

Solar energy in Texas

While solar energy currently makes up a small fraction of the mix of energy sources in Texas, the state ranks first in the nation in solar resource potential, according to the State Energy Conservation Office (SECO). A solar energy company is developing plans for a 60-megawatt solar plant northeast of Austin that would be the largest such facility in the United States.

Solar energy is produced by capturing light and heat from the sun that can be used to generate electric power. Texas has high levels of solar radiation that pass through the atmosphere unobstructed by pollutants, clouds, water vapor, and other matter, according to SECO. Some have called for state policies to encourage development of this resource in order to reduce carbon emissions from and dependence on fossil fuels. Because the sun shines during the day, supporters of developing solar energy say, it could balance energy from wind, which blows strongest at night. Others say solar energy should stand on its own with conventional and other renewable energy sources and that it is inappropriate for the state to intervene by choosing winners and losers in the energy market.

Factors that have helped establish a framework in Texas for pursuing solar energy include a thriving wind energy industry aided by state and federal tax incentives, a network of people experienced in the energy business, a large semiconductor and microprocessor industry that could design and manufacture solar equipment, and groundwork for transmission lines. As the solar energy industry matures in Texas, however, it also is expected to face challenges. These include the higher cost of producing electricity with solar resources, concerns about aesthetics of solar equipment, reliably integrating solar energy into the electric grid, and intermittent generation since without an effective storage system solar energy is available only when the sun shines.

This report describes the current status of solar energy in Texas and in other states and outlines anticipated policy proposals for incorporating solar energy into Texas' energy future. The Texas Legislature may revisit issues involving solar energy during its 2011 regular session.

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Types of solar power

Solar power can be categorized into three basic areas: solar hot water heating, concentrating solar power (CSP), and photovoltaic (PV) solar energy systems. Each of these solar energy technologies works by capturing energy from the sun's heat or light.

Solar hot water heating

Small rooftop collectors can collect the heat from the sun in order to heat water for laundry, bathing, and other purposes. While solar water heaters do not generate electricity, they can reduce the amount of energy used for water heating in a home or business by 75 percent or more.

Concentrating solar power plants

Solar thermal power plants, also known as concentrating solar power (CSP) plants, harness the heat from the sun in order to heat water to high levels with large mirrors that focus sunlight on a small area. This heated water is converted to steam, which is used to run steam turbines to generate electricity in a manner similar to a fossil fuel-fired power plant.

CSP requires a hot climate and a readily available water supply to generate enough steam to run the electric turbines and keep the mirrors clean. The United States has 431 megawatts of CSP in operation, according to Environment Texas, an environmental advocacy group, but none in Texas. Most operating projects are in California, with other installed capacity in Arizona, Nevada, and Hawaii.

CPS Energy in San Antonio has a 20-year agreement to purchase power from a 27-megawatt concentrating solar dish-engine project in West Texas called Western Ranch. It is expected to be online in 2011.

Photovoltaic solar systems

Photovoltaic (PV) systems use panels to convert sunlight directly into electricity. PV systems are made of semi-conductor material that when hit with sunlight frees electrons that produce an electric current. No

moving parts are required, and water use is limited to maintaining a clean surface area.

PV systems can be installed to provide electric power directly to the user or for connection to the electric grid. The systems are modular and can be sized to meet electricity needs in constrained, urban areas or open, rural areas. For example, PV systems can be used for small residential rooftops, large on-site business and government systems, or power plant-sized facilities.

The smallest residential use with PV systems is about 1 kilowatt, often produced by rooftop systems to offset another source of electricity. PV system use by individual power plant-sized facilities ranges from 250 to 500 megawatts. While Texas currently does not have any large PV arrays operating, municipal utilities in San Antonio and Austin have signed contracts to purchase power from facilities now being built, and a private firm is developing plans for a PV facility near Austin.

Costs of solar power systems

Both CSP and PV solar energy systems can produce energy at significantly lower costs today than in the 1980s, but costs remain high compared to conventional energy sources. However, according to a recent analysis by Lazard, a financial advisory and asset management firm, solar energy technologies are becoming increasingly cost-competitive with conventional generation technologies, excluding certain factors such as transmission, back-up generation, construction, and fuel costs. For example, producing energy from a coal plant costs from 7 to 15 cents per kilowatt hour, from a nuclear plant costs from 8 to 11 cents per kilowatt hour, and from an integrated gasification combined cycle plant costs from 10 to 13 cents per kilowatt hour. Producing energy from a CSP plant costs from 12 to 19 cents per kilowatt hour and from a PV plant from 9 to 19 cents per kilowatt hour, depending on the PV technology.

