



Go Solar Texas:

Building Capacity for Solar at the Local Level

GRIDNEXT 2016 Conference, Georgetown Texas



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Council of Governments**



Presentation Overview

NCTCOG & the Sierra Club; Who we are & Why we care about solar

Texas: The State of Solar

Tools for Growing Solar (NCTCOG)

Examples and Steps on Community Solar

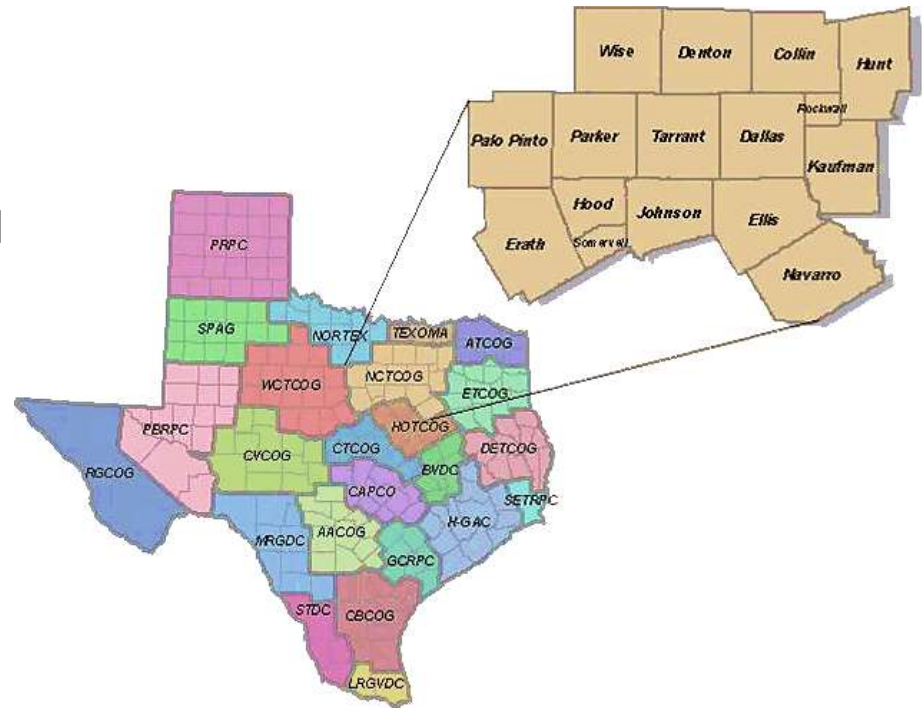
How to Make Our Buildings Solar-Ready

NCTCOG & THE SIERRA CLUB: WHO WE ARE AND WHY WE CARE ABOUT SOLAR

Solar is a low emission energy source. Increased deployment of solar has the potential to help reduce harmful emissions that contribute to ozone formation and health concerns.

About NCTCOG

The North Central Texas Council of Governments (NCTCOG) is one of 24 Council of Governments across Texas whose main function is to transcend jurisdictional boundaries to promote sound development and facilitate cooperation among member governments. NCTCOG works on many quality of life issues such as transportation planning, air quality, environmental management, emergency preparedness, workforce development, and more. For information on all Texas regional agencies, visit the [Texas Association of Regional Councils](#).



About Sierra Club, Lone Star Chapter

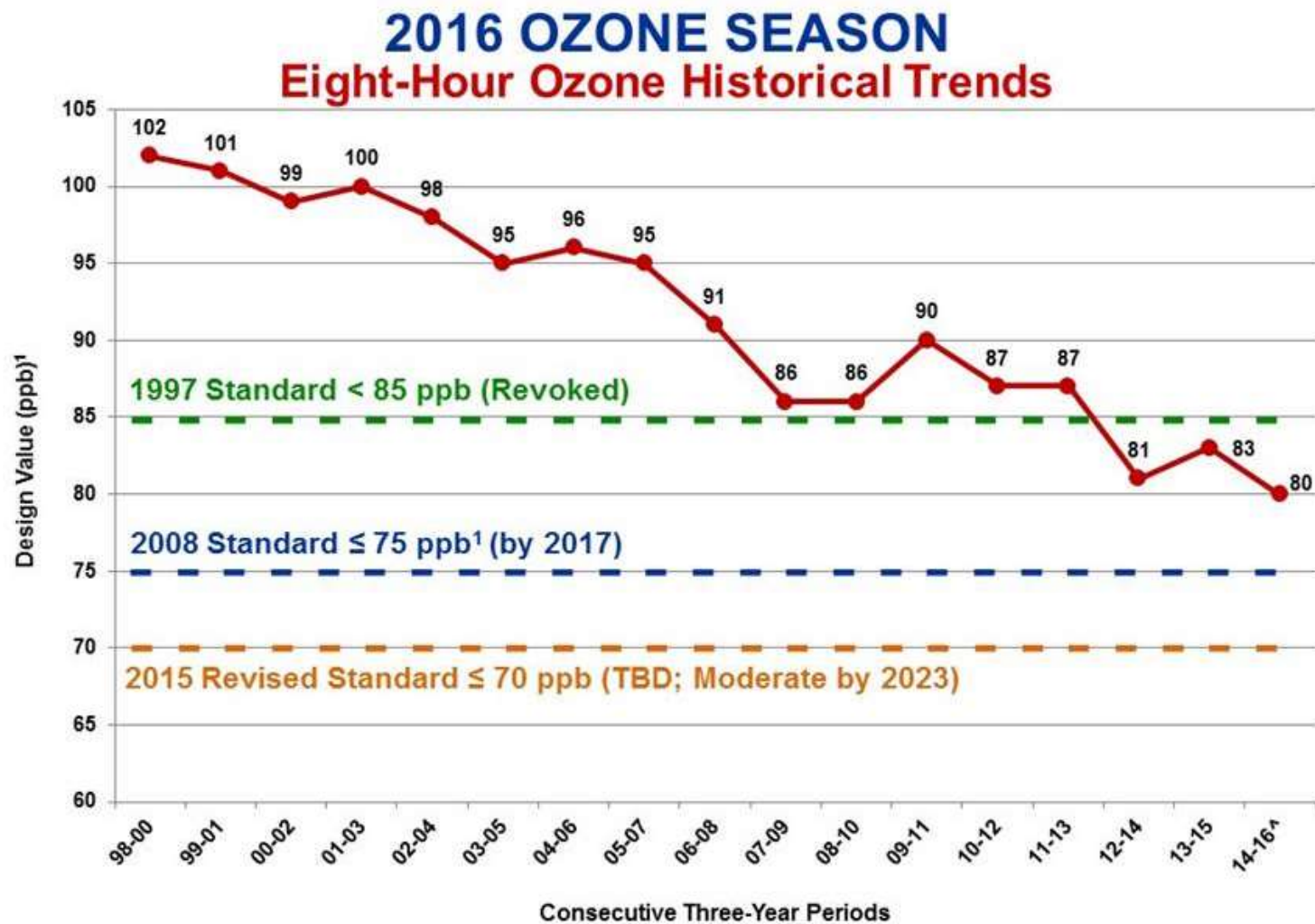
The Sierra Club is the nation's largest and oldest conservation organization and is more than 100 years old.



