



North Central Texas  
Council of Governments



# Setting the Stage for Solar Development & the SolSmart Cohort

April 1, 2024

# Session 1 Agenda

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**Welcome & Introductions**

**Cohort Overview & Expectations**

**Peer Introductions**

**Energy 101**

**The State of Solar Energy**

**Next Steps**



# Who You'll Hear From

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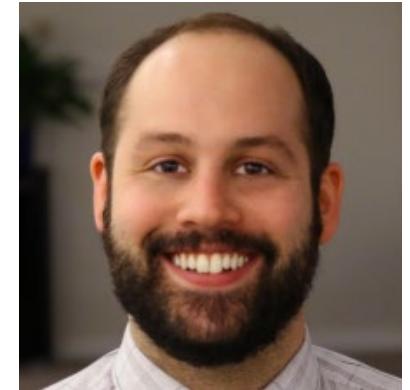
**Joaquin Escalante**  
*Transportation Planner I*  
*Dallas-Fort Worth Clean Cities*  
*North Central Texas Council of*  
*Governments*  
*(NCTCOG)*  
[jescalante@nctcog.org](mailto:jescalante@nctcog.org)



**Alyssa Knox**  
*Environment and Development*  
*Planner II, North Central Texas*  
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*Principal Transportation Planner*  
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*Senior Manager, Clean Energy*  
*World Resources Institute (WRI)*  
[zach.greene@wri.org](mailto:zach.greene@wri.org)



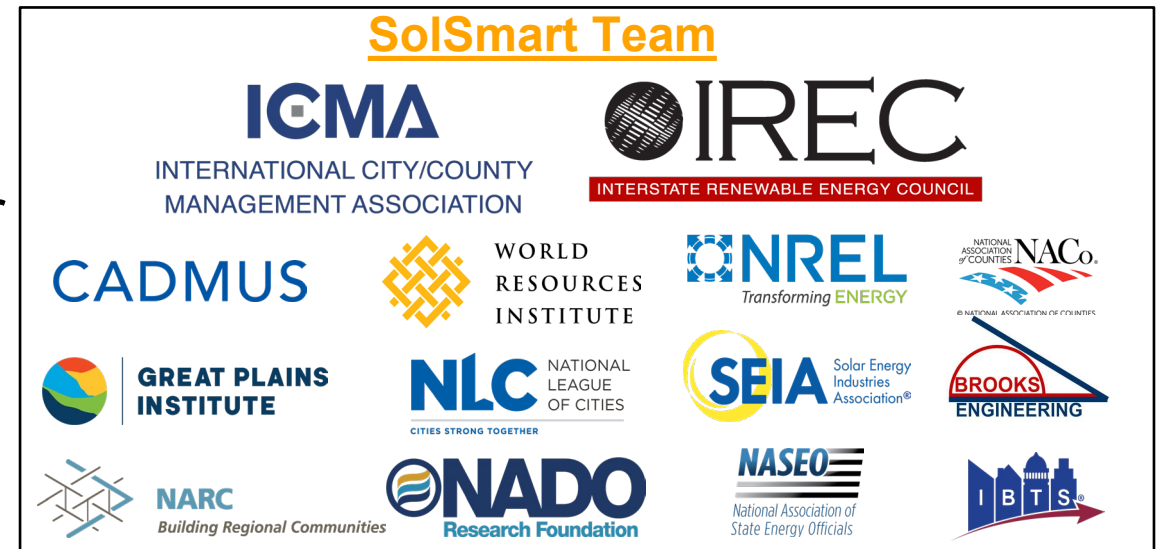
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# Cohort Overview & Expectations

# About SolSmart

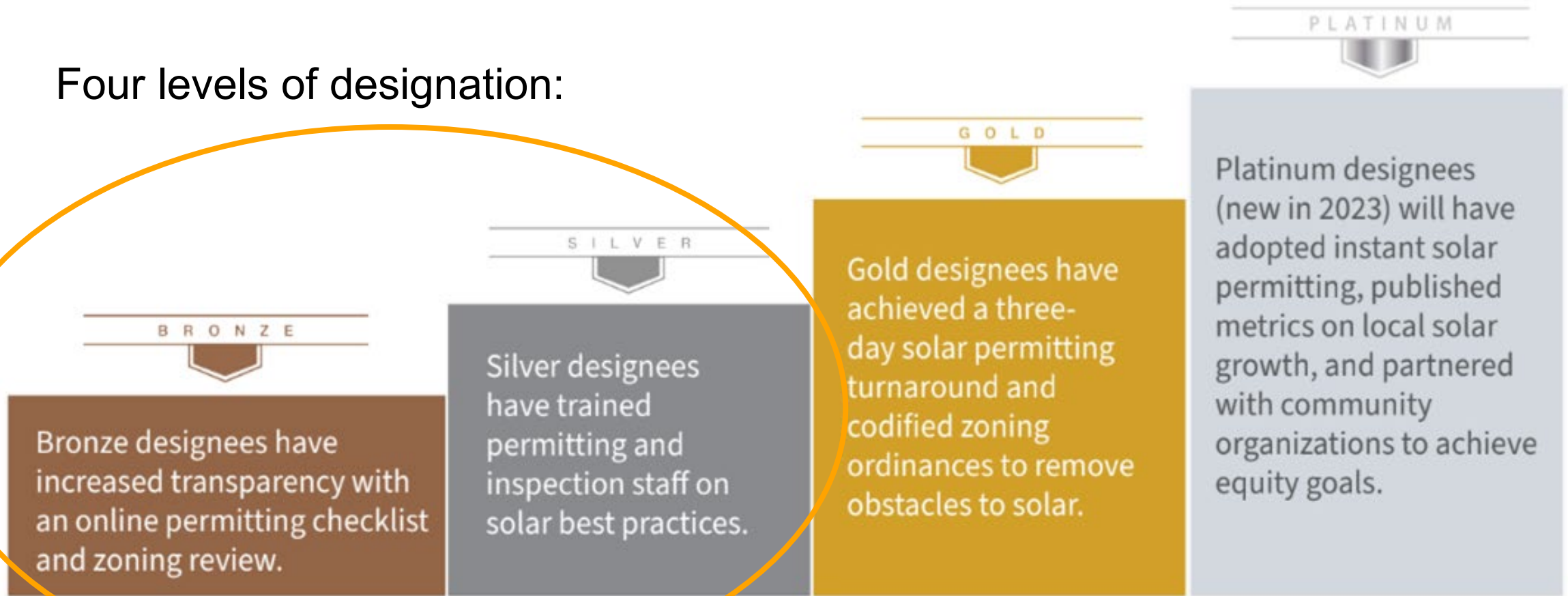
SolSmart is a national **designation** and **technical assistance** program funded by the U.S. Department of Energy's Solar Energy Technologies Office (SETO) to help local governments nationwide make it faster, easier, and more affordable for residents and businesses to go solar.



A SolSmart **designation recognizes communities that have taken key steps to address local barriers to solar** energy and foster the growth of mature local solar markets. It demonstrates that a community is “**open for solar business,**” making it attractive to solar companies and other business development.

# Designation Structure

Four levels of designation:



# SolSmart: A Roadmap to Advance Solar Locally

## Five “Solar-Ready” Categories

Permitting &  
Inspection

Market  
Development

Planning &  
Zoning

Government  
Operations

Community  
Engagement

23 Chicago-area cities, towns, and counties awarded SolSmart designations at Argonne National Lab in 2019



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# The Cohort's Pathway to Bronze



**Complete 3 prerequisites**  
**20 pts in Permitting & Inspection**  
**20 pts in Planning & Zoning**  
**60 pts total**

- Solar Statement (Prereq.)
- Permitting/Inspection
  - PI-1: Permitting checklist (Prereq.)
  - PI-2: Permitting training (10 pts)\*
  - PI-3: Inspection training (10 pts)\*
- Planning & Zoning
  - PZ-1: Zoning review (Prereq.)
  - PZ-18: Planning/zoning training (10pts)\*
  - *Community chosen action (10pts)*
- Special Focus Categories
  - GO-13: Regulatory/Market Training (10 pts)\*
  - CE-1(+): Solar landing page (10+ pts)

# For Communities Interested in Silver



**Complete 4 prerequisites  
100 total points**

- Permitting/Inspection
  - ~~PI-2: Permitting training (Prereq.)\*~~
  - ~~PI-3: Inspection training (Prereq.)\*~~
- Special Focus Categories
  - ~~CE-1: Solar landing page (Prereq.)~~
- Planning & Zoning
  - PZ-4 or PZ-5: Rooftop solar as a by-right accessory use (Prereq.)

