



Southern California Edison (SCE) PRP Solar Siting Survey Overview

These documents and the analysis and conclusions contained in them are exclusively the work of Clean Coalition, who bears sole responsibility for the content.

Objective: Provide an estimate of the solar generation potential in the PRP area based on specific sites that can generate 500 kW (AC) of power or greater.

Methodology:

- Identify appropriate sites, in both size and position, including rooftops, parking lots, and parking garages
- Narrow down candidate sites to the most feasible locations, using estimates that exclude difficult, cluttered, or overly shaded areas
- Measure the most feasible rooftop square footage per candidate site
- Calculate the solar potential in kW AC per site
- Include logical groupings where applicable such as office parks, shopping centers

Deliverables:

- Summary document
- Overview in power point format
- Excel file that provides the detailed survey data per site and in summary
- Map file (.kml) that, when used in Google Earth, displays the PRP area with all the surveyed sites as sun icons. Clicking on each sun icon provides more information
- 1-page user's guide to Excel and Map files

Summary: over 160 MW of new solar PV technical potential exists in the PRP area across rooftops, parking lots, and parking garages

PRP Solar Potential by PV size: totals per sites greater than 1 MW, sites greater then 500 kW but less than 1 MW, and sites less than 500 kW. The sites that are less than 500 kW are included as part of logical groupings such as office parks or shopping centers.

		Summary by PV Size							
		Num_Sites	kW_Total	PV W_AC >	1,000 kW	> PV W_AC >	500 kW	Less than	500 kW
PRP Area:	24	110	69,964 kW	26	36,599 kW	34	22,118 kW	50	11,246 kW
PRP Area:	59	221	105,437 kW	16	26,371 kW	68	48,031 kW	137	31,035 kW
PRP Area Overlap:		22	11,023 kW	4	6,673 kW	4	2,564 kW	14	1,786 kW
Totals:		309	164,378 kW	38	56,297 kW	98	67,585 kW	173	40,495 kW

PRP Solar Potential by site type: totals for rooftops, parking garages (multi-story parking structures that would enable rooftop-style mounting), parking lots (e.g. ground mount), and brown fields

		Summary by Site Type							
		Roof_Flat	kW_Total	Pkg_Garage	kW_Total	Pkg_Lot	kW_Total	Brown_Fld	kW_Total
PRP Area:	24	48	40,728 kW	18	12,831 kW	43	14,605 kW	1	1,800 kW
PRP Area:	59	113	58,125 kW	15	11,081 kW	93	36,232 kW	-	- kW
PRP Area Overlap:		15	9,599 kW	1	504 kW	6	920 kW	-	- kW
Totals:		146	89,253 kW	32	23,408 kW	130	49,917 kW	1	1,800 kW

Observations:

1. More opportunities are available from structures less than 1 MW vs. greater than 1 MW due to common commercial and industrial building sizes
2. Parking Lots and Parking Garages represent a potential that is about 75% of the rooftop potential. Most of the large commercial buildings have adjoining large parking lots, and solar PV in parking lots provides an additional benefit: shade for cars (PV covered parking lots at schools and colleges are often the first to be occupied).

Steps	Tool / Source
1) Define realistic solar potential per site category: <ul style="list-style-type: none"> • Rooftops, Parking Lots, Parking Garages • High, Medium, Low PV density assessment based on contiguous space / amount of “clutter” per site 	Local PV Project Developers
2) Identify, categorize and quantify PV potential for sites: <ul style="list-style-type: none"> • Site Sq Ft and density assessment • Location • Distance to closest feeder(s) 	Google Earth Pro Google Maps
3) Survey full PRP Area: <ul style="list-style-type: none"> • Identify target zones • Identify largest opportunities: 1MW+ • Rescan for smaller size sites: 500 kW+ • Rescan for groupings: business parks, shopping centers, etc. 	Google Earth Pro Google Maps Web searches
4) Generate .kmz and .xlsx files	Google Earth Pro, MS Excel
5) Generate summary reports	MS Word, PowerPoint

