



Q4

PPA Price Index





About the LevelTen Energy PPA Price Index

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Leveling The Playing Field

Power purchase agreement (PPA) prices have historically been shrouded in secrecy—adding yet another hurdle to a complex transaction process. We're creating unprecedented transparency by sharing data on projects featured in the LevelTen Marketplace to help developers make informed pricing decisions and sellers identify the best projects to service their sustainability goals.

Digging Deeper With Data

What's in the LevelTen PPA Price Index? A customized report detailing PPA pricing averages, broken down nationally and across independent service operators (ISOs), and split by wind and solar. We also include data on average project size and forward shape scalars across geographies and energy types to help developers and sellers understand the latest trends in their areas.

Regional Data

The PPA Price Index includes prices for the following ISOs:

- **CAISO:** California Independent Service Operator
- **ERCOT:** Electric Reliability Council of Texas
- **MISO:** Midcontinent Independent System Operator
- **PJM:** PJM Interconnection
- **SPP:** Southwest Power Pool

Stay In The Know

Up-to-date data is always the most useful—so we've committed to publishing our PPA Price Index on a quarterly basis. However, PPA prices represent only a fraction of the data required to effectively evaluate PPA opportunities. For real-time analysis of project value and risk, cash flow modeling, price curves and more, please request credentials to the LevelTen Marketplace at [Leveltenenergy.com/marketplace](https://leveltenenergy.com/marketplace).



Q4 2018 Report Overview

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With another quarter of renewable energy procurement having come to a close, LevelTen Energy is excited to share the Q4 2018 PPA Price Index Report, the third edition of this truly unique type of data and analysis. The report provides an in-depth look at PPA price averages submitted through the LevelTen Energy Marketplace, representing more than 700 price offers across almost 400 projects.

The following are a handful of key takeaways from Q4 2018:

- Overall, PPA prices are on the rise: An evenly weighted index of P25 prices across wind and solar for the five major markets covered rose \$0.34/MWh, or 1.3%.
- Solar prices rose moderately in most markets, with the notable exception of SPP, where prices dropped substantially due to an influx of competitively priced projects at South Hub.
- Wind price movement was a mixed bag, with prices rising in MISO, ERCOT and PJM and dropping in SPP and CAISO.
- On a technology-blended basis, the SPP market dropped the most with both P25 and P50 prices down over \$2/MWh, while the MISO market rose the most with P25 prices up \$2.25/MWh and P50 prices up \$0.2/MWh.

We have included a few new updates in this report, including:

- Addition of Price Index Trend data for CAISO
- Breakout of Palo Verde Hub data for solar
- Expanded MISO coverage with data at two additional hubs for solar and one additional hub for wind

Methodology

For the data presented below, the term “prices” refers to offer prices uploaded to the LevelTen Marketplace that were active as of 2/10/19. Data are based on a real-time, as-generated, hub-settled VPPA contract structure, with un-escalated prices offered across a range of project commercial operation dates (C.O.D.s). Contract tenors range from 10-25 years for solar and 5-20 years for wind, with prices predominately submitted at a 15-year length. Offer price data are aggregated and reported in percentile buckets (e.g., “P25” refers to the 25th percentile offer price); national & ISO data are generally reported to the P10 level, while hub-specific data are reported to the P25 level to maintain confidentiality.

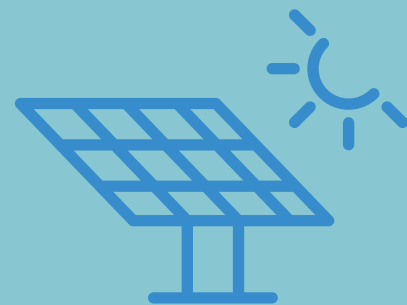
Solar

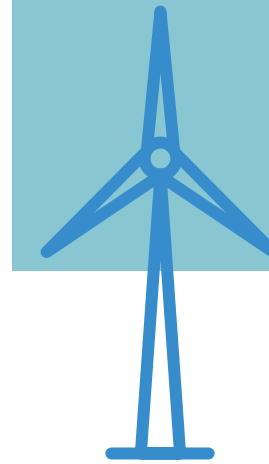
Solar prices were generally seen rising across the board with the notable exception of SPP, where prices dropped substantially due to an influx of competitively priced projects at South Hub.

Historically solar in SPP has not been particularly competitive compared to SPP wind or ERCOT wind and solar projects, so this is a notable change.

Other changes of note:

- Coverage expanded significantly from 220 projects to 282 due to more projects that were added to the LevelTen Marketplace.
- PJM solar prices rose materially on both a P25 and P50 basis as well as at all of the five major hubs covered.
- ERCOT solar prices increased slightly on a P25 basis due to price increases at the North Zone and South Zone, although the Houston Zone declined and the West Zone experienced little change.
- With the breakout of prices at Palo Verde Hub in CAISO, we can see significantly lower prices as compared to SP15 or NP15, although this may not translate to better value due to lower wholesale energy prices at Palo Verde.
- Higher MISO pricing partly reflects additional offers at the relatively higher-priced Minnesota and Illinois hubs.





