Kansas
Solar Development Analysis

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Table of Contents

Kansas Solar Development

ANALYSIS

The state of solar development in Kansas can be evaluated by key factors such as federal and local regulations, incentives, grid interconnection and integration. The current state of development activity in Kansas is growing considerably 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 Kansas 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.

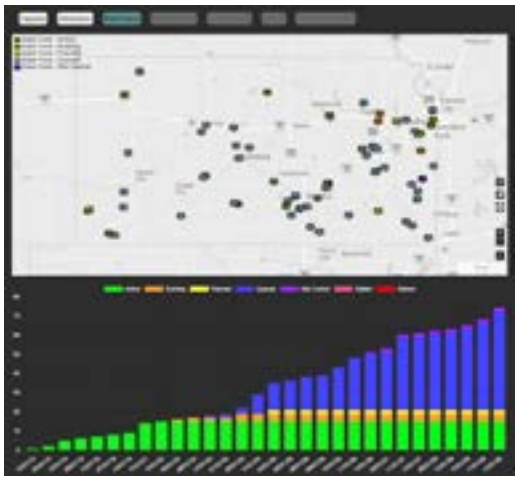
Kansas Solar Energy
ACTIVITY

Status	KS Solar Farm Count	KS Solar Farm Capacity (MWac)	KS Solar Farm Generation (MWh)
Operating	15	49.03	7,938
Under Construction	4	4.9	2,954
Planned	2	3	1,276 (est.)
Queued Projects	50	10,743.08	3,674,548 (est.)
Site Control (Lease Options)	2	97	18,580 (est.)

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

Kansas currently has **15** active and operating utility-scale solar farms with a total capacity of **49.03 MW**. Kansas also has an extensive pipeline for future development with 4 farms under construction, 2 planned farms, 50 queued projects with a total capacity of over 10 GW, and 2 site control farms with a total capacity of 97 MW.

Overall, if all under construction, planned, queued, and site control farms go into operating status, Kansas will expand its capacity by nearly **11 GW**. In Kansas, the average solar farm size is 30.62 acres, producing 3.27 MW of electricity under ideal conditions.



Overview: Past, Present & Future of Solar in Kansas

In the 1970s and 1980s, Kansas's initial interest in solar energy was sparked by the oil crises, with federal tax incentives playing a crucial role. However, due to high costs and low efficiency of early solar technology, adoption remained limited. During the 1990s, abundant and cheap fossil fuels, particularly coal and natural gas, further hampered significant investment in solar energy. Research and development were primarily confined to academic institutions and small-scale projects.

The 2000s and 2010s saw a shift towards renewable energy in Kansas, partly due to the state's **Renewable Portfolio Standard (RPS)** enacted in 2009, which set a target of 20% renewable energy by 2020. Technological advancements made solar power more economically viable, while state and federal policies, including net metering and tax credits, promoted growth. Kansas has witnessed a rise in both utility-scale projects, such as the **Johnson Corner Solar Project**, and an increase in residential and commercial solar installations.

