

# Powering the Permian

The interplay between hydrocarbon and power markets in West Texas

*August 17, 2021*

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# Cautionary Statement

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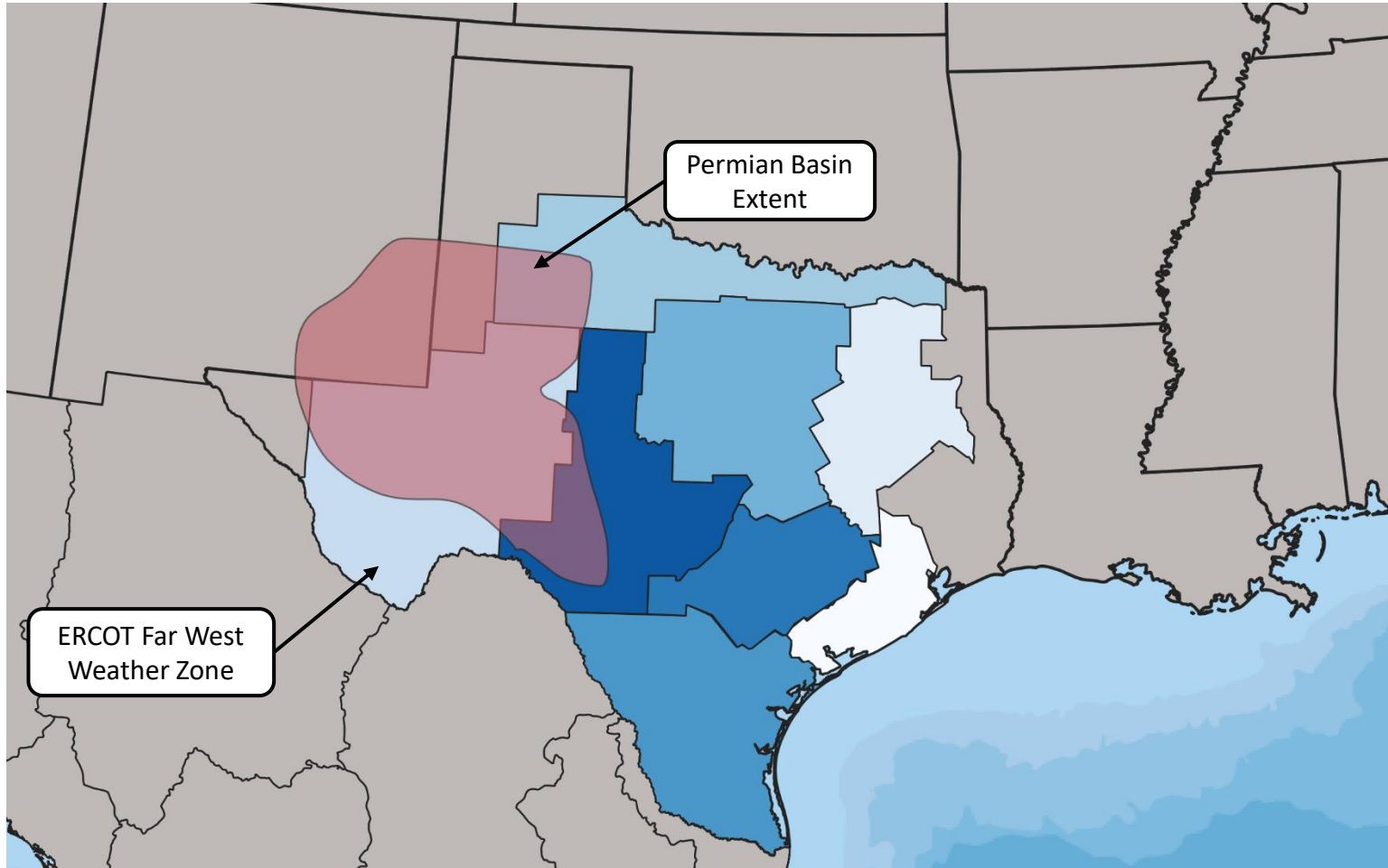
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# Key Takeaways

- Unlike the rest of Texas, electricity demand (load) in West Texas has been closely tied to Permian oil and gas production. Load has tripled over the last 10 years as Permian production has grown.
- Over the next 5 years, the Permian is expected to increase oil production by 2 MMb/d and gas production by 8 Bcf/d. These increases in production will continue to cause concentrated pockets of electricity demand in West Texas.
- In response to concentrated load, quality renewable resource, and transmission buildout, developers have targeted West Texas and developed about 11 GW of wind and solar capacity. That accounts for a third of ERCOT's renewable buildout.
- The concentration of renewable generation has changed pricing dynamics in ERCOT, leading to lower, more volatile pricing, which will affect how industry players execute on their ESG goals.