The Lone Star Chapter is the Texas state chapter and has been around for more than 50 years.

In recent years, the Sierra Club has spearheaded the Beyond Coal Campaign to rid our nation of reliance on coal, and is now focused on Beyond Coal to Clean Energy, or the solutions to our energy needs. Currently, the Lone Star Chapter runs its clean energy work through our "Blueprint for Clean Energy Future in Texas"

Ozone Nonattainment & Air Quality



¹Attainment Goal - According to the US EPA National Ambient Air Quality Standards, attainment is reached when, at each monitor, the *Design Value* (three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration) is equal to or less than 70 parts per billion (ppb).

²Not a full year of data, current as of 10/30/2016



TEXAS: THE STATE OF SOLAR

Texas has more solar energy potential than any other US state. Currently, Texas ranks 7th in the country in installed solar capacity.

Texas' Benefits From Solar



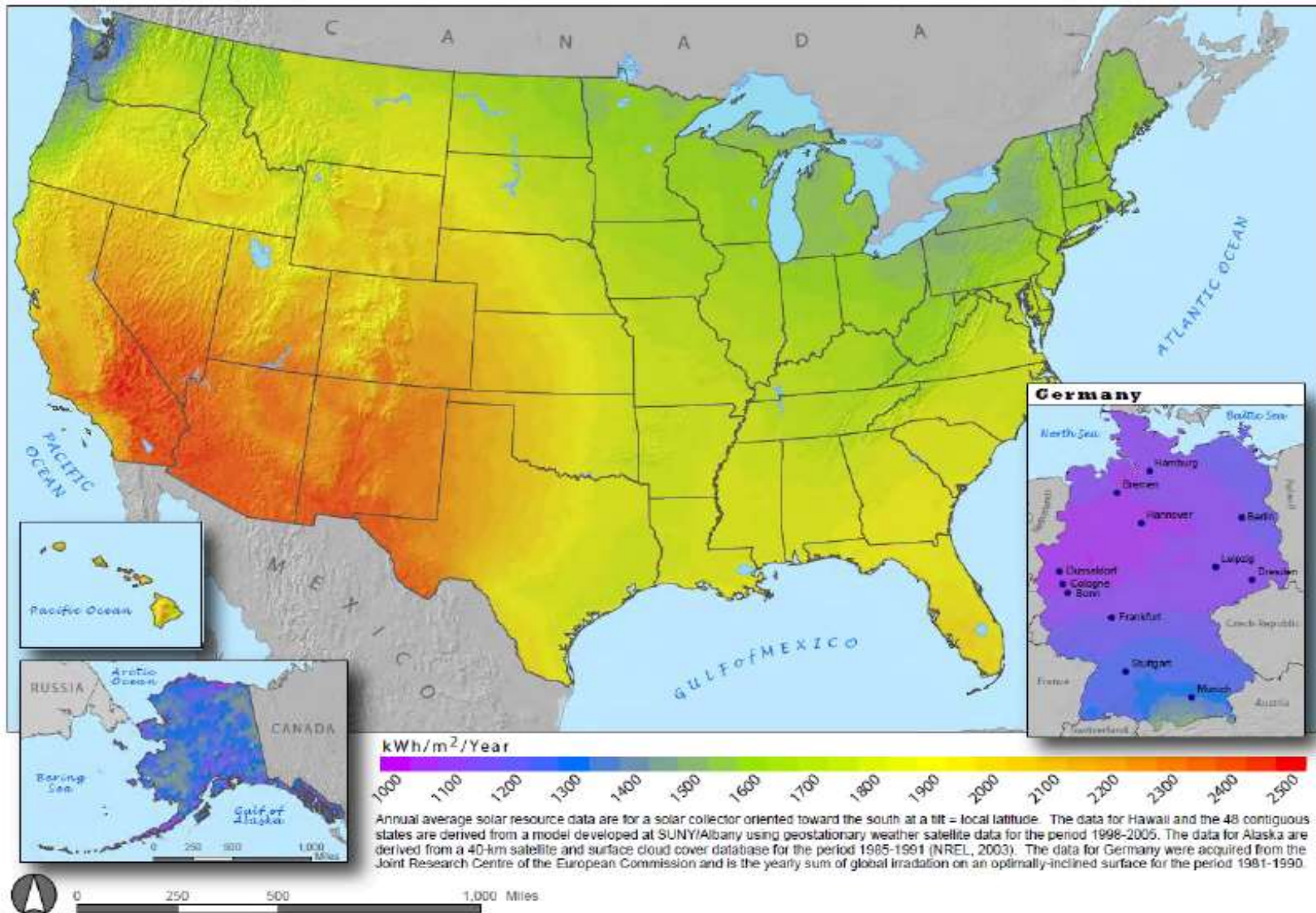
Abundant Resource

Meet Growing Energy Demand

