

Reaching for the Sun



How San Antonio and Austin
Are Showing that Solar Is a Powerful
Energy Option for Texas



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Cover photo: A rooftop solar installation in Austin. Photo courtesy of Meridian Solar.

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Executive Summary

Texas has the nation's greatest potential for solar energy. "Going solar" is a smart solution for Texas—it reduces our reliance on fossil fuels, curbs air pollution, saves water, creates local jobs and keeps money in the local economy.

Austin and San Antonio are showing how Texas can expand the use of solar energy and reap the benefits. **The electric utilities in San Antonio and Austin have installed four times more solar photovoltaic (PV) capacity than the rest of Texas combined.** The solar policies adopted by these cities and their municipal utilities provide a strong example for how the rest of Texas can reach its solar energy potential.

Solar energy benefits Texas' environment and economy.

- Greater use of solar energy can help reduce the need for coal and

natural gas power plants that cause air pollution, contribute to global warming, and use water for cooling.

- Solar power can save money for consumers. For example, a recent study by the operator of Texas' electricity grid shows that the most cost-effective way to meet the state's growing need for electricity on the hottest summer days is to add solar and wind energy generating capacity rather than natural gas-fired power plants.
- Texas' growing market for solar energy has helped attract solar energy companies, such as Austin-based Heliovolt and OCI Solar Power, which intends to open its headquarters in San Antonio.

Solar energy installations supported by Austin and San Antonio’s municipally owned electric utilities account for more than 85 percent of the solar energy capacity supported by all electric utilities statewide.

- CPS Energy, which serves San Antonio and surrounding areas, reports solar energy installations of 52.6 megawatts (MW), nearly half of all the solar energy capacity supported by utilities in Texas.
- Austin Energy has supported the installation of 41.3 MW of solar energy capacity, 38 percent of all utility-supported solar power in the state. (See Figure ES-1.)
- Measured in terms of installed solar energy per customer account, Austin Energy has 0.099 kilowatts (KW) of solar energy generation per customer

account and CPS Energy has 0.073 kW per customer account. El Paso Electric is a distant third with 0.005 kW of installed solar energy per customer account, followed by Oncor with 0.003 kW of solar capacity per customer account.

- Among municipalities, San Antonio leads the state with 42.6 MW of solar energy capacity installed within its city limits. Webberville, northeast of Austin, ranks second, thanks to a utility-scale solar project supported by Austin Energy. A project supported by San Antonio-based CPS Energy places nearby Somerset third. Austin itself has solar photovoltaic capacity of 6.5 MW. In contrast, Dallas, with 50 percent more residents than Austin, has installed just 1.2 MW. (See Figure ES-2.)

Figure ES-1. Utility-Supported Solar Power by Utility

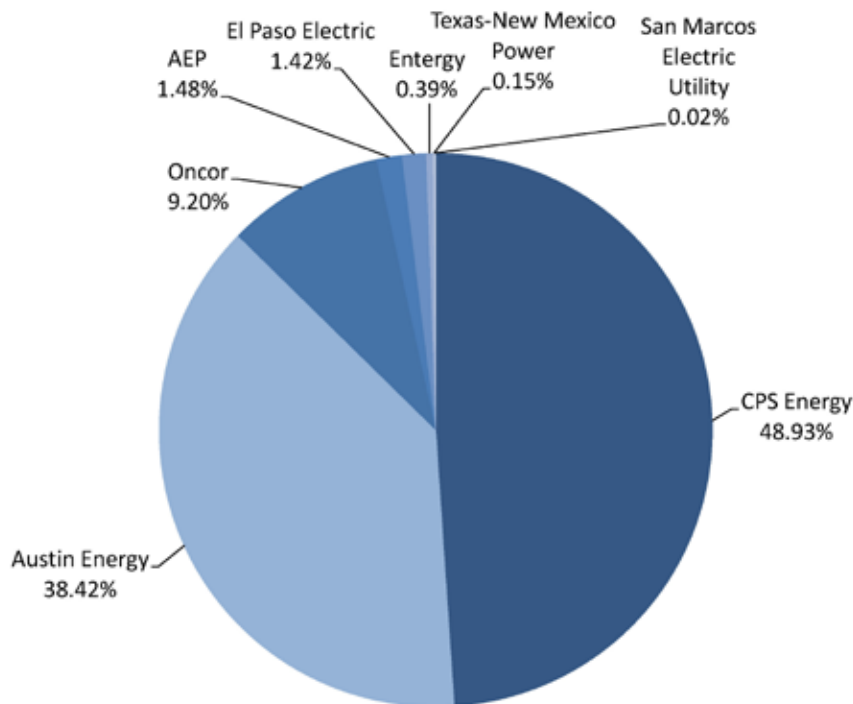
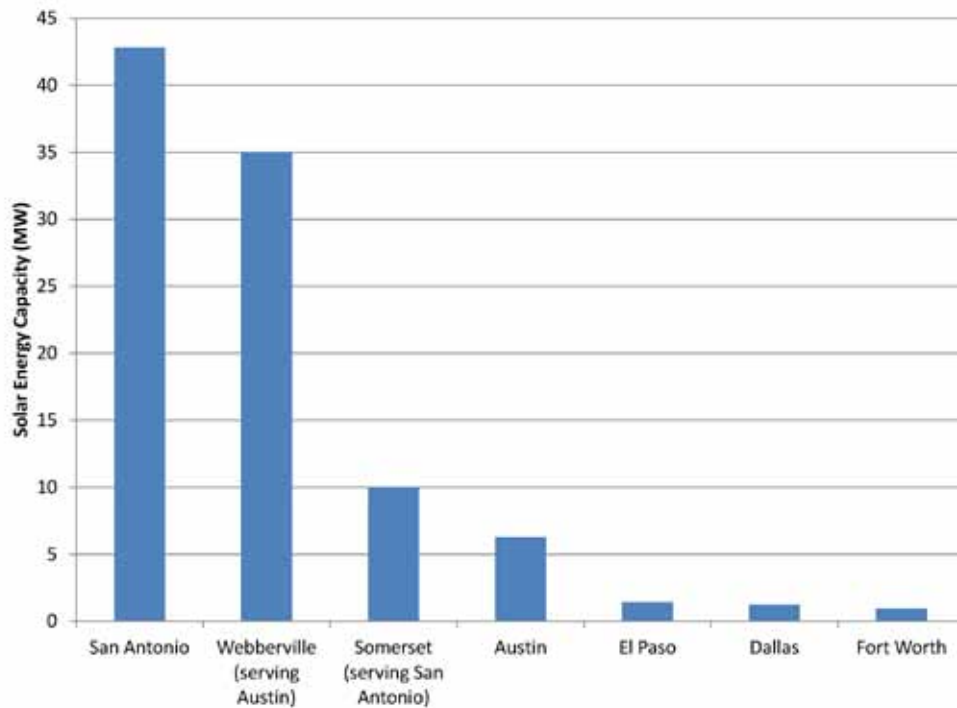


Figure ES-2. Utility-Supported Installed Solar Power by City*



Austin and San Antonio are leading Texas in solar energy because they have adopted strong policies that encourage solar power on residences and businesses, and in utility-scale installations.

