

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

# Solar in Action



## Salt Lake City, Utah

Includes case studies on:

- Improving Net Metering and Interconnection Standards—  
Solar Salt Lake Project
- Removing Barriers to Third-Party Financing
- Pilot Solar Homes
- Solar Salt Lake Implementation Plan



A 25-kW solar photovoltaic system provides power to the county-owned Clarke Planetarium in downtown Salt Lake City. This project received technical assistance from the Solar Salt Lake Project and the DOE Technical Assistance Team. *Photo by Sara Baldwin, NREL/PIX 18363*

*Cover photos from The City of Salt Lake City, NREL/PIX 18362, The Salt Lake City, Utah, skyline*

## 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](http://www.solaramericacommunities.energy.gov).

# Salt Lake City's Starting Point

Salt Lake City, in partnership with Salt Lake County, was designated by the U.S. Department of Energy (DOE) on June 20, 2007, as a Solar America City. At that time, Salt Lake City and Salt Lake County were home to 40% of Utah's population and growing rapidly. At the onset of Salt Lake City's designation as a Solar America City, numerous regulatory, financial, and educational barriers to solar existed. For example, the state and utility net metering and interconnection rules prohibited systems over 25 kilowatts (kW); an ambiguity in Utah law prohibited third-party financing and power purchase agreements; the lack of a state renewable portfolio standard and limited state and utility incentives deterred the solar industry; residential customers were unable to access viable solar financing options; comparatively low energy prices and an electricity generation mix in the state dominated largely by fully depreciated coal challenged the economics of solar; and a lack of understanding about solar contributed to preventing the widespread adoption of solar energy in all markets.

Salt Lake City's prior solar successes with support from DOE's Million Solar Roofs Initiative (2005–2007) demonstrated the value of and need for continued local efforts to advance solar energy.

## Building Partnerships and Setting Goals

Through the Solar America Cities designation, Salt Lake City and Salt Lake County joined forces with Utah Clean Energy, a local nonprofit, and other partners to form the Solar Salt Lake Project—a strategic public-private partnership with the goals of addressing the aforementioned barriers and developing a solar implementation plan designed to significantly drive the adoption of solar energy throughout Salt Lake Valley by 2015 and beyond. Salt Lake City and partners set out to push forward a solar market transformation in Salt Lake City, Salt Lake County, the state of Utah, and ultimately the West.

The goal of the Solar Salt Lake Project is to develop a fully scoped city and county-level implementation plan that would facilitate at least 10 megawatts (MW) of new solar photovoltaic (PV) installations in the

government, commercial, industrial, and residential sectors by 2015.

Through barrier identification, research, analysis, and stakeholder input, the plan would identify strategies to support long-term solar deployment, including:

- Integrating solar into city/county planning, ordinances, and facilities
- Identifying policies, regulations, and programs that support solar adoption
- Partnering with developers and builders to incorporate solar in the residential and commercial building markets
- Evaluating and implementing financing options for residential and commercial solar
- Providing solar education and outreach.

From the onset, the Solar Salt Lake Project engaged diverse stakeholders to form strategic partnerships in support of the project goals. The original partnership from Phase I was expanded during Phase II of the project, which was funded by a second grant.

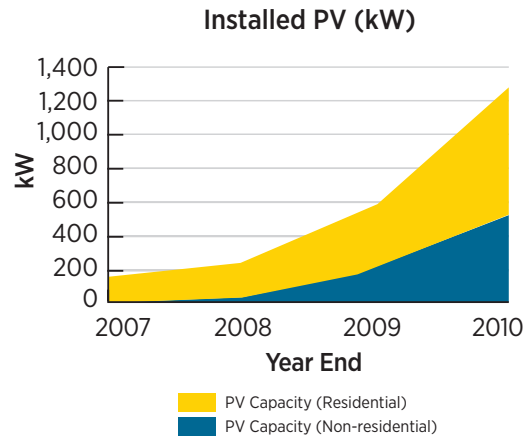
#### ***Phase I (2007–2009)—U.S. Department of Energy Solar America Cities Grant***

- Salt Lake City: Project lead
- Utah Clean Energy: Project manager, nonprofit organization, directs and manages project activities and ensures goals are met
- Salt Lake County: Local government, facilitates identified solutions to advance solar
- Kennecott Land: Private company, implements innovative projects for residential solar in new developments
- Rocky Mountain Power: Investor-owned utility, partners on technical assistance projects

The primary goals and activities of Phase I centered on barrier identification and development of a comprehensive city- and county-wide solar implementation plan that established a long-term commitment to solar deployment and would facilitate solar adoption in all sectors.

