



SOUTH BAY CITIES
COUNCIL OF GOVERNMENTS

SOLAR WITH CONFIDENCE

Residential Solar in Manhattan Beach

Solar for Single-family Homes

- Solar Basics
- System Sizing & Siting
- Payment Options
- Find a Contractor
- Energy Storage & EV Integration
- City Web Resources

Manhattan Beach Designated SolSmart Gold!



Designated in **Gold** March 2019

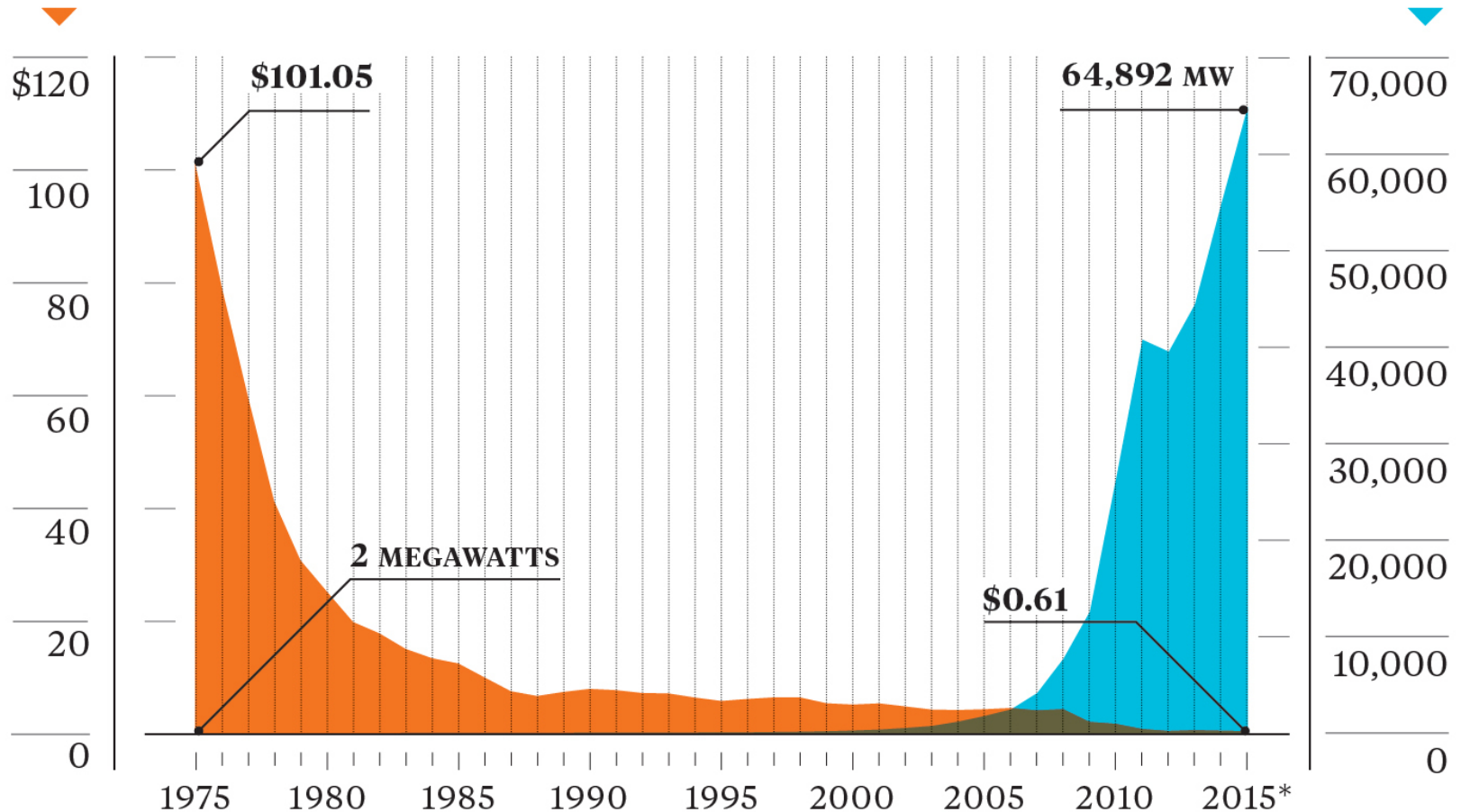


As Price Decreased, Installs Increased

4

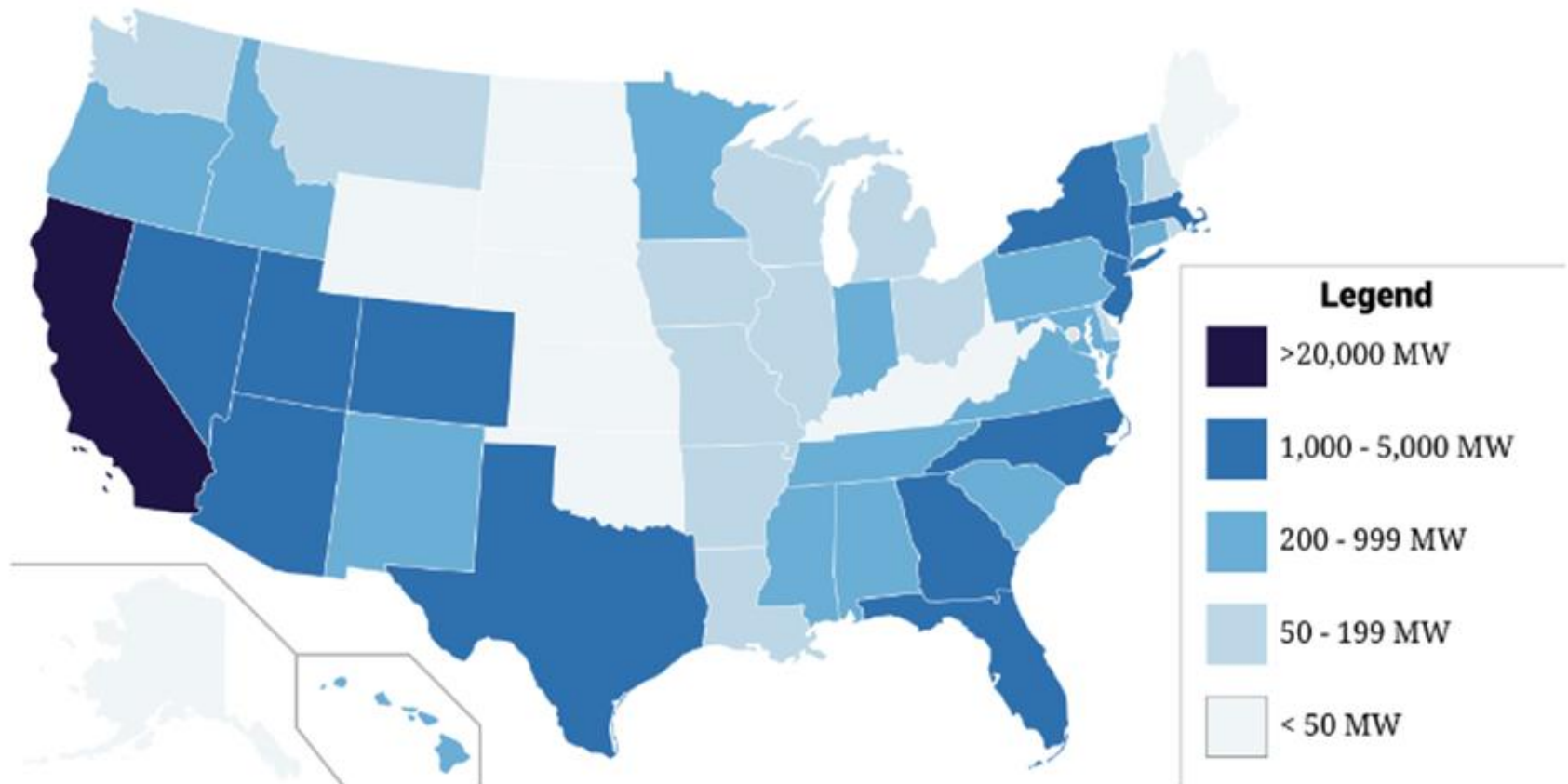
Price of a solar panel per watt

Global solar panel installations



**Estimate. Sources: Bloomberg, Earth Policy Institute, www.earth-policy.org*

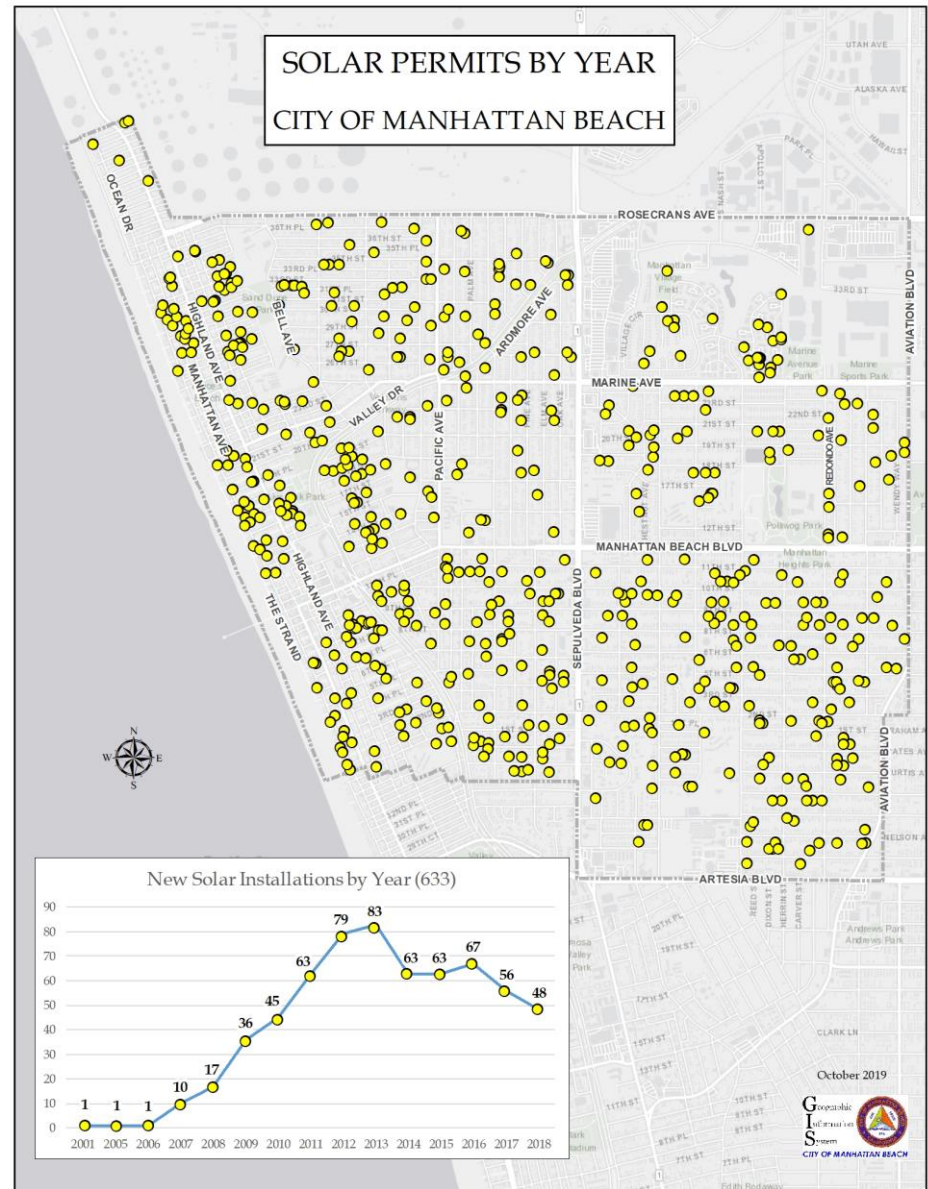
Cumulative Solar Capacity by State through Q2 2018



Manhattan Beach Solar Leadership

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633 permitted solar systems in Manhattan Beach since 2001



What does this mean for your bottom line? 7

- **Prices have decreased**
 - Total install cost \$3.00 to \$5.00 per Watt
- **Equipment efficiency**
 - More watts per panel
 - Fewer conversion losses (from DC to AC)
- **Tax credit**
 - Currently 30%
 - Will decrease to 26% in 2020



Solar Basics: System Components

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Module



Array



Inverter



Micro Inverter



Kilowatt Hour

A measure of electrical energy equivalent to a power consumption of 1,000 watts for 1 hour.

kWh = (kilowatt hour) Unit of energy

- You consume kWh
- PV system produces kWh

If you leave 10 100W lightbulbs burning for 1 hour...

