

# Solar Energy: How to Produce Your Own Electricity

## Presentation Overview

- Introduction
- Advantages of Solar
- How solar works
- Financial Incentives
- How do you get solar?



# Who is Sunlight Solar?



**Sunlight Solar Energy, Inc.**  
**Newton, MA**

**617-332-1870**  
**[www.sunlightsolar.com](http://www.sunlightsolar.com)**



- Over 20 years solar experience
- Over 400 installations in New England
- Licensed and insured home improvement contractor
- 10-Year Installation Warranty

## ***Our Mission:***

*Sunlight Solar Energy is dedicated to educating our customers and empowering them to make intelligent buying decisions.*

# Why Solar – Environmental Reasons



- Reduce your impact on the environment
  - Control your carbon offset
  - Increase your community's awareness of energy independence
- Over 30 years, the benefits of a 5kW system are equivalent to:
  - Planting 30 acres of trees **OR** not driving 237,000 miles!
  - Removing 190,000 lbs CO<sub>2</sub> (greenhouse gas) from the atmosphere!





# Where does your energy come from?

According to an NSTAR Electric Energy Label, which outlines where a customer's energy mix is coming from, the top three energy sources - Coal, Natural Gas, and Nuclear – all make up more than 82% of a Massachusetts energy bill.



**42% Natural Gas**



**30% Nuclear**



**10% Coal**

# Why Solar- Economic Reasons

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## 1) Take Control of Your Electric costs:

*MA is amongst the highest electricity rates in the nation!*

- 1) Reduce or eliminate your electric bills by \$700 to \$1,200 per year.
- 2) Protect yourself from rising utility rates.

Design life of solar panels is 40-50 years

## 2) Adds Value to Your Home:

Based on a study funded by the US Department of Housing and Urban Development, along with the Environmental Protection Agency -

***Solar can add \$20,000 in home value for every \$1,000 of yearly energy cost savings.***

**Will not increase property tax**

***Your solar system will generate \$1,100 to \$1,800 of additional annual income through the Renewable Energy Credit Program.***



# Efficiency First

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## ■ Power Stripping

- Phantom Loads= 10-15% of your energy bill.  
Power strips in each room of your home. Turn off when leaving.  
Important rooms – kitchen, home office or entertainment room.

## ■ Passive Solar Advantage

- Open blinds during the day to let in sunlight during colder months help heat your home. Keep blinds closed during warmer months to reduce your AC use

## ■ Get a free energy audit – [Masssave.com](http://Masssave.com)

- Switch light bulbs, seal up your attic, blow test door. Learn how your home might be losing energy. **866-527-7283**

