



# ***The Sun Shines on Lexington***

## ***Our Rooftop Revolution***

March 7, 2014

# Agenda

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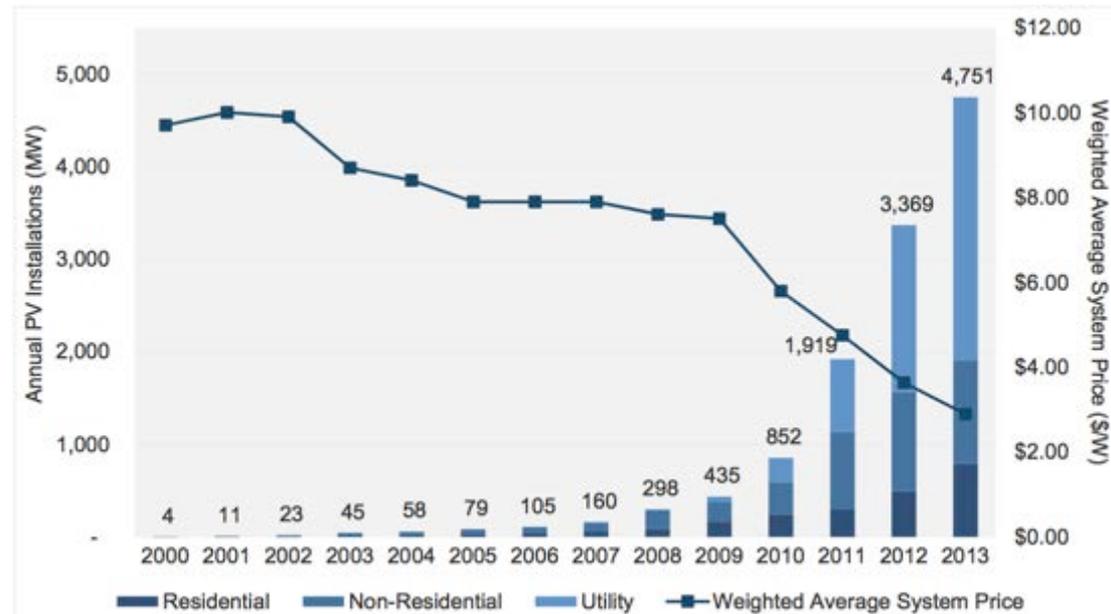
- Solar Industry Overview
- Town of Lexington Solar Potential
- Residential Solar Potential
  - 3 easy tests – Do you have a good house for solar?



# Solar Industry Overview

- Rapid growth
- Lower costs
- Higher efficiency
- Higher reliability
- Longer life
- Finance options