Wind

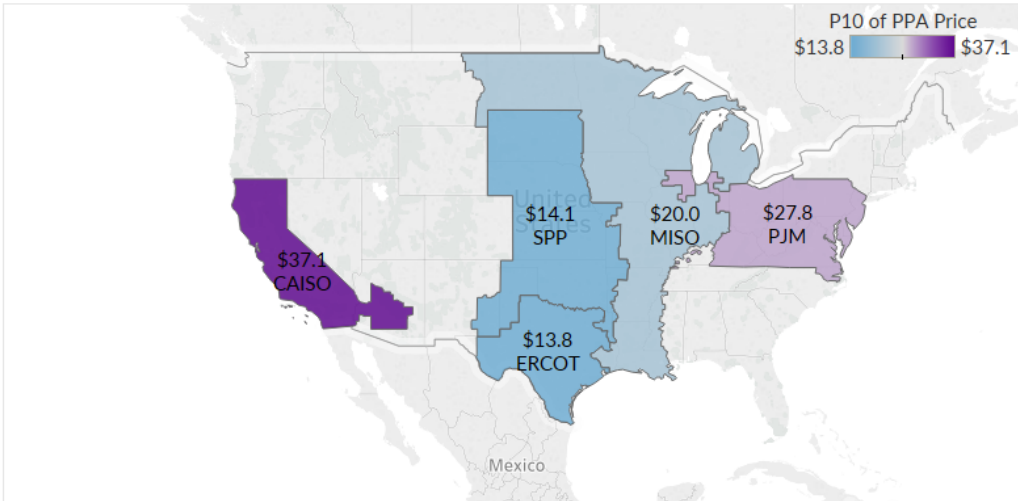


Wind price movement was a mixed bag with prices rising in MISO, ERCOT and PJM, while dropping in SPP and CAISO.

- PJM continued its trend from last quarter of rising prices with P25 index prices rising \$1.6 /MWh.
- MISO P25 prices rebounded sharply by over \$3 /MWh. Due to the smaller wind project pool in MISO compared to PJM, SPP and ERCOT, we expect higher volatility in this market now and in the near future.
- ERCOT and SPP prices were little changed on a P25 basis, though we did see a drop in the P10 price in both markets, reflecting better value among the lowest-priced projects.
- CAISO wind remains a fairly illiquid market, resulting in a significant decrease in the P50, though there was little change amongst the best available projects.

National Market Overview

Wind PPA Price by ISO
P10 Hub Price



Marketplace Metrics

Total Projects	389.0
Pricing Offers	745.0
Total MW Offered	44,501.0
P25 of Levelized PPA Price	\$25.98
P50 of Levelized PPA Price	\$31.51
P75 of Levelized PPA Price	\$38.00

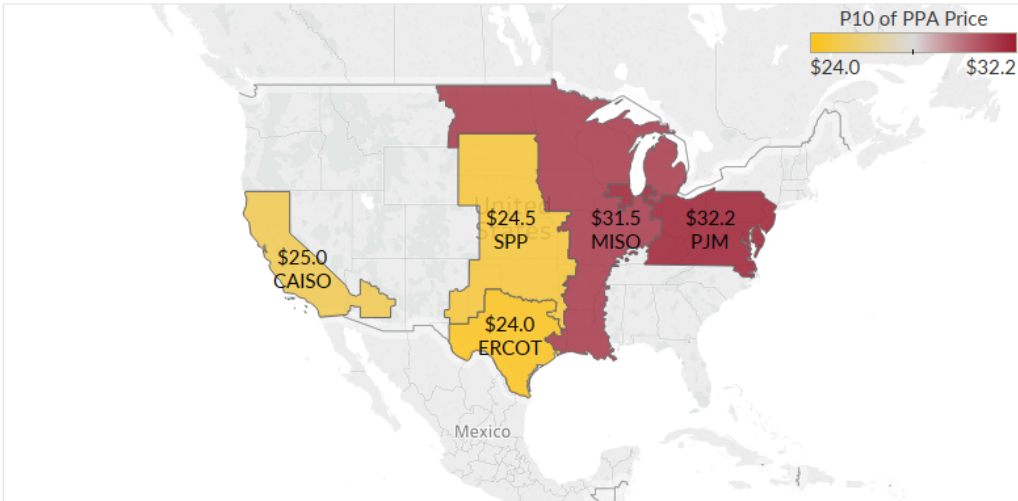
Solar Metrics

Total Projects	282.0
Pricing Offers	553.0
Total MW Offered	28,600.7
P25 of Levelized PPA Price	\$27.50
P50 of Levelized PPA Price	\$32.92
P75 of Levelized PPA Price	\$38.52

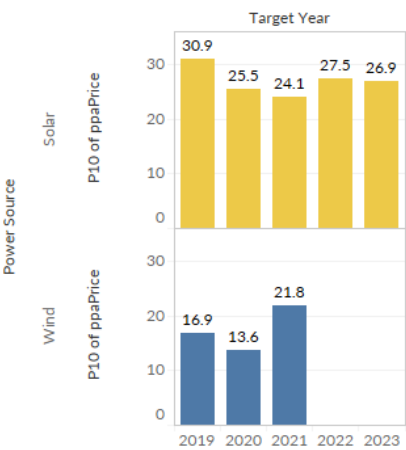
Wind Metrics

Total Projects	101.0
Pricing Offers	180.0
Total MW Offered	15,623.3
P25 of Levelized PPA Price	\$15.95
P50 of Levelized PPA Price	\$19.55
P75 of Levelized PPA Price	\$33.50

