



IS HOUSTON SOLAR READY?

*A review of Solar Energy Implementation in
the City of Houston*

Collaborative report:

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ACKNOWLEDGMENTS

On behalf of Richard Hunton Jr, Chair, and the Board of Directors of the U.S. Green Building Council-Texas Gulf Coast Chapter I am pleased to present the chapter's first collaborative report in its research and publication series. This publication and press event represents a transformation in local USGBC programming to become a leading resource for organizations to work together to create answers to pressing issues related to the built environment.

It is our sincere hope that this effort continues and the chapter remains a vibrant organization that can bridge industry knowledge with community solutions for better built environments along the Texas Gulf Coast.

It is important to recognize our collaborative organizations, members and committed stakeholders. Without them, this launch would never have occurred or been successful.

Thank you very much for all you do everyday to build a better community for us.

Lora-Marie Bernard

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IS HOUSTON SOLAR READY?

A review of Solar Energy implementation in the City of Houston

At USGBC we aim to serve as a window to present the current status of solar energy deployment in the City of Houston, showcase up to date information directly from governmental, non-governmental and private organizations that have contributed in its implementation. This review serves as a tool to implement our research initiative among the chapter through the production of a "COLLECTION Series guides", which is aimed at all those involved in the process of procurement, design and construction of the green built environment in the Texas Gulf Coast Area. These guides should stimulate fundamental change in green practices by providing information on particular technologies and practices, showcasing LEED awarded examples in the region and providing specific guidance of practices in relation to the LEED rating system.

During the past decade, the City of Houston has seen solar energy rapidly growing from an emerging to a mainstream technology that ranges from small scale on-site electricity installations to large scale solar plants. Today, the city's solar energy integration in buildings offers a much more mature market, with available federal and local tax incentives, a swift permitting process and state legislation that sets the technology as an economically viable option in the energy market. The growth of available products has lowered technology prices and the option to sell excess power to the grid offers financial tools particularly favourable for the residential sector.

While conditions in Houston are ideal for solar panels on low-rise commercial buildings, residential solar installations are more prevalent. Centerpoint Energy reports a total installed capacity of 3,490 Kw from on-site solar energy sources connected to the grid by 2012. From this number 55 percent corresponds to 575 residential installations while the remaining 45 percent represents 54 non-residential installations. As commercial energy use is significantly greater per building, so the potential for solar energy deployment will be equally greater in this sector throughout the city. However, the incorporation of renewable energy in this sector has been relatively minimal. Currently, initial investment, financial plans and local tax incentives affect the viability of commercial installations.

Our results show that additional financial incentives, further research and education are needed to encourage investment among the commercial and other sectors.

In our view, Houston is solar ready among the residential sector and we applaud the successful individual initiatives, primarily driven by strong commitment to sustainability missions, which are showing positive results.

Angela Bejarano BArch, MSc.
Research Manager
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SOLAR HOUSTON INITIATIVE

The City of Houston constantly strives to keep solar at the forefront of its sustainability vision, striking a balance between increasing market growth and decreasing regulatory barriers. With existing installations at the George R. Brown Convention Center, City Hall Annex, Discovery Green, and most recently, the Houston Permitting Center, the City is a test bed for solar technologies. The Green Building Resource Center provides leadership and education and shows real-time energy production of its rooftop solar panels. This center provides valuable resources to better inform the public when they are ready for solar and citizens are able to learn what system works best in this climate and location.

The City's 5-Star Program is a creative way to couple renewable energy systems and energy efficiency projects. The 5-Star Program "sustainably" reinvests in Houston's historic neighborhoods. Builders receive incentives to build energy efficient homes and add photovoltaics and solar thermal as upgrades to these newly completed homes. On the regulatory side, funded by the DOE's SunShot Rooftop Solar Challenge grant, the City worked with HARC on streamlining and refining the solar permitting process. With the support of some federal grant funding, the City will be working on promoting market readiness of solar technologies. Grant funding will be used to make installing rooftop solar photovoltaic easier, faster, and cheaper for homeowners and businesses by implementing streamlined and standardized processes that will dramatically improve local market conditions. The City is also keeping track of legislation relating to solar, supporting bills such as PACE (Property Assessed Clean Energy) financing that help property owners break down the financial barriers to installing renewable energy projects.

The City has explored potential ideas that would keep the market moving forward, including ICLEI's Solar Benefit program. This idea would reduce the complexity and cost of residential solar through a collective group discount program. The program would reach the residential sector via targeted outreach through employer organizations in Houston. The City of Houston is considering offering this solar program to City staff.

In the commercial sector, there are companies that are implementing solar projects as a testament to their corporate

sustainability mission. The City wants to bring recognition to those Houston companies, such as IKEA and Smith and Associates, and celebrate their dedication to leading the charge in the private sector. Other companies, such as NRG, are providing more affordable solutions for residential solar by offering a solar lease program to their customers.