## Q4 2013: Largest Quarter Ever

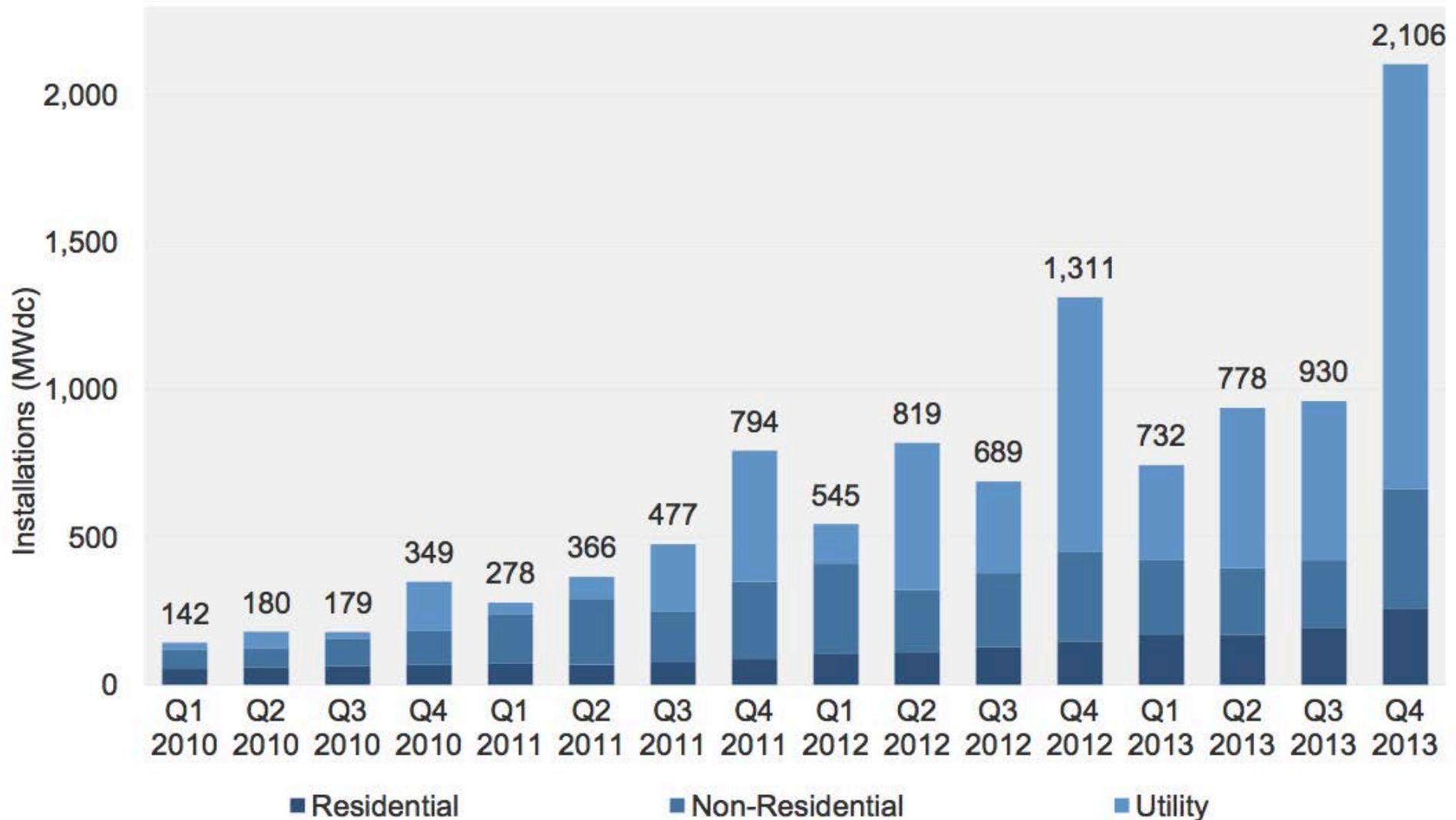


Source: SEIA US Solar Market Insight: 2013 Year in Review

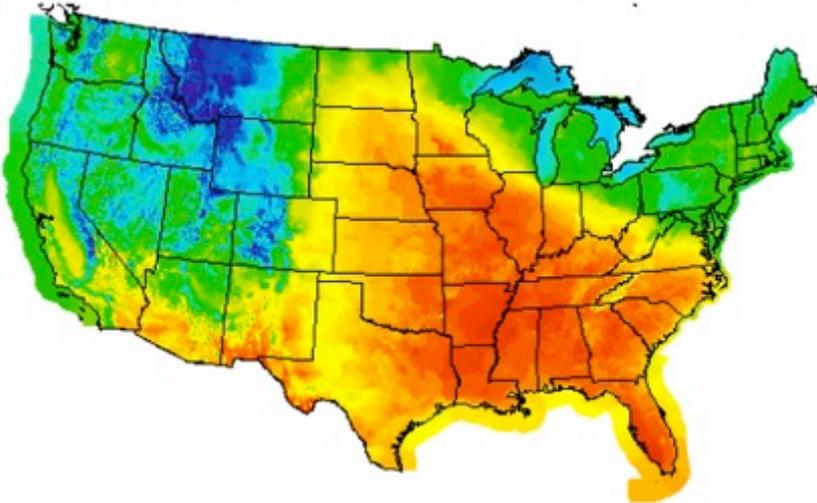
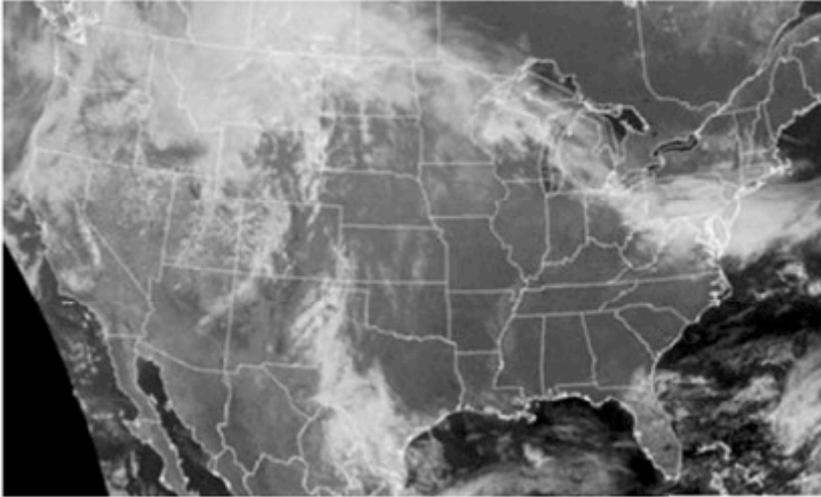
- 4.7 GW US Solar installations
  - More than double 2011's record pace