## ■ Install a Solar Dryer-

- Use a cloth line to dry clothing and reduce your dryer use

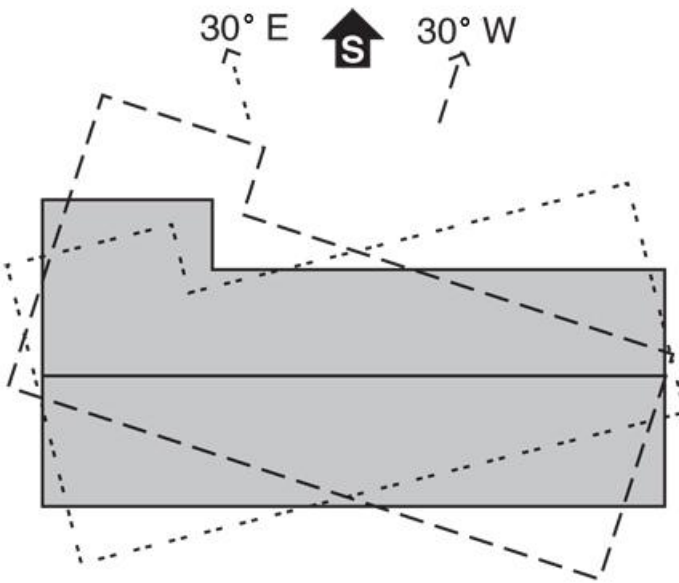
## ■ Solar Thermal Hot Water

- Offset demand on gas, oil, or electric





# What Makes a Site Good for Solar?



- **Orientation**

True South is ideal

- **Pitch**

Ideal pitch is 35-40 degrees

- **Shade**

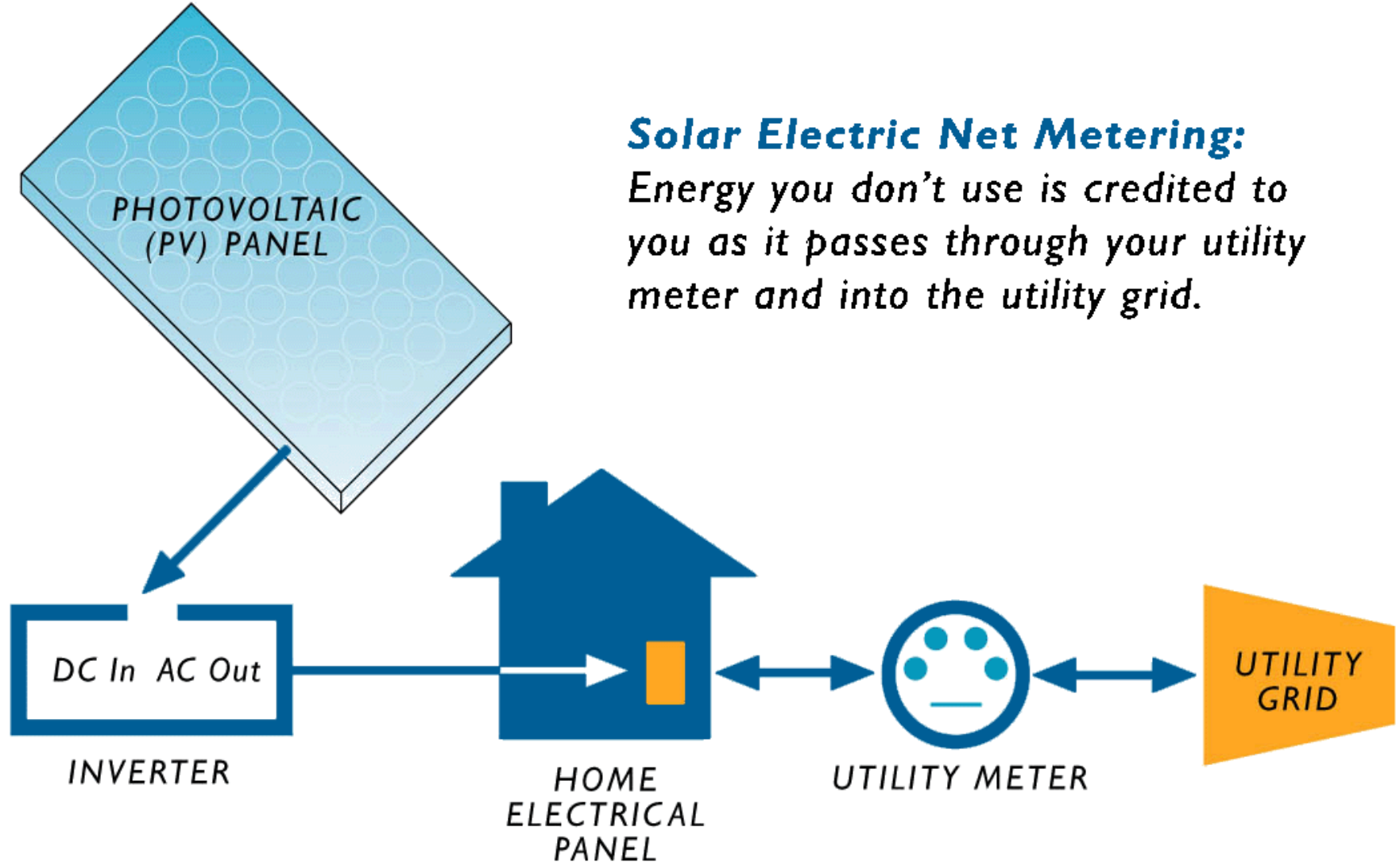
Shade will *significantly* reduce output