## **Installed Capacity**

Salt Lake County (including Salt Lake City)



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

#### ***Phase II (2010–2012)—U.S. Department of Energy Solar America Cities Special Projects Grant***

- Salt Lake City, Utah Clean Energy, and Salt Lake County
- Ballard Spahr, LLC: Law firm, provides technical and legal support
- Interstate Renewable Energy Council: Nonprofit, represented by Keyes & Fox, provides technical and legal support
- Utah Governor’s Office of Economic Development: State government, coordinates on solar activities and attracting solar industries to Utah
- Utah State Energy Program: State government, coordinates on solar activities and promotion of American Recovery and Reinvestment Act solar rebates
- Kennecott Land: Private company, implements innovative projects for residential solar in new developments.

The primary goals and activities of Phase II center on removing key financial barriers to solar, by enabling third-party financing, residential/commercial financing options, and solar incentives.



An apartment building in downtown Salt Lake City is powered by the sun. This low-income, historic building has been retrofitted to be near net-zero energy for the occupants. *Photo from LaPorte Group, NREL/PIX 18366*





The Solar Salt Lake team gathers with representatives from the Denver and Tucson Solar America Cities teams at the 3rd Annual Solar America Cities Meeting, which was held in Salt Lake City. Photo by Doug Crockett, NREL/PIX 18365

One of the first and most important steps taken at the onset of the Solar Salt Lake Project was selecting a solar project manager to navigate the collective efforts, formulate a plan to grow the local solar market, and facilitate the activities to achieve the project goals. Salt Lake City and Salt Lake County selected Utah Clean Energy, a local nonprofit organization, to fulfill this role for both phases of the project.

Phase I and Phase II of the Solar Salt Lake Project efforts span a broad cross-section of initiatives aimed at removing market barriers to solar and increasing the installed capacity of solar energy in Salt Lake City and Salt Lake County to 10 MW by 2015, including:

- Create a leadership team to spearhead the Solar Salt Lake Project (Phase I)
- Identify barriers to solar implementation through targeted technical analyses, stakeholder surveys and meetings, and Solar Salt Lake workshops (Phase I)
- Develop and disseminate best practices drawn from national best practices (Phase I)
- Work with Kennecott Land and local home builders to explore and integrate solar technology into new residential and commercial developments in the Daybreak Community Development (Phase I)
- Develop an implementation plan for Salt Lake City and Salt Lake County to establish a long-term commitment to solar deployment and facilitate solar adoption in all sectors (Phase I)
- Provide education and training for the building community, utilities, code officials, the real estate and appraisal community, city zoning, historic district commissions, and the general public, other local governments, nonprofits, churches, schools, and businesses (Phase I and II)
- Engage diverse stakeholders and utilize technical assistance to remove key financial and regulatory barriers

to widespread, large-scale solar development in the City and County of Salt Lake, such as net metering and interconnection (Phase I), expansion of solar-PV incentive programs (Phase II), and third-party power purchase agreements (Phase II)

- Research and implement replicable alternative financing structures (Phase II).

## Accomplishments and Highlights

In Phase I of the project, the Solar Salt Lake team focused on identifying market barriers and developing strategies to overcome those barriers. Highlights of these efforts include:

- Completed the Solar Salt Lake Implementation Plan to guide and coordinate local efforts to increase solar energy use.
- Utah’s net metering grade went from “F” in 2007 to “A” in the 2009 “Freeing the Grid” report ([www.freeingthegrid.org](http://www.freeingthegrid.org)). The Solar Salt Lake team was awarded the Solar America Cities “Barrier Buster” award at the 2010 Solar America Cities Annual Meeting for efforts to improve net metering. Additionally, the state adopted improved interconnection standards and saw a two-fold increase in the number of net-metered solar projects since 2008.
- The prominent, award-winning production builder Garbett Homes is now offering solar as a standard option (the first in Utah) on its Solaris Collection homes, several of which were pre-sold during the recession. They have plans to build an additional 100 Solar Homes at Kennecott Land’s Daybreak Community.
- Technical and legal analyses continue to be used to inform decision-makers and next steps for Solar Salt Lake Partners, along with state and other local governments, policymakers, regulators, and key stakeholders.
- Salt Lake County and Salt Lake City are actively incorporating solar into facilities and planning, while also working to improve solar codes and streamline the permitting process.
- After extensive stakeholder engagement efforts by the Solar Salt Lake team, Utah’s 2010 legislature passed a law to allow third-party financing for government, churches, and school facilities.
- Salt Lake County issued a request for proposals for a power purchase agreement for approximately 1 MW of solar PV. Additionally, the Utah Museum of Natural History and the Architecture Department of the University of Utah are both investigating power purchase agreement options for solar on university facilities.
- Initiated a power purchase agreement for a 2.6-MW PV system on the roof of the Salt Palace Convention Center.

- Salt Lake City was the host for the 2010 Solar America Cities Annual Meeting.
- The Church of Jesus Christ of Latter Day Saints constructed a highly energy efficient and solar-powered church, which garnered prominent media attention and support.

## Case Studies: Successes and Challenges

### Improving Net Metering and Interconnection Standards—Solar Salt Lake Project

At the onset of the Solar Salt Lake Project, both net metering and interconnection were significant barriers to an emerging solar market. The 2007 “Freeing the Grid” report gave Utah an “F” grade for both net metering and interconnection, and two solar workshops identified net metering and interconnection as two key barriers that needed to be addressed before a solar market could thrive anywhere in Utah.

When the Utah Public Service Commission (PSC) initiated two dockets in 2007 to review and consider adoption of the updated Energy Policy Act of 2005 Public Utility Regulatory Policy Act standards for net metering and interconnection, several local entities got involved in the technical conferences and hearings.

Then, in 2008, the Utah legislature and governor passed and signed into law Senate Bill 84 – Net Metering Provisions, which made changes to Utah’s net metering policy. Several key decisions about net metering were deferred to the Utah PSC.

In February 2009, the PSC opened a net metering docket to rule on the remaining decisions in the bill. The Solar Salt Lake Project partners educated and engaged more than 40 businesses, citizens, local and state government officials, and public interest organizations in the proceedings. Ultimately, the commission adopted favorable rules. Utah’s new net metering provisions included the following improvements:

- Increased the commercial system cap size to 2 MW

Improved net metering rules and interconnection standards help make solar a more attractive option for Utah homeowners. *Photo from Utah Solar Tour 2010, NREL/PIX 18367*



- Valued excess generation from residential and small commercial systems as kilowatt hour credits
- Adopted a system-wide net-metered capacity cap equal to 20% of Rocky Mountain Power’s 2007 peak demand (representing nearly 1 GW)
- Allowed customer-generated Renewable Energy Credits to stay with the customer
- Allowed large commercial customers to choose the most favorable means to credit excess generation in an innovative attempt to address the challenge of commercial customers with high demand charges.

In the end, changes removed critical barriers to distributed renewable energy generation and helped Utah earn an “A” grade for net metering in the 2009 “Freeing the Grid” report.

Simultaneous to the net metering proceedings, the PSC undertook a comprehensive review and revision of the state’s interconnection standards, engaging several Solar Salt Lake Partners throughout these proceedings. After nearly 2 years of stakeholder involvement, public meetings, and public comments on draft interconnection standards, the updated (and improved) standards were adopted in April 2010. The new interconnection standards reflect best practices with respect to key interconnection issues, including:

- Increasing the level 1 review to include systems up to 25 kW (up from 10 kW)
- Allowing aggregation of generators at a single location
- Requiring standardized agreements
- Removing the disconnect switch requirement for systems smaller than 10 kW
- Determining appropriate levels and fees for different system sizes
- Expediting application review and approval procedures.

As expected, Utah’s new interconnection standards bestowed Utah with top honors for interconnection in the new 2010 edition of “Freeing the Grid,” which can be viewed at [www.newenergychoices.org/uploads/FreeingTheGrid2010.pdf](http://www.newenergychoices.org/uploads/FreeingTheGrid2010.pdf).