**Your community will have to decide how to achieve ~40 points, but 20-30 points can be easily achieved through resources on the solar landing page**

# Supporting Activities

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- Each session will conclude with an overview of a “supporting activity” that you can complete between sessions to advance your progress toward designation.
- These activities may include:
  - Speaking with colleagues in other departments
  - Reviewing existing plans, processes, or policies
  - Drafting checklists and/or other brief materials
  - Reviewing examples of best practices



# Cohort Structure & Timeline

## 1-on-1 check-ins

### **Session #1: Setting the stage for solar development**

Overview of regional and state energy context

### **Session 3: Permitting & inspection for solar**

Training on best practices for permitting and inspecting solar arrays

### **Session 5: Wrap up & next steps**

Address any outstanding questions and chart a pathway forward

**April/May 2024**

**June/July 2024**

**April 2024**

**May/June 2024**

**July/August 2024**

### **Session 2: Planning for solar**

Best practice guidance for planning and zoning of small and large-scale solar arrays

### **Session 4: Community engagement & municipal operations**

Guidance on how to support residents, businesses, and your own operations teams as they consider adopting solar

**Access to 1-on-1 technical assistance support**

# Technical Assistance Examples

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Planning and zoning

Feasibility assessments

Permitting and inspection

Policy and market expertise

Procurement

Financing

Solar PV system design

Stakeholder Engagement





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# Peer Introductions

# Learn more about your peers!

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## Please share:

- What community do you represent and what is your role?
- How have you seen solar development occurring in your community?
- Why did you join this cohort and what do you hope to achieve?

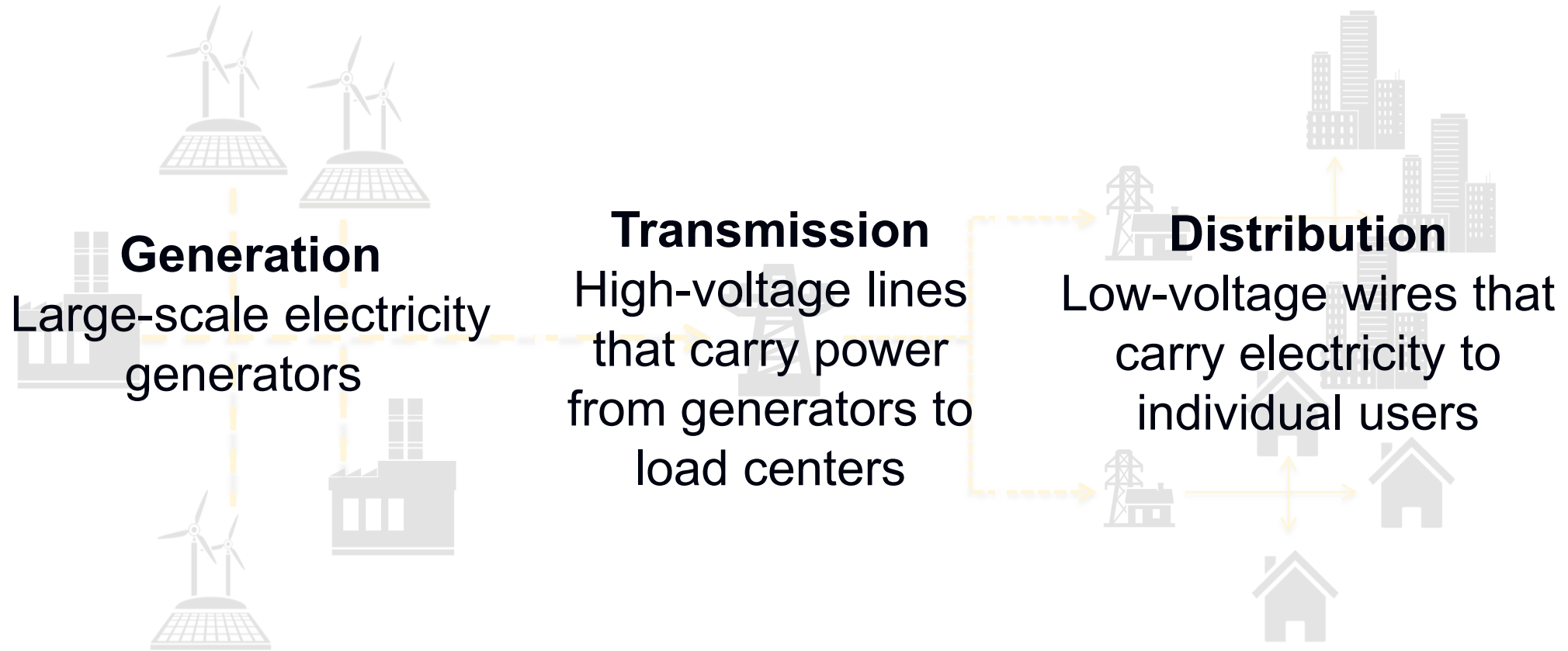


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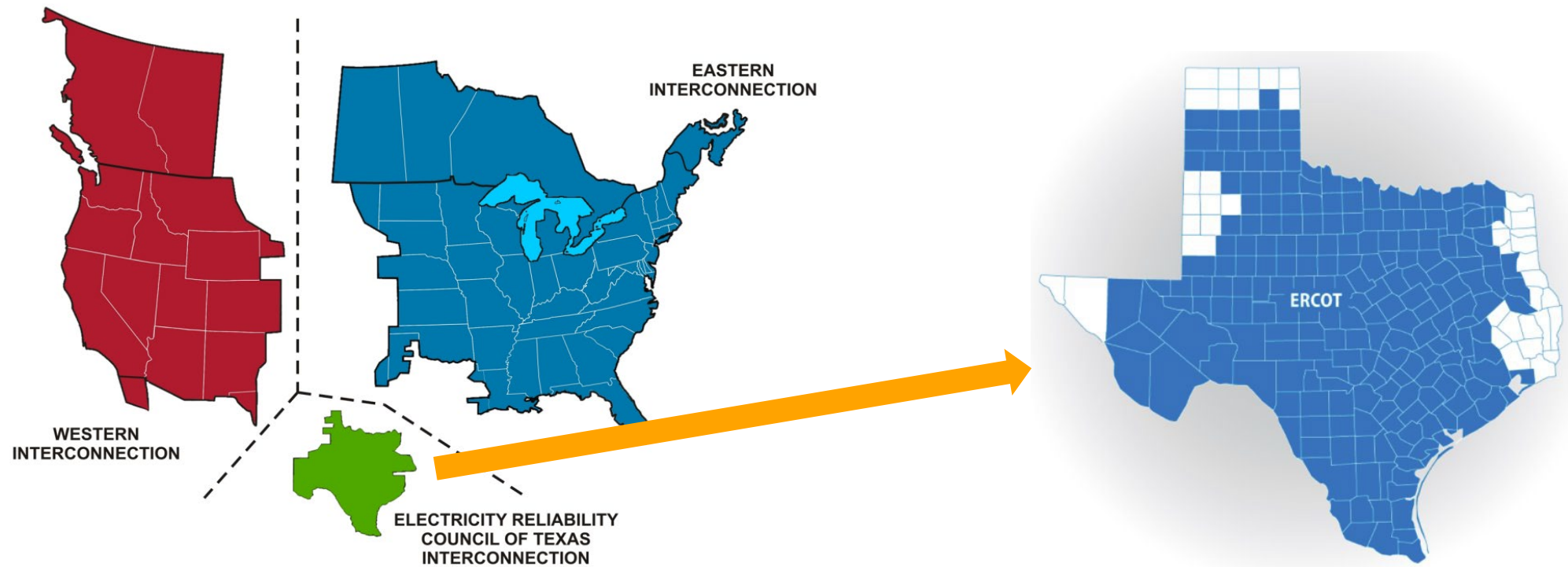