# Grid-Tied Solar PV and Net Metering

## **Solar Electric Net Metering:**

*Energy you don't use is credited to you as it passes through your utility meter and into the utility grid.*





# PV System Components: Panels





# PV Components: Racking



Roof Mounted



Ground Mounted



# PV Components: Inverters



# Federal and State Incentives

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## ■ Commonwealth Solar Rebate

- \$.75/watt Base Incentive
- \$.10/watt MA Made Product
- \$.85/watt Home Value (\$350,000) or Income (\$95,420)

Total= \$1.70/watt for first 5,000 watt, capped at **\$8,500**

## ■ Tax Credits

- Federal: 30% of net cost, no cap
- State: 15% of net cost, \$1,000 cap
- Sales and Property Tax Exempt in MA

## ■ Solar Renewable Energy Credits (SRECs)

Minimum \$285 per mWh (=1,000 kWh)





# What is an SREC?

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- **State Renewable Energy Portfolio Standard (RPS)**
  - 15% of Electricity From Class I Renewable by 2020
- **Solar Carve Out**
  - 400 MW Must Be Solar (about 2 million solar panels)
  - 2011 Compliance Obligation is 69 MW
- **Electric Suppliers Must Buy SRECs to Comply**
  - 1 SREC = 1,000 kWh or 1 mWh

# What is an SREC?

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- **Sold to electric suppliers via broker (SRECTrade)**
  - Floor: Clearinghouse Auction Price Fixed at **\$285**
  - Ceiling: 2011 Alternative Compliance Payment **\$550**
- **Opt-In Term**
  - Currently 10 years for guaranteed floor price
- **Payment and Recording**
  - Data monitoring system records and reports system production
  - System owner is paid quarterly by SRECTrade

# Case Study: 3.2 kW Wareham, MA

Robinson, 14 Sunpower 230 watt panels



## 3.2 kW System Incentives

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■ System: 14 panel each producing 230 watts = 3.2 kW	
■ Total System Value:	\$26,086
■ Massachusetts rebate	<u>- \$6,762</u>
■ “Out-of-Pocket”	\$19,324
■ State and Fed tax credits	<u>- \$6,797</u>
■ Final Investment	<b>\$12,527</b>
■ Annual savings on bill	\$779
■ Annual S-REC income (minimum)	\$1,109
■ Simple Payback	6 Years



# Case Study 6 kW Maynard, MA

King, (27) Sunpower 225 watt panels

Home use  
9,135 kWh

Solar Contribution  
7,473 kWh (82%)



# 6 kW System Incentives

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■ System: 27 225 watt panels = 6.075 kW	
■ Total System Value:	\$42,525
■ Massachusetts rebate	<u>- \$8,500</u>
■ “Out-of-Pocket”	\$34,025
■ State and Fed tax credits	<u>- \$11,207</u>
■ Final Investment	<b>\$22,818</b>
■ Annual savings on bill	\$1,495
■ Annual S-REC income (minimum)	\$2,109
■ System Payback	6 Years



# Low Use, City Home

Mercer Hennen, (10) Sunpower 210 watt panels, 2.1 kW system





# Aesthetically Pleasing Array

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Yarmoff, (48) Sunpower 205 watt panels, 9.8 kW system





# Maynard, MA – Evergreen Array

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Kucich, (14) Evergreen 210 watt panels, 2.94 kW system