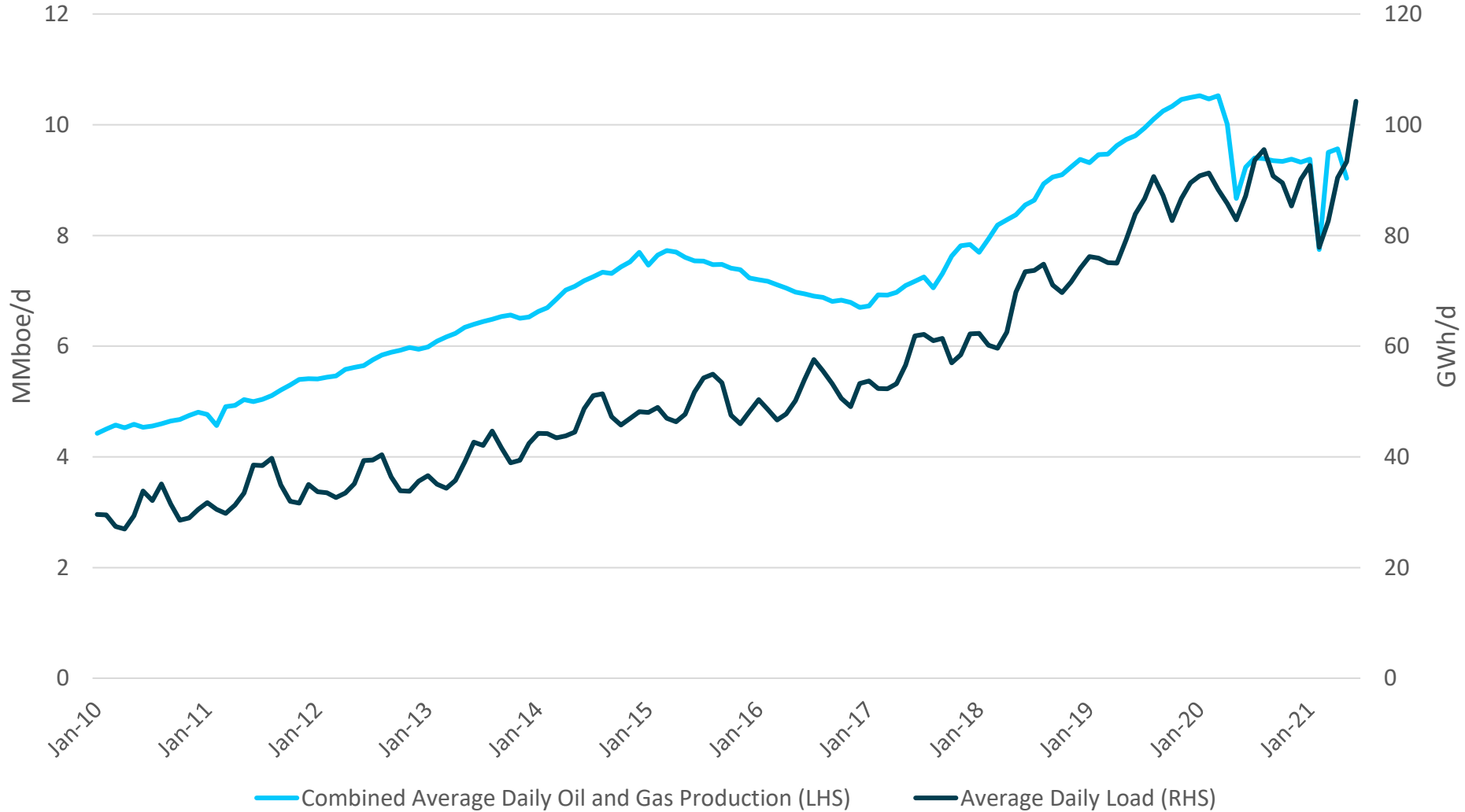


**ERCOT Modeled Load in the Permian**



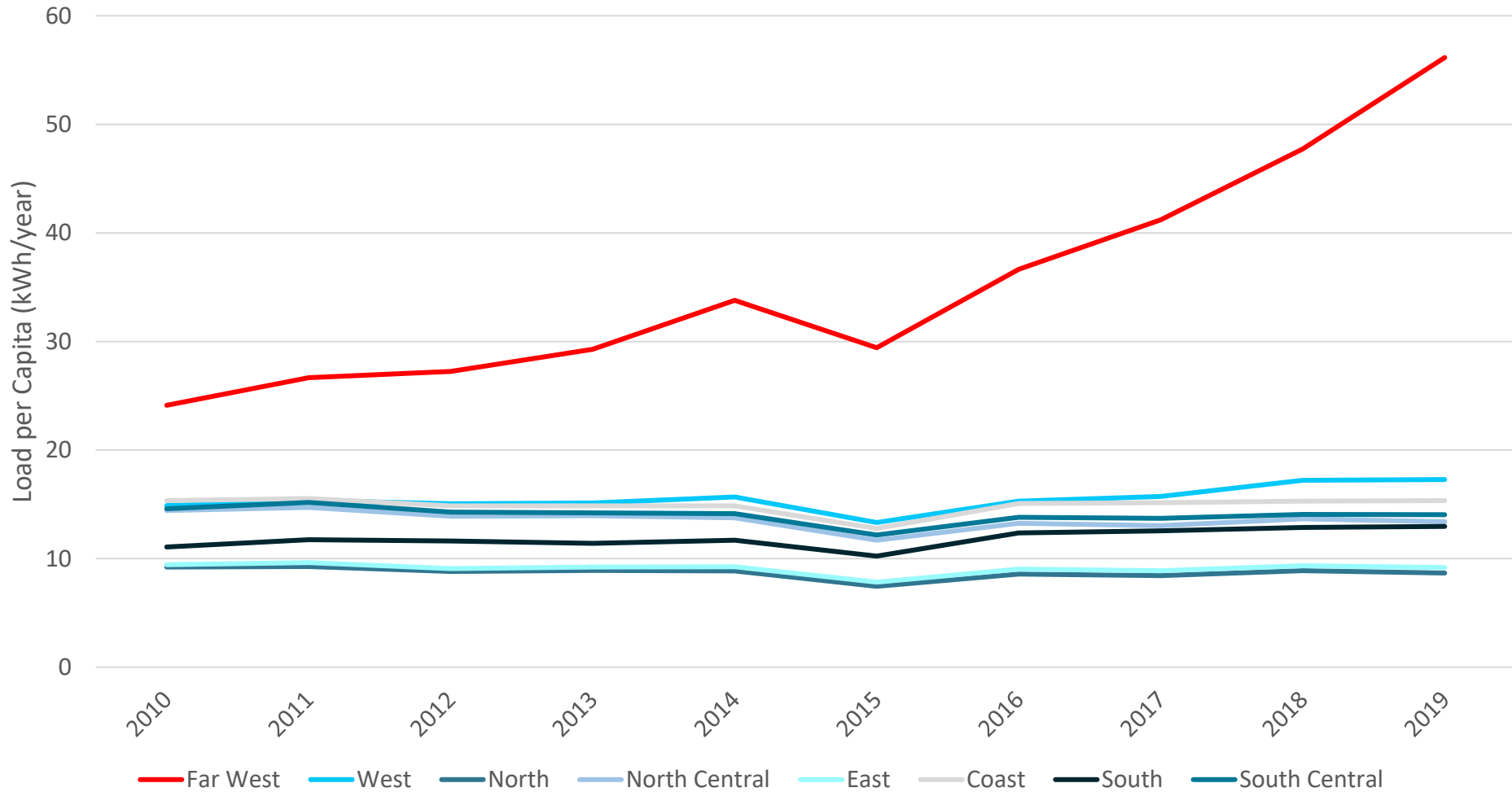
As Permian oil and natural gas production has boomed, demand for electricity has gone along with it. Load in the Far West zone has more than tripled in the last 10 years.

### Texas Permian Production vs ERCOT Far West Electric Load



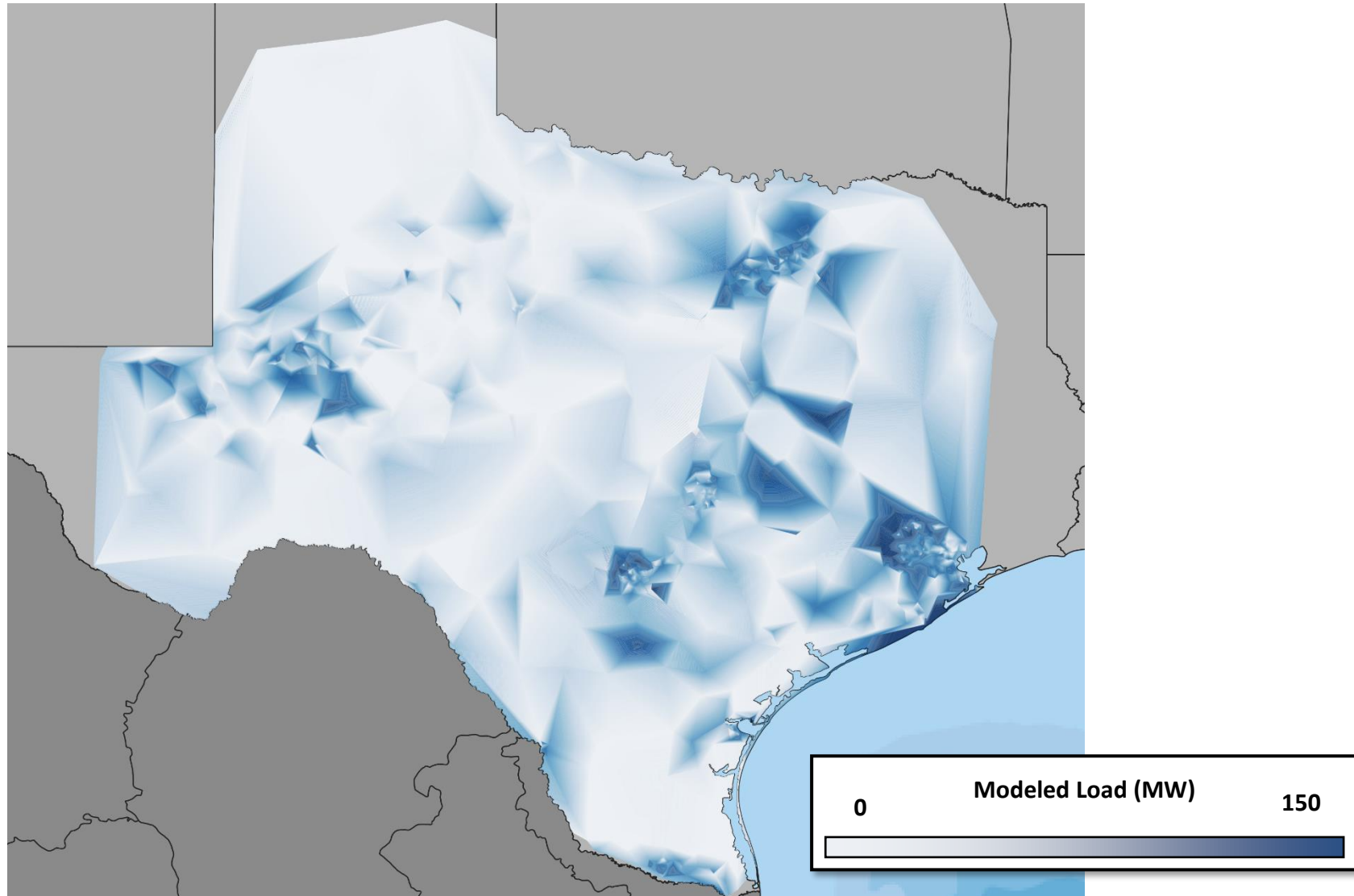
While most areas of ERCOT's electricity demand is tied to population, the Far West has grown with the growth of hydrocarbon production