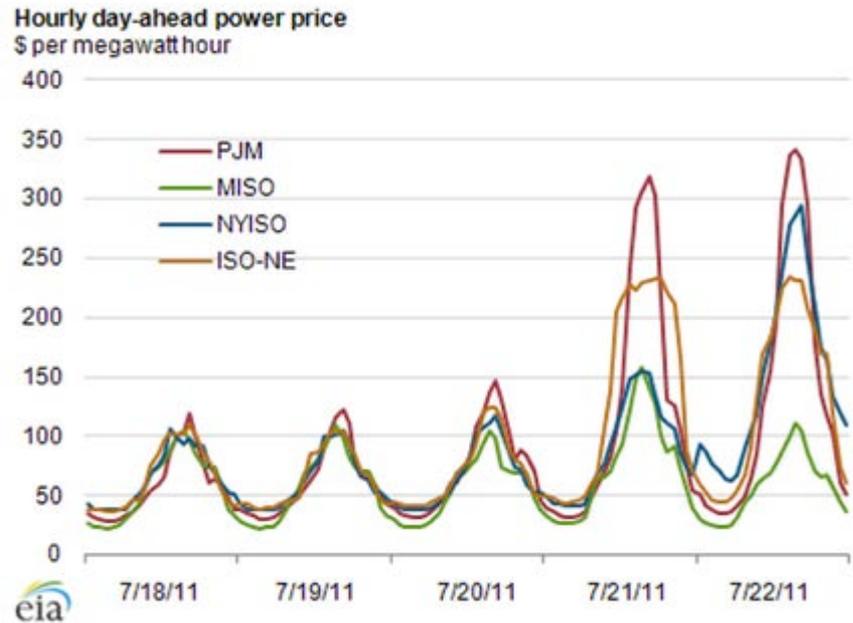
# Solar Industry Overview



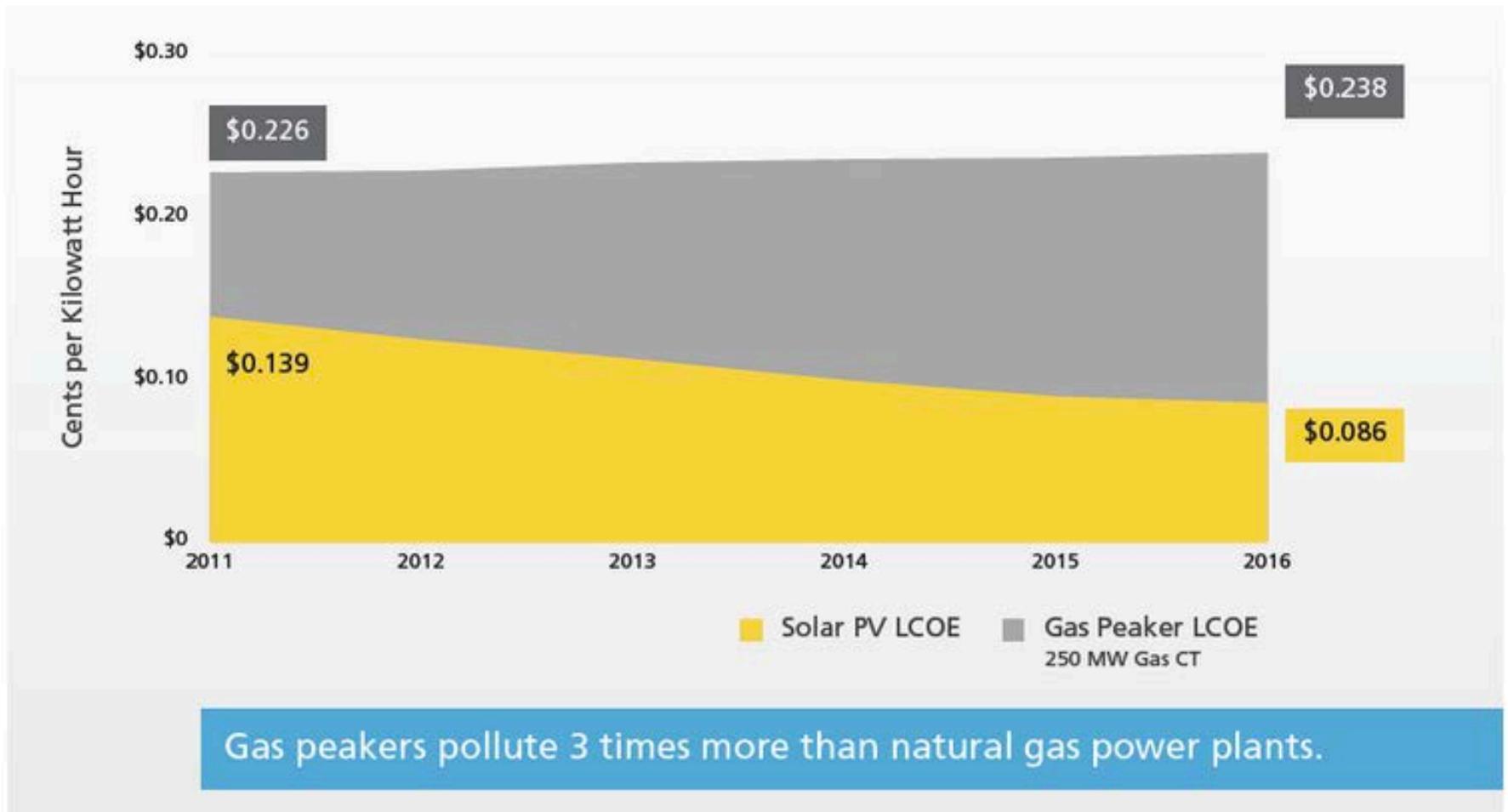
# Solar Power and Heat Waves



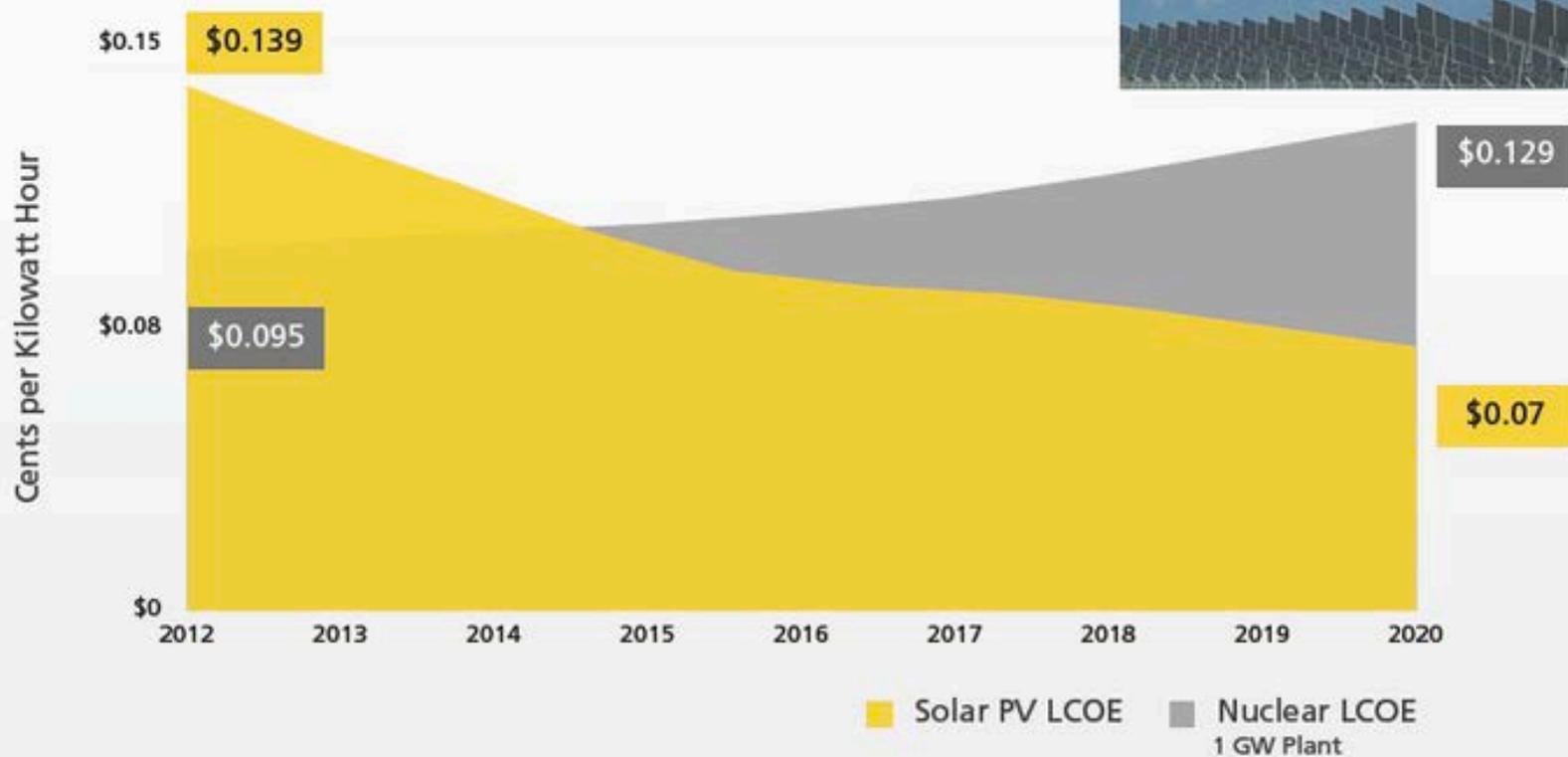
Solar power when it is needed most



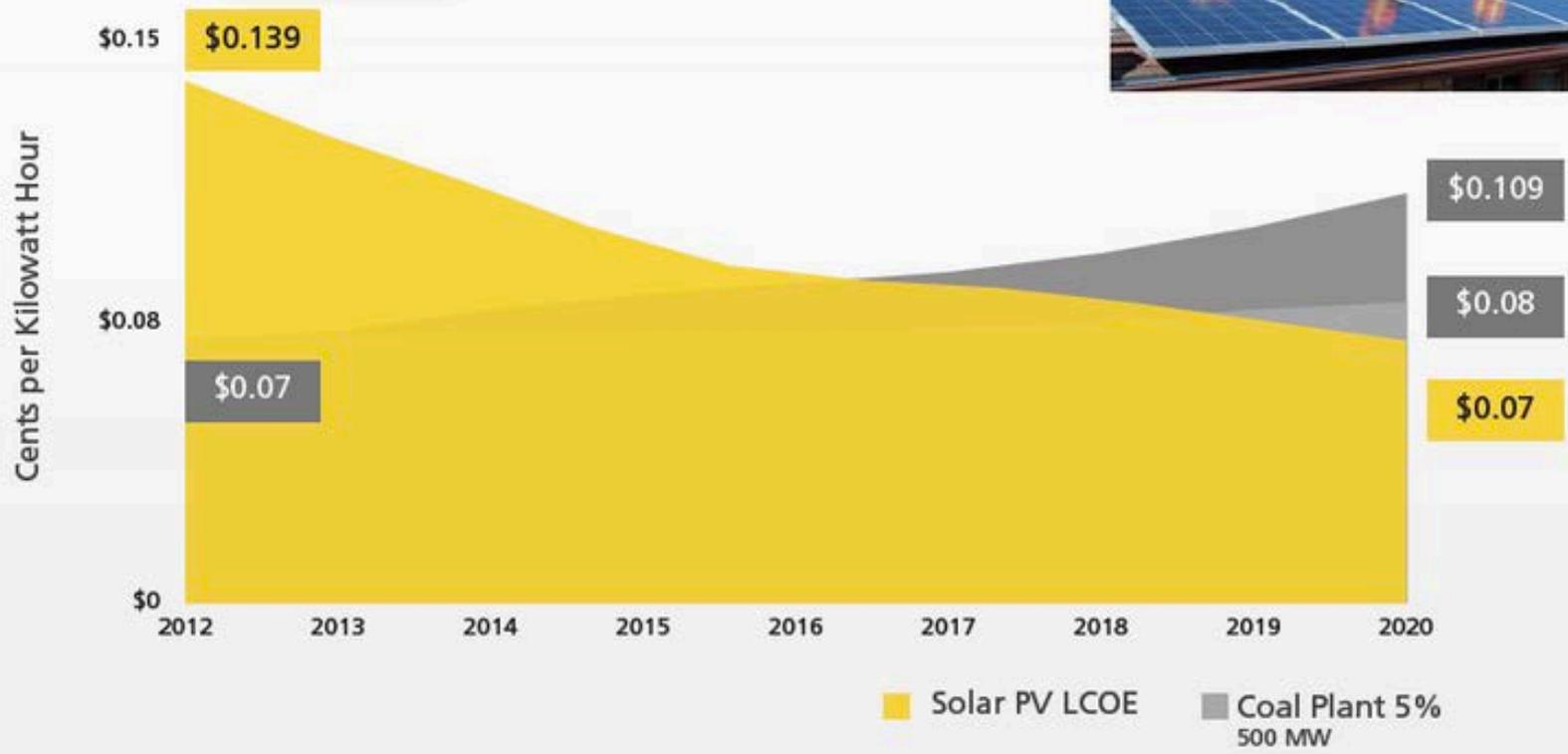
# Solar costs lower than Gas Peakers



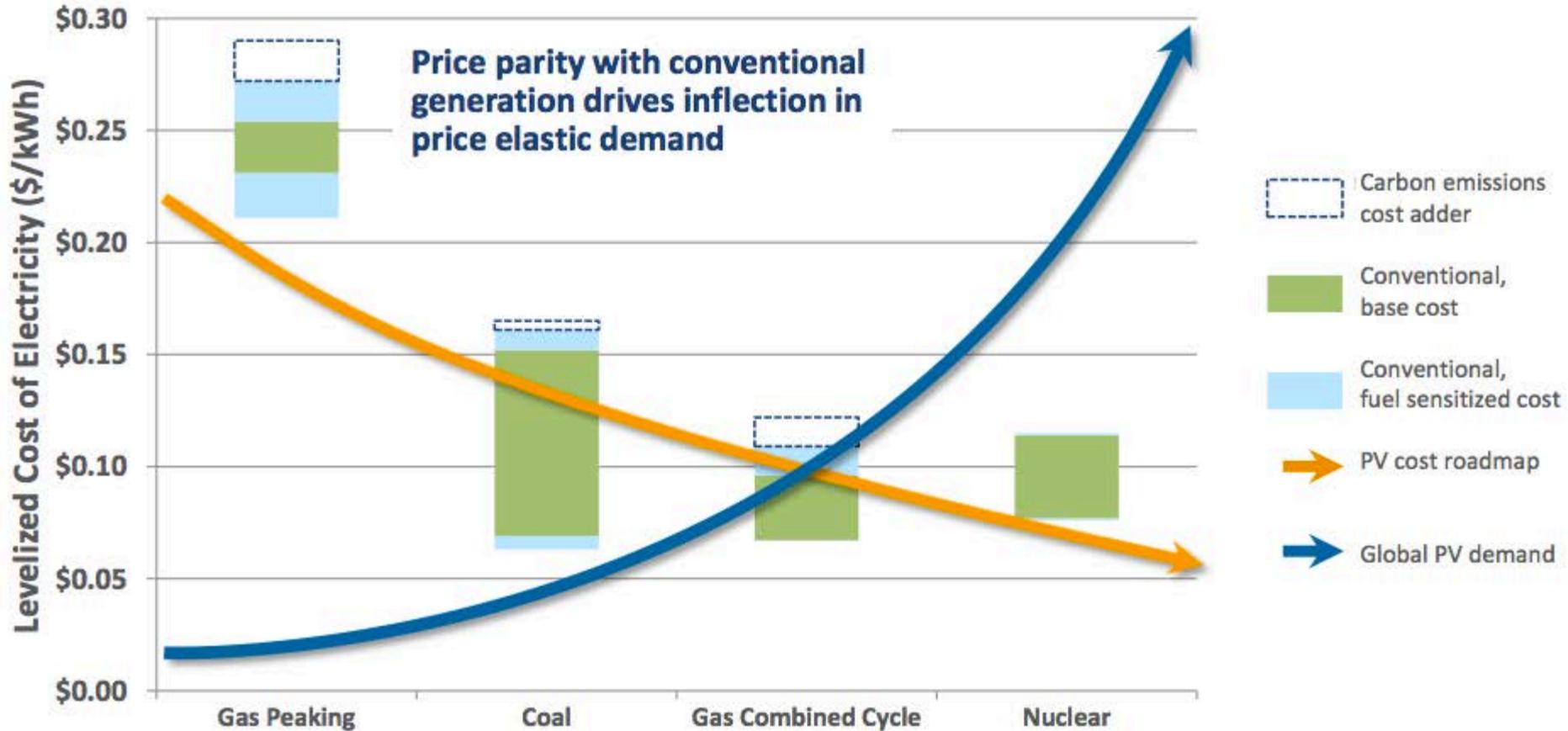
# Solar Costs and New Nuclear



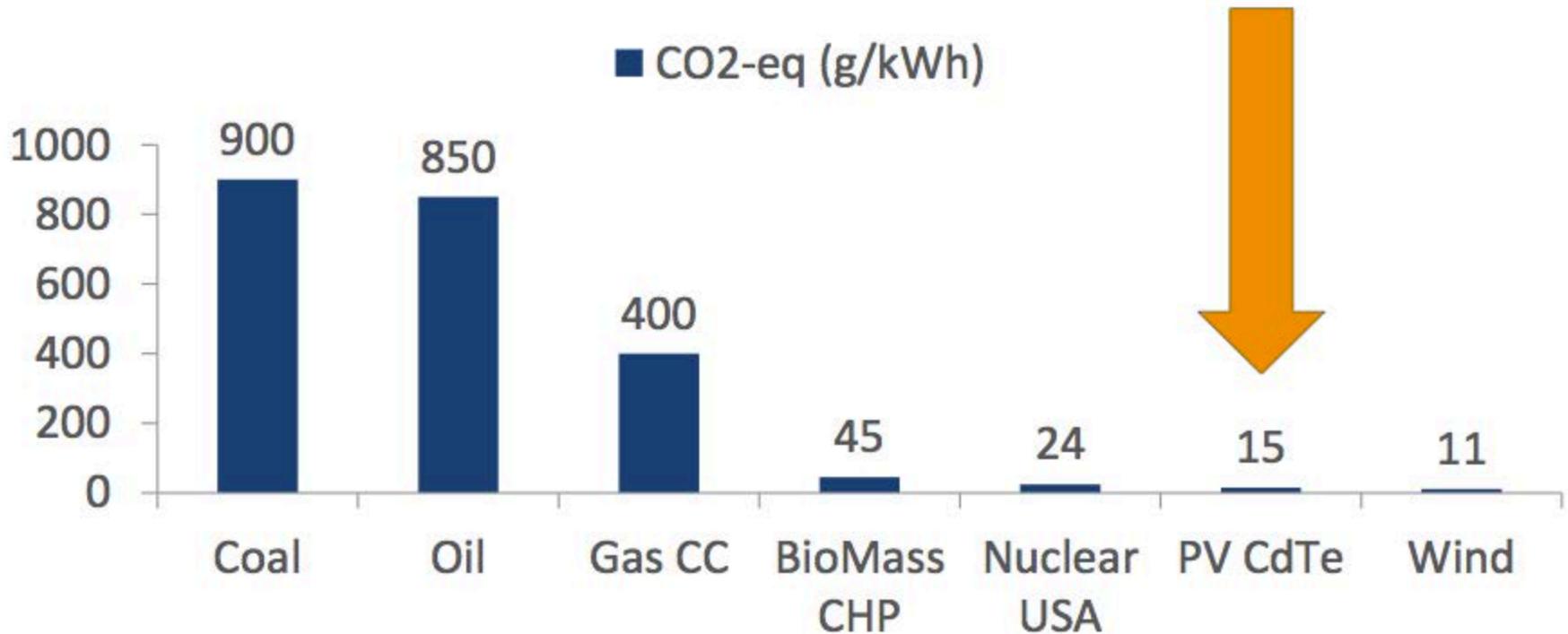
# Solar Costs vs. New Coal



# Solar Inflection Points

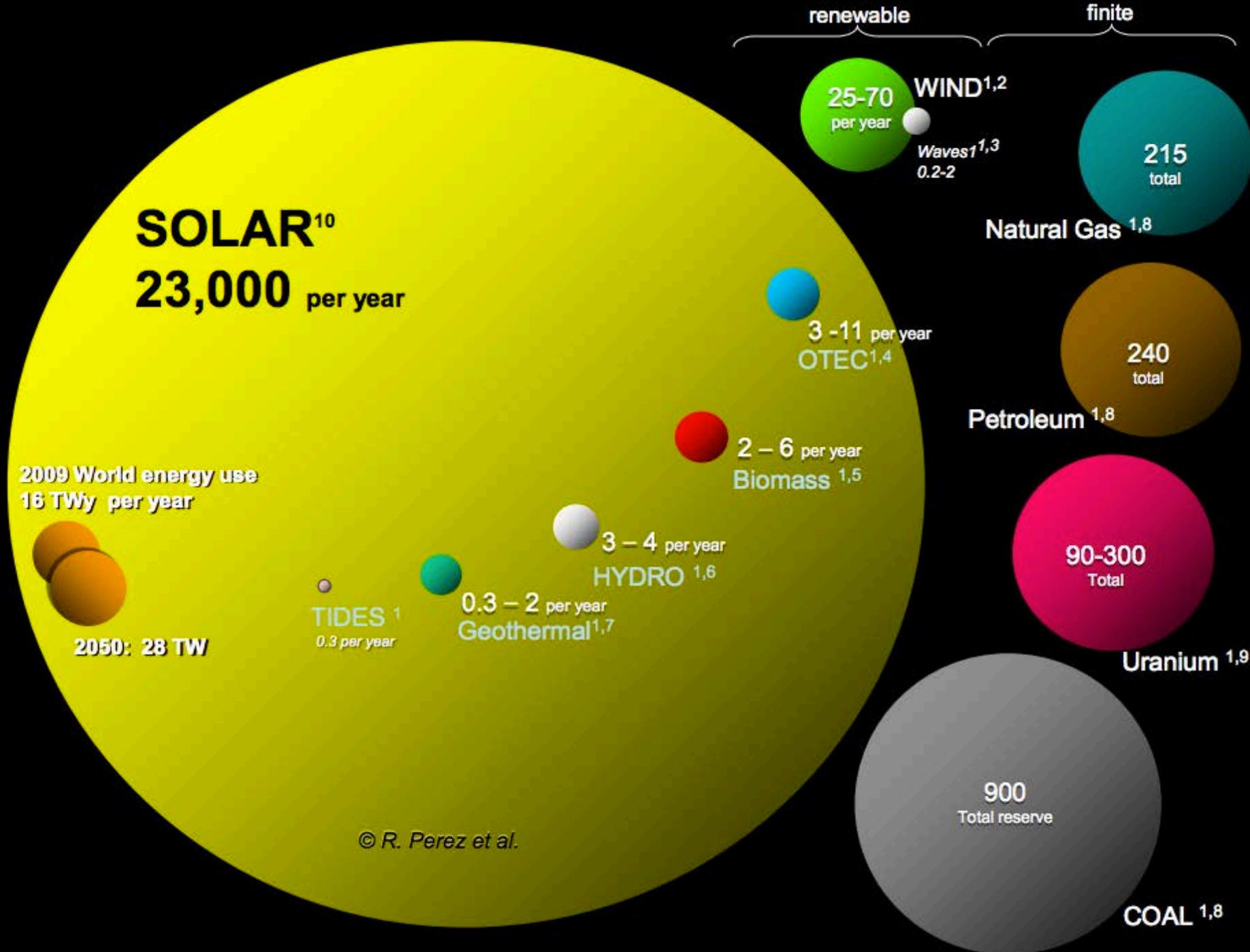