Improve Air Quality

Economics and Financial Stability

Solar Abundance



Solar Abundance

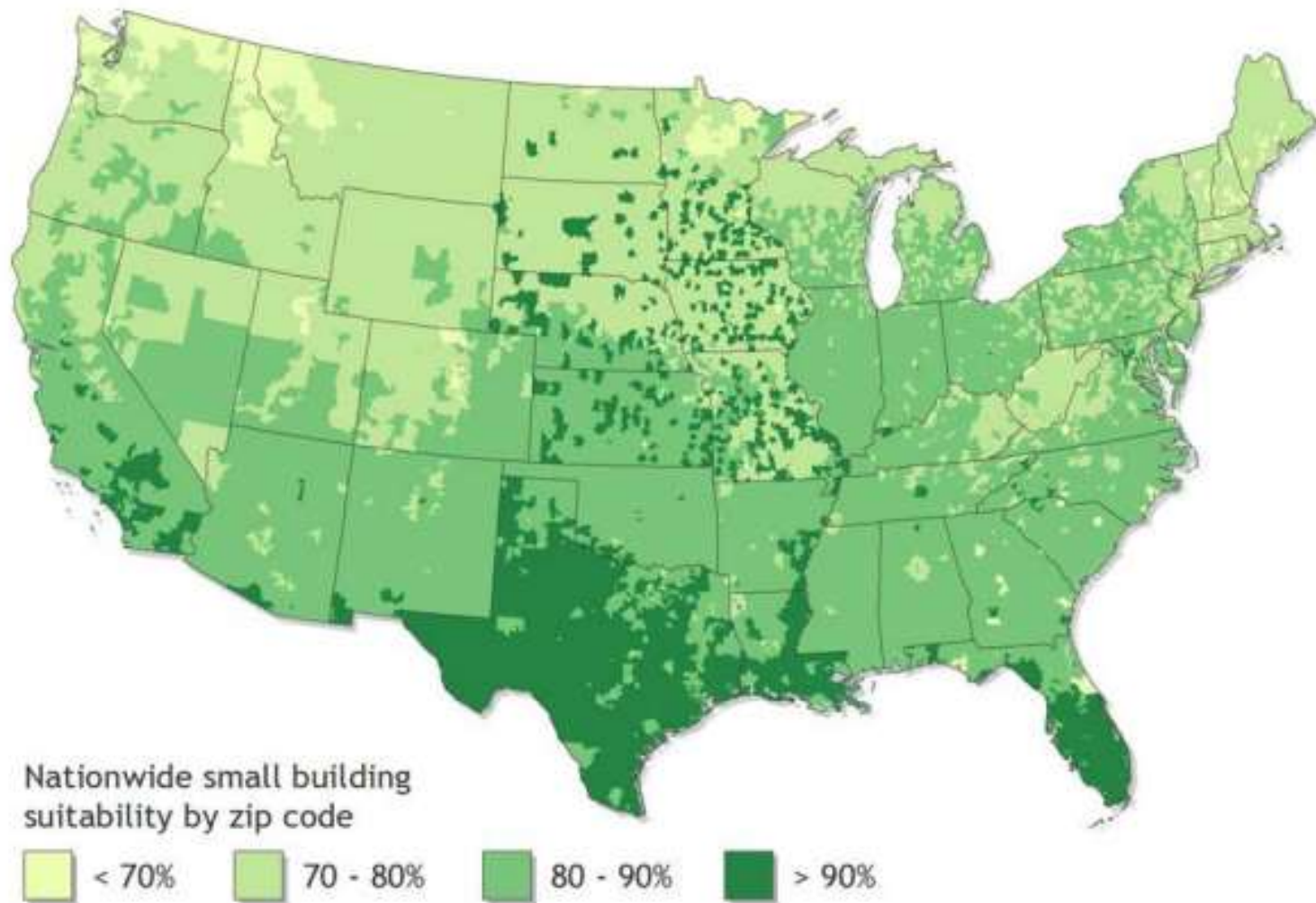


Figure ES-1. Percentage of small buildings suitable for PV in each ZIP code

Texas' Benefits From Solar



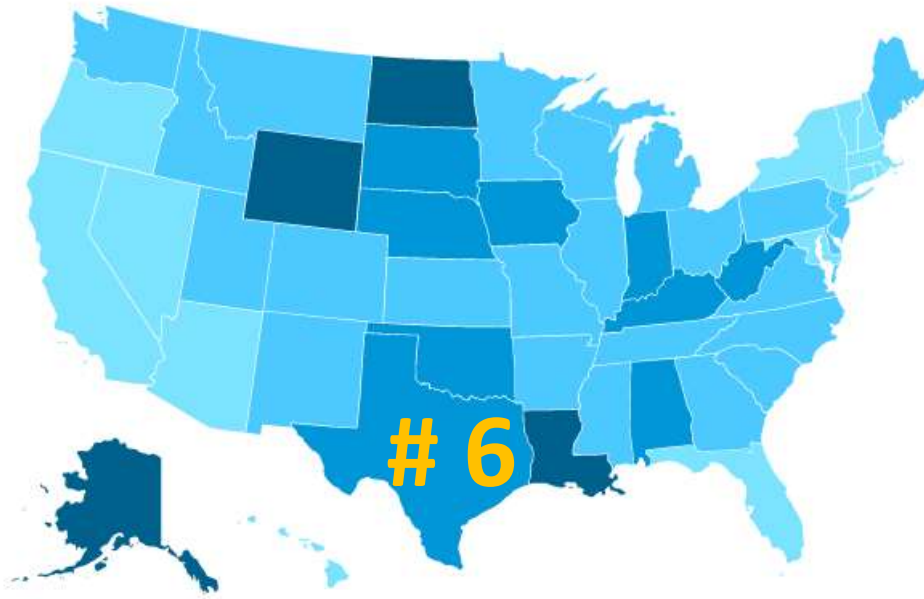
Availability of Abundant Resource

Meet Growing Energy Demand

Improve Air Quality

Economics and Financial Stability

Growing Energy Demand



New Peak Demand Records
are being set each year:

2015: 69,877 MW

2016: 71,093 MW

Meanwhile population,
and corresponding
energy needs, are
growing across North
Central Texas

Population Trends

- One of the fastest growing states
- NCTCOG population forecasted to grow by 47% between 2017 and 2040, to over 10.5 million
- Per capita Income expected to increase
- Thousands of housing units being developed
- Business relocation to North Central Texas

Texas' Benefits From Solar



Availability of Abundant Resource

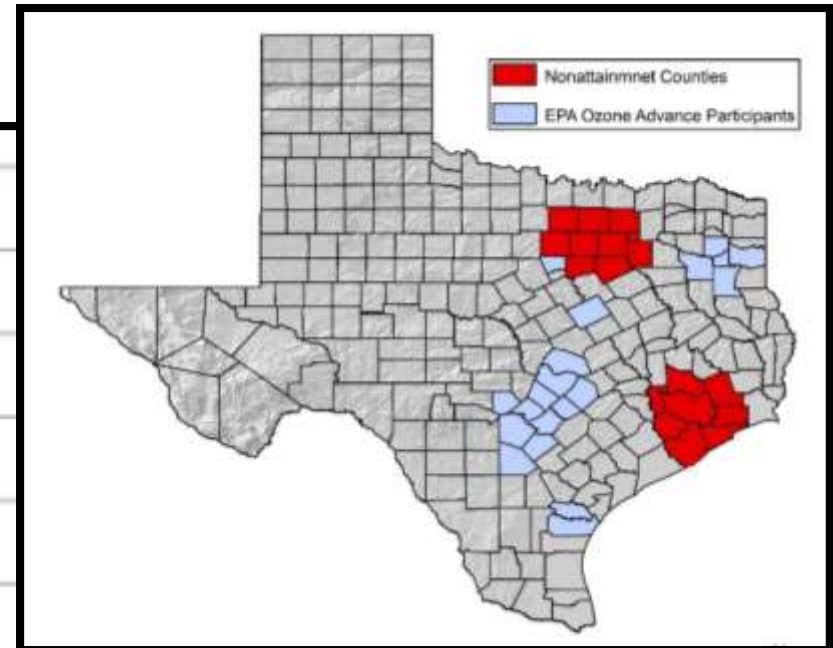
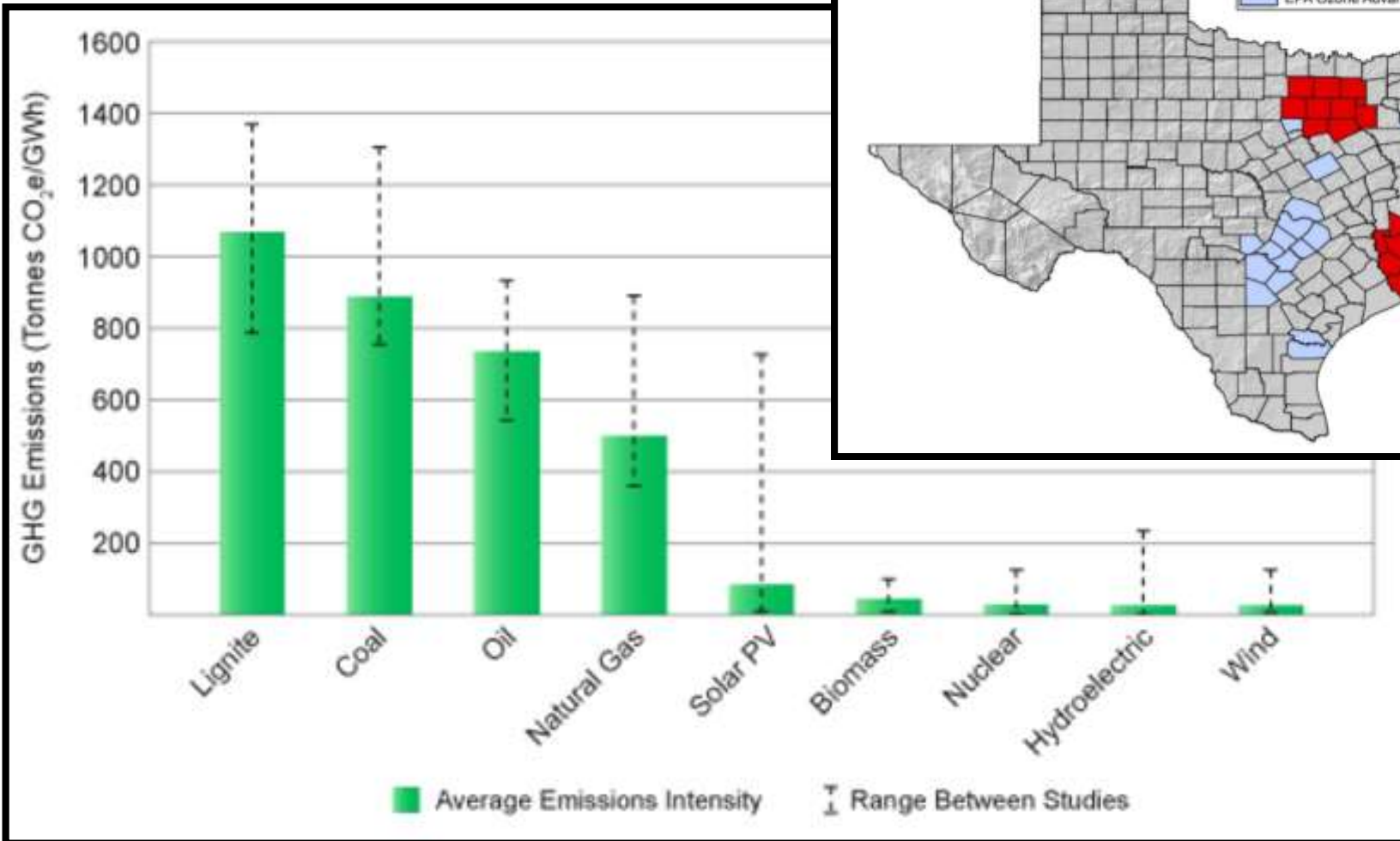
Meet Growing Energy Demand