# Energy 101

# “The grid” – the largest machine in the world

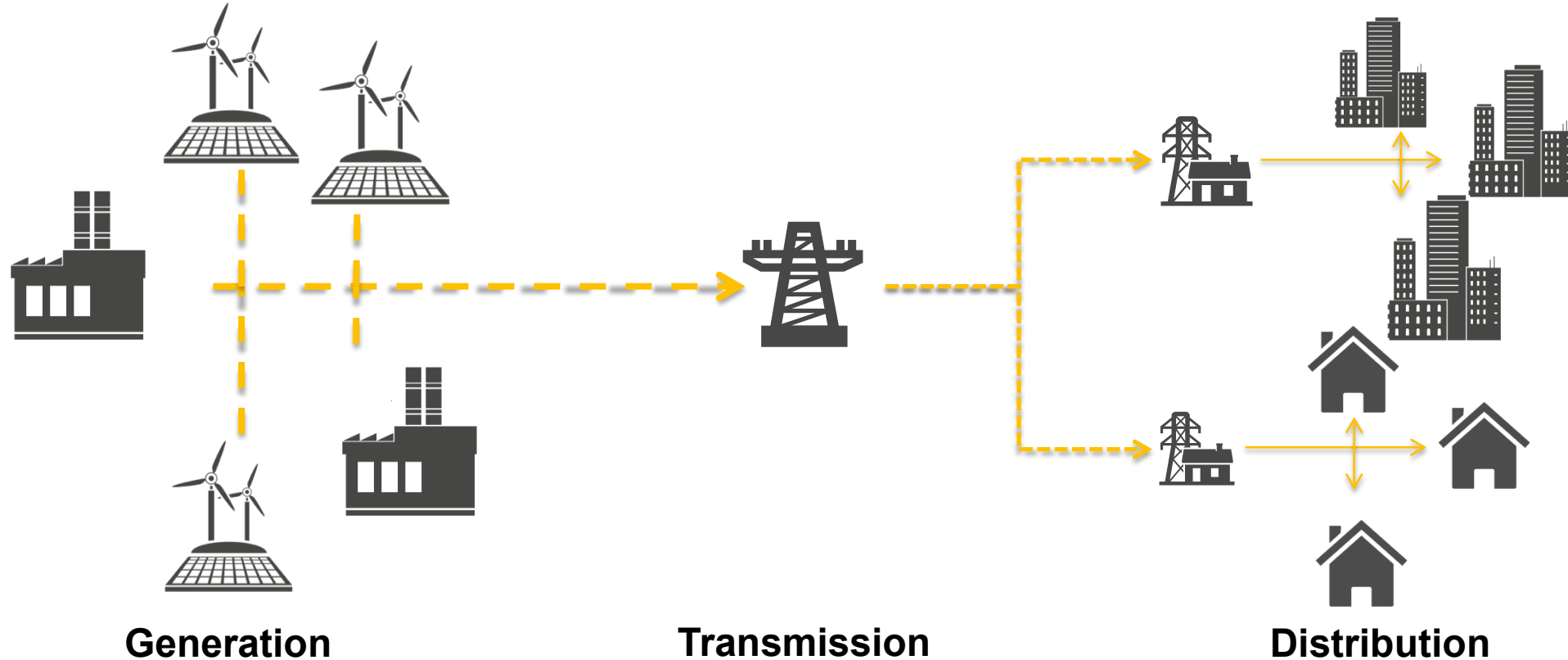


# The grid is subdivided into interconnections, balancing authorities and reliability organizations



Sources: <https://www.energy.gov/oe/articles/north-american-electric-reliability-corporation-interconnections>

# The power system consists of wholesale markets and retail services and is connected by grid infrastructure



## Wholesale

Market Players		Activities
Electricity generators (coal, gas, nuclear, wind, solar)	Electricity providers (e.g., utilities)	Sale of power between generators & electricity providers

## Retail

Market Players		Activities
Electricity providers (utilities)	Retail customers (industrial, commercial, residential)	Sale of power between electricity providers and customers

# There are 7 organized wholesale markets in the U.S.

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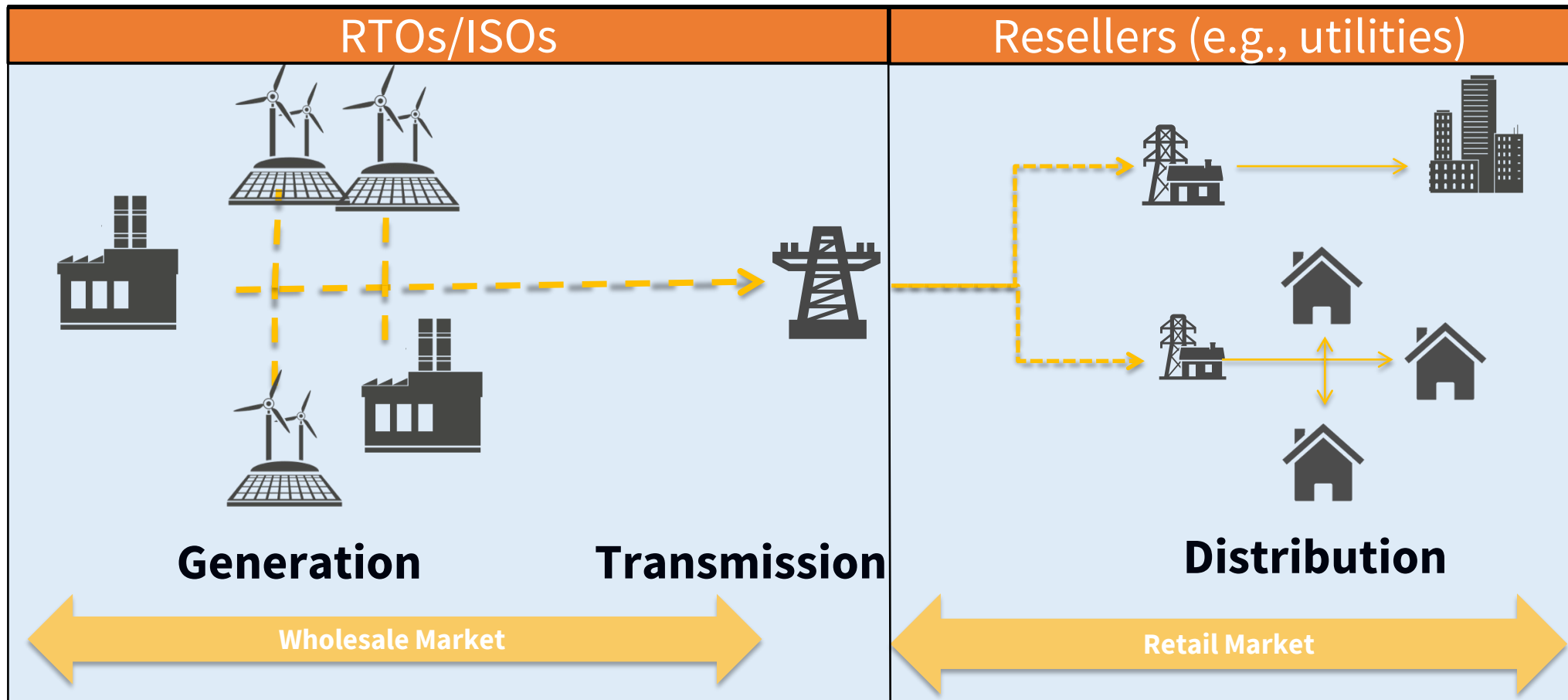
- Regional Transmission Organizations (RTOs) or Independent System Operators (ISOs) are responsible for:
  - Balancing energy supply and demand at least cost
  - Operating markets for energy, ancillary services, and (in certain RTOs) capacity
  - Ensuring sufficient resources are in place for grid reliability
  - Conducting transmission planning
  - Overseeing a stakeholder process to obtain input on RTO decision-making
- Markets can help to integrate and operate clean energy on the grid, and they provide additional flexibility to buyers
- With the transition to clean energy, market rules are evolving.

## ERCOT Markets

Energy	Ancillary Services
<ul style="list-style-type: none"><li>• Markets to secure electricity to meet consumer demand in the near term</li></ul>	<ul style="list-style-type: none"><li>• Markets for resources that can come online quickly &amp; provide services that balance the system as it moves electricity</li></ul>

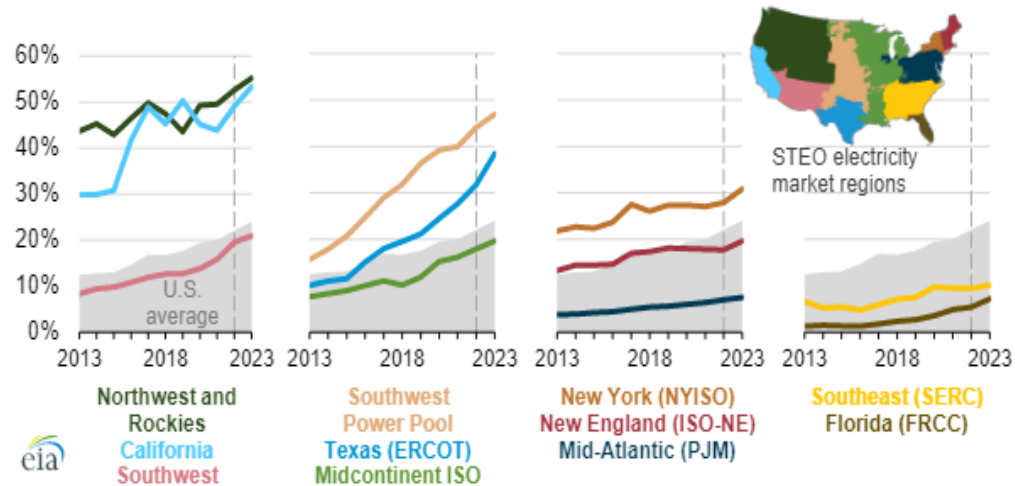


# Roles in a regions covered by a RTO/ISO



# Wholesale markets affect the deployment of clean energy technologies

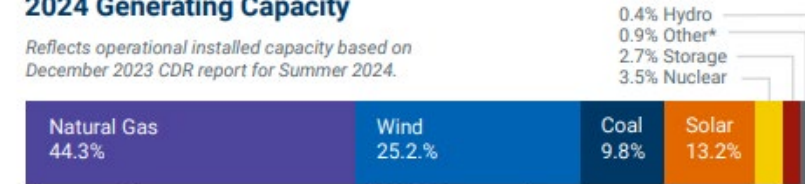
## RENEWABLE ELECTRICITY GENERATION SHARE BY MARKET/REGION IN THE



## GENERATION WITHIN ERCOT

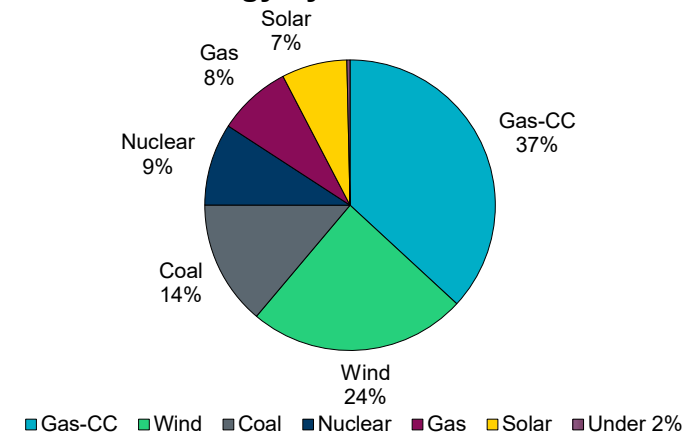
### 2024 Generating Capacity

Reflects operational installed capacity based on December 2023 CDR report for Summer 2024.