Load per Capita in ERCOT Weather Zones



The Permian shows similar concentrated pockets of electric demand that are seen in populous cities such Houston, Dallas, Austin, and San Antonio

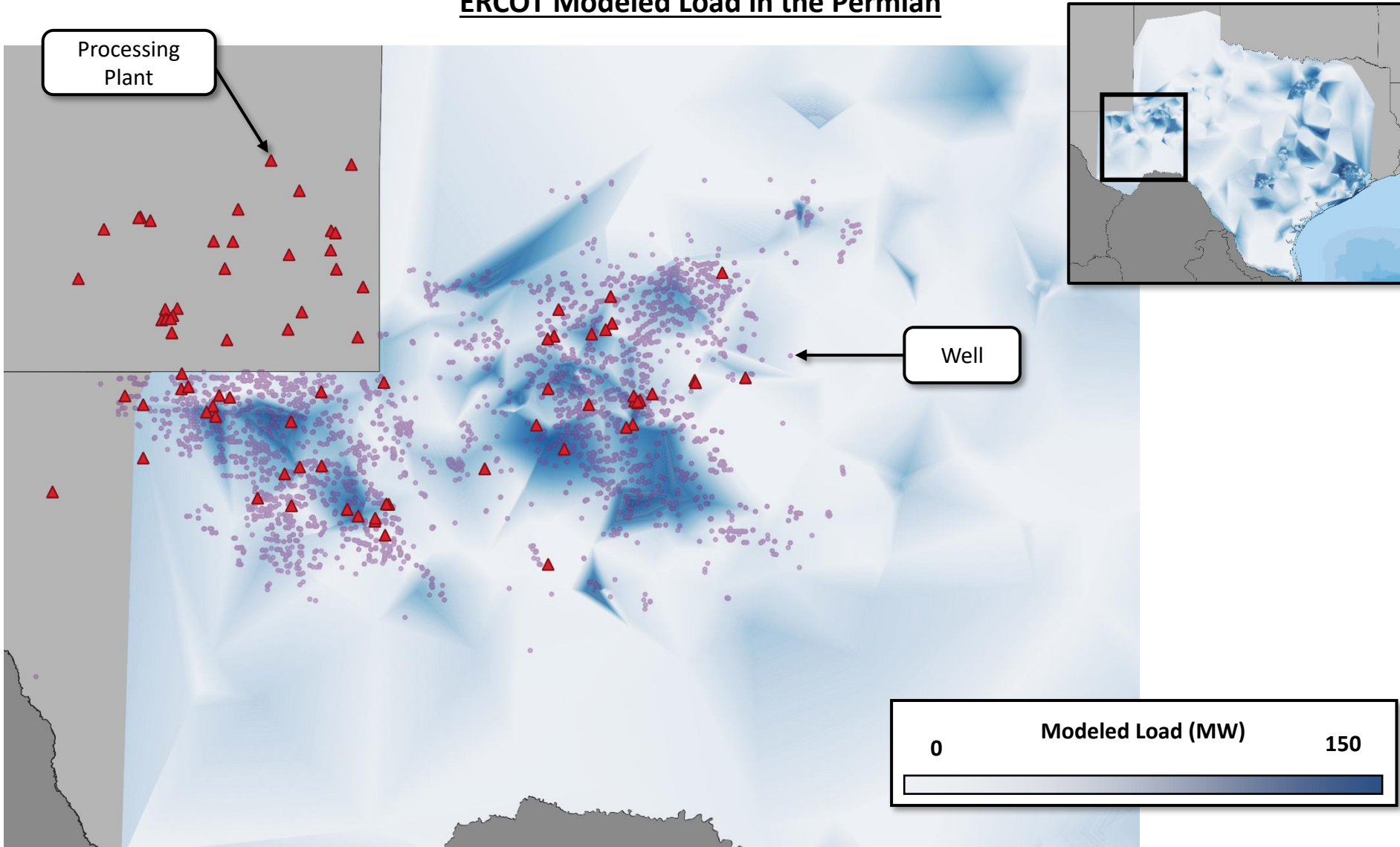
**ERCOT Modeled Load**



Note: Modeled load for 9/15/2020, 5PM  
Source: BTU Analytics' Power View, ERCOT

Load in the Permian has been centered around drilling activity and related infrastructure, such as processing plants

### ERCOT Modeled Load in the Permian



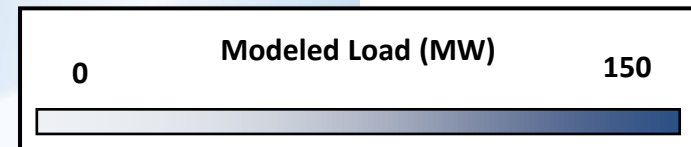
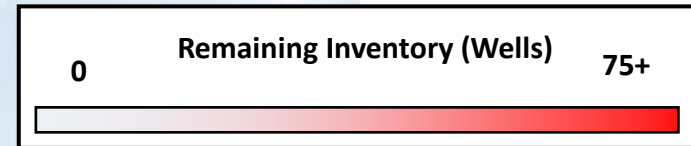
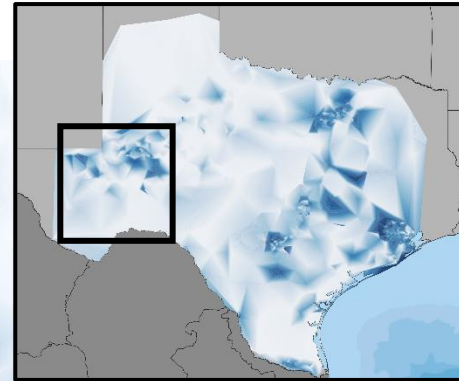
Note: Modeled load for 9/15/2020, 5PM. Includes wells spud in 2019 and 2020  
Source: BTU Analytics' Power View, BTU Analytics' Oil & Gas Economics View, ERCOT



With 20 years of runway left in the Permian, expect load to grow in core areas and expand outside of core areas as drilling and infrastructure shift

