



Extreme Cold & Winter Weather | Update #1

REPORT TIME & DATE: 12:00 PM EST | Tuesday, February 16, 2021

REPORT DISTRIBUTION: Public

EXECUTIVE SUMMARY

An arctic air mass is impacting the Central United States, bringing snow, ice, and extreme cold temperatures from the Canadian border as far south as Texas, causing record winter power demand and impacting power generation, including natural gas and wind facilities. The Electric Reliability Council of Texas (ERCOT), the Southwest Power Pool (SPP), and the Midcontinent Independent System Operator (MISO) have implemented controlled power outages across portions of their systems to manage load. The arctic air mass is expected to continue impacting the region through the remainder of the week and additional winter weather is forecast in Texas on Wednesday.

Electricity Sector Summary

- As of 10:30 AM EST, February 16, ERCOT and SPP have declared Energy Emergency Alert (EEA) Level 3 due to operating reserves falling below the required minimum as high demands related to ongoing severe winter weather event exceeded available generation capacity. Generation resources are strained due to cold weather tripping units, natural gas supply curtailments, and wind power generation outages. ERCOT, SPP, and MISO have instructed utilities to shed firm load and implement controlled outages. Controlled outages could continue throughout the day.
 - As of 10:45 AM EST, there were approximately 4.89 million power outages across Texas, Louisiana, and Oklahoma, with 4.5 million outages in Texas.
 - Although a substantial number of customers are out of power due to the controlled power outages, some customers are without power in Texas and Louisiana due to damaged infrastructure from the ongoing winter weather.

Natural Gas Sector Summary

- As of February 16, gas production in the U.S. South Central Region was down approximately 6.3 billion cubic feet per day (Bcf/d) due to wellhead freeze-offs and natural gas processing plant outages caused by extreme cold. These outages represent approximately 30% of U.S. South Central output and approximately 7% of total U.S. gas production. Although production losses due to freeze-offs are temporary, output takes time to return to normal levels and the cumulative reduction over several days could be substantial.
- Gas suppliers are responding to high demands and gas production outages by withdrawing gas from storage. As of February 16, gas storage draws in the U.S. South Central region are up approximately 10 Bcf/d (100%) compared to pre-event withdrawals.

Petroleum Sector Summary

- As of February 16, approximately 3.6 million bcf/d of refining capacity was reported offline in the U.S. Gulf Coast region as refiners have shut down refineries either due to the cold weather directly or due to power outages. These refinery outages account for approximately 36% of total U.S. Gulf Coast refining capacity and approximately 19% of total U.S. refining capacity.

DOE ACTIONS

- DOE is coordinating with industry, interagency, and state partners to provide situational awareness and support restoration efforts.
- DOE is holding daily calls with electricity and oil and natural gas partners and is in regular contact with the North American Electric Reliability Corporation.
- The DOE Power Marketing Administrations are working with customers, reliability coordinators, and balancing authorities to support reliability within their service territories.
- Following a formal petition from ERCOT on February 14, the Acting Secretary of Energy issued an emergency order pursuant to section 202(c) of the Federal Power Act to authorize the dispatch of additional generation units in the ERCOT region to help ensure reliability. This allows ERCOT to dispatch generation units they deem necessary to meet electricity demand from February 14 through February 19, 2021 even if they are in exceedance of limits for sulfur dioxide, nitrogen oxide, mercury, and carbon monoxide emissions, as well as wastewater release limits. The order and additional information can found at: <https://www.energy.gov/oe/downloads/federal-power-act-section-202c-ercot-february-2021>.

