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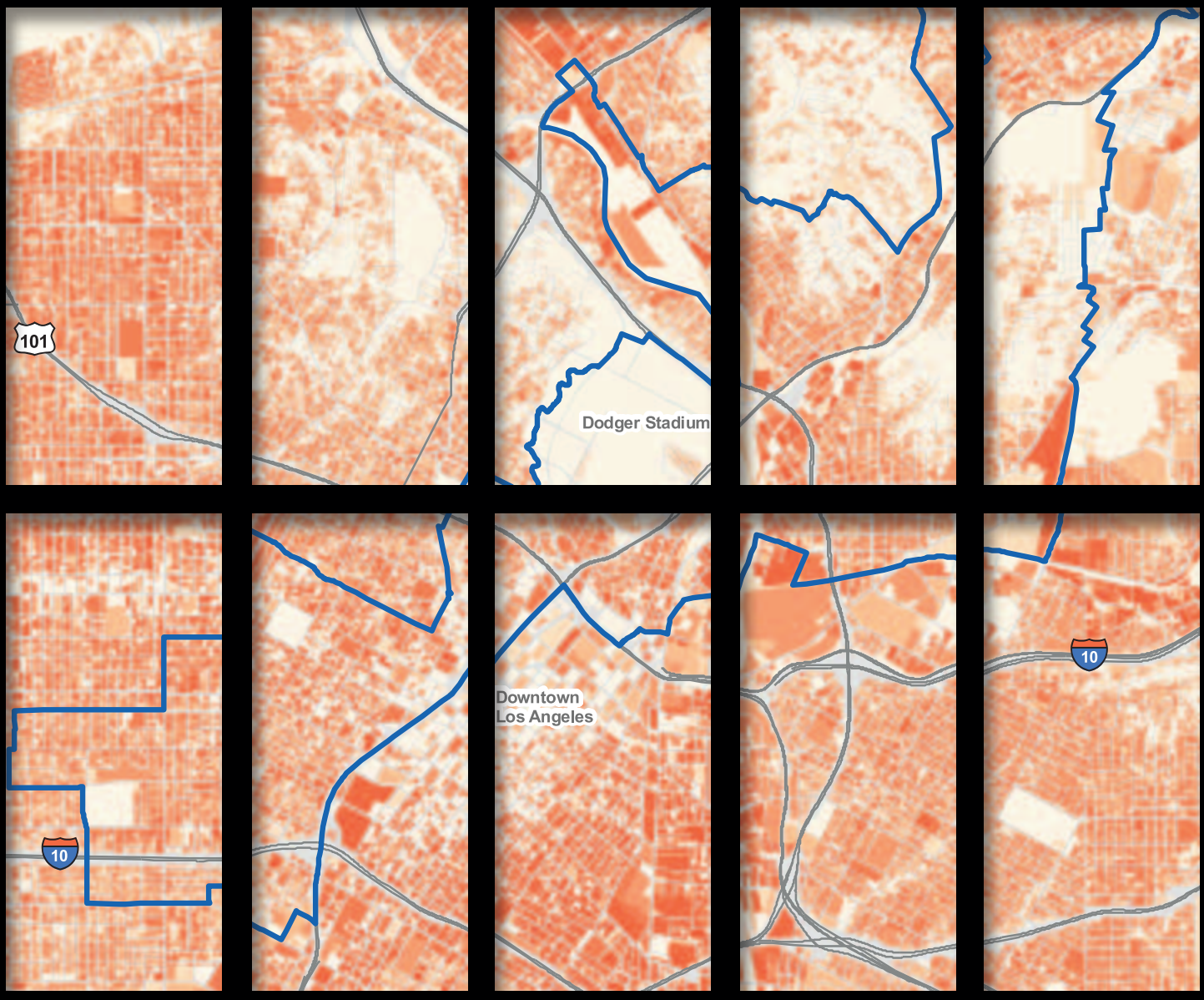

Los Angeles

SOLAR ATLAS

“For Los Angeles to be

the cleanest, greenest city,

we need participation

from every Angeleno...

we know that dirty fossil fuels

will only become more scarce

and more expensive

in the years to come.

This helps move

us toward renewable energy

while at the same

time creating new jobs.”

– Mayor Villaraigosa

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2011

Los Angeles
ROOFTOP SOLAR ATLAS

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Acknowledgements

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INTRODUCTION

Los Angeles is endowed not only with bountiful sunshine, but also with vast expanses of low-rise urban development that offers valuable siting opportunities for distributed solar energy generation. This atlas describes the geography of the region's rooftop solar resources. The information may prove useful for economic development planners, solar photovoltaic (PV) installers, utility planners, building owners, public administrators, labor union leadership, and anyone interested in the development of solar power in Los Angeles.

Los Angeles County has over 19,000 megawatts of rooftop solar PV potential, while the City of Los Angeles has over 5,500 megawatts.* These maps, which are based on aerial photography of the solar-usable rooftop space,** should be viewed as providing long-run estimates of rooftop potential.***

This atlas is organized to help cities and electricity utilities understand their own solar rooftop potential so that they may be better stewards of these resources. Each map presents the geographical distribution of solar potential across neighborhoods and parcels. In addition, each map is accompanied by a description of how the solar potential varies across single- and multifamily residences, commercial and industrial parcels, and nonprofit and government parcels, since the economic benefits and policy incentives may vary accordingly. Because cost-effectiveness increases with the size of a solar installation, the atlas also presents for each jurisdiction the number of potential solar projects by size as well as the total rooftop potential.

The maps in this atlas are best used for identifying the overall spatial patterns of rooftop solar potential. However, they are an incomplete tool for investigating individual sites. This atlas does not contain information on the age or material integrity of rooftops. The usable portion of rooftop may change over time due to changes in shading (tree growth or tall adjacent construction) or roof modification. Those interested in specific rooftops should consult with a qualified professional for an on-site analysis. The data sources and analytical methods used in this atlas are discussed in detail in the appendix.