1 kW × **1 Hour** = **1 Kilowatt-hour (kWh)**

1 Kilowatt 1 Hour

Net Metering

A billing mechanism that allows you to receive credit when your solar production exceeds your electricity demand and thereby flows into the grid.

Time of Use*

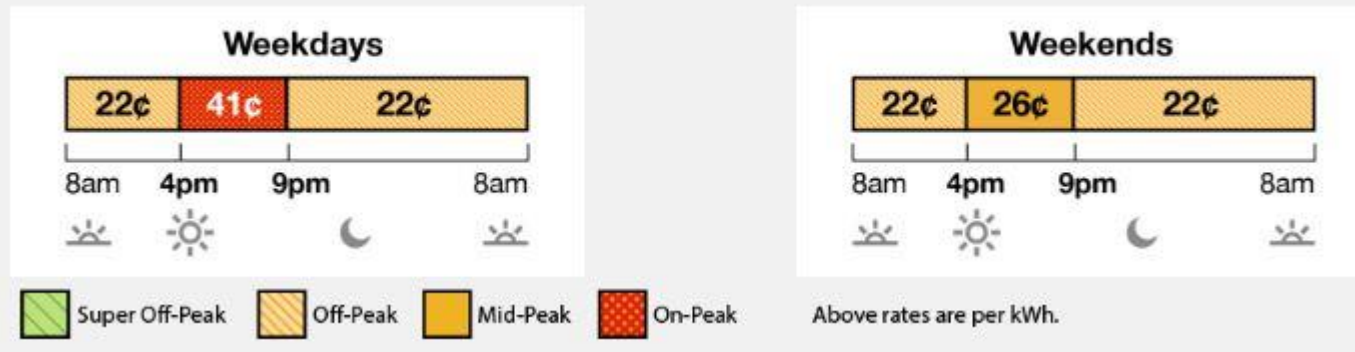
A rate plan in which rates vary according to the time of day, season, and day type (weekday or weekend/holiday). Higher rates are charged during peak demand hours** and lower rates during off-peak (low) demand hours.

*All solar systems must be on a Time of Use rate.

**Peak periods have shifted from 12:00 PM – 6:00 PM.

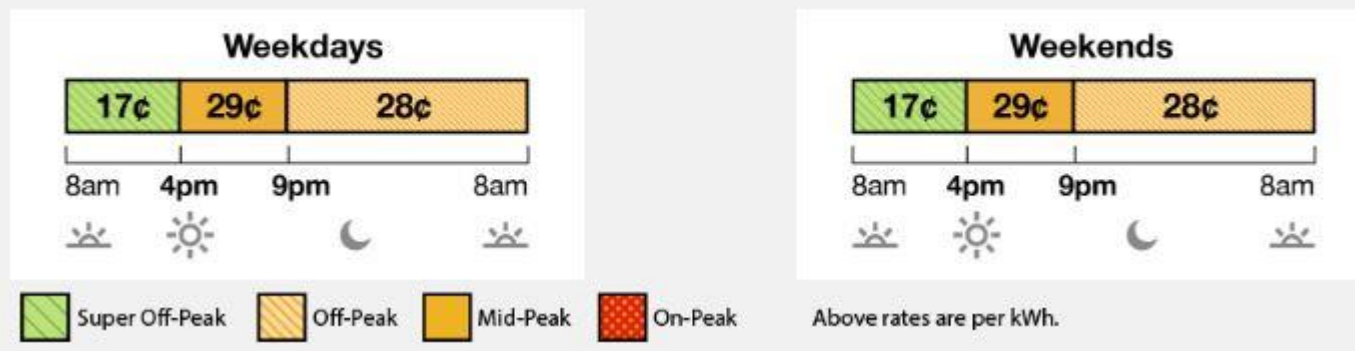
SCE Summer Rates*

June to September (4 months)



SCE Winter Rates*

October to May (8 months)



*Rates effective as of April 12, 2019 for TOU-D-4-9PM. Other residential rates will vary.

Payback

Financial return.

Solar Basics: Terminology

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E.g. 3 kW system at \$4.00/W, 2% utility escalation rate, 9.5 year payback

| Years | Project Costs | O&M/ Equipment Replacement | Electric Bill Savings | Change in Federal Tax Liability | Total Cash Flow | Cumulative Cash Flow |
|---------|---------------|----------------------------------|--------------------------|---------------------------------------|--------------------|-------------------------|
| Upfront | (\$12,000) | - | - | - | (\$12,000) | (\$12,000) |
| 1 | - | - | \$791 | \$3,600 | \$4,391 | (\$7,609) |
| 2 | - | - | \$803 | - | \$803 | (\$6,806) |
| 3 | - | - | \$815 | - | \$815 | (\$5,991) |
| 9 | - | - | \$890 | - | \$890 | (\$842) |
| 10 | - | (\$22) | \$904 | - | \$882 | \$40 |
| 23 | - | (\$37) | \$1,095 | - | \$1,058 | \$11,651 |
| 24 | - | (\$39) | \$1,112 | - | \$1,073 | \$12,724 |
| 25 | - | (\$41) | \$1,128 | - | \$1,087 | \$13,811 |
| Totals: | (\$12,000) | (\$1,541) | \$23,750 | \$3,600 | \$13,811 | - |

Reduce your use before you produce!