### Removing Barriers to Third-Party Financing

Third-party financing for renewable energy generation, whether through a lease or a power purchase agreement, helps remove one of the most significant barriers to renewable energy generation: high up-front costs. As part of the Solar Salt Lake Project efforts, Salt Lake County commissioned a study to determine the best available options for financing solar on county-owned facilities. The study showed that the county’s most viable financing option was to contract with a third-party provider and to enter into a power purchase agreement.

However, Utah’s law contained a statutory ambiguity regarding the legality of third-party financing, casting doubt on whether or not third-party providers would be subject to regulation as a public utility. In order to help resolve the statutory ambiguity, the PSC opened an investigative docket (09-999-12) in November 2009. The Solar Salt Lake partners educated and engaged more than 50 stakeholders on the issue, most of whom got involved in the third-party docket.

Then, during the 2010 legislative session, a bill was introduced to clarify that third-party financing providers would not be subject to regulation as a public utility under Utah law. After much negotiation and deliberation, the bill passed with a narrowed scope, enabling third-party financing (power purchase agreements) for local and state government, schools, religious institutions, and certain qualified non-profit entities.

Salt Lake County is taking advantage of this new opportunity, utilizing a power purchase agreement for a 2.6-MW solar PV project on the roof of the Salt Palace Convention Center. This project is slated to be the largest rooftop solar PV system in the country.

With the Solar Salt Lake Project’s efforts to educate other entities about the availability of third-party financing, the Salt Lake solar market is expected to grow significantly with some larger projects. For example, the Utah Division of Construction and Facilities Management, University of Utah, and Utah Museum of Natural History are currently exploring third-party financing option for its facilities.

## Pilot Solar Homes

During Phase I of the Solar Salt Lake Project, Kennecott Land and the other project partners collaborated with local production builders to build two showcase energy-efficient solar homes at Kennecott Land’s Daybreak Community development. Featured in the 2008 Parade of Homes, these homes also became part of an ongoing research effort to monitor energy usage and energy savings. On the heels of this effort, a prominent production builder in Utah (Garbett Homes) decided to branch out and start building solar homes at Daybreak, offering a new line of solar homes (the Solaris Collection). These homes turned out to be the saving grace for this builder at the onset of the housing slump. Because of the unique combination of incentives, Garbett was able to offer these homes at competitive prices. These homes sold 3 to 4 times faster than other homes in the same neighborhood of similar size and price. Garbett Homes continues to explore the solar market and has become a known leader in solar-powered homes.

## Solar Salt Lake Implementation Plan

The Solar Salt Lake Project developed “Powering Our Future—Solar Salt Lake Implementation Plan” as part of its efforts as a Solar America Cities partnership. The plan is a first-of-its-kind tool to help elected officials, government agencies, and affiliated partners identify and adopt proven strategies for transforming solar opportunities into success stories. The plan was developed in order to help guide the development of a viable and robust solar market across Utah.

The plan reflects 3 years of experience, research, and analysis in four key topic areas, which address the principal barriers to solar energy:

- The Regulations and Policies section focuses on the key regulatory and policy measures fundamental to fostering the solar market.
- The Financial section highlights practical and innovative measures designed to level the financial playing field for solar energy.
- The Outreach, Education, & Workforce Development section focuses on strategies to grow and train the solar workforce and educate the public about solar.
- The final section, Solar Integration, identifies how solar can be effectively integrated into utility planning and government emergency preparedness plans.

The plan details 18 innovative strategies proven to increase solar adoption. By reading the plan:

- Elected officials will learn the components of an effective state renewable portfolio standard with a distributed generation set-aside—a policy measure that has successfully driven the solar market in states across the country.
- Mayors and City Council members will learn about why and how to implement effective municipal solar financing mechanisms, such as dedicated loan programs or public benefits funds.
- Local planning and zoning officials will gain insight on why expedited permitting for solar and solar access provisions are low-cost ways to encourage solar adoption.
- Public agencies and educational institutions will learn the importance of solar code trainings and proven means to grow a competent solar workforce to meet increased solar demand.