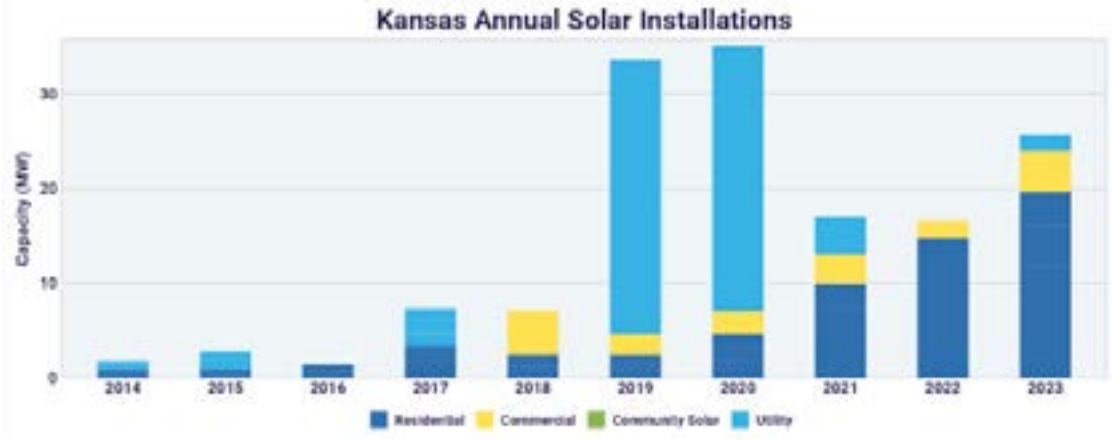
Kansas's solar energy capacity is expected to grow significantly, driven by declining technology costs and increasing environmental awareness. Solar farm development in Kansas is steadily progressing, with notable projects like the aforementioned Johnson Corner Solar in Johnson City, which produces 27.5 MW, enough to power 4,198 homes. Other significant installations include the City of Pratt Solar, generating 7.7 MW, and corporate initiatives by companies like ALDI, which developed a 2 MW project in Olathe.

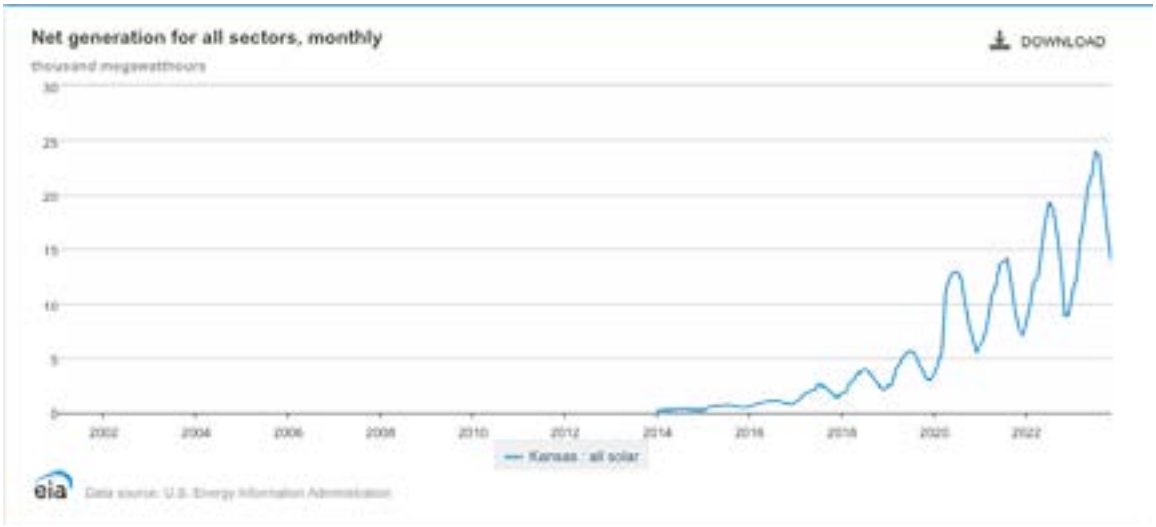
The solar energy in Kansas powers approximately **22,637 homes**, contributing to 10.15% of the state's electricity supply. Several policies and market initiatives have shaped Kansas's solar landscape, such as the state's RPS and various federal incentives aimed at subsidizing solar manufacturing.

Kansas has installed a total of ~50 megawatts (MW) of solar capacity. There are around 6,218 solar installations across the state. Kansas's solar industry includes 50 companies involved in various aspects of the market, such as manufacturing and installation. The solar sector in Kansas has seen a total investment of $319 million, and prices for solar installations have decreased by 43% over the past decade. Looking ahead, Kansas is projected to add another **6.8 GW** of solar capacity over the next five years, which would improve its national ranking to 34th from its current national ranking of 44th,

in terms of growth projections.

