



# Texas

## Solar Development Analysis

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# Texas Solar Development ANALYSIS

The state of solar development in Texas can be evaluated by key factors such as federal and local regulations, incentives, grid interconnection and integration. The current state of development activity in Texas is rapidly growing and can be seen in this analysis summarizing all facets of solar energy project development.

We will break down the various federal and state incentives available to solar energy developers in Texas and how to access them.

LandGate provides key data to the top developers and financiers in the country. To learn more about access to this platform, or to talk about how to apply the information below to your business, book time with a member of our dedicated energy markets team.



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# Texas Solar Energy ACTIVITY

Status	TX Solar Farm Count	TX Solar Farm Capacity (MWac)	IL Solar Farm Generation (MWh)
Operating	137	14,460	2,666,105
Under Construction	19	4,970	1,561,533 (est.)
Planned	64	19,500	6,017,403 (est.)
Queued Projects	514	115,786	21,802,869 (est.)
Site Control (Lease Options)	24	2,807	794,351 (est.)

\*est is the estimated peak total electricity generation that those solar farms will produce once operational

As of August 2023, Texas has 137 solar farms already operating with a current capacity of 14,460 MW<sup>1</sup> and a current electricity generation of 2,666,105 MWh. Texas has a significant amount of operating solar farms compared to the other states in the US, and it has one the largest development of solar farms with 19 solar farms under construction of 4,790 MW capacity total, 64 planned solar farms with 19,500 MW capacity total, as well as 514 Utility-Scale Queued projects and 24 site control projects.

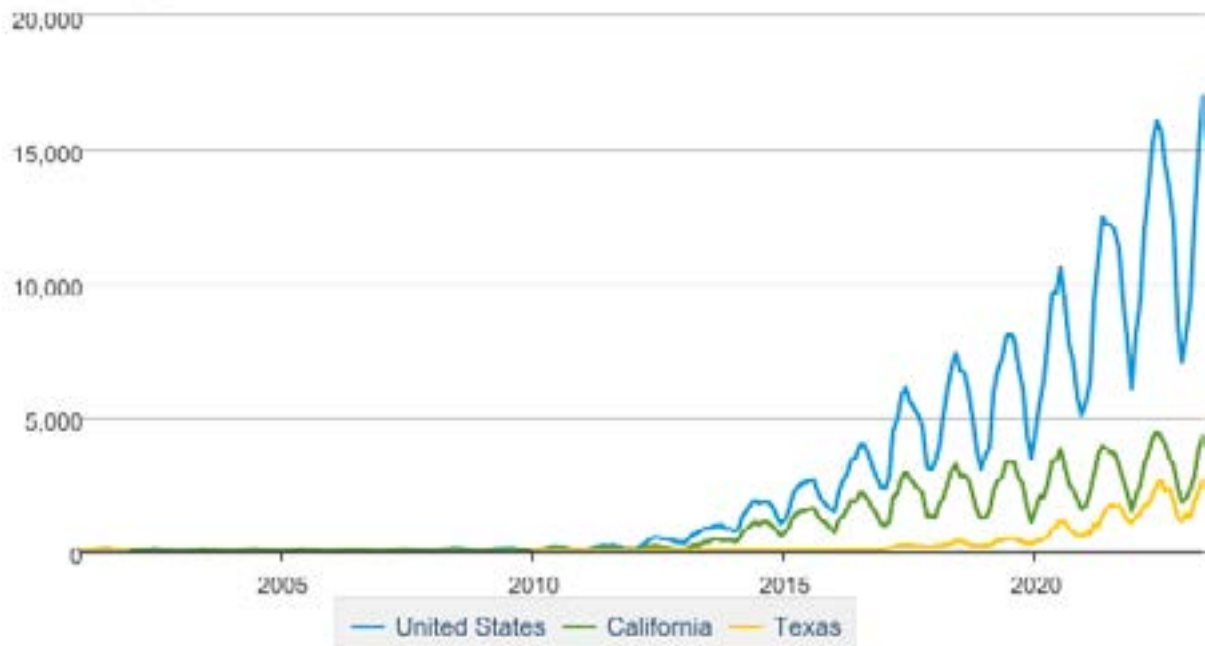
Overall, if all planned and under construction farms go into operating status, Texas will expand its capacity by 24,470 MW. That's a 70% growth in capacity for the state! In Texas, the average solar farm size is 100 acres, producing 25 MW of electricity under ideal conditions. So a solar farm in Texas needs an average of 4 acres per MW of capacity.