Solar PPA Price by ISO
P10 Hub Price

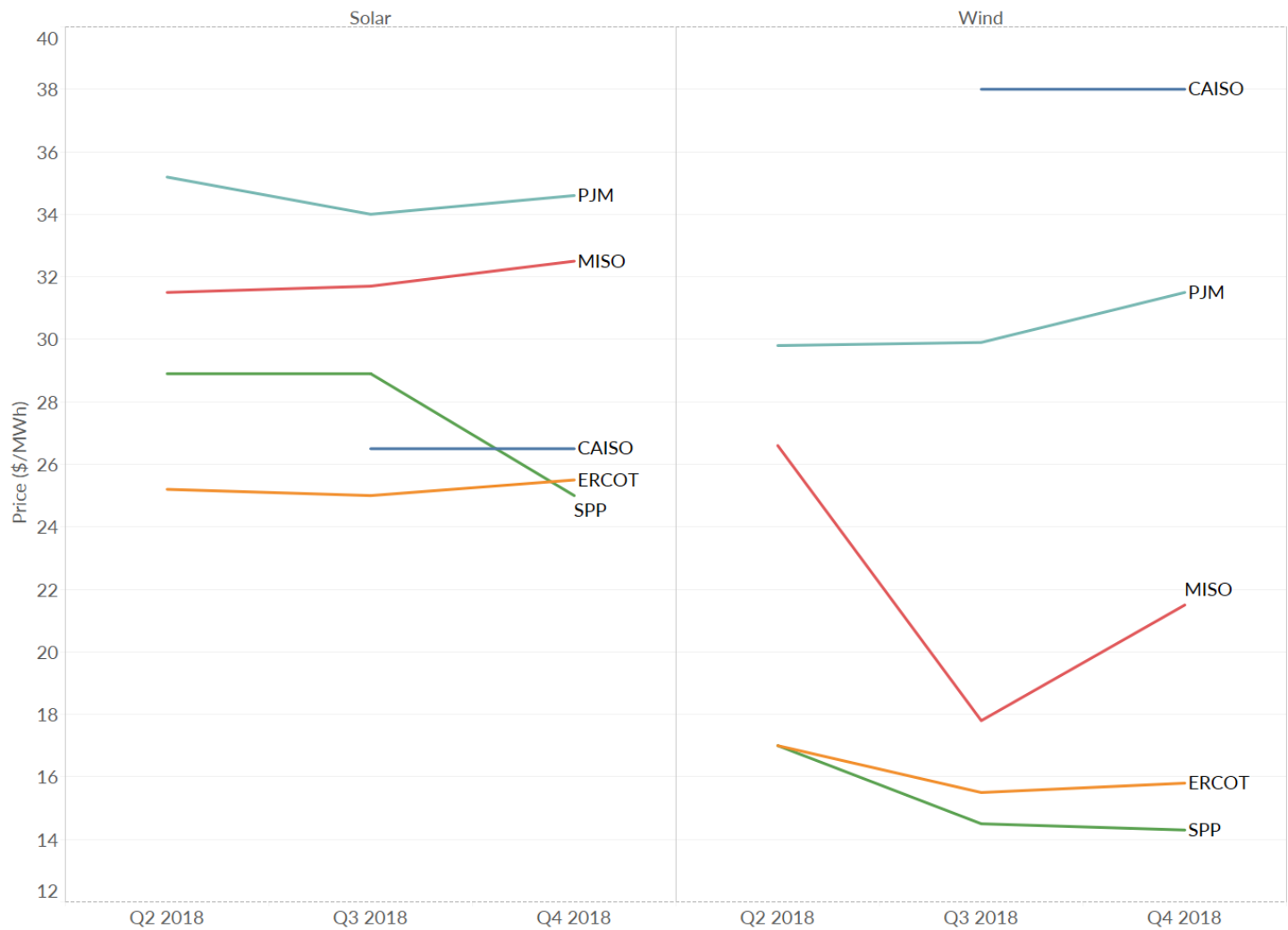


P10 PPA Price by COD



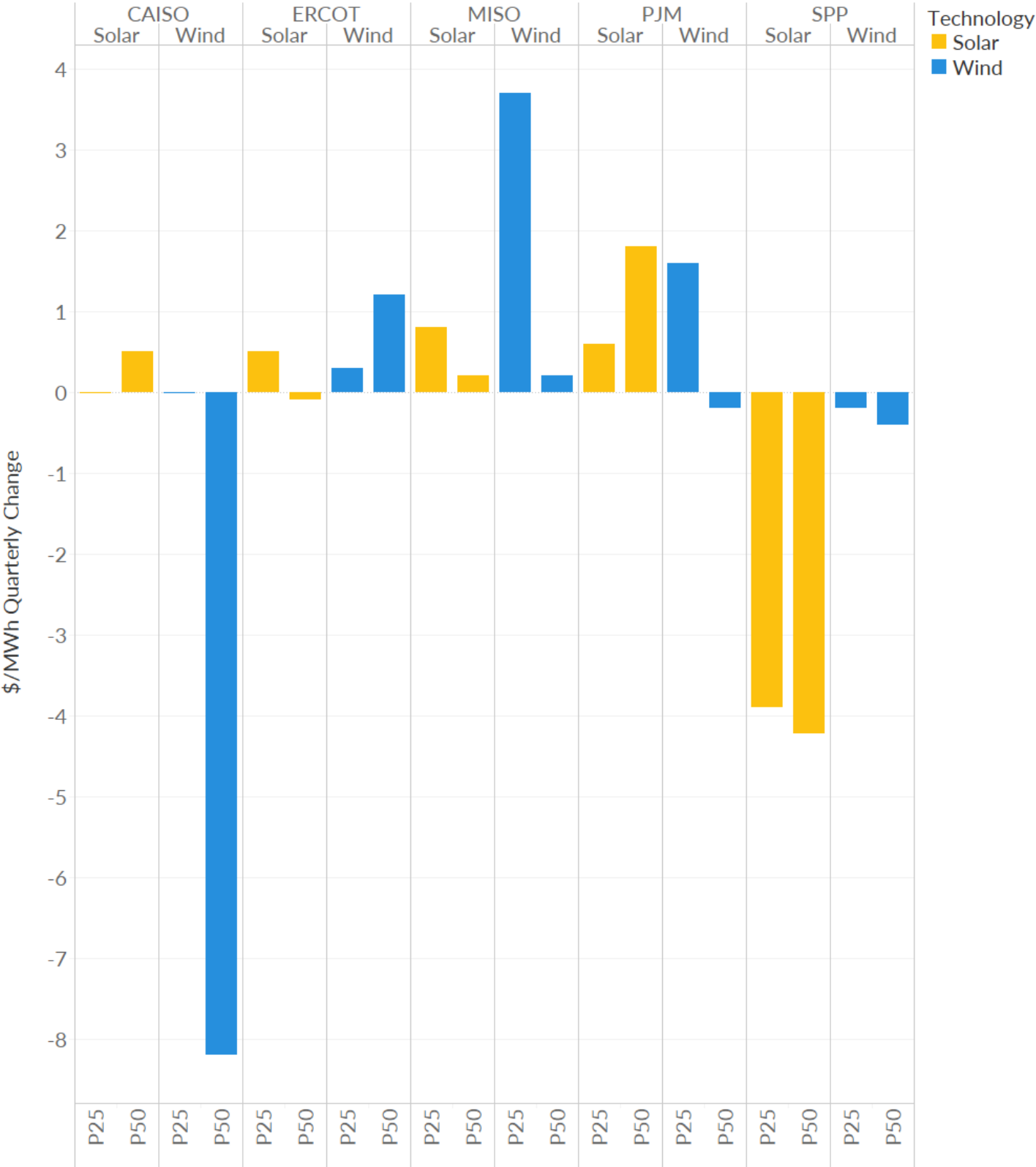
Price Index Comparison