Improve Air Quality

Economics and Financial Stability

Low-Emission Energy Source

Energy Source Emission Comparison



Texas' Benefits From Solar



Availability of Abundant Resource

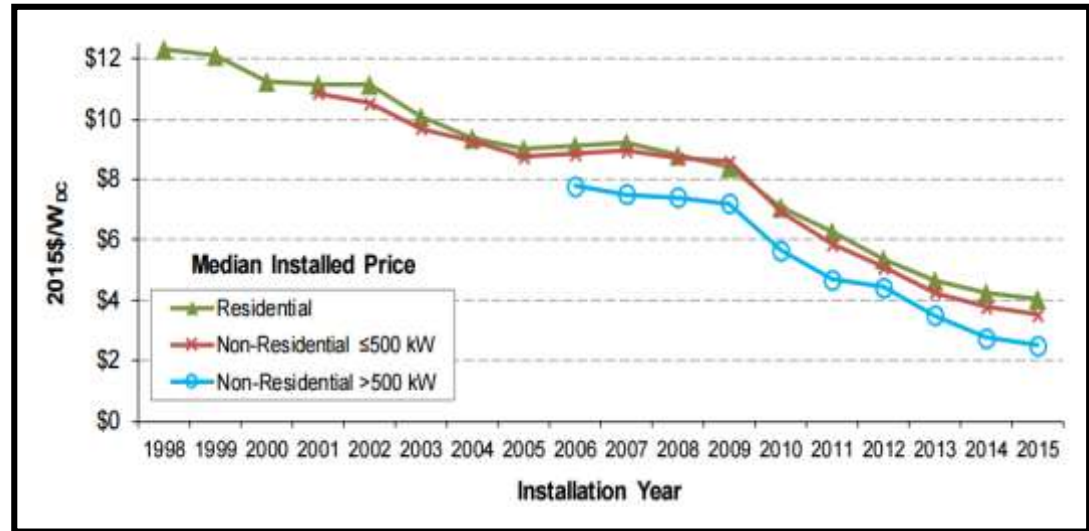
Meet Growing Energy Demand

Improve Air Quality

Economics and Financial Stability

Economics and Financial Stability

- Federal Investment Tax Credit
- Declining Solar Costs
- Solar Job Growth



Solar is Here!

Municipal and School Solar Commitments



Austin, Bridgeport ISD,
Dallas, Denton,
Duncanville, Georgetown,
Irving ISD, McKinney,
Pasadena ISD, Presidio
ISD, San Antonio

Large Solar Projects and Community Solar



CPS Energy
CoServ Electric
Austin Energy
MP2 Energy
REI, Kohl's, Target, Ikea, FedEx