ELECTRICITY SECTOR

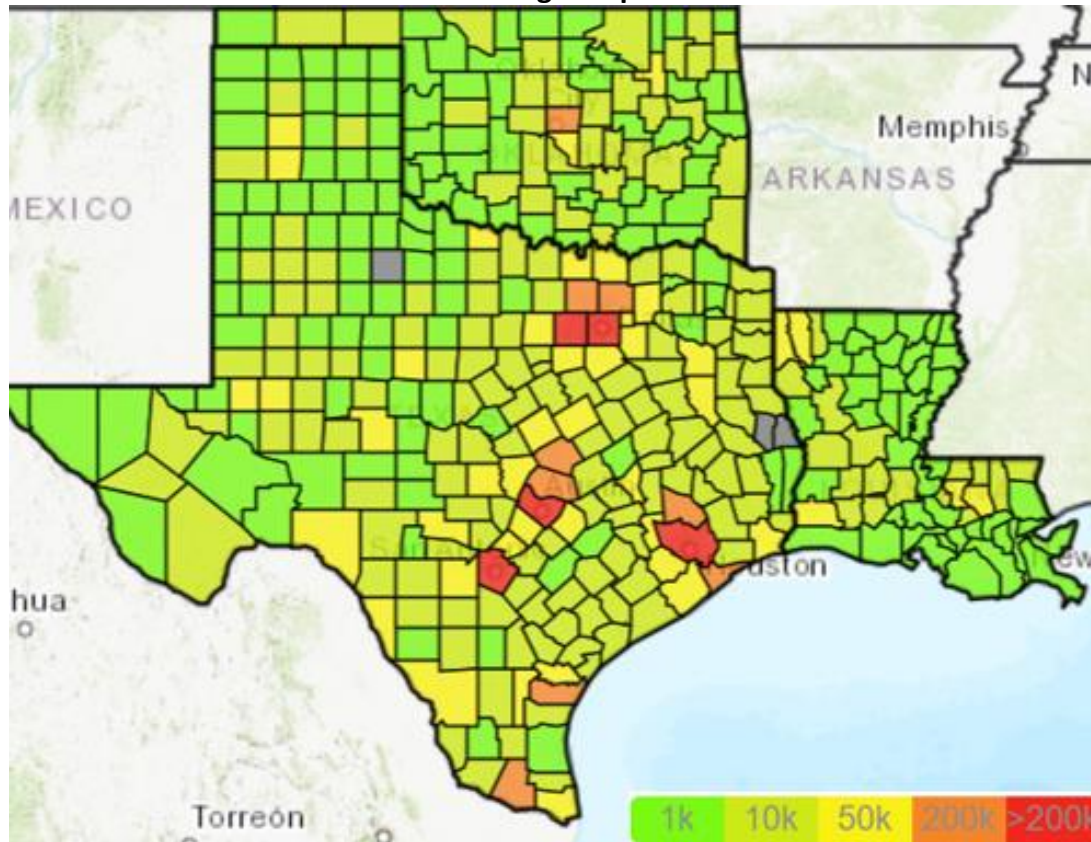
POWER OUTAGES

- As of 10:45 AM EST, there were approximately 4.89 million power outages across Texas, Louisiana, and Oklahoma, with 4.5 million outages in Texas.
- Oregon has also experienced a severe winter storm causing widespread outages, totaling 223,098 as of 10:45 AM EST.

Extreme Cold Customer Power Outages as of 10:45 AM EST 02/16/2021		
State	Current Outages	% of State Without Power
Texas*	4,511,638	27%
Louisiana	164,525	2%
Oklahoma	211,496	<1%
Total	4,887,659	-