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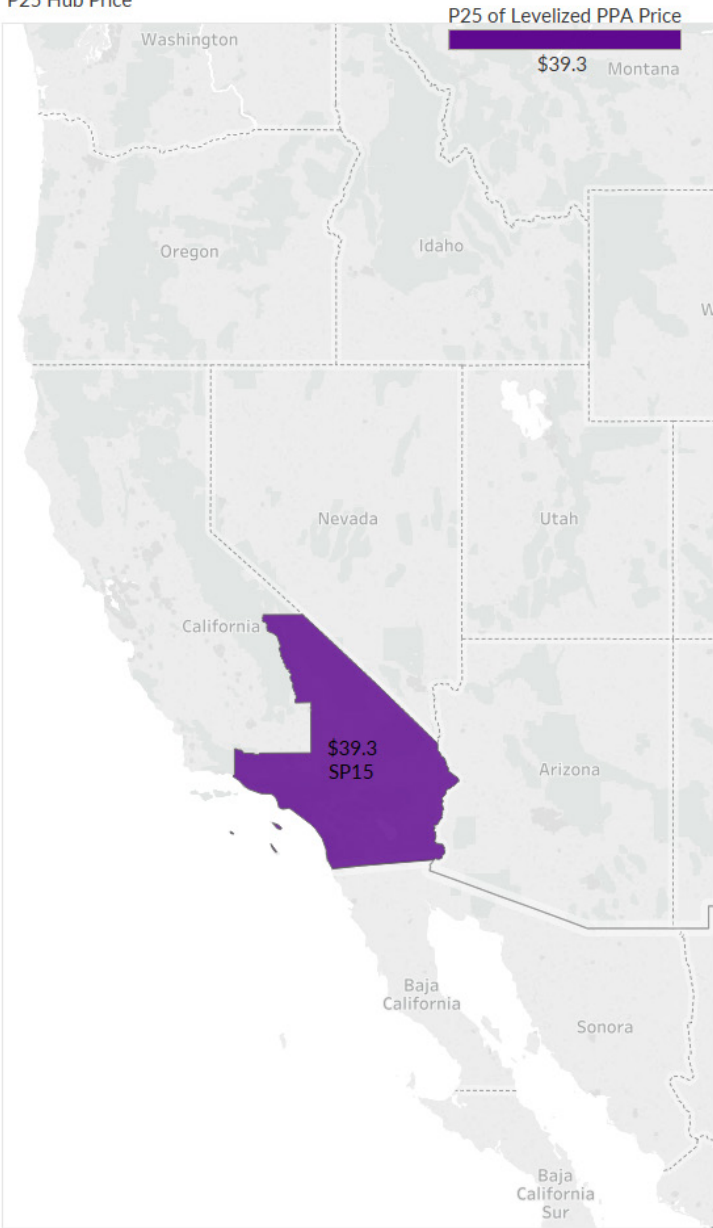
Quarterly Aggregate Price Changes

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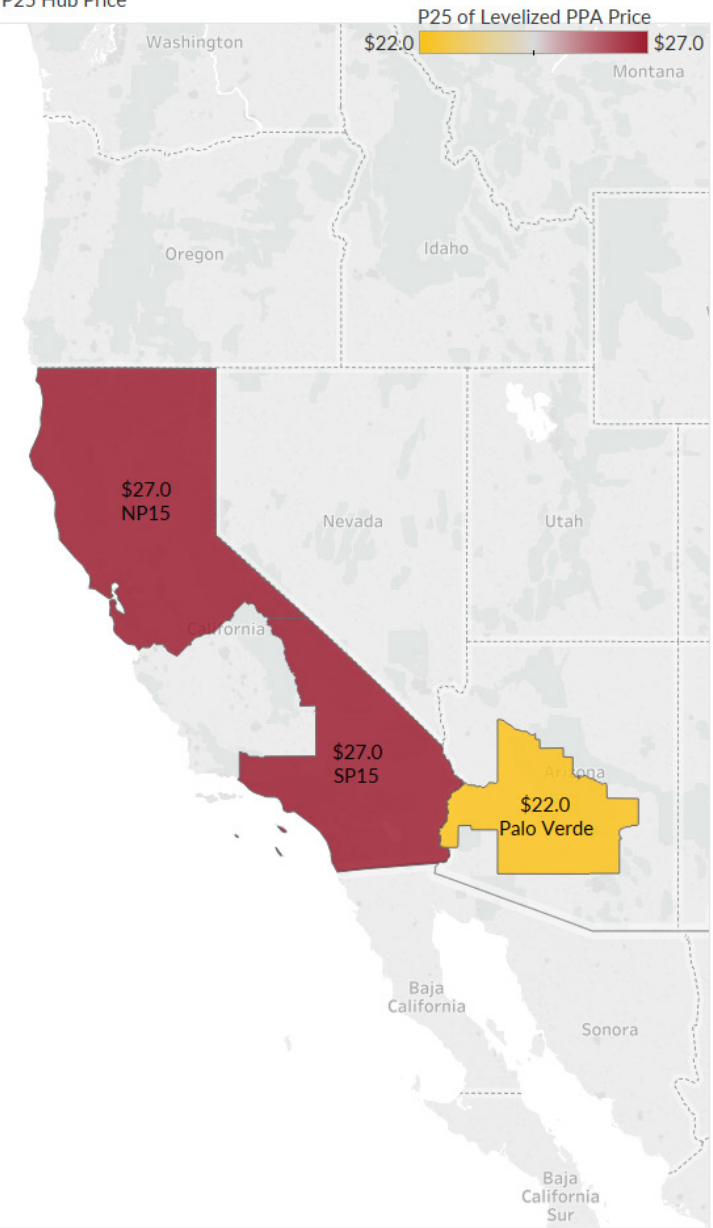