** See Bringing Solar Energy to Los Angeles at (luskin.ucla.edu/publications) authored by the UCLA Luskin Center and commissioned by the Los Angeles Business Council.*

*** See the Los Angeles County Solar Map at (solarmap.lacounty.gov).*

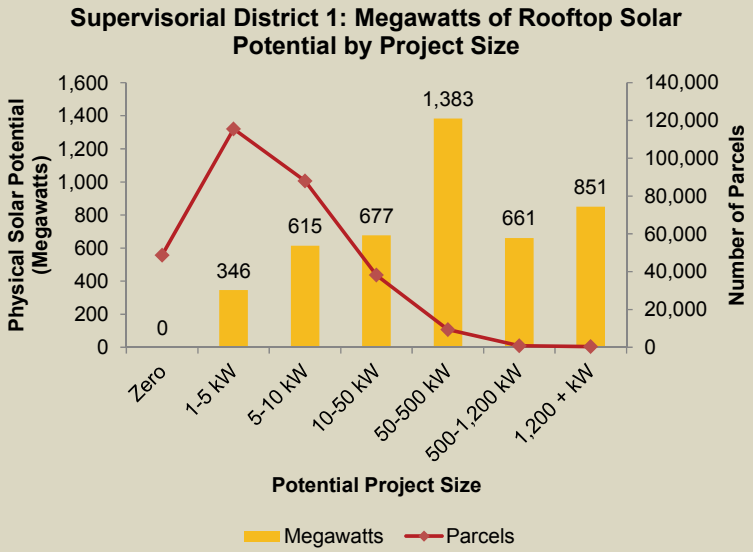
**** This atlas assumes that roofs that have solar potential but cannot currently not support solar because of old age or poor quality will be replaced in 10 to 15 years under a standard capital maintenance program.*

CONTENTS

Solar Statistics of Los Angeles County Supervisorial District 1

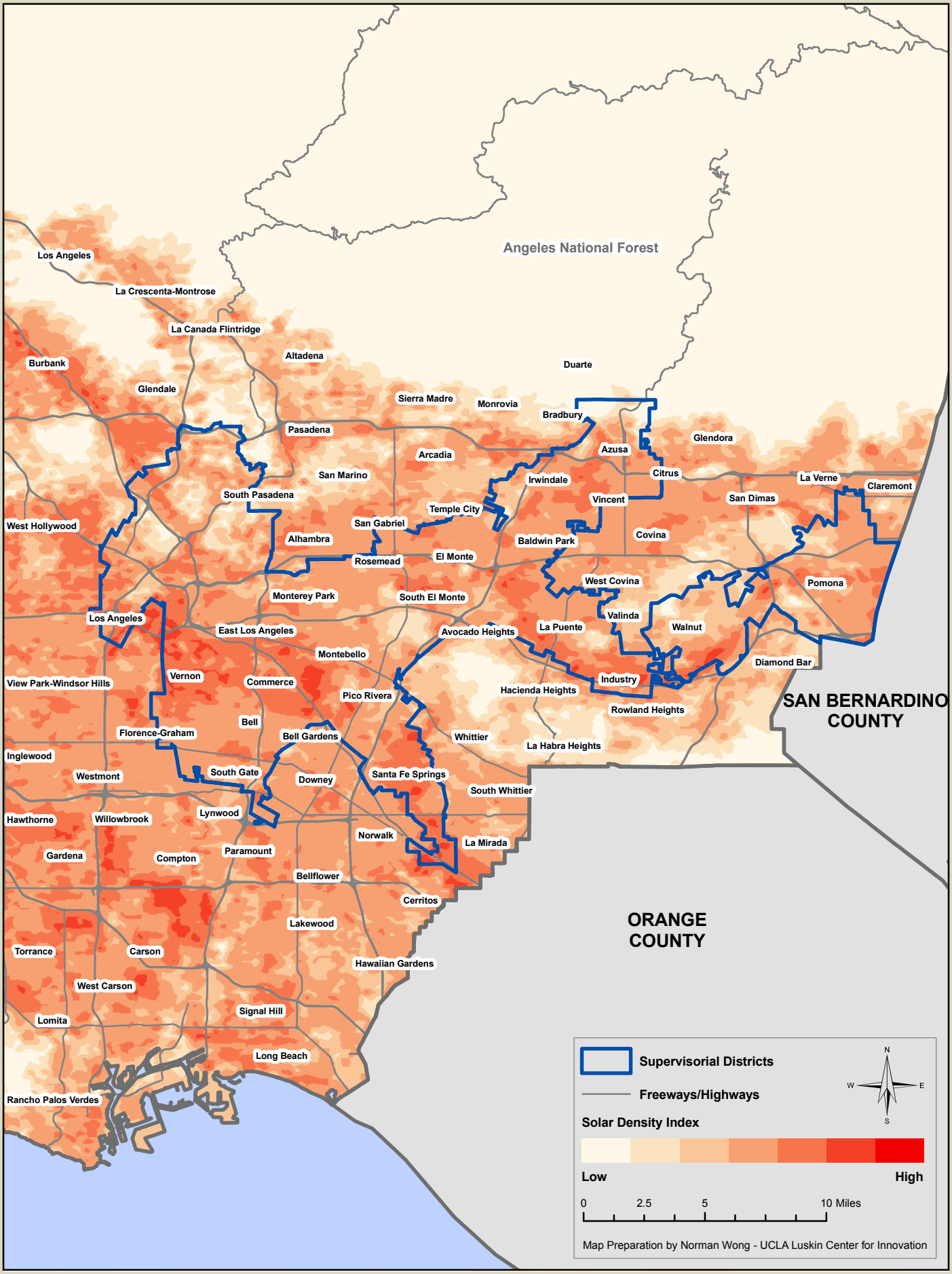
Area	228.0 square miles
Population	2,117,389 (2009 estimate)

Total Potential Sites	252,351		
Commercial & Industrial	10.5%	Median Rooftop Availability	19.2%
Multi-family	20.2%	Median Potential of Parcels	4.3 Kilowatts
Single Family	68.6%	Median Solar Density Index	10.7%
Government or Non-profit	0.7%	Total Rooftop Solar Potential	4,531 Megawatts