Although the price of solar panels has declined dramatically over the last two decades, the upfront cost of a rooftop solar power system can be a barrier if a homeowner plans to stay in a home for only a few years. A portion of the upfront cost is retrofitting older homes by upgrading the electrical system, reinforcing the roof, and creating connections between the electrical system and the panels installed on the roof.

Current Texas solar energy policy

In recent years, Texas has enacted laws to encourage the development and use of renewable energy sources, including solar energy. The Legislature established a renewable portfolio standard (RPS) in 1999 and expanded it in 2005 to set targets for use of renewable energy statewide.

Renewable portfolio standard

The electric market restructuring bill enacted by the 76th Legislature in 1999, SB 7 by Sibley, had a goal of promoting retail competition and consumer choice in Texas. To provide a choice of renewable energy sources for consumers, the Legislature established a renewable portfolio standard under Utilities Code, sec. 39.904 that requires companies selling electricity to retail customers to support renewable energy generation. The RPS is a market-driven policy intended to ensure the availability and use of renewable energy as electricity markets became more competitive. Renewable energy technologies that qualify for the RPS are those that do not rely on energy resources derived from fossil fuels or waste products from fossil fuels. These sources include solar, wind, geothermal, hydroelectric, tidal energy (wave), and biomass, including landfill gas.

SB 20 by Fraser, enacted during the 79th Legislature's first called session in 2005, expanded the RPS goals to require an additional 5,000 megawatts, incrementally, beyond the then-required 880 megawatts of renewable capacity. It set a target of 10,000 megawatts by 2025. The 2015 goal of 5,880 megawatts was surpassed in 2008 by all renewable sources, seven years early, with more than 6,000 megawatts just from wind power. In an effort to diversify the state's renewable energy sources, when the renewable portfolio standard was expanded in 2005 state lawmakers required the Public Utility Commission (PUC) to set a target of at least 500 megawatts of capacity from a renewable energy technology other than one using wind energy.

Financial incentives

Texas currently offers various tax deductions and exemptions to encourage use of renewable energy sources, including solar energy.

In calculating its business franchise tax, a corporation or other entity subject to the state franchise tax may deduct from the tax base the cost of a solar energy device. An entity may deduct 10 percent of the amortized cost of the system.

Texas also offers a franchise tax exemption to companies in Texas engaged solely in the business of manufacturing, selling, or installing solar energy devices. This exemption has no ceiling, so it is a substantial incentive for solar manufacturers.

Texas voters in 1978 adopted a constitutional amendment authorizing the Legislature to exempt solar or wind-powered energy devices from property taxes. The Tax Code allows an exemption from the appraised value of the property equal to the amount that arises from the installation or construction of a solar energy device primarily for on-site use.

In 1975, the Legislature exempted solar energy devices from the sales and use tax, but the exemption was repealed in 1987.

Non-tax incentives in Texas include a program offered by the Texas Department of Rural Affairs, to provide grants to qualifying cities with fewer than 50,000 residents and counties with fewer than 200,000 residents for installing renewable energy projects. Also, the LoanSTAR Program, a revolving loan program through SECO under the Comptroller's Office, offers low-interest loans to all public entities, including state, public school, college, university, and non-profit hospital facilities, for enacting measures to reduce energy costs. On-site renewable energy options, such as solar water heating, photovoltaic panels, and small wind turbines, are encouraged in the analysis of potential projects.

Solar energy in other states

Texas ranked 13th among the states for solar energy production in 2009, with 8.3 megawatts of solar electricity capacity. California was the top U.S. solar-energy producing state by far with 1,102 megawatts of solar electricity capacity. New Jersey was second with 128 megawatts, followed by Nevada with 100 megawatts and Colorado with 59 megawatts. One

megawatt of solar capacity is enough to power about 200 homes, depending on several factors, including solar technology and the average electricity consumption of households in the area.

According to the Solar Energy Industries Association, 30 states and the District of Columbia have renewable portfolio standards, and 18 of those have carved out a portion of their RPS specifically for either solar or all distributed renewable generation. Distributed renewable generation (DRG) is energy created from a renewable source at or near the place it is used, such as residential solar or wind systems. Five states provide extra renewable energy credits for solar or distributed renewable generation, which are credits that are purchased to satisfy the RPS requirements. Missouri and Washington, D.C. recently increased their overall RPS standards, while Illinois added a 6 percent solar carve-out and Nevada increased its carve-out from 5 to

6 percent. At least four states now include solar water heating as a qualifying energy source.

