Peninsula Advanced Energy Community (PAEC)
Solar Siting Survey

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- Questions will be answered during the Q&A portion of the webinar
- Contact Josh for webinar questions: josh@clean-coalition.org
Bob O’Hagan
Program Engineer

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Solar Siting Survey: Purpose

- Who is the Clean Coalition
  - Why do a Solar Siting Survey?
- What does a Solar Siting Survey consist of?
  - How is it done?
- What did we find?
- What does the report/map look like?
- What is the Integration Capacity Analysis?
Clean Coalition mission

To accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise
Clean Coalition overarching objectives

- From 2025 onward, at least 80% of all electricity from newly added generation capacity in the United States will be from renewable energy sources.

- From 2025 onward, at least 25% of all electricity from newly added generation capacity in the United States will be from local renewable energy sources.
  - Locally generated electricity does not travel over the transmission grid to get from the location it is generated to where it is consumed.

- By 2025, policies and programs are well established for ensuring successful fulfillment of the 80% & 25% objectives.
  - Policies reflect the full value of local renewable energy.
  - Programs prove the superiority of local energy systems in terms of economics, environment, and resilience; and in terms of timeliness.
Clean Coalition vision = Community Microgrid future
FITs address the wholesale DG market segment

- **Project Size**
  - 5 kW
  - 500 kW
  - 50+ MW

- **Distribution Grid**
  - Wholesale DG
    - Serves Local Loads
  - Retail DG
    - Serves Onsite Loads

- **Central Generation**
  - Serves Remote Loads

- **Transmission Grid**

**Making Clean Local Energy Accessible Now**
WDG unleashed solar in Germany

Solar Markets: Germany vs California (RPS + CSI + other)

Germany deployed over 10 times more solar capacity than California, almost entirely on built-environments, in the decade starting 2002, despite California having 70% better solar resource.

Sources: CPUC, CEC, SEIA and German equivalents.
German solar is mostly local (on rooftops)

**German Solar Capacity Installed through 2012**

- **up to 10 kW**: 9.25%
- **10 to 30 kW**: 26%
- **30 to 100 kW**: 23.25%
- **100 kW to 1 MW**: 22.5%
- **over 1 MW**: 19%

Source: Paul Gipe, March 2011

Germany’s solar deployments are almost entirely sub-2 MW projects on built-environments and interconnected to the distribution grid (not behind-the-meter)
Solar Siting Survey: Components

What is it?
- Survey of potential PV siting opportunities performed over a well-defined area
- Includes primarily large rooftops and aggregations of closely related smaller rooftops
- Also includes parking lots and parking garages
- Has a lower limit generation size of 100 KW AC

Tools used to site the potential opportunities
- Survey and coordinates: Google Earth
- Database and KML generation: Excel
- Addresses and site names: Google Maps, Bing Maps, Mapquest
- Alternate display app: Google Maps
PAEC survey area in Google Earth
Solar Siting Survey summary

Key findings
- Over 65 MW of PV potential can be easily found at the 100 kW minimum level

Key takeaways
- Parking lots and garages are very underutilized, comprising over 40% of the total

Tie-in to overall objectives
- The capacity to site PV on commercial, industrial, and civic rooftops is waiting to be utilized
Deliverables

- Spreadsheet database
- Summary report
- Google Earth map derived from the database
  - Includes ICA data
- Google Maps readable version of Google Earth file
## Summary by Structure PV Size

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PAEC Solar Siting Survey example of information
Survey map viewed in Google Maps
Integration Capacity Analysis (ICA)

- Brief look at components
  - Feeder map
  - Analysis criteria
  - Sample of the types of generation and load profiles that are used in the analysis
ICA map for 600 Elm St, San Carlos (50 m, closest)

ICA Data for City Hall

Map width: 1.35 miles, map height: 0.64 miles
Distribution Resources Planning (DRP): Integration Capacity Analysis criteria

[Diagram showing the criteria for Power System, including Thermal, Power Quality/Voltage, Protection, and Safety/Reliability.]

Source: https://www.navigantresearch.com/blog/distribution-resource-plans-integrated-capacity-analysis
ICA: DER generation and load profiles

Source: https://www.navigantresearch.com/blog/distribution-resource-plans-integrated-capacity-analysis
Summary of Solar Siting Survey

- Purpose
- Elements
- How it helps a FIT program
Thank you. Any questions?

For questions and assistance, contact:

Bob O’Hagan
Programs Engineer
bob@clean-coalition.org
(m) 408-394-9067
ICA data at feeder into San Carlos City Hall

500 kW PV should be straightforward interconnection
Integration Capacity Data

The RAM map is now designed to display integration capacity values for DER. These values are intended to help users by indicating DER capacities that are expected to require Detailed Interconnection Studies. It is encouraged that customers apply using DER capacities that are less than the reported Integration Capacity value to have better chances of passing the interconnection Fast Track.

The distribution lines are colored based on a Red Amber Green coloring scale where green represents locations on each feeder that have higher integration capacity values than other locations on the feeder. Red is intended to display locations with lower capacity values, but does not necessarily mean a DER is not allowed to interconnect. The lower capacity values intended to show high chances of requiring detailed interconnection study. The coloring scheme is currently based on the PV Integration Capacity values.
**PG&E ICA URLs**

- **PG&E** (login account needed)
  - ICA Map URL
  - ICA Map Help URL

- **SCE** (no login needed)
  - [https://www.arcgis.com/home/webmap/viewer.html?webmap=e62dfa24128b4329bfc8b27c4526f6b7](https://www.arcgis.com/home/webmap/viewer.html?webmap=e62dfa24128b4329bfc8b27c4526f6b7)
  - No login needed

- **SDG&E** (login account needed)
  - Logins
    - [https://sempra.maps.arcgis.com/home/signin.html?returnUrl=https%3A//sempra.maps.arcgis.com/apps/webappviewer/index.html%3Fid%3D8b11127abc7a47169de07eb77c2657c9](https://sempra.maps.arcgis.com/home/signin.html?returnUrl=https%3A//sempra.maps.arcgis.com/apps/webappviewer/index.html%3Fid%3D8b11127abc7a47169de07eb77c2657c9)
ICA map of San Mateo County

At high altitude, only transmission lines and substations are shown.
Distribution Resources Planning history:
Hunters Point Substation feeders
Substation operation: Normal vs high-penetration PV

**Normal:**
All power flows from transmission grid down to loads

**High-penetration PV:**
Power on some feeders flows back through substation