Overall, while Kansas currently lags behind in national rankings, the state has substantial growth potential due to its favorable solar policies and declining installation costs.





As seen in the graphic above, much of Kansas's net generation distributed via solar originated post-2014. While Kansas has a complex fuel mix contributing to the state's total net generation, utility-scale solar developments are on the rise and currently account for over 5% of the current generation. While this expansion is fairly recent, it's noteworthy that with an extensive future pipeline for utility scale and small-scale projects, Kansas is poised to become one of the pioneers of solar energy in the United States with the current projections estimating that the state will grow by **6.8 GW** in the next 5 years, with the state currently investing over **$319 million**.

UTILITY-SCALE SOLAR

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. Below is a breakdown of the different types of solar farms and their development statuses.

Utility-Scale

The state of Kansas is regulated by the Southwest Power Pool (SPP). SPP coordinates the flow of electricity across the high-voltage, long-distance power lines in its territory. SPP develops market and reliability rules so that the grid operates reliably and safely in Kansas.

Projects Queued for Development in Kansas

SPP Generator Interconnection Queue

Number of Solar Farms	Capacity (MWac)	Solar Farm Generation (MWh)
50	10,743.08	3,674,548

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 Kansas is **~ 4 years**. As per the projected in-service dates for the current projects in queue, Kansas will most likely add **6 to 7 GW** of Utility Scale farms by the end of 2025.

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

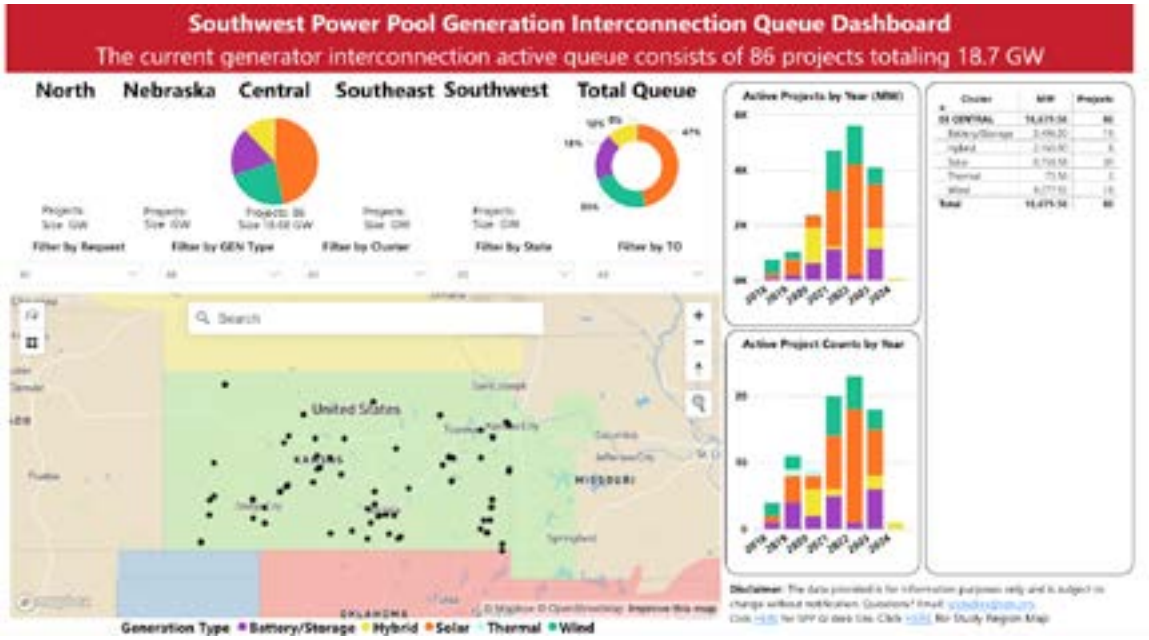
Factors to take into consideration:

- 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.

Solar PowerVal 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.

