# Solar Opportunities in Boston

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## About MCG

International consulting firm specializing in clean energy policy development and sustainable strategy implementation

U.S. headquarters in Boston, Mass. with offices in Berlin, Frankfurt and Brussels

Significant experience in Massachusetts solar procurement, stakeholder facilitation and solar policy analysis



## About MCG: Our Clients



























### **About Solar Boston**

- Three-year, U.S. DOE funded initiative to promote municipal solar best practices
- Mayor Menino set 25MW goal by 2015
- A few Solar Boston accomplishments
  - Tracked and mapped all solar installs in Boston
  - Improved solar permitting
  - Installed more then 500kW on municipal property
  - Implemented residential rebate program







"We are like tenant farmers chopping down the fence around our house for fuel when we should be using nature's inexhaustible sources of energy – sun, wind and tide. ... I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."

> -Thomas Edison to Henry Ford and Harvey Firestone (1931)



# Solar Technology Overview



# Solar Energy: Many Diverse Applications

- Heat domestic water supplies
- Cool buildings
- Generate steam for process heat
- Space heating
- Pool heating
- Utility scale power plants
- Distributed electricity generation







### Benefits of Distributed Solar Generation

- Good for the environment
  - CO<sub>2</sub> reduction
  - Reduced resource consumption
  - Criteria pollutants

•Good for energy markets and the economy

- Reduced electricity demand during peak loads
- Market price suppression effects
- Green jobs
- •Good for your wallet
  - Solid returns for systems installed today
  - Long-term electricity price security







### Typical Distributed PV Configuration





# Variety of PV Technologies





# Variety of Configurations





# The Massachusetts PV Market



#### The Mass. Solar Market has Grown Substantially





#### And business owners are leading the way: Mass. Solar Installs in kW (2010-2011)





# What's Driving Market Growth?

- Aggressive Federal, State and City Goals
  - U.S. Department of Energy "Sun Shot"
    - \$1 per watt installed by 2017
  - Governor Patrick
    - 400 MW in Mass. by 2017
  - Mayor Menino
    - 25 MW by 2015
- Incentive programs to meet these goals
- Technology price declines
- Market competition











# About those incentives...

- Federal Investment Tax Credit (ITC)
  - 30 percent tax credit
- Depreciation (100% Bonus or 5-Year MACRS)
  - Depreciate an asset with a 30+ year life over five years
- State Solar Renewable Energy Certificate (SREC) Market
  - Earn more than \$285 per MWh of power produced
- Net-metering
  - Sell your excess solar energy to NSTAR at your retail rate



### Commercial System Case Study

Simple Payback Solar Calculator				
Inputs	Total Project Size		154	kW
	Total Project Cost	\$	930,651	
	Electricty cost	\$	0.1285	\$/kWh
	Solar Renewable Energy Credit Price	\$	285	\$/MWh
Calculations	Cost per kW	\$	6,054	\$/kW
	Annual Production		174	MWh
	Federal Tax Credit	\$	279,195	(Credit or Rebate)
	Annual Mass. Solar Renewable Energy Credits	\$	51,810	(Minimum value, 10-year guaranteed price)
	Solar Electricity Value	\$	23,360	
	Depreciation Credit	\$	254,042	(100% Bonus in 2011)
Outputs	Yearly expected cash flow (Year 1-10)	\$	75,170	
	Yearly expected cash flow (Year 11-25)	\$	22,420	
	Simple Payback		5.3	Years
	IRR		13%	



## Third Party Ownership Models

- Many business owners don't have the capital for a PV investment
- Number of third-party financing companies working Mass
  - Design, build, own, operate and decommission a system on your property
  - The system owner receives tax benefits and SREC revenues
  - Many supported by major commercial and investment banks
- Building owner typically signs a ten to twenty year power purchase agreement
  - Fixed electricity price, below retail
  - Many contracts in the state in the \$.06-.10 per kWh range



## **Solar Installation Considerations**



What makes a good solar site?

- Roof with view of southern sky
- Few obstructions (RTUs, piping, etc.)
- Newer roofs (or willingness to replace a roof)
- Structurally sound



### A Few Recommendations

- Multiple estimates are key to getting the best deal
  - 4-6 may be ideal
- Apples to apples comparisons are important when evaluating estimates
- Understand all the relationships when signing a thirdparty contract
- Get comfortable with the risks around net-metering, the SREC market and tax benefits



**Boston Initiatives to Watch** 

- Solar Boston Residential Rebate Program
- Mayor's Innovation District Solar Challenge
- Solar Boston Map Updates
- Interested? Let's talk.



## Questions?

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