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# Texas Solar Energy ACTIVITY

**Net generation, all utility-scale solar, all sectors, monthly**

thousand megawatthours



Data source: U.S. Energy Information Administration

Texas ranks second, only behind California, for Solar development and production of Solar Generated electricity. The state produces 10 times as much solar power as it did five years ago and is continuing to rapidly expand renewable energy focused development.

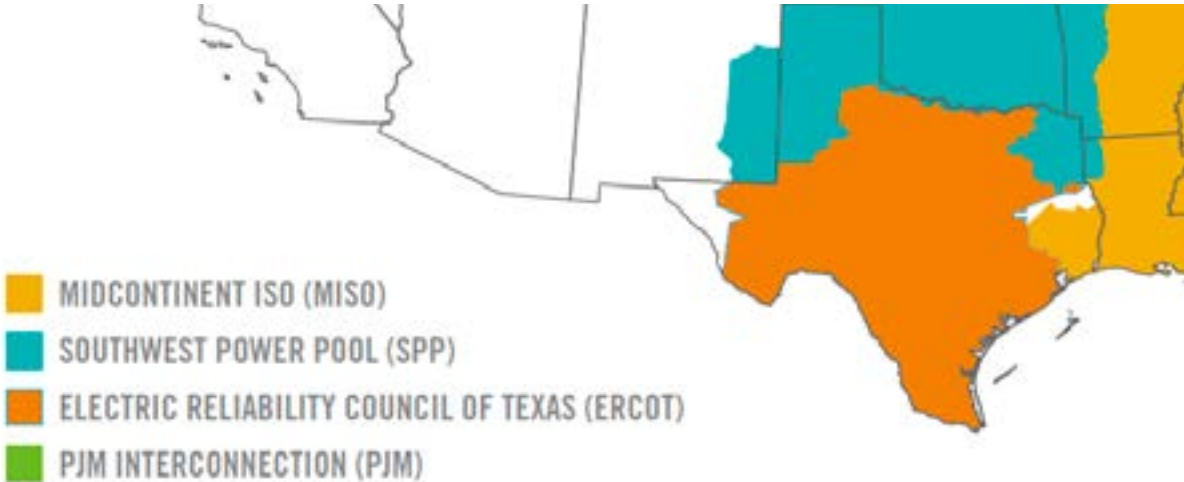
# Analyzing Utility-Scale Development in Texas

Utility-scale solar refers to solar farms often created and managed by utilities, independent power producers, or energy firms. These projects aim to produce electricity on a large scale and deliver it directly into the distribution grid. These solar farms generally have more than 10 MW in capacity. Contrarily, community-scale solar refers to smaller-scale solar power facilities, under 10 MW, that are primarily intended to serve local communities or particular user groups.

Texas is a particular state for solar development where the majority of the state is regulated by the Electric Reliability Council of Texas (ERCOT). A handful of counties in the north are governed by Southwest Power Pool (SPP) and a few counties in the east are under Midcontinent Independent System Operator (MISO).