Parcels with the Largest Potential Solar Projects in Supervisorial District 1				
Rank	**Potential (kW)**	**Parcel Address**	**Zip Code**	**Parcel Use Description**
1	7,340	21749 Baker Pkwy	91748	Warehousing, Distribution, Storage
2	7,201	15541 Gale Ave	91745	Warehousing, Distribution, Storage
3	6,933	20005 Business Pkwy	91789	Warehousing, Distribution, Storage
4	6,912	1601 W Mission Blvd	91766	Warehousing, Distribution, Storage
5	6,706	5300 Sheila St	90040	Food Processing Plants
6	6,296	3880 N Mission Rd	90031	Warehousing, Distribution, Storage
7	5,979	12520 Slauson Ave	90670	Warehousing, Distribution, Storage
8	5,931	21535 Baker Pkwy	91748	Warehousing, Distribution, Storage
9	5,552	13500 Foster Rd	90670	Warehousing, Distribution, Storage
10	5,444	21508 Ferrero	91789	Warehousing, Distribution, Storage
11	5,293	15930 Valley Blvd	91744	Warehousing, Distribution, Storage
12	5,279	9630 Norwalk Blvd	90670	Warehousing, Distribution, Storage
13	5,263	5305 Rivergrade Rd	91706	Warehousing, Distribution, Storage
14	5,170	2400 Yates Ave	90040	Heavy Manufacturing
15	5,125	9400 Santa Fe Springs Rd	90670	Warehousing, Distribution, Storage
16	5,105	13060 Temple Ave	91746	Light Manufacturing
17	4,975	7301 Telegraph Rd	90640	Warehousing, Distribution, Storage
18	4,903	3300 Garfield Ave	90040	Heavy Manufacturing
19	4,586	20300 Business Pkwy	91789	Warehousing, Distribution, Storage
20	4,478	3100 E Slauson Ave	90058	Warehousing, Distribution, Storage

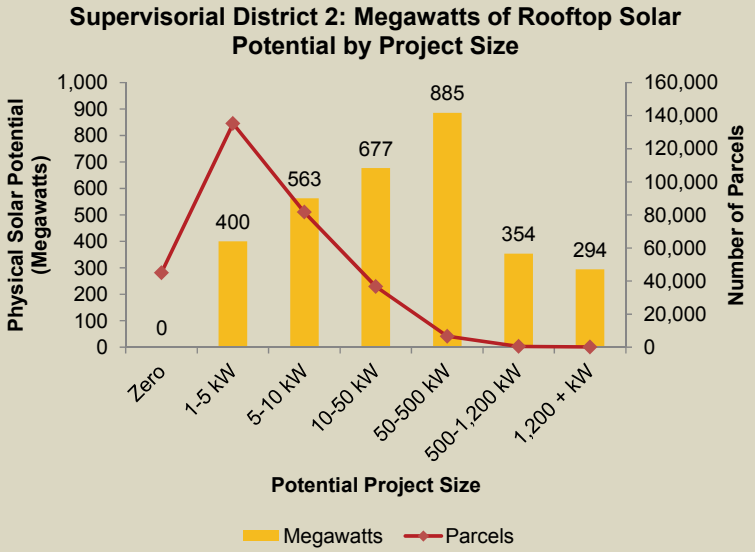
Rooftop Solar Potential of Los Angeles County Supervisorial District 1



Solar Statistics of Los Angeles County Supervisorial District 2

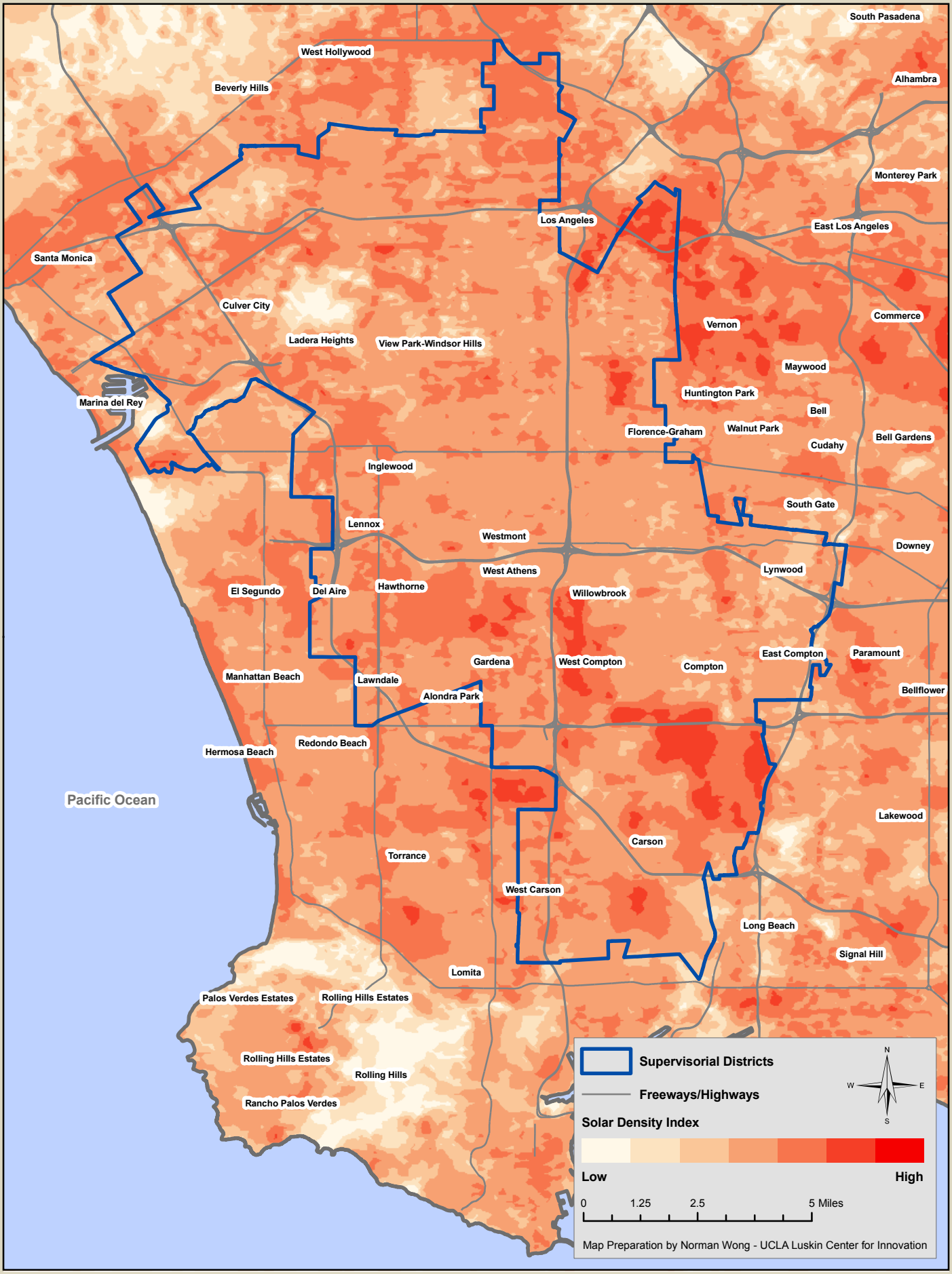
Area	158.0 square miles
Population	2,092,018 (2009 estimate)

