



Effects of the Winter Storm in the Electric Reliability Council of Texas (ERCOT) Region in February, 2021

April, 2021



February Cold Snap

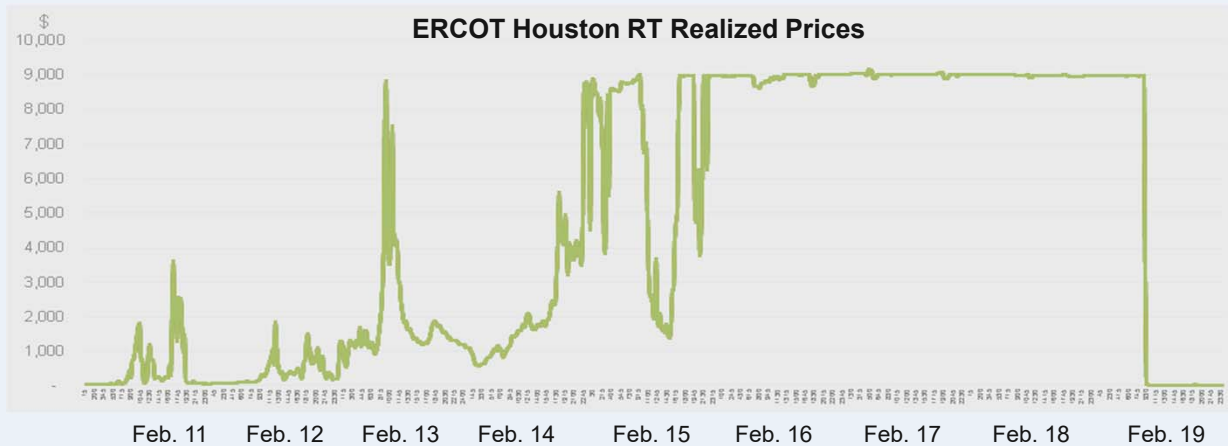
- Extreme cold weather in Texas caused prices to touch the \$9,000 administrative cap
- 185 generating units including coal and natural gas units tripped offline; wind turbines froze, a nuclear unit went down for 48 hours
- Several natural gas power plants lost their natural gas supply
- ERCOT ordered providers to shed up to 14 GW to serve 2.8 million households, however 40% of expected supply was not available
- Texas' independent market monitor has recommended \$16 billion in power charges be reversed, however state regulators have declined to rescind them
- ERCOT is facing a \$2.5 billion shortfall as more than a dozen companies may default; one utility has filed for bankruptcy, more may follow



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ERCOT Pricing – February 11 to 19, 2021

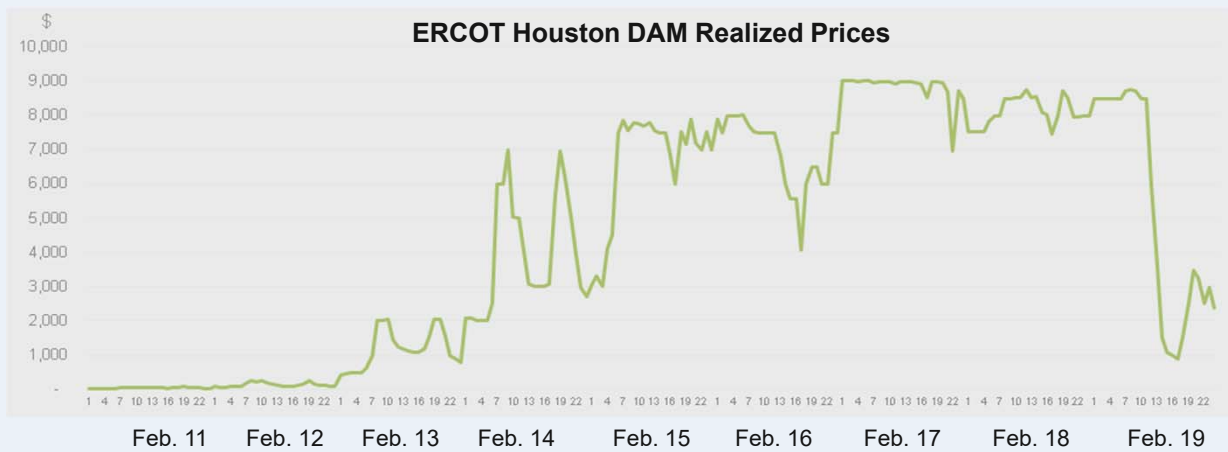
Real Time (RT) prices hit \$9,000 administrative cap in all major ERCOT hubs almost three days



