



Office of Energy Projects Energy Infrastructure Update For March 2019

Natural Gas Highlights

- Texas Eastern and Brazoria Interconnector Gas Pipeline received authorization to place in service the Stratton Ridge Expansion Project, which will provide 322 MMcf/d of firm transportation capacity from multiple receipt points on Texas Eastern to a delivery point on Brazoria's system in Brazoria County, TX.
- Transco received authorization to place in service its St. James Supply Project, which will provide 162 MMcf/d of firm transportation capacity from Transco's Station 65 in St. Helena Parish, LA to a new interconnection with the Yuhuang Chemical Plant in St. James Parish, LA.
- Corpus Christi LNG received authorization to place in service its LNG export and import terminal in San Patricio and Nueces Counties, TX. The proposed terminal will provide 2,140 MMcf/d of export capacity and 400 MMcf/d of import deliverability.
- Sabine Pass Liquefaction received authorization to place in service its 700 MMcf/d Train 5 in Sabine Pass, LA.
- Northern Natural received authorization for its Ventura North 2019 E-line Extension Project, which will replace capacity by constructing two miles of new pipeline and abandoning a valve setting and short segments of pipeline in Worth County, IA and Freeborn County, MN.
- Empire received authorization to construct its Empire North Project, which includes two new compressor stations, modifications to meter and regulator stations, and pipeline segments in Ontario County, NY and Tioga County, PA in order to provide an additional 205 MMcf/d of firm capacity to customers in the Northeast and Canada.
- Texas Eastern received authorization for its Line 27 Partial Abandonment Project, including abandoning a 6.5 mile segment of 30-inch line on its Penn-Jersey system in Delmont, PA.
- Columbia Gas received authorization to construct and operate seven new injection/withdrawal storage wells and related pipelines and appurtenances in Ashland, Holmes, Knox, and Richland Counties, OH. The new wells will not alter the field's capacity or deliverability.
- Equitrans received authorization to abandon by sale to Consol, 18 natural gas injection and withdrawal wells in Greene County, PA. The abandonments would take place over the course of 10 years and not affect service to firm customers.
- WBI Energy requests authorization for its Line Section 22 Expansion Project, which includes replacing 9.5 miles of pipeline in Carbon and Yellowstone Counties, MT, in order to increase the maximum allowable operating pressure and provide 22.5 MMcf/d of incremental firm transportation service.
- Centerpoint Energy request the determination of service areas within which it may, without further Commission authorization, enlarge or expand its natural gas distribution facilities. These facilities consist of small diameter pipelines used to make deliveries to customers in various counties in Arkansas, Texas, and Louisiana.
- Columbia Gas requests authorization for its Line 134 Replacement Project, which includes replacing 3.2 miles of pipeline in Armstrong and Butler Counties, PA for integrity and safety reasons. This project will not affect pipeline capacity.
- Tennessee Gas requests authorization to abandon inactive supply lateral Line No. 520A-100 and associated meter, platforms, and appurtenances in Terrebonne Parish, LA.
- Gulf South requests authorization to construct its Index 99 Expansion Project, consisting of 22 miles of pipeline and appurtenant facilities in San Augustine and Sabine Counties, TX, in order to provide up to 500 MMcf/d of additional firm transportation in East Texas.
- National Fuel requests authorization to plug and abandon Wells 656P, 849P, and 855P and related infrastructure at its East Branch Storage Field in McKean County, Pennsylvania. There would be no change in service to its customers.
- Young Gas requests authorization to increase the total certificated gas storage capacity at its storage field in Morgan County, CO from 9.95 Bcf to 10.95 Bcf. The proposed increase does not require infrastructure changes and would result in enhanced withdrawal capabilities.
- Transforeland Pipeline requests authorization to make modifications at the Kenai LNG Plant in Nikiski, AK, in order to import LNG to cool the existing storage tanks and sendout boiloff gas instead of flaring it or venting it.