### ERCOT Modeled Load in the Permian

3x3 mi grid showing drilling remaining inventory

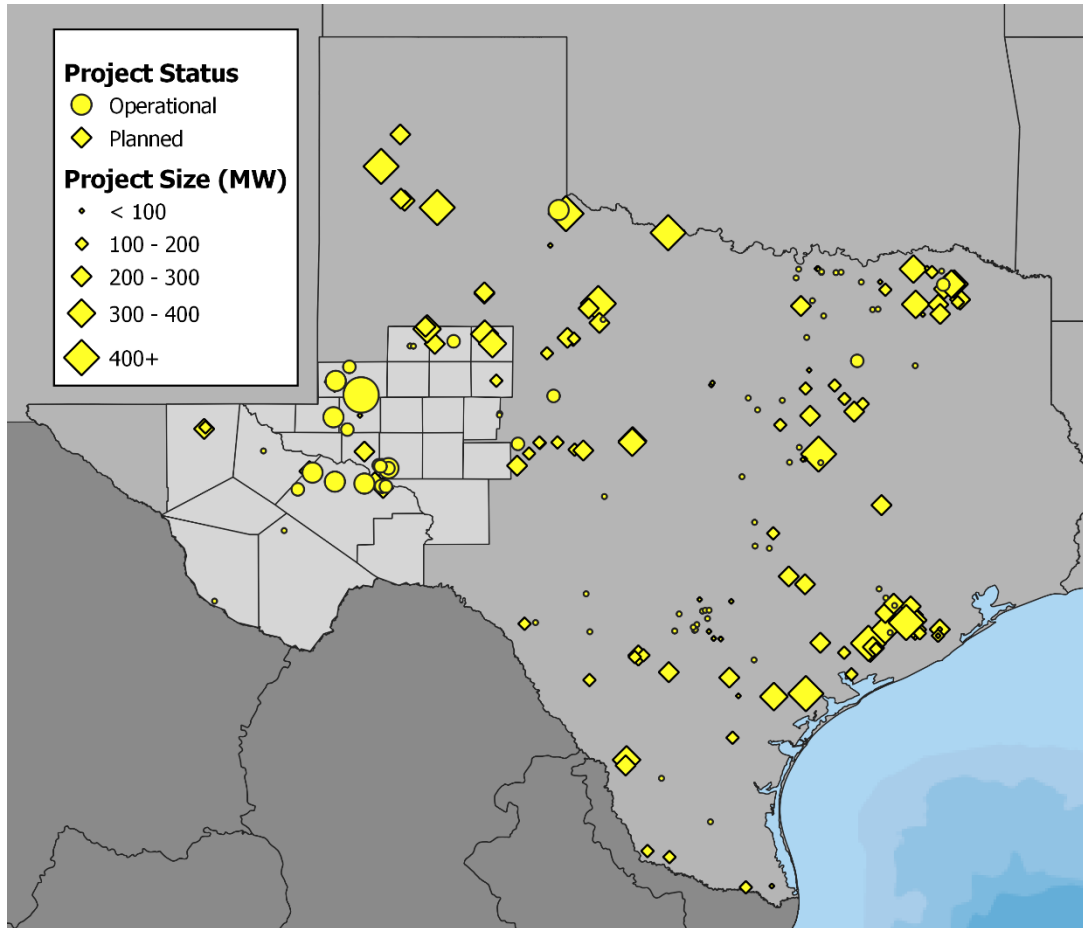


Note: Modeled load for 9/15/2020, 5PM. Includes wells spud in 2019 and 2020. Remaining inventory Only includes analysis of acreage where at least one horizontal well has been drilled within BTU Analytics' grid since 2013.

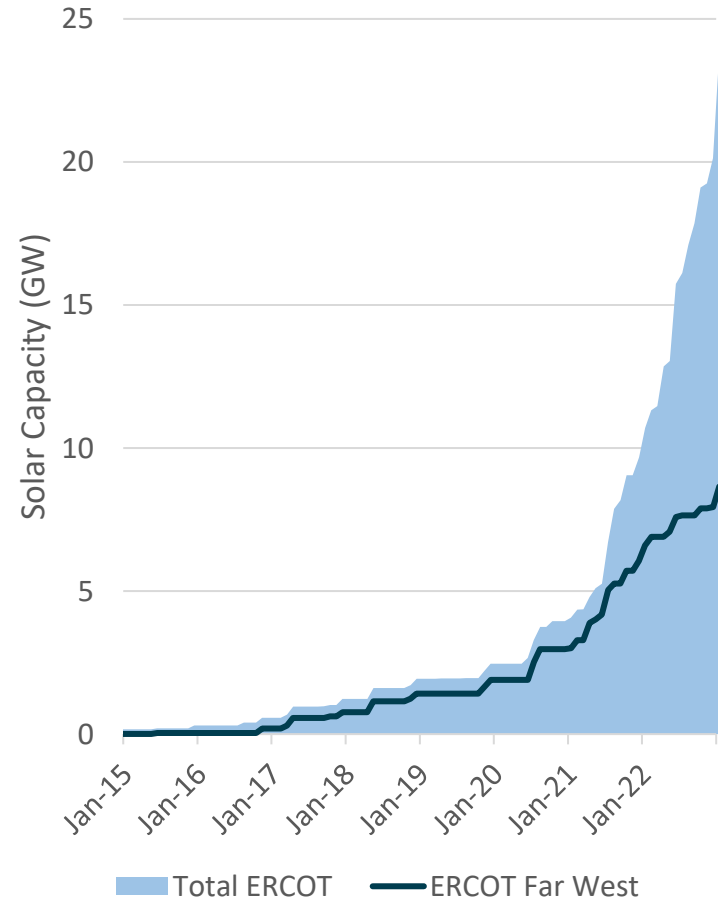
Source: BTU Analytics' Power View, BTU Analytics' Oil & Gas Economics View (updated July 2021), FactSet

Quality solar resource sits near the core of the Permian, so development has been very active in the area. So much so that today the Far West accounts for about 80% of total ERCOT solar capacity.