Total Potential Sites	260,848		
Commercial & Industrial	8.6%	Median Rooftop Availability	18.7%
Multi-family	25.7%	Median Potential of Parcels	4.1 Kilowatts
Single Family	64.8%	Median Solar Density Index	10.9%
Government or Non-profit	0.9%	Total Rooftop Solar Potential	3,173 Megawatts



Parcels with the Largest Potential Solar Projects in Supervisorial District 2				
Rank	**Potential (kW)**	**Parcel Address**	**Zip Code**	**Parcel Use Description**
1	4,734	2201 E Carson St	90810	Warehousing, Distribution, Storage
2	4,402	2501 S Alameda St	90058	Warehousing, Distribution, Storage
3	4,301	2417 E Carson St	90810	Warehousing, Distribution, Storage
4	4,247	1065 Lomita Blvd	90710	Mobile Home Parks
5	3,878	1501 E Victoria St	90746	Warehousing, Distribution, Storage
6	3,411	19801 S Santa Fe Ave	90221	Warehousing, Distribution, Storage
7	3,329	17700 Avalon Blvd	90746	Mobile Home Parks
8	3,287	17701 Avalon Blvd	90746	Mobile Home Parks
9	3,282	1371 Charles Willard St	90747	Warehousing, Distribution, Storage
10	3,098	1650 Glenn Curtiss St	90220	Warehousing, Distribution, Storage
11	2,950	23000 Avalon Blvd	90745	Warehousing, Distribution, Storage
12	2,942	2700 E Imperial Hwy	90262	Warehousing, Distribution, Storage
13	2,875	2201 S Wilmington Ave	90220	Food Processing Plants
14	2,693	1601 E Olympic Blvd	90021	Warehousing, Distribution, Storage
15	2,688	11852 Alameda St	90262	Warehousing, Distribution, Storage
16	2,616	2220 E Carson St	90810	Warehousing, Distribution, Storage
17	2,588	13031 W Jefferson Blvd	90066	Government Parcel
18	2,569	20642 S Fordyce Ave	90810	Light Manufacturing
19	2,555	23914 S Alameda St	90810	Mineral Processing
20	2,545	22351 Wilmington Ave	90745	Warehousing, Distribution, Storage

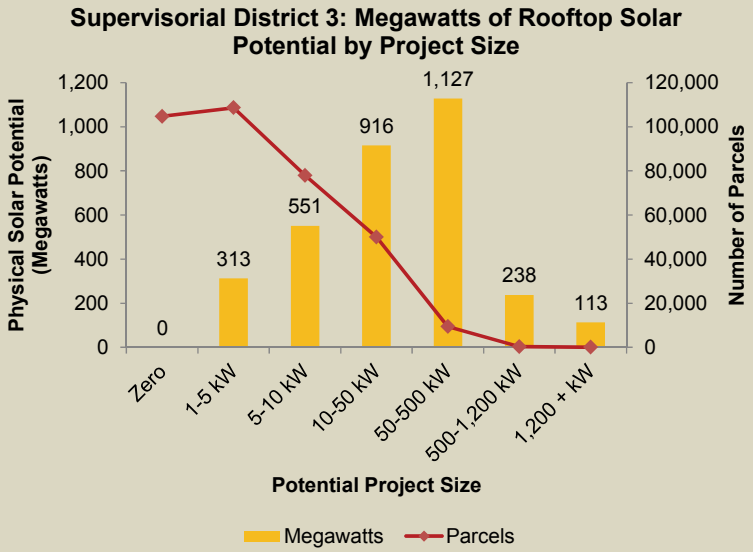
Rooftop Solar Potential of Los Angeles County Supervisorial District 2