1) Total kWh to offset*

2) Divide by 1,500 kWh

**E.g. 6,000 kWh / 1,500 kWh = 4
kW PV system**

*You cannot offset more than 100% of your use (based on last year before installing solar).

System Sizing & Siting: Roof Condition

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System Sizing & Siting: Roof Condition

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- Orientation
- Shade
- Hips & valleys
- Age of roof



Cash: buy the system outright

Property-Assessed Clean Energy (PACE): financed through an assessment on your property tax bill

Lease: A third-party buys the system and charges a monthly lease payment

Other Financing: Home equity loan, PV lending programs

Find a Contractor: Installation

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Seek multiple bids

- [SBCCOG Contractor List](#)
- [Go Solar California Database](#)

Online Platforms

- [EnergySage](#)
- [Pick My Solar](#)



Workmanship: 1 year

Modules: 25 years


Inverters: 10 years

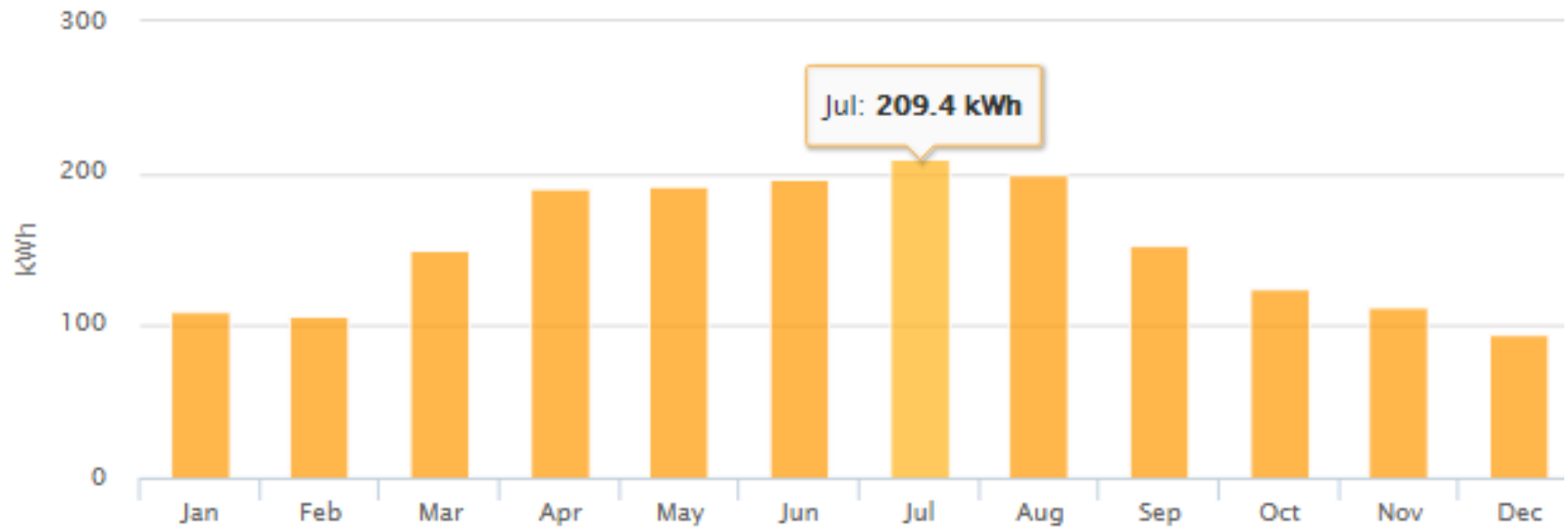
Batteries: 10 years

Maintenance: Typically not included!

Solar Basics: Annual Production Curve

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 Monthly Production



Solar Basics: Daily Production Curve

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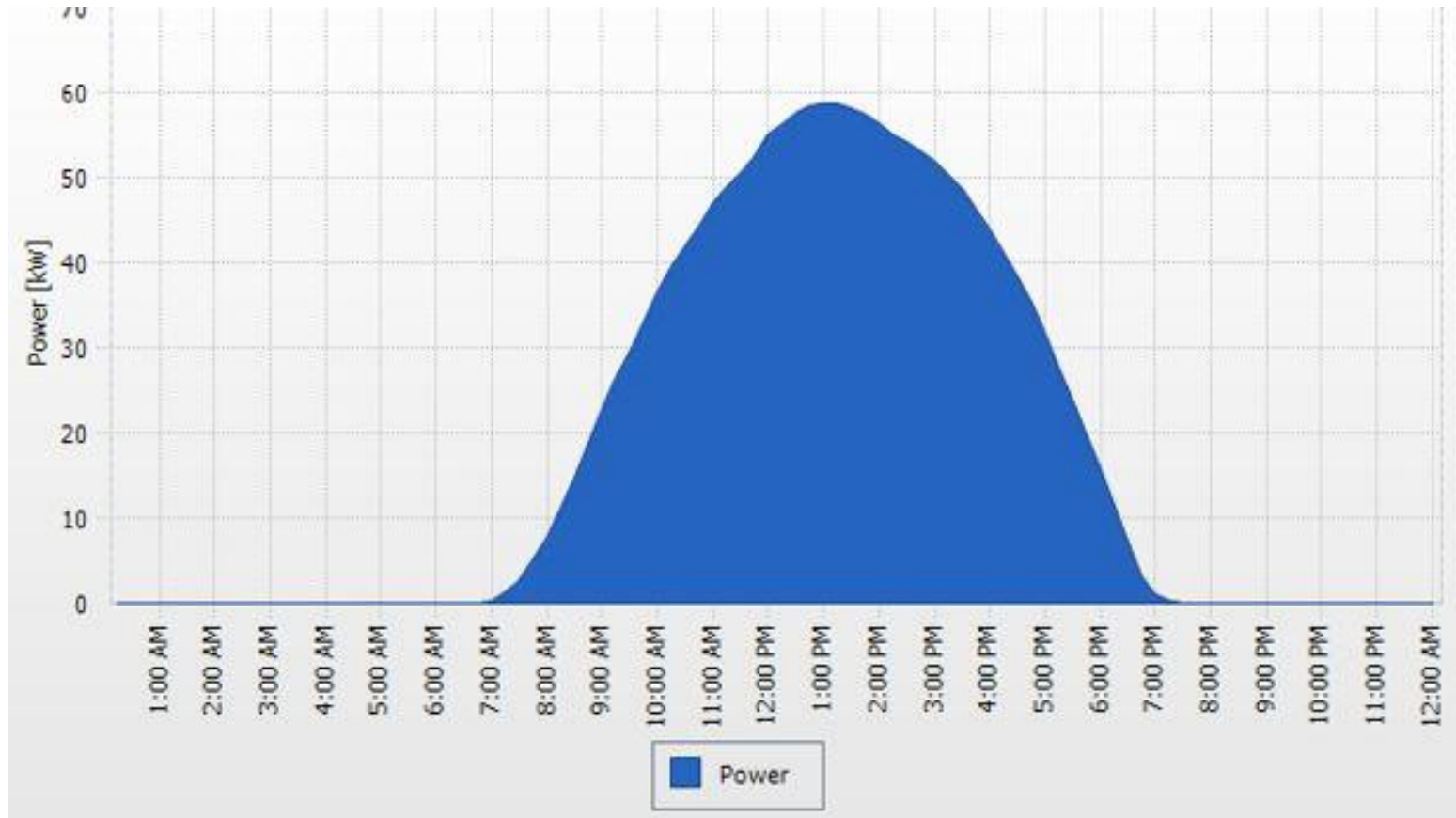