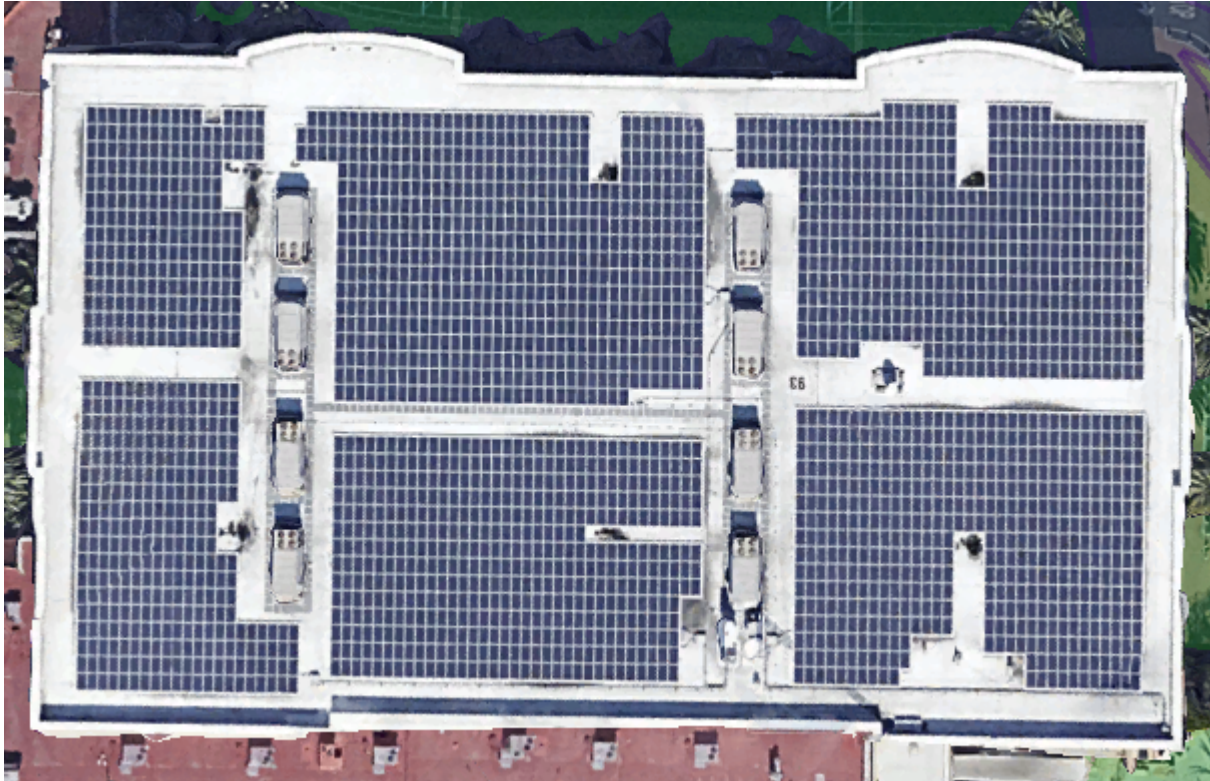
SCE provided the following two files:

- Preferred Resources Pilot Map (.kmz)
 - Defines boundaries of PRP areas 24 & 59
 - Version available with transparency on polygon fill color so rooftops are visible
- PRP RFO Interconnection Map (.kmz)
 - Identifies substations and feeders
 - Allows identifying closest possible feeders to site

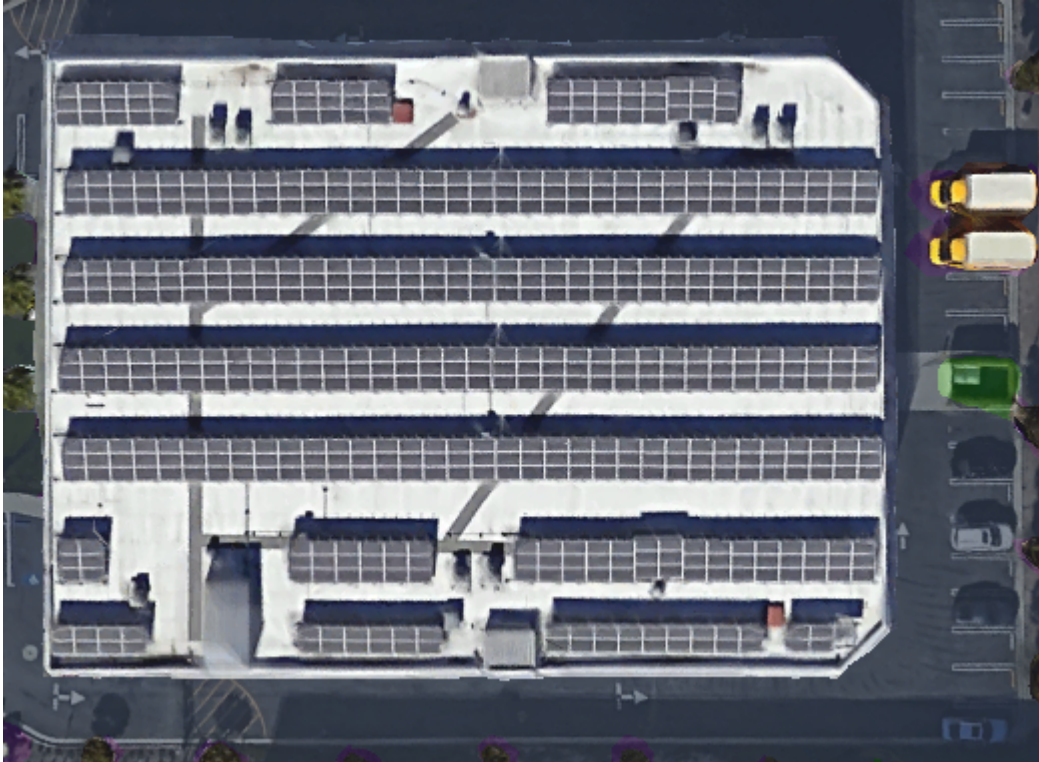
Structure	High Density	Medium Density	Low Density	Notes
Flat Roof	7 W/Sq. ft.	6 W/Sq. ft	5 W/Sq. ft	1, 2
Parking Garage	7 W/Sq. ft	N/A	N/A	1, 2, 3
Parking Lot	N/A	6 W/Sq. ft	N/A	2, 4, 5
Brown Field	7 W/Sq. ft	N/A	N/A	6