The City understands the need for clean, renewable energy is not only to improve the environment but also to offer more reliability during times of extreme weather events. Using grant funding, 17 mobile solar-powered shipping containers/generators (SPACE units) were acquired through a partnership with the University of Houston Green Building Components Program and placed at fire stations, parks, neighborhood centers and schools. The generators are designed for emergency relief efforts during hurricanes or cooling centers during times of extreme heat. When not being used in an emergency, they are used year-round for services, outdoor classrooms or to educate the public and bring awareness to solar projects.

As the market for solar matures, the City of Houston will continue to present creative renewable energy programs and offer support and resources to those who are solar ready.

The City is also a leader in purchasing renewable energy credits. It is the largest purchaser of renewable energy in the nation. Currently, green power accounts for 35% of the City's electricity usage with a goal of achieving 50% in 2013. The City's commitment to green power is setting an example for homeowners and businesses in Houston.

Laura Spanjian
Sustainability Director
City of Houston

SOLAR HOUSTON INITIATIVE AND THE HOUSTON'S PARTICIPATION IN THE DOE ROOFTOP SOLAR CHALLENGE

The City of Houston is committed to achieving a sustainable solar infrastructure. In 2008, Houston was named a United States Department of Energy (DOE) Solar America City. As a Solar America City, Houston teamed with the Houston Advanced Research Center (HARC), Sandia National Laboratory (Sandia), industry, and academia, to implement the Solar Houston Initiative and prepare the Solar Houston Plan. The Solar Houston initiative was focused on identifying and overcoming barriers associated with establishing a solar infrastructure that is incorporated into the City of Houston's overall energy plan. A broad group of Houston area stakeholders, facilitated by HARC, came together to develop a comprehensive solar plan that went beyond technology to address barriers and establish demonstrations, public outreach, education programs and other activities.

Through the support of the DOE SunShot Rooftop Solar Challenge (RSC) grant to the Texas Collaboration (San Antonio, Austin, and Houston), Houston has been able to implement several of the recommendations of the Solar Houston Plan, including:

- Continued coordination with the local transmission and distribution utility (CenterPoint) and retail electric providers (REP).
- Identification of opportunities to improve permitting and interconnection.
- Providing training on PV systems to City inspectors.
- Educating the public by continuing outreach.
- Evaluating methods of addressing financial barriers to residential solar
- Maintaining www.solarhoustontx.org.
- Continuing meetings with stakeholders to get ongoing feedback from the solar community on their needs.

There are many exciting things happening for solar in Houston. NRG is rolling out a new residential solar lease program. That program, bundled with the PV buyback programs offered by the retail electric provider subsidiaries Green Mountain Energy and Reliant Energy (the largest REP in the Houston area) offer customers new cost effective financing mechanisms for residential PV. In addition, new companies, such as SpearPoint Energy have begun marketing commercial lease and PPAs to the commercial market in the Houston area. Inspectors and others in the community have had the opportunity to complete both the DOE on-line PV inspector training and have had the opportunity to be trained in person, best practices for PV installations to increase efficiency and safety. The inspectors present at the code official training were introduced to the Solar ABCs permitting process template for typical installations. We hope that this momentum can continue going forward.

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SUSTAINABLE ENERGY AT HOUSTON COMMUNITY COLLEGE

The recognition of climate change throughout the world has led to a new paradigm shift. We have realized the importance of renewable energy, and the training of a new workforce to lay the infrastructure for a sustainable future.

We at Houston Community College Central are developing a new Solar Certificate program in conjunction with our HVAC (Air Conditioning) course. We are on schedule to have this course available in the fall of 2013. It will include solar safety, installation, troubleshooting and home weatherization. Solar is used in many areas including Oil and Gas and of course in the home. We are not alone in this endeavor as many other colleges and universities have taken up the challenge.

This course will be the beginning of our sustainable energy program. As we move forward we at HCC have planned to offer Geo-Thermal and Wind Turbine programs.

Indeed we are including sustainable energy in many of our workforce programs. For example, we are researching with other colleges how to use the waste oil from our culinary program to convert to Diesel fuel. Also, our Interior Design program is promoting the use of recycled products and making sustainable energy part of their certificate program. In our Construction Trades Division, we are training our faculty in LEAN manufacturing principles, thus educating our students to understand how important LEAN is to industry. Indeed, LEAN principles are used in many other areas such as Building Infrastructure Management, Enterprise Management and Culinary Arts. According to James P. Womack, Daniel T. Jones, and Daniel Roosin (1990) in their book "The Machine That Changed the World" they provided a comprehensive description of the entire lean system. They documented its advantages over the mass production model pioneered by General Motors and predicted that lean production would eventually triumph. Indeed, they argued that it would triumph not just in manufacturing but, in every value-creating activity from health care to retail to distribution. Toyota created and used this to create real and truly sustainable value for their customers, their employees, and their owners. LEAN is the reduction of waste. To achieve this, a company must look at what creates value and eliminate all other activities. Therefore, it is common sense to promote sustainable, renewable energy. Be proactive, invest now to sustain, and indeed have a livable planet for the current and future generations.

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