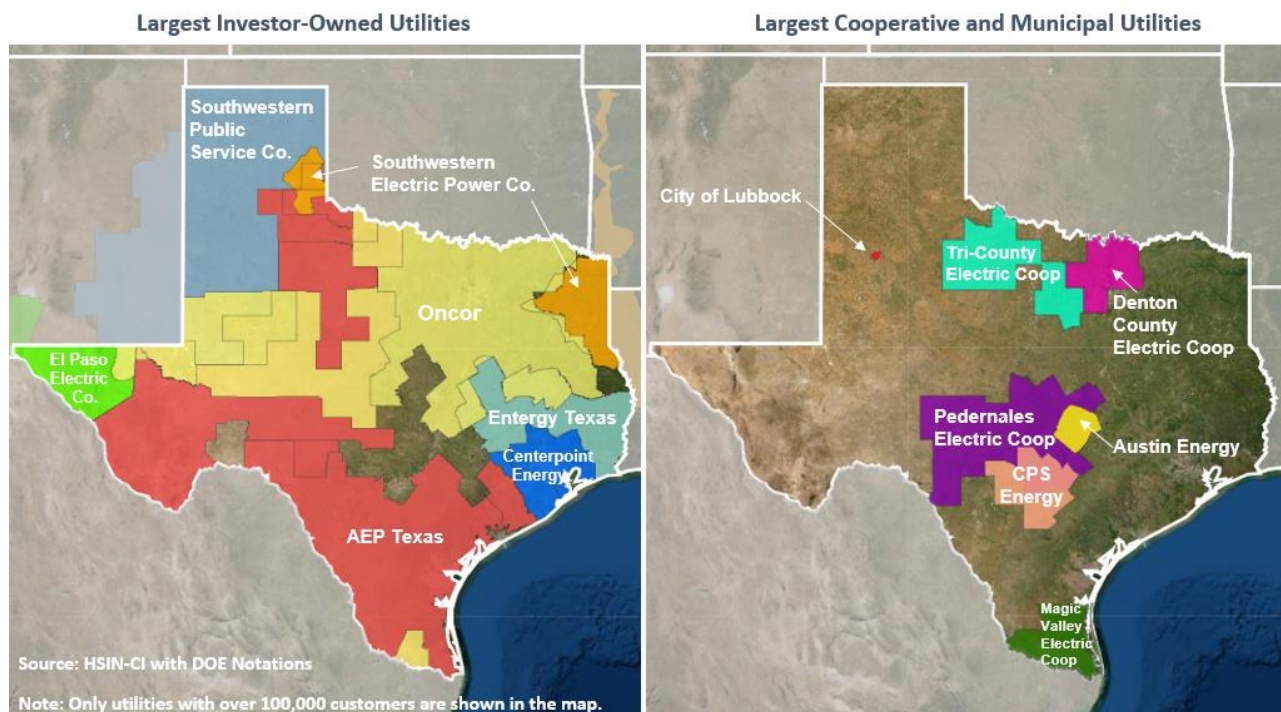
*Some outages due to winter storms, rather than controlled power outages.

Outage Map



ELECTRICITY OVERVIEW

- High demands related to ongoing extreme cold winter weather in the ERCOT, SPP, and MISO territories exceeded available generation capacity on February 15. At 2:25 AM EST on February 15, ERCOT declared an EEA 3 and instructed utilities across ERCOT’s territory to shed firm load and implement controlled outages. MISO also instructed Entergy Texas to shed firm load in MISO’s Western (Texas) Load Pocket. SPP declared EEA 3 at 7:15 AM EST on February 16, signaling that operating reserves are below the required minimum. SPP implemented a load shed and cut electricity exports.
- In addition to high-demand, the cold temperatures have caused natural gas well “freeze-offs,” curtailing the availability of natural gas in some locations. Additionally, an ice storm late last week and continuing winter weather have limited wind generation due to icing on the turbines. Solar generation has also been limited due to heavy cloud cover. Weather impacts have also been reported at other generation facilities.
- Although a substantial number of customers are out of power due to the controlled power outages, some of the customers are without power in Texas and Louisiana due to damaged infrastructure related to the winter weather.