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Natural Gas Activities in March 2019

| Status | No. of Projects | Storage Capacity (Bcf) | Deliverability (MMcf/d) | Capacity (MMcf/d) | Miles of Pipeline | Compression (HP) |
|----------------------------------|-----------------|------------------------|-------------------------|-------------------|-------------------|------------------|
| Pipeline | | | | | | |
| Placed in Service | 2 | | | 484 | 1 | 12,500 |
| Certificated | 1 | | | 205 | 1 | 53,068 |
| Proposed | 3 | | | 523 | 35 | 0 |
| Storage | | | | | | |
| Placed in Service | 0 | 0.0 | 0.0 | | | 0 |
| Certificated | 0 | 0.0 | 0.0 | | | 0 |
| Proposed | 1 | 1.0 | 0.0 | | | 0 |
| LNG (Import & Export) | | | | | | |
| Placed in Service (Export) | 2 | 10.1 | 2,840.0 | | | 0 |
| Certificated (Import/Export) | 0 | 0.0 | 0.0 | | | 0 |
| Proposed (Import/Export) | 0 | 0.0 | 0.0 | | | 0 |

Source: Staff Database

Natural Gas Activities through March 31, 2019 January through March 31, 2018

| Status | No. of Projects | Storage Capacity (BCF) | Deliverability (MMcf/d) | Capacity (MMcf/d) | Miles of Pipeline | Compression (HP) |
|----------------------------------|-----------------|------------------------|-------------------------|-------------------|-------------------|------------------|
| Pipeline | | | | | | |
| Placed in Service | 4 | | | 3943.5 | 1.4 | 282,400 |
| through March 31, 2018 | 2 | | | 980.0 | 34.1 | 62,760 |
| Certificated | 7 | | | 1129.2 | 61.3 | 107,081 |
| through March 31, 2018 | 16 | | | 3251.5 | 242.4 | 121,015 |
| Storage | | | | | | |
| Placed in Service | 0 | 0.0 | 0.0 | | | 0 |
| through March 31, 2018 | 0 | 0.0 | 0.0 | | | 0 |
| Certificated | 1 | 0.0 | 79.0 | | | 0 |
| through March 31, 2018 | 1 | 0.3 | 125.0 | | | 0 |
| LNG (Import & Export) | | | | | | |
| Placed in Service (Export) | 2 | 10.1 | 2840.0 | | | 0 |
| through March 31, 2018 | 1 | 0.0 | 825.0 | | | 0 |
| Certificated (Import/Export) | 1 | 8.2 | 1414.0 | | | 0 |
| through March 31, 2018 | 0 | 0.0 | 0.0 | | | 0 |

Source: Staff Database



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Hydropower Highlights (nonfederal)

- NorthWestern Corporation filed an application to raise the capacity of its Missouri-Madison Project No. 2188 from 305.240 MW to 308.910 MW. The project is located on the Missouri and Madison Rivers in Cascade, Gallatin, Lewis and Clark, and Madison Counties, MT.

Hydropower Project Activities in March 2019

| Status | Conventional | | Pumped Storage | | Hydrokinetic | | Total No. of Projects | Total Capacity (MW) |
|--------------------------|--------------|---------------|----------------|---------------|--------------|---------------|-----------------------|---------------------|
| | No. | Capacity (MW) | No. | Capacity (MW) | No. | Capacity (MW) | | |
| Filed | | | | | | | | |
| License | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-MW Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capacity Amendment | 1 | 3.670 | 0 | 0 | 0 | 0 | 1 | 3.670 |
| Conduit Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Issued | | | | | | | | |
| License | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-MW Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capacity Amendment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conduit Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Placed in Service | | | | | | | | |
| License | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-MW Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capacity Amendment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conduit Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: Staff Database

Hydropower Project Activities Year to Date (through March 31, 2019)

| Status | Conventional | | Pumped Storage | | Hydrokinetic | | Total No. of Projects | Total Capacity (MW) |
|--------------------------|--------------|---------------|----------------|---------------|--------------|---------------|-----------------------|---------------------|
| | No. | Capacity (MW) | No. | Capacity (MW) | No. | Capacity (MW) | | |
| Filed | | | | | | | | |
| License | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-MW Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capacity Amendment | 2 | 3.900 | 0 | 0 | 0 | 0 | 2 | 3.900 |
| Conduit Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Issued | | | | | | | | |
| License | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-MW Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capacity Amendment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conduit Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Placed in Service | | | | | | | | |
| License | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-MW Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Capacity Amendment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conduit Exemption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: Staff Database



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Electric Generation Highlights

- Calpine Mid Merit II LLC's 760.0 MW natural gas-fired York Energy Center expansion in York County, PA is online. The power generated is sold to Constellation Energy Group under long-term contract.
- Upper Michigan Energy Resources Corp's 128.1 MW natural gas-fired F D Kuester Generating Station in Marquette County, MI is online. The power generated is sold to Cliffs Natural Resources Inc under long-term contract.
- Upper Michigan Energy Resources Corp's 54.9 MW natural gas-fired AJ Mihn Generating Station in Baraga County, MI is online. The power generated is sold to Cliffs Natural Resources Inc under long-term contract.
- Pine River Wind Energy LLC's 161.3 MW Pine River Wind Park in Gratiot County, MI is online.
- Mendota Hills LLC's 75.4 MW wind powered Mendota Hills Project expansion in Lee County, IL is online. The power generated is sold to Commonwealth Edison Co. under long-term contract.