- Municipal utilities in Austin and San Antonio have set high, solar-specific goals in their plans to adopt renewable energy and diversify their energy resources.
- Utility customers in these two cities have had consistent access to solar energy incentives and loan programs, which help defray the up-front costs of solar energy projects.
- Austin and San Antonio have long-term plans to finance solar development and to attract solar companies to their regions.

In order to achieve the growth in solar power that Austin and San Antonio have experienced, Texas should implement policies that promote the adoption of solar power.

- Statewide, Texas should strengthen its renewable portfolio standard by including a goal of building 4,000 MW of solar energy capacity by 2020. The state should require utilities to meet that goal, in part, by installing solar PV panels on 250,000 rooftops.
- Texas should adopt statewide standards to ensure that homeowners and small businesses are fairly compensated for the excess solar electricity they generate and supply to the grid.
- The state should update its Property-Assessed Clean Energy (PACE) financing legislation to enable lenders to offer commercial and residential property owners a secure long-term financing option for solar PV systems.

* Houston is not on this list because it is served by CenterPoint Energy, which does not offer any incentives for solar energy. The 2.25 MW of solar energy installed in Houston were installed without utility support.

Introduction

Texas is a global leader in renewable energy. Our state ranks first in the nation for the amount of electricity it generates from wind power, with twice as much installed capacity as second-place California.¹ Spurred by the state's ample wind resources and policies that encourage construction of wind farms, utilities and private investors have more than doubled the state's installed wind capacity in just the past five years.² This wind energy helps reduce pollution from electricity generation, produces electricity without further straining the state's water supplies, and protects consumers from the volatile price of fossil fuels.³

But while Texas has been quick to reap the benefits of wind energy, we have been slower to tap our tremendous potential

for solar energy. The Lone Star state ranks number one in the United States for solar energy potential, but only 13th for installed solar energy capacity.⁴ That means Texas has less solar energy capacity installed than smaller and less sunny states like New Jersey and Massachusetts.

There are parts of Texas, however, that are showing how the state could achieve leadership in solar energy. San Antonio and Austin, working with their electric utilities, have embraced solar energy by directly investing in large-scale solar energy production and by offering supportive policies and financing for residents and businesses to install solar panels. Hundreds of customers in those two cities now generate clean power for

themselves and their neighbors. Demand for solar equipment has created steady business for contractors who install solar panels, solar energy companies have opened new offices and hired more staff, and customers with solar panels have experienced lower power bills. At the same time, San Antonio and Austin

customers continue to enjoy lower than average electricity prices compared to the customers of other large utilities.⁵

Texas has the potential to reap similar benefits statewide if it makes the same commitment to solar energy—putting the state on a pathway to a cleaner, healthier and more economically vibrant future.

Solar Energy Is Good for Texas

Solar power is a smart energy option for Texas—it uses a resource that is plentiful in Texas while reducing air pollution and lowering costs for Texas consumers.

Texas has tremendous solar energy potential. (See Figure 1.) The National Renewable Energy Laboratory estimates that Texas has the space to install more than 20,000 GW of utility-scale solar energy generation and 60 GW of distributed solar energy on rooftops.⁶ That amount of solar generation could produce more than 100 times the electricity consumed each year in Texas.⁷

Solar Energy Is Good for Public Health and the Environment

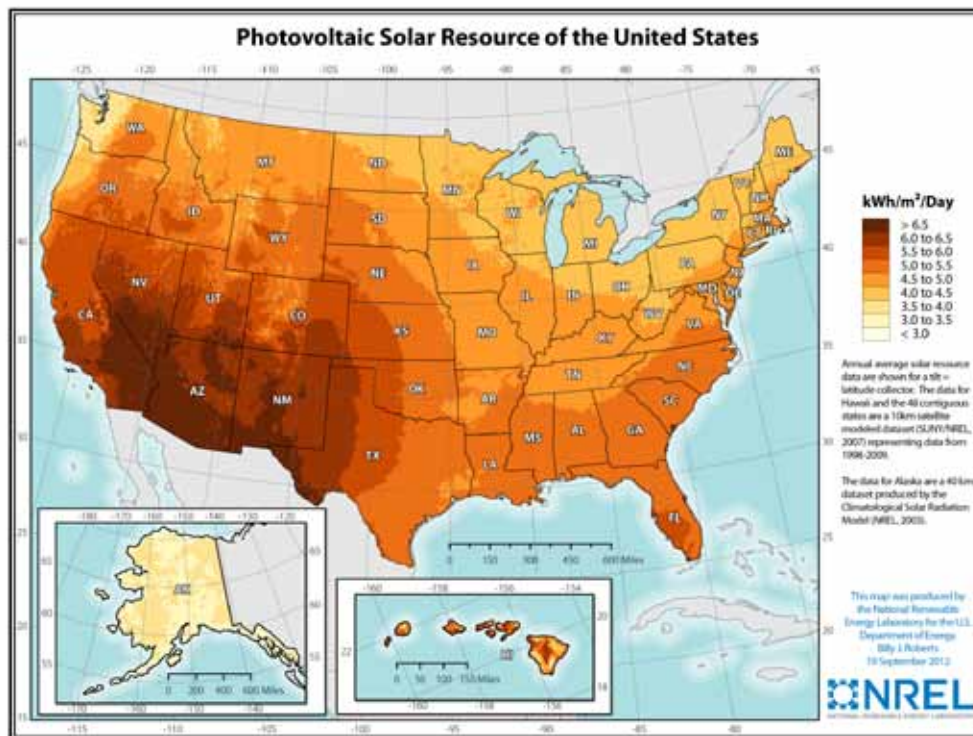
Producing electricity from solar energy is a clean alternative to electricity

from coal and gas, protecting Texans' public health and the environment.

Coal and gas accounted for 82 percent of Texas' electricity generation in 2010.⁹ Combustion of these fossil fuels releases dangerous compounds into the atmosphere, endangering the public and threatening the health of our climate in dramatic and irreparable ways.

- Burning coal and natural gas to produce electricity released 204,000 metric tons of nitrogen oxides in Texas in 2010.¹⁰ Nitrogen oxides are a primary component of smog, and low levels of smog inhaled over the long term can cause and aggravate a host of health problems, especially lung problems and cancer.¹¹
- Texas power plants released 430,000 metric tons of sulfur dioxide in 2010.¹² Sulfur dioxide is the primary component of acid rain, which can devastate forests and lakes, and

Figure 1. Texas Has the Highest Solar Energy Potential in the Nation⁸



sulfur dioxide in fine particulate form threatens human health.¹³

- In 2010, Texas power plants released more than 251 million metric tons of carbon dioxide, the leading global warming pollutant.¹⁴ Extreme weather events, such as the current drought in Texas, are projected to become more common in the future if we fail to reduce global warming pollution.¹⁵ The drought in 2011 alone killed as many as 500 million trees in Texas—one threat on a long list of environmental damages Texas will face if it does not act to reduce its combustion of fossil fuels.¹⁶

In addition, coal, natural gas and nuclear power plants require huge volumes of water for cooling. Water withdrawals for power plant cooling systems account

for 40 percent of freshwater withdrawals nationally.¹⁷ Some of that water evaporates, leaving it unavailable for future local use, while the rest is returned to the source—albeit at a much higher temperature that damages aquatic ecosystems.