California's initiatives

California leads the nation's solar energy production. In January 2006, California's Public Utilities Commission (PUC) approved the California Solar Initiative, which through a number of regulatory decisions authorized the state to invest \$3.3 billion in consumer rebates for small-scale solar electric power systems over 11 years. It established a statewide goal of building a million solar electric roofs, the equivalent of 3,000 megawatts of solar electric power. The investment was funded from a surcharge on electric and gas customers within the utilities regulated by the PUC.

In August 2006, Gov. Arnold Schwarzenegger signed into law SB 1, more commonly known as the Million

Federal solar energy policy

The United States ranked fourth in the world in 2009 for solar energy capacity installed, with 2,108 megawatts. Germany was the world leader with 9,677 megawatts, Spain second with 3,595 megawatts, and Japan third with 2,628 megawatts, according to the Solar Energy Industries Association.

The federal government offers tax credits to manufacture and install solar equipment. In 2005, the investment tax credit for solar projects increased from 10 percent to 30 percent. The credit reduces overall tax liability for individuals or businesses that invest in solar energy generation technology. In 2008, Congress extended the credit to 2016 and to residential and utility system owners.

When the recent recession tightened credit markets, the federal government, as part of the American Recovery and Reinvestment Act of 2009, offered a 30 percent upfront grant instead of the solar tax credit, allowing the commercial tax credit to be taken as a cash grant for a limited time. The grant program is set to expire at the end of 2010. The Recovery Act also lifted the \$2,000 cap on the residential investment tax credit for solar thermal installations, allowing a full 30 percent investment tax credit on solar water heating and other solar thermal technologies for the homeowner.

The Recovery Act eliminated federal taxes on subsidized energy financing provided under federal, state, or local programs for projects designed to conserve or produce energy. It also provided a new tax credit for renewable energy manufacturing facilities and billions of dollars more for solar research and deployment financing.

The U. S. Department of Energy is partnering with the Western Governors' Association to encourage certain solar installations in states with the best solar potential, including Arizona, California, Colorado, New Mexico, Nevada, Utah, and Texas. The goal of the initiative is to install 1,000 megawatts of new concentrating solar power systems in the southwestern United States, including Texas, by 2010.

Solar Roofs Bill. SB 1 expands California's plan to customers of municipal-owned utilities over which the PUC does not have jurisdiction, allows about 500,000 new solar energy systems into the program, and requires developers building subdivisions with more than 50 new single-family homes to offer the option of a solar energy system to all customers beginning January 1, 2011. The goal of the plan is to have one million solar roofs in California by 2018. In February, California increased the number of customers for whom net metering would be available. Net metering is used at a home or business that has its own renewable energy generator, such as rooftop solar panels, to measure the difference between energy produced and consumed on-site.

In January 2007, as part of the California Solar Initiative, the California Energy Commission launched a partnership with home builders and developers with the goal of creating a self-sustaining market for solar homes and gaining builder commitment to installing solar energy systems as a standard feature for new homes. The overall goal is to achieve 400 megawatts of new solar-produced electricity by the end of 2016.

In 2009, the California legislature directed the California PUC to approve feed-in tariffs, which require energy supply companies to give priority to electricity generated using renewable energy sources, feed it into the grid, and pay producers a fixed price. By contrast, under a quota system, such as a renewable portfolio standard, the regulatory authority specifies that a fixed proportion of electricity on the market must be produced by renewable energy sources. Both Germany and Ontario, Canada use feed-in tariffs, rather than a quota system, to regulate their renewable energy industry.

Supporters of feed-in tariffs say they offer equal opportunity to all willing participants in the market and freedom for them to produce and sell their own energy, stimulating rapid growth. They say a quota system fails to provide long-term certainty because once a goal is reached, power producers have no incentive to continue supporting renewable sources. They say quota systems favor large, vertically integrated generators and are more difficult to design and implement than feed-in tariffs.

New Jersey's initiatives

New Jersey committed to promoting solar initiatives when its Clean Energy Program was enacted in 2001.

Since then, New Jersey has become one of the nation's largest PV markets, second only to California, which has four times the population and energy use, according to the IC² Institute at the University of Texas. In 2006, the New Jersey Board of Public Utilities issued regulations requiring the state to produce 22.5 percent of its energy from renewable sources by 2021, including 2.12 percent from solar resources. This solar electric percentage would result in about 1,500 megawatts of solar-electric power.