## Projects Queued for Development in Texas

ISO	Number of Solar Farms	Capacity (MWac)
ERCOT	468	105,325
SPP	28	7,050
MISO	18	3,411



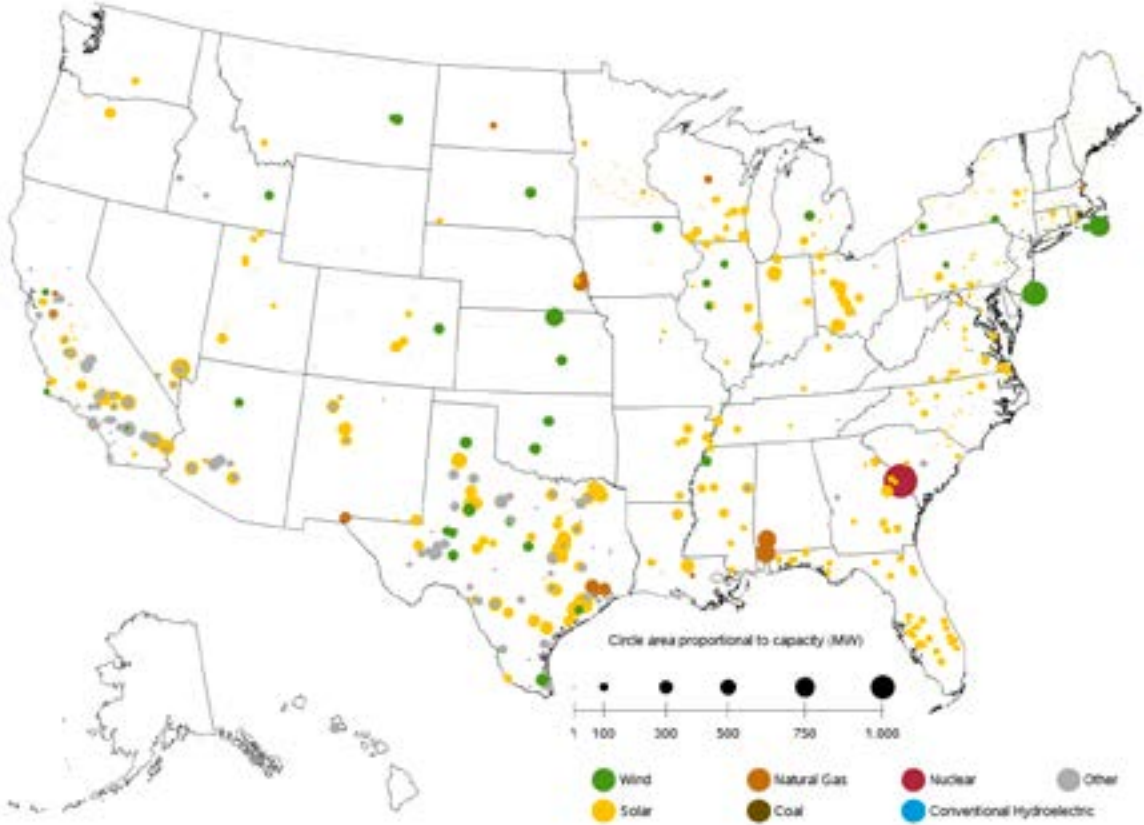
A project in queue means that the project enters the interconnection queue of that region waiting for regulatory approval. During this period, the analysis of possible engineering and land factors is conducted to determine the feasibility of the project to be constructed and connected to the grid. The average amount of time it takes for a farm to go from queue to operational in Texas is 45 Months! As per the projected in-service dates for the current projects in queue, Texas will most likely add 30 GW

of Utility Scale farms by the end of 2025, which is a 200% increase in operational capacity.

**Did you know?**

LandGate's PowerCapital solution is the only technology suite offering a complete M&A database and research analytics for wind, solar, and CCS project development.