REGIONAL DETAILS

ERCOT

OVERVIEW

- At 2:25 AM EST on February 15, ERCOT declared an EEA 3 and instructed utilities within ERCOT's service area in Texas to shed firm load and implement controlled outages due to generation inadequacy.
 - Prior to declaring an EEA 3 and implementing load shed, ERCOT declared an EEA 1 at 1:17 AM EST and an EEA 2 at 2:12 AM EST due to the loss of several generation units.
- ERCOT anticipates generators to return to service and renewable output to increase on February 16. ERCOT anticipates that customer outages will decrease throughout the day.
- Reduced supply of natural gas due to well "freeze offs," lower-than-normal solar generation due to heavy cloud cover, and limited wind generation due to icing on the turbines have further constrained electricity generation.
- On the evening of February 14, the Acting Secretary of Energy issued an emergency order pursuant to section 202(c) of the Federal Power Act to authorize the dispatch of additional generation units in the ERCOT region to help ensure reliability. This allows ERCOT to dispatch generation units they deem necessary to meet electricity demand from February 14 through February 19, 2021 even if they are in exceedance of limits for sulfur dioxide, nitrogen oxide, mercury, and carbon monoxide emissions, as well as wastewater release limits.
- ERCOT is the independent system operator for the state of Texas, serving about 26 million people and about 90% of the state's electric load. ERCOT operates largely independently from the rest of country and is not subject to federal oversight.

DEMAND FORECAST

- The current-day forecast peak is 58,266 MW as of 9:15 AM EST.
- The day-ahead forecast peak for February 17 is 75,056 MW, even higher than the forecast peak on February 16.



MISO**OVERVIEW**

- Due to extreme winter weather and temperature, generation and transmission failures have occurred in the Entergy Texas Western Load Pocket of MISO. To alleviate transmission overloads, interruptible load was shed.
- MISO declared a Maximum Generation Emergency Event Step 2c effective February 15 at 6 PM EST through February 15 at 10 PM EST for the South Region. Local balancing authorities are asked to issue public appeals to reduce demand and should prepare to shed load due to forced generation outages and extreme cold temperatures. North/Central Regions are in Maximum Generation 1b.
- Utilities in additional states began shedding load on the evening of February 15.
- MISO's Cold Weather Alert is in effect through February 17. Temperatures are expected to be as low as 0 degrees F and operators should expect to be contacted about fuel restrictions.
- MISO is the independent system operator and regional transmission organization for much of the Midwest, with 15 U.S. member states, including a small portion of Texas not covered by ERCOT.

SPP**OVERVIEW**

- SPP declared an EEA 3 effective at 6:15 AM EST on February 16 for the entire balancing authority area, which was followed by load-shed.
- SPP is forecasting a morning peak of above 44.6 GW around 10 AM EST on February 16, higher than the peak load of 43.661 MW on February 15.
- SPP had previously declared an EEA Level 2 beginning at 8:22 AM EST on February 15, an EEA Level 1 at 6 AM EST on February 15, and a period of conservative operations at 1 AM EST on February 9.
- SPP experienced some generator outages on the morning of February 15 that contributed to local loading issues in addition to reducing supply needed to serve load.
- Electricity prices within the SPP service areas are at the top of the range.
- SPP has 14 member states in the central and western U.S. and performs contract reliability coordination services in three additional states.

NATURAL GAS SECTOR

NATURAL GAS SUMMARY

Extreme cold temperatures have led to sharp increases in gas demands for home heating and electricity generation across much of the Central U.S. At the same time, the cold has led to supply disruptions caused by well freeze-offs and natural gas processing plant outages in several producing areas in the U.S. South Central region (TX, OK, KS, LA, AR, MS, AL), which typically accounts for approximately 20-25% of total U.S. gas production.

NATURAL GAS PRODUCTION

- Wellhead freeze-offs have caused producers to cut back natural gas production in the South Central United States, including in the Permian Basin in Texas and New Mexico, the Cana Woodford in Oklahoma, and the Denver-Julesburg in Colorado. Over the past weekend the Permian Basin saw temperatures overnight as low as 0 degrees F.
- As of February 16, Texas gas production was estimated at 15.7 billion cubic feet per day (Bcf/d), down approximately 30% from pre-event average.
- Although production losses due to freeze-offs are temporary, output takes time to return to normal levels, and the cumulative reduction over several days could be substantial.