Robust development of the solar energy market in New Jersey has been attributed to certain major factors. A solar electric requirement in the state's RPS has helped to create demand for solar energy and contributed to investor confidence in the market. Reliable interconnection of solar electricity onto the grid and net metering, which measures the difference between energy produced and consumed on-site, make it easier for systems to connect to the distribution system and be compensated for their contribution. In addition, a rebate program has helped finance more than 50 percent of the cost of installation, and a solar renewable energy credit financing model provides energy credits and additional long-term financing for those who invest in solar.

High demand for solar rebates has forced the program to be shut down several times over the years when applications outpaced rebate money. This spurred New Jersey regulators to consider weaning solar energy off of state subsidies by replacing rebates with renewable energy credits that could be bought and sold on the open market.

Texas solar policy options

During the 2009 regular session of the 81st Legislature, more than 60 bills relating to solar energy were filed, many seeking to create market incentives for development of solar energy in Texas. Many of these may be revisited in 2011.

The proposed bills, most of which were not enacted, would have increased goals for solar energy installation and provided financial incentives, including tax breaks, to help make the industry more cost-competitive with other energy sources. A proposed "homeowner's bill of rights" would have addressed buyback rates for energy

produced with solar resources as well as contract and interconnection standards. It would have established more stringent consumer protections for owners of solar energy systems and removed restrictions by homeowners associations on installing residential solar energy systems. One bill that was enacted, HB 1937 by Villarreal, allows homeowners and businesses to finance on-site renewable energy systems or energy-efficient improvements through municipal loans with a multi-year assessment on their property.

PACE financing

Property-assessed clean energy (PACE) financing allows homeowners and business owners to finance on-site renewable energy systems, such as rooftop solar panels, and energy efficiency projects by way of a special multi-year assessment on their property. HB 1937 by Villarreal, now Local Government Code, ch. 376, enacted in 2009, allows municipalities to offer PACE financing in Texas, although implementation of this form of financing has been hindered by legal questions.

Under a PACE program, a city or, in some cases, a county will make funding available for the upfront costs of on-site renewable energy and energy efficiency projects and will recoup the costs through a multi-year assessment as part of the property tax bill of the improved property.

Property owners may borrow money for the improvements and repay the money through a voluntary special assessment secured by a lien against the property. Any assessment imposed under PACE financing is considered a lien against the property until the assessment and any related interest or penalty is paid, even if the property is sold to another party. Funding for PACE programs often is made available through municipal or other government-backed bonds.

The city of Berkeley, Calif., was the first to adopt this financing mechanism in 2008. Since then, 21 states, including Texas, have enacted PACE-enabling legislation.

San Antonio and Austin, each of which received \$10 million in competitive energy efficiency block grant funding from the U. S. Department of Energy, have

been the first to set up municipal programs. El Paso and Houston are actively pursuing PACE financing as well, but were not recipients of federal block grant funding.

Supporters of PACE financing say it allows homeowners to finance a clean energy capital expenditure, such as rooftop solar panels, which can range from \$5,000 to \$25,000 per project, without relying on traditional consumer financing methods or personal credit. High upfront costs and the fact that people may sell their homes before the payback period of the improvements is reached are barriers for retrofitting a home. Under PACE, homeowners pay only for the years they are in the home, then transfer payment to the next owner. For example, if a solar project has a 12-year payback period and 20-year useful life, a homeowner who is going to have to pay \$20,000 up front and plans to live in the home for only 5-7 years might not want to do it. PACE would allow homeowners to pay only a pro-rated share of the costs for the period they own the house.

Legal questions. Certain legal questions have hindered implementation of PACE financing in Texas.

Some have expressed concerns about the constitutionality of PACE funding. The Texas Constitution, in Art. 3, secs. 50, 51, and 55, and in Art. 16, sec. 6, prohibits governmental entities from donating or lending public funds to any private person and from lending credit in support of the debts of private persons. However, case law holds that an incidental private benefit from the use of public funds is not unlawful as long as use of the funds has a predominant public purpose, the city retains sufficient control over the transaction to ensure that the public purpose is accomplished and to protect the public's investment, and the public receives a return benefit.

If public funds were used in a PACE program, projects financed would need to have a valid public purpose. Economic development, emission reduction, and energy conservation have been found to be valid public purposes in other states where PACE programs have been implemented. Similar findings in Texas law on what constitutes a public purpose have never been applied directly to a PACE program. This includes Art. 3, sec. 52-a, of the Texas Constitution, which states that economic development is a valid public purpose. Some

Texas municipalities have hesitated to move forward without guidance from the Attorney General's Office. As of July, no one has requested an attorney general's opinion on this issue.

