



Indiana

Solar Development Analysis

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Indiana Solar Development ANALYSIS

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



Indiana Solar Energy ACTIVITY

Status	IN Solar Farm Count	IN Solar Farm Capacity (MWac)	IN Solar Farm Generation (MWh)
Operating	85	753.55	69,088 (est.)
Under Construction	8	224.8	123,440 (est.)
Planned	13	1,382.07	710,640 (est.)
Queued Projects	315	37,406.21	3,828,133 (est.)
Site Control (Lease Options)	19	4,565	3,385 (est.)

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

As of October 2023, Indiana has 85 solar farms already operating with a current capacity of 754 MW¹ and a current electricity generation of 69,088 MWh. Indiana has a significant amount of operating solar farms compared to the other states in the US, and it has a massive development of solar farms with 8 solar farms under construction of 225 MW capacity total, 13 planned solar farms with 1,328 MW capacity total, as well as 315 Utility-Scale Queued projects and 19 site control projects.

Overall, if all planned and under construction farms go into operating status, Indiana will expand its capacity by 1606.87 MW. That's a **213% growth** in capacity for the state. In Indiana, the average solar farm size is 42.5 acres, producing 7.2 MW of electricity under ideal conditions. So a solar farm in Indiana needs an average of 5.9 acres per MW of capacity.

Indiana Solar Energy **ACTIVITY**

Historically, Indiana has been known for their coal production and coal-driven economy. Solar development and the implementation of renewable energy sources only recently picked up pace, as Indiana shifted from 89% to 53% coal usage for its electricity needs over the span of 2009 to 2019. The surge in solar development since 2020 has been greatly influenced by recent federal policies, and Indiana’s state-level incentives, which are discussed in more detail below, have also contributed to the increase in queued solar projects.

The recent emergence of federal policies have played a significant role in promoting solar development since 2020. The aforementioned spike of utility-scale solar projects added to the queue from 2020 onwards is attributable to implementation of the federal Investment Tax Credit (ITC) and the Inflation Reduction Act (IRA) in 2022. The commercial ITC amounts to 30% of the invested basis in eligible property that initiated construction before the end of 2019. The IRA outlined an ITC extension to 30% for solar system installation.

Indiana has also implemented state-level incentives (outlined in detail below) contributing to the influx of queued solar development. The combination of strict Renewable Portfolio Standard (RPS) metrics and programs such as net metering, sales and property tax exemptions on solar systems, and the passage of the Senate Enrolled Act 390 passed by the General Assembly in April 2023 has outlined incentives for counties to be designated “solar or wind-ready” communities, through new and consistent solar and wind energy standards for each county.

Utility-Scale vs. Community-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. 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. Below is a breakdown of the different types of solar farms and their development statuses.

Utility-Scale

Indiana is a particular state for solar development where the south of the state is regulated by Midcontinent Independent System Operator (MISO), and the north of the state is regulated by Pennsylvania-New Jersey-Maryland Interconnection (PJM).

Projects Queued for Development in Indiana

ISO	Number of Solar Farms	Capacity (MWac)
MISO	93	15,923
PJM	192	17,537

ISO	Withdrawn Solar Farms	Capacity (MWac)
MISO	57	8,736
PJM	33	4,107

A large percentage of farms have been withdrawn from the interconnection queues of Midcontinent Independent System Operator (MISO) and Pennsylvania-New Jersey-Maryland (PJM). Each year on average, Indiana has seen the withdrawal of 6 solar projects. The state has faced challenges encompassing regulatory issues, including shifts in regulations and permitting delays in the regulatory sphere, financial challenges like fluctuations in solar panel costs and financing issues, complexities related to utility interconnections, environmental

worries, community objections related to visual impact, property values, changes in energy demand within the market, and the complexities of the project development process. These various challenges have collectively contributed to the considerable number of solar projects being withdrawn in Indiana.

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 Indiana is 40 Months! As per the projected in-service dates for the current projects in queue, Indiana will most likely add 4.32 GW of Utility Scale farms by the end of 2024, which is almost a 470% 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.

Projects Under Site Control

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 19 project leases with an estimated capacity of 4565**

MW. LandGate 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.

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.

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.

