Go Solar Texas:
Building Capacity for Solar at the Local Level

GRIDNEXT 2016 Conference, Georgetown Texas

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<table>
<thead>
<tr>
<th>Presentation Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCTCOG &amp; the Sierra Club; Who we are &amp; Why we care about solar</td>
</tr>
<tr>
<td>Texas: The State of Solar</td>
</tr>
<tr>
<td>Tools for Growing Solar (NCTCOG)</td>
</tr>
<tr>
<td>Examples and Steps on Community Solar</td>
</tr>
<tr>
<td>How to Make Our Buildings Solar-Ready</td>
</tr>
</tbody>
</table>
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

2016 OZONE SEASON
Eight-Hour Ozone Historical Trends

1997 Standard < 85 ppb (Revoked)

2008 Standard ≤ 75 ppb¹ (by 2017)

2015 Revised Standard ≤ 70 ppb (TBD; Moderate by 2023)

Consecutive Three-Year Periods

Design Value (ppb)¹

66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102

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).

¹Not a full year of data, current as of 10/30/2015

Source: NCTCOG TR Dept
Air Quality Control Strategies & Local Programs
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

Source: The National Renewable Energy Laboratory
Solar Abundance

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

Source: The National Renewable Energy Laboratory
Texas’ Benefits From Solar

Availability of Abundant Resource

Meet Growing Energy Demand

Improve Air Quality

Economics and Financial Stability
Growing Energy Demand

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

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

Sources: Energy Information Agency and the Electricity Reliability Council of 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

Sources: World Nuclear Association
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

Sources: International Renewable Energy Agency and the Lawrence Berkeley National Laboratory
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)

- **2010**: 15 MW
- **2011**: 42 MW
- **2012**: 82 MW
- **2013**: 121 MW
- **2014**: 193 MW
- **2015**: 288 MW
- **2016**: 288 MW + 987 MW + 572 MW = 1,847 MW
- **2017**: 288 MW + 1,197 MW + 572 MW = 2,057 MW

Source: ERCOT Future Directions for ERCOT presentation (March 2016)
Solar Growth, North Central Texas


Source: North Texas Renewable Energy Group
The Lone Star State has installed 534 megawatts (MW) of solar capacity, enough to power 57,000 homes.*

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:
- Home Owners
- Business Owners
- Local Governments
- School Districts
- Utilities
- Solar Professionals
Planning improvements

Step 1, PL 1-A
Address Solar in the Zoning Code and Permitting

Address solar in the zoning code

Zoning codes, solar ordinances and comprehensive plans define the local community. These documents can establish solar as “by-right” development of rooftop, ground-mounted and large-scale solar projects. Solar ordinances can also address some barriers for solar deployment by creating a precise, regulatory framework that can promote solar energy. Solar ordinance policies can include integrating solar into comprehensively planning and zoning codes, modifying aesthetic requirements, and encouraging solar energy by providing incentives. Solar ordinance policies can also address solar in historic districts/natural areas.

There are several common practices for integrating solar in comprehensive plans:

- Establish clear “by-right” zoning procedures for solar systems in appropriate districts.
- Include provisions for small-scale residential and commercial systems.
- Allow solar systems to be exempted from nuisance regulations.
- Establish clear “as-of-right” procedures for solar systems in appropriate districts.
- Provide for solar systems in designated areas.
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Cost Benefit Analysis

Project Deliverables

Report

Fact Sheets

Excel Tool

Benefits and Costs of Model Solar Applications for Local Governments

FIRE STATION #6 IN MCKINNEY

As an example, a simple grid-tied solar energy system at the Fire Station #6 in McKinney, Texas, produces an estimated 127,000 kWh of electricity annually, about 60 percent of the Fire Station's annual energy needs.

The project was funded in part by a grant through the Texas State Energy Conservation Office. It consists of 233 polycrystalline solar modules, rated at 215 watts each, installed on 3 different roof surfaces. The panels are attached to the roof areas utilizing clamps that allow the modules to be attached to the roof without making penetrations. It utilizes multiple string inverters due to limited space for a large centralized inverter, and includes a web-based monitoring system that provides real-time energy production data through a standard web browser.

FRONTIER ASSOCIATES

Frontier Associates, August 2018 www.frontierassoc.com

North Carolina State University
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:**
- **Summary:** Georgetown Utility Service's service area ranks #1 in Texas and #2 nationally for solar energy generation.
- **Quick Facts:**
  - Georgetown Utility Services has contracted with SunEdison to build and maintain a 248 MW solar array near Fort Stockton, TX. The array will be operational by 2022.
  - The 450 MW energy system is expected to increase from 5.4% renewable energy to 20% by the end of 2022.
- **CoServes:**
  - **Summary:** CoServes Energy is the nation’s largest electric cooperative in Texas.
  - **Quick Facts:**
    - CoServes has a largely rural customer base in Texas.
    - CoServes Energy has successfully added clean energy to its grid by relying on local companies for solar energy equipment and installation.
    - CoServes Energy has already surpassed its goal of generating 500 MW of renewables by 2022.

**Case Study:**
Electric Cooperatives in Texas

**Presidio Independent School District:**
- **Summary:** Presidio Independent School District (PISD) is a public school district in Presidio, TX. The district has campuses that serve Presidio, Candelaria, Chihuahua, and Roosevelt, TX. PISD 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, PISD 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. PISD ISD applied for several grants to retrofit district buildings with solar and in 2012, the first solar modules were installed. "Solar PV is our goal," says Dennis McIntire, the Superintendent for PISD ISD. PISD ISD aims to continue adding solar to help minimize infrastructure costs while maintaining a higher percentage of school dollars applied to direct student services.

**Case Study:**
Independent School Districts in Texas

**CoServes Solar Station:**
- **Summary:** The CoServes Solar Station is located on 56 acres of land.
- **Quick Facts:**
  - There are 235 subscribers to the CoServes Solar Station program.
  - The CoServes Solar Station will use 3.5 MW panels in the array.
  - Each panel is expected to produce 12,000 kWh/year for a total of 12.5 million kWh.
  - The CoServes Solar Station is a Solar-Based Structure, selling blocks of energy produced to their customers.
  - A member’s minimum usage over the past six months is the maximum energy block that can be purchased.

**Funding:**
- **In 2012,** Presidio ISD received a grant of $425,000 from the Texas Energy Conservation Office (TECO) to install 22 kW rooftop array at the elementary school. The grant required that the district match solar panel installation costs. Presidio ISD also received $500,000 from the U.S. Department of Energy National Environmental Policy Act (NEPA), secured by U.S. Congresswoman for the 33rd Congressional District, where 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

Find out if your area has a Community Solar program!

- El Paso Electric
- CoServ Electric
- Austin Energy
- Mid-South Synergy
- CPS Energy
- MP2 Energy
- Nueces Retail Electric Cooperative
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.
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.

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


- 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”](https://www.iccsafe.org/)

**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
• Exceptions?
Shaded, Small, Already has Solar

• 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.
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
For Context:

ERCOT Peak Load (2016) was **71,000 MW**
- Solar Installed generation (288 MW) accounts for **0.42%** of Peak Load in 2015
- Solar Installed generation (2053 MW) accounts for **2.98%** of Peak Load based on 2017 projections

Source: ERCOT Generation Interconnection Status Report, 2016
Questions and Contact

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