Some of the more prominent utilities in the state of Kansas include the Kansas Public Service Company (APS), regulated by the Kansas Corporation Commission (ACC), Tucson Electric Power (TEP), and Salt River Project (SRP). These three largest utilities (TEP, APS, and SRP) represent over 80% of electricity production for the state of Kansas.



The graphic on the Southwest Power Pool (SPP) Generation Interconnection Queue highlights the active projects in Kansas, with a significant focus on solar energy. The queue consists of 86 projects totaling 18.68 GW, with solar energy projects making up 8,756.58 MW, which is approximately 47% of the total capacity. This indicates a strong commitment to expanding solar energy in Kansas.

The temporal trends show a substantial increase in active projects from 2018 to 2022, peaking in 2022 before a slight decline in 2023. The number of projects in 2024 is minimal, possibly due to reporting delays or fewer new project submissions. The map reveals a concentration of projects in major urban and peri-urban areas like Wichita and Kansas City, suggesting these areas are key for solar installations.

Kansas's growing emphasis on solar energy aligns with state policies, federal tax incentives, and decreasing costs of solar technology, which have collectively driven this expansion. However, challenges such as interconnection delays, supply chain issues, and high soft costs remain. Addressing these will be crucial to sustain future growth.
Overall, Kansas demonstrates a robust trajectory towards enhancing its solar energy capacity, reflecting strategic efforts to diversify its energy sources and promote sustainability.

Notable Solar Projects in Kansas: Deep Dive

Active Solar Farms

Project	Capacity	Description
Johnson Corner Solar 	27.5MW	• Owned and operated by Lightsource Bp • Year of commercial operation: 2020 • Enough electricity to meet the needs of approximately 4,198 homes • Utility: Sunflower Electric Cooperative
City of Pratt Solar 	7.7MW	• Owned and operated by Kenyon Energy • Developed by Innovaetus • Year of commercial operation: 2019 • Has the capacity to power 1,176 homes • Utility: City of Pratt, KS

Queued Solar Farms

Project	Capacity	Description
West Gardner Solar 	217MW	• Owned and operated by NextEra Energy Resources • Spans Johnson and Douglas counties • If built, will be the largest solar farm in Kansas, generating enough power for thousands of homes and businesses
Free State Solar 	159MW	• Owned and operated by Savion • Expected year of commercial operation: 2025 • Encompasses 1,105 acres and focuses on agrivoltaics, integrating agriculture with solar energy generation

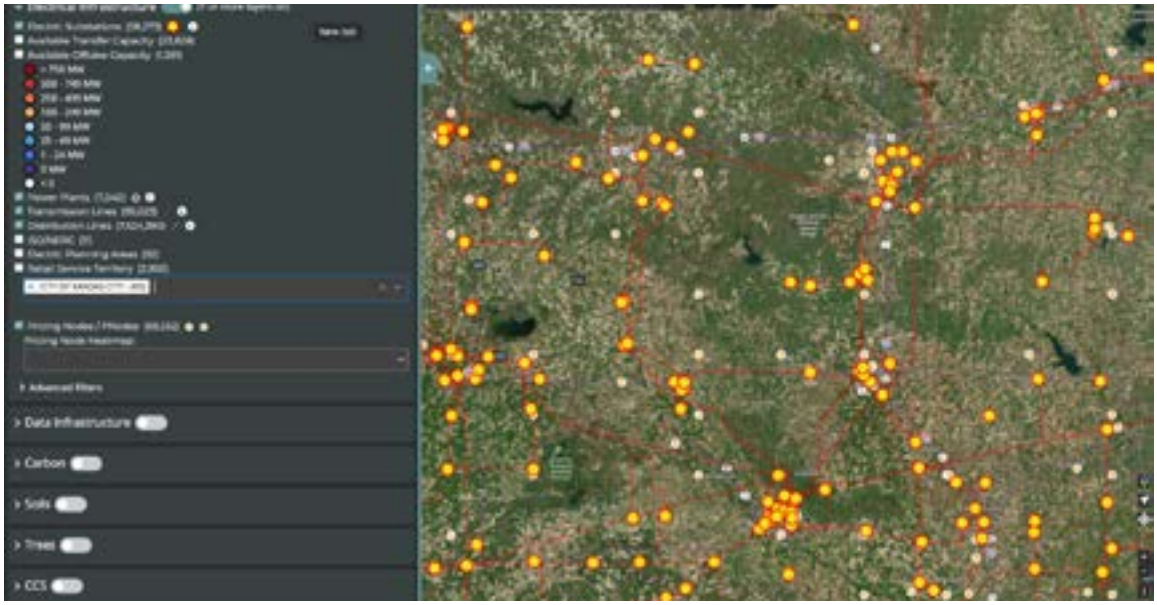
How is a Utility-Scale solar project submitted to the queue to connect to the electric grid?