New Generation In-Service (New Build and Expansion)

| Primary Fuel Type | March 2019 | | January – March 2019 Cumulative | | January – March 2018 Cumulative | |
|-------------------|--------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|
| | No. of Units | Installed Capacity (MW) | No. of Units | Installed Capacity (MW) | No. of Units | Installed Capacity (MW) |
| Coal | 0 | 0 | 0 | 0 | 0 | 0 |
| Natural Gas | 11 | 943 | 16 | 1,482 | 16 | 987 |
| Nuclear | 0 | 0 | 0 | 0 | 3 | 30 |
| Oil | 0 | 0 | 2 | 5 | 8 | 18 |
| Water | 0 | 0 | 4 | 29 | 5 | 18 |
| Wind | 3 | 239 | 15 | 1,011 | 16 | 1,789 |
| Biomass | 0 | 0 | 0 | 0 | 3 | 3 |
| Geothermal Steam | 0 | 0 | 0 | 0 | 2 | 34 |
| Solar | 6 | 11 | 59 | 1,155 | 163 | 1,579 |
| Waste Heat | 0 | 0 | 0 | 0 | 0 | 0 |
| Other * | 1 | 0 | 4 | 0 | 8 | 5 |
| Total | 21 | 1,193 | 100 | 3,682 | 224 | 4,463 |

Sources: Data derived from Velocity Suite, ABB Inc. and The C Three Group LLC. The data may be subject to update.

* "Other" includes purchased steam, tires, and miscellaneous technology such as batteries, fuel cells, energy storage, and fly wheel.

Total Available Installed Generating Capacity

| | Installed Capacity (GW) | % of Total Capacity |
|------------------|-------------------------|---------------------|
| Coal | 259.05 | 21.68% |
| Natural Gas | 529.22 | 44.29% |
| Nuclear | 107.98 | 9.04% |
| Oil | 39.75 | 3.33% |
| Water | 100.44 | 8.41% |
| Wind | 98.17 | 8.22% |
| Biomass | 16.11 | 1.35% |
| Geothermal Steam | 3.84 | 0.32% |
| Solar | 38.10 | 3.19% |
| Waste Heat | 1.36 | 0.11% |
| Other* | 0.78 | 0.07% |
| Total | 1,194.78 | 100.00% |

Sources: Data derived from Velocity Suite, ABB Inc. and The C Three Group LLC. The data may be subject to update.



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Proposed Generation Additions and Retirements by April 2022

| Primary Fuel Type | All Additions | | High Probability Additions | | Retirements | |
|-------------------|---------------|-------------------------|----------------------------|-------------------------|--------------|-------------------------|
| | No. of Units | Installed Capacity (MW) | No. of Units | Installed Capacity (MW) | No. of Units | Installed Capacity (MW) |
| Coal | 1 | 17 | 1 | 17 | 54 | 14,641 |
| Natural Gas | 236 | 62,895 | 115 | 30,475 | 108 | 10,171 |
| Nuclear | 12 | 11,481 | 4 | 4,800 | 9 | 9,052 |
| Oil | 17 | 730 | 6 | 37 | 22 | 1,067 |
| Water | 222 | 14,996 | 79 | 942 | 21 | 527 |
| Wind | 534 | 100,129 | 137 | 25,105 | 1 | 239 |
| Biomass | 58 | 617 | 24 | 461 | 30 | 142 |
| Geothermal Steam | 18 | 913 | 6 | 280 | 0 | 0 |
| Solar | 2,506 | 81,595 | 529 | 12,927 | 5 | 2 |
| Waste Heat | 3 | 34 | 2 | 29 | 0 | 0 |
| Other * | 110 | 453 | 34 | 7 | 1 | 2 |
| Total | 3,717 | 273,860 | 937 | 75,080 | 251 | 35,843 |

Sources: Data derived from Velocity Suite, ABB Inc. and The C Three Group LLC. The data may be subject to update.

* "Other" includes purchased steam, tires, and miscellaneous technology such as batteries, fuel cells, energy storage, and fly wheel.

Electric Transmission Highlights

- Otter Tail Power Corporation has completed the 165.0 mile 345 kV Big Stone City – Ellendale South Transmission Project. The \$319.7 million interstate project connects ND and SD.