Commercial, Community & Behind-the-Meter Solar Farms

Projects under development in Indiana

Indiana is a state where the Northern region is regulated by both the Northern Indiana Public Service Company (NIPSCO) and Indiana-Michigan Power, which is a subsidiary of American Electric Power (AEP). The Southern region is primarily regulated by Duke Energy and Vectren. Below is an analysis of community solar farms and other small-scale solar projects in the queue.

Indiana has seen considerable growth in Community and Distributed generation. There are currently around 90 community solar farms that are less than 10 MW in Indiana. The state also has one of the fastest growing development pipelines for small scale solar projects as there has been much discourse on the implementation of community solar programs. These programs typically allow consumers to access solar energy without

the need to install their own solar systems, typically benefiting from energy generated at an external solar array.

Community solar can lead to approximately a 10 percent reduction in electricity expenses for residential consumers. Supporters argue that it has the potential to provide affordable renewable energy to individuals with low to moderate incomes, extending the advantages of solar power to those who may not be able or willing to install solar panels on their own property. To align with the Department of Energy's definition of community solar, state legislators would need to authorize a third-party market, which would require project developers and utilities to adhere to regulations for enrolling customers and establishing community solar installations.

Future Incentives and Legislation for Community Solar

In April, the General Assembly approved Senate Enrolled Act 390, which grants permission for the creation of a Center for the Development of Commercial Solar and Wind Energy-Ready Communities within the Indiana Office of Energy Development. This center aims to offer readily available information regarding the permits necessary for commercial solar and wind energy projects. Additionally, it will collaborate with local permitting authorities to facilitate these projects. This initiative encourages counties to achieve the status of "solar or wind-ready" communities by implementing consistent solar and wind energy standards specific to Indiana counties, instead of mandating statewide compliance.

In terms of future Indiana state legislation, Senate Bill 313 was proposed in 2022, outlining a comprehensive plan aimed at promoting community solar energy initiatives in Indiana. The bill is soon to be implemented and its terms would take effect immediately upon ratification: all electric utilities except for municipally owned utilities and rural electric membership corporations would be required to establish or solicit proposals for the creation of at least five community solar facilities every two years. These community solar



facilities would allow customers of the respective electricity providers to subscribe to a predetermined amount of electricity generated by these solar installations. In return, customers would receive credits on their monthly bills for the electricity they subscribe to from these community solar facilities. The bill also establishes a structured process for the solicitation, selection, and approval of proposals for the construction, ownership, and operation of these community solar facilities within the service areas of electricity providers. This initiative is designed to expand access to solar energy and foster renewable energy adoption across the state while benefiting both consumers and the environment.

Glossary



Commercial/Business: Commercial solar is simply solar for a commercial business



Community Supply: Community Solar



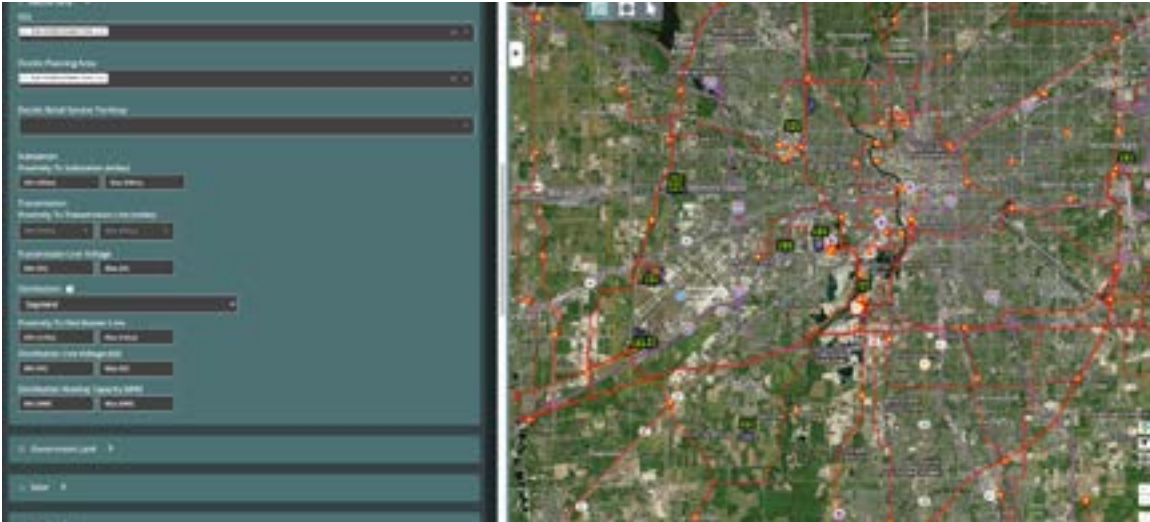
Industrial: An industrial photovoltaic system or industrial solar PV system refers to a system with a power output greater than 100 kWp, an ideal capacity for many types of companies for purposes of self-consumption as well as production and sale of electrical energy.