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 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.

How does a Utility-Scale solar project connect to the electric grid?



These projects are interconnected through transmission lines that carry electricity from one point to another in an electric power system grid. These lines are used to transmit electrical power from power generation sources to distribution centers, which are then distributed to end-users. Through LandGate's accessible transmission line data, developers and landowners can evaluate land parcels based on segments & feeders, proximity to existing distribution lines and distribution hosting capacity.

Commercial, Community, & Behind- the Meter
SOLAR FARMS

Commercial solar farms in Kansas have seen a marked increase in recent years, driven by both state incentives and corporate sustainability goals. Large-scale commercial installations, such as those by companies like ALDI and IKEA, reflect a growing trend among businesses to invest in renewable energy. ALDI's 2 MW solar project in Olathe is one of the largest corporate solar installations in the state, highlighting the commercial sector's commitment to reducing carbon footprints and operational costs.

Community solar farms are becoming an increasingly popular model in Kansas, providing a way for multiple residents or businesses to benefit from a single solar array. This approach makes solar energy accessible to those who may not have the option to install panels on their own property, such as renters or individuals with unsuitable rooftops. Programs like Midwest Energy's community solar initiatives allow participants to purchase or lease part of a solar farm and receive credits on their electricity bills for their share of the power produced. These projects not only enhance energy equity by broadening access to solar power but also foster community involvement and local economic development.