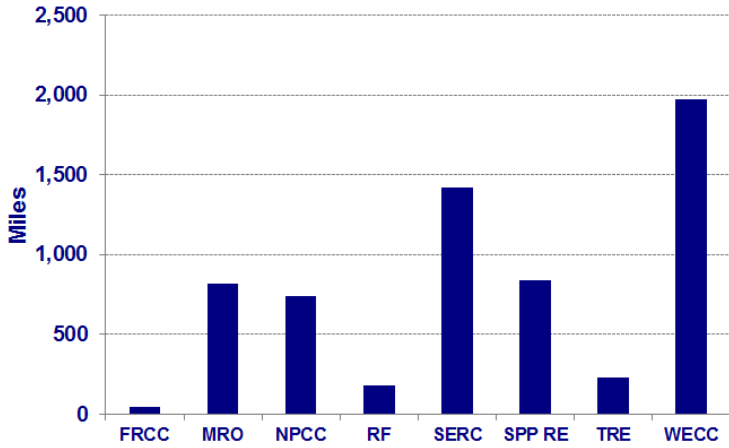
| Voltage (kV) | Transmission Projects Completed | | | | Proposed Transmission Projects In-Service by April 2021 | |
|---------------------|---------------------------------|--------------|---------------------------------|------------------------------------|---|----------------|
| | March 2019 | March 2018 | January – March 2019 Cumulative | January – December 2018 Cumulative | High Probability of Completion | All |
| Line Length (miles) | | | | | | |
| ≤230 | 0.0 | 28.0 | 20.0 | 392.3 | 532.1 | 1,748.0 |
| 345 | 165.0 | 169.8 | 165.0 | 819.3 | 960.0 | 2,845.0 |
| 500 | 0.0 | 0.0 | 7.4 | 69.4 | 738.0 | 1,662.0 |
| Total U.S. | 165.0 | 197.8 | 192.4 | 1,281.0 | 2,230.1 | 6,255.0 |

Sources: Data derived from Staff Database and U.S. Electric Transmission Projects ©The C Three Group, LLC.

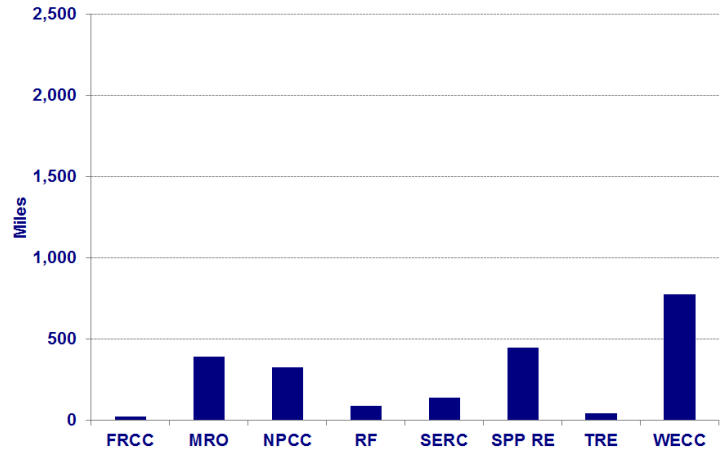


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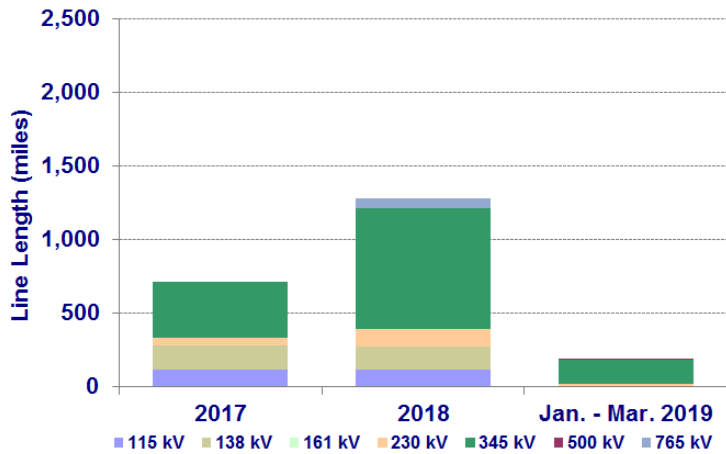
All Transmission Projects with a Proposed In-Service Date by April 2021



Transmission Projects with a High Probability of being completed by April 2021



New Transmission Projects by Voltage



Sources: Data derived from Staff Database and U.S. Electric Transmission Projects ©The C Three Group, LLC.

Disclaimer: This Report contains analyses, presentations, and conclusions that may be based on or derived from the data sources cited, but do not necessarily reflect the positions or recommendations of the data providers.