Solarize Projects

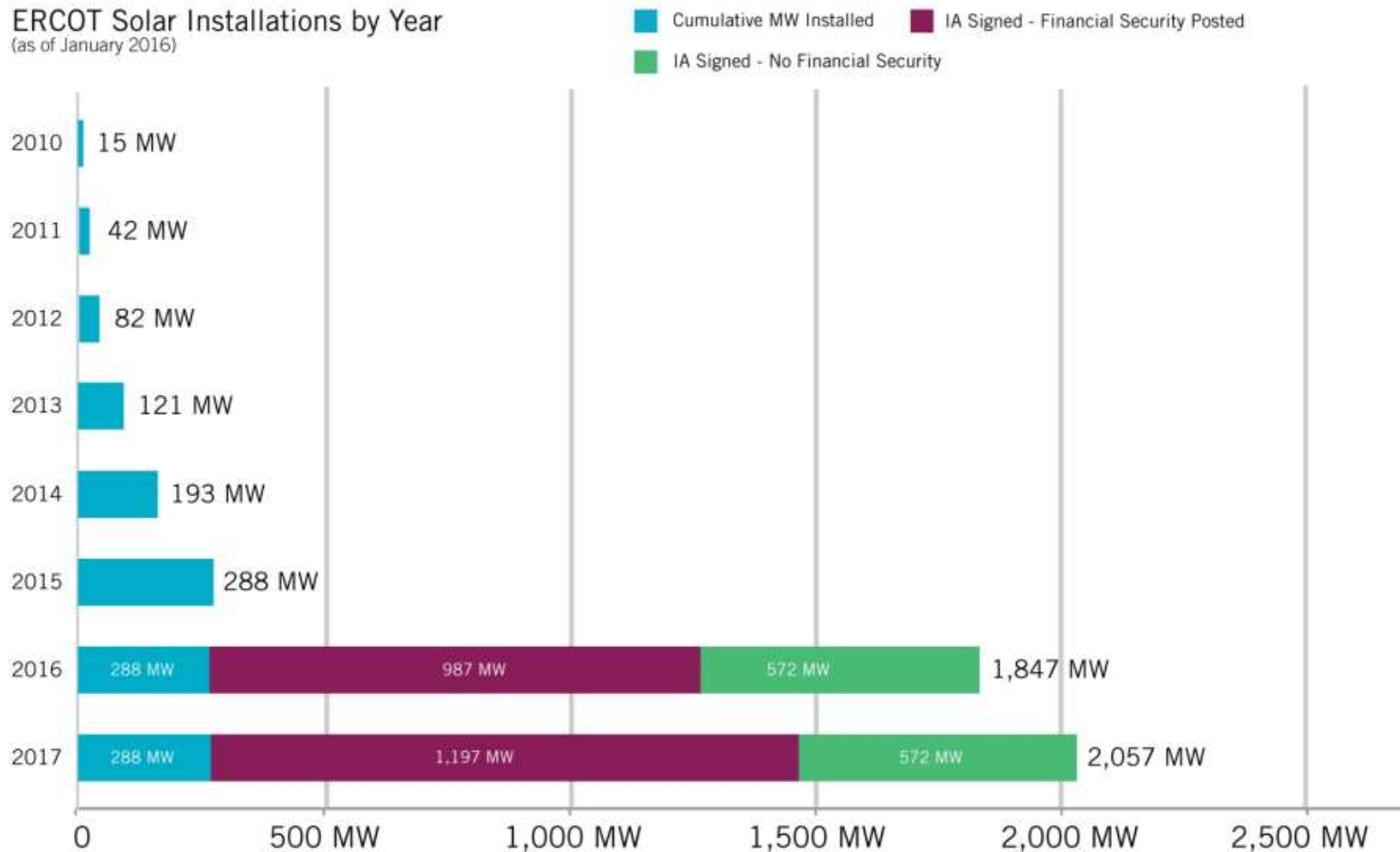


Plano
Houston
Garland
Wells Branch
Gillespie County

Solar Growth, Texas

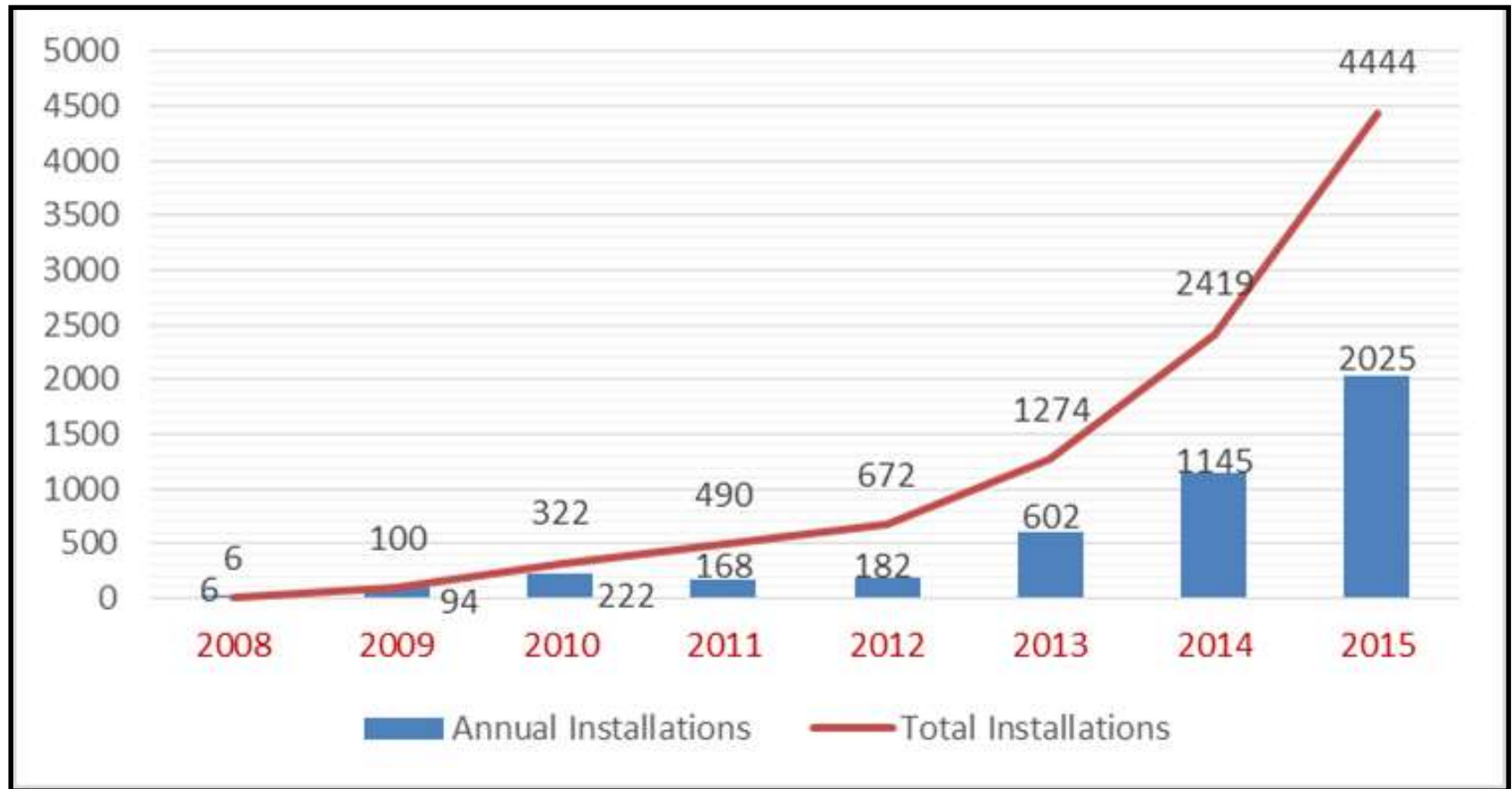
Utility Scale Solar Generation – January 2016

ERCOT Solar Installations by Year
(as of January 2016)



Solar Growth, North Central Texas

Annual and Total Rooftop Installations (2008 – 2015)



TOOLS FOR GROWING SOLAR

The Lone Star State has installed 534 megawatts (MW) of solar capacity, enough to power 57,000 homes.*

*Source: Solar Energy Industries Association, SEIA.org/smi. Acquired August 2016. Data as of December 2015.

GoSolarTexas.org, Solar Information Clearinghouse



Solar power is an emerging clean energy option that can positively impact North Texas' environment and save consumers money on their electric bills. Dallas-Fort Worth is a prime location for solar technology and its growth due to the region's climate and geography. Solar power can provide much of the needed electricity when electricity demand is highest - when it's hot and the sun is shining.

With proper implementation, solar energy will help to improve air quality by decreasing the amount of fossil fuel power generation needed. This corresponds to reduced emissions that contribute to Texas' air pollution and current nonattainment status for the pollutant ozone in several regions.