The priority and enforceability of the statutory lien created by PACE financing also has been a subject of concern. Under HB 1937, the assessment would be secured through a lien on the property, but the bill does not explicitly provide that the city's lien on the property be a priority lien. Some express concern that bond buyers that would finance PACE programs would show little interest in subordinated PACE liens, making it less likely that a PACE bond market would develop. Another concern is that interest rates would be prohibitively high on bonds for subordinated liens. Some believe the seniority of the PACE loan lien to that of a first mortgage lender would be crucial to structuring financing acceptable to both the rating agencies and to investors.

The U.S. Department of Energy is devoting \$150 million in stimulus money to help communities cover set-up and administrative costs for PACE programs. However, Fannie Mae and Freddie Mac, the government entities that guarantee more than half of the residential mortgages in the United States, said in letters to mortgage lenders on May 5 that the energy-efficiency liens could not take priority over a mortgage. This may result in mortgage lenders, who depend on Fannie Mae and Freddie Mac to buy their home loans, demanding that the entire PACE lien be paid off before issuing a new loan. A slowdown in interest in PACE programs across the country is anticipated due to the uncertainty. Several PACE program administrators have suspended applications pending a resolution.

Third-party ownership of PV systems

Another financing alternative for on-site renewable energy systems, such as rooftop solar panels, would be allowing a third party to own the systems. For example, in North Texas, SolarCity, a business entity, has teamed with TXU to lease panels to homeowners. SolarCity builds, owns, operates, and maintains the system, and the homeowner signs a 15-year lease for it, eliminating the upfront costs.

The deal is exclusively between SolarCity and the homeowner. This option currently is available only for

ratepayers in the Oncor service area, and only TXU and Green Mountain will buy back excess solar-generated power. Oncor is providing solar rebates for participants, with the rebates paid directly to SolarCity to keep the lease payment lower. More than 300 people have signed contracts with SolarCity, and the large amount of interest in the program has made it difficult for Oncor to keep up with demand.

Mandatory non-wind RPS and solar carve-out

SB 541 by Watson, which passed the Senate during the 2009 regular session, but died on the Major State Calendar in the House when no further action was taken, would have amended the existing renewable portfolio standard (RPS) by establishing new renewable energy goals to be met with two tiers. Tier 1 renewable energy would have included solar, wind, geothermal, hydroelectric, tidal energy (wave), and biomass, including landfill gas. Tier 2 would have included tier 1 renewable energy technology, excluding energy derived from wind with a capacity of more than 150 kilowatts. SB 541 also would have replaced the target of 500 megawatts of non-wind renewable capacity with a goal of 1,500 megawatts of tier 2 renewable energy, to be installed by January 1, 2020.

The Public Utility Commission (PUC) currently is working on a proposal for the 500-megawatt "non-wind" RPS in Texas. The PUC issued a proposed rule on April 16 that, if adopted, would provide a tiered approach, including a solar-specific tier, within the 500-megawatt non-wind requirement.

The proposal also would make the 500-megawatt non-wind goal mandatory, seeking to clarify sec. 39.904(a) of the Utilities Code, which states that the PUC "shall establish a target of at least 500 megawatts of capacity from a renewable energy technology other than a source using wind energy." Some have interpreted "target" as not being mandatory because other language in the same provision establishes specific benchmarks and directives for when renewable capacity must be installed and for meeting certain thresholds by specified dates. A final decision on the PUC rule is expected by the end of the year. The PUC also is considering the role of distributed renewable generation as part of two separate rulemakings on the 500-megawatt non-wind RPS goal and energy efficiency implementation.

Supporters of a mandatory non-wind RPS

say a tiered but flexible approach would encourage development of a variety of renewable technologies needed for a balanced energy program. They say this tiered framework, which would allow energy providers to meet goals by procuring renewable energy credits or submitting alternative compliance payments, is designed to ensure that the RPS results in a diverse portfolio of resources. It sets a goal for businesses and allows them to figure out the most cost-effective way to get there, creating a market and allowing the market to set the price through supply and demand.

While Texas has installed more renewable energy than any other state thanks to large-scale wind development in West Texas, the state has fallen behind in developing other emerging renewable energy technologies, such as solar, geothermal, and biomass power. A second-tier RPS would help jumpstart these industries in Texas and diversify the state's energy sources, continuing Texas' leadership in clean, renewable energy with a market-based approach. This would encourage renewable energy equipment manufacturing plants to locate in Texas and provide price protections for businesses and consumers with a gradual, staged increase of megawatt targets. It also would be an important step toward preparing for the possibility of federal carbon regulation. This approach would offset more than 7 million tons of CO₂ by 2020 and have a significant impact on NO_x and particulate matter emissions, according to Environment Texas.