### Operational and Proposed ERCOT Solar Capacity



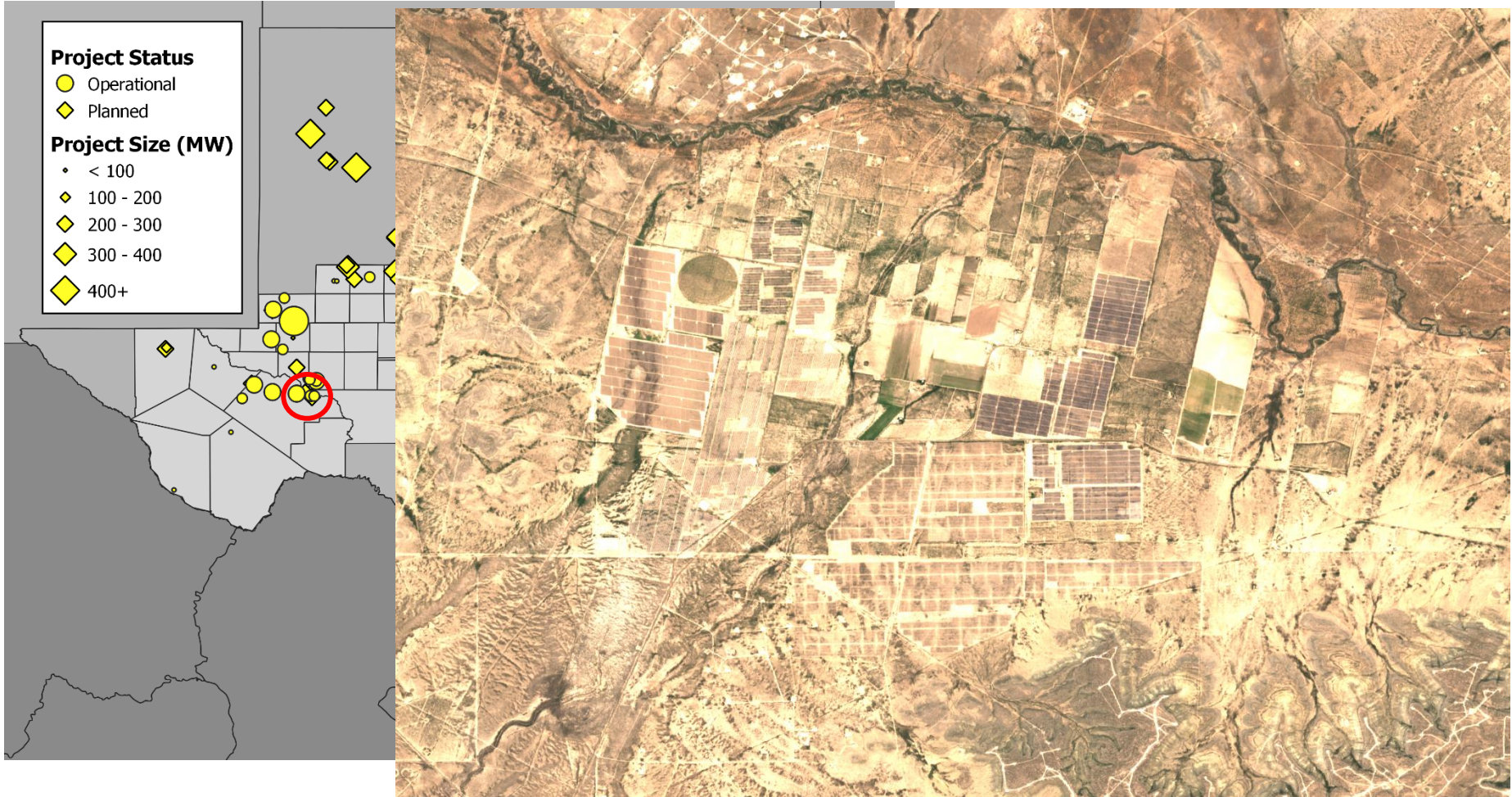
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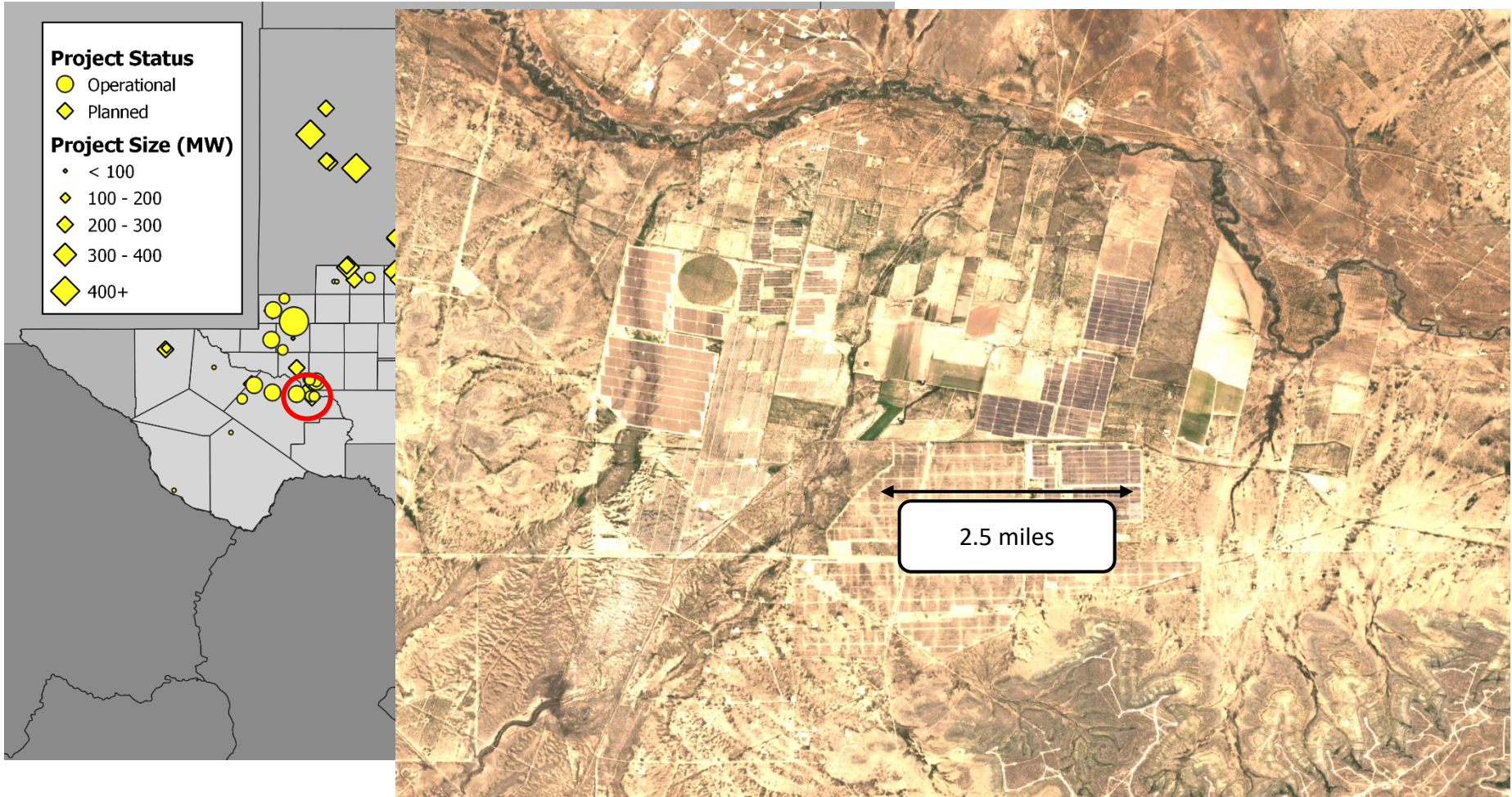
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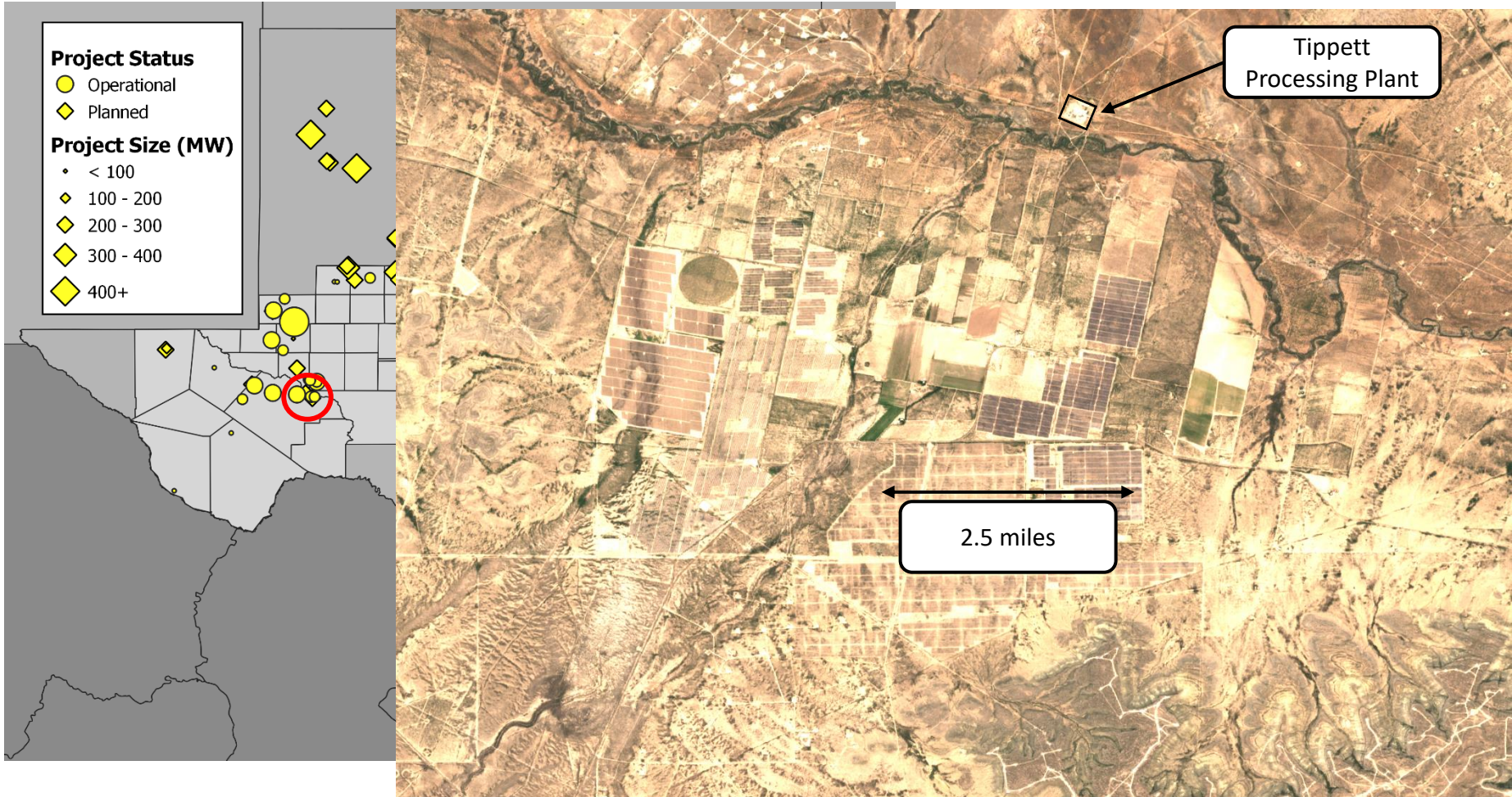