Adopting clean solar energy and transitioning away from dangerous fossil-fuel based energy sources will help protect the people and environment of Texas.

Solar Energy Is Good for Consumers and the Economy

Installing more solar power would deliver cost savings for consumers, while boosting local economic activity. According to a report by the Brattle Group for the Solar Energy Industries Association, Texas consumers could pay lower electricity costs if more solar energy

were brought online.¹⁸ The Brattle Group estimated that if an additional 1,000 MW of solar energy had been online in Texas during the very hot summer of 2011, the average wholesale electricity price would have dropped by \$0.6 per megawatt-hour (MWh)—saving \$520 million for customers across the state.¹⁹

In Austin and San Antonio, which lead the state in solar energy capacity, electricity prices are lower than the average price paid by customers of Texas' other largest electric utilities—companies that have invested little in solar energy.²⁰

Solar PV systems generate electricity even when water supplies are limited, helping to ensure adequate electricity at a reasonable price is available to consumers even during drought. The ongoing drought in Texas led the Electric Reliability Council of Texas (ERCOT), operator of the state's power grid, to warn in late 2011 that up to 3,000 MW of capacity might be unavailable if water supplies dropped below the levels needed by power plants for cooling.²¹ The loss of this amount of capacity would raise prices and potentially trigger rolling blackouts with widespread economic impacts.

In addition, output from solar energy facilities is greatest when demand for power is highest—on hot, sunny afternoons when air conditioners are

running full blast. Even without drought conditions, Texas is facing increasingly constrained power supplies during times of peak demand. ERCOT warns that Texas does not have enough generating capacity to be fully confident of avoiding rolling blackouts this coming summer on the hottest days.²² Solar energy is well suited to meet this need. Furthermore, a recent analysis by ERCOT suggests that adding wind and solar energy generating capacity to meet peak power demand would result in lower electricity prices than would adding natural gas-fired power plants.²³

Texas' ample solar resources—and therefore potentially large market—have enabled the state to attract several solar manufacturing companies. The presence of producers of solar energy equipment, like Fort Worth-based Entech and Austin-based Heliovolt, helps support the local economy.²⁴ Another solar energy company, OCI Solar Power, recently committed to moving its headquarters to San Antonio and building manufacturing facilities in the city, creating hundreds of jobs.²⁵

Solar is a good choice for the people of Texas and the environment. Two cities, Austin and San Antonio, are leading Texas on the path to harness this solar energy potential.

Austin and San Antonio Outstrip Other Texas Cities in Solar Energy

In the past three years, the municipal utilities in Austin and San Antonio have supported the installation of four times more solar energy capacity than all other utilities in Texas combined. A strong commitment to solar energy by the utility companies in both cities has led to extensive development of distributed and utility-scale solar projects.

Total Capacity by Utility

Solar energy projects supported by publicly owned utilities based in San Antonio and Austin account for more than 85 percent of all the utility-supported solar energy capacity in Texas.²⁶ CPS Energy, the publicly owned utility that serves San Antonio and surrounding areas, reports 52.6 MW of

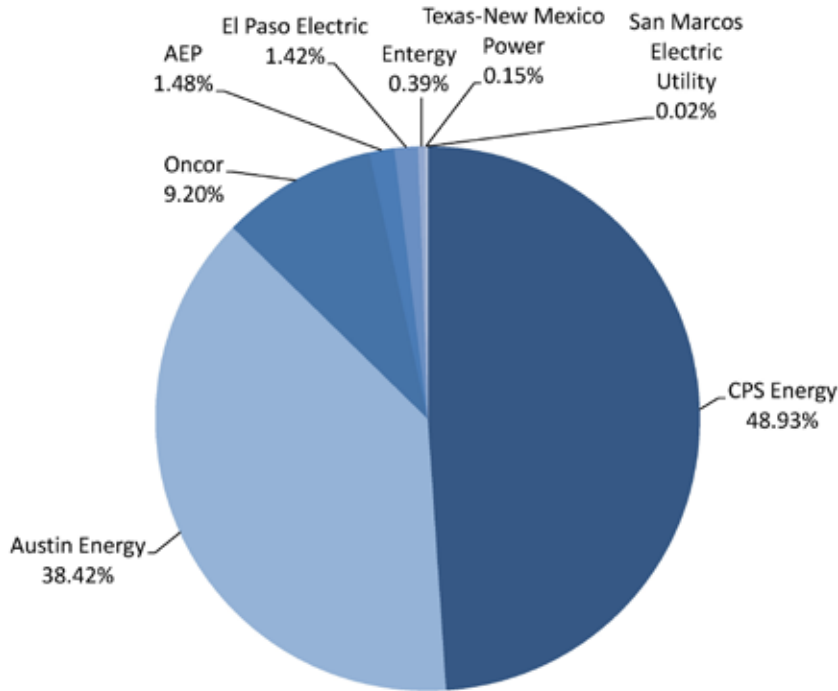
solar power capacity that it helped install in its service territory, while Austin Energy has 41.3 MW. A total of 107.5 MW of solar power has been installed statewide with support from utilities. (See Figure 2.)

Oncor, the utility serving Dallas, Fort Worth and other areas, is a distant third to CPS Energy and Austin Energy, with 9.89 MW of solar power.

Total Capacity Per Customer Account

On the basis of installed solar energy per customer account, Austin Energy has 0.099 kW per customer account and CPS Energy has 0.073 kW of solar capacity per customer account.²⁷ El Paso Electric is a distant third with 0.005 kW

Figure 2. Utility-Supported Solar Power by Utility



of installed solar energy per customer account, followed by Oncor with 0.003 kW of solar capacity per customer account. (See Table 1.)