IMAGE COURTESY: SMA SUNNY PORTAL

Solar Basics: Not all days created equal

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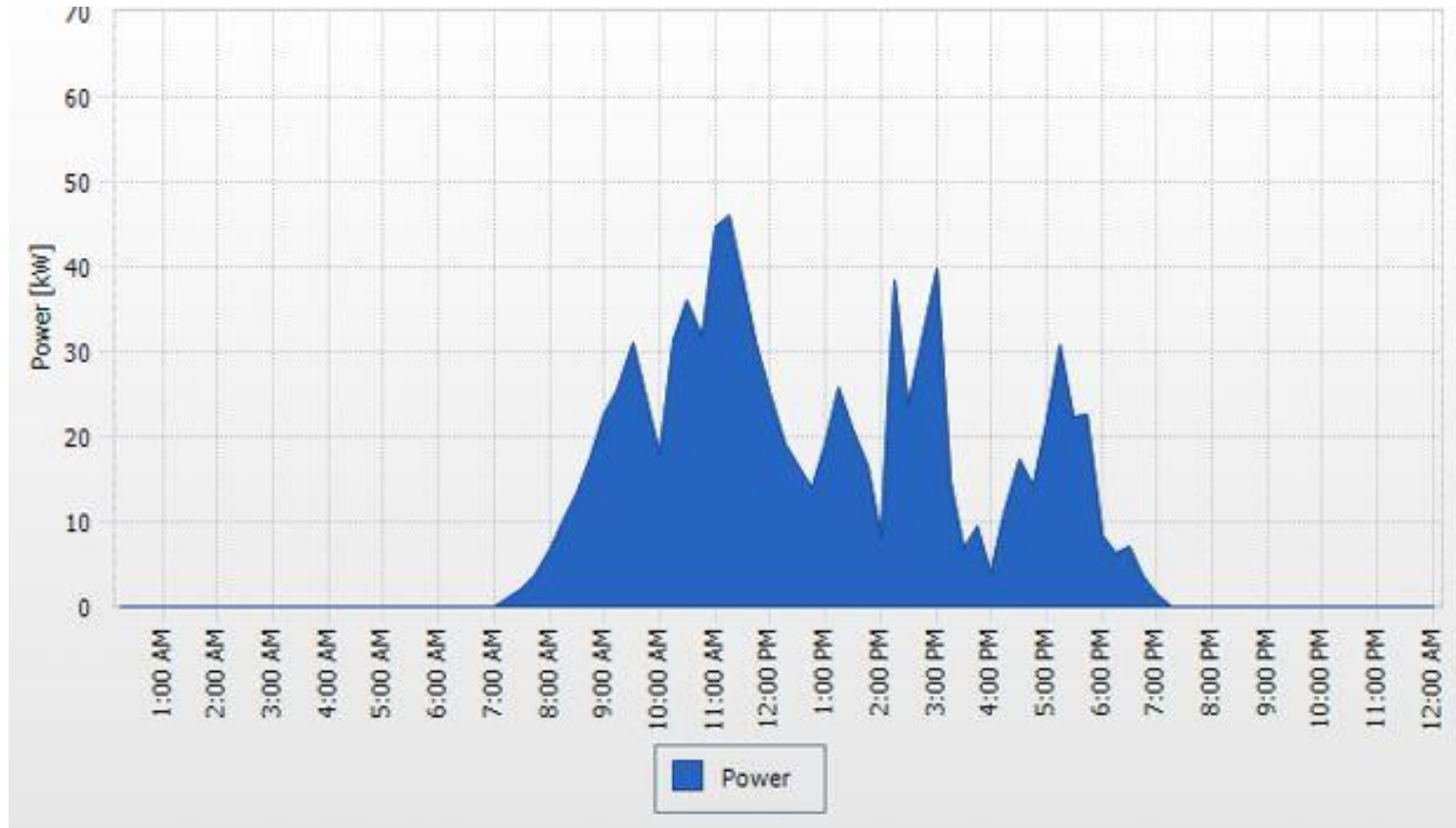
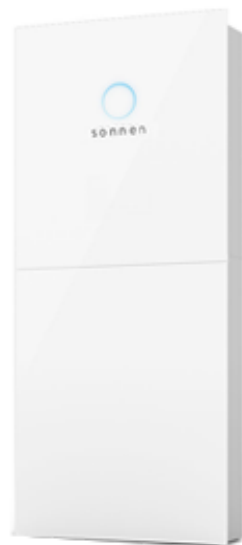