Each strategy is described in the following terms: providers—the most appropriate stakeholders to authorize or implement the measure; best practices—examples of successful implementation in other areas and/or accepted industry practices; history and current status—as they relate to the Solar Salt Lake Project or the state of Utah; technical assistance—technical or legal support that has been utilized or that may be



needed to implement the specified measure; and goals—identified commitments from the Solar Salt Lake Project and/or suggestions to consider going forward.

The Solar Salt Lake Project has already successfully explored and implemented several measures identified in the plan, demonstrating the effectiveness of a strategic approach for increasing solar adoption. For example, thanks to the project successes thus far Salt Lake County is developing a 2.6-MW solar-PV installation on the roof of the Salt Palace Convention Center. This project will more than double the amount of installed solar PV capacity in Utah and is slated to be one of, if not the largest, roof-top solar PV installation in the country. Additionally, the installed solar PV capacity in Salt Lake City and Salt Lake County has tripled since 2007 thanks, in part, to improvements to net metering and interconnection standards.

## Top Takeaways

- Engage multiple diverse partners to demonstrate broad interest and commitment to goals, while also leveraging resources and fostering creative solutions and innovative opportunities.
- Work with the utilities and utility regulatory agencies as much as possible to get an understanding of the perceived barriers to solar and the possible solutions to overcome them within the utility regulatory arena.
- Use consistent messaging, verifiable information, and reputable analyses to dispel misconceptions and help facilitate a more informed dialogue about solar energy.
- Use workshops and trainings to effectively reach targeted audiences and improve the acceptance and understanding of solar energy across many professions.

## Next Steps

As the Solar Salt Lake Project team continues with its Phase II project efforts, the focus remains on removing the financial barriers to adopting residential and commercial solar, which will encompass the following activities:

- Continue working towards the goal of 10 MW of solar installations by 2015.
- Implement replicable financing structures for local governments, residential, and commercial sectors.
- Work with state and local governments, churches, and schools to replicate Salt Lake County's innovative financing structure using third-party financing.
- Explore the expansion of Rocky Mountain Power's utility pilot solar PV incentive program and other solar incentive programs. Currently Rocky Mountain Power's incentive program is set to expire, and the Solar Salt Lake team is attempting to have the program expanded.
- Provide outreach and education to targeted stakeholders and Utah's building community to continue to remove barriers and increase awareness of the value of solar energy to Utah.
- Serve as a model for other cities and jurisdictions in Utah and nationwide that wish to address financial and regulatory barriers to solar deployment.

## Additional Resources

- Solar Salt Lake Website: [http://solaramericacommunities.energy.gov/solaramericacities/salt\\_lake\\_city/](http://solaramericacommunities.energy.gov/solaramericacities/salt_lake_city/)
- Salt Lake County Green: [www.green.slco.org/](http://www.green.slco.org/)
- Utah Clean Energy: <http://utahcleanenergy.org/>
- Kennecott Land Daybreak: [www.kennecottland.com/daybreak](http://www.kennecottland.com/daybreak)
- Utah State Energy Program: <http://geology.utah.gov/sep/>
- Utah Governor's Office of Economic Development: <http://business.utah.gov/>
- Utah Solar Energy Association: [www.utsolar.org/](http://www.utsolar.org/)

### For more city information, contact:

Sara Baldwin, Utah Clean Energy Email: [slcgreen@slcgov.com](mailto:slcgreen@slcgov.com) Telephone: 801-535-6540

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/](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/](http://www.solaramericacommunities.energy.gov/solaramericacities/action_areas/)

Ann Arbor Austin Berkeley Boston Denver Houston  
 Knoxville Madison Milwaukee Minneapolis-Saint Paul  
 New Orleans New York Orlando Philadelphia Pittsburgh  
 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)

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

**EERE Information Center**  
 1-877-EERE-INFO (1-877-337-3463)  
[www.eere.energy.gov/informationcenter](http://www.eere.energy.gov/informationcenter)

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 10% post consumer waste.

Prepared by the National Renewable Energy Laboratory (NREL) NREL is a national laboratory of the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Operated by the Alliance for Sustainable Energy, LLC

DOE/GO-102011-3218 • October 2011