



December 14, 2016

Planning and Sustainability Commissions

City of Palm Springs

**STUDY SESSION:**

**RESIDENTIAL SOLAR STRATEGY**

# PALM SPRINGS GREENHOUSE GAS (GHG) REDUCTION GOALS



- ✘ 2007 General Plan sets out as policy goals requiring the use of energy-efficient and green building practices and requiring the use of green building techniques in the design and construction of public buildings and facilities.
- ✘ 2013 Climate Action Plan suggests that we advance the voluntary green building program to a mandatory green building requirement for residential buildings, with technical support services.
- ✘ 2016 Sustainability Plan calls on the City to develop strategies to reduce community-wide contributions to greenhouse gas emissions to 1990 levels by 2020 and 80% below 1990 by 2050, encourage the building or retrofitting of one million square feet of green buildings, reduce the total energy use by all buildings built before 2012 by 10%, reduce energy use and carbon use from new homes and buildings, and supply 50% of all energy from renewable sources by 2030.





# WHY REQUIRE RESIDENTIAL SOLAR?

- ✘ New construction creates additional GHG emissions and accelerates climate change. Once emitted, these gases can remain in our atmosphere for hundreds of years.
- ✘ In Palm Springs, our last GHG audit (2010) revealed that 70% of our emissions come from the gas and electricity used to heat, light and cool our buildings.
- ✘ Increases supply of renewable energy to a Community Choice Aggregation program now being studied by Riverside County.
- ✘ New technology with solar-generating roof shingles expected to be available next year.
- ✘ Provides head start to Palm Springs architects and developers in planning for Zero Net Energy building standards expected starting in 2020.
- ✘ Reinforces Palm Springs branding as a Sustainable City that meets its stated goals.