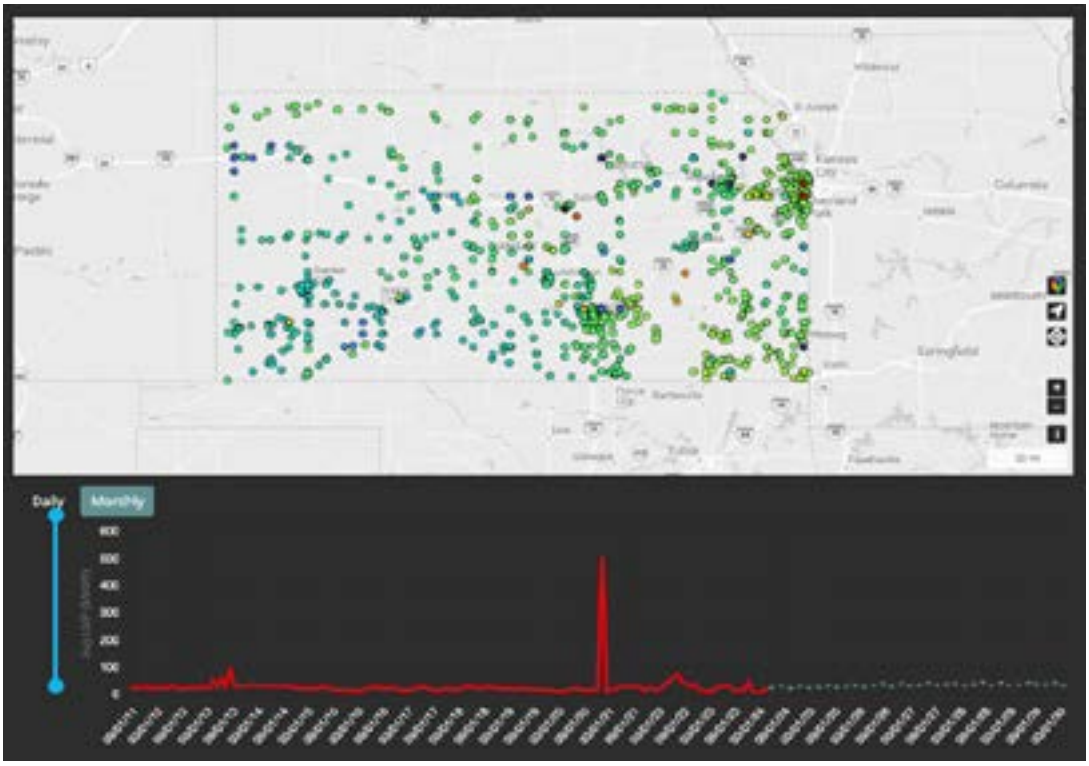
Behind-the-meter solar installations refer to solar panels installed on-site at residential or commercial properties, directly offsetting the electricity consumption of the building. This setup is increasingly popular in Kansas due to the financial benefits it offers, including reduced electricity bills and eligibility for net metering, where excess generated power can be sold back to the grid. Homeowners and businesses in Kansas are leveraging state incentives and federal tax credits, such as the 30% Federal Investment Tax Credit (ITC), to make these installations more affordable.

The rise in behind-the-meter solar installations is driven by decreasing costs of solar panels and growing awareness of the environmental benefits of renewable energy.

Kansas is experiencing significant growth in solar energy across commercial, community, and behind-the-meter installations. Commercial solar farms are being adopted by large corporations aiming to cut operational costs and meet sustainability targets. Community solar farms are providing a viable option for those without suitable rooftops to participate in the renewable energy transition, promoting inclusivity and community development. Behind-the-meter installations are becoming more widespread among homeowners and businesses due to financial incentives and the push towards energy independence. Collectively, these initiatives are positioning Kansas as a proactive state in the adoption of solar energy, contributing to its renewable energy goals and sustainability efforts.

Kansas

LMP Scorecard



Merchant Energy Pricing: **Market: SPP** **(Southwest Power Pool)**	
Number of price nodes active:	**1580**
Average LMP price as of 05/01/24:	**$19.75**
Average retail price as of 05/01/24 (how much a community solar farm or behind the meter electricity generation sales electricity for + consumer purchase cost)	**11.15¢/kWh** Current commercial electricity rate **9.83¢/kWh** Rate in January 2020
Percentage change in average LMP in the past 3 years	**+39.0%**
Forecasted percentage change in average LMP Price for 2024:	**+29.0%**

Average LMP Prices: Historical & Forecasts

Year	Avg LMP Price ($/MWh)
2019	$19.65
2020	$17.05
2021	$20.17
2022	$21.53
2023	$32.35
2024 (est.)	$22.71
2025 (est.)	$29.28
2026 (est.)	$35.48

Based on the LMP and ISOs data in Kansas, the 2025 average LMP is estimated to be 29.28/MWh, increasing by 13.4% compared to $22.71/MWh in 2024.

Kansas
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.