To learn more about solar resources and information available to you, select the level of solar that applies to you.



Resources for Local Governments



Planning Improvements

Step 1, PL 1-A

Address Solar in the Zoning Code and

Address solar in the zoning code

Zoning codes, solar ordinances and comprehensive plans for a community. These documents can establish solar as "by-right" development of rooftop, ground-mounted and large-scale barriers for solar deployment by creating a precise, regulatory policies can include integrating solar into comprehensive modifying aesthetic requirements, and encouraging solar can also address solar in historic districts/structures.

There are several common practices for integrating solar

- Establish clear "as-of-right" zoning procedures for solar systems in appropriate districts.
- Small-scale residential and commercial systems districts.
- Solar systems can be exempted from unreasonable coverage.
- Height requirements on principal building structure. Exemptions should be outlined in zoning ordinance may also inadvertently restrict optimal deployment.
- Accessory uses can be restricted by lot regulations: impervious surface and lot coverage requirements; ground, they are not an impervious surface. These installations.
- Review processes for solar installations in historic districts by increasing labor costs through delayed installation districts minimally restrictive. A solar ordinance significantly impact the aesthetics of the zone.
- New subdivisions or developments can be required process through subdivision regulations. This may (see Step 2-1A), optimizing building orientation options were considered.

For information on Solar Ready II and the Best Management Practices, visit www.nctool.org/solar



North Central Texas
Council of Governments



SOLAR PHOTOVOLTAIC (PV) SYSTEM PERMIT APPLICATION CHECKLIST

This Permit Application Checklist is intended to be used as a best management practice when establishing local government requirements for residential and commercial solar photovoltaic (PV) system permits. Local governments may modify this checklist to accommodate their local ordinances, code requirements, and permit procedures. The following application items may, at the community's discretion, be replaced by an expedited process such as those published by the Solar America Board for Codes and Standards or referenced as examples in the Solar Ready II materials posted at www.nctool.org/solar.

1. REQUIRED INFORMATION

Type of Application

- ☐ Residential
- ☐ Commercial (Also see Part 2)

Type of Solar PV System

- ☐ Roof Top
- ☐ Ground Mount
- ☐ Other: Click here to enter text

Size of System (kW): Click here

- ☐ Completed permit application(s) Building Department for standard

- ☐ Roof Top: An electrical permit
- ☐ Ground Mount: Building and
- ☐ Other: Building and/or electrical

- ☐ Installed in accordance with the by the State of Texas, applicable etc.); subject to plan approval.

NOTE: The National Electrical Code (NEC) is the minimum standard for electrical wiring in the United States as of September 1 of a

NOTE: Potential impacts of solar evaluated by the local government

- ☐ Construction Documents: Two sets.

- ☐ Site specific, stamped engineering: If determined to be installation plans, manufacturer
- ☐ Make, model, and quantity (TAT) standard by a National

NCTool, in partnership with the National Association of State Governments, is participating in the Solar Ready II initiative to assist the United States as a



Project Deliverables

Cost Benefit Analysis

Model Applications

**Simple
Grid-Tied
Solar**



**Solar with
Ancillary
Benefits**

Solar on Landfills/Contaminated Sites



Solar on Shading Structures



**Solar with
Storage**

Grid-Tied Solar with Storage



Mobile Solar with Storage



Case Studies

Case Study:

Municipally Owned Utilities in Texas



Georgetown Utility Services



Georgetown Utility Services (Partial Service Area Boundary)

Quick Facts

Georgetown Utility Services has contracted with SunEdison to build and maintain a 200 MW solar array near Fort Stockton, in West Texas. The array will be operational by 2017.

Georgetown Utility Services will be producing 200 MW of energy in total once they go 100% renewable. Currently, the utility has a peak load of 243 MW.

Georgetown Utility Services is expanding to increase from 10% renewable energy to 100% by the end of 2017.

Summary

Georgetown Utility Services (GUS) serves an overall population of 20,000 in TX. In 2012 the utility announced the city to pursue a plan to secure the most cost-effective and reliable renewable energy source based on the business case for paying customers with a long-term, flat rate.



A Growing City

In 2015, the City of Georgetown purchased 150 MW of the energy while electricity to GUS in Texas where a panel can Texas because of the use the high capacity to (CREZ) lines, installed to

Case Study:

Municipally Owned Utilities in Texas



CPS Energy



Summary

CPS Energy is the nation's 165,000 electric customer. CPS Energy and distribution. With a make solar energy available programs that shading angle, roof orientation, and solar panel type. CPS Energy believes in energy efficiency technologies to help customers more wisely and lower new jobs and education opportunities for the community. With CPS Energy has committed resources to be compensated by 2020. CPS Energy has already surpassed its goal of generating 200 MW of renewables by 2020.

Quick Facts

CPS Energy's service area ranks 8th in Texas and 8th nationally for solar energy generation.

CPS Energy has 9 solar farms, which together are generating over 300 MW of solar power. That is enough energy to power over 37,000 homes.

The largest of their solar installations will be a 400-acre solar farm expected to generate 200 MW.

CPS Energy offers 3 different ways to engage their customers with solar energy — community solar, private ownership, and solar hosting.

CPS Energy enthusiastically links clean energy investment to local job creation by relying on local companies for solar equipment and installation.

CPS Energy has already surpassed its goal of generating 200 MW of renewables by 2020.

Case Study:

Electric Cooperatives in Texas



CoServ Electric

Quick Facts

There are 235 subscribers to the CoServ Solar Station program.

The CoServ Solar Station is located on 18 acres of land.

The Solar Station is a 2 MW array.

There are 8,448 fixed-tilt 315 watt solar panels in the array.

Each panel is expected to produce 475.4 kWh-hours per year for a total of 3.9 million kWh.

CoServ Solar Station is a Rate-Based Structure, selling blocks of energy produced to their customers.

A member's minimum usage over the past 12 months is the maximum energy block that can be purchased.

The solar project to help lower the cost of utility-scale power and cooperative members.

The most challenging step for CoServ was finding land sale prices and restrictive zoning and permitting regulations, but worked with a land broker who was able to help the co-op for the solar array. CoServ chose to build a megawatt (M-co-op) determined that it would be more time and cost effective.

Summary

CoServ Electric (CoServ), a cooperative (co-op) in the CoServ, Denton, Cooke, Wichita, in diversifying their energy receive options and a value diversification applied in the program was guided by participants in the Solar-Utility



CoServ and Community solar is a concept the NRECA SUNCOA project large scale solar project to rooftops, such as renters or When NRECA was granted took advantage of the opportunity participating in the SUNCOA during the project development ranged from resources for co-op members.