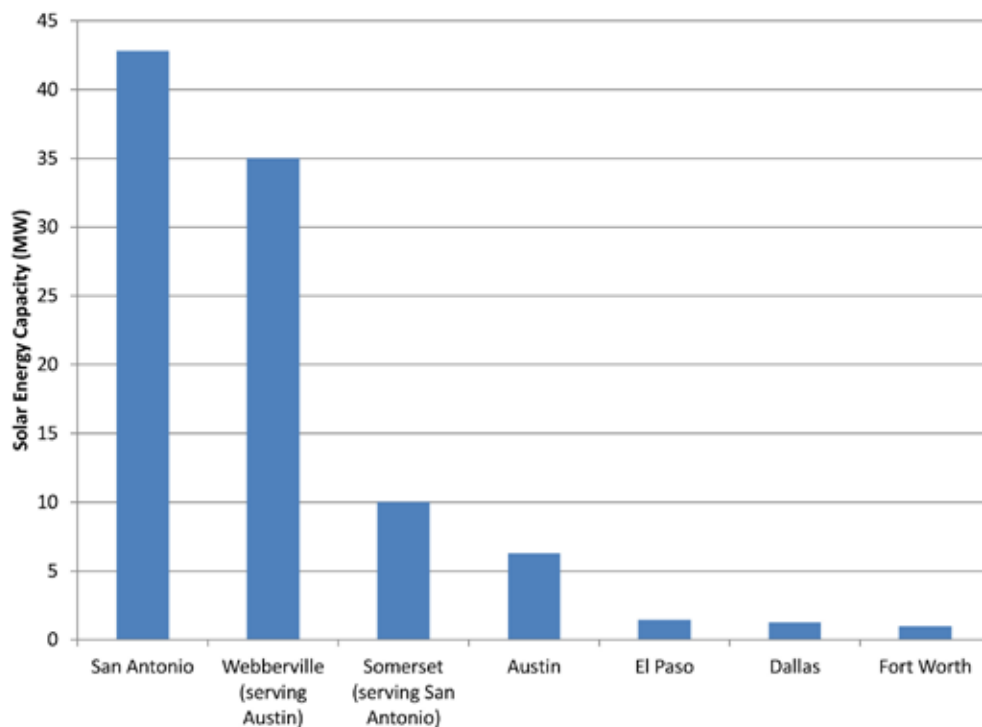
Table 1. Utility-Supported Solar Energy Capacity Per Customer Account²⁸

Utility	kW Solar Energy Per Customer Account
Austin Energy	0.099
CPS Energy	0.073
El Paso Electric	0.005
Oncor	0.003
AEP	0.002
Entergy	0.001
San Marcos Electric Utility	0.001
Texas-New Mexico Power	0.001

Total Capacity by City

San Antonio has 42.6 MW of solar energy capacity within its city boundary. The Webberville solar energy project supported by Austin Energy places Webberville second on the list of cities with the most solar capacity, followed by Somerset, home to a CPS Energy solar power project. Austin is fourth and El Paso is fifth with 1.4 MW. Dallas, with 50 percent more residents than Austin, has installed just 1.2 MW. (See Figure 3.)

Figure 3. Utility-Supported Installed Solar Power by City*



Utility-Scale Capacity

Austin and San Antonio excel in both distributed solar energy and utility-scale projects. Distributed solar power may be installed on the rooftops of homes, businesses, warehouses, schools and municipal buildings, generating electricity close to where it is consumed. Utility-scale projects typically are built on open land and are much larger.

Austin and San Antonio have invested in both distributed and utility-scale solar energy projects, while other utilities in the state have supported distributed solar projects only. (See Table 2.)

More than 800 distributed generation projects have been completed with

support from CPS Energy in the past three years, while Austin Energy has completed more than 1,000.

Austin Energy has one utility-scale facility, the 35 MW solar facility in Webberville, which has provided power since December 2011.²⁹ CPS Energy buys energy from the 14 MW Blue Wind Solar Project, developed by Duke Energy in 2010. The utility also has a 25-year agreement with SunEdison to purchase all of the electricity produced by the 19.8 MW William R. Sinkin Centennial Solar Farms 1 and 2, completed in June 2012, and the 10 MW Somerset Solar Farm.³⁰ There are no other utility-scale solar projects in Texas.

* Houston is not on this list because it is served by CenterPoint Energy, which does not offer any incentives for solar energy. The 2.25 MW of solar energy installed in Houston were installed without utility support.

Both utilities are planning to expand their solar energy capacity in coming years. According to its strategy report, Austin Energy is purchasing and leasing land—and even leasing rooftop areas on warehouses and retail outlets with flat roofs—in order to reach its goal of 200 MW of solar energy by 2020. These plans include another 30 MW from a proposed solar power plant in Saragosa (in West Texas), a proposed 75 MW solar plant in Toyah (also in West Texas), 40 MW from the proposed Round Mountain Hybrid solar and wind plant (west of Austin), and 25 MW from rooftop and community solar installations.³¹



The Webberville Solar Farm supported by Austin Energy has been producing electricity since December 2011.

Photo: RES Americas

To continue to build its solar portfolio, CPS Energy signed a 25-year agreement with OCI Solar in July 2012, beginning a 400 MW solar project that has the potential to make Texas one of the nation’s top states for solar energy.³² This project, involving a number of solar power projects to be developed across the state, will produce enough energy to power 70,000 San Antonio homes.³³ Some of these installations will be as distant as West Texas, but they are being driven by

CPS Energy policies.³⁴ The project will also help San Antonio meet its goal of creating a solar energy industry in the city, bringing 805 jobs to San Antonio with the location of OCI’s corporate headquarters and a manufacturing facility to produce PV modules, trackers and inverters in the city.³⁵

Table 2. Distributed Versus Utility-Scale Solar Projects

Utility	Utility-scale (kW)	Distributed (kW)
CPS Energy	43,800	8,815
Austin Energy	35,000	6,312
Oncor	0	9,889
AEP	0	1,593
El Paso Electric	0	1,525
Entergy	0	416
Texas-New Mexico Power	0	162
San Marcos Electric Utility	0	19

Austin and San Antonio Lead Texas Because of Strong Solar Energy Policies

Austin and San Antonio have achieved high levels of solar energy by setting goals and adopting policies to facilitate the growth of solar power. Solar capacity elsewhere in Texas is much lower because the state has relatively limited policies to promote solar energy.

Policies of Austin and San Antonio Promote Utility-Scale and Rooftop Solar Energy Development

Strong public policies have driven the development of solar energy in Austin and San Antonio. These local policies include a significant solar energy goal,

fair payment to customers for solar energy they generate, and solar rebate and loan programs to reduce the up-front costs of solar power.

Renewable Electricity Goals with a Meaningful Solar Requirement

The publicly owned utilities in San Antonio and Austin have set aggressive goals for the adoption of renewable energy, including goals to obtain significant portions of their electricity from solar power.

In 2007, the Austin City Council passed a resolution that set a renewable electricity goal of 30 percent by 2020, with 100 MW of that power coming from solar

energy. Since 2011, Austin Energy has increased these targets beyond the goals of the Austin City Council’s resolution—to 35 percent renewable energy by 2020 and 200 MW of solar development by 2015.³⁶ More recently, the Austin Local Solar Advisory Committee recommended that Austin Energy increase its solar energy requirement to 400 MW by 2020, including 200 MW of solar energy within Austin city limits.³⁷

CPS Energy, the municipal electric utility that serves the greater San Antonio area, has set similarly ambitious goals for the adoption of solar energy. CPS Energy has adopted a goal of using renewable energy to meet 20 percent of its electricity demand by 2020, with at least 100 MW of energy derived from non-wind renewable sources.³⁸ In addition, the utility seeks to attract businesses to San Antonio that will create jobs and spur the development of clean energy in the city.³⁹ Solar energy development plays a large role in this initiative.

Fair Payment to Customers for Solar Energy They Generate

Most rooftop solar power systems produce more electricity during the middle of the day than the building consumes. The solar panels feed that excess power into the electricity grid for distribution to other consumers. Austin Energy and CPS Energy have adopted policies to compensate the owners of solar PV systems for the excess solar energy they generate. Such compensation is a critical incentive for the widespread installation of small-scale solar energy projects.