The sum of the percentages may not equal 100% due to rounding.  
\*Other includes biomass and DC Tie capacity.

### Energy by Fuel for 2023



Sources: <https://www.eia.gov/todayinenergy/detail.php?id=53459>;  
[https://www.ercot.com/files/docs/2022/02/08/ERCOT\\_Fact\\_Sheet.pdf](https://www.ercot.com/files/docs/2022/02/08/ERCOT_Fact_Sheet.pdf); ERCOT 2023 Fuel Mix Report



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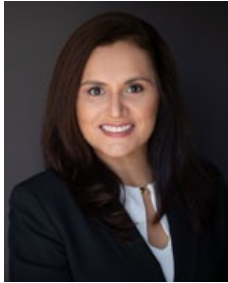


# The Public Utility Commission of Texas regulates electric utilities' rates, power supply, customer offerings, and resource plans

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Chair Thomas Gleeson



Cmmr. Lori Cobos



Cmmr. Kathleen Jackson



Cmmr. Jimmy Glodfelty

## PUCT Responsibilities

- Sets ERCOT's budget and oversees ERCOT's operations
- Oversees state programs and procurements like renewable energy development
- Oversees Retail Electric Market operations
- Regulates utilities to ensure compliance with rules and regulations
- Regulates water, telecommunications, and permitting

Compared to other PUCs, the PUCT has the smallest budget per capita and per MWh of all states

# The Implications of these Wholesale Market Issues on Local Government Goals

Table C1 | Relevant Issues in ERCOT and Implications for Local Governments

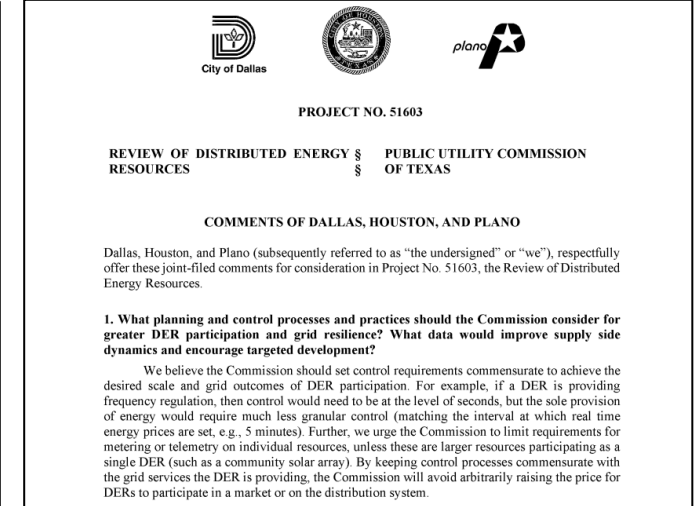
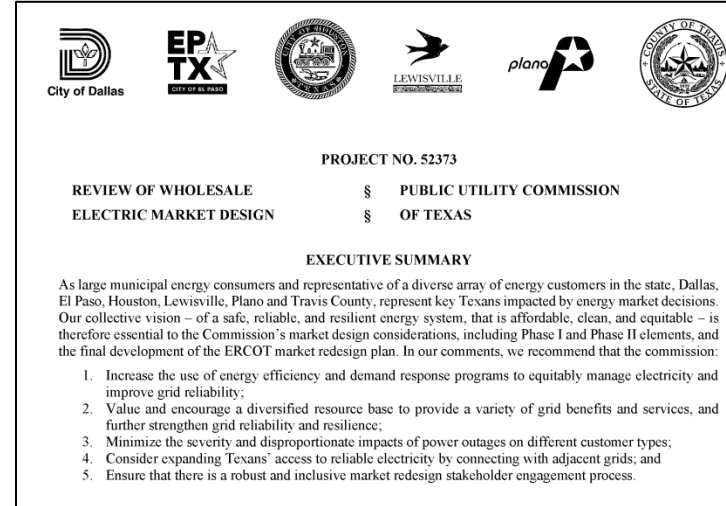
ISSUE	DEFINITION/BRIEF EXPLANATION	IMPLICATIONS FOR LOCAL GOVERNMENTS	ERCOT STATUS
Transmission planning	High build-out of transmission for renewables undertaken under CREZs; LRTP required	Large amount of transmission construction provides greater access to lower-cost renewable resources	More transmission is needed to meet the significant growth of renewable resources in the state
Capacity accreditation and markets	No reliability requirement or capacity market	Not an area of concern at present, depending upon outcome of PUCT actions; creation of a nonrenewable capacity obligation could increase costs	PUCT discussions of a reliability requirement for utilities have created concerns that it may result in greater procurement of nonrenewable resources
Energy and ancillary services markets	ERCOT uses high scarcity pricing to incentivize resource development, but at levels that can be harmful to consumers	High scarcity prices may be more harmful to consumers than useful in providing an incentive for renewable resources	Price cap reduced in light of extreme pricing that occurred in 2021
Stakeholder processes	Open and transparent process with opportunity for public comment	Easier to participate in and have knowledge of ERCOT discussions than in other RTOs	No changes are planned for the ERCOT stakeholder process

*Notes:* CREZ = Competitive Renewable Energy Zone; ERCOT = Electric Reliability Council of Texas; LRTP = Long-Range Transmission Planning; PUCT = Public Utility Commission of Texas.

Sources: <https://files.wri.org/d8/s3fs-public/2022-03/impacts-wholesale-market-rules-policies-clean-energy-goals-primer-local-governments.pdf?VersionId=LpzRCEAQtF9.A4NCyZvLdQXCC.PS3uhv>

# Texas Examples of Engagement on Grid Issues

- Local governments submitted comments to the PUCT on the wholesale market redesign and the aggregated distributed energy resource dockets.
- ERCOT formed a new Texas Municipal Officers Advisory Board in response to a letter sent by the mayor of Castle Hills following Winter Storm Uri.
- There are coalitions of cities in various TDU regions that engage on key grid issues.



Sources: <https://www.dallasnews.com/opinion/commentary/2021/07/21/texas-municipal-leaders-formed-an-group-to-communicate-directly-with-ercot/>; [https://interchange.puc.texas.gov/Documents/52373\\_288\\_1173087.PDF](https://interchange.puc.texas.gov/Documents/52373_288_1173087.PDF); [https://interchange.puc.texas.gov/Documents/51603\\_24\\_1215674.PDF](https://interchange.puc.texas.gov/Documents/51603_24_1215674.PDF)



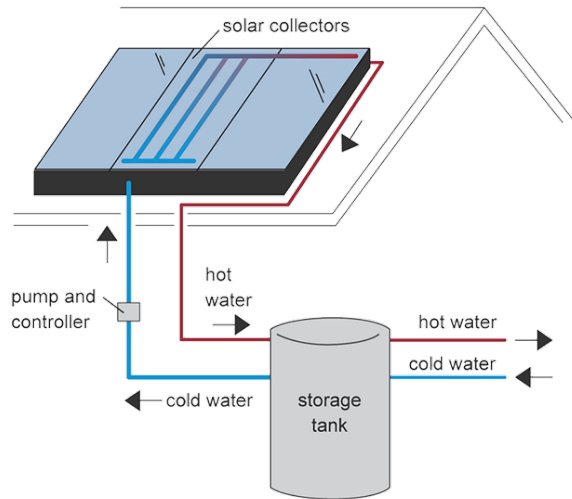
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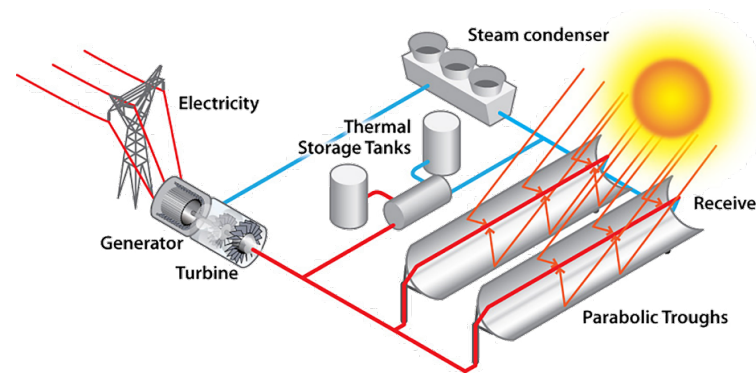
# The State of Solar