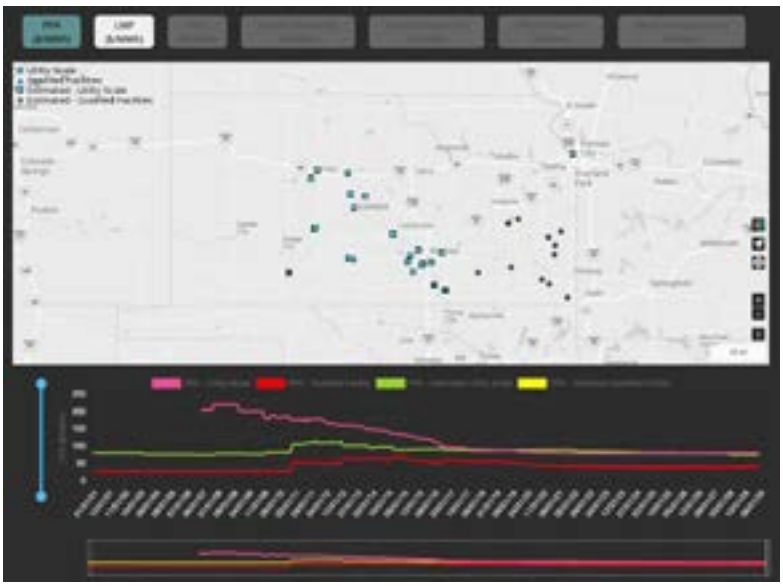
The average Estimated Utility-Scale PPA price in Kansas is $79.14 $/MWh. This demand influences PPA prices as developers strive to meet regulatory requirements while remaining profitable. Additionally, limited land availability poses challenges for large-scale renewable projects, increasing costs associated with land acquisition and development, thus impacting PPA prices.

In Kansas, Power Purchase Agreement (PPA) prices are influenced by a diverse array of factors. The state's energy mix, comprising coal, natural gas, nuclear, hydroelectric, and wind energy, along with the increasing competitiveness of renewable sources like wind power due to technological advancements, significantly impacts PPA rates. As Kansas's energy landscape evolves, with a growing emphasis on renewables and technological innovation, the dynamics driving PPA prices continue to evolve, reflecting the complexities of the state's energy market.

Furthermore, Kansas's low development costs have contributed to stable PPA prices. Advancements in solar technology have led to increased efficiency and lower manufacturing costs, making solar panels more affordable to install and maintain. These technological innovations have also improved the overall performance and reliability of solar systems, reducing operational expenses and enhancing long-term cost competitiveness.

Additionally, economies of scale and growing market maturity have contributed to stable PPA prices in Kansas. As the solar industry expands and more projects come online, developers benefit from economies of scale in manufacturing, installation, and project development, driving down overall costs. Moreover, increased competition among solar developers and suppliers has spurred innovation and efficiency improvements throughout the value chain.

Kansas
PPA Scorecard



Average PPA Prices:

Year	Price ($/MWh)
2020	$81.58
2021	$79.86
2022	$80.02
2023	$79.61
2024	$79.14

Average Utility-Scale PPA last 12mo:	**$79.14/MWh**
Average PPA price change in the last 3 years	**-1.3%**
Largest PPA buyers:	**Meta, Citizens Financial**

