

Managing Lean and Green:  
**Using the Sun to Power Affordable Housing**

Workshop presented by Andrea Watson, Center for Sustainable Energy;  
with David Buckner, Solar Energy Systems; and, Bob Allgor, National Grid  
1/7/09

Solar energy can be used to NYC's electric and hot water needs starting today. The presenters at the January workshop of the Managing Lean and Green series provided an overview of solar technology and the financial incentive options available for meeting upfront costs of purchase and installation. With this information, participants compared the relative merits of solar photovoltaic (electric) and solar thermal (hot water) technology and discussed potential financing mechanisms to take advantage of solar energy in affordable housing.

**Solar Energy in NYC**

Andrea Watson is the NYC Solar Coordinator for the Center for Sustainability at Bronx Community College. Solar America Cities (<http://www.solaramericacities.energy.gov>) is a partnership between the U.S. Department of Energy and 25 cities accelerating the adoption of solar technologies; the Center for Sustainability is NYC's agent. NYC has set a goal to locally generate 8.1 MW from solar electricity by the year 2015.

Andrea discussed why solar energy is right for New York City.

- NYC's current electricity production causes pollution and negative health impacts. In NYC, 25,000 asthma attacks and 1,000 asthma deaths occur annually.
- More than half of New York City's electricity peak needs—over 6,000 Megawatts—are produced within city limits. Local power plants burn fossil fuels, which contribute to NYC's air pollution and greenhouse gas emissions. During the summers, electricity usage is highest and we turn to the least efficient (most polluting) power plants to meet these needs.
- New York's residential customers pay the highest electricity rates in the continental United States.
- NYC must adopt new technology and methods to keep up with our annual one and a half percent increase in electricity demand.
- NYC is vulnerable to blackouts. Estimated costs of the NYC blackout in 2003 exceed \$1 billion.
- Solar energy is non-polluting, renewable, and available. The amount of solar energy falling on NYC is twice that of the need.
- NYC's maximum sun exposure coincides with peak demand. If the surfaces of building façades and rooftops are covered, 18% of the electricity city needs can be met.

The biggest challenges against widespread use of solar energy are high upfront costs as well as interconnection and technical barriers. Supportive policies and public funding are needed to overcome these barriers.

**Solar PV**

David Buckner is the President of Solar Energy Systems, a Brooklyn-based company providing design services and installation of solar systems.

David elaborated on the practicalities, costs, and financial incentives of installing solar photovoltaic (PV) systems.

- Financial incentives available to NYC residents for installing solar PV include:
  - NYSERDA Incentive and Loan Programs
  - Federal Income Tax Credits
  - Federal Modified Accelerated Cost-Recovery System (MACRS)
  - NYS Tax Credits
  - NYC Property Tax Abatement Subsidies
- Those taking full advantage of these incentives can fund up to 90% of the total project costs. For more information see: <http://prattcenter.net/energy-nyc-solar.php>
- A 25kilowatt (KW) system costs \$225,000 but requires less than \$20,000 net investment. The savings at \$.15 per kilowatt hour (KWH)—based off of fuel market rate—is \$4,239. As a result, the system pays for itself in four to five years.
- A 50KW System costs \$400,000 but requires less than \$40,000 net investment. The savings at \$.15 per KWH—based off of fuel market rate—is \$8,177. Again, the system pays for itself in four to five years.
- Most solar panels guarantee that they will produce 80% of their original output through 25 years of usage. The actual life of the system may be 40 years.
- It takes two to three months to submit and receive initial approvals which include:
  - Department of Buildings (DOB)
  - Nationally Recognized Testing Laboratories (NRTL) Third-Party Evaluations
  - NYSERDA Incentive Application
  - Con Ed Utility Interconnection Application
- If the building is deemed a landmark or historic, additional approval is needed.
- Installation is relatively quick at two weeks which includes Structural, Mechanical, and Electrical work.
- Typically, 10 watts per square foot on a rooftop grade is generated. However, the system can be raised on a steel structure with butt-jointed panels. The panel surface area is increased, thus so does the average watts per square foot generated.
- An issue when considering Solar PV is whether the building is master-metered. For master-metered buildings, the solar system can cover a significant percent of the electric needs of the building. For individually metered buildings, the solar system can be sized to cover only the common area electricity needs.
- A major issue facing affordable housing feasibility is the inability for nonprofits to take advantage of tax credit incentives. One alternative available to nonprofits is the power-purchase agreement. Under a power-purchase agreement, one or more investors own the equipment and sell the electricity at a reduced cost to the building owner. The investors pay the up-front costs of purchase and installation while benefiting from tax incentives and accelerated depreciation of the equipment for a period of six years. Once the equipment depreciates, it is sold to

- the nonprofit. One of the workshop participants shared their intention to use this model with Morgan Stanley.
- Pratt Center is interested in working with nonprofits to identify pilot projects for solar installations.

### **Solar Thermal**

Bob Allgor is a Senior Project Manager with National Grid, the second-largest utility company in the U.S. and the largest gas-supplier in NYC. Bob described the latest technology for solar thermal and National Grid's financial incentives for solar thermal.

- The most common Solar Hot Water heating system is the flat plate collector; water pipes are directly heated by the sun and the hot water is stored in a hot water tank. A second less common technology is the evacuated tube collector; this system is more expensive but more efficient.
- To meet the hot water needs of one typical family of four using about 80 gallons of hot water per day requires two flat plate collectors. The upfront cost of a system for this household would be approximately \$8,000 (two 4' x 10' panels). National Grid Rebates and Federal and New York State Tax Credits will pay approximately \$4,500 of this amount. Therefore, the net cost to the owner is about \$3,000. The annual savings in reduced gas costs to heat the water is \$275 and the system pays for itself in 11 years.
- The system is much more economical if purchasing a large quantity of panels.
- Multi-Family Housing (Five or more units) is covered within National Grid's commercial incentives. Under their rebate program, National Grid pays \$3 per thermal unit for first year savings for up to 50% of the project cost or \$100,000. In addition, Federal Tax Credits cover 30% of net costs. The IRS also allows Accelerated Depreciation and NYC's Real Property Tax incentives apply to solar thermal.
- National Grid provides free walk-through energy audits for residential buildings at 800-860-0815. For multi-family buildings please call 800-843-3636 or see [www.thinksmarthinkgreen.com](http://www.thinksmarthinkgreen.com)

The Power Point presentations given at this workshop are available on the Energy Matters website at: <http://prattcenter.net/energy-workshop-materials.php>

*Summary provided by Megan Houston with the Pratt Center for Community Development.*