Notes:

1. Area calculated is normally corner-to-corner unless otherwise noted in the comments field in the spreadsheet. Edge clearance setbacks and panel maintenance access are assumed in these numbers.
2. May have areas restricted, notched or cut off as noted in the comments field in the spreadsheet.
3. High density due to no need for fire truck access between parking rows
4. Only includes central areas that have double row (nose-to-nose) parking. Single row parking around perimeter omitted. Impact on trees & planter boxes not included.
5. Medium density due to requirement for fire truck access clearance between parking rows.
6. Brown field was initially considered but dropped after project started. One potential site was left in database for reference.



- Minimal roof clutter, grouped well
- Minimal setbacks and maintenance access
- Macy's Spectrum Center



- Minimal roof clutter
- More setbacks and maintenance access than High Density
- APN 43507107

PV Density Examples: Low



- Many skylights
- Much open space
- Looks like Tetris game
- Costco Tustin

- Lots of unusable space
- More setbacks and maintenance access
- Staples Aliso Viejo



PV Density Examples: Shopping Center



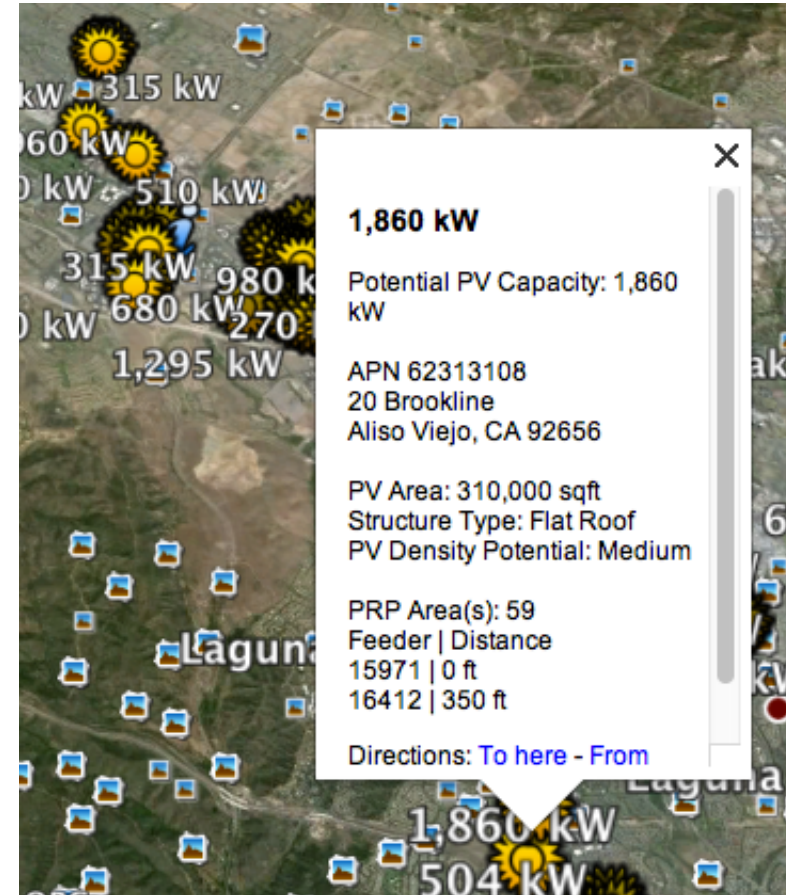
- Marketplace at Laguna Niguel

Outputs: Excel File







- Detailed data per site, including site address, site type, density rating, viable square feet, PV potential per site, distance to feeder(s), available feeder capacity, notes, etc.
- Summary tab: contains all summaries and breakdowns
- All data fields are explained within the file
- Can be easily filtered by city, zip code, type of structure, etc.