# Solar Technologies

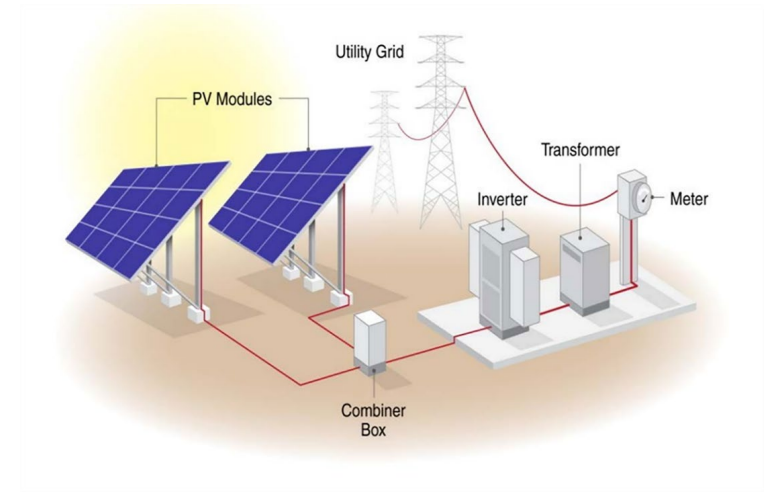
## Solar Thermal



## Concentrating Solar Power (CSP)



## Solar Photovoltaic (PV)



Sources: EIA; DOE; NREL

# Solar Panel Technologies

## Crystalline Silicon

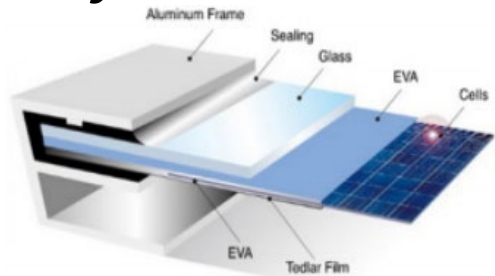


Figure 2: Components of crystalline silicon panels. The vast majority of silicon panels consist of a glass sheet on the topside with an aluminum frame providing structural support. Image Source: [www.riteksolar.com.tw](http://www.riteksolar.com.tw)

## Cadmium Telluride

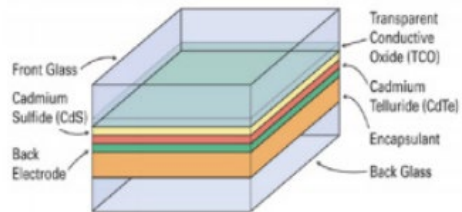
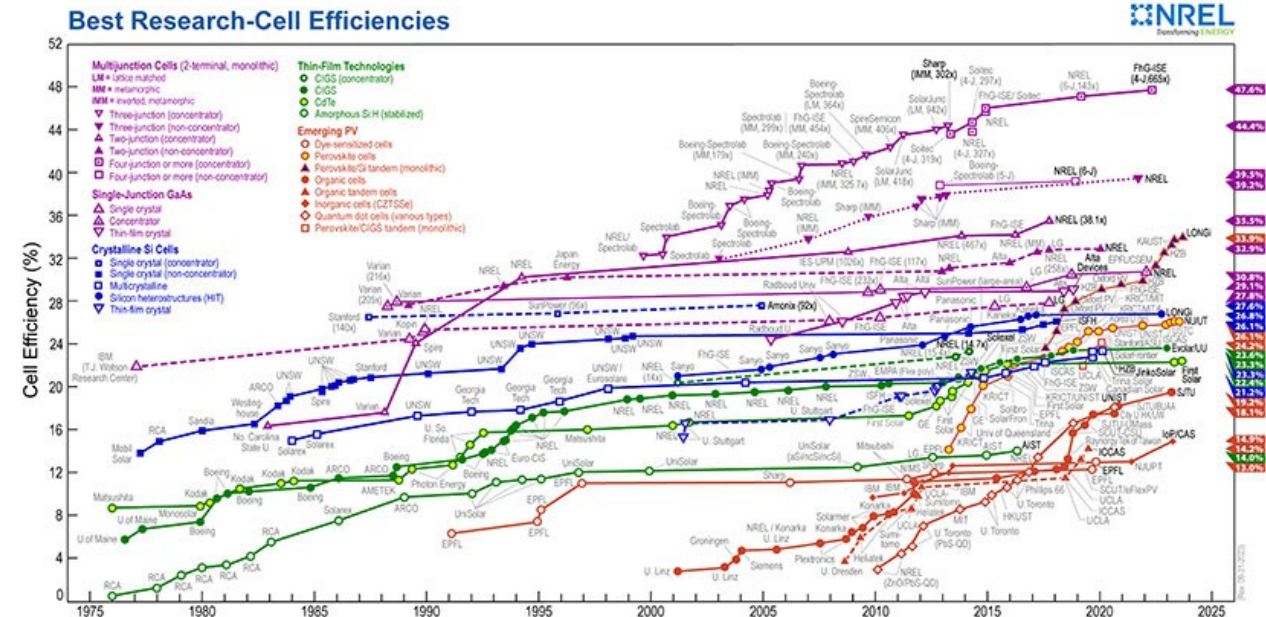


Figure 3: Layers of a common frameless thin-film panel (CdTe). Many thin film panels are frameless, including the most common thin-film panels, First Solar's CdTe. Frameless panels have protective glass on both the front and back of the panel. Layer thicknesses not to scale. Image Source: [www.homepower.com](http://www.homepower.com)



Source: NSCU <https://nccleantech.ncsu.edu/wp-content/uploads/2019/10/Health-and-Safety-Impacts-of-Solar-Photovoltaics-PV.pdf>, NREL

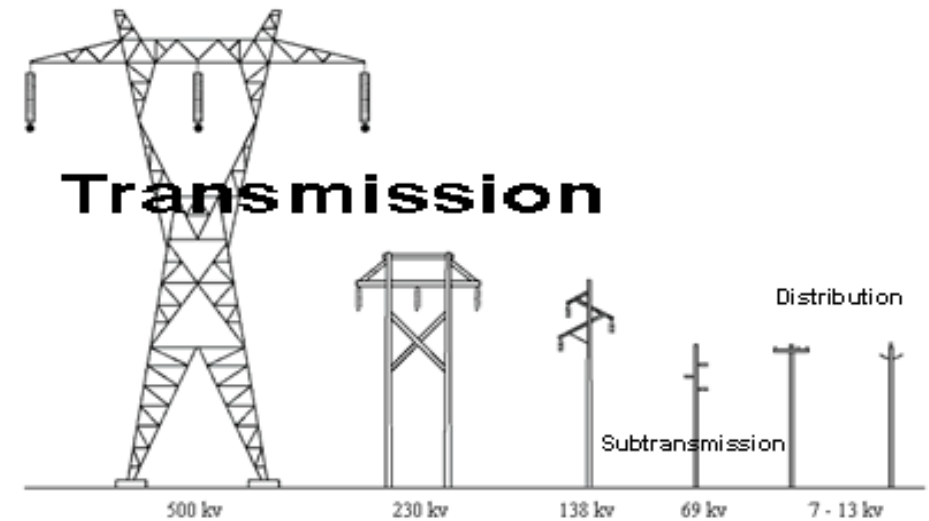


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# Solar's Relationship to the Grid

- Off-Grid
- Grid-connected
  - Behind-the-meter (i.e., demand side)
    - “Distributed generation” or DER
  - In-front-of-the-meter (i.e., supply side)
- Interconnection points:
  - Distribution network- shorter distance, lower voltage. Rule of Thumb- <69kv.
  - Transmission network- long distance, high voltage. Rule of Thumb- >69kv