CAISO Market Overview

Wind PPA Price by Hub
P25 Hub Price

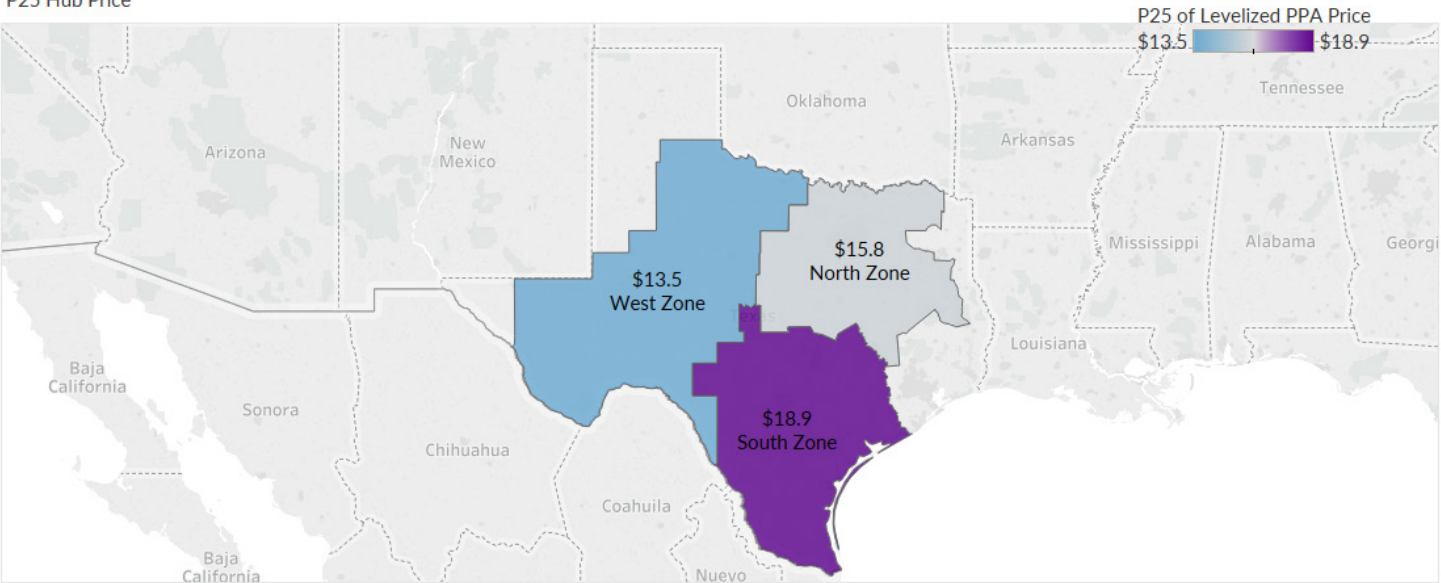


Solar PPA Price by Hub
P25 Hub Price

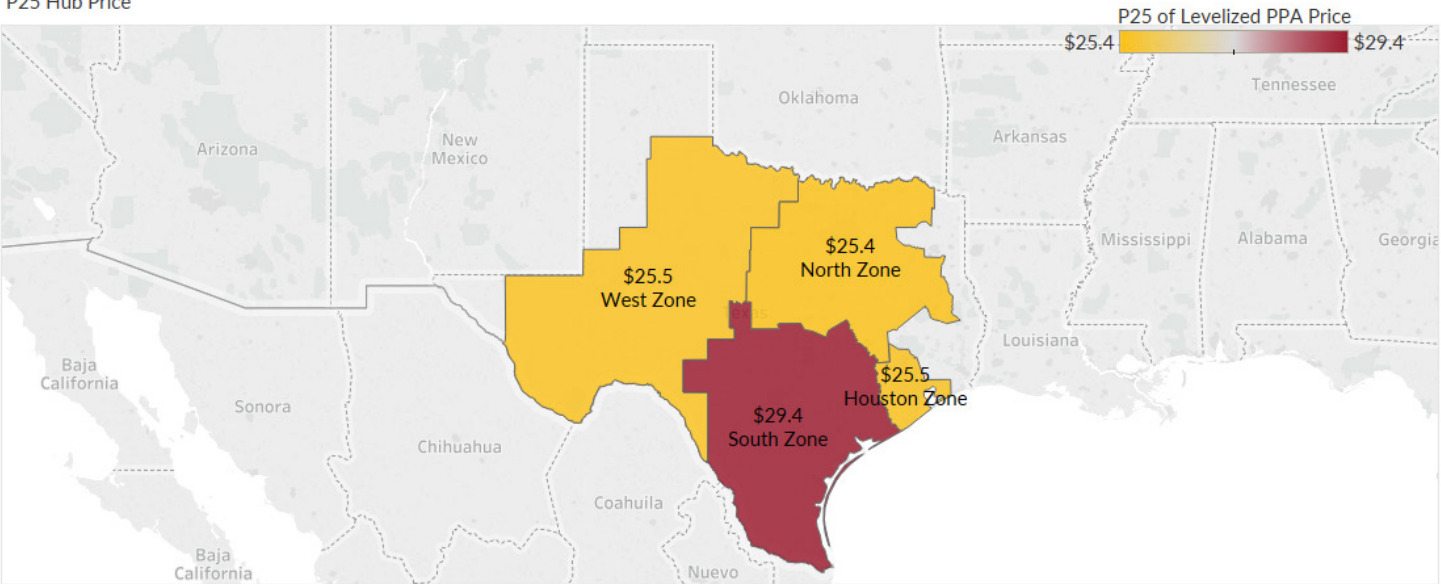


ERCOT Market Overview

Wind PPA Price by Hub