Solar Statistics of Los Angeles County Supervisorial District 3

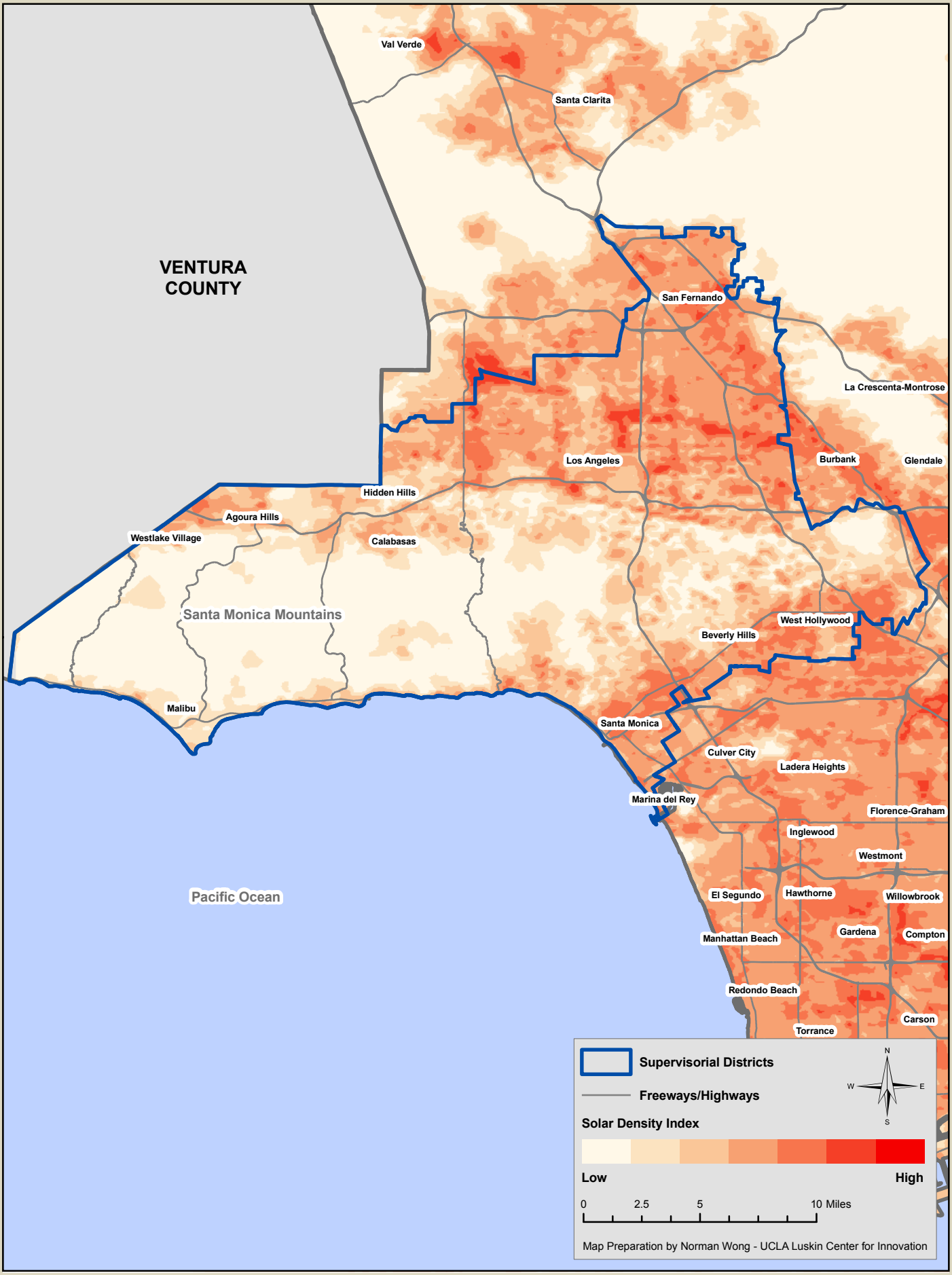
Area	432.0 square miles
Population	2,076,675 (2009 estimate)

Total Potential Sites	246,372		
Commercial & Industrial	7.6%	Median Rooftop Availability	12.0%
Multi-family	14.9%	Median Potential of Parcels	3.4 Kilowatts
Single Family	76.9%	Median Solar Density Index	6.5%
Government or Non-profit	0.6%	Total Rooftop Solar Potential	3,257 Megawatts



Parcels with the Largest Potential Solar Projects in Supervisorial District 3				
Rank	**Potential (kW)**	**Parcel Address**	**Zip Code**	**Parcel Use Description**
1	3,771	4544 Colorado Blvd	90039	Light Manufacturing
2	3,597	5500 Canoga Ave	91367	Heavy Manufacturing
3	3,366	8500 Balboa Blvd	91406	Heavy Manufacturing
4	3,351	6600 Topanga Canyon Blvd	91303	Shopping Centers (Regional)
5	3,277	29500 Heathercliff Rd	90265	Mobile Home Parks
6	2,868	3900 Lankershim Blvd	90068	Heavy Manufacturing
7	2,806	11428 Sherman Way	91605	Warehousing, Distribution, Storage
8	2,672	12745 Arroyo St	91342	Light Manufacturing
9	2,430	8201 Woodley Ave	91406	Light Manufacturing
10	2,302	13691 Gavina Ave	91342	Mobile Home Parks
11	2,171	12820 Pierce St	91331	Warehousing, Distribution, Storage
12	2,149	4024 Radford Ave	91604	Motion Picture, Radio & Television
13	2,144	16800 Roscoe Blvd	91406	Government Parcel
14	1,998	5308 Derry Ave	91301	Light Manufacturing
15	1,943	7821 Orion Ave	91406	Light Manufacturing
16	1,928	5601 De Soto Ave	91367	Hospitals
17	1,841	16000 Arminta St	91406	Warehousing, Distribution, Storage
18	1,823	21500 Victory Blvd	91367	Shopping Centers (Neighborhood, community)
19	1,813	3900 Lankershim Blvd	90068	Heavy Manufacturing
20	1,715	675 Glenoaks Blvd	91340	Warehousing, Distribution, Storage

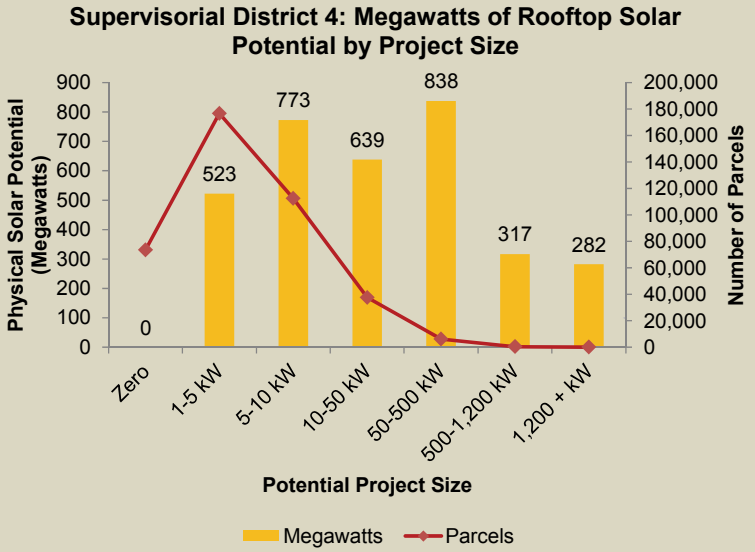
Rooftop Solar Potential of Los Angeles County Supervisorial District 3