Street address	City and ZIP code	Latitude of structure	Longitude of structure	Surface area in sqft	Structure type	PV power density assesment	Estimated PV potential [W, AC]	Total PV potential at this address [W, AC]
Address	City_ZIP	Lati	Longi	Area_ft2	PV_Type	PV_Rating	W_AC	Site_W_AC
3201 S Susan St	Santa Ana, CA 92704	33.704927	-117.910982	165,000	Roof_Flat	High	1,155,000	1,155,000
3441 W MacArthur Blvd	Santa Ana, CA 92704	33.704258	-117.914180	120,000	Roof_Flat	Medium	720,000	720,000
3320 S Fairview St	Santa Ana, CA 92704	33.702076	-117.908998	170,000	Roof_Flat	Medium	1,020,000	1,020,000
3300 S Bristol St	Santa Ana, CA 92704	33.702816	-117.887707	95,000	Roof_Flat	Medium	570,000	845,000
3300 S Bristol St	Santa Ana, CA 92704	33.702979	-117.886707	55,000	Pkg_Lot	Medium	275,000	-
3900 S Bristol St	Santa Ana, CA 92704	33.695739	-117.887860	157,700	Roof_Flat	Medium	946,200	946,200
2001 E Dyer Rd	Santa Ana, CA 92705	33.707939	-117.844428	346,100	Roof_Flat	High	2,422,700	2,422,700
2040 E Dyer Rd	Santa Ana, CA 92705	33.705920	-117.845644	238,600	Roof_Flat	High	1,670,200	1,670,200
2001 Carnegie Ave	Santa Ana, CA 92705	33.709638	-117.840411	100,000	Roof_Flat	High	700,000	700,000
1951 Carnegie Ave	Santa Ana, CA 92705	33.710225	-117.841594	95,000	Roof_Flat	Medium	570,000	570,000
2525 Pullman St	Santa Ana, CA 92705	33.710999	-117.847653	95,000	Roof_Flat	High	665,000	665,000
1800 E St Andrew Pl	Santa Ana, CA 92705	33.720475	-117.843203	200,000	Roof_Flat	Low	1,000,000	1,000,000
2400 S Grand Ave	Santa Ana, CA 92705	33.714956	-117.851856	170,000	Roof_Flat	High	1,190,000	1,190,000
1505 E Warner Ave	Santa Ana, CA 92705	33.717200	-117.848189	206,000	Roof_Flat	High	1,442,000	1,442,000
1224 E Warner Ave	Santa Ana, CA 92705	33.715521	-117.855663	115,000	Roof_Flat	Low	575,000	1,695,000
1224 E Warner Ave	Santa Ana, CA 92705	33.713926	-117.855369	160,000	Roof_Flat	High	1,120,000	-
1928 S Grand Ave	Santa Ana, CA 92705	33.721782	-117.852348	198,000	Roof_Flat	Medium	1,188,000	1,188,000
1856 Park Ct Pl	Santa Ana, CA 92705	33.748842	-117.841434	300,000	Brown_Fld	Medium	1,800,000	1,800,000
1395 S Lyon St	Santa Ana, CA 92705	33.730134	-117.844042	99,000	Roof_Flat	Medium	594,000	594,000

- Sun icons mark each potential PV site in the PRP area
- Clicking on the sun icon provides more info (see picture)
- All data in the Google Earth file comes from the Excel spreadsheet



Google Earth Map File Iconography

Type of Site	Placemark Icons	Comments
Potential PV site		Flat roofs, parking lots, parking structures. Solar potential in kW AC is shown in the title. Clicking on the sun icon provides more info.
Shopping Center		Aggregate total kW for all potential PV sites at that location.
Business Center		Aggregate total kW for all potential PV sites at that location.
Education		Aggregate total kW for all potential PV sites at that location.
Airport		Aggregate total kW for all potential PV sites at that location.
Informational site		Examples of structures with existing PV, including PV sites already in place within a group

More Detail Regarding the Sun Icon Info Panels

Section	Information
Placemark title	<ul style="list-style-type: none"> Repeat of icon label kW for individual sites Note about grouping if icon represents a group
Site location information	<ul style="list-style-type: none"> Site identifier (if known) <ul style="list-style-type: none"> Name, occupant, assessor parcel number, etc. Address <ul style="list-style-type: none"> Note: same address is used for all items in a grouping such as a shopping or business center
Solar Potential	<ul style="list-style-type: none"> Roof area in square feet (for individual sites) <ul style="list-style-type: none"> Normally corner-corner unless noted in comments Structure type PV density assessment
Circuit information and PRP Area	<ul style="list-style-type: none"> PRP Area(s) in which structure is found Circuit A (closest) feeder ID <ul style="list-style-type: none"> Birds-eye straight line distance Circuit B (next closest) feeder ID, distance, if available
Comment	<ul style="list-style-type: none"> Any relevant notes

