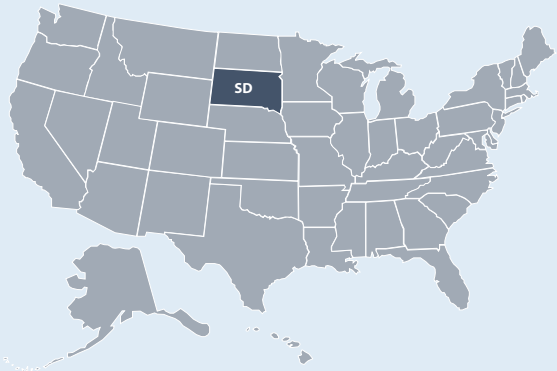
State of South Dakota
ENERGY SECTOR RISK PROFILE

U.S. DEPARTMENT OF ENERGY
Cybersecurity, Energy Security, and Emergency Response



South Dakota State Facts

POPULATION
0.88 M

HOUSING UNITS
0.40 M

BUSINESS ESTABLISHMENTS
0.03 M

ENERGY EMPLOYMENT: 9,745 jobs
PUBLIC UTILITY COMMISSION: South Dakota Public Utilities Commission
STATE ENERGY OFFICE: Energy Management Office - South Dakota Bureau of Administration
EMERGENCY MANAGEMENT AGENCY: South Dakota Office of Emergency Management
AVERAGE ELECTRICITY TARIFF: 9.97 cents/kWh
ENERGY EXPENDITURES: $4,393/capita
ENERGY CONSUMPTION PER CAPITA: 441 MMBtu
(8th highest out of 50 states and Washington, D.C.)
GDP: $52.0 billion

Data from 2020 or most recent year available.
For more information, see the Data Sources document.

ANNUAL ENERGY CONSUMPTION

ELECTRIC POWER: 12,870 GWh
COAL: 1,700 MSTN
NATURAL GAS: 85 Bcf
MOTOR GASOLINE: 10,800 Mbbl
DISTILLATE FUEL: 8,000 Mbbl

ANNUAL ENERGY PRODUCTION

ELECTRIC POWER GENERATION: 45 plants, 14.5 TWh, *5.0 GW total capacity*
- **Coal:** 1 plant, 2.6 TWh, *0.5 GW total capacity*
- **Hydro:** 4 plants, 7.9 TWh, *1.6 GW total capacity*
- **Natural Gas:** 9 plants, 1.2 TWh, *1.2 GW total capacity*
- **Nuclear:** 0 plants
- **Petroleum:** 12 plants, 0.0 TWh, *0.3 GW total capacity*
- **Wind & Solar:** 17 plants, 2.8 TWh, *1.4 GW total capacity*
- **Other sources:** 2 plants, 0.0 TWh, *0.0 GW total capacity*

COAL: 0 MSTN
NATURAL GAS: 0 Bcf
CRUDE OIL: 1,100 Mbbl
ETHANOL: 25,800 Mbbl

Data from EIA (2018, 2019).

This State Energy Risk Profile examines the relative magnitude of the risks that the state of South Dakota's energy infrastructure routinely encounters in comparison with the probable impacts. Natural and man-made hazards with the potential to cause disruption of the energy infrastructure are identified. Certain natural and adversarial threats, such as cybersecurity, electromagnetic pulse, geomagnetic disturbance, pandemics, or impacts caused by infrastructure interdependencies, are ill-suited to location-based probabilistic risk assessment as they may not adhere to geographic boundaries, have limited occurrence, or have limited historic data. Cybersecurity and other threats not included in these profiles are ever present and should be included in state energy security planning. A complete list of data sources and national level comparisons can be found in the Data Sources document.

South Dakota Risks and Hazards Overview