# Environmental Footprint

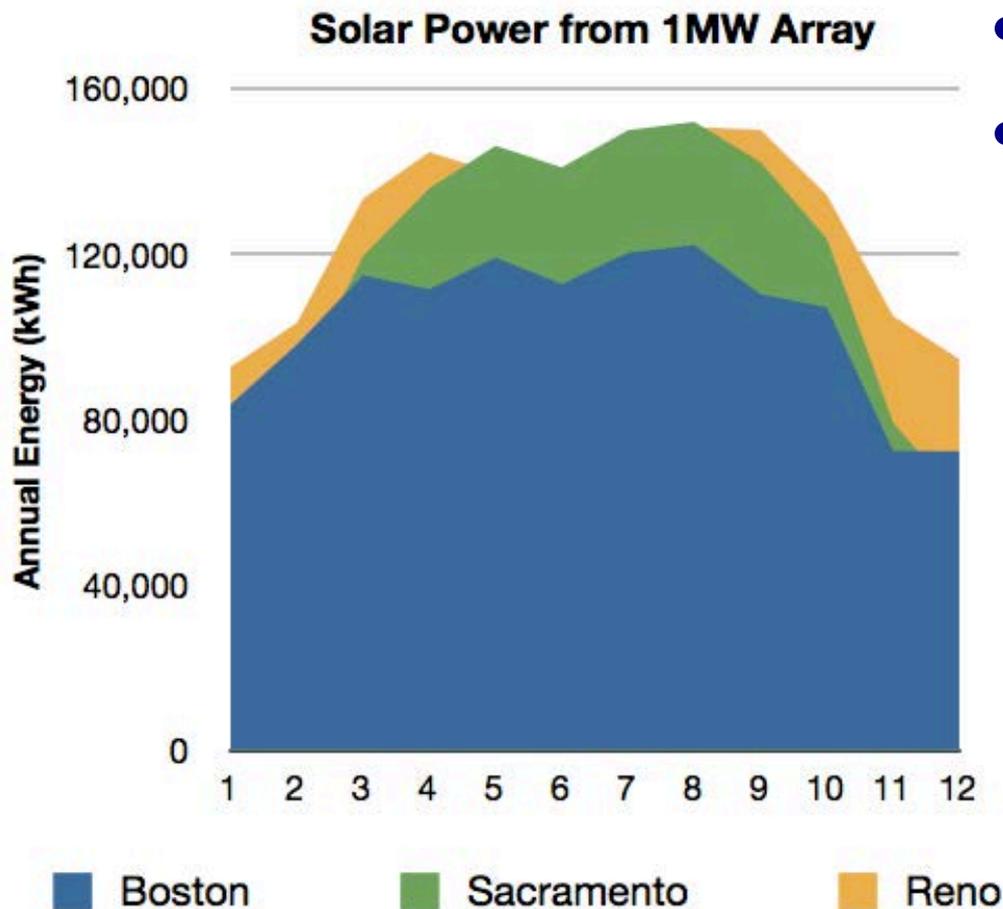


Source: ExternE project, 2003; Kim and Dale, 2005; Fthenakis and Kim, 2006; Fthenakis and Alsema, 2006; Fthenakis and Kim, in press. de Wild-Scholten & Schottler, 2009.





# Solar Energy Potential



- Location, Location...
- Lexington has excellent solar potential
  - 1.5x more than Germany
  - 11% less than Sacramento and
  - 19% less than Reno
  - 1,243 MWh / Year

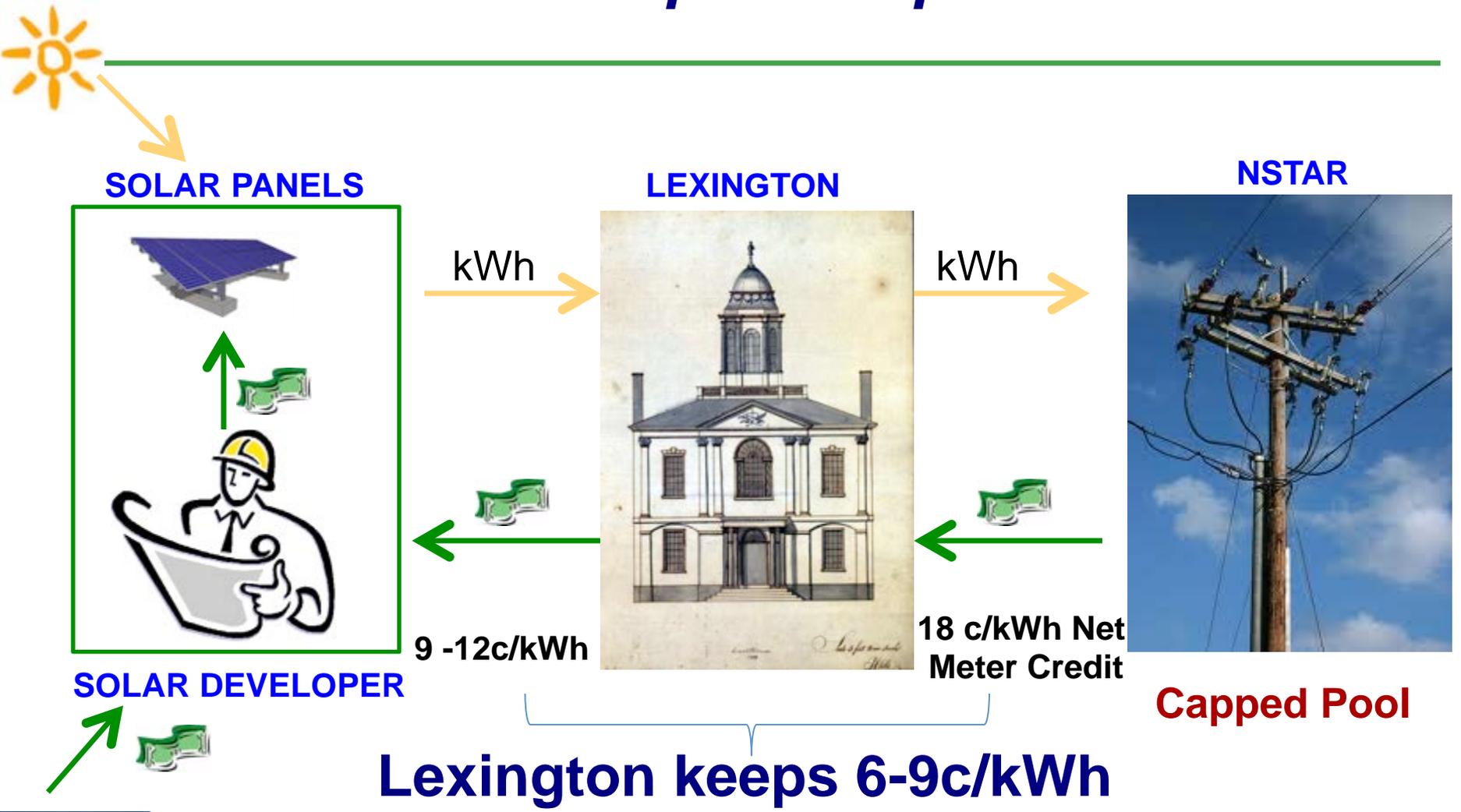


# *Excellent Town Solar Sites*

- Hartwell Avenue
- Hadley Building
- School Buildings



# Economics = Zero Capital for positive cash flow



**SREC II & Tax Incentives**



# Lexington Solar Potential

Facility Name	Estimated System Size (kW)	Solar Energy Production (kWh)
Lexington High School	792	916,243
Diamond Middle School	306	355,368
Bridge Elementary School	302	351,845
Bowman Elementary School	294	341,115
Clark Middle School	252	290,505
Public Services Building	246	286,587
Harrington Elementary School	193	225,992
Fiske Elementary School	193	224,723
Estabrook Elementary School	TBD	TBD
Cary Library	66	75,493
<b>Rooftop Total</b>	<b>2,642</b>	<b>3,067,871</b>
Hartwell Ave Landfill	3,000	3,520,932
<b>Grand Total</b>	<b>5,642</b>	<b>6,588,803</b>



# *Hadley Building – Solar Potential*

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- Hadley is an outstanding solar site
  - 164° & 195° solar azimuth
  - Large white roof
  - 246 kW array
  - 286,000 kWh / yr
- Electricity demand
  - 403,000 kWh / yr
- Lowers CO<sub>2</sub> emissions over 250,000 lbs. / year