Solar Statistics of Los Angeles County Supervisorial District 4

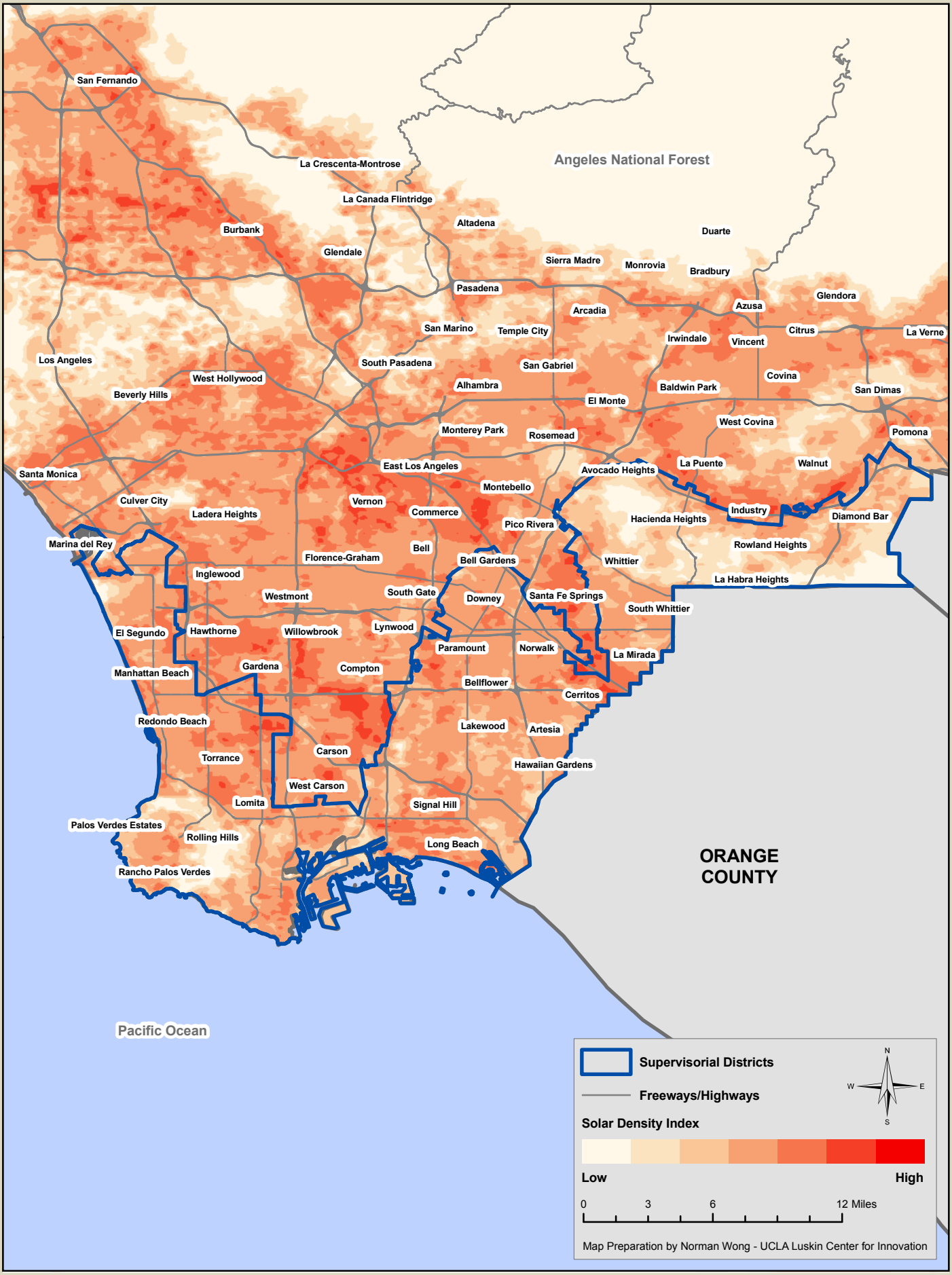
Area	428.0 square miles
Population	2,026,903 (2009 estimate)

Total Potential Sites	333,491		
Commercial & Industrial	4.9%	Median Rooftop Availability	17.5%
Multi-family	12.5%	Median Potential of Parcels	3.8 Kilowatts
Single Family	82.1%	Median Solar Density Index	9.4%
Government or Non-profit	0.5%	Total Rooftop Solar Potential	3,370 Megawatts



Parcels with the Largest Potential Solar Projects in Supervisorial District 4				
Rank	**Potential (kW)**	**Parcel Address**	**Zip Code**	**Parcel Use Description**
1	6,987	300 Westmont Dr	90731	Warehousing, Distribution, Storage
2	6,202	19700 Van Ness Ave	90501	Warehousing, Distribution, Storage
3	5,081	700 Van Ness Ave	90501	Office Buildings
4	4,911	19001 S Western Ave	90501	Office Buildings
5	4,797	400 Westmont Dr	90731	Warehousing, Distribution, Storage
6	4,233	2027 Harpers Way	90501	Light Manufacturing
7	4,116	7500 Amigos Ave	90242	Warehousing, Distribution, Storage
8	3,846	16501 Trojan Way	90638	Warehousing, Distribution, Storage
9	3,643	2401 E Wardlow Rd	90807	Heavy Manufacturing
10	3,596	20333 Normandie Ave	90502	Food Processing Plants
11	3,565	15155 Northam St	90638	Warehousing, Distribution, Storage
12	3,366	4500 Via Marina	90292	Five or more apartments
13	3,313	401 Westmont Dr	90731	Warehousing, Distribution, Storage
14	3,188	239 Los Cerritos Mall	90703	Shopping Centers (Regional)
15	3,073	500 Crenshaw Blvd	90503	Light Manufacturing
16	3,004	12214 Lakewood Ave	90242	Motion Picture, Radio & Television
17	2,956	14001 Rosecrans Ave	90638	Warehousing, Distribution, Storage
18	2,836	3501 Sepulveda Blvd	90505	Shopping Centers (Regional)
19	2,788	4240 W 190th St	90504	Warehousing, Distribution, Storage
20	2,685	4110 Santa Fe Ave	90810	Light Manufacturing