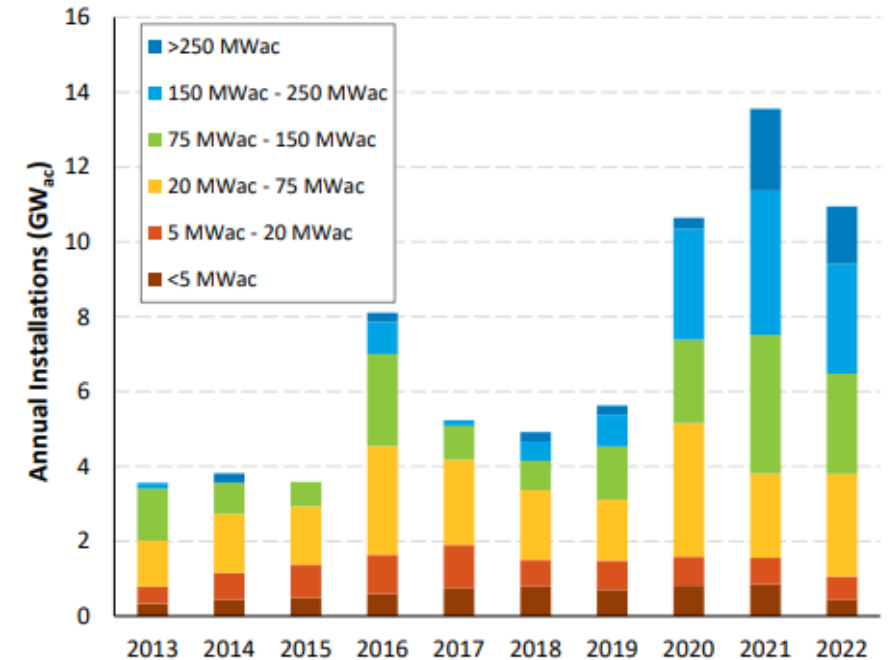
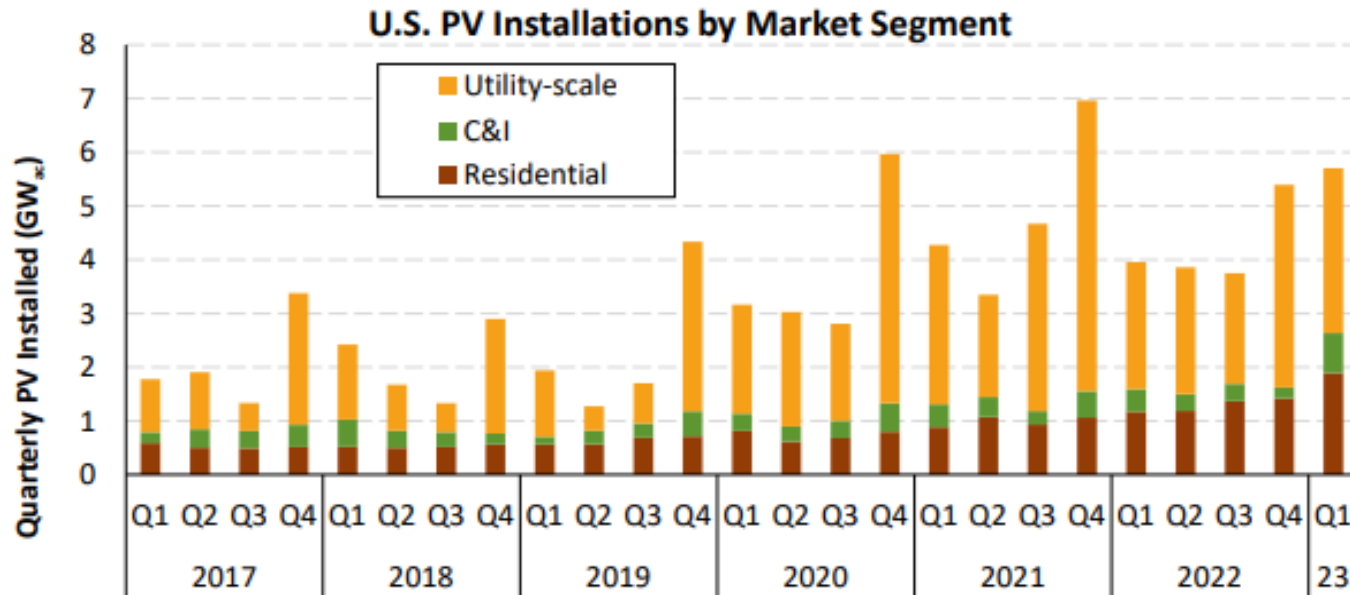
Source: OSHA.gov

# Solar's Relationship to the Grid

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Characteristics	Community-Scale Solar	Utility-Scale Solar
<b>Technology</b>	PV	PV (or CSP)
<b>Relationship to the Grid</b>	Connects to the distribution network either behind or in front of the meter	Connects to the transmission network in front of the meter
<b>Relationship to the Site</b>	Typically ground mounted and the principal land use, but can be sited on large rooftops	Ground mounted and typically the principal land use
<b>Relationship to Existing Land Use and Development Pattern</b>	Fits into the established lot or block pattern of the surrounding area	May require lot mergers, street removal, or new roads for site access
<b>Site Area</b>	1–20 acres	>20 acres
<b>Rated Capacity</b>	250 kW–5 MW	>5 MW

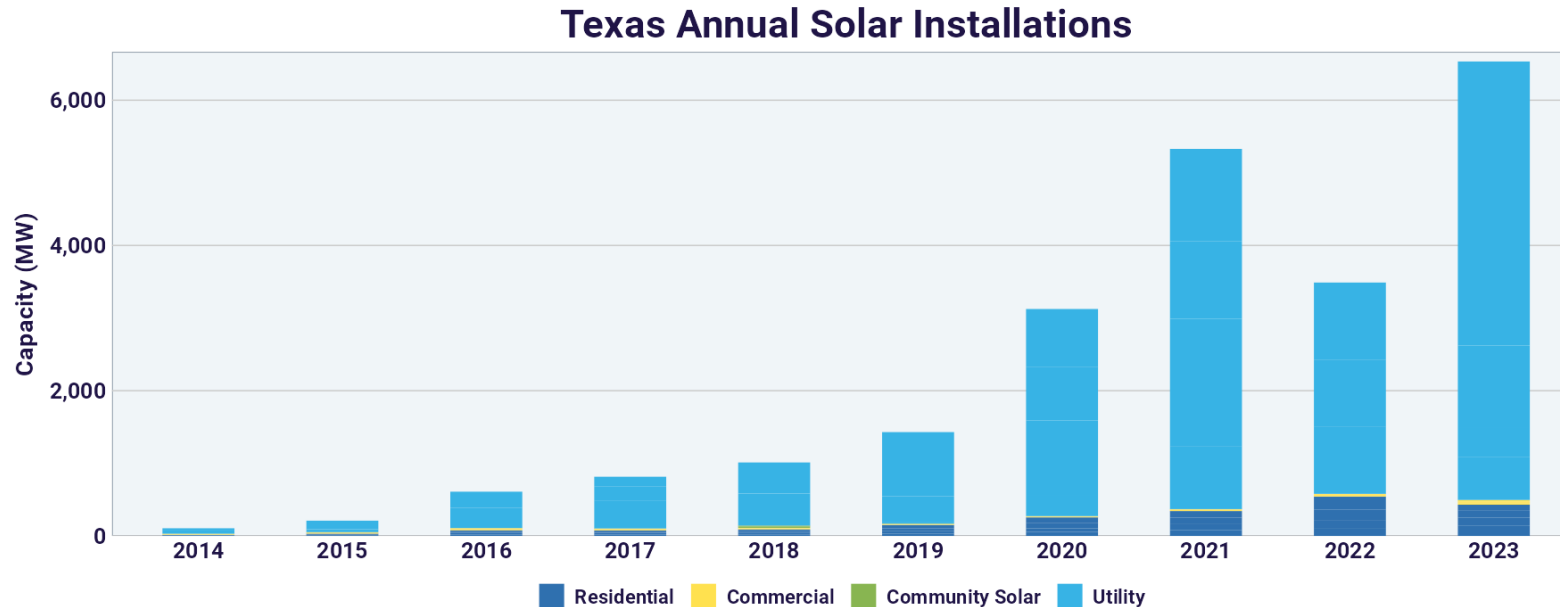
# Trends in US Installations



Sources: <https://www.nrel.gov/docs/fy23osti/87189.pdf>, <https://www.nrel.gov/docs/fy23osti/87189.pdf>

# Texas is a solar leader...

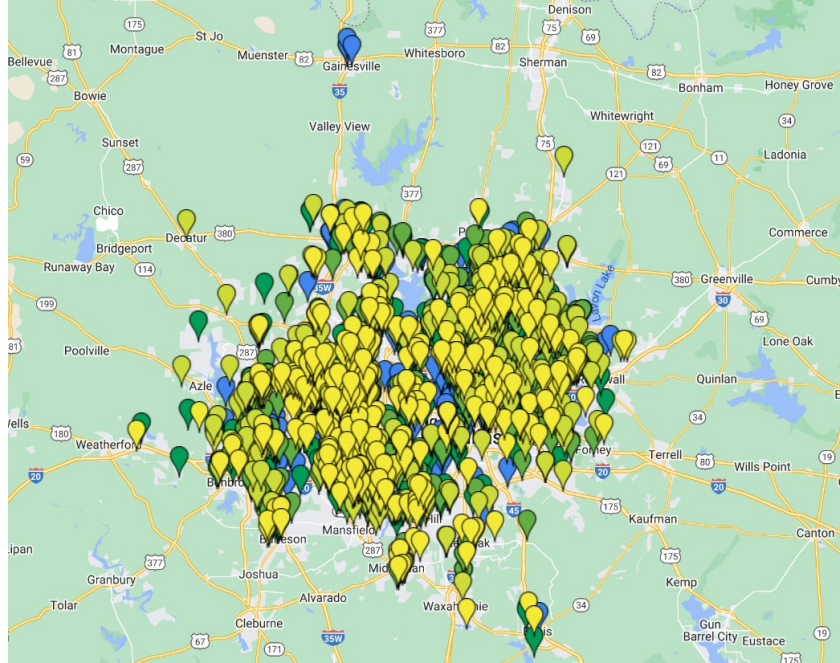
- Texas ranks 2<sup>nd</sup> in the country in total amount of installed solar and was 1<sup>st</sup> in installations in 2023.
- 627 solar companies in Texas support 11,250 solar jobs in the state.