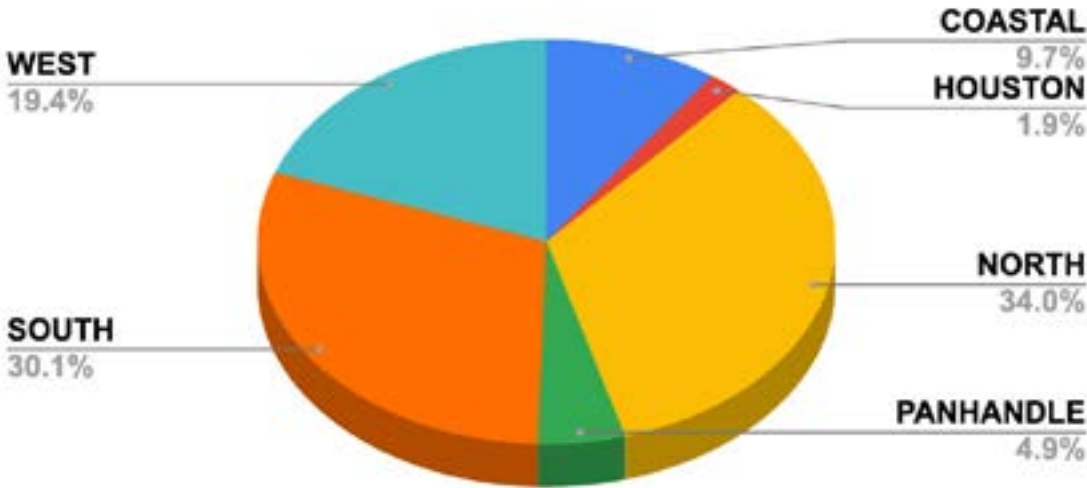
Figure 6.1.C. Utility-Scale Generating Units Planned to Come Online from July 2023 to June 2024



Sources: U.S. Energy Information Administration, Form EIA-860, 'Annual Electric Generator Report' and Form EIA-860M, 'Monthly Update to the Annual Electric Generator Report.'

# ERCOT Interconnection Queue Analysis

**Texas Queued Solar Development by CDR Reporting Zone**



The CDR report uses Forecast Zones to identify the geographical location of generation resources. Forecast Zones generally have the same boundaries as the 2003 Congestion Management Zones. There are six Forecast Zones: Coastal, Houston, North, Panhandle, South, and West. The maximum amount of solar development is within the North, South and West Zones, where 83.5% of total development is queued. As of the latest Interconnection queue report by ERCOT, out of the 536 Solar projects, 45 solar farms with a total capacity of 13,900

MW have received a Notice to Proceed (NTP) and have entered a “Planned” stage, 12 solar projects with a total capacity of 3,400 MW have begun construction and 11 projects with a total capacity of 2,684 MW have started to actively generate electricity. Leaving 468 projects queued for development.



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## Projects Under Site Control in Texas

Site Control is land under lease or under option to lease. Solar developers run an initial assessment of the suitability of parcels for solar farms. After they put the land under option, they need time to run their due diligence and submit the project to the queue. When the solar project is about to be approved by the queue, the solar developer exercises the solar farm option agreement to convert it to a solar farm lease agreement. These site control projects have not entered the interconnection queue yet. Currently there are 24 project leases with an estimated capacity of 2,807 MW. Land-Gate analyzes county tax & deed assessor records to find lease agreements already in place between developers and landowners. This unique dataset is continuously updated by a process that locates new lease documents within days of new agreements being filed with each county.

How do developers screen and run due diligence for those solar farm projects in site control?

### Factors to take into consideration:

- Electricity generation
- Electricity commodity prices (LMP, incentives, PPA)
- Capital costs
- Operating costs
- Timing
- Risks

Using the factors above and a standard solar panel size, the buildable acreage and a land coverage ratio (encompassing row spacing and maintenance spacing) we calculate the maximum number of panels that could fit on the parcel. This helps us estimate the capacity the project lease will add to the grid and calculates a Market Value of the solar project.

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LandGate's Solar PowerVal tool enables similar capabilities to evaluate land parcels for solar development and get an independent economic report for solar projects of all statuses. This tool allows developers and project financiers to fast-track the process of submitting a feasibility study to the queue for approval through independently produced Engineering & Economic analytics and Solar 8760 reports or evaluate projects and parcels for origination and M&A.

## **How is a utility-scale solar project submitted to the queue to connect to the Electric Grid?**

Typically, the queue submission process within an ISO or Utility area follows similar steps.