A non-wind RPS should contain a solar carve-out large enough to create a robust solar market in Texas, solar supporters say. A commitment to solar energy would provide significant payback for Texas with job creation, economic benefits, the ability to meet energy demand, reduced pollution, and ultimately, lower energy costs. It also would maximize the investments made in the Competitive Renewable Energy Zone (CREZ) transmission lines, which are transmission lines in areas of the state that have been designated by the PUC to be most suitable for generating capacity from renewable energy technologies.

Opponents of a mandatory non-wind RPS say electricity generation should be based on the market, as renewable energy is more expensive and not as cost-effective a way to produce energy.

Electricity consumers can anticipate paying millions more per year on electricity under a mandatory non-wind RPS. Retail electric providers that did not meet the standards under the regulatory mandate may have to buy credits in a trading program or make alternative compliance payments to meet their obligations. This essentially would be a cap-and-trade system, for which the costs ultimately would be passed on to consumers. Along with the added administrative burdens imposed on retail entities, requiring utilities to use more expensive energy sources would increase electric rates. Subsidizing these costly renewable resources in the competitive retail market and passing the costs on to consumers would be inefficient, uneconomical, and burdensome.

Solar plants and other renewable sources cannot produce the same amount of energy as more traditional generating plants. Many of the renewable energy generating facilities, such as those for solar energy, require a traditional back-up energy source. This duplicates generation and further increases costs.

Other opponents say that requiring electric providers to use a minimum amount of solar energy may have the unintended consequence of discouraging development of other types of resources. Any amendment to the renewable portfolio standard should be technology-neutral so that the renewable technologies most prepared to meet the goals within the shortest time frame and with the greatest economic development impact are allowed to compete. If a particular technology or resource dominates in the same way as wind, then once the 500-megawatt goal has been achieved, the Legislature can determine if more diversity is required. If a carve-out is necessary, it would be better to have one for all distributed renewable generation sources that could include solar, wind, and geothermal.

Government mandates for using non-wind renewable resources, including solar energy, should not be too aggressive. This could lead to scarcity of these resources, driving up the price and encouraging retail entities to choose to make alternative compliance payments instead of using more costly renewables. These mandated alternative compliance payments would become, in effect, a hidden tax, opponents say.

Solar-ready homes

The Legislature also may consider establishing goals and creating incentives for making new buildings “solar ready” by integrating solar energy systems into buildings at the time of construction or preparing buildings to make solar improvements easy to install.

SB 545 by Fraser, which passed the Senate during the 2009 regular session but died on the Major State Calendar in the House, would have required a builder of new homes in a subdivision that contained more than 50 lots to offer the homebuyer at least one plan under which the homebuyer could purchase an option to install a solar energy device on the home for heating or cooling or for the production of power.

Supporters of creating “solar-ready” homes say that ensuring that new houses are built with proper wiring, south-facing roofs that take advantage of sunlight, and landscaping that avoids shade on roofs could significantly reduce the cost of installing solar power systems. Creating “solar-ready” homes and businesses, along with using other renewables and implementing energy efficiency measures, could contribute to an increase in net-zero energy performance, which is the capacity to produce enough energy on-site with renewable energy sources to equal the amount of energy used. Having all new homes in Texas built for net-zero performance could reduce the need for new large power plants, reduce annual global warming pollution, and reduce homeowners’ energy bills.

Tax exemptions and incentives

Exempting solar energy systems and installations from certain state and local taxes, providing a franchise tax credit for investments in solar energy, and creating a solar generation incentive program have been considered in other states to encourage expansion of solar energy generation. The 81st Texas Legislature in 2009 considered, but did not enact, several bills that would have provided financial incentives to the solar industry in an effort to jumpstart the solar market.

SB 619 by Shapleigh and HB 2226 by Parker would have exempted certain solar energy devices from the state sales tax. HB 1328 by McClendon and SB 832 by Wentworth would have made the existing ad valorem tax exemption for solar- or wind-powered energy devices automatic after a one-time filing, similar to a homestead exemption. HB 4639 by Lucio would have offered a franchise tax credit for investments in solar energy in addition to the currently available deduction from the tax base.