Source: <https://www.seia.org/state-solar-policy/texas-solar>

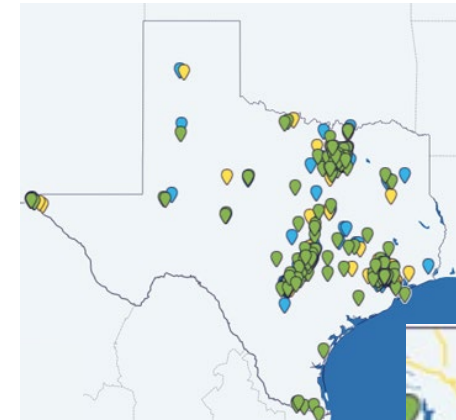
# ...and North Central Texas is no exception.

## Solar Installations in North Central Texas



- Blue pin: Schools/Muni/Commercial/Fed
- Green pin: Homes, Solar Above \$20k
- Light green pin: Homes, Solar \$13.3k-20k
- Yellow-green pin: Homes, Solar \$7k-13.3k
- Yellow pin: Homes, Solar <\$7k or unknown

## Solar Companies



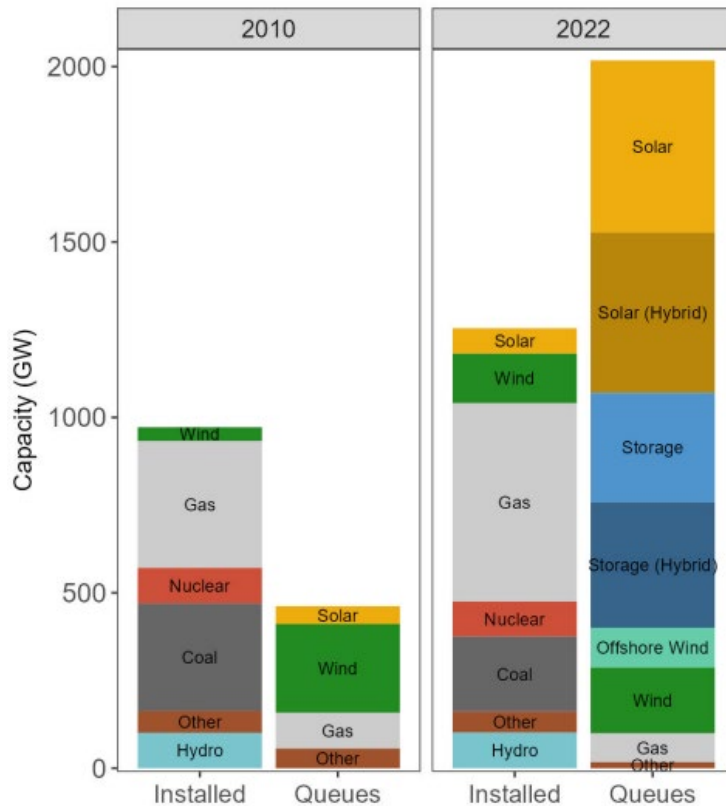
- Green pin: Installer
- Yellow pin: Manufacturer
- Blue pin: Other



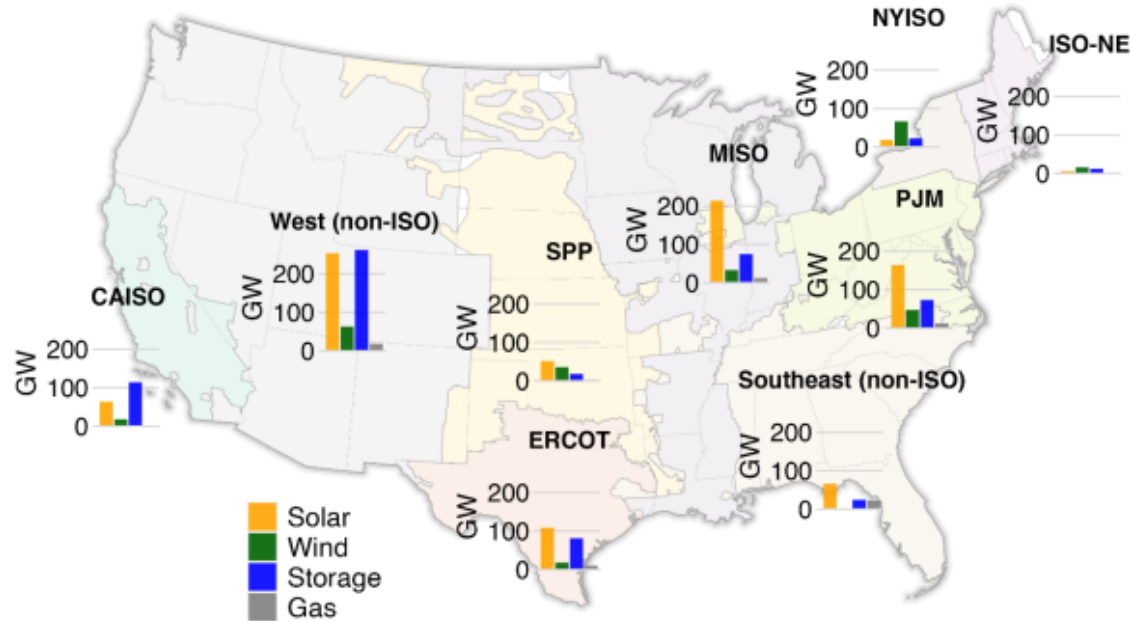
Source: <http://www.gosolartexas.org/>

# Solar (and storage) is growing in ERCOT

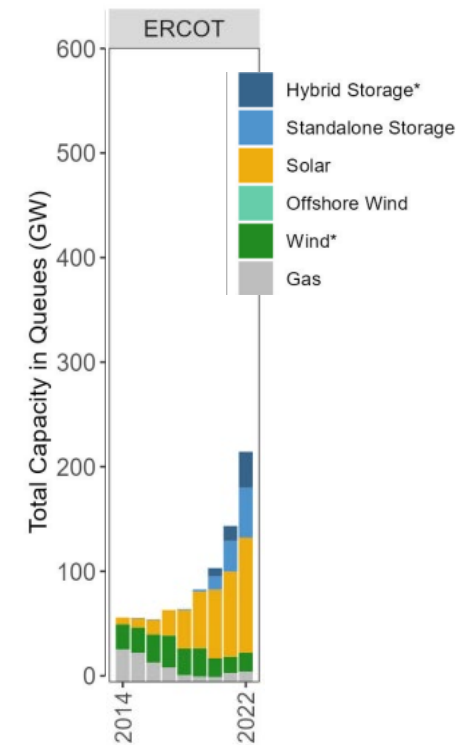
**Entire U.S. Installed Capacity v. Active Queues**