# Hartwell Avenue Site

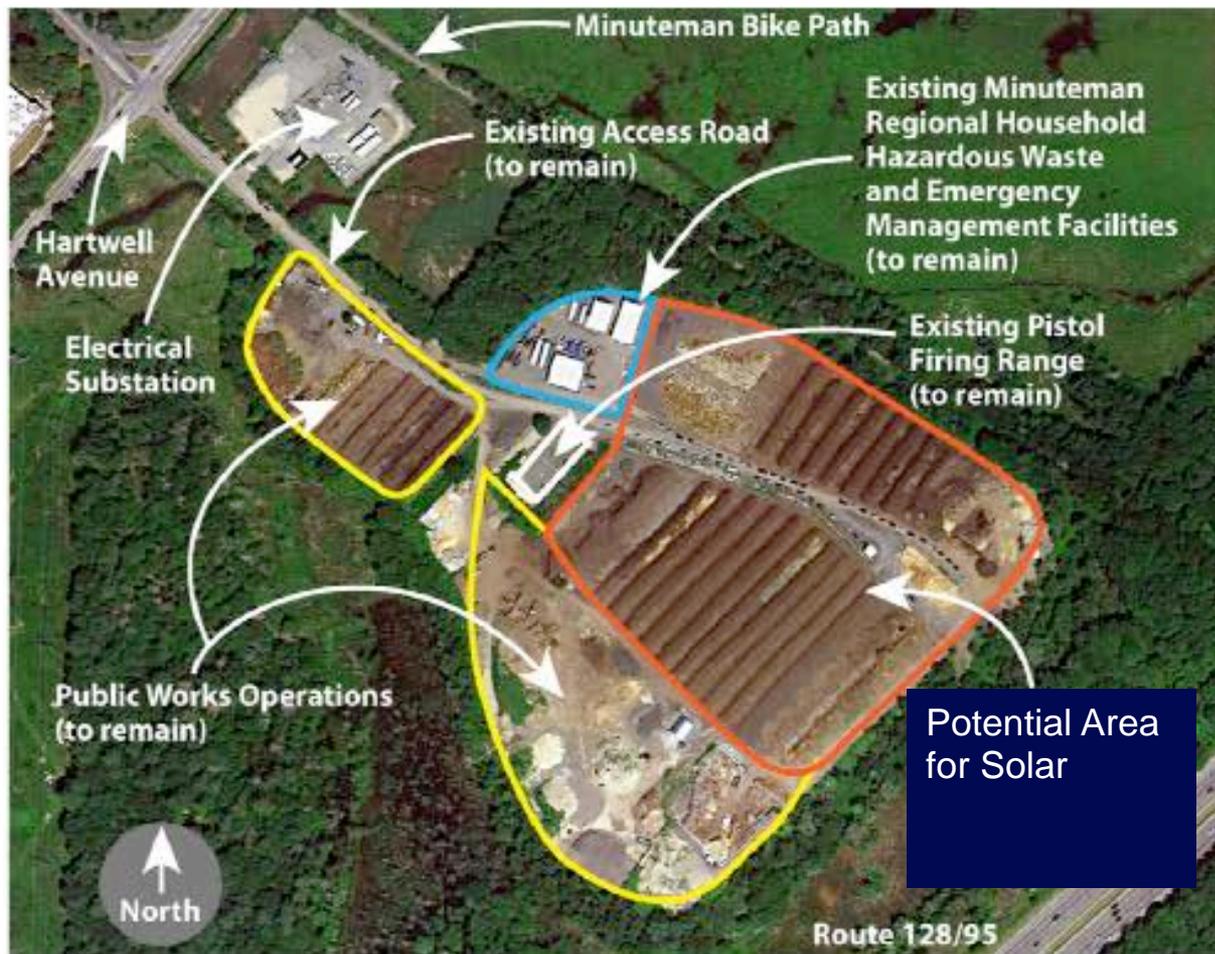
Excellent Solar Site

12 Solar Acres  
NSTAR  
Substation

3 MW Installation  
3.5M kWh / Year

Positive Cash Flow\*  
\$4,000,000 -  
\$6,000,000

\*20 Years





# Environmental Benefits

137,591,350 kWh of clean electricity over next 20 years



Your town's PV system will  
save a total of

**5,962,867 lbs.**  
of CO<sub>2</sub> emissions each year

This is the equivalent of  
eliminating

**8,068,490 miles**  
of driving each year

This is the equivalent of  
preserving

**12,756 acres**  
of eastern mountain forests.

Saves **\$3,482,592** in external costs of CO<sub>2</sub> emissions over 20 years

