



# Renewable Energy Training – City of Boston

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Massachusetts Renewable Energy Trust



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TECHNOLOGY  
COLLABORATIVE

RENEWABLE ENERGY TRUST

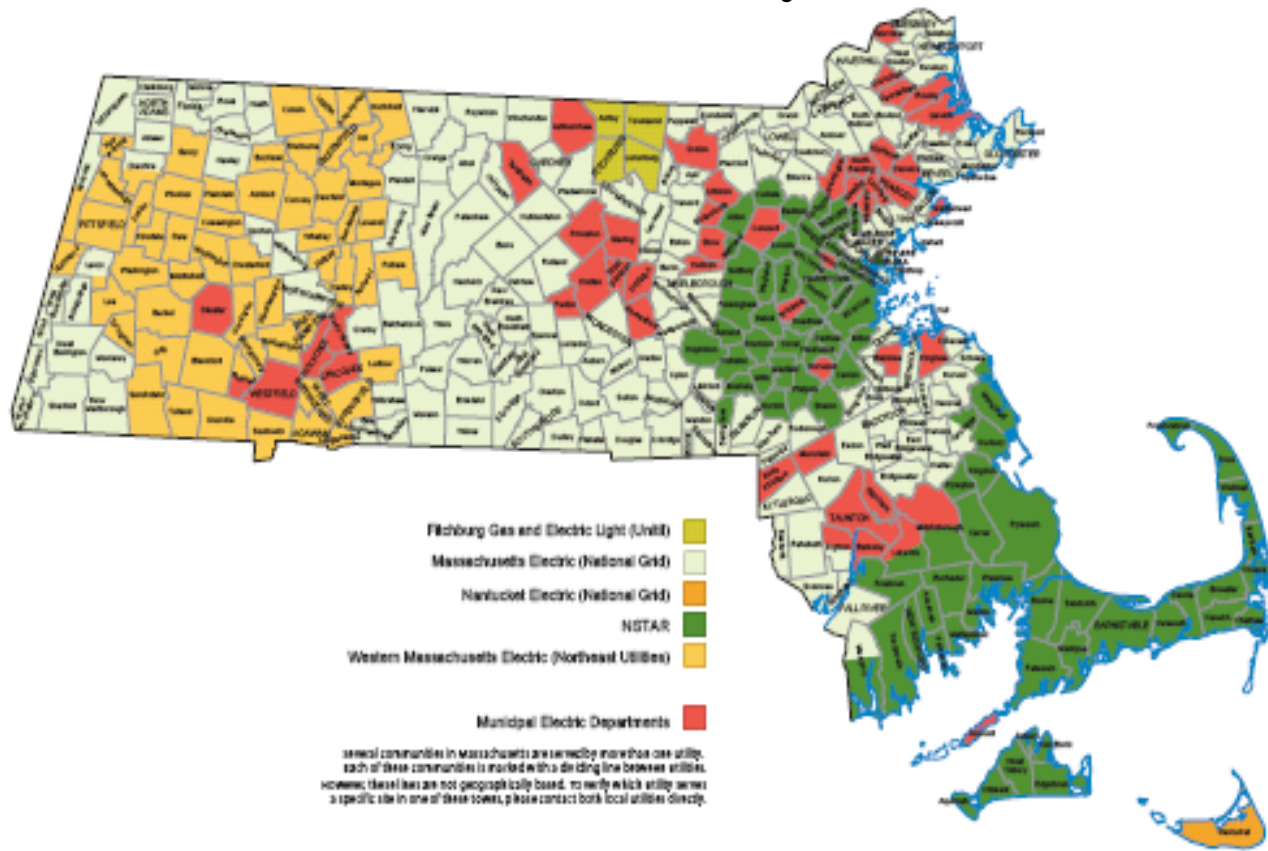
# MTC AND THE TRUST

- Renewable Energy Trust was established in 1998 to:
  - increase the supply of & demand for electricity generated from clean sources, and
  - promote the development of a Massachusetts renewable technology industry cluster.
- Massachusetts Technology Collaborative (MTC) was selected to administer the Trust.
- MTC has supported over 700 projects, companies, and related activities with over \$200 million awarded.
- **Over 500 PV projects installed = 3.0 MW**
- Plus wind, small hydro, fuel cells, biomass, landfill gas



# AREAS ELIGIBLE FOR FUNDING

- Source of funds is a surcharge  \$25 million/yr
- Only customers in investor owned utility service territories:



# ELIGIBLE RENEWABLE TECHNOLOGIES

- Established in enabling legislation
- Green Buildings initiatives support
- commercially available technologies:

- Solar PV
- Wind
- Biomass
- Fuel Cells
- Hydro



- **Must generate electricity**



# Renewable Energy for Affordable Housing

- **Introduction**
- Background
- Requirements
- Getting Started
- The Process
- Additional Information
- Questions

# Green Affordable Housing: Transforming the Marketplace

- **Initiative Purpose:** Catalyze affordable housing financing, development, and builder communities to include more green design and renewable energy in future developments.
- **Success:** Ensure that affordable housing is built greener and healthier in the future; renewable energy is a tool used by trades to build higher performing buildings
- **New Partners:** Combine high-performance design, renewable energy technologies, and in some cases, smarter financing, to build healthier, affordable, energy-efficient homes for Massachusetts residents.