One approach is net metering, in which the utility credits a customer’s account for electricity sent into the grid. Texas is one of only seven states without a statewide net metering requirement—it is left to the utility or retail electricity provider



A solar energy system installed on the roof of a house in San Antonio with the help of CPS Energy.

Photo: Solar San Antonio

to decide whether to offer a net metering program to its customers.⁴⁰ According to a 2011 survey, some form of net metering is available through only four of Texas’ 47 retail electricity providers, 24 of Texas’ 80 electric co-ops, and five of the state’s 74 municipal utilities—including Austin Energy and CPS Energy.⁴¹

Customers of CPS Energy can participate in the utility’s net metering program. CPS Energy meters how much electricity a customer withdraws from the grid versus supplies into the grid from the customer’s PV panels. The utility calculates the net amount the customer withdraws from the grid. If the customer consumes more than the PV panels generate, the utility charges just for net consumption.⁴² In the event that the customer’s solar energy installation generates more electricity in a month than the customer consumes, CPS Energy purchases the excess power for \$0.015 to \$0.025 per kWh.

In the early years of its solar programs, Austin Energy offered net metering for its customers with renewable energy systems, including solar PV.⁴³ Now it offers a value-of-solar payment that accounts for the system-wide benefits of solar energy.⁴⁴

In contrast to net metering, in which customers receive a credit on their power bill for excess electricity they generate, the value-of-solar payment allows producers of solar electricity to sell all the solar energy they generate to their utility at a price that reflects the true importance of additional energy to the utility during times of peak demand. Customers then buy from the utility all the electricity they consume, paying the same rate as other customers.

In the middle of the day, when demand for energy peaks, the additional energy provided by customers' PV panels is extremely valuable. Without that solar energy to meet demand, the utility might need to invest in a new power plant or additional transmission capacity to deliver power. Austin Energy's value-of-solar payments to PV system owners factor in the value of these huge avoided costs.⁴⁵ By providing solar energy producers with a source of income, value-of-solar payments drive long term investment in solar development.⁴⁶

Approved by the Austin City Council in June 2012, Austin Energy's value-of-solar program pays residential customers \$0.128 per kWh produced by solar PV systems of a maximum size of 20 kW.⁴⁷ From this program, the owner of a typical solar energy system of 5 kW, which produces 5 to 5.2 MWh of energy over the course of a year, would receive up to \$665 in compensation annually.⁴⁸

Austin Energy's Commercial PV Incentive Program offers an incentive to commercial and multi-family residential customers with up to 200 kW of capacity,

at the rate of \$0.14 per kWh of solar energy.

CPS Energy plans to reinstitute in revised form an incentive program called "Solartricity" that was originally piloted in 2010. The program is scheduled to be re-launched in 2015.⁴⁹

Solar Loans and Rebates for Residential Customers

Loan and rebate programs for solar PV systems offered by utilities can help defray the up-front costs of solar power installation.

To defray the up-front costs of solar installations, Austin Energy offers a loan program to help qualifying residential customers install solar PV systems. A local bank, in partnership with Austin Energy, offers loans of up to \$20,000 for solar PV installations between 1 and 20 kW, to be paid off over the course of 2 to 10 years.⁵⁰ These loans can be used in combination with Austin Energy's solar PV rebates. For solar PV systems between 1 and 20 kW in size, Austin Energy offers a \$2.00 per watt incentive with a limit of \$15,000 per installation and \$50,000 per site.⁵¹

Austin Energy has begun allowing certain non-profit and governmental customers to take advantage of solar leases offered by third parties.⁵² The lease structure helps customers reduce the up-front costs of solar installations while providing the leasor access to available federal tax credits.⁵³ Non-profit customers can lease the solar equipment from a third-party vendor and purchase the equipment after a number of years, giving them time to accumulate savings from the solar installation.⁵⁴ The first solar lease project was approved in Austin in late 2012, for a non-profit called Lifeworks. This 154.4 kW system will

Property-Assessed Clean Energy: An Undeveloped Tool for Financing Solar Projects

Property-Assessed Clean Energy (PACE) financing programs established by local governments allow property owners to borrow money from a specially created fund for clean energy projects. The loan is paid off on property tax bills over a number of years.⁵⁷ Thus, future repayment of the loan is assured, even if the property changes hands. PACE can be a powerful tool for Texas property owners seeking to finance solar power.

Unfortunately, PACE financing programs for residential borrowers are currently on hold nationally due to opposition from the Federal Housing Finance Agency and the mortgage lenders Fannie Mae and Freddie Mac. Many states are moving forward with commercial PACE programs even while residential PACE remains stalled, including three programs in California and one program in Boulder, Colorado.⁵⁸ Texas adopted PACE legislation in 2009, but questions about the legality of how PACE would create new taxing districts and the protests from Fannie Mae and Freddie Mac have prevented programs from moving forward.⁵⁹ Legislation was proposed in January 2011 to clarify PACE in Texas, but this bill failed to pass.⁶⁰

Currently, there are efforts in Texas to make PACE financing viable for commercial properties. Austin and San Antonio have advocated for PACE financing programs in order to make solar energy more affordable for property owners in their cities. In its 2012 strategic plan, the Austin Local Solar Advisory Committee advocates for the passage of legislation to allow PACE financing to move forward in Texas.⁶¹ Other municipalities, such as San Antonio, Houston and El Paso, have expressed interest in developing PACE financing programs.⁶²

produce 253,417 kWh of electricity per year, providing Lifeworks the equivalent of the electricity used by 22 Texas homes over the course of a year.⁵⁵

CPS Energy offers a rebate program to customers who install solar panels on a home, school or business. Depending on the type of customer, CPS Energy offers rebates ranging from \$1.30 to \$2.50 per watt, up to \$25,000 for residential customers and commercial customers who do not use local CPS Energy providers, and up to \$100,000 for schools and commercial customers using local CPS providers.⁵⁶

These loan, rebate and leasing programs tailored to the needs of different customer groups are critical for driving small-scale solar development.

Limited Statewide Policies Have Failed to Spur Solar Energy Growth in Texas

Texas has implemented some statewide policies designed to encourage solar development—such as tax breaks for renewable energy businesses and less regulation of homeowners seeking to install a solar PV system—but these policies have not been enough to drive the spread of solar energy in Texas. Texas does not require utilities to invest in solar power, there is no consistent net metering requirement that would allow solar producers to sell excess energy back to their utilities, and there are no statewide programs to address the high up-front costs of solar energy installation. Policies

in San Antonio and Austin do address these critical concerns—creating a great disparity between solar energy growth in these leading cities and elsewhere in Texas.