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ERCOT Pricing – February 11 to 19, 2021

Day-Ahead Market (DAM) prices were lower, but many hours hit administrative cap

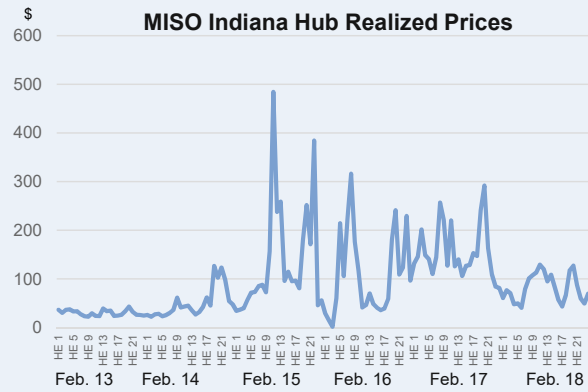
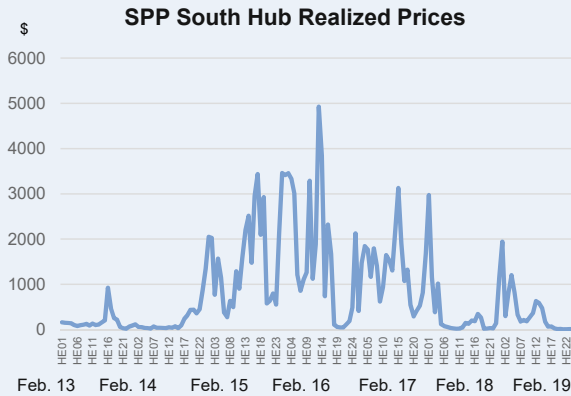


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Analysis of Other Markets – February 13 to 19, 2021

SPP region registered acute spikes in prices way above their \$1,000/MWh cap

MISO experienced similar constraints, however with lower price spikes



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ERCOT Pricing History

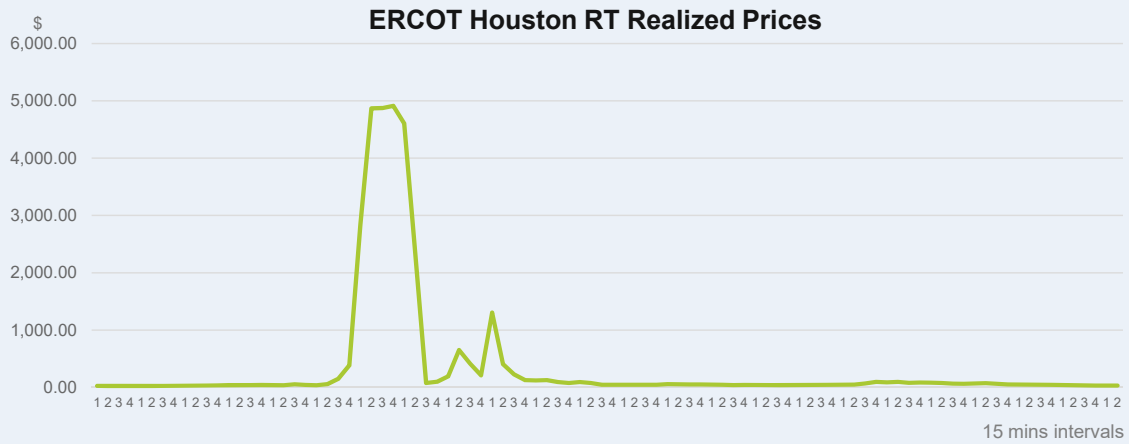
- ERCOT's market is price-volatile: supply crunches occur during extreme temperature swings when demand peaks
- Typically viewed as a summer-only market, pricing volatility has also occurred in winter:
 - A severe storm in February 2011 knocked out almost 200 coal and natural gas power plants, leading to rolling blackouts affecting millions of Texans over an eight-hour period
 - A January 2014 cold snap forced plants offline, leading to four hours of rolling blackouts
- ERCOT created a set of best practices for power plants, but these remain suggestions
- ERCOT has increased the administrative cap over several years to \$9,000



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ERCOT Pricing – January 6, 2014 Cold Snap