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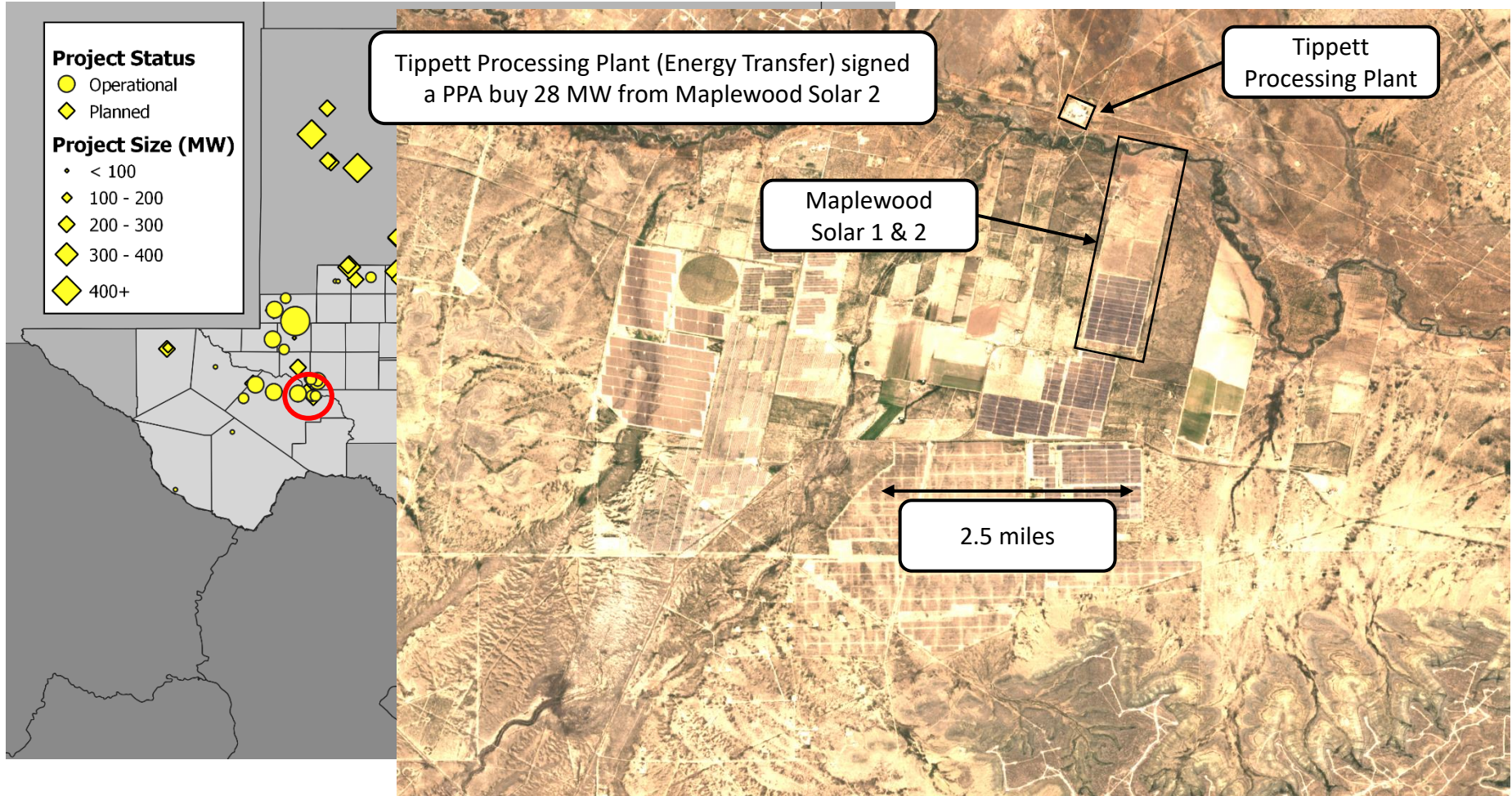
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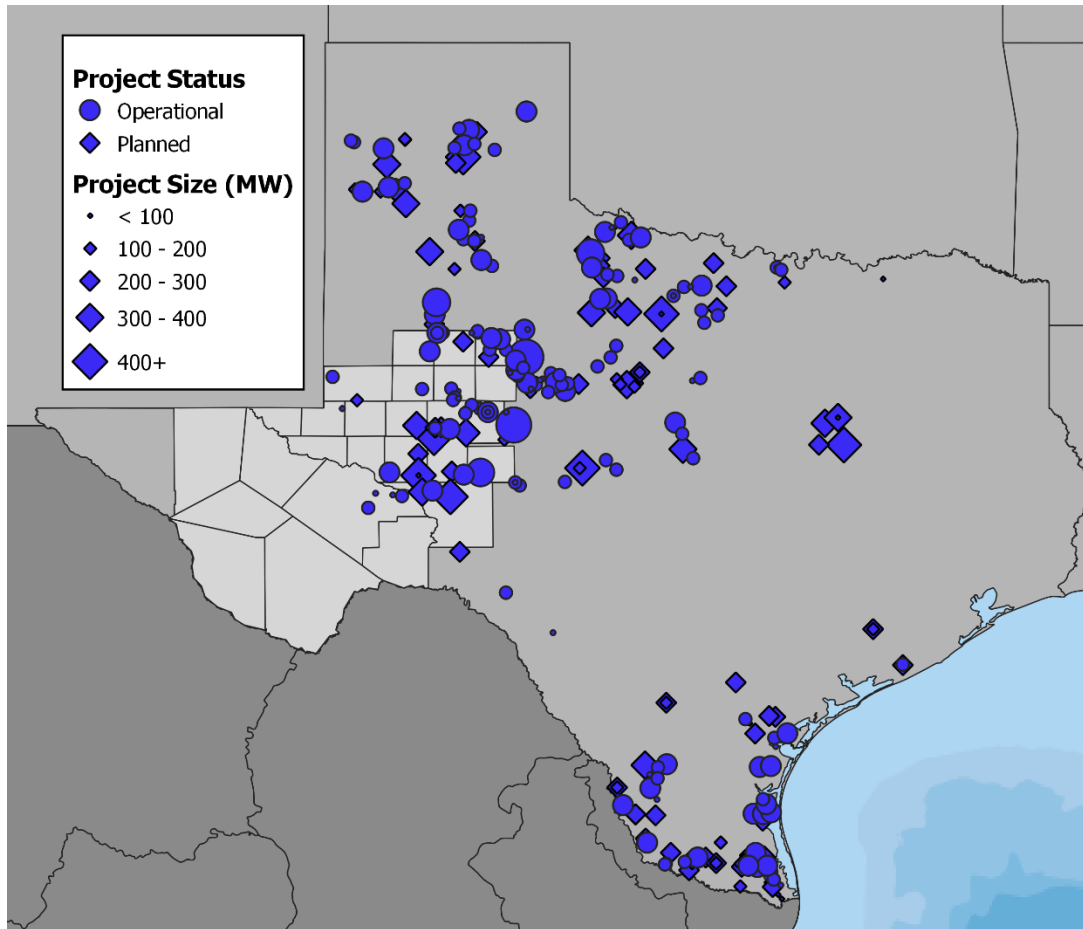
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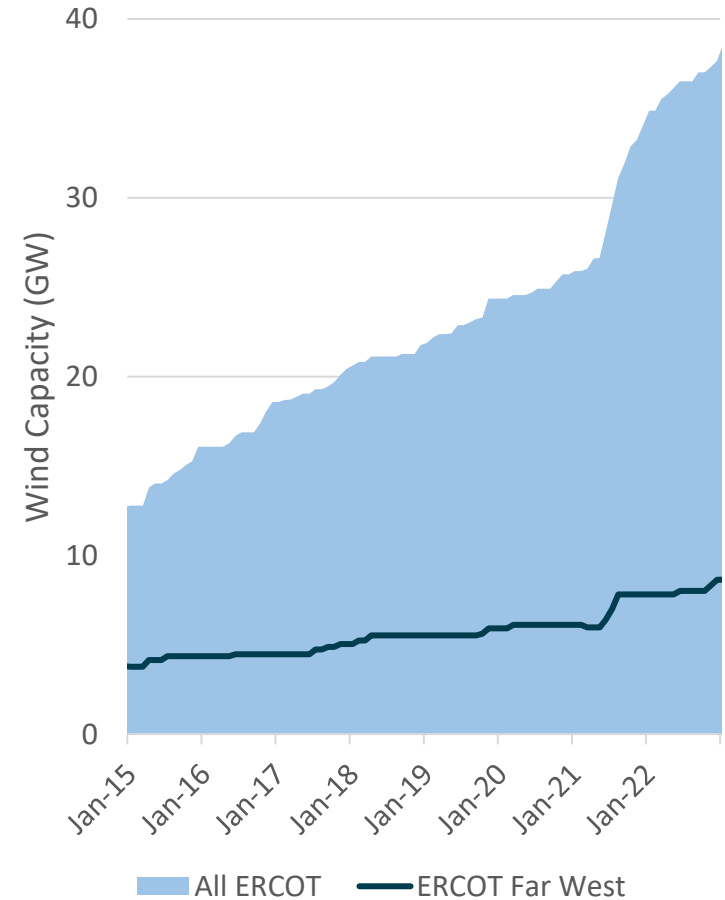