Residential/Home: “Residential solar” means solar panels to power a single house. The panels are typically mounted on a homeowner’s roof, but could also be mounted in the backyard.



How does a Community or Distributed Generation 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 Land-Gate’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.

Indiana

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.

Indiana saw the average LMP price increase by 45.46% in the past 3 years with an average price of \$32.38 \$/MWh in 2023. This price is expected to increase by 1.79% 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

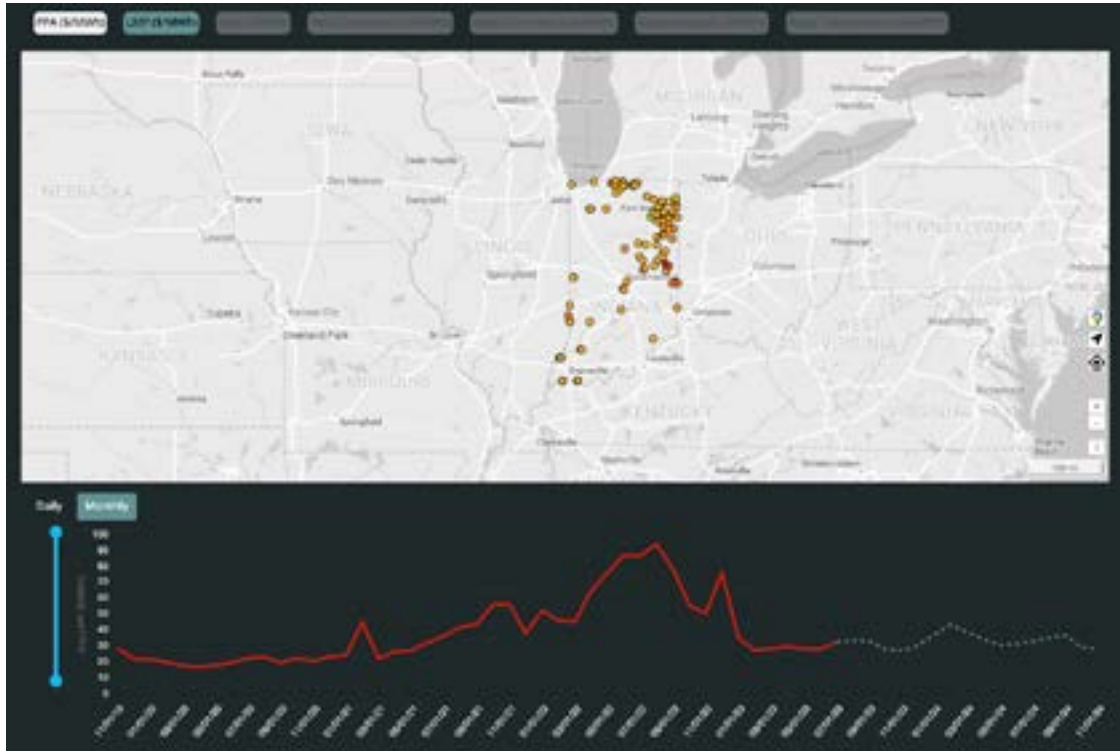
few years in Indiana. The current commercial electricity rate is 13.65 ¢/kWh which is a 23.75% increase compared to the commercial electricity rate of 11.03 ¢/kWh in 2020.

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.