# Ground Mount

Romer, (24) Sunpower 210 watt panels, 5.04kW system



# Pole Mount & Dual Axis Tracker

Ladd, (24) Sunpower 225 watt panels, 5.4 kW system

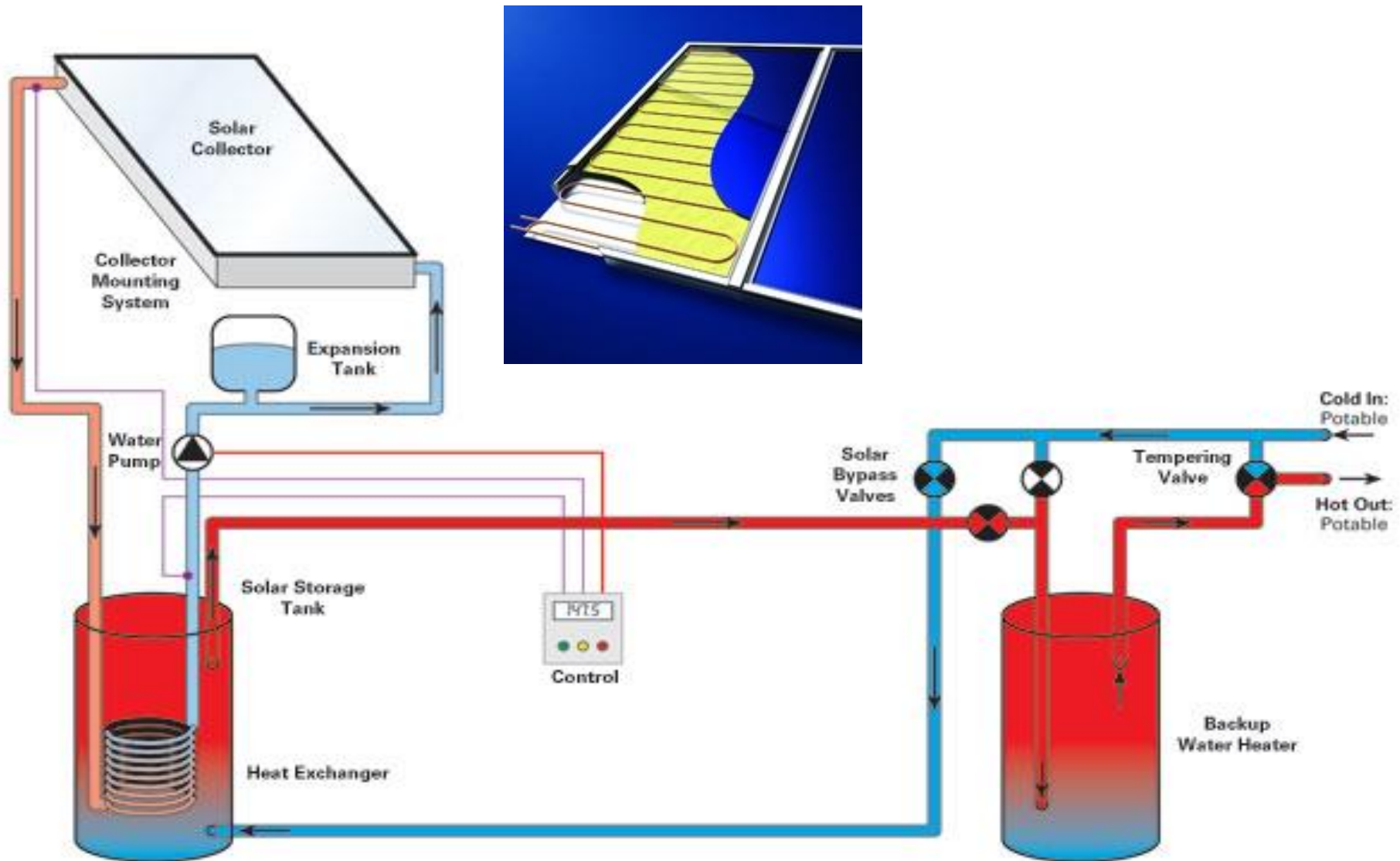








# Solar Hot Water









# Solar Hot Water Components





# Solar Hot Water and PV

Knudson, (2) Schuco Hot Water Collectors

Overall Investment  
\$10,000

MassCEC Rebate  
\$1,000

State Tax Credit:  
\$1,000

Federal Tax Credits:  
\$2,700

Total Investment  
After incentives  
**\$5,300**



# How do I find out about solar for my home?



1. Sign up for a free site evaluation today.
2. Schedule your home energy audit  
[www.masssave.com](http://www.masssave.com)
3. Receive a custom proposal that meets your energy needs.
4. Sunlight Solar will apply for you to reserve your Commonwealth Solar Rebate.



# Q & A



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