Wind development in ERCOT has been focused further to the east and north than the Permian. However the Far West still accounts for a quarter of total ERCOT wind capacity.

### Operational and Proposed ERCOT Wind Capacity

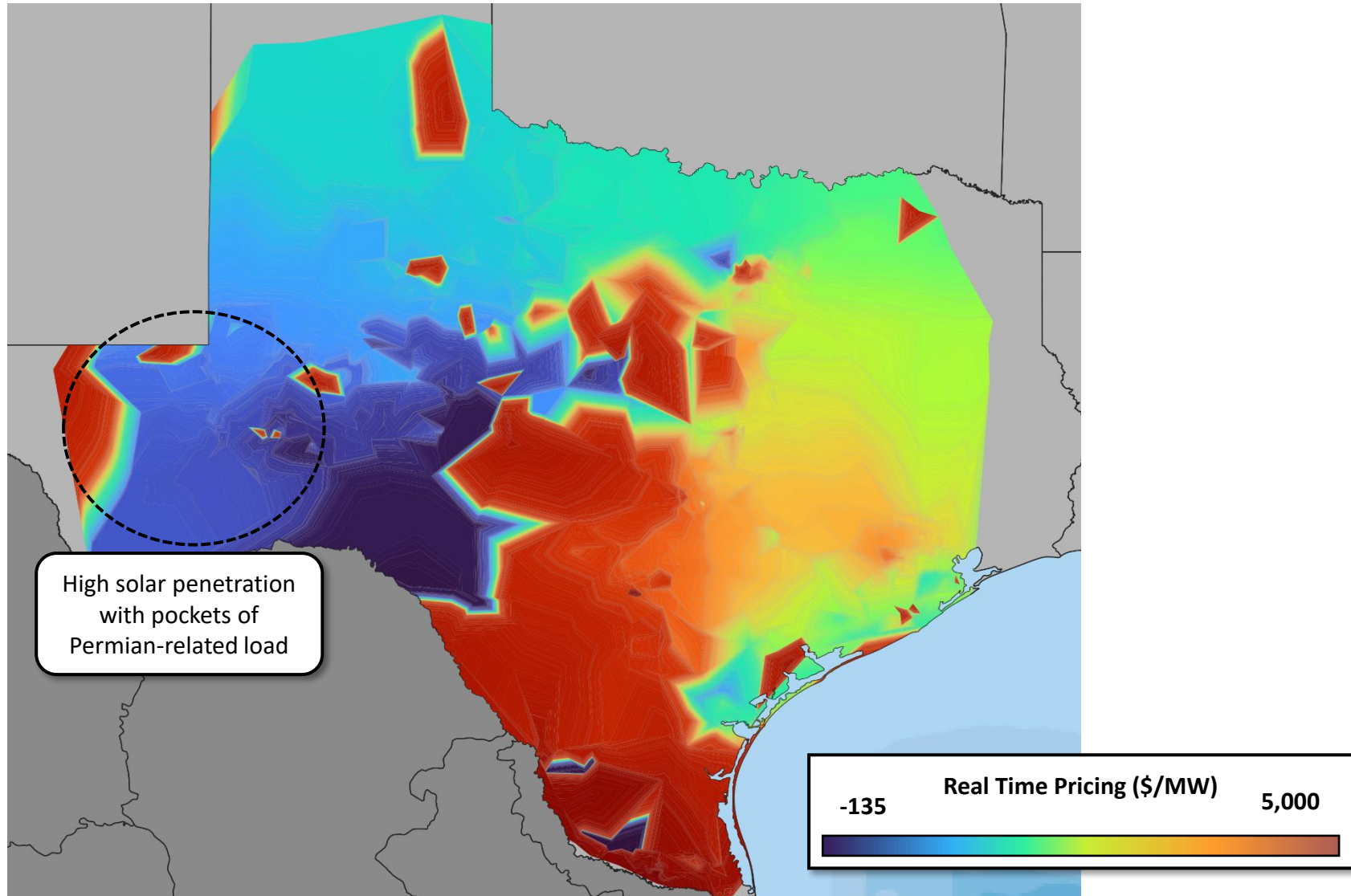


### Operational and Proposed Wind Capacity



Renewable penetration in western ERCOT has driven down pricing regionally, while also contributing to congestion and higher prices in eastern load pockets