IMAGE COURTESY: SMA SUNNY PORTAL

Energy Storage EV Infrastructure

Sonnen Eco 10



Capacity – 10.0 kWh

Power – 7.0 kW

Tesla Powerwall



Capacity – 13.5 kWh

Power – 5.0 kW

LG RESU 10

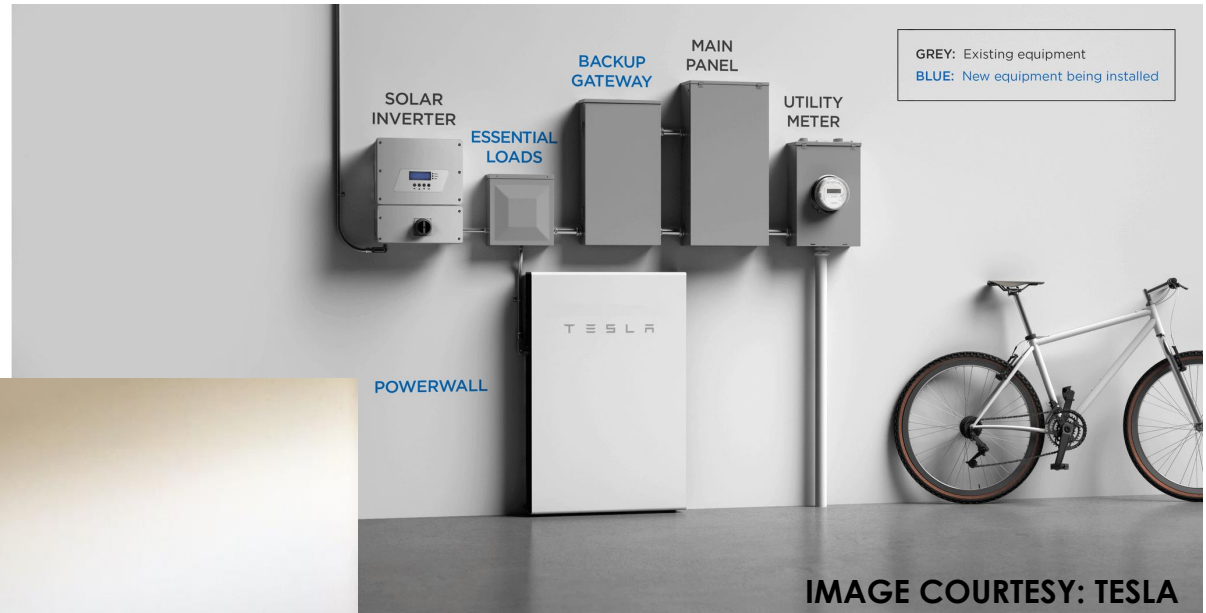


Capacity – 9.8 kWh

Power – 5.0 kW

\$5,000 - \$7,000+ per battery plus \$1,000 - \$3,000 for installation + tax/fees

Tesla Powerwall



Sonnen Eco 10 + EV Charger

CEC Self Generation Incentive Program

Currently \$0.35/Wh of installed battery capacity

E.g. 10,000 Wh (10 kWh) X \$0.35 = \$3,500 rebate

SCE Clean Fuel Reward Program

\$1,000 per vehicle bought or leased after January 1, 2019. \$450 per vehicle bought or leased before 2019.

CPA Customers Remain Eligible for SCE Rebates!

EV Chargers in Manhattan Beach

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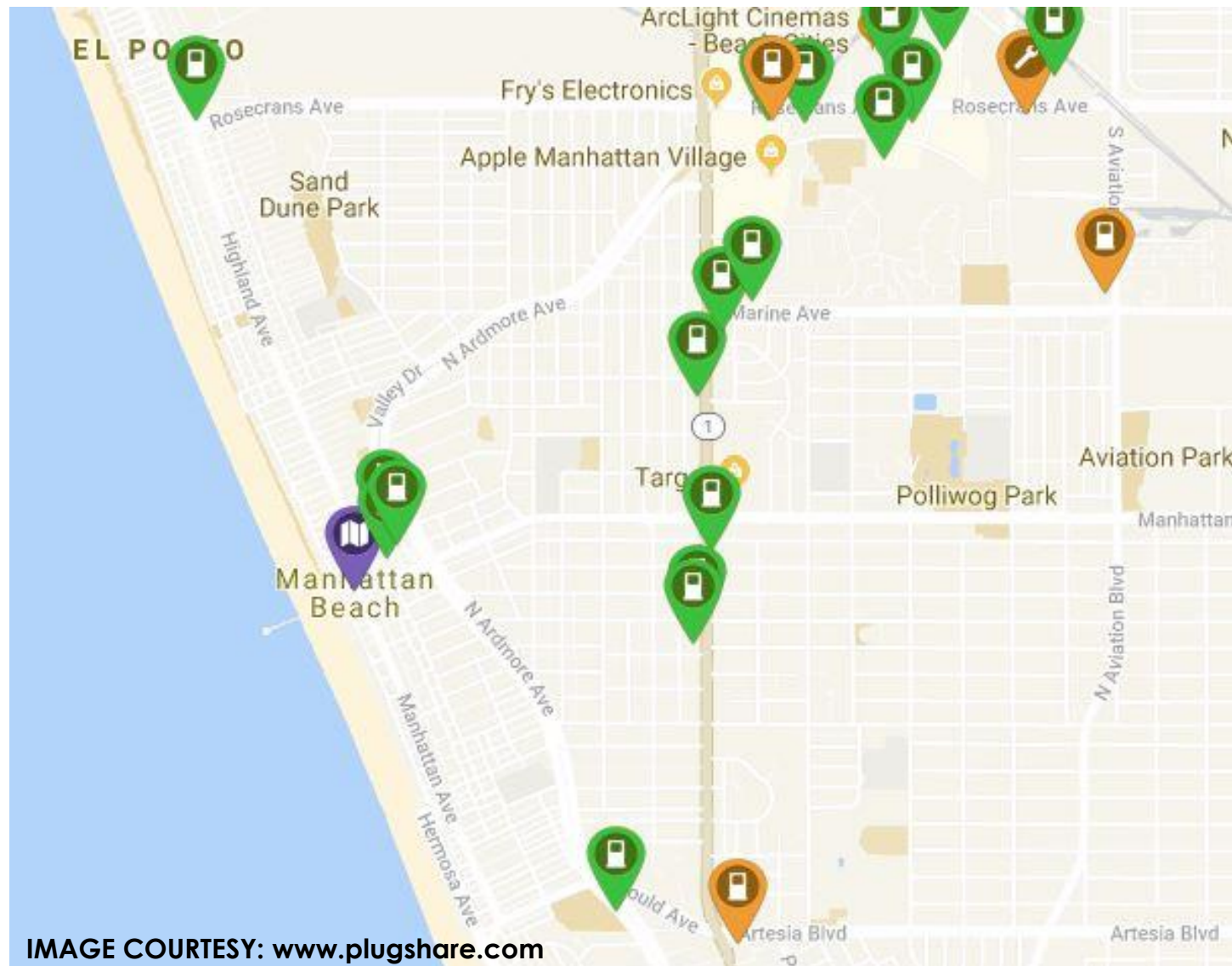
City-operated
chargers:

**(4) Stations in the
Civic Center
Parking Garage**

**(2) Stations in
Parking Lot #4**

**(2) Stations in
Metlox Parking
Garage**

**(2) Stations in
Parking Lot #3**

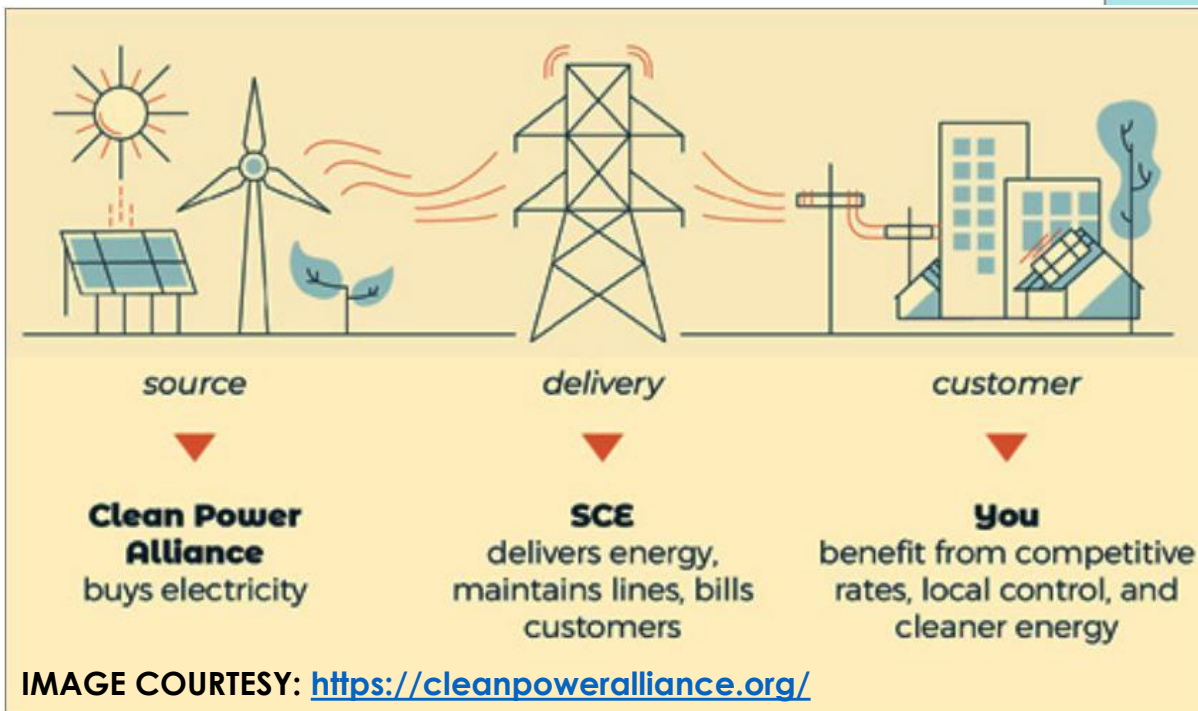




Clean Power

Provides 50% renewable content and the opportunity to support building a cleaner future, all at cost competitive rates.

more.



Available Resources

- **Solar PV Handout & Permit Forms**
- Financing & Contractor Resources
- Renewable South Bay LA County Solar Map

[Departments](#) » [Community Development](#) » [Building and Safety](#) »

Permits, Forms and Handouts

Font Size: [+](#) [-](#) [+](#) [Share & Bookmark](#) [Feedback](#) [Print](#)

[City Hall Hours](#) are Mondays through Thursdays 7:30 AM to 5:30 PM and Fridays 7:30 AM to 4:30 PM. Before you plan a trip to City Hall, check out our Permitting Center Schedule to know when staff and services are available.

[Permitting Center Schedule](#)

Permit Fees:
\$50 Plan Check
\$50 Permit



SOLAR (PV) SYSTEM PERMIT WORKSHEET

COMMUNITY DEVELOPMENT DEPARTMENT

1400 Highland Avenue, Manhattan Beach, CA 90266-4795

Telephone (310) 802-5500 FAX (310) 802-5501 TDD (310) 546-3501

Permit #: _____

Date: _____

Reviewed By: _____

Job Address:

Property Owner:

Applicant:

Contractor:

CSLB License No:



City of Manhattan Beach Community Development

Phone: (310) 802-5500

FAX: (310) 802-5501

TDD: (310) 546-3501

Photovoltaic Solar Panel Plan Check Guidelines

Updated: 12-20-16

ORDINANCE NO. 15-0022

MBMC 9.06

CALIFORNIA CIVIL CODE SECTION 714

GOVERNMENT CODE SECTION 658505

Please attach these forms to approved plans

1. All work must comply with 2016 California Building Code and California Electrical Code as well as applicable Manhattan Beach Municipal Code and amendments.