NATURAL GAS PROCESSING PLANTS

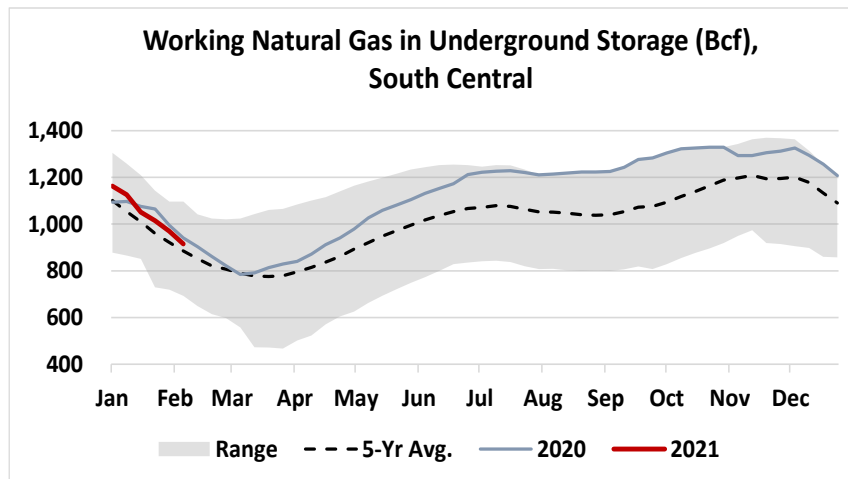
- Some natural gas processing plants across Texas have reportedly shut down due to freezing conditions. This has forced the shut-in of some natural gas production.

NATURAL GAS STORAGE

- Suppliers are compensating for lost output and responding to the surge in gas demand by withdrawing gas from storage facilities.
- Draws from gas storage facilities in the U.S. South Central region have increased sharply during the cold weather event, doubling to about 20 Bcf/d from about 10 Bcf/d pre-event.

NATURAL GAS STOCKS

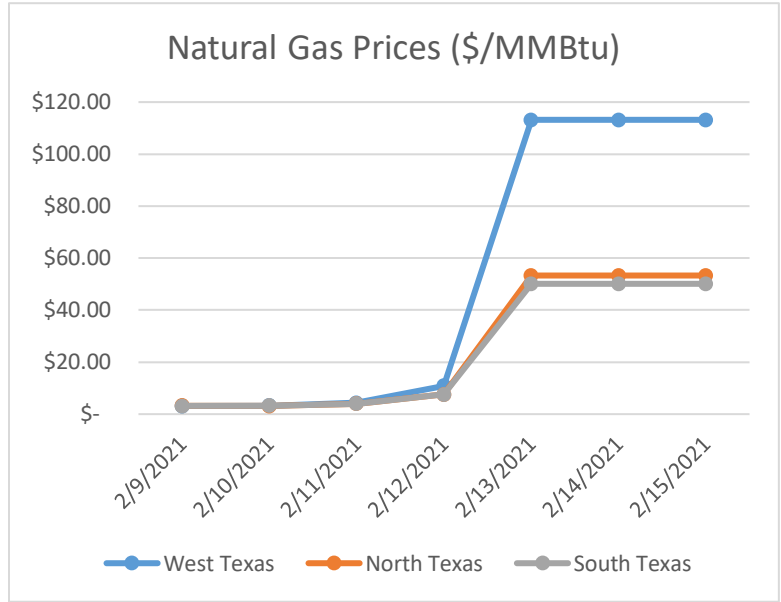
- Natural gas stocks in the U.S. South Central region stood at 915 Bcf/d on February 5, 4.3% above the five-year average for this time of year.
- According to [EIA's Form 191](#) data, Texas has 30 active natural gas storage facilities.



South Central includes Alabama, Arkansas, Kansas, Louisiana, Mississippi, Oklahoma, and Texas

NATURAL GAS PRICES

- Natural gas prices have increased across Texas with spot prices increasing above \$100/MMBtu in several markets. Price increases have been seen across the entire Midcontinent as demands due to cold weather have strained supply and resulted in price spikes.



NATURAL GAS UTILITIES

- On February 12, the Texas Railroad Commission [issued an emergency order](#) temporarily prioritizing natural gas deliveries to natural gas utilities for residences, hospitals, schools, churches, and other human needs customers.