The solar developer needs to complete and submit an official interconnection request form provided by the ISO or utility, that captures essential project details and starts the interconnection process. Project specifications should include details like name, location (latitude and longitude), point of interconnection, capacity, expected energy production, environmental impact, technology layout-inverters, solar panels, system layout through a Feasibility study with an 8760 report to help initially assess the project's compatibility with the existing grid infrastructure. The Solar developer will also have

to pay an initial payment to secure a position in the interconnection queue and contribute towards the cost of initial studies and evaluations conducted by the ISO/Utility. Post the submission of the form, reports and payment, the project is now effectively in the queue.

After the project has entered the queue, Injection reliability study and system impact study is conducted. These studies determine the exact impact of the project on existing infrastructure and identifies any potential network updates required to reliably interconnect the solar project to the grid. Once the study is completed, the developer gets a complete picture of the financial cost of the solar farm with regards to the complete CAPEX and Budget. This helps the decision making process of whether to move forward with

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the development of the solar project or withdraw the application from the queue. If the project seems viable to move forward the developer signs an interconnection agreement with the ISO/Utility and essentially looks to produce Economic and Financial reports for Bankers and Investors to help facilitate the construction of the solar project.

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# Texas

## LMP Data

**LMP (Locational Marginal Price) is a pricing mechanism used in wholesale/merchant energy markets to determine the cost of electricity at specific locations (node) within the grid.** LMP considers a number of variables, including the cost of generating power, transmission constraints, grid congestion, losses, and load at certain nodes or locations within the electrical grid. The prices at which electricity is bought and sold in the market in real time or on an hourly basis are reflected in its calculation, which is done through market procedures.

**Texas saw the average LMP price increase by 54% in the past 3 years with an average price of \$33.72 \$/MWh in 2023.** This price is expected to increase by 18.6% in 2024 and attract several renewable energy developers for utility and community scale solar projects. Similarly, consumer electricity purchase cost has also increased drastically for the past few years in Texas. The current commercial electricity rate is 8.68 ¢/kWh which is a 14.2% increase compared to

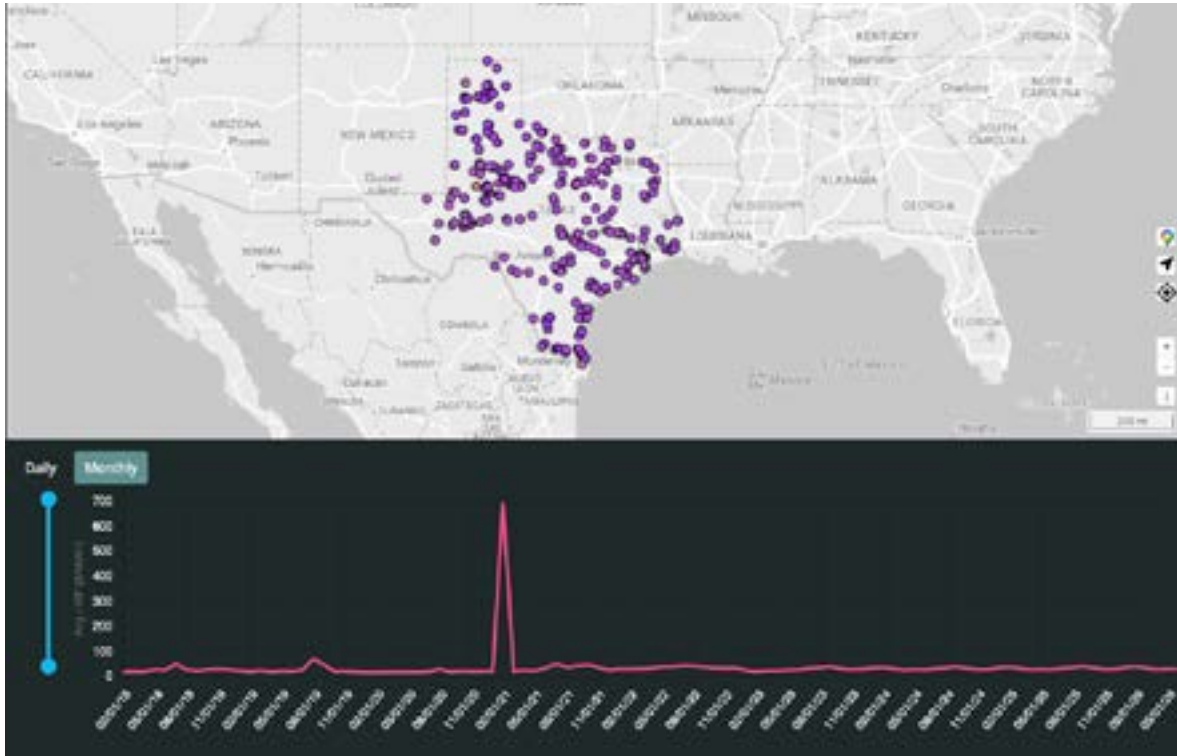
the commercial electricity rate of 7.6 ¢/kWh in 2020.

