U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Challenges and Successes on the Path toward a Solar-Powered Community

Solar in Action

Orlando, Florida

Includes case studies on:

- Solar Loan Buy-Downs and On-Bill Financing
- Net Meter Aggregation
- Market Barriers Through Targeted Solar Roundtables
- Pilot Community Solar Program

SOLAR AMERICA CITIES

Part of the Solar America Communities program

October 2011

The Orlando Science Center features rooftop PV panels. *Photo from Orlando Utilities Commission (OUC), NREL/PIX 18715*

Cover photos from iStock/8304000, downtown Orlando

About the U.S. Department of Energy's Solar America Communities program:

The U.S. Department of Energy (DOE) designated 13 Solar America Cities in 2007 and an additional 12 cities in 2008 to develop comprehensive approaches to urban solar energy use that can serve as a model for cities around the nation. DOE recognized that cities, as centers of population and electricity loads, have an important role to play in accelerating solar energy adoption. As a result of widespread success in the 25 Solar America Cities, DOE expanded the program in 2010 by launching a national outreach effort, the Solar America Communities Outreach Partnership. As the Solar America Cities program evolved to include this new outreach effort, the program was renamed Solar America Communities to reflect DOE's commitment to supporting solar initiatives in all types of local jurisdictions, including cities and counties. Visit Solar America Communities online at www.solaramericacommunities.energy.gov.

Orlando's Starting Point

The City of Orlando was designated by the U.S. Department of Energy (DOE) on March 28, 2008, as a Solar America City. By the time of this designation, the city already had ambitious plans for a green energy future in collaboration with Orlando Utilities Commission's (OUC) renewable energy and conservation programs. In 2007, the Mayor of Orlando unveiled his Green Works Orlando initiative focused on five pillars of sustainability: energy efficiency and green buildings; transportation; sustainable infrastructure and conservation; green spaces; and advocacy and education. As a result, the city was working on more than 30 sustainability initiatives, including installing municipal solar sites, offering incentives for green roof and solar installations, exploring solar energy technologies for the new events center and performing art center, mapping the community's carbon footprint, and creating an action plan to reduce it.

Building Partnerships and Setting Goals

In October 2007, the Green Future Alliance ("the Alliance") partnership was established between OUC, the City of Orlando, and Orange County. The Alliance would develop strategies to make solar technology more technically and economically feasible, while increasing its visibility and accessibility in all sectors of the urban landscape.

In 2007, the Alliance planned to develop a comprehensive strategic energy plan that would identify appropriate methods of integrating solar and other sustainable development practices into all major sectors of Central Florida with a goal of pioneering strategies that could be readily adopted by other governmental agencies, which would increase the potential impact from local to national.

Planned activities to reach a cumulative installed solar capacity of 5 megawatts (MW) by 2008, 10 MW by 2010, and 15 MW by 2015 within metro Orlando included:

- Streamline the permitting process for installing solar systems

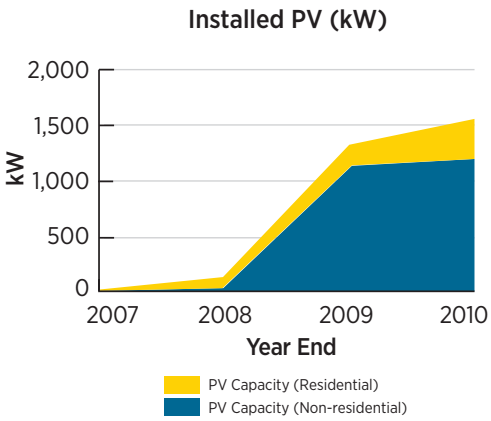
- Conduct a solar resource analysis (based on geographic information systems) to help identify existing and potential solar installation sites
- Engage stakeholders
- Work with local economic development groups to conduct a market analysis of barriers to implementing solar technologies
- Conduct solar education and training workshops targeting:
  - building code officials and inspectors
  - government officials and local legislators
  - solar business developers
  - building energy managers
  - residential and small commercial building owners.
- Conduct a series of consensus-building roundtables to bring together stakeholders and solar subject matter experts to identify successful solar policies and programs.