# Partnership Funding Summary

<b>Partner</b>	<b>Partnership Amount</b>
<b>Boston Community Capital</b>	\$5,000,000
<b>Cape Light Compact</b>	\$1,500,000
<b>City of Boston</b>	\$2,000,000
<b>HAP, Inc.</b>	\$2,000,000
<b>Joint Management Committee</b>	\$1,500,000
<b>MA Department of Housing &amp; Community Development</b>	\$1,500,000
<b>MassHousing Finance Agency</b>	\$8,500,000
<b>WinnDevelopment</b>	\$2,500,000



# Partnership Common Elements

- Already in the Affordable Housing arena
- Grants or loans primarily for Renewable Energy, but also energy efficiency in some cases
- Energy Star or better construction
- Leverage additional funds (e.g., utilities, other housing funds)



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# How does Solar Work?

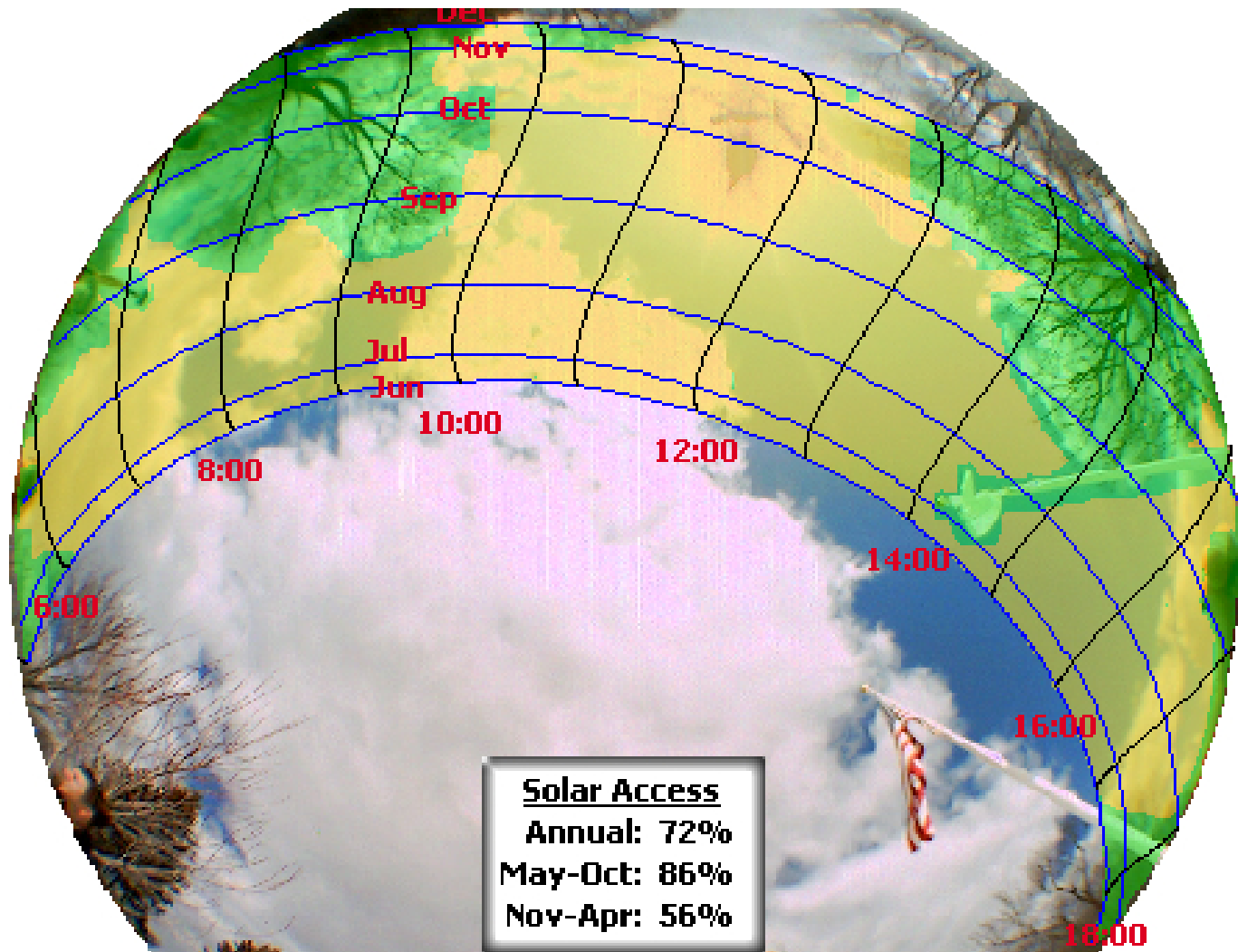
- Direct sunlight
- Creates DC electricity
- Tied to the grid
- Typically 1200 kWh/kW/year
- Net metered – up to 60 kW ac
- Typically \$8-\$10/Watt