Texas Lacks Solar Energy Generation Goals

Texas does not have a solar electricity generation goal. Though the Public Utilities Commission of Texas (PUCT) has the authority to establish a solar energy generation goal as part of the state's renewable portfolio standard, the PUCT has not done so. Texas has a renewable portfolio standard that applies to its investor-owned utilities and is regulated by the PUCT. According to Texas' renewable portfolio standard, investor-owned utilities and retail energy suppliers collectively must obtain 5,880 MW of electricity from renewable energy sources by 2015 and 10,000 MW by 2025, including 500 MW from non-wind renewable energy sources.⁶³ The PUCT has not acted to fully implement the non-wind renewable energy requirement.

Texas has already surpassed its 2025 goal for total renewable energy capacity but, because there is no specific requirement for solar energy, utilities have met the requirement largely with wind energy. Without a specific requirement for non-wind renewable energy, Texas will likely continue to miss out on the unique benefits of solar energy.

Utilities Do Not Offer Effective Programs for Financing Solar

Several utilities in addition to Austin Energy and CPS Energy have provided incentive programs for solar energy, but some have been cancelled and those that remain are less well established than those offered in Austin and San Antonio.

Texas' energy efficiency resource standard mandates that investor-owned utilities meet 20 percent of their growth in demand through savings from energy efficiency. However, utilities are greatly limited in the tools they may use to meet these goals. Programs that support the installation of solar technologies can be credited toward meeting the energy efficiency requirement, spurring some utilities to create loan and rebate programs for solar technologies.⁶⁴ However, utilities have multiple regulatory and financial incentives to focus on energy efficiency measures, causing them to make only limited investments in solar programs.

A number of utilities around the state offer solar rebate pilot programs—such as American Electric Power's SMART Source PV Program, Oncor's Solar PV Program, and El Paso Electric's Solar PV Pilot Program—but others, such as Entergy's program and a program through the Texas-New Mexico Power Company, were discontinued after a few years.⁶⁵ In contrast, the municipal utilities in Austin and San Antonio have well-established rebate and incentive programs as part of their long-term solar strategies.

Other Policies Are Too Modest to Boost Solar Development

Texas has established laws clarifying the regulation of small-scale owners of solar PV systems, providing tax breaks for solar companies, and offering protections for homeowners wishing to install solar energy—but without a strong solar requirement for utilities and financing programs, these smaller policies have proven to be inadequate to support solar growth.

In May and June 2011, the Texas Legislature passed and the governor signed a bill to promote the growth of small-scale solar PV systems by clarifying

the status of “third party” owners of small-scale renewable power. Third-party ownership has opened the doors to solar energy for customers in several states, by allowing customers to lease solar panels that are installed on their roofs by an outside firm. These arrangements often allow consumers to avoid the substantial up-front costs of solar energy. The law, SB 981, clarifies that these owners are not to be regulated like electric utilities. This makes it easier for people engaged in small-scale solar power production to connect a solar PV system to the electric grid.⁶⁶

Texas also provides tax breaks for companies installing solar panels. Renewable energy devices, including solar energy devices, are exempt from property taxes, and renewable energy businesses that work to manufacture,

sell or install renewable energy devices, including solar PV systems, are exempt from the Texas franchise tax.⁶⁷ These tax exemptions make it easier for utilities to attract solar developers to the region, as the municipal utilities in San Antonio and Austin have done.

One additional, recent step that Texas has taken to support solar energy is to enact a law to protect homeowners. Texas law removes barriers to home solar installations by stipulating that property owners’ associations cannot prevent homeowners from installing solar PV systems. According to HB 362, enacted in June 2011, property owners’ associations cannot enact or enforce laws that prevent the installation of solar PV systems.⁶⁸ This law protects the right of Texas residents to install solar power at home.

Policy Recommendations

Solar energy is a powerful solution for Texas. Solar power clears the air, reduces our dependence on fossil fuels, saves water, and fuels local economies. Austin and San Antonio, and their municipal utilities, are leading the way by demonstrating that solar energy is a real option for Texas that can deliver significant benefits to our communities.

The state of Texas should follow the solar “playbook” that Austin Energy and CPS Energy have adopted by implementing a suite of policies that will support development of Texas’ solar energy resource.

Texas should set solar energy goals.

- Texas should strengthen its renewable portfolio standard by including a goal of building 4,000 MW of solar energy capacity by 2020, a requirement that will make solar energy production a significant part of utili-

ties’ energy portfolios. Because most Texas utilities are deregulated, they have limited ability to offer solar energy programs unless the state adopts a solar energy generation requirement. Texas should adopt a new requirement soon, to allow utilities and their customers to take advantage of the 30 percent federal investment tax credit for new solar PV systems, set to expire in 2016.

- Texas should require utilities to reach that 4,000 MW goal in part by installing solar PV panels on 250,000 roofs, which would fulfill approximately one-quarter of the 4,000 MW goal. Distributed solar energy generation produces electricity where it is consumed, and therefore reduces the need for additional transmission infrastructure.

Texas should ensure that financing is available to encourage solar energy development at the residential, commercial and municipal levels.

- Solar energy incentive strategies should include a mix of programs that offset the initial costs of installation, such as solar rebate and loan programs, and programs that reward customers for solar energy production, such as value-of-solar programs.
- Texas should require investor-owned utilities to compensate residential and commercial customers for solar energy they sell into the electrical grid. Net metering or value-of-solar programs ensure that customers receive compensation for the power they provide.
- Texas should revise its PACE program, adopted in 2009, to address ambiguity regarding creation of new tax districts. Once PACE has been revised, local governments should explore PACE financing for commercial properties, which are not stalled by residential mortgage regulators at the federal level.
- Until Texas adopts other policies to support solar energy, the Public Utilities Commission of Texas should allow utilities to continue to implement solar energy as a way to meet their energy efficiency requirements. Unfortunately, a new ruling by the Public Utilities Commission of Texas may endanger these solar incentive programs by capping the amount of money investor-owned utilities can charge their customers for efficiency programs.⁶⁹
- To promote installation of solar energy on school roofs, Texas should establish a funding source to help school districts purchase and install solar energy systems. During the school year, solar energy pairs well with the daily energy needs of schools, which have high demand during the day and very little at night. In addition, if schools are fairly compensated for the energy their solar PV systems generate in the summer months when schools consume essentially no power, the additional revenue could help support school budgets.

Methodology

To assess the impact of policies adopted by electric utilities in support of solar energy, we collected data from major electric utilities in Texas on the distributed and utility-scale solar energy projects they have supported financially. Relevant solar energy projects include those owned by citizens, businesses and energy companies, so long as the solar energy installation was helped by a rebate, net metering, value-of-solar payment, power purchase agreement or other financial support from the utility.

No single source provides information on the solar energy installations helped by utilities in Texas, so we collected our data from several sources.

- We received data on 2010-2011 solar projects funded by Oncor Electric, AEP (which includes Texas Central Company (TCC), Texas North Company (TNC), Southwestern Electric Power Company (SWEPCO)), Entergy, Texas-New Mexico Power Company and El Paso Electric from Galen Barbose of the Electricity Markets and Policy Group at Lawrence Berkeley National Laboratory. Publicly available 2012 data was provided directly by Clean Energy Associates.
- Austin Energy directly provided data on distributed solar projects it has funded as of late October 2012.