PETROLEUM SECTOR

PETROLEUM SECTOR SUMMARY

Extreme cold temperatures and power outages have forced operators to shut down refineries in the U.S. Gulf Coast region. Additionally, extreme cold temperatures and well freeze-offs have led to production outages in producing areas.

PORTS

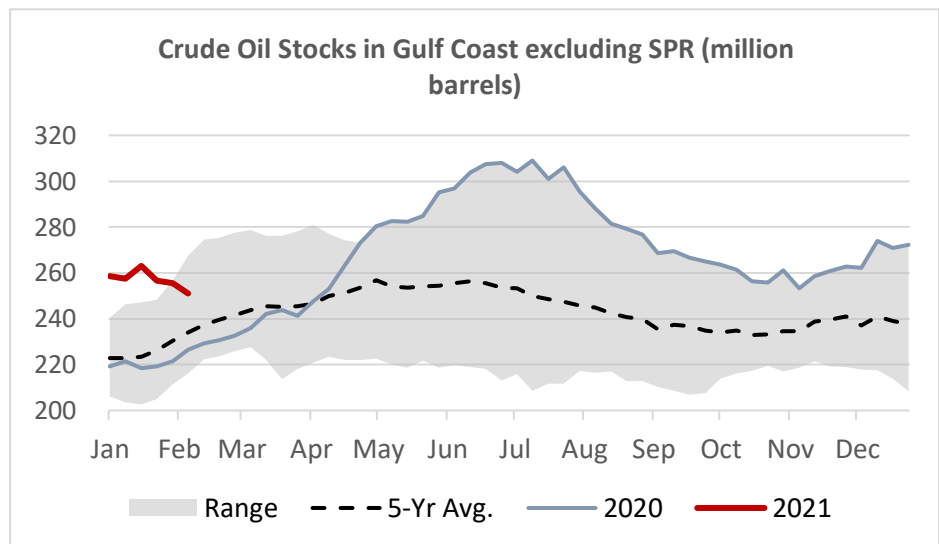
- Operations in the Houston Ship Channel have been reduced due to freeze offs impacting refineries and terminals. On February 16, there were 13 vessels waiting to depart the channel with 18 ships in queue to come into the waterway.

REFINERIES

- There are approximately 3.6 million bcf/dof refinery capacity outages due to the severe cold along the Texas Coast, or about 36% of PADD 3 refinery capacity, and 20% of U.S. refinery capacity.

OIL STOCKS

- Crude oil stocks in the Gulf Coast (PADD 3) averaged 251 million barrels for the week ending February 5, 7.2% above the five-year average for this time of year.



EMERGENCY DECLARATIONS & WAIVERS

EMERGENCY DECLARATIONS

To provide vital supplies and transportation services to a disaster area in the United States, emergency declarations may be issued by the President, Governors of States, or the Federal Motor Carrier Safety Administration (FMCSA). These declarations trigger the temporary suspension of certain Federal safety regulations, including Hours of Service for motor carriers and drivers engaged in specific aspects of the emergency relief effort. See [49 CFR 390.23](#) for the actual emergency regulation.

Emergency Declarations and HOS Waivers <i>as of 1:00 PM EDT 02/15/2021</i>				
State/Territory	Details	Effective Dates		Status
		Start	End	
Virginia	State of Emergency	2/11	3/13	Active
Oregon	State of Emergency	2/13	2/20	Active
Kentucky	Kentucky Transportation Cabinet Declaration of Emergency - Assistance for power restoration and delivery of gasoline, propane, and diesel fuels	2/11	2/21	Active
Mississippi	State of Emergency	2/14	2/21	Active
Alabama	State of Emergency	2/14	Continuing	Active
Louisiana	State of Emergency	2/11	Continuing	Active
Oklahoma	State of Emergency	2/12	Continuing	Active
Texas	Texas Department of Public Safety Emergency Notice – Assistance for delivery of Propane and Home Heating Oils	2/10	2/15	Active
	Federal Emergency Declaration	2/11	Continuing	Active
	State Disaster Declaration	2/12	Continuing	Active

Sources: State government, White House, and FMCSA websites.