# Where does Solar Work?

- Flat or South Facing roof
- Solid roof (4-7 lbs./s.f.)
- Little to no shading
- Proper electrical load profile

# Unacceptable Solar Resource



Data by Solmetric SunEye™ -- [www.solmetric.com](http://www.solmetric.com)

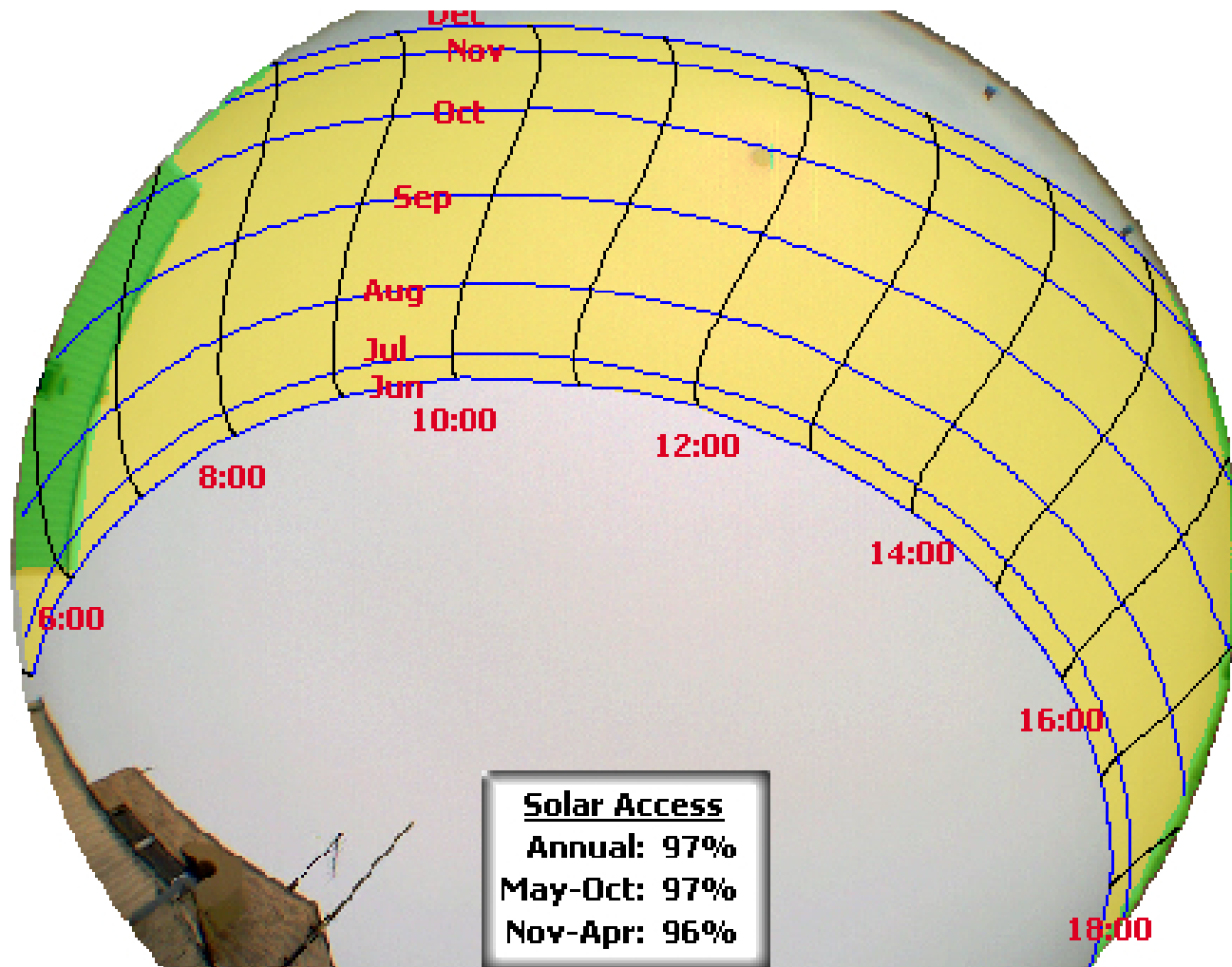


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# Acceptable Solar Resource



Data by Solmetric SunEye™ -- [www.solmetric.com](http://www.solmetric.com)