Higher LMP prices correspond to higher electricity costs, which could mean more money for solar installations. When compared to solar projects in areas with lower LMP pricing, locations with higher LMP prices may result in higher revenue. Power purchase agreements (PPAs) and solar project participation in energy markets are both impacted by LMP. The ability to engage in market transactions and maybe land more advantageous PPAs gives solar projects situated in areas with favorable LMP pricing a competitive edge in the electricity markets. LMP can affect the PPAs for solar projects' pricing conditions, lengths, and general allure.

By offering participants in community solar more potential power bill savings, higher LMP pricing can improve the value proposition. Greater adoption of community solar may result from community solar projects situated in regions with higher LMP prices being more economically feasible and appealing to potential members.

# Texas

## LMP Scorecard



<b>Merchant Energy Pricing:</b> <b>Market: ERCOT</b> <b>Hub: Texas Hub</b>	
Number of price nodes active:	<b>330</b>
Average LMP price as of 08/20/23:	<b>\$33.71</b>
Average retail price as of 07/01/23 (how much a community solar farm or behind the meter electricity generation sales electricity for + consumer purchase cost)	<b>8.68¢/kWh</b> Current commercial electricity rate <b>7.6¢/kWh</b> Rate in January 2020, +14.2% incr.
Percentage change in average LMP in the past 3 years	<b>+54.0%</b>
Forecasted percentage change in average LMP Price for 2024:	<b>+18.60%</b>

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## Average LMP Prices: Historical & Forecasts

Year	Avg LMP Price (\$/MWh)
2018	\$27.97
2019	\$25.42
2020	\$21.89
2021	\$53.60
2022	\$54.52
2023	\$33.72
2024 (est.)	\$40.00
2025 (est.)	\$44.68
2026 (est.)	\$50.15

Based on the LMP and ISOs data in Texas, the 2024 average LMP is estimated to be \$40.00/MWh, increasing by 18.6% compared to 2023.

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# Texas

## PPA Data

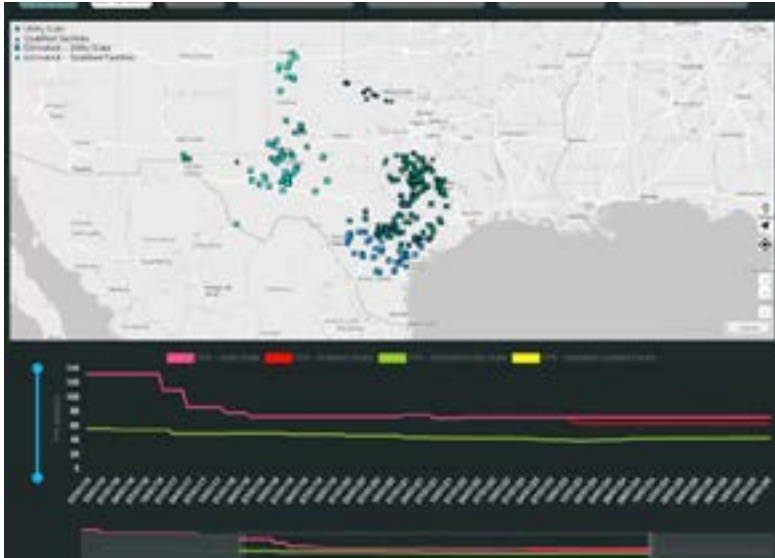
Utility-scale solar can be integrated into the grid and electricity can be sold at a predetermined price thanks to PPAs (Power Purchase Agreements) with utilities or power purchasers. Even if they are unable to put solar panels on their own homes, PPAs for community-scale solar projects allow local participants to profit from solar energy generation. The time and amount of power sales are governed by the PPA's terms, which guarantees a steady market for the solar installation.