Federal & KS State

Tax Incentives for Solar Developers

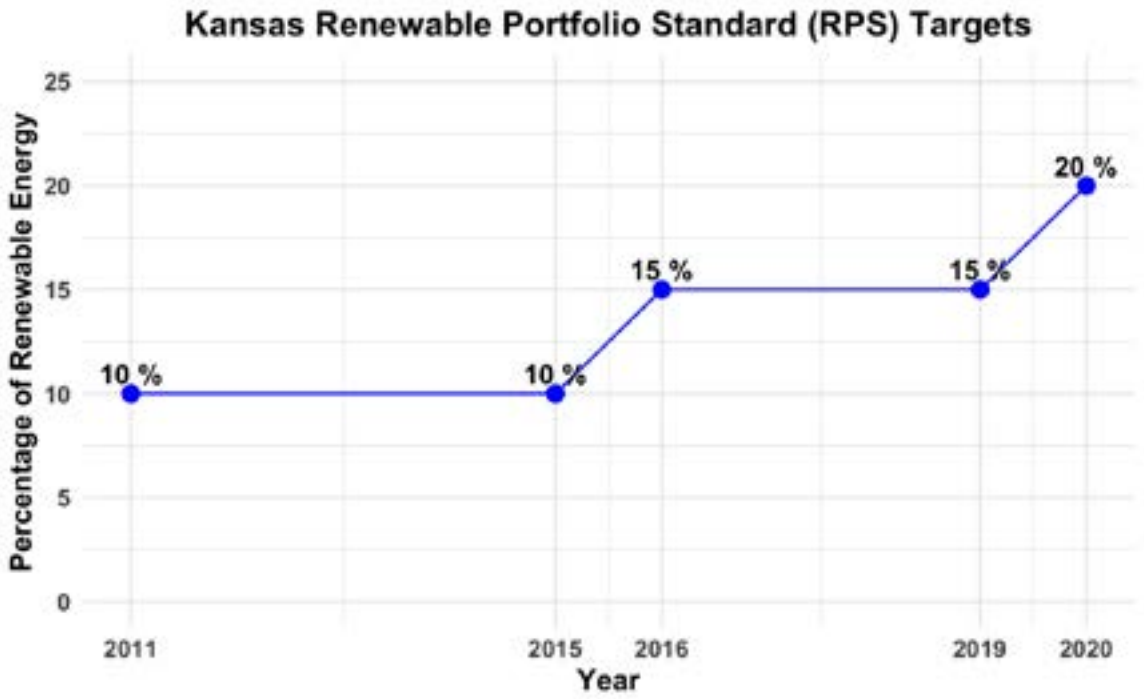
There are several federal and state incentives available for solar development in Kansas, intended to encourage the use of solar energy by making solar power more affordable for businesses and organizations that install solar systems. These incentives can improve the financial viability of solar projects 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

KS Solar Development Incentive	Type	About
Federal Solar Tax Credit, Solar Tax Credit (ITC)	Federal	The ITC allows for a 30% tax credit on the cost of solar system installation, applicable through 2032. Furthermore, solar panel installations are exempt from sales tax and any value-added property tax that may be levied from it.
Net Energy Metering	State	Kansas allows for net metering, which means that when your solar panels produce more electricity than you use, the excess energy is sent back to the grid, and you earn credits that can offset future energy bills.
Property Tax Exemption	State	Solar panels in Kansas are exempt from property taxes. This means that installing solar panels will not increase your property taxes, even though they increase the value of your home.
Evergy Clean Energy Program	State	In Kansas City, Evergy offers various solar incentives, including net metering, where customers can sell excess energy back to the grid and receive credits at an avoided cost rate. This program helps reduce the cost of solar installations for residents.
Midwest Energy Solar Program	State	Midwest Energy offers the How$mart Energy Efficiency Finance Program, which provides financing for energy efficiency improvements, including solar installations. This on-bill financing option allows customers to make upgrades without upfront costs, repaying through their utility bill
Rural Energy for America Program (REAP) Grants	State	These grants provide financial assistance to small businesses in rural areas for energy audits, energy efficiency improvements, and the installation of renewable energy systems. This program helps reduce energy costs and promotes the use of clean energy.

Other Incentives

Renewable Portfolio Standard (RPS) Goal:
Kansas has a Renewable Portfolio Standard (RPS), which was established in 2009. The RPS initially set mandatory targets for renewable energy production for the state's utilities. According to the legislation, Kansas utilities were required to obtain 10% of their electricity from renewable resources from 2011 to 2015, 15% from 2016 to 2019, and 20% by 2020.

However, in 2015, Kansas shifted its RPS from a mandatory standard to a voluntary goal. Despite this change, the state has continued to make significant progress towards integrating renewable energy, particularly wind power, into its energy mix. Kansas utilities have largely met and exceeded the original targets set by the RPS.



With such a wealth of new data on the state of Solar Development in Kansas, we imagine you might have questions about how to apply these trends, data, and tools to your own solar development efforts in Kansas. 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. Schedule time with our team here to talk one on one.

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