### ERCOT Real Time Power Prices

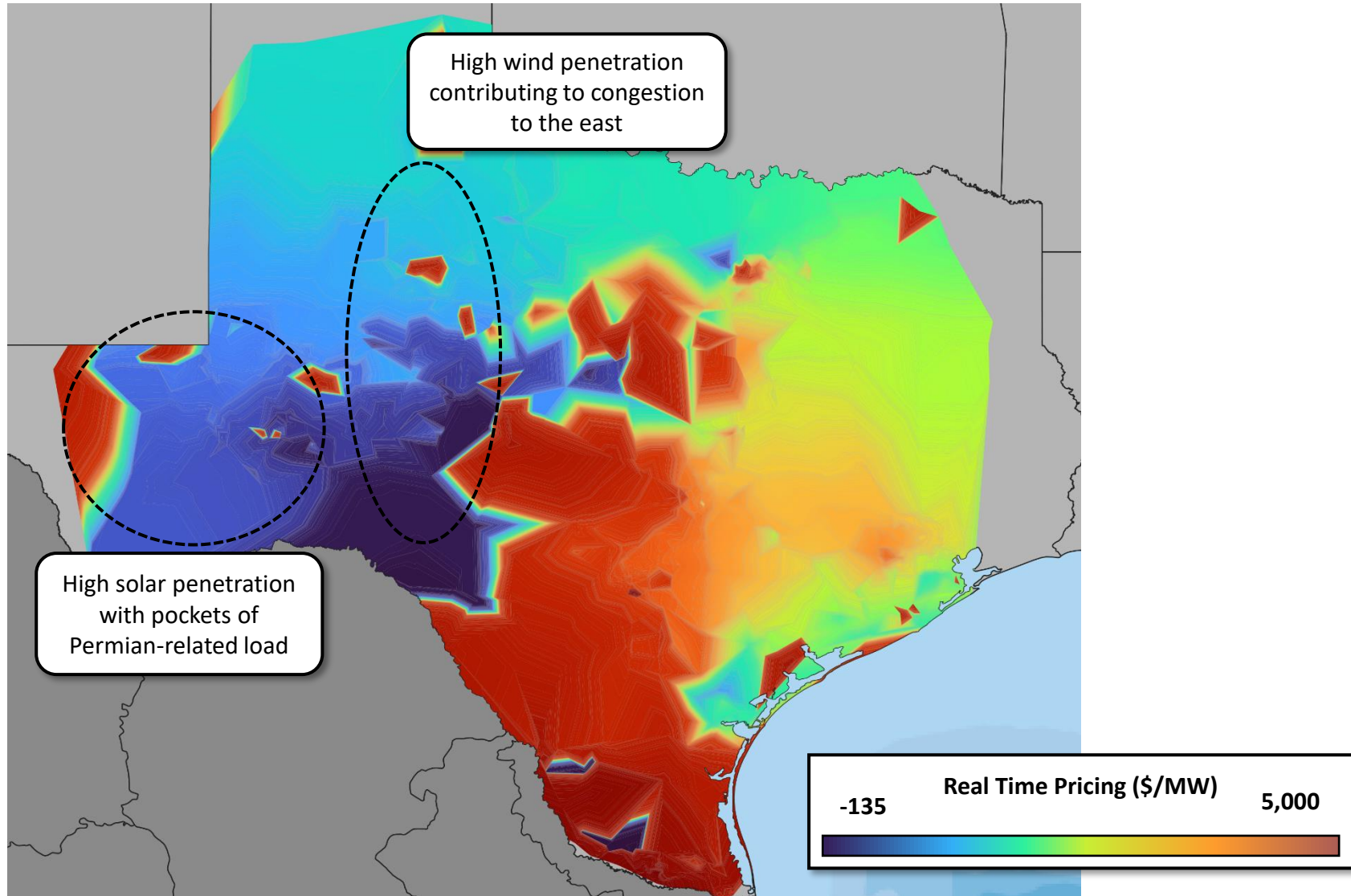


Note: Real time prices for 8/10/2020, 1PM  
Source: BTU Analytics' Power View, ERCOT



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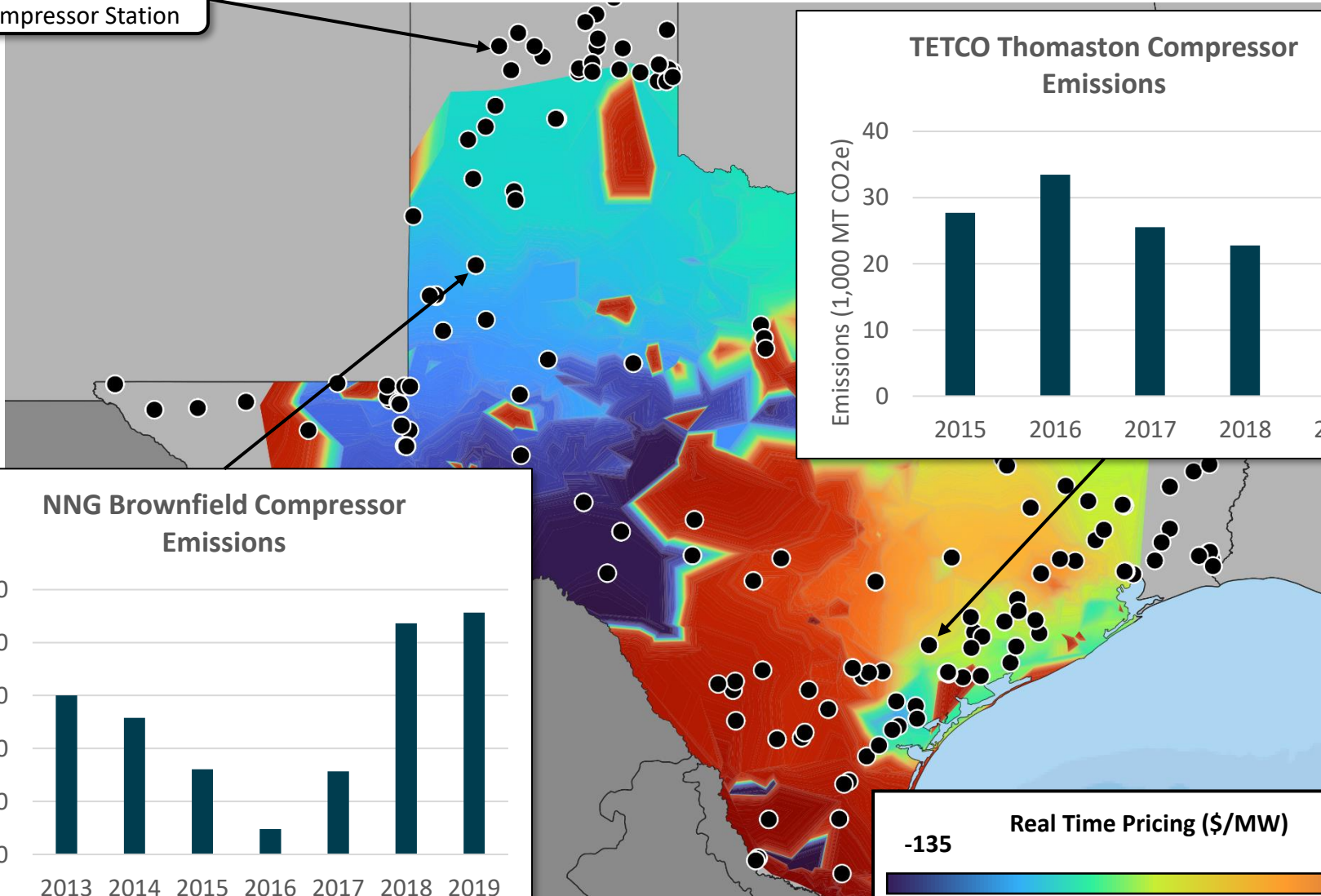


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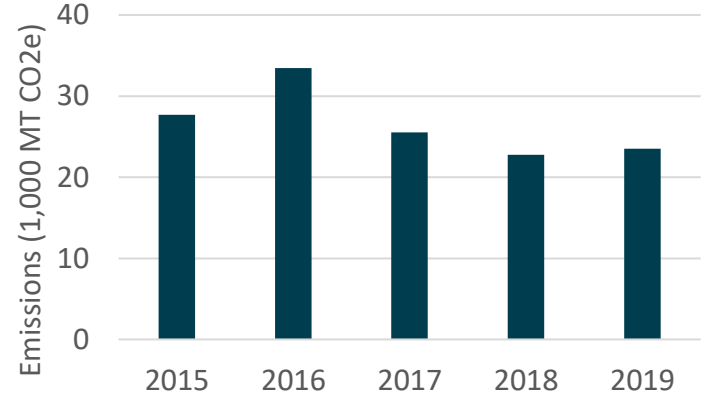
As the industry makes strides towards decarbonization and electrification, understanding the interplay between commodities markets will be paramount to making investment decisions

**ERCOT Real Time Power Prices**

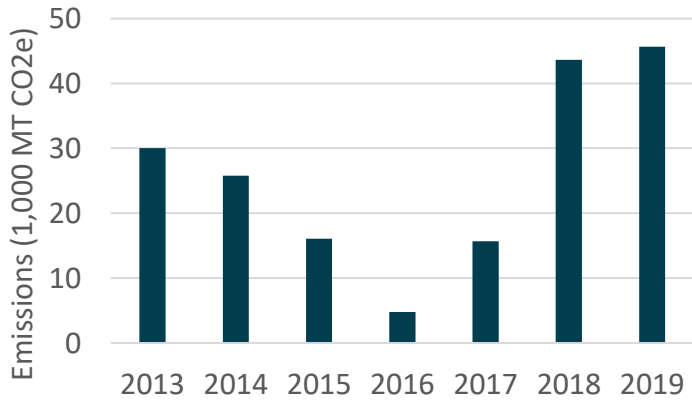
Natural Gas Compressor Station



**TETCO Thomaston Compressor Emissions**



**NNG Brownfield Compressor Emissions**



**Real Time Pricing (\$/MW)**  
-135  5,000

Note: Real time prices for 8/10/2020, 1PM  
Source: BTU Analytics' Power View, ERCOT, EPA

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