We obtained information about Austin Energy's utility-scale project from FRV AE Solar, *Webberville Solar Farm*, downloaded from www.webbervillesolar.com, 1 February 2013.

- Solar San Antonio provided data on solar projects funded by CPS Energy from 2010 through late 2012.
- CenterPoint Energy provided information on solar energy projects in its territory, which includes Houston, from 2007 to mid-2012. Because the projects were not supported by the utility, we did not include this in our tally of utility-supported solar energy.

We reviewed the data in advance of our analysis to ensure we could analyze

it. The only adjustments we had to make were to the extensive data provided by Austin Energy. With that data, we:

- Excluded projects for which there was no data on the size of the solar energy installation in the standard test condition (STC) size rating.
- Excluded projects that failed to list a final inspection date, per guidance from Tim Harvey, Conservation Coordinator with Austin Energy, personal communication, 23 January 2013.
- Assigned each solar project to a city based on its zip code using the U.S. Postal Service's zip code look-up tool at www.usps.com. For the few residential projects that did not show a zip code, we assumed they were located in Austin.

Appendix: Utility-Supported Solar Power for Top 30 Cities

City	Capacity (kW)	Rank
San Antonio	42,615	1
Webberville	35,000	2
Somerset	10,000	3
Austin	6,271	4
El Paso	1,436	5
Dallas	1,243	6
Fort Worth	972	7
Waco	598	8
Grand Prairie	520	9
Round Rock	382	10
Arlington	349	11
Irving	347	12
Bedford	280	13
Sulphur Springs	276	14
Plano	263	15
San Benito	243	16
Allen	233	17
Wichita Falls	198	18
Harlingen	195	19
Big Springs	194	20
Duncanville	190	21
Longview	162	22
Paris	135	23
Carrollton	120	24
Farmers Branch	118	25
Conroe	112	26
Mansfield	108	27
Temple	101	28
Laredo	98	29
Alpine	98	30

Note: Houston is not on this list because it is served by CenterPoint Energy, which does not offer any incentives for solar energy. The 2.25 MW of solar energy installed in Houston were installed without utility support.

Notes

1. National Renewable Energy Laboratory, *Current Installed Wind Power Capacity (MW)*, 25 October 2012.
2. National Renewable Energy Laboratory, *2007 Year End Wind Power Capacity (MW)*, 25 April 2008.
3. Wind energy has suppressed electricity prices, per Public Utility Commission of Texas, *Report to the 81st Texas Legislature: Scope of Competition in Electric Markets in Texas*, January 2009.
4. Solar potential: Anthony Lopez, et al., National Renewable Energy Laboratory, U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis, July 2012. Solar installations: Solar Energy Industries Association, *Solar Energy Facts: Q3 2012*, 11 December 2012.
5. City of Austin and Austin Energy, *Austin Energy Rate Analysis and Recommendations Summary*, 29 August 2011, and U.S. Department of Energy, Energy Information Administration, *Electric Sales, Revenue and Price*, 27 September 2012.
6. Anthony Lopez, et al., National Renewable Energy Laboratory, U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis, July 2012.
7. Solar generation: see note 6. Electricity consumed in Texas: U.S. Department of Energy, Energy Information Administration, *State Electricity Profiles 2010*, 30 January 2012.
8. National Renewable Energy Laboratory, *Solar Maps*, downloaded from www.nrel.gov/gis/solar.html, 2 February 2013.
9. U.S. Department of Energy, Energy Information Administration, *State Electricity Profiles 2010*, 30 January 2012.
10. Ibid.
11. U.S. Environmental Protection Agency, *Nitrogen Dioxide: Health*, downloaded from www.epa.gov/oaqps001/nitrogenoxides/health.html on 7 December 2012.
12. See note 9.
13. Ibid.
14. Ibid.
15. Carolyn Lochhead, "Climate Change: Can We Change In Time?," *San Antonio Express-News*, 26 January 2013.
16. Texas Forest Service, Texas A&M University System, *Preliminary Estimates Show Hundreds of Millions of Trees Killed by 2011 Drought* (press release), 19 December 2011.
17. Brent Barker, "Running Dry at the Power Plant," *EPRI Journal*, Summer 2007.
18. Jurgen Weiss, et al., The Brattle Group for Solar Energy Industries Association, *The Potential Impact of Solar PV on Electricity Markets in Texas*, 19 June 2012.
19. Ibid.
20. See note 5.
21. Electric Reliability Council of Texas, *ERCOT News: October Board Meeting Highlights*, 20 October 2011.
22. Electric Reliability Council of Texas, *Future Electric Outlook Shows Improvement* (press release), 20 December 2012.
23. Electric Reliability Council of Texas, *Long-Term System Assessment for the ERCOT Region*, December 2012.
24. Office of the Governor, *Texas Renewable Energy Industry Report*, July 2012.
25. CPS Energy, *OCI Solar Power* (factsheet), downloaded from www.cpsenergy.com/files/OCI_Solar_Fact_Sheet.pdf, 31 January 2013.
26. Unless otherwise noted, all numbers in the "Austin and San Antonio Outstrip Other Texas Cities in Solar Energy" section are based on calculations from data we collected. See methodology for a complete explanation.

27. Data on utility-supported solar installations by city were obtained as described in the methodology. Data on the customer bases for Austin Energy, CPS Energy, El Paso Electric, Entergy and San Marcos Electric Utility came from U.S. Department of Energy, Energy Information Administration, *Electric Sales, Revenue and Price*, 27 September 2012. The size of Oncor's customer base came from Energy Future Holdings, *Oncor*, downloaded from www.energyfutureholdings.com/about/businesses/oncor.aspx, 31 January 2013. The size of AEP's customer base came from American Electric Power, *About AEP Texas*, downloaded from <https://aep texas.com/info/facts/>, 31 January 2013. The size of Texas-New Mexico Power's customer base came from TNMP, *About Us*, downloaded from www.tnmp.com/about/index.htm?source=m2, 31 January 2013.
28. Ibid.
29. Webberville Solar Farm, *Project Overview*, downloaded from webbervillesolar.com/ProjectOverview.html, 24 January 2013.
30. CPS Energy, *Nearly 20 MW Solar Project Brings Water and Electricity Together* (press release), 18 June 2012, and CPS Energy, *New Energy Economy Boosts CPS Energy's Solar Power and Area Education* (press release), 13 August 2012.
31. Michael Osborne, Austin Energy, *Final Report on Strategy to Reach 200 MW of Solar Generation, per Resolution No. 20110804-027* (memorandum), 1 November 2011.
32. CPS Energy, *CPS Energy, OCI Solar Power Launch Largest Municipally Owned Mega Solar Project* (news release), 23 July 2012.
33. Ibid.
34. Laylan Copelin, "San Antonio Utility Deal Will Make State a Leader in Solar Production," *Statesman* (Austin, TX), 23 July 2012.
35. See note 32.
36. U.S. Department of Energy, "City of Austin – Renewables Portfolio Standard," *Database of State Incentives for Renewable Energy*, 05 November 2012, downloaded from www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX11R&re=1&ee=1, 15 January 2013.
37. Austin Local Solar Advisory Committee, *A Strategic Plan for Local Solar in Austin*, 1 November 2012.
38. U.S. Department of Energy, "San Antonio City Public Service (CPS Energy) – Renewables Portfolio Goal," *Database of State Incentives for Renewable Energy*, 20 November 2011, downloaded from www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX15R&re=1&ee=1, 16 January 2013.
39. CPS Energy, *San Antonio's New Energy Economy*, 2012, downloaded from www.cpsenergy.com/About_CPS_Energy/Who_We_Are/New_Energy_Economy/index.asp, 21 January 2013.
40. Texas Legislature Online, *HB 3693, Enrolled*, downloaded from www.capitol.state.tx.us/BillLookup/Text.aspx?LegSess=80R&Bill=HB3693 on 21 January 2013. For a link to a map showing states' net metering programs, see U.S. Department of Energy, Green Power Markets, *Net Metering*, downloaded from <http://apps3.eere.energy.gov/greenpower/markets/netmetering.shtml>, 1 February 2013.
41. Austin Energy and the City of Brenham electric utility are listed in this database of net metering programs: Interstate Renewable Energy Council, *State and Utility Net Metering Rules for Distributed Generation*, 21 January 2013, downloaded from www.irecusa.org/irec-programs/connecting-to-the-grid/net-metering/, 21 January 2013. For a report on Texas' net metering policies, see David Power, Public Citizen, *Texas Solar Owners Need Fair Treatment in the Marketplace: Fix Texas' Broken Net-Metering Policy*, January 2011.