SB 545 by Fraser, which passed the Senate but died on the Major State Calendar in the House when no further action was taken, would have required the PUC to establish a solar incentive program to be implemented by electric utilities for residential and commercial customers. The PUC also would have had to establish procedures to achieve the goal of installing at least 3,000 megawatts of solar generation capacity in Texas by 2020, at least 1,000 megawatts of which would have been distributed renewable generation, which is energy created at or near the place it is used. The PUC would have had to set rebate amounts, paid for by a surcharge on electricity bills, for installing solar generation and periodically adjust the rebate amount to maximize the solar generation installed. The rebate amounts would have been reduced by at least 5 percent each year. Solar generation manufactured in Texas would have had up to a 20 percent higher rebate amount than other solar generation. The provisions of SB 545 were added as a Senate amendment to HB 1243 by Gallego, but HB 1243 died in the House when the end-of-session deadline passed for consideration of Senate amendments.

Supporters of providing financial incentives for solar energy systems and installations say the health of Texas’ solar energy industry depends on having a sizable demand for the solar industry’s products and services and on the costs associated with meeting that demand. Meager state incentives do little to overcome existing market barriers, such as cost, for all types of solar energy development.

The Legislature also may consider establishing goals and creating incentives for making new buildings “solar ready.”

A statewide solar program similar to those that jump-started the California and New Jersey markets would make Texas one of the premier solar states. Experiences in other states and countries, especially Germany, have shown that government incentives can lead to increased demand and lower prices, the first steps to a robust, self-sufficient solar market. Many state programs reduce incentives as more capacity is brought online, based on the idea that as the industry matures, the price of materials, construction and financing should come down.

Supporters of financial incentives for solar energy systems say government incentives for private industries are nothing new. For example, in 1917, the federal government offered a tax credit to a young oil industry to encourage exploration and drilling, opening up an industry that transformed the economy and creating thousands of new companies and many more jobs. Today's solar power proponents hope the solar energy industry will see the same results from generous federal and state incentives and from creative business models

like power purchase agreements, which are contracts between an electricity generator and a power purchaser, such as a utility, to buy electricity. Under a power purchase agreement, the generator would secure funding for a project, maintain and monitor energy production, and sell the electricity at a set price for the term of the contract.

Opponents of providing financial incentives for solar energy systems and installations by exempting them from certain taxes say that while it may jump-start the solar industry, it is questionable public policy for the government to make decisions that would affect a market in that manner, essentially picking winners and losers.

Requiring electricity customers to pay for such a program through a surcharge on electricity bills, an amount that could have been as much as \$100 million a year for five years under SB 545, would add costs for consumers. While everyone would have to pay the surcharge, only those customers that participated in the program would receive any benefit.

Texas businesses contributing to solar industry

Several businesses identified by Environment Texas, an environmental advocacy group, span the solar supply chain and can be found in several parts of the state. For example, Tessera Solar, headquartered in Houston, develops, owns and operates large-scale solar plants, including the Western Ranch Solar Project in West Texas, now under development. HelioVolt Corporation, founded in Austin in 2001, manufactures advanced thin-film solar cells that can be used for roofing tiles and glazing. Meridian Solar is a solar electric design and installation company with offices in Austin, Dallas-Fort Worth and San Antonio. Entech Solar, headquartered in Fort Worth, designs and manufactures proprietary solar modules and has worked with federal agencies to build solar power systems for terrestrial and space applications.

Other businesses in Texas whose activities are not limited to the solar industry contribute key components. For example, PPG Industries, a glass manufacturer with a facility in Wichita Falls, produces glass for solar modules. USA Wire and Cable is an Austin-based wire and cable distributor serving the solar industry. Barr Fabrication in Brownwood, which manufactures components for the wind, solar, and other energy industries, provided steel support structures for Nevada Solar One, one of the largest concentrating solar plants in the world. ExelTech, based in Fort Worth, engineers and manufactures inverters used in the solar industry to convert electricity produced by solar power into electricity that can be used in a standard wall outlet. Applied Materials, which is headquartered in Santa Clara, Calif. but has an Austin location, provides equipment, service, and software products for the fabrication of semiconductor chips, flat panel displays, solar photovoltaic cells, flexible electronics and energy efficient glass. Monsanto Electronic Materials Company (MEMC) has a facility in Pasadena that is one of the world's largest producers of polysilicon, used to create photovoltaic cells.

Buyback rates

Texas' current policies on net metering technology provide no guarantee that customers who want to install solar panels and generate surplus electricity will be paid a fair price by their electric provider for the electricity they supply back to the electric grid.

Some proposals that may be seen during the 82nd Legislature include establishing buyback rates for energy produced by solar resources, improving standards for contracts for connection to the electric grid, and consumer protections for owners of solar energy systems. Proposals may include requiring all utilities to offer net metering and use metering programs that provide time-of-use billing and buyback, both of which compensate owners of PV systems for producing lower-cost solar power during periods of highest demand.