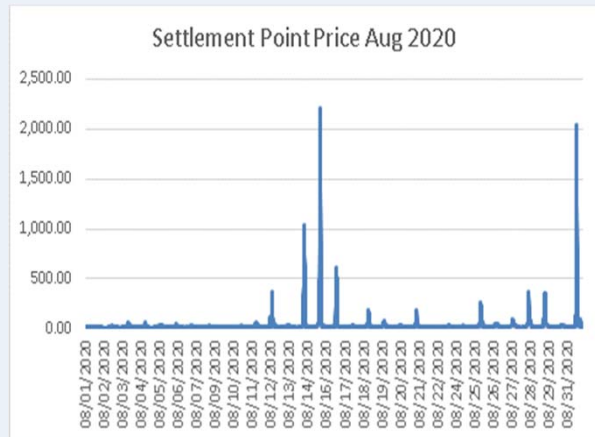
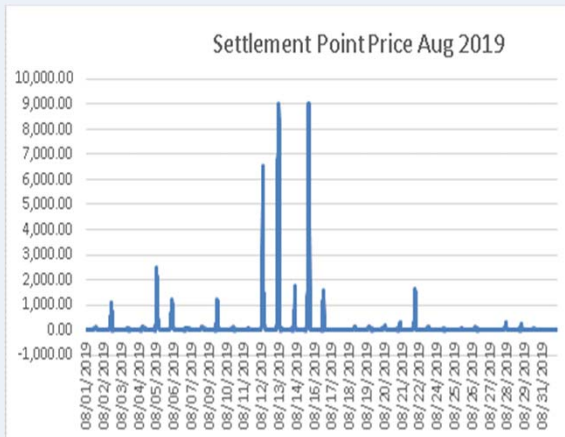
Previous winter episodes of RT price spikes have occurred, but were shorter and less severe



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ERCOT Pricing – Summer Episodes

August ERCOT North price spikes in 2019 and 2020



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ERCOT Market Overview

- ERCOT is an energy-only market that doesn't operate a capacity market and doesn't require power operators to deliver power at all costs during extreme weather events
- ERCOT considers high peak pricing to be the incentive for producers to continue operating, and does not penalize or fine generators who do not produce
- If an electricity producer agrees to supply power, but fails to deliver, the producer must pay to replace that power, but there is no penalty other than lost revenue
- The cost of replacing power depends on the wholesale market, which can be as high as \$9,000/MWh



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Hedging Strategy – AEGIS Contingent Outage Product

- The AEGIS Contingent Outage (CO) product has a double-trigger that indemnifies power producers against a financial loss due to an unplanned outage/derate during price spikes in power markets
- AEGIS has offered a CO product since 2017
- Unplanned outages and derates are defined by North American Electric Reliability Corporation Generating Availability Data Systems (NERC GADS)
- US power markets can be very volatile during severe weather conditions, with outages and constraints on the grid causing spikes in a matter of minutes
- The policy payout is calculated comparing actual prices to the insured price multiplied by MW lost and length of unplanned event – a straightforward process using published pricing
- Insured price is set by member/insured



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Contingent Outage Claim Example

- A 100 MW power plant in ERCOT's Houston region buys a CO policy for calendar year 2021. It suffers an unplanned outage due to a tube leak from February 17 at 00:00 until February 18 at 23:59. The policy covers all hours with no days deductible, but a \$2 million aggregate deductible with a policy limit of \$50 million. The insured price is \$30/MWh.
- The final payout is $\$21,528,000 + \$21,499,200 - \$2,000,000 = \$41,027,200$

Price \$	February 17	February 18
Average realized daily price	9,000	8,988
Insured price	30	30
Difference	8,970	8,958
Hours covered	24	24
MW covered	100	100
Daily payout	21,528,000	21,499,200



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Contingent Outage Key Terms

- Regional split: written in all US regions
- Maximum line size: \$100 million aggregate limit per policy
- Unique features: Non-Claims Bonus and Loyalty Credit
- Event duration limit: generally 30-90 days
- Additional features: MW capacity limit, dollar deductibles, etc.
- The insured price can be a fixed price for policy duration, variable per month or a spark spread
- Settled on Real Time (RT), Day-Ahead Market (DAM) or both, hourly or daily average price
- Can cover 7x24 / 5x16 / 7x16 etc. with one or several units covered under one policy
- Key exclusions: coverage limited to plant site – outages outside of the plant site or on the grid are excluded. Other exclusions: Catastrophe/Terror, War/Cyber/Outage due to the issues on the transmission grid, inadequate water or fuel supply. Some exclusions can be bought-back.



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