# JURISDICTIONS WITH MANDATORY SOLAR ORDINANCES:



## JURISDICTIONS WITH MANDATORY SOLAR ORDINANCES\*

Jurisdiction	Requirement	Enacted	In Effect	Municipal Code	Ordinance	Cost Effectiveness Study
Culver City	1 kW solar per every 10,000 sq ft in MF and Commercial new construction or renovations over 10,000 sq ft	Mar-08	Spring 2008	<a href="http://library.amlegal.com/nxt/gateway.dll?f=jumpink&amp;jumpink_x=Advanced&amp;jumpink_vpc=first&amp;jumpink_xsl=querylink_xsl&amp;jumpink_sel=title;path:content-type:home-title:item-bookmark&amp;jumpink_d=california(culver)&amp;jumpink_q={field%20folio-destination-name:%2715.02.1000%27}&amp;jumpink_md=target-id=JD_15.02.1000">http://library.amlegal.com/nxt/gateway.dll?f=jumpink&amp;jumpink_x=Advanced&amp;jumpink_vpc=first&amp;jumpink_xsl=querylink_xsl&amp;jumpink_sel=title;path:content-type:home-title:item-bookmark&amp;jumpink_d=california(culver)&amp;jumpink_q={field%20folio-destination-name:%2715.02.1000%27}&amp;jumpink_md=target-id=JD_15.02.1000</a>	<a href="http://www.culvercity.org/Home/ShowDocument?id=440">http://www.culvercity.org/Home/ShowDocument?id=440</a>	<a href="http://www.energy.ca.gov/title24/2005standards/ordinances/2007-06-20_CULVER_CITY.PDF">http://www.energy.ca.gov/title24/2005standards/ordinances/2007-06-20_CULVER_CITY.PDF</a>
Lancaster	1 to 1.5 kW on lots over 7,000 sq ft. 1.5+ kW on lots over 100,000 sf ft. Builders can aggregate requirements of a subdivision and divide among some of the units. Builders can meet the requirement through the purchase of RECs.	Mar-13	Nov-13	<a href="https://www.municode.com/library/ca/lancaster/codes/code_of_ordinances?nodeId=TIT15BUCO_CH15.28ENCO_15.28.020IMSOENSY">https://www.municode.com/library/ca/lancaster/codes/code_of_ordinances?nodeId=TIT15BUCO_CH15.28ENCO_15.28.020IMSOENSY</a>	<a href="http://www.energy.ca.gov/title24/2013standards/ordinances/lancaster/Lancaster_Submittal_to_California_Energy_Commission.pdf">http://www.energy.ca.gov/title24/2013standards/ordinances/lancaster/Lancaster_Submittal_to_California_Energy_Commission.pdf</a>	<a href="http://www.energy.ca.gov/2013publications/CEC-400-2013-005/CEC-400-2013-005-D.pdf">http://www.energy.ca.gov/2013publications/CEC-400-2013-005/CEC-400-2013-005-D.pdf</a>
Sebastopol	2 watts per sq ft of insulated building space, or 75% offset of electric load. If solar is infeasible, other alternative energy sources can be used, or builders can pay a fee.	May-13	Jul-13	<a href="http://www.codepublishing.com/CA/Sebastopol/#1/Sebastopol15/Sebastopol1572.html">http://www.codepublishing.com/CA/Sebastopol/#1/Sebastopol15/Sebastopol1572.html</a>	<a href="http://www.publicceo.com/wp-content/uploads/2013/05/agenda_item_number_5_pv_ordinance.pdf">http://www.publicceo.com/wp-content/uploads/2013/05/agenda_item_number_5_pv_ordinance.pdf</a>	
San Francisco	Solar PV or solar thermal covering 15% of roof area on new buildings 10 stories or less. Installing a living roof is an alternative option.	Apr-16	Jan-17	<a href="http://library.amlegal.com/nxt/gateway.dll?f=templates&amp;fn=default.htm&amp;vid=amlegal:sanfrancisco_ca">http://library.amlegal.com/nxt/gateway.dll?f=templates&amp;fn=default.htm&amp;vid=amlegal:sanfrancisco_ca</a>	<a href="http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances16/o0071-16.pdf">http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances16/o0071-16.pdf</a>	
Santa Monica	1.5 watts per sq ft of total residential building. 2 watts per sq ft of building footprint for MF & Commercial.	Apr-16	May-16	<a href="https://www.smgov.net/Departments/OSE/Categories/Green_Building/Code_Requirements.aspx">https://www.smgov.net/Departments/OSE/Categories/Green_Building/Code_Requirements.aspx</a>	<a href="http://www.gcode.us/codes/santamonica/revisions/2513CCS.pdf">http://www.gcode.us/codes/santamonica/revisions/2513CCS.pdf</a>	<a href="http://docketpublic.energy.ca.gov/PublicDocuments/15-BSTD-03/TN207723_20160119T163414_Ron_Takiguchi_Comments_Santa_Monica_Cost_Effectiveness_Analysis.pdf">http://docketpublic.energy.ca.gov/PublicDocuments/15-BSTD-03/TN207723_20160119T163414_Ron_Takiguchi_Comments_Santa_Monica_Cost_Effectiveness_Analysis.pdf</a>
San Mateo	New SF - at least a 1 kW MF 3-16 units - at least a 2 kW MF 17+ units - at least a 3 kW system Non-residential <10,000 sq ft - at least a 3 kW Non-residential 10,000+ sq ft - at least a 5 kW	May-16	Jan-17	<a href="http://gcode.us/codes/sanmateo/view.php?topic=23-23_24-23_24_030">http://gcode.us/codes/sanmateo/view.php?topic=23-23_24-23_24_030</a>		

\*This spreadsheet was prepared by Rachel A. DiFranco, Sustainability Coordinator, City of Fremont, and is current as of Aug. 25, 2016





# CURRENT AND PLANNED SOLAR DEVELOPMENTS IN PALM SPRINGS

- ✘ Alta Verde (Andreas Hills Neighborhood)
- ✘ Tuscany Heights (Little Tuscany Neighborhood)
- ✘ Serena Park (former site of Palm Springs Country Club, 350 new single and multifamily homes)
- ✘ Miralon (San Rafael Neighborhood, 1,150 new single and multifamily homes)
- ✘ Sunia Investments (Racquet Club West Neighborhood, 24 new condominium units in 6 buildings)