Case Study:

Independent School Districts in Texas



Presidio Independent School District



Quick Facts

Location: Presidio, TX

Facilities Participating: Presidio High School, Presidio Elementary, District Office, District Technology Center

PV Capacity: 120 kW

Average Annual Production: 900,000 kWh

PV Location: Ground mount, rooftop

Project Installation: First modules — 2013, Fully installed — 2014

Cost: \$1,000,000

PV Funding: Partial ISD budget and partial grants (USDOE)

Summary

Presidio Independent School District (ISD) is a public school district in Presidio, TX. The ISD has 3 campuses that serve Presidio, Candelaria, Chinati, and Ruidosa, TX. Presidio ISD has become a leader in solar energy production in West Texas. The district saw the value in investing in renewable energy and is reaping the educational, environmental, and economic benefits. While undergoing budget cuts from the state, Presidio ISD turned to the abundance of West Texas sunshine as a way to enhance the district's value and provide a long term return on investment. Presidio ISD applied for several grants to retrofit district buildings with solar and in 2013 the first solar modules were installed. "Solar PV is our goal," says Dennis McEntire, the Superintendent for Presidio ISD. Presidio ISD aims to continue adding solar to help minimize infrastructure costs while maintaining a higher percentage of school dollars applied to direct student services.



Funding

In 2010, Presidio ISD received a grant of \$250,000 from the State Energy Conservation Office (SECO) to install 72 kW rooftop array at the elementary school. The grant required that the district match 20% of the project costs. Presidio ISD also received \$500,000 from the U.S. Department of Energy National Environmental Policy Act (NEPA), secured by Ciro D. Rodriguez, the U.S. Congressman for the 33rd Congressional District, who is an active voice for solar power in the region.

Trainings and webinars

Putting Underutilized Land to Work for Solar



Jul 27, 2016

This webinar provides information to local governments, special districts, and businesses interested in going solar by siting PV arrays on brownfields, landfills, and other previously unusable lands.

[View Training Materials](#)

PACE Financing



Jul 12, 2016

Property Assessed Clean Energy (PACE) is a financing method available to businesses that allows them to finance 100% of a solar energy system.

[View Training Materials](#)

Community Solar in Texas



Jul 8, 2016

This webinar provides information to electric utility cooperatives and municipal owned utilities who may be interested in exploring opportunities for community solar programs.

[View Training Materials](#)

Solar for Local Governments



Jun 8, 2016

Local government officials will learn about the basics of solar energy, ways to ease the permitting process, and discover the economic benefits of solar energy.

[View Training Materials](#)

Solar PV for Fire and Code Officials Workshop



Jun 8, 2016

Fire Inspectors will learn about applicable fire codes and methods for implementing code requirements in residential and commercial photovoltaic (PV) systems.

[View Training Materials](#)

Financing Solar Energy Systems



Jun 7, 2016

This class covers available rebates and tax credits for purchasing solar energy systems for commercial and multi-family property owners and lenders.

[View Training Materials](#)

Community Solar

Texas Community Solar Guidelines

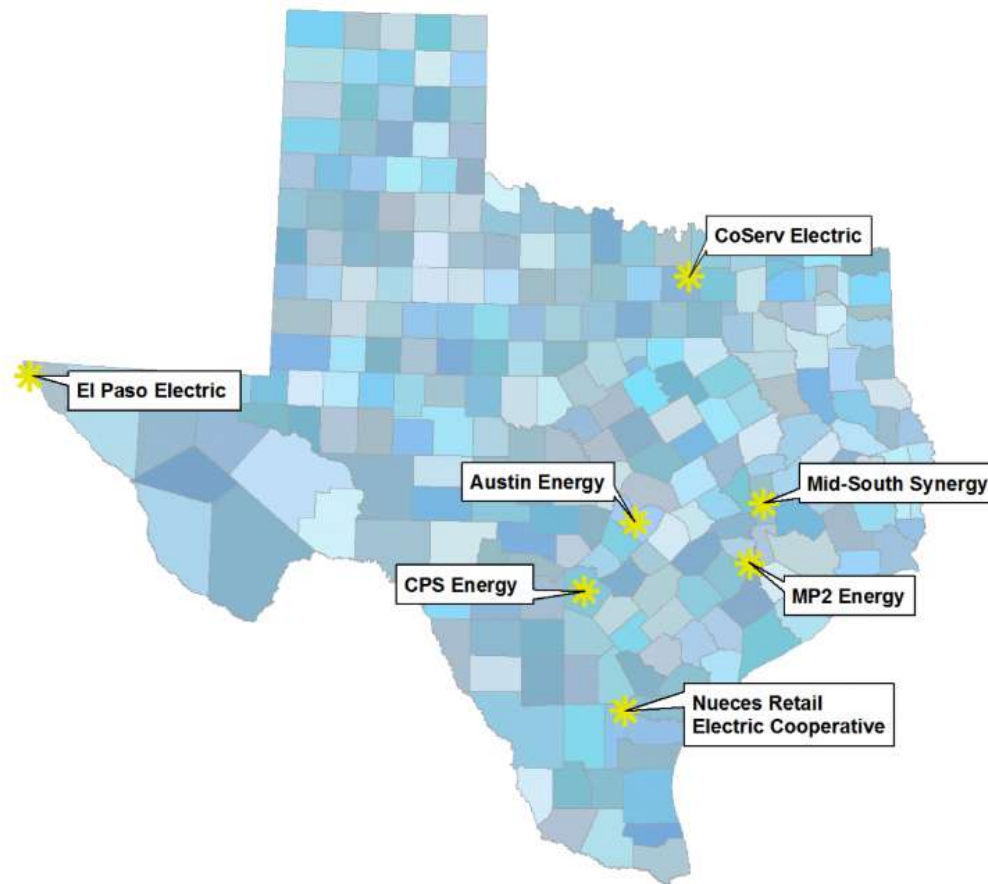
for Electric Cooperatives and Municipally Owned Utilities



Produced by the North Central Texas
in partnership with the State Energy

August 2018

Find out if your area has a Community Solar program!



Features of Community Solar Projects

- Uses economies of scale to meet consumer demand for solar energy
- Bring the decision of whether to invest in solar to a simple yes or no
- “On-site” or “Off-site”
- Premium product or Buy-in
- Can include expanded accessibility or battery storage
- Can work in Competitive Market or Vertically-Integrated Coop or Municipal Utility Market
- Can Work in ERCOT or in Non-ERCOT Market

On-site vs Off-site

- On-site, rooftop community solar projects are usually called “solarize” or “group-buy” programs
- Solarize initiatives can be led and facilitated by residents as with Solarize Plano, or by local governments for maximum effectiveness
- Off-site community solar projects are more common in Texas and exist as centralized solar farms

Premium Products vs. Solar Buy-ins

- With a “premium product” community solar program, residents agree to pay extra money per kWh each month to claim they receive solar energy
 - Austin Energy, Bandera Electric Co-op
 - Note two important aspects of Austin Energy project: storage added and a commitment to a more affordable option for CAP (Customer Assistance Program) through weatherization
- In a buy-in program, consumers purchase ownership of “shares” of the solar farm
 - CPS energy, Nueces Energy Co-op
 - NCTOG has produced an excellent document designed to help public utilities assess the viability of local community solar options.

(http://www.gosolarnorthtexas.org/sites/gosolartexas.org/files/docs/Texas-Community-Solar-Guidelines_Aug2016.pdf)

Community Solar also works in Competitive Areas

- Retail Electric Providers can and should team up with solar developers to offer their customers a "Solar" option.
- The market potential for solar, especially for renters and for commercial customers, is huge.