Available Resources

- Solar PV Handout & Permit Forms
- **Financing & Contractor Resources**
- Renewable South Bay LA County Solar Map

[Departments](#) » [Environmental Sustainability](#) » [How Can You Go Green?](#) » [Environmental Resources](#) »

PACE Financing Program

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L.A. County Launches Residential PACE Program

The City of Manhattan Beach approved Resolution 6256 on June 15, 2010 authorizing participation in the County's Property Assessed Clean Energy (PACE) program. Los Angeles County's Commercial PACE Program has been in operation since 2012 and began initiating loans for commercial properties in 2013.

On March 3, 2015, the Los Angeles County Board of Supervisors authorized the implementation of their Residential PACE Program. The County will work with Renewable Energy and Sustainable Building administrators of the program to offer PACE financing to residents. The HERO program launched for LA County residents.

PACE is a financing program sponsored by Los Angeles efficiency, renewable energy and water-saving improvements. PACE allows LA County to issue bonds for the installation of energy projects that are permanently financed annually through an assessment on their property tax bill.

Why should I participate in Los Angeles County's (LA) PACE Program?

- Stricter underwriting criteria
- Better consumer protections
- Additional foreclosure support
- Lower interest rates and fees
- Access to LA County HERO and CaliforniaFIRST

More information and a list of FAQs is available on the

Database of Solar Installers, Contractors, and Retailers in California

Frequently Asked Question

*** First, PICK COMPANY TYPE (Required):**

- ☐ Contractor/Installer (License to install energy systems.)
- ☐ Retailer (Only sells products. Usually is not licensed to install systems.)

THEN....

Search by Company Name:

OR - Search by City Location:

OR - Search by County Company Serves:

Select County ▼

OR - Search by Your ZIP Code:

Select Distance From Your ZIP: **5 Miles** ▼

OR - Search by Type of System:

- ☐ Solar Photovoltaics
- ☐ Wind
- ☐ Fuel Cell
- ☐ Geothermal

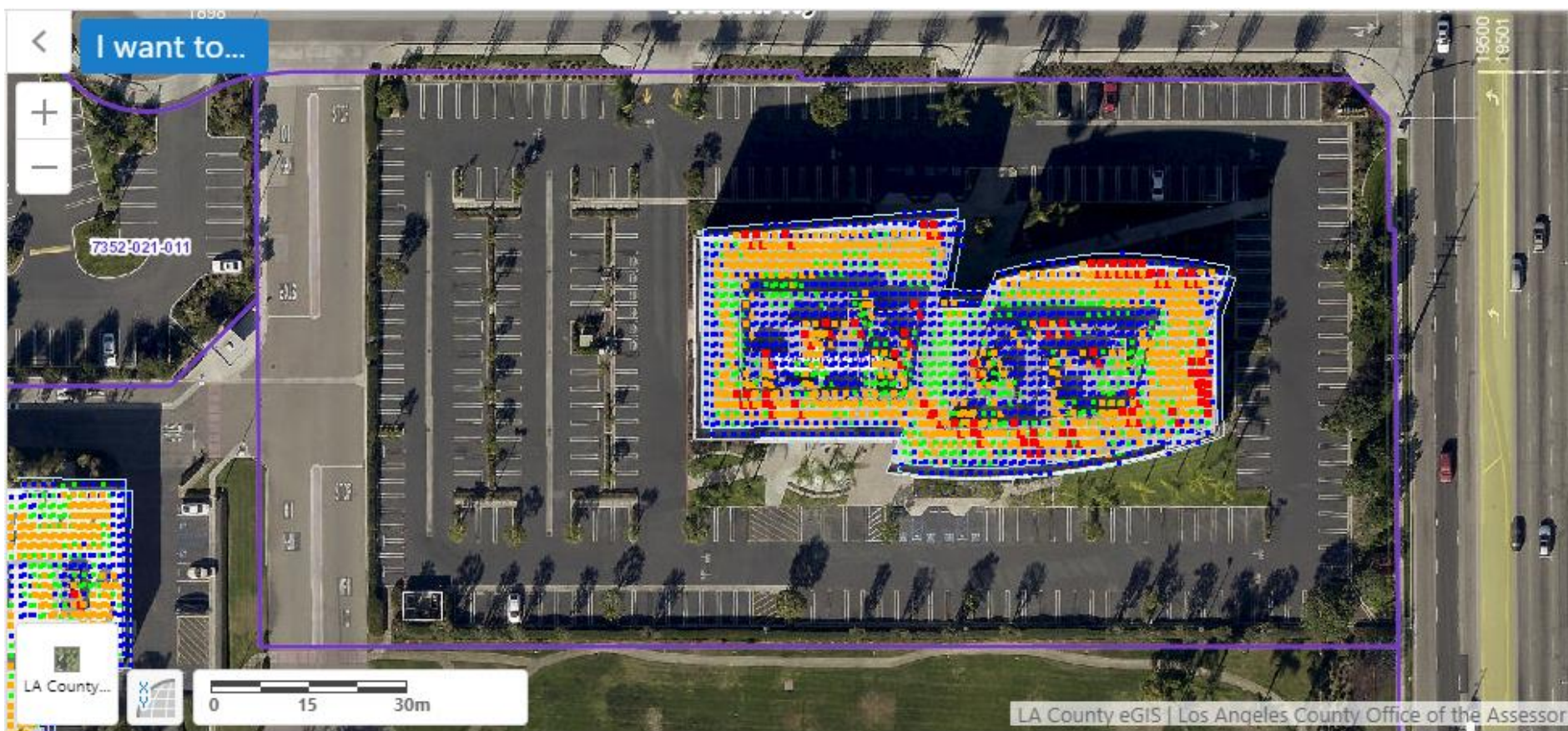
Search

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Available Resources

- Solar PV Handout & Permit Forms
- Financing & Contractor Resources
- **Renewable South Bay LA County Solar Map**

City Web Resources: LA County Solar Map 38



Manhattan Beach Building & Safety Department
(310) 802-5505

Manhattan Beach Sustainability Office
(310) 802-5508

South Bay Cities COG, Aaron Baum
(310) 371-7222, aaron@southbaycities.org

**Who's ready to go
solar?**



SOLAR WITH CONFIDENCE

EcoMotion, Inc.
619 S. Olive St., Suite 200
Los Angeles, CA 90014
949-292-7314

Thank you