# PROPOSED SOLAR ORDINANCE

## KEY PROVISIONS

- ✘ Requires the installation of a solar electric photovoltaic (PV) system with a nameplate wattage 2.0 times or greater than the square footage of the home (2.0 watts per square foot).
- ✘ Applicable to all new construction of single and multifamily residential dwellings.
- ✘ Also applicable to any addition to an existing single-family residential building that increases the square footage by 25% or greater, provided that the increase is at least 500 square feet, and all single-family residential remodels, alterations or renovations that are made involving demolition, remodel or renovation of more than 50% of the structure and that have a permit valuation of \$250,000 or more.
- ✘ At the time of submittal of a building permit application for any residential dwelling or retrofit project meeting the thresholds, an applicant must submit plans and an application for the mandatory solar photovoltaic system.



# COST/SAVINGS ANALYSIS

- ✘ For a 4 kW system (based on 2,000 square foot house), estimated additional cost to homeowner net of 30% federal tax credit is \$9,660 for new construction and \$10,500 for a retrofit.
- ✘ Monthly additional cost of \$49 (assuming 4.25% 30-year fixed mortgage interest rate) for new construction and \$91 for a retrofit (assuming 8.5% 20-year PACE financing).
- ✘ Estimated monthly energy cost offset of \$137 in based on system generating 6,000 kWh annually and SCE default tariff for solar customers under Net Energy Metering Successor Tariff (NEM-ST) effective July 1, 2017.
- ✘ Estimated monthly savings of \$88 for new construction and \$46 for a retrofit.
- ✘ Connections under NEM-ST grandfathered for 20 years.





# CURRENTLY AVAILABLE INCENTIVE PROGRAMS

- ✘ 30% Solar Investment Tax Credit through the end of 2019, then 26% in 2020 and 22% in 2021.
- ✘ New Solar Housing Program, incentive currently \$0.50/watt for market-rate housing projects.
- ✘ Single-Family Affordable Solar Housing rebate of \$3/watt for affordable housing projects.
- ✘ Property-assessed clean energy (PACE) loans. PACE financing is also available for energy efficiency and water conservation projects (such as desert landscaping and artificial turf), and the projects can be grouped together. Under certain conditions, both interest and principal payments may be deductible.
- ✘ A recent appraisal study of homes in the San Diego area confirmed recapture of the cost of installing a solar PV system upon resale.







# FOCUS QUESTIONS FOR STUDY SESSION

- ✘ Should city officials take a more active lead in the pursuit of solar energy? (Desert Sun, 7/18/75)
- ✘ Should multifamily homes be included in the solar mandate for new construction?
- ✘ Is 2.0 watts per square foot the right standard?
- ✘ Should solar be required for major retrofits?
- ✘ Are the retrofit thresholds appropriate?



# NEXT STEPS AND STRATEGY

- ✘ Green Building / Solar Subcommittee to review feedback from this study session and make recommendation to full Planning and Sustainability Commissions.
- ✘ Planning and Sustainability Commissions to vote on recommendation to City Council.
- ✘ If adopted by Council on first reading, ordinance would need to be submitted to California Energy Commission (CEC) for approval, along with supporting analysis on how City of Palm Springs has determined that the proposed local standard will save more energy than the current provisions in the California Energy Code and its determination that the local standards are cost-effective.
- ✘ Adoption on second reading would follow CEC approval.
- ✘ Objective is for ordinance to be in effect on or about July 1, 2017.