Making Buildings Solar-Ready?

New Construction – Promote/Require “Solar Ready!”

- Promote Solar-Ready code provisions to developers and home builders
- Adopt [2015 International Residential Code Appendix U](#). Houston recently adopted the solar-ready provision while adopting the 2015 International Energy Conservation Code. See [Houston’s New Residential Construction Code Favors Solar Energy](#). Which other city will be next?
- Austin’s Electric Utility Commission and Resource Management Commission have recommended similar provisions – currently being reviewed by Solar, Plumbing and Mechanical Board and could go to City Council in December for Adoption
- Opinion article - [Calling all Architects: Help us Recover from “Pointy Roof Disease”](#)

Existing Construction – Show citizens the home’s “Sun Number”

Making Homes Solar-Ready: Background

- Makes sure that newly constructed buildings can easily incorporate future solar
- Begins to be a "movement" with passage of California Title 24 Solar-Ready Requirements (2013)
- California Energy Commission – “The intent of the solar ready building requirements is to integrate design considerations that impact the feasibility of installing solar energy systems into the original building design. The Energy Standards require buildings to have an allocated solar zone that is free of obstructions and is not shaded. In addition, the Energy Standards require that the construction documents depict a plan for connecting a PV and SWH system to the building’s electrical or plumbing system. For areas of the roof designated as solar zone, the plans must also clearly indicate the structural design loads for roof dead load and roof live load.

Solar-Ready: A New Movement?

- 2015 IECC includes a **residential** solar-ready provision (Appendix RB) that jurisdictions can adopt
- State of California passed solar-ready residential **and commercial** provisions in 2013; implemented in 2014
- State of Massachusetts has proposed solar-ready for both **residential and commercial -- C402.3.2 Solar-ready zone area.**
- Houston has a solar-ready residential requirement;
- 2018 IECC has a proposed **MANDATORY** solar-ready provision
- Energy Trust of Oregon requires it for certain incentive programs
- San Francisco has approved a solar-installation requirement on all new buildings, while Seattle has solar-ready plus renewable energy requirement for certain commercial buildings.

Texas? It's Happening

- All cities in Texas are currently adopting new energy codes because of HB 1736 and SECO rules;
- Houston became first city in Texas to require that homebuilders make homes solar-ready.
- What is required?
 - Solar-ready zone of 300 feet, with at least 80 contiguous feet areas;
 - Electrical box large enough to incorporate future breaker and a "For Future Solar" sticker;
 - A conduit to the roof;
 - Construction Document
- Austin is currently considering a modified solar-ready provision that would apply to homes above 600 square feet roofs; townhouses, multi-family and commercial buildings with more than 2000 feet roof-space;
- Action expected in December;
- El Paso passed as voluntary measure.
- Others: City of Lewisville.

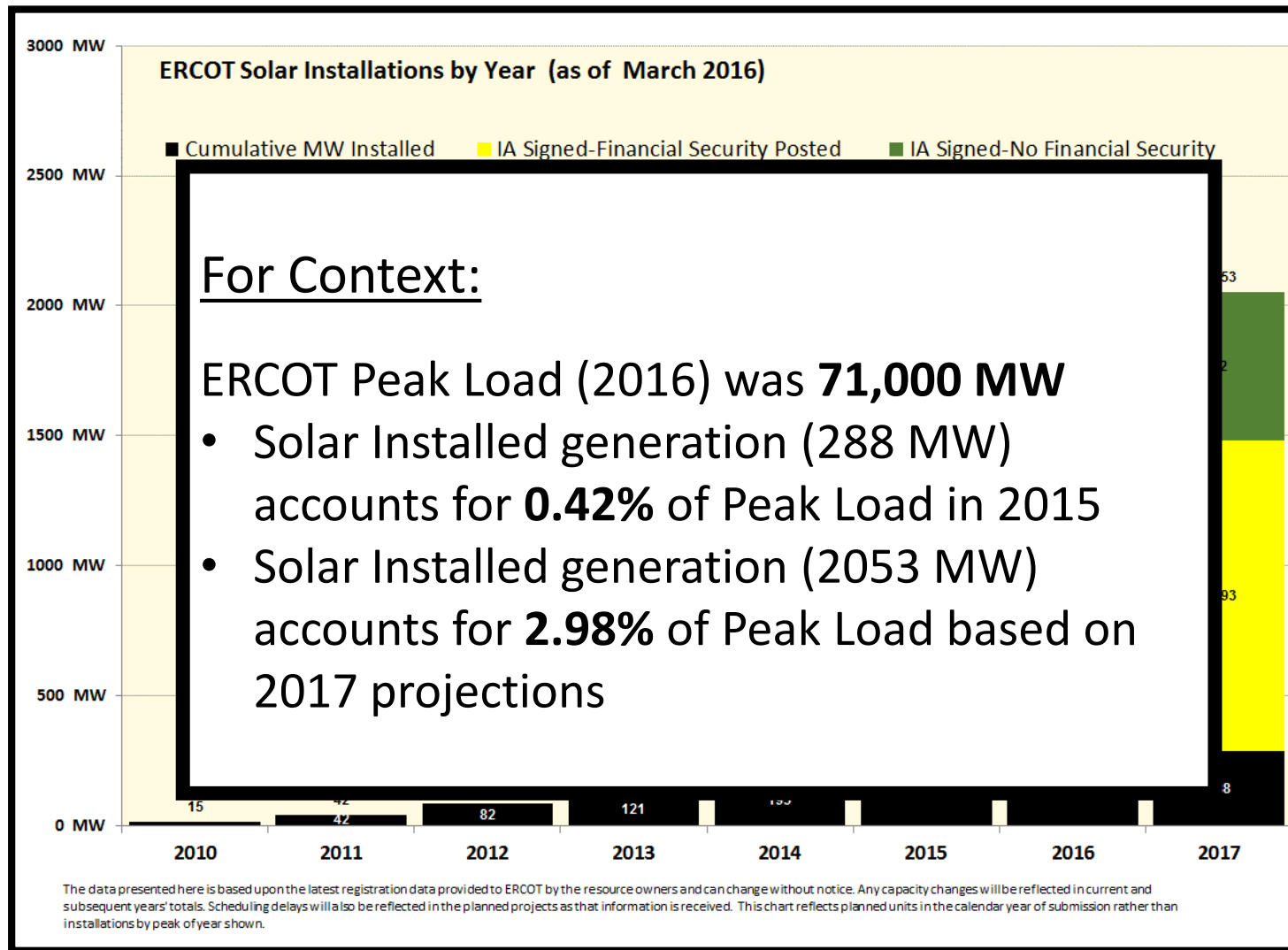
EXCEPTIONS?

Shaded, Small, Already has Solar

Next Steps on Solar-Ready

- Make solar-ready a requirement in 2018 IECC;
- Make it clear that solar-ready homes and businesses will help create more markets for solar and increase value
- Making it easier for cities to adopt by:
 - Creating Easy Compliance Documents and Options
 - Educating builders and building code officials
 - Advertising homes and buildings that are solar-ready

Parting Thoughts



Questions and Contact

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