**Queues across the U.S.**



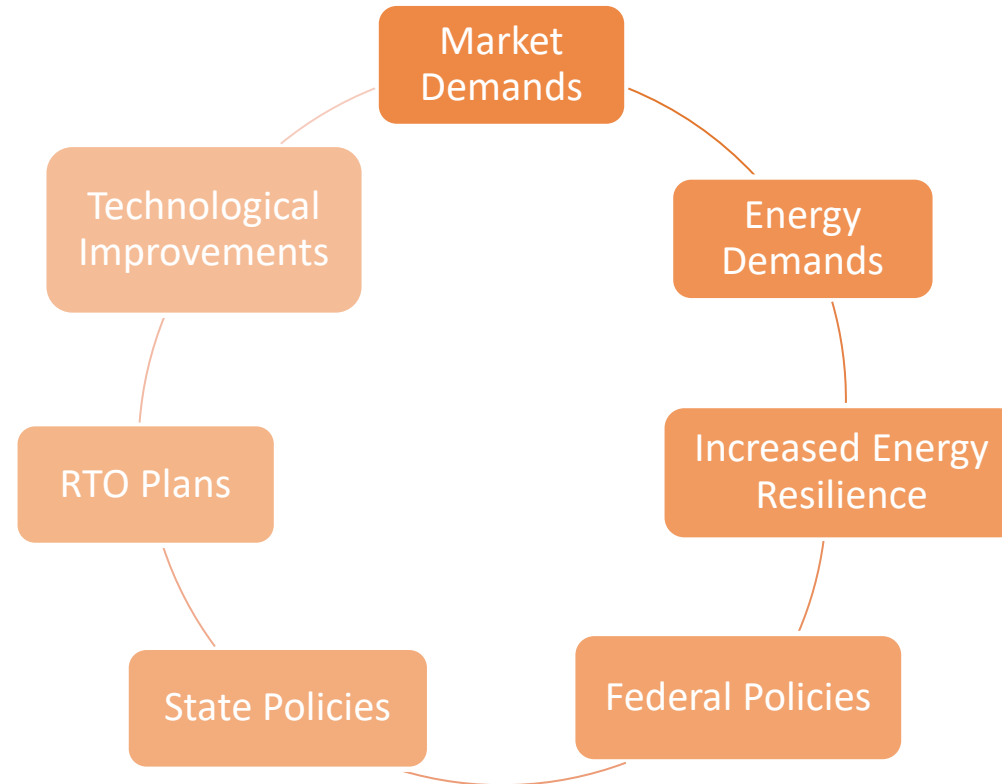
**ERCOT's Queue**



Source: <https://emp.lbl.gov/publications/queued-characteristics-power-plants-1>

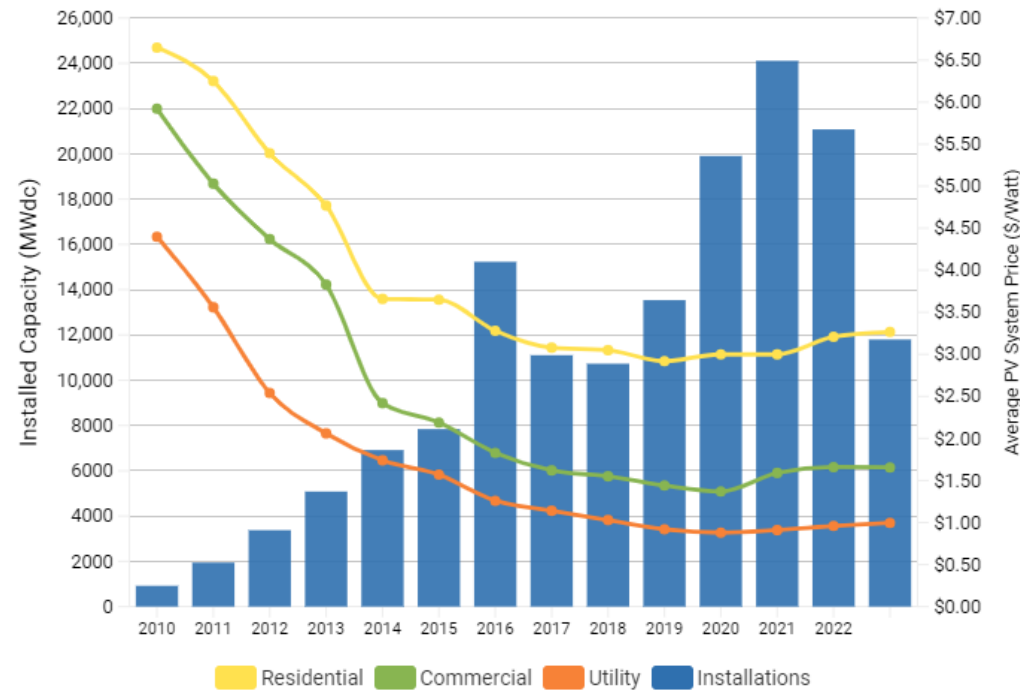
# Drivers of Demand

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# U.S. Pricing and Cost of Energy Trends

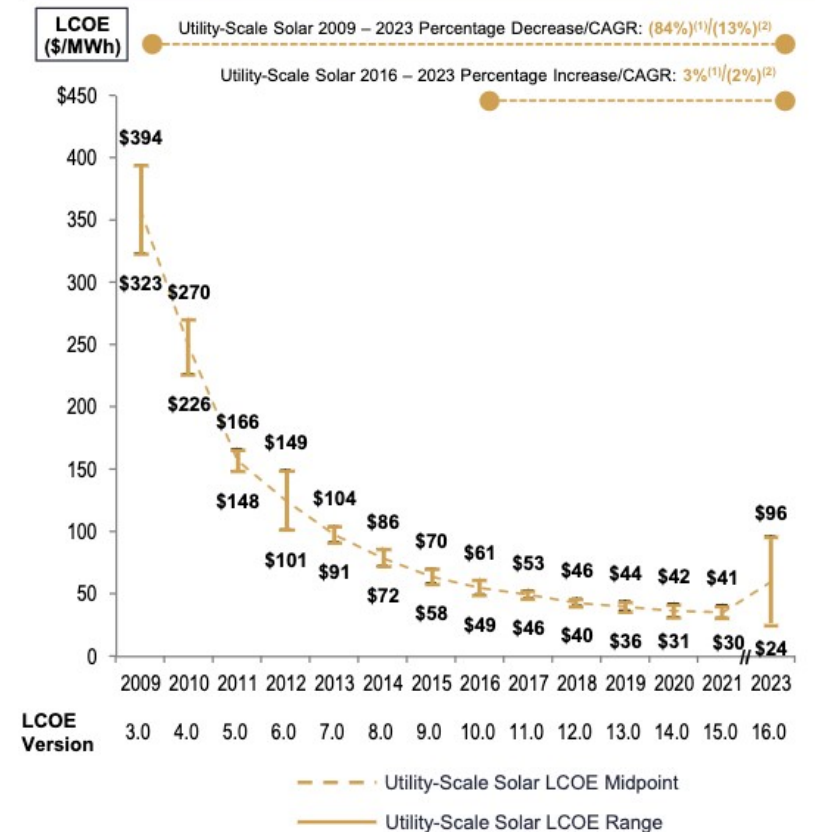
U.S. Solar PV Pricing Trends & Deployment Growth



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2023



Unsubsidized Solar PV LCOE



Sources: <https://www.seia.org/solar-industry-research-data>; <https://www.lazard.com/research-insights/levelized-cost-of-energyplus/>



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# Next Steps

# Next Steps for Communities Interested in Participating in the Cohort



- A "**Solar Statement**" (PR-1) is a letter that demonstrates your local government's commitment to pursuing SolSmart designation.
- All communities receiving technical assistance must submit a Solar Statement, and it's a prerequisite for designation at any tier.
- A Solar Statement is **not** a binding agreement, a memorandum of understanding or any other kind of legal document.
- The Solar Statement should be signed by a department head or an elected official, or it can go through a council approval process.



## SOLAR STATEMENT

Tuesday, February 27, 2024

Debra Perry  
International City/County Management Association  
777 North Capitol St. NE, Ste. 500  
Washington, DC 20002

Brandy O'Quinn  
Interstate Renewable Energy Council  
125 Wolf Road, Suite 100  
Albany, NY 12205

Dear Debra Perry and Brandy O'Quinn:

On behalf of (*local government name*) I am proud to announce our commitment to become a SolSmart-designated community. In partnership with the SolSmart team, our dedicated staff members will work to improve solar market conditions, making it faster, easier, and more affordable for our residents and businesses to install solar energy systems. These efforts will also increase the efficiency of local processes related to solar development, which may save our local government time and money.

We will leverage SolSmart to achieve the following solar goals:

- Choose an item or type a custom description.
- Choose an item or type a custom description.
- Choose an item or type a custom description.

These goals demonstrate that our community is committed to making continual improvement in our solar market. This includes ensuring solar development is inclusive and equitable. We're looking forward to learning more from the SolSmart program how to expand access to solar for all our residents and support solar energy adoption for those that are under resourced or underserved.

The SolSmart program will build on our solar efforts, such as (*relevant plans or initiatives such as energy plans, community solar, solarize, state or other federal solar programs*)

To measure progress along the way, we will track key metrics related to solar energy deployment, such as installed solar, permitting processing time, and growth in residential installations.

We understand that the SolSmart program has criteria and point requirements as outlined in the SolSmart Program Guide needed to achieve each tier of designation. We're excited to submit this solar statement to complete the first requirement of the program.

Inquiries related to our SolSmart participation can be directed to (*city contact name*) at (*email address*).

Sincerely,

  
Printed name  
Title

# Supporting Activities for Workshop 2

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1. Identify staff in other departments (planning and buildings) that you will need to engage as part of this effort.
2. Introduce them to SolSmart and the cohort process.
3. Note the upcoming trainings that they (and their colleagues) will either need to attend or watch later.
4. Feel free to begin broaching other conversations, such as the need to develop a permitting checklist, adjust your zoning ordinance, etc.

# Workshop 2 Overview

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- Workshop 2 is “**Planning for solar**” and it will focus on issues related to land use, applications of solar, local plans and planning processes, and zoning ordinances.
- We will be following up to determine the best time for this session, but it will be sometime in late April or early May.
- Please invite planning staff to attend or ensure they’re willing to watch the recording.

# Thank You!

- If you want to **have questions about the cohort**, please reach out to Joaquin Escalante ([energy@nctcog.org](mailto:energy@nctcog.org))
- If you have **questions about SolSmart or external TA**, please reach out to Zach Greene ([zach.greene@wri.org](mailto:zach.greene@wri.org))