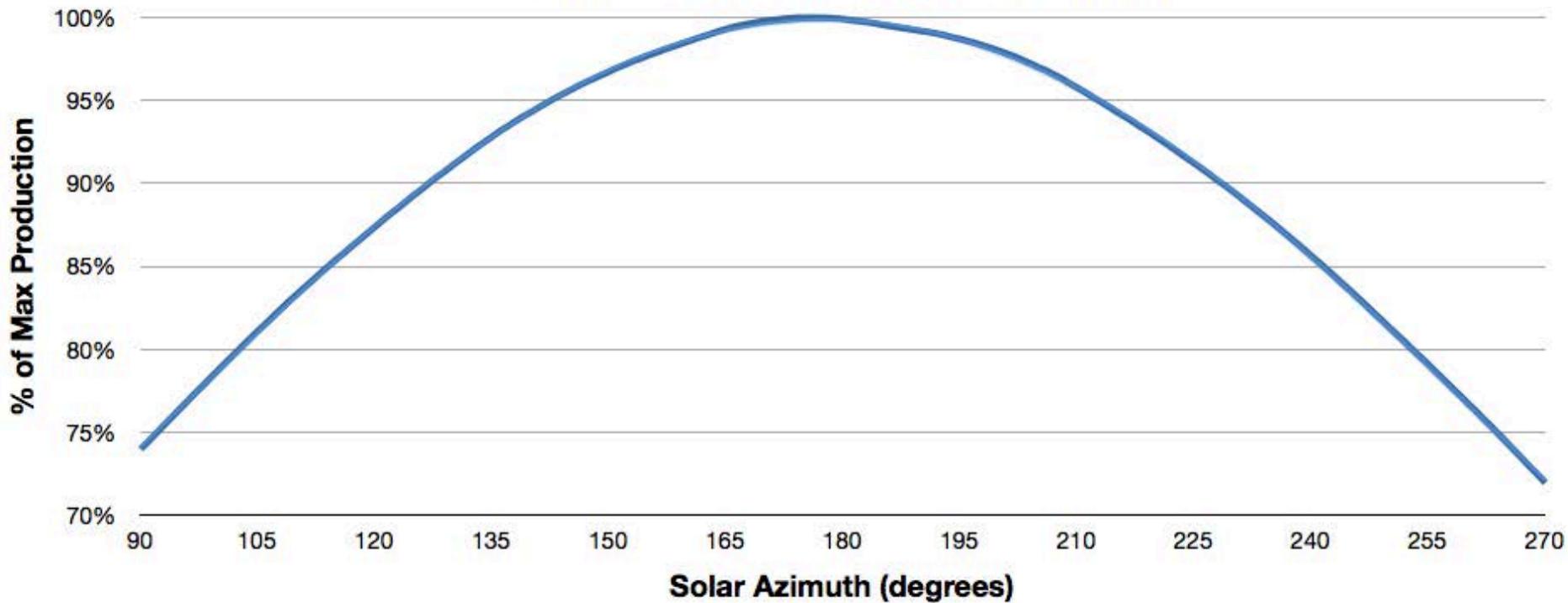


# Solar Azimuth

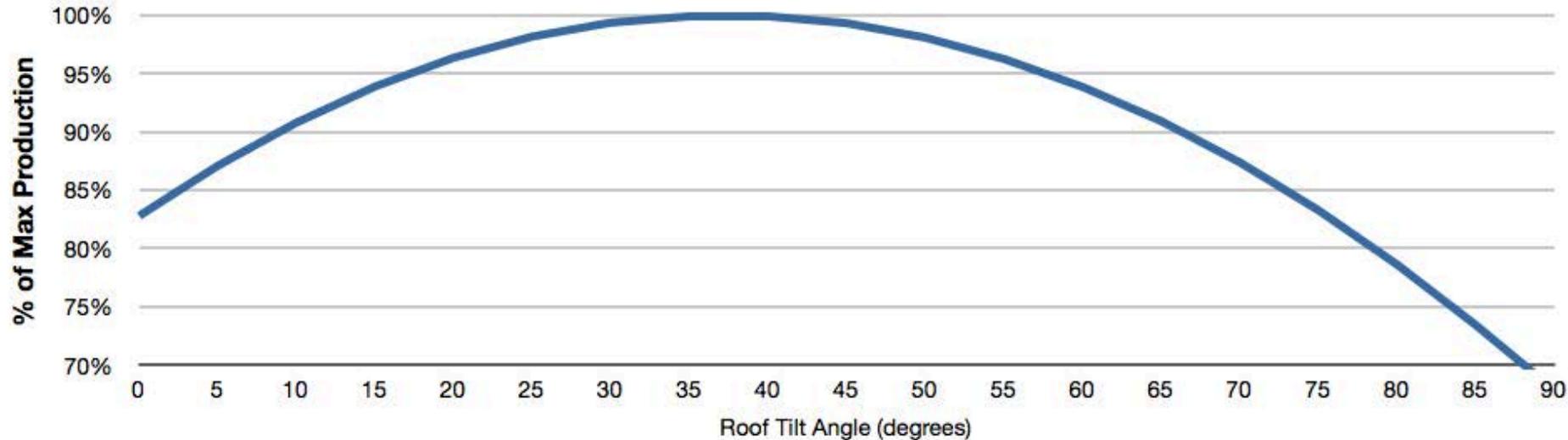
Solmetric Rooftop Azimuth Tool <http://tools.solmetric.com/Tools/roofazimuthtool>



## Solar Production vs Solar Azimuth



## Solar Production vs. Roof Tilt



# PVWatts® Calculator



## Customize Your System To Your Roof

On the map below, click the corners of the desired system. Note that the roof tilt and azimuth cannot be automatically determined from the aerial imagery, and consequently the estimated system size may not reflect what is actually possible.

Module Efficiency:

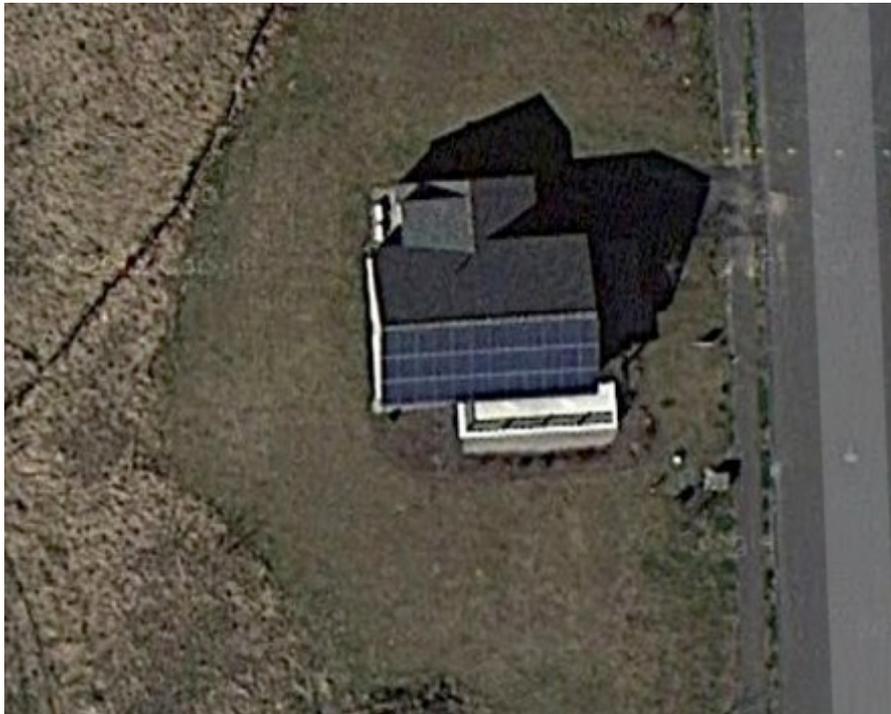
**System Size: 9.5 kWdc (63 m<sup>2</sup>)**



# Shading

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Google Maps

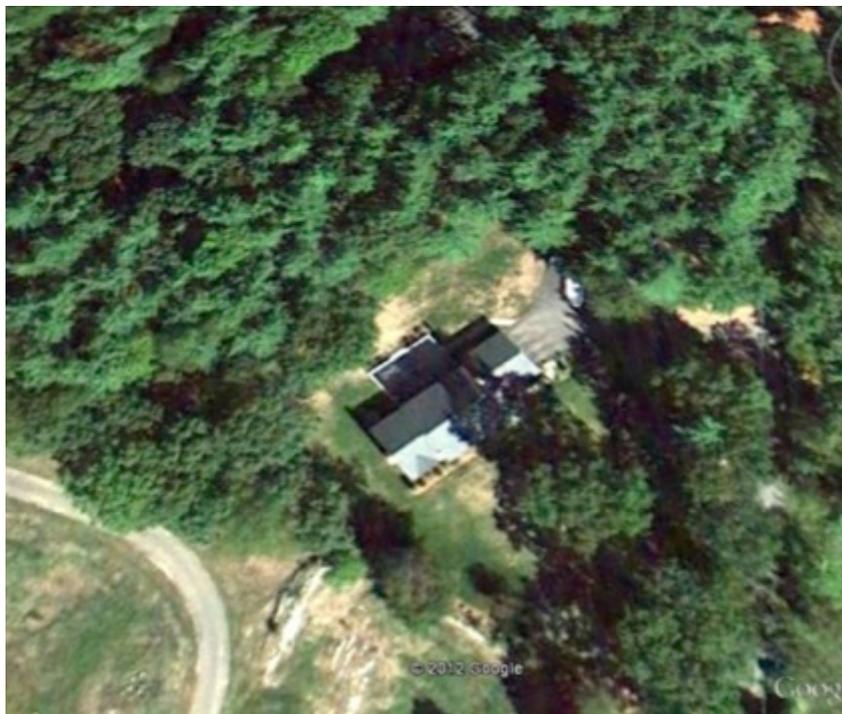


Solar Pathfinder



# Shading

Google Maps



Solar Pathfinder





# ***Sustainable Lexington***

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*We develop programs to  
enhance Lexington's sustainability and resilience*

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<http://sustainablelexington.org>



## Solar Production vs. Solar Azimuth & Tilt