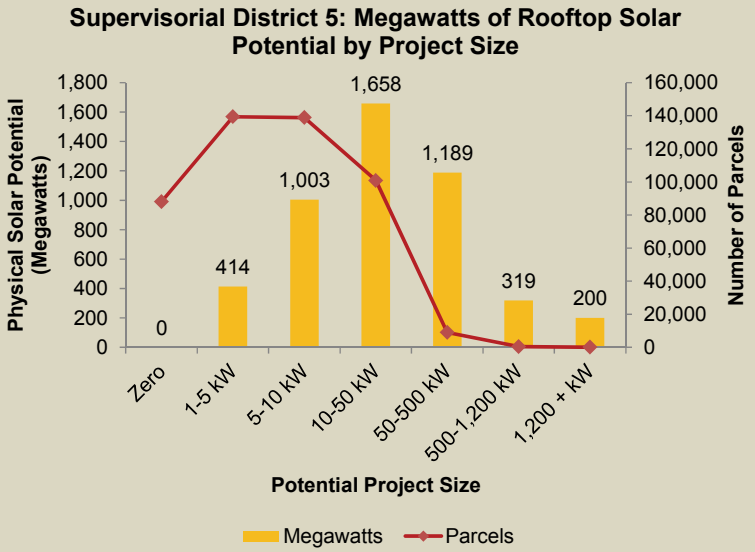
Rooftop Solar Potential of Los Angeles County Supervisorial District 4



Solar Statistics of Los Angeles County Supervisorial District 5

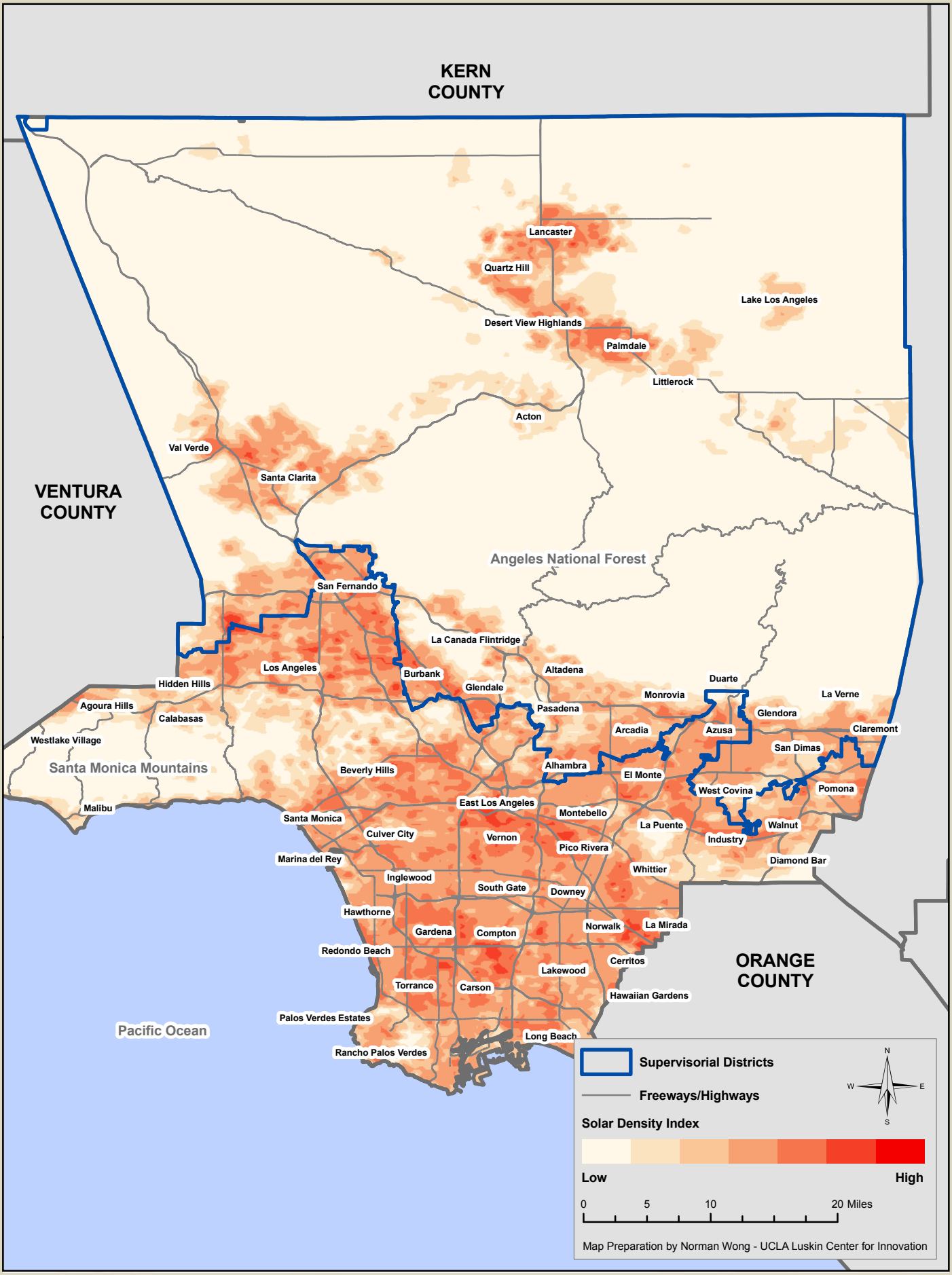
Area	2,838.0 square miles
Population	2,125,986 (2009 estimate)

Total Potential Sites	388,752		
Commercial & Industrial	4.8%	Median Rooftop Availability	19.7%
Multi-family	8.0%	Median Potential of Parcels	5.3 Kilowatts
Single Family	86.7%	Median Solar Density Index	9.1%
Government or Non-profit	0.5%	Total Rooftop Solar Potential	4,782 Megawatts



