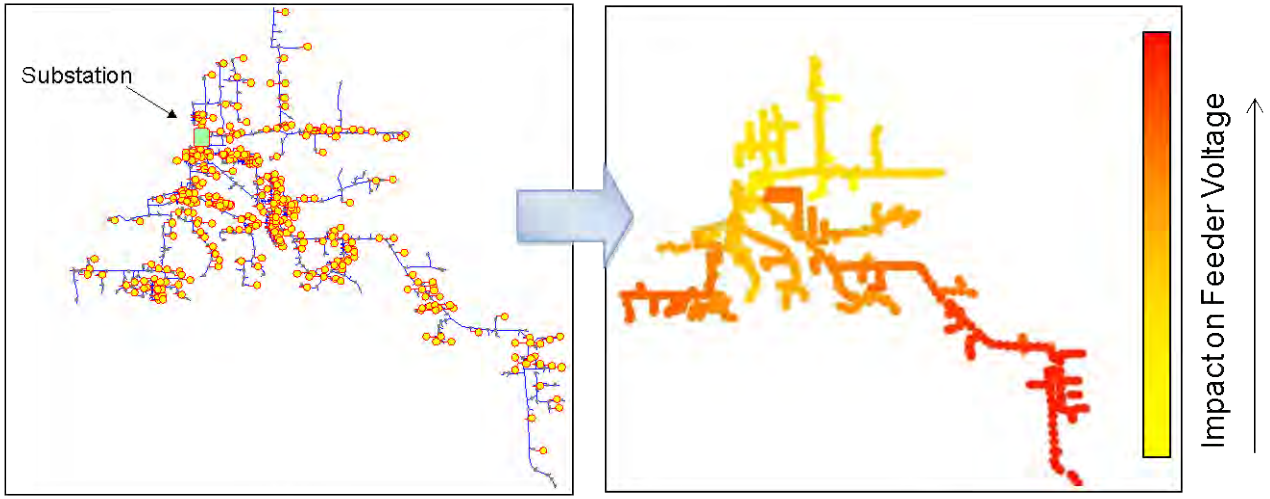


Figure 2 Feeder Model with Distributed PV (A) and Resulting Voltage Impacts Resulting from High Penetration[2]