Indiana

LMP Scorecard



Merchant Energy Pricing: Market: MISO & PJM Hub: Indiana Hub	
Number of price nodes active:	104
Average LMP price as of 07/01/23:	\$32.38
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)	13.65¢/kWh Current commercial electricity rate 11.03¢/kWh Rate in January 2020, +23.75% incr.
Percentage change in average LMP in the past 3 years	+45.46%
Forecasted percentage change in average LMP Price for 2024:	+1.79%

Average LMP Prices: Historical & Forecasts

Year	Avg LMP Price (\$/MWh)
2018	\$57.10
2019	\$25.77
2020	\$22.84
2021	\$38.04
2022	\$43.57
2023	\$36.22
2024 (est.)	\$38.90
2025 (est.)	\$43.20
2026 (est.)	\$48.99

Based on the LMP and ISOs data in Indiana, the 2024 average LMP is estimated to be \$38.90/MWh, increasing by 7.4% compared to 2023.

Indiana

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 Indiana is \$101.92 \$/MWh. This price has increased by 5.17% in the past 3 years. A higher PPA price allows for increased revenue and potentially higher profits for developers, making a project more economically viable, especially with higher upfront costs. When the revenue generated from selling electricity is higher, it helps to provide a better return on investment, making projects even

more attractive to investors. Electricity consumers may also benefit. Higher PPA prices often provide more stable pricing in the long term, and fixed PPA prices can protect consumers from price fluctuations in other energy markets. Overall, this may incentivize greater solar renewable energy development in Indiana.

Indiana PPA Scorecard



Average PPA price 2023:	\$101.92
Average PPA price change in the last 3 years	5.7%
Largest PPA buyers:	BofA, EDP, Amazon

Average PPA Prices:

Year	Price (\$/MWh)
2018	\$96.65
2019	\$99.91
2020	\$101.92
2021	\$101.92
2022	\$101.92
2023	\$101.92

Federal & Indiana State Tax Incentives for Solar Developers

The average Utility-Scale PPA price in Indiana is \$101.92 \$/MWh. This price has increased by 5.17% in the past 3 years. A higher PPA price allows for increased revenue and potentially higher profits for developers, making a project more economically viable, especially with higher upfront costs. When the revenue generated from selling electricity is higher, it helps to provide a better return on investment, making projects even more attractive to investors. Electricity consumers may also benefit. Higher PPA prices often provide more stable pricing in the long term, and fixed PPA prices can protect consumers from price fluctuations in other energy markets. Overall, this may incentivize greater solar renewable energy development in Indiana.

IL Solar Development Incentive	Type	About
Net Metering	State	State policy change in 2017 implemented net metering; Solar projects installed before July 1, 2022 may be able to receive net metering until July 1, 2032
Renewable Portfolio Standard (RPS)	State	Indiana's Clean Energy Portfolio Standard is currently active and in phase 2 of its 3 phase process: <ol style="list-style-type: none"> 1. Average of 4% of electricity supplied between 2013 and 2018 2. Average of 7% between 2019 and 2024 3. Average of 10% in 2025
Federal Solar Tax Credit (ITC)	Federal	Developers can claim 30% of the installation cost as a credit on their federal income taxes.

Net Metering

Net metering is a billing arrangement that allows consumers who generate their own electricity from renewable sources to receive credit for any excess electricity they produce and feed back into the grid. In West Virginia, customers who have installed any renewable energy systems, such as solar panels or wind turbines, are credited at the retail rate, the same rate the customer would pay for the electricity if they were to consume from the grid.

Senate Enrolled act 390

In April, the General Assembly approved Senate Enrolled Act 390, which grants permission for the creation of a Center for the Development of Commercial Solar and Wind Energy-Ready Communities within the Indiana Office of Energy Development. This center aims to offer readily available information regarding the permits necessary for commercial solar and wind energy projects. Additionally, it will collaborate with local

permitting authorities to facilitate these projects. This initiative encourages counties to achieve the status of “solar or wind-ready” communities by implementing consistent solar and wind energy standards specific to Indiana counties, instead of mandating statewide compliance.