The average Utility-Scale PPA price in Texas is \$58.42 \$/MWh. This price has decreased by 14.5% in the past 3 years. A lower PPA price means that the cost of power from the particular project is now more competitive when compared to other energy sources. It implies that a solar or wind farm, for example, has become more cost-effective and is now able to offer electricity at a cheaper cost, making it a more alluring option for

consumers. Electricity consumers may benefit from cheaper electricity prices as a result of a drop in PPA prices. This can lower consumers' overall energy expenses and have a positive effect on their electricity bills, whether they are residential, commercial, or industrial customers.

# Texas

## PPA Scorecard



Average PPA price 2023:	<b>\$58.42</b>
Average PPA price change in the last 3 years	<b>-14.5%</b>
Largest PPA buyers:	<b>Amazon &amp; Meta</b>

### Average PPA Prices:

Year	Price (\$/MWh)
2020	\$68.67
2021	\$68.67
2022	\$63.59
2023	\$58.74



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# Federal & Texas State Tax Incentives for Solar Developers

There are several federal and local incentives available for solar development in Texas, intended to encourage the use of solar energy by making solar power more affordable for businesses and organizations that install solar systems. These incentives can improve the financial viability of solar projects since they lower the initial costs and increase the return on investment. Solar project incentives aid in the switch to clean, renewable energy sources, which lower greenhouse gas emissions and slow climate change. Incentives aid in increasing the deployment of solar projects by making solar energy more financially appealing, replacing fossil fuel-based power and lowering the environmental effects related to traditional energy sources.

<b>TX Solar Development Incentive</b>	<b>Type</b>	<b>About</b>
Federal Solar Tax Credit (ITC)	Federal	Developers can claim 30% of the installation cost as a credit on their federal income taxes.
Renewable Portfolio Standard (RPS)	State	The TX governing body sets targets for the RPS which is the percentage of energy that utilities must derive from renewable sources.

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## **Federal Solar Tax Credit, also known as the Investment Solar Tax Credit (ITC)**

Developers of community-scale and utility-scale solar projects are eligible for the Federal Solar Tax Credit as long as the solar energy systems they install meet the requirements. The tax credit percentage for community-scale solar and utility-scale solar projects is also 30% of the total project cost. This means that developers can claim 30% of the installation cost as a credit on their federal income taxes.

## **Renewable Portfolio Standard (RPS)**

Renewable portfolio standards (RPSs), one of the first and most effective advanced energy initiatives, establish a percentage of utility sales or a particular megawatt hour (MWh) capacity that must be supplied by renewable sources by a certain date.

In 1999, Public Utility Commission of Texas (PUCT) established that 5,880 MW of

energy or 5.4% of the state's net capacity should be generated from renewable energy sources by 2012. PUCT also set a target of 10,000 MW of renewable energy capacity by 2025. With major renewable project development Texas achieved the target 15 years early in 2010. Since 2006, Texas has produced more electricity from the sun and wind than any other state. Although Texas lacks a statewide solar tax credit or rebate scheme, many local governments and utility companies (both big and small) provide incentives. Several utilities companies offer rebate programs. Companies such as American Electric Power (AEP) Texas, Austin Energy, CPS Energy, Oncor provide these incentives depending on the solar project size and location.



With such a wealth of new data on the state of Solar Development in Texas, we imagine you might have questions about how to apply these trends, data, and tools to your own solar development efforts in Texas. Our dedicated energy markets team can help walk you through how to access and interpret this information in a way that is relevant to your business needs. Scan the code to the right to schedule time with our team to talk one on one.



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