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# Inverters



- 5-10 year warranty
- Some made in MA (Solectria, Satcon)
- Consumer should have a replacement plan



# NEW FEDERAL TAX INCENTIVE HIGHLIGHTS

- Solar Business Federal Tax Credit increased from 10% to 30% (plus accelerated depreciation)
- Solar Residential Federal Tax Credit set at 30% (\$2,000 cap)
- Fuel Cell Business Federal Tax Credit set at 30% (or \$1,000 per kW)
- Database of state renewable energy incentives:
  - <http://www.dsireusa.org>



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# Requirements - Technical

- Minimum 70% solar access
- 5 year warranty
- Licensed electrician
- Insurance Requirements
- Prevailing Wage



# Requirements - Reporting

- 20 year design life
- Automatic Reporting – kWh production
- System covenant
- Production Tracking System



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# Initial Steps

- Locate a Contractor:
  - <http://sebane.org/>
  - <http://www.nesea.org/syp/>
- Determine solar feasibility (South facing, roof loading)
- Determine available capital, electrical load



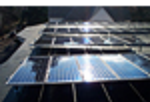
# Choosing a Contractor

- Multiple bids
- Meets MTC insurance requirements
- Experience with MTC projects



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# EXAMPLE BEST CASE: PROJECT PLAN

- Independent Research and Fatal Flaws Analysis (e.g., How-To-Guides)
- Contractor Selection
- Site Assessment (orientation, shading, roof and mounting, load, etc.)
- Design and Construction
- Interconnection
- Maintenance



# Bowdoin Apartments - Malden



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# Residential Pitched Roof Mount



Small Renewables Initiative – 2.4 kW



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# Flat Roof w/ Pitched Mounting



Northcoast Seafoods – 117 kW



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# Other Resources

- <http://www.masstech.org/cleanenergy/cando/howto.htm>
- <http://www.dsireusa.org/>
- <http://www.irecusa.org/>



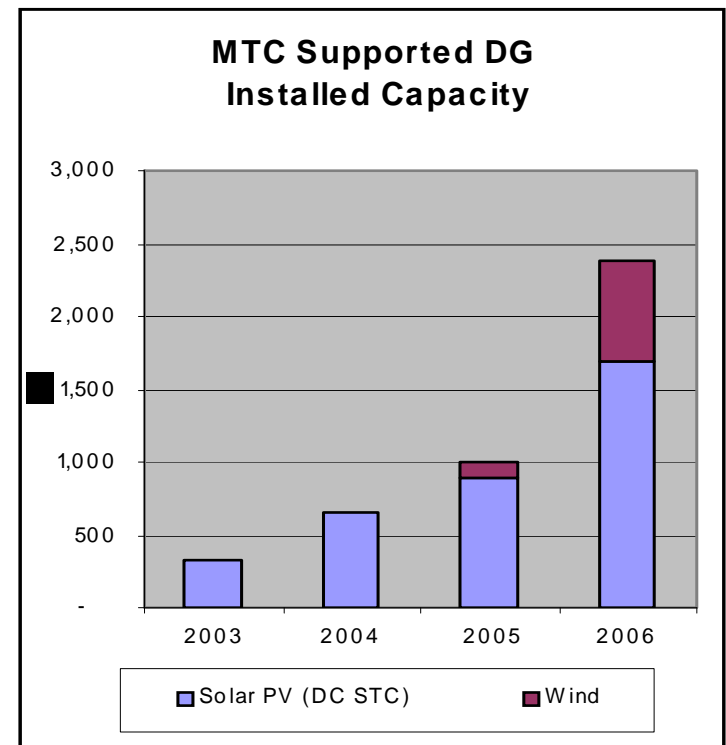
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# MTC SUPPORTED DG INSTALLATIONS THROUGH 2006



<b>MTC Supported DG Installed Capacity (kW)</b>					
	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>Total</b>
Solar PV (DC STC)	335	650	899	1,699	<b>3,583</b>
Wind	-	10	103	684	<b>797</b>
Biomass CHP	-	-	-	-	-
Hydro	-	-	-	-	-
<b>Total Capacity</b>	<b>335</b>	<b>661</b>	<b>1,002</b>	<b>2,383</b>	<b>4,380</b>



# Brockton Brightfields



LARGEST PV PROJECT IN NEW ENGLAND - 425 kW



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# Questions?

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