P25 Hub Price

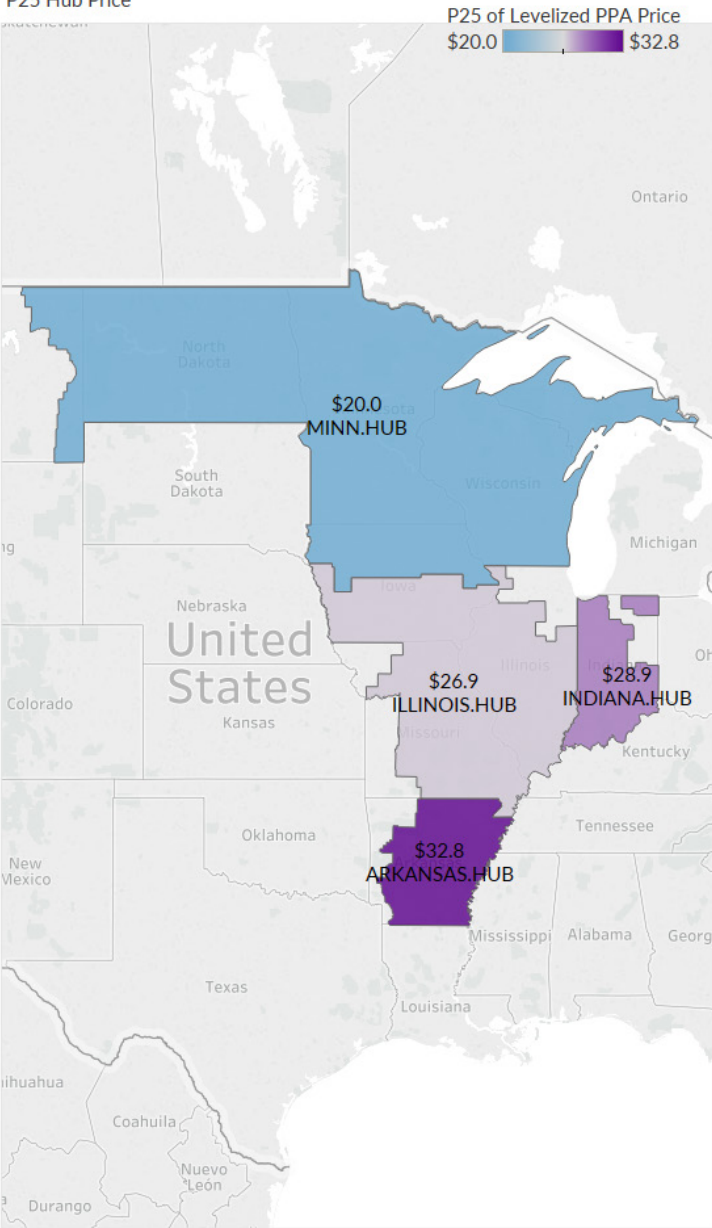


Solar PPA Price by Hub
P25 Hub Price

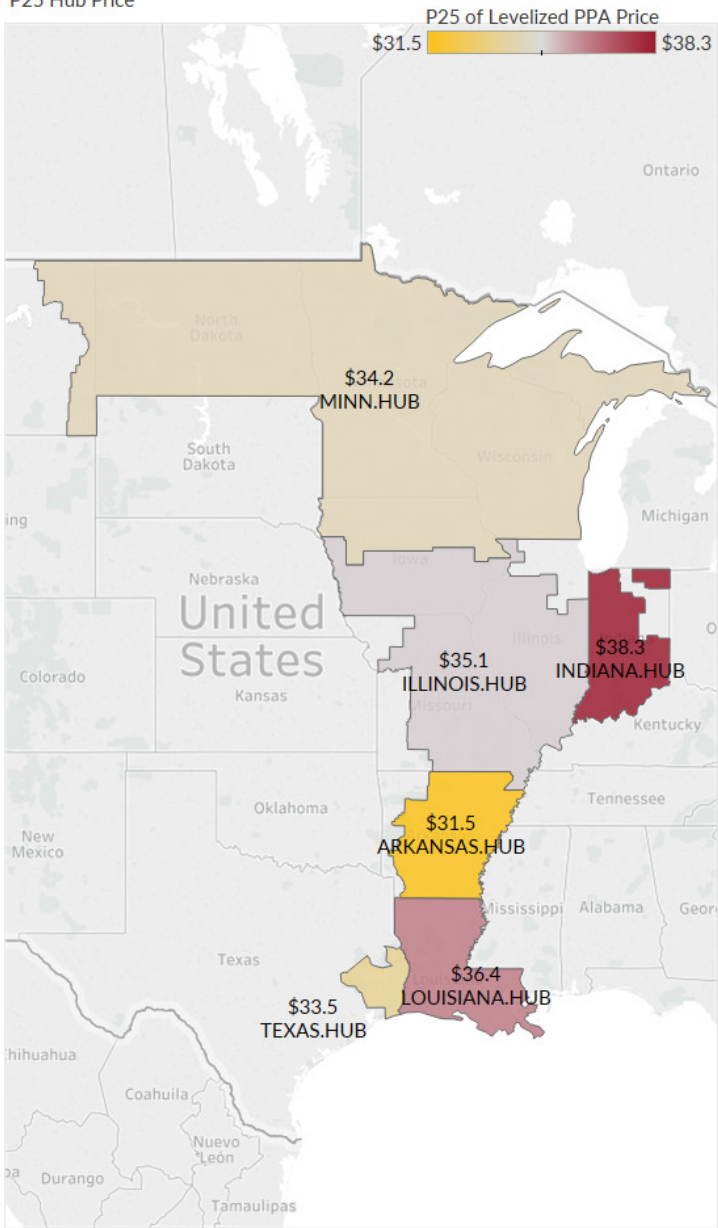


MISO Market Overview

Wind PPA Price by Hub
P25 Hub Price