42. CPS Energy, *Solar PV—Understanding Your CPS Energy Bill*, downloaded from www.cpsenergy.com/Residential/Rebates/Solar_Rebates/Solar_Photovoltaic/SolarPV_billing.asp, 1 February 2013.
43. U.S. Department of Energy, “Austin Energy – Net Metering,” *Database of State Incentives for Renewable Energy*, 09 October 2012, downloaded from www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX04R&re=1&ee=1, 16 January 2013.
44. Karl Rábago, et al., Austin Energy and Clean Power Research, *Designing Austin Energy’s Solar Tariff Using a Distributed PV Value Calculator*, no date, downloaded from www.cleanpower.com/wp-content/uploads/090_DesigningAustinEnergysSolarTariff.pdf, 1 February 2013.
45. Austin Energy, *From Section 6: Residential Rate Design*, downloaded from www.austinenergy.com/energy%20efficiency/Programs/Rebates/Solar%20Rebates/proposedValueSolarRate.pdf, 1 February 2013.
46. U.S. Department of Energy, *Solar Powering Your Community: A Guide for Local Governments*, January 2011.
47. Austin Energy, *Residential*, downloaded from www.austinenergy.com/About%20Us/Rates/pdfs/Residential/Residential.pdf, 1 February 2013.
48. According to Austin Energy, a typical solar PV system of 100 square feet will produce 1,000 – 1,040 kWh of electricity per year: Austin Energy, *Solar Photovoltaics – Customer Costs and Benefits*, 2013, downloaded from www.austinenergy.com/energy%20efficiency/Programs/Rebates/Solar%20Rebates/customerBenefits.htm, 23 January 2013.
49. City of San Antonio, *Solar Development Plan*, 20 April 2012.
50. U.S. Department of Energy, “Austin Energy – Residential Solar Loan Program,” *Database of State Incentives for Renewable Energy*, 3 May 2012, downloaded from www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX140F&re=1&ee=1, 16 January 2013.
51. Ibid.
52. Austin Energy, *Commercial Solar Photovoltaic Performance-Based Incentive Program Guidelines and Qualifications*, 27 October 2012.
53. Amy Smith, “Then There’s This: Solar for Lease,” *The Austin Chronicle*, 11 January 2013, and Austin Energy, *Council Approves Incentives for 10 Solar Projects by Businesses, Non-profits*, 17 January 2013.
54. Amy Smith, “Then There’s This: Solar for Lease,” *The Austin Chronicle*, 11 January 2013.
55. Austin Energy, *City Council Approves First Solar Lease Project by Non-Profit* (press release), 6 December 2012.
56. U.S. Department of Energy, “CPS Energy – Solar PV Rebate Program,” *Database of State Incentives for Renewable Energy*, 17 February 2012, downloaded from www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX60F&re=1&ee=1, 17 January 2013.
57. Texas House of Representatives, House Research Organization, *Solar Energy in Texas*, 20 July 2010, downloaded from www.hro.house.state.tx.us, 25 January 2013.
58. Renewable Funding, Clinton Climate Initiative, Lawrence Berkeley National Laboratory, *Policy Brief: Property Assessed Clean Energy (PACE) Financing: Update on Commercial Programs*, 23 March 2011.
59. See note 57.
60. Texas Legislature, *HB 659*, 82nd Legislative Session, downloaded from www.legis.state.tx.us/BillLookup/History.aspx?LegSess=82R&Bill=HB659, 4 February 2013.
61. See note 37.
62. Kate Galbraith, “Can a National Energy-Efficiency Program Work in Texas?” *Texas Tribune*, 19 July 2010.
63. U.S. Department of Energy, “Texas

Incentives/Policies for Renewable Energy, Renewable Generation Requirement,” *Database of State Incentives for Renewable Energy*, 4 April 2012, downloaded from www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX03R&ee=0, 16 January 2013.

64. See Chapter 25, Subchapter H, Division 2, Definition 50, at Public Utilities Commission Texas, *Substantive Rules Applicable to Electric Service Providers*, downloaded from www.puc.texas.gov/agency/rulesnlaws/subrules/electric/25.181/25.181.pdf, 21 January 2013.

65. For examples of some investor-owned utilities’ programs, see Federal Energy Management Program, *Energy Incentive Program, Texas*, November 2012, downloaded from www1.eere.energy.gov/femp/financing/eip_tx.html, 21 January 2013. For results of Entergy’s pilot program, see Entergy, *Welcome to Entergy Solar PV Program Website, 2009-2012*, downloaded from www.txreincentives.com/epv/, 22 January 2013. For results of TNMP’s pilot program, see TNMP, *Welcome to the*

TNMP Solar PV Pilot Program Website, 2009-2012, downloaded from www.txreincentives.com/tpv/, 22 January 2013.

66. Texas Legislature Online, *SB 981*, 1 September 2011, downloaded from www.capitol.state.tx.us/BillLookup/Text.aspx?LegSess=82R&Bill=SB981, 1 February 2013.

67. Office of the Governor, *Texas Renewable Energy Industry Report*, July 2012, downloaded from www.governor.state.tx.us/files/ecodev/Renewable_Energy.pdf, 17 January 2013, page 4.

68. U.S. Department of Energy, “Solar Rights,” *Database of State Incentives for Renewable Energy*, 6 May 2012, downloaded from www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX33R&re=1&ee=1, 16 January 2013.

69. Terrence Henry, “How a New Utility Rule Could Mean Less Energy Efficiency for Texas,” *StateImpact*, 1 October 2012.