Parcels with the Largest Potential Solar Projects in Supervisorial District 5				
Rank	**Potential (kW)**	**Parcel Address**	**Zip Code**	**Parcel Use Description**
1	7,097	2825 E Avenue P	93550	Heavy Manufacturing
2	4,954	1301 E Avenue I	93535	Mobile Home Parks
3	4,547	3501 W Avenue H	93536	Warehousing, Distribution, Storage
4	4,524	20525 Nordhoff St	91311	Light Manufacturing
5	4,173	25655 Springbrook Ave	91350	Heavy Manufacturing
6	4,071	40701 Rancho Vista Blvd	93551	Mobile Home Parks
7	3,652	1501 N Victory Pl	91502	Shopping Centers (Regional)
8	3,316	500 S Buena Vista St	91521	Athletic & Amusement Facilities
9	3,267	2753 E Eastland Ctr Dr	91791	Shopping Centers (Neighborhood, community)
10	3,052	9301 Tampa Ave	91324	Shopping Centers (Regional)
11	3,004	27361 Sierra Hwy	91351	Mobile Home Parks
12	2,991	3000 W Alameda Ave	91523	Motion Picture, Radio & Television
13	2,980	1233 W Avenue P	93551	Shopping Centers (Regional)
14	2,848	1011 Lockheed Way	93599	Light Manufacturing
15	2,771	27460 Avenue Scott	91355	Light Manufacturing
16	2,673	9120 Mason Ave	91311	Light Manufacturing
17	2,606	2330 E Avenue	93535	Mobile Home Parks
18	2,447	8811 Canoga Ave	91304	Mobile Home Parks
19	2,404	8900 De Soto Ave	91311	Heavy Manufacturing
20	2,402	1200 West Covina Pkwy	91791	Shopping Centers (Regional)

Rooftop Solar Potential of Los Angeles County Supervisorial District 5



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INITIATIVES

CLIMATE CHANGE

The Luskin Center's Climate Change Initiative is designed to strengthen local governments' capacity to reduce emissions and adapt to climate change.

GREEN CHEMISTRY

The Luskin Center's Green Chemistry initiative is advancing health and environmental protections in the field of engineered nanomaterials (ENMs). Luskin Center researchers in collaboration with academic partners and state and federal agencies are advancing health and environmental protections in the booming field of nanotechnology.

SMART WATER SYSTEMS

The Luskin Center's Smart Water Systems initiative seeks to inform solutions for more sustainable and smart water systems. This initiative explores options for addressing Southern California's severe drought by tapping into unused or underutilized water sources.

CLEAN TECHNOLOGY

Through strategic research and communication, the Luskin Center is supporting Mayor Villaraigosa's Office and other members of the Clean Tech LA collaborative in the goal to make the city of Los Angeles a center for the clean technology industry.

SUSTAINABLE ENERGY

Researchers analyze and recommend strategies to effectively advance renewable energy and energy efficiency in California. The Luskin Center's Sustainable Energy initiative analyzes and recommends strategies to effectively advance renewable energy and energy efficiency in California.

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APPENDIX

The Los Angeles County Chief Information Office provided the data used to create this atlas. The data was compiled to support the Los Angeles County Solar Map initiative, an interactive web-based application designed to help people investigate the feasibility of rooftop solar for individual sites (see solarmap.lacounty.gov). The Luskin Center modified this data in order to measure solar potential from a regional perspective. These adjustments allowed each tax-assessed land parcel in Los Angeles County to be evaluated for solar potential and categorized into market segments. A detailed discussion of the methodology used to accomplish this is provided in the Luskin Center report "Bringing Solar Energy to Los Angeles" (available at luskin.ucla.edu/publications). The "physical potential" of a rooftop is defined as the maximum solar capacity that could be achieved if solar PV arrays were installed on all available rooftop space that receives direct sunlight from 9 a.m. to 4 p.m. every day of the year. These maps represent the physical potential existing on rooftops. Parking lots, open space, infrastructure rights-of-way, and building-integrated photovoltaics (BIPV) are not shown on these maps.

Two methods were used to analyze the spatial patterns of solar potential. First, for small-scale maps that show large areas of Los Angeles County, we created the images using "heat map" analysis. This technique shows high-level patterns and concentrated "hot spots" of solar potential, but does not show individual land parcels. Second, for large-scale maps of smaller geographies, parcel maps were used to categorize each parcel. The parcels were categorized by geometric interval to facilitate a visually appealing and accurate display of the distribution of solar potential.*

While it is possible to distinguish individual parcels on these maps, there can occasionally be differences between the measured solar potential and the actual potential of a rooftop. Users of this atlas should verify the solar potential of a specific site with other sources of information.

Adjacent to each map is a page of descriptive statistics about the geography shown on the map. The page provides basic information such as population and physical area. It also contains a breakdown of the land parcels in the jurisdiction based on market segment. Rooftop Availability is the ratio of the area available for solar to the rooftop area. Median Potential of Parcels is the median size of the potential projects based on the assumptions in Appendix 1 of "Bringing Solar Energy to Los Angeles."**

Median Solar Density Index describes the ratio of area available for solar to the area of the land parcel. This measure incorporates land use patterns and suitable area for solar to show the "density" of solar potential in Los Angeles. Total Rooftop Solar Potential is the sum of the potential for all parcels within the geographic boundary. The chart shows how the potential projects are distributed by size, while the table shows the 20 largest potential projects based on capacity in kilowatts.

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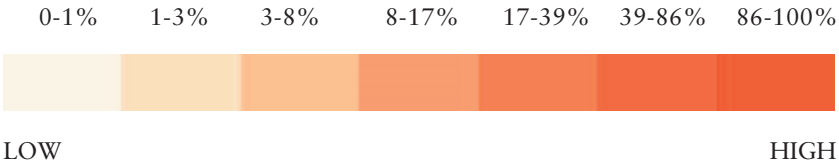
* *http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Geometrical_interval*

** *Assuming 100 square feet per kilowatt of solar capacity.*

APPENDIX

The color gradients in the legend of each map represent the solar density index. The parcels were categorized according to the ratio of square feet available for solar to the square feet of the land parcel. The colors suggest a continuous distribution of the density of parcels corresponding to these ratio values. Land use patterns, building profiles, development history, and numerous other factors influence the solar density of each area. Areas with commercial and industrial uses typically stand out as being denser, while single-family residential uses, high-rise commercial uses, and older developments with mature vegetation tend to be less dense according to this measure.



The maps in this atlas are intended to describe the physical distribution of the solar potential as a function of land use. These maps should not be used as a primary source of information for a single rooftop without validating the results against several other sources of information.

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“Sustaining

the environment

is the greatest

inheritance one can

leave to children,

and the most

enduring gift to

community and nation.”

– Meyer Luskin

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