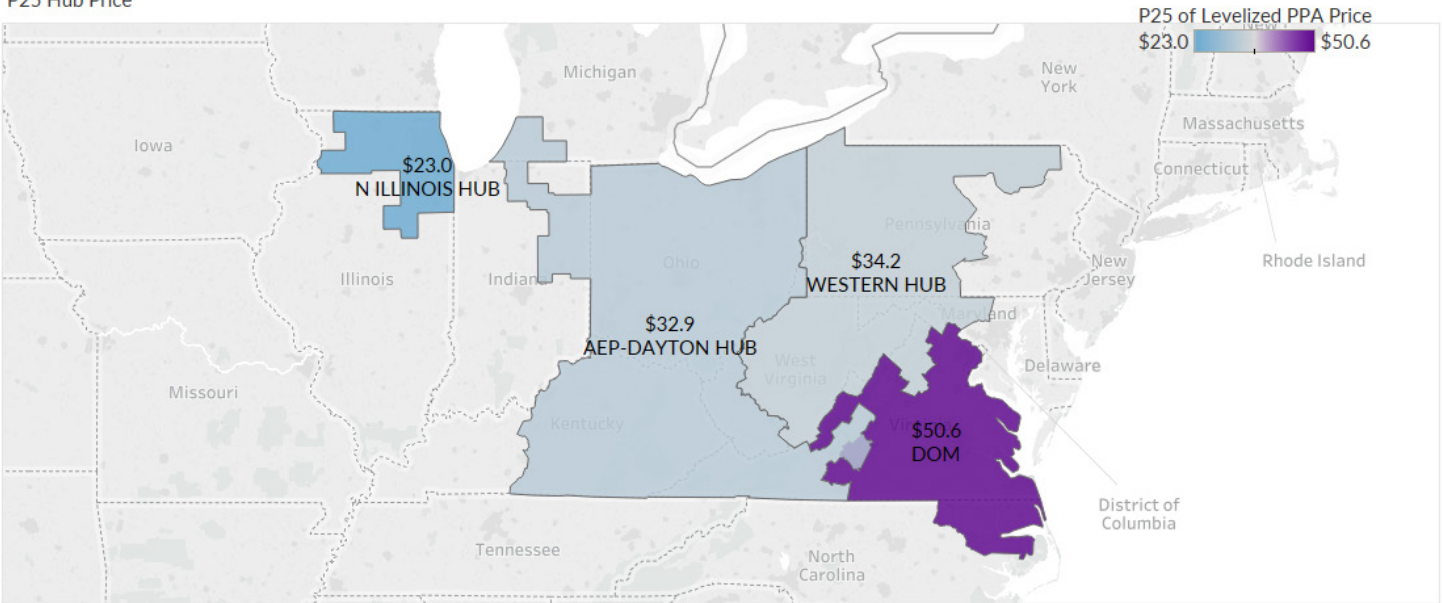


Solar PPA Price by Hub
P25 Hub Price

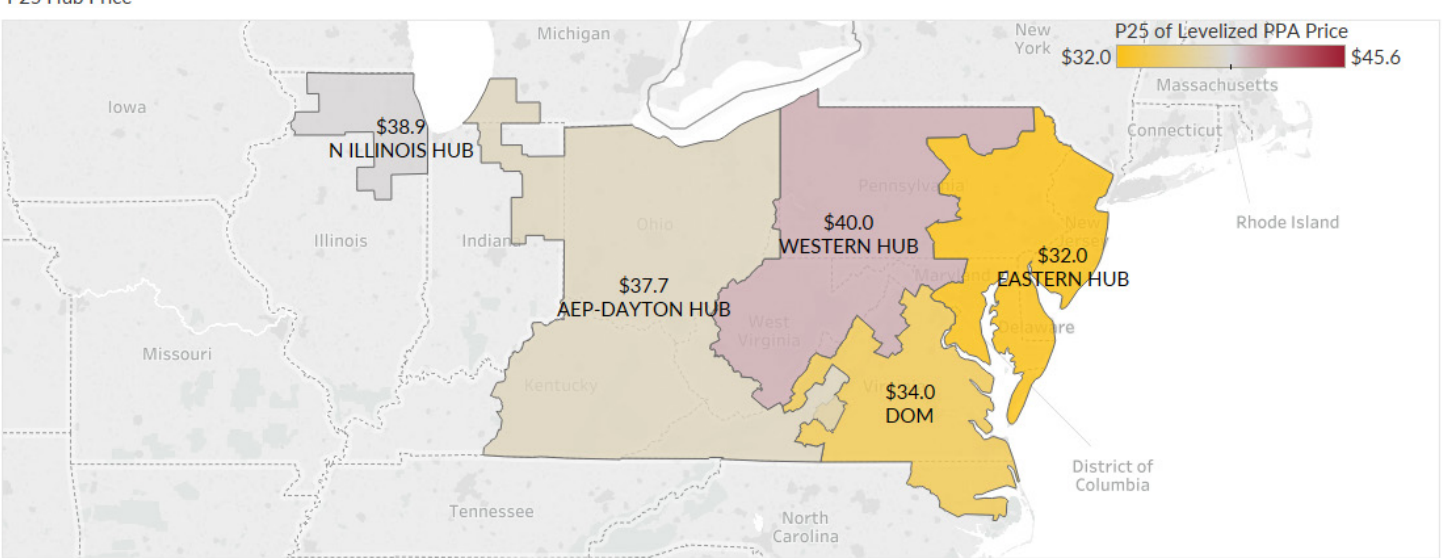


PJM Market Overview

Wind PPA Price by Hub
P25 Hub Price

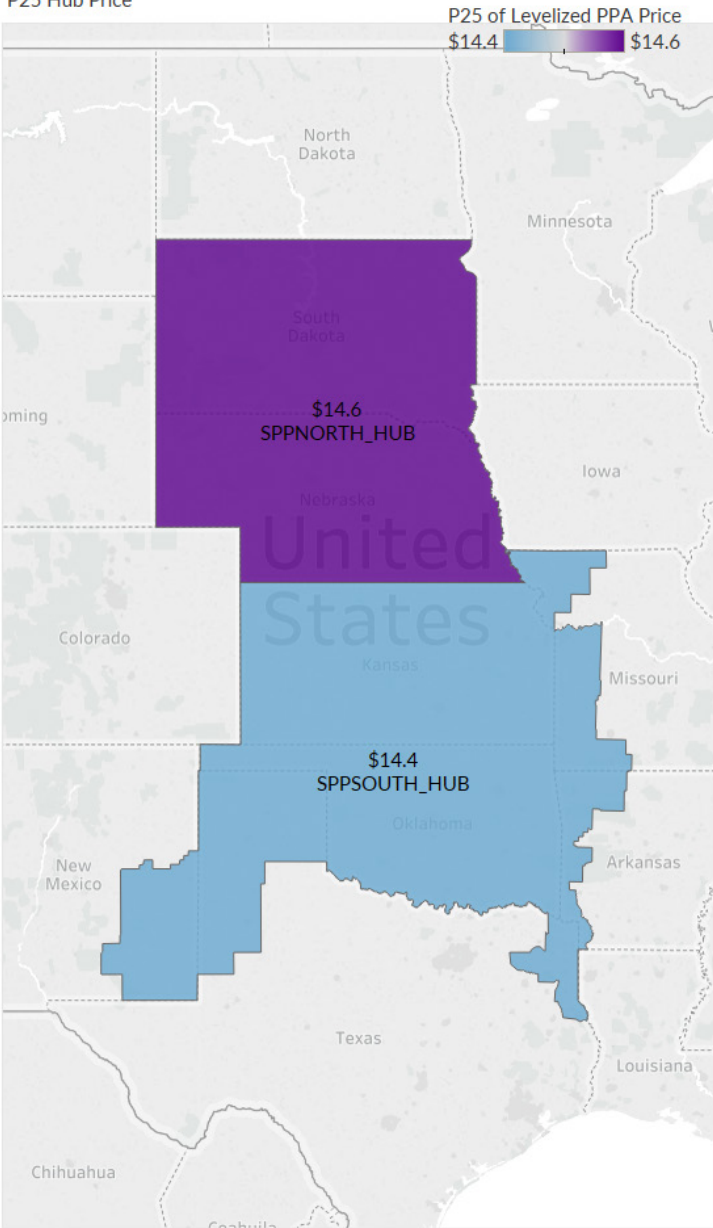


Solar PPA Price by Hub