Indiana Code 8-1-42

Communities in Indiana now have the option to transform into solar energy-ready communities as outlined in Indiana Code § 8-1-42. To be considered “solar energy-ready,” a community must adhere to specific requirements. These include setback regulations that dictate distances between solar energy systems and surrounding obstacles, ground cover and vegetation maintenance to promote environmental sustainability, and the installation of at least 6-foot-high fencing around the project. Additionally, there are guidelines for cable burial, glare reduction, signal interference mitigation, sound level control, and the prompt repair or replacement of any drainage-related infrastructure damage. Prior to project commencement, a detailed decommissioning and site restoration plan must be submitted to the

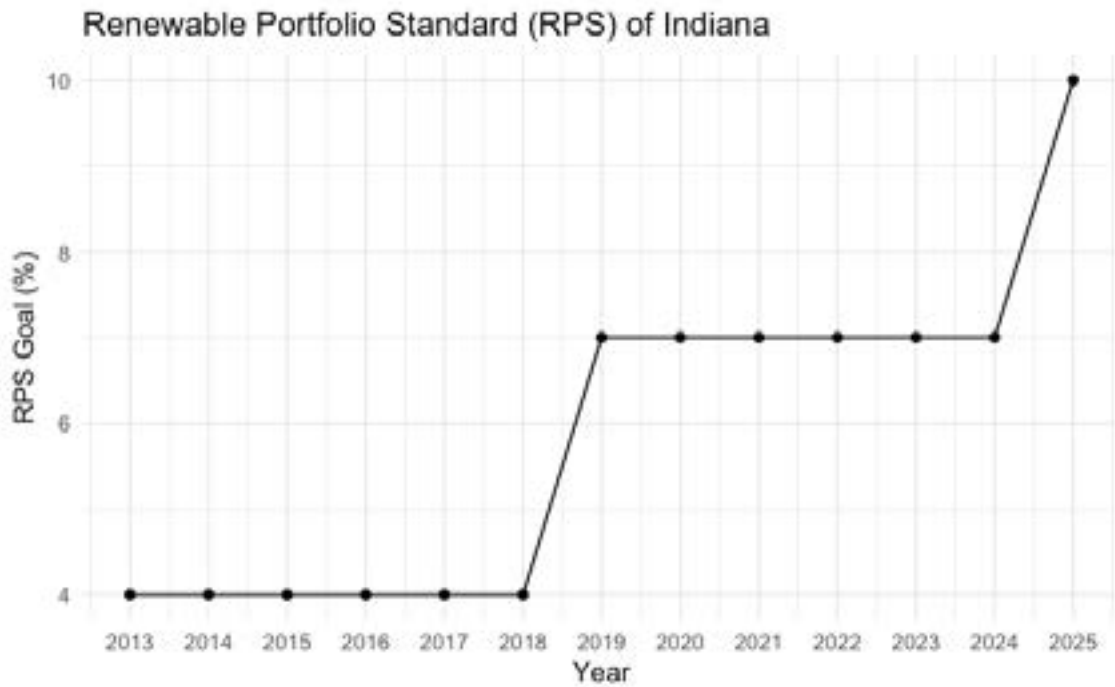
permit authority. Communities would need to adhere to the aforementioned setback regulations, landscape buffers, height limitations, etc. These are to ensure communities receive financial incentives from the upcoming budget cycle based on the amount of energy they produce.

Renewable Portfolio Standard (RPS)

Indiana has a Clean Energy Portfolio Standard, which sets targets for the percentage of energy that utilities must derive from renewable sources. The RPS creates a market demand for renewable energy, including solar power. As a developer of community-scale or utility-scale solar projects, you can benefit from this policy as utilities seek to procure renewable energy to meet their obligations. This can provide opportunities for power purchase agreements (PPAs) or other contractual arrangements. Under the current standard, Indiana requires large electric utility companies to source a

minimum of 7% of electricity from renewable sources till 2024 and a minimum of 10% of their electricity from renewable sources by 2025.

Indiana is also providing Solar Renewable Energy Credits (SRECs). RECs are certificates that are created when a renewable energy generating facility produces electricity. RECs may be sold to the utility for meeting the state's Renewable Portfolio Standards. Utilities such as Duke Energy and NIPSCO have started REC programs such as GoGreen Indiana and the Green Power Certification which have furthered solar development in local communities in Indiana.



Current Status: 7% (as of 2019)

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.



With such a wealth of new data on the state of Solar Development in Illinois, we imagine you might have questions about how to apply these trends, data, and tools to your own solar development efforts in Illinois. 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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