Solar impact on Mortgage

	<u>4 kW Solar Install Retrofit</u>	<u>4 kW Solar Install New Construction</u>
System Cost	\$15,000	\$12,000 (\$10,000 with NSHP Rebate)*
GC 15% mark up	\$0.00	\$1,800
Total	\$15,000	\$13,800
<u>Minus 30% Federal Tax Credit</u>	<u>(\$4,500)</u>	<u>(\$4,140)</u>
Net Cost to Home Owner	\$10,500	\$9,660
Monthly cost if added to mortgage (30 years @ 4.25%)	N/A	\$49.00 per month
Monthly cost with PACE financing (20 years @ 8.5%)	\$91.00 per month	N/A
Monthly cost of \$500,000 mortgage (30 years @ 4.25%)		\$2,460.00
Monthly cost of \$509,660		\$2,509.00

\* Developer may be eligible for further rebates of up to \$0.50 per watt (\$2,000.00 for 4kW), depending on New Solar Homes Partnership (NSHP) available funds and adjustment of subsidy amounts in 2017

Company ?



Ratings & reviews ?



EQUIPMENT

Panel manufacturer ?

LG ↗

Hanwha Q Cells ↗

Suniva, Inc. ↗

Trina Solar Energ... ↗

Trina Solar Energ... ↗

Hyundai ↗

Panel rating ?



FINANCING OPTION



Cash Purchase ?

Cash Purchase

Cash Purchase

Cash Purchase

Cash Purchase

Cash Purchase

Cash Purchase



Purchase with Loan ?

**LOAN**

**LOAN**

**LOAN**

**LOAN**

**LOAN**

**LOAN**

SOLAR COSTS & BENEFITS

Net system price ?

\$32,032

\$26,656

\$29,488

\$30,422

\$35,845

\$34,206

Price per Watt (\$/W) ?

\$3.25

\$3.20

\$2.95

\$2.99

\$3.79

\$3.34

Down payment ?

Monthly payment year 1 ?

\$309

\$225

\$360

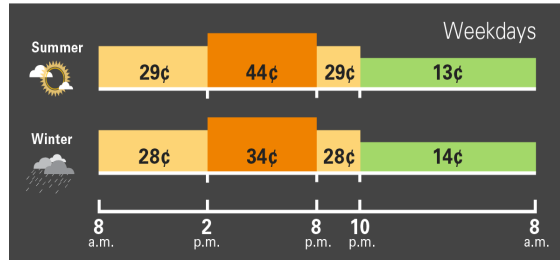
\$141

\$305

\$359

First year, first month electricity cost calculated by EnergySage...

### TOU-D-A Pricing and Time Periods



Monthly Baseline Credit: 10¢ per Baseline kWh | Daily Basic Charge: 3¢  
Minimum Daily Charge: 33¢

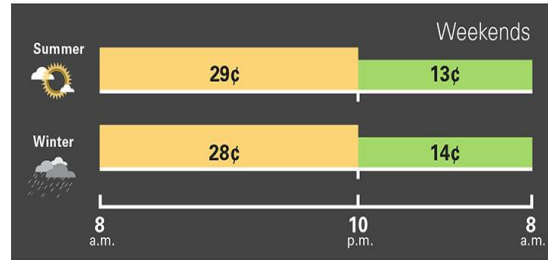
**Summer Rates:**  
June through September, 4 months

**Winter Rates:**  
October through May, 8 months

**Price/kWh:**

- Super Off-Peak
- Off-Peak
- On-Peak

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### Retrofit Install

### New Construction

### Net Monthly Financed Cost

SCE cost offset *	\$137.00	\$137.00
Monthly solar cost **	(\$91.00)	(\$49.00)
Monthly savings	\$46.00	\$88.00

\* SCE cost offset based on 6,000 kWh of annual production @ a blended pro forma rate of \$0.2733 per kWh. Pro forma rate is net of Nonbypassable Charges (NBCs) of \$0.0261 per kWh.  
6,000 x \$0.2733 = \$ 1,640 annual cost offset; \$1,640 / 12 = \$137 monthly cost offset.

\*\* Monthly solar cost based on 8.5% fixed interest rate for retrofit install and 4.25% for new construction.