P25 Hub Price

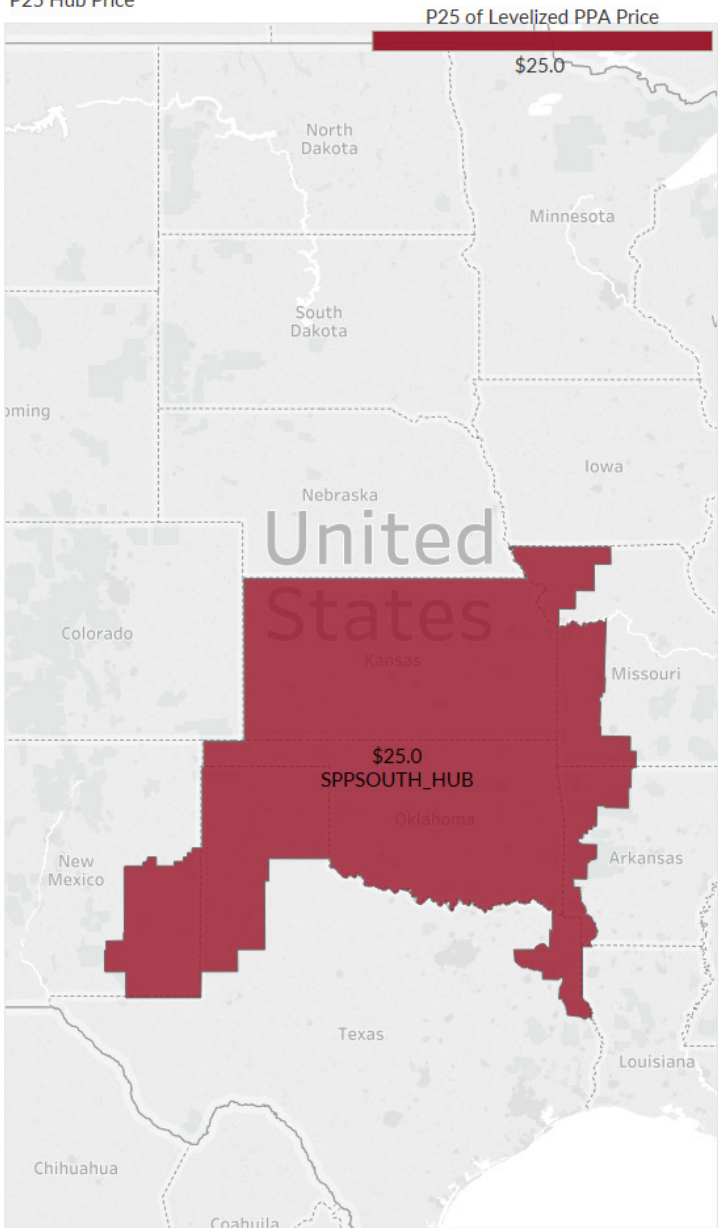


SPP Market Overview

Wind PPA Price by Hub
P25 Hub Price



Solar PPA Price by Hub
P25 Hub Price





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