During the 2009 regular session, HB 1243 by Gallego would have required electric utilities, electric cooperatives, or retail electric providers to contract with owners of distributed renewable generation (DRG) so that surplus electricity the owners generated was available for sale to the transmission and distribution system at fair market value. DRG is energy from small, renewable energy sources located where the energy is used, rather than energy originating from large, centralized facilities. HB 1243 passed both houses, but died in the House when a point of order was sustained that the deadline for considering Senate amendments to the bill had expired.

HB 1866 by Solomons would have amended the customer protection chapter of the Utilities Code to provide all buyers of retail electric service the opportunity to connect DRG to the electric grid. The PUC would have been required to establish safety, technical, and performance standards for DRG that could be connected. HB 1866 passed the House, but died in the Senate Business and Commerce Committee.

Both bills would have established that DRGs are not to be defined as electric utilities, which have certain registration requirements.

Supporters of requiring a certain buyback rate for DRG say it would encourage the production of clean, renewable energy. DRG reduces the need for new

conventional generation, transmission, and distribution systems that are damaging to the environment. Despite a great deal of interest in DRG, barriers inhibit its growth. For example, a DRG owner currently is subject to the same registration requirements as a big generation company. Also, not all electric providers are allowing connection to the electric grid or offering to buy surplus electricity.

Requiring electric providers to buy back surplus electricity ultimately could be a net benefit to them by reducing their own peak demand. This would offset any initial burden that may be placed on them by requiring them to put systems in place to buy back surplus electricity produced from DRG, supporters say.

Opponents of requiring a certain buyback rate say such a requirement would burden electric providers by requiring them to put technical and administrative systems in place in order to buy back surplus electricity produced from DRG. While connecting DRG produced by electric customers to the grid should be encouraged, any legislation should specify the standards for interconnection in order to ensure the grid's technical integrity, they say.

HOA restrictions on solar panels

Some homeowners who wish to install PV panels are facing resistance from homeowners associations (HOAs). HOAs have expressed concerns about the aesthetics of the panels and about health and safety risks if the panels are improperly installed.

Several bills considered during the 2009 regular session, including SB 545 by Fraser, SB 236 by West, and HB 25 by Leibowitz, would have prohibited a property owners' association from restricting a property owner from installing a solar energy device, except in certain instances. These provisions would have applied to a deed restriction adopted on, before, or after the effective date of the bill.

Municipal and utility initiatives

Regardless of how state lawmakers choose to proceed, some utilities and municipalities are offering rebate programs to their customers to promote the use of solar energy. Rebate amounts range from \$2.25 to \$4

a watt for a PV system and from \$1,000 to \$3,000 for solar water heaters. Among those taking this approach are Austin Energy, CPS Energy of San Antonio, Oncor, Entergy, and other utilities and municipalities.

Rebates from individual electric providers and federal stimulus funding have increased installation of small-scale rooftop solar panels on homes, businesses, and schools in the last two years. No utility-scale solar energy systems are currently operational in Texas, although the first is expected to come online at the end of this year.

Austin Energy has signed a contract for a power purchase agreement (PPA) for 30 megawatts of PV solar generation from a plant being built in Webberville, about 15 miles east of Austin. The Webberville Plant will be built and owned by a separate company, and Austin Energy will enter into a PPA with a fixed price for 25 years. The Webberville plant is expected to come online at the end of 2011.

CPS Energy of San Antonio signed contracts for two PPAs in 2009 for a total of 41 megawatts of solar generation. Western Ranch, a 27-megawatt CSP system to be located just east of Marfa, is expected to go online in March 2011 with a 20-year contract. Blue Wing, a

14-megawatt PV solar energy system located southeast of San Antonio, will begin operating in December 2010 with a 30-year contract.

The Western Ranch project recently has faced opposition from some residents of Marfa and the surrounding area due to a concern that the noise and light pollution from the project could mar the tranquility and landscape that make the area so appealing.

RRE Austin Solar, a start-up solar company with corporate backing from India, recently won tax breaks from the city of Pflugerville to build a \$230 million, 60-megawatt solar PV plant on about 600 acres near Pflugerville, northeast of Austin. This plant would be the largest PV plant in the United States.

Under the tax break agreement, RRE Austin Solar will install for Pflugerville and the Pflugerville school district up to \$750,000 in solar panels and small wind turbines and provide educational training to the school district. A similar agreement, also likely to limit taxes, has been negotiated but not finalized with the Elgin school district. The company also is seeking property tax breaks from Travis County. If Travis County agrees, the company will consider headquartering in Austin.

— by *Blaire D. Parker*

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