Accomplishments and Highlights

- Orlando launched its solar Web pages and solar map at www.orlandorunsonsun.com. This page is part of the Power Up Florida website (http://powerupgreenenergy.com/) that promotes energy efficiency, solar, and other renewable energy technologies. The solar map increases public awareness about solar potential in the Orlando area and facilitates greater solar usage among commercial and residential customers.
- OUC and the Florida Solar Energy Research & Education Foundation completed seven stakeholder roundtables to identify barriers and solutions to solar integration by meeting with stakeholders throughout the Orlando region.
- Orlando completed a series of community solar education and training workshops, including:
  - two Solar PV for Code Officials workshops held in conjunction with the Florida Solar Energy Center (FSEC)

Installed Capacity

Orlando



Installed PV capacity increase from December 31, 2007, to December 31, 2010

Orlando Green Alliance leads at the Solar America Cities Annual Meeting 2010. Pictured, left to right, Jon Ippel, City of Orlando; David Click, Florida Solar Energy Center; Stephen Barkaszi, Florida Solar Energy Center; Natalia Paredes, OUC; and Jennifer Szaro, OUC. *Photo from Natalia Paredes, OUC, NREL/PIX 18714*

The solar array rooftop system on the south concourse of the Orange County Convention Center was completed in 2008 as a DOE Solar America Showcase. *Photo from Orange County Convention Center, NREL/PIX 18077*

- two Solar Thermal for Code Officials workshops, also in conjunction with FSEC
- two workshops for solar businesses held with FSEC and Growth Innovators Inc. to communicate business development guidelines for new and existing solar companies
- one Solar for Building Managers workshop held with FSEC to help managers understand basic solar concepts, types of technology, the certification process, and general system sizes and scopes
- six Solar Consumer workshops for residential and small commercial customers held in conjunction with the Florida Renewable Energy Association.

- OUC partnered with Orlando Federal Credit Union to offer low-interest loan options for solar installations and provide a monthly production credit to customers for the energy their systems produce.

Case Studies: Successes and Challenges

Solar Loan Buy-Downs and On-Bill Financing

OUC partnered with the Orlando Federal Credit Union to offer low-interest loans for residential solar installations. Customers can borrow up to $7,500 for a solar water heating (SWH) system at an interest rate of 0% to 4%, depending on the repayment term, which ranges from 3 to 7 years. Customers can borrow up to $20,000 for a photovoltaic (PV) system at an interest rate of 2.0% to 5.5% over a term ranging from 3 to 10 years. Customers can repay loans over time as fixed payments on their monthly utility bills.

This program complements the utility's production-based incentive (PBI) program for PV and SWH where customers receive a monthly credit of $0.05/kilowatt-hour (kWh) and $0.03/kWh, respectively, in exchange for the environmental attributes. As of February 2011, 75 customers received the low-interest loans, 8 for PV and 67 for SWH. For more information, go to http://reliablygreen.ouc.com/en/what_you_can_do_0.aspx.

Challenges: Because of the tough economic climate, not all residential customers qualify for the loans. Applicants are turned away due to stringent credit score requirements and lack of adequate home equity.

OUC aims to expand the program by increasing the number of lenders, making more options available to customers. OUC also is actively considering low-interest loan options for commercial customers.

Low-interest loans are available for residential solar installations.

Net Meter Aggregation

The Orlando Utilities Commission (OUC) offers the option to aggregate meters through consolidated billing to customers who install PV on a site with multiple electric meters. Excess solar production on one meter can be credited against the aggregated energy usage at the site. OUC's net-metering policy is applicable to all customer classes for systems up to 2 MW. Net excess generation is credited at the utility's retail rate and carried over to the customer's subsequent bill indefinitely. A customer may request reimbursement at any time for any credit on the account.

Challenges: OUC is working to synchronize the different rate structures and wide array of meters with the billing system for large commercial applications so they communicate with each other effectively.

Market Barriers through Targeted Solar RoundTables

The City of Orlando conducted a series of seven solar roundtables (interactive workshops) to develop a list of solar policies and priorities to help the city meet its aggressive solar

installation targets. Each of the roundtables targeted a different stakeholder group or market segment, including:

- Commercial and public buildings
- Affordable and multi-family housing
- New communities and existing residential housing
- Disaster planning and emergency management
- Economic development and green jobs
- Service and tourism industry
- Community and regional planning

By using sophisticated electronic polling software, the Alliance was able to educate; provide real-world examples of solar; and collect ideas, barriers, and solutions that relate to each of its stakeholder groups. Participants submitted immediate feedback, facilitating real-time consensus building on priorities and policies. Each meeting featured subject matter experts who spoke about integrating solar technologies into key sectors.

In conjunction with the Florida Solar Energy Research & Education Foundation, summary reports and a final report were generated. The final report summarizes recommended approaches to solar implementation in all key market segments and identifies policy, financial, and outreach concepts collected during each of the roundtables. It also contains detailed conclusions and recommendations based on participant feedback.

Challenges. The Alliance worked to find a balance between using the electronic polling equipment and having open-ended discussions. While using the equipment benefited the program by allowing for surveys and tracking/ recording feedback, it also resulted in a lack of verbal participation among attendees.

A 1,920-square-foot solar water heating system is featured at the Orlando IKEA store. *Photo from IKEA Orlando, NREL/PIX 18711*

Beta Center's Hope Kramer addresses the Solar America Cities press conference. With her, from left, are Maylen Arlen-Dominguez, Orlando Utilities Commission president; Richard Crotty, former Orange County mayor; and Mayor Buddy Dyer, City of Orlando. *Photo from OUC, NREL/PIX 18717*

Due to the length of each roundtable (4 hours), it was difficult to get key players to attend each roundtable segment. The Alliance rescheduled the roundtables multiple times to secure a successful turnout.

Pilot Community Solar Program

OUC is developing a business plan to pilot a new community solar program. "Community solar" refers to solar electric systems owned by multiple community members who contribute to the cost of the system and receive a proportionate share of the power and/or financial benefit of the system. Community solar allows residents who would not otherwise be able to install solar on their homes (due to cost, location, or type of home) to participate in solar energy generation. OUC will issue a request for proposals to solicit participation from solar developers to design and install a rooftop Community Solar Project in the range of 400 to 500 kilowatts of PV. The city and county will support any additional marketing necessary to promote the program to OUC customers.

The capacity of the solar array will be sold in kilowatt blocks to customers. After the system is fully subscribed, construction will begin. Customers sign a contract for the length of the Power Purchase Agreement term to purchase the solar energy from their portions of the system.

After the solar array is operational, OUC will bill the customer monthly at the Power Purchase Agreement rate minus OUC's PV incentive rate for the portion of their energy that comes from the solar array. If a customer uses less energy than his or her portion of the solar array produced in any given month, he or she will receive an energy bill credit equal to the amount of unused kilowatt-hours (a form of virtual net metering). This

enables customers to gain the full value of the output of the system and encourages them to conserve electricity.

Customers receive a fixed rate for all or a portion of their energy usage for the length of the contract (20 to 30 years). This rate is expected to be about $0.02 to $0.04 greater than OUC's current residential rate for electricity (depending on the price of the Power Purchase Agreement). The rate will not increase over time with OUC's other fuel-related rate increases.

Challenges. OUC must build a structure within its billing system that can successfully represent this model. It also must conduct sufficient marketing and outreach to fully subscribe this program.

Top Takeaways

- The Alliance experienced two major setbacks at the state level due to lack of education among state decision makers. First, the State of Florida did not renew its solar rebate program, which provided a generous $4 per watt incentive for PV systems and a $500 rebate for solar domestic hot water systems. Additionally, Florida's solar property tax exemption statute expired and was not renewed in the 2010 legislative session because some feared it would further erode local government funds. This left local governments, utilities, and Florida citizens with fewer leveraging options and a significantly heavier financial burden related to solar investments.
- The website www.orlandorunsonsun.com provides an array of valuable information to consumers interested in solar. It soon will feature a geographic information system solar map that calculates a site's solar potential.
- More outreach and education is necessary to keep the momentum rolling for solar adoption for a variety of stakeholders and target markets, including code officials, energy managers, new solar businesses, and consumers.

Next Steps

The Alliance plans a number of activities to expand the integration of solar energy technologies in the Orlando area, including:

- Evaluate the current state of permitting processes in Central Florida by reaching out to four local code jurisdictions and creating a matrix of permitting requirements for each one. The team also will survey local solar contractors on their permitting experience to gain a better understanding of the current process and determine whether improvements can be made.
- Actively improve the content of www.orlandorunsonsun.com by adding reports, presentations, and videos of the solar stakeholder roundtables and solar workshops.
- Construct and commission OUC's 6-MW Stanton Energy Center PV array, expected to be completed at the end of 2011.
- Release the request for proposals for the Community Solar Farm and Commercial Customer Solar Aggregation Project.
- Increase the amount of OUC's Solar Program incentive levels. Investigate adding more lending partners to the low-interest loan offering, and expand the loan option to include commercial customers.
- Host a Solar Policy Workshop for key decision makers in the State of Florida entitled, "Solar Solutions for Central Florida—An Interactive Forum." The event will cover general information on the state of solar on a local and federal level. It will discuss the outcome of the stakeholder solar roundtables and then bring national speakers to discuss the recommendations provided in the Master Solar Plan. The workshop will end with an open discussion to obtain feedback from attendees. The goal is for attendees to discuss feedback and explore recommendations that best suit the Orlando area as well as the State of Florida.
- Create five turnkey solar education kits (one for each target group from past workshops) that include teaching materials; a professionally produced, 60-minute DVD presentation; marketing templates (posters, promotional inserts, and handouts); and a 30-second television and radio copy to promote solar energy use.

Additional Resources

- Orlando's Solar Website, Orlando Runs On Sun: http://orlandorunsonsun.com/
- Florida Solar Energy Center: http://www.fsec.ucf.edu/en/
- Directory of Florida Solar Contractors: www.flaseia.org/Directory/contractors.htm
- Orlando Utilities Commission – Solar: http://reliablygreen.ouc.com/en/what_you_can_do_0.aspx
- Orange County Convention Center – Green Initiatives: http://www.occc.net/Community/green.asp
- City of Orlando – Green Works Orlando: http://www.cityoforlando.net/elected/greenworks/index.htm
- Power Up Florida: http://powerupgreenenergy.com/

Downtown Orlando. *Photo from iStock/8304000*

For more city information, contact:
Jennifer S. Szaro, Renewable Energy Manager, Orlando Utilities Commission Telephone: 407-434-2100

For more information on going solar in your community, visit *Solar Powering Your Community: A Guide for Local Governments* at http://solaramericacommunities.energy.gov/resources/guide_for_local_governments/

For more information on individual cities' solar activities, visit www.solaramericacommunities.energy.gov/solaramericacities/action_areas/

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Portland Sacramento Salt Lake City San Antonio San Diego
San Francisco San José Santa Rosa Seattle Tucson

Clockwise from top left: *Photovoltaic system in Philadelphia Center City district (photo from Mercury Solar Solutions); rooftop solar electric system at sunset (photo from SunPower, NREL/PIX 15279); Premier Homes development with building-integrated PV roofing, near Sacramento (photo from Premier Homes, NREL/PIX 15610); PV on Calvin L. Rampton Salt Palace Convention Center in Salt Lake City (photo from Utah Clean Energy); PV on the Denver Museum of Nature and Science (photo from Denver Museum of Nature & Science); and solar parking structure system at the Cal Expo in Sacramento, California (photo from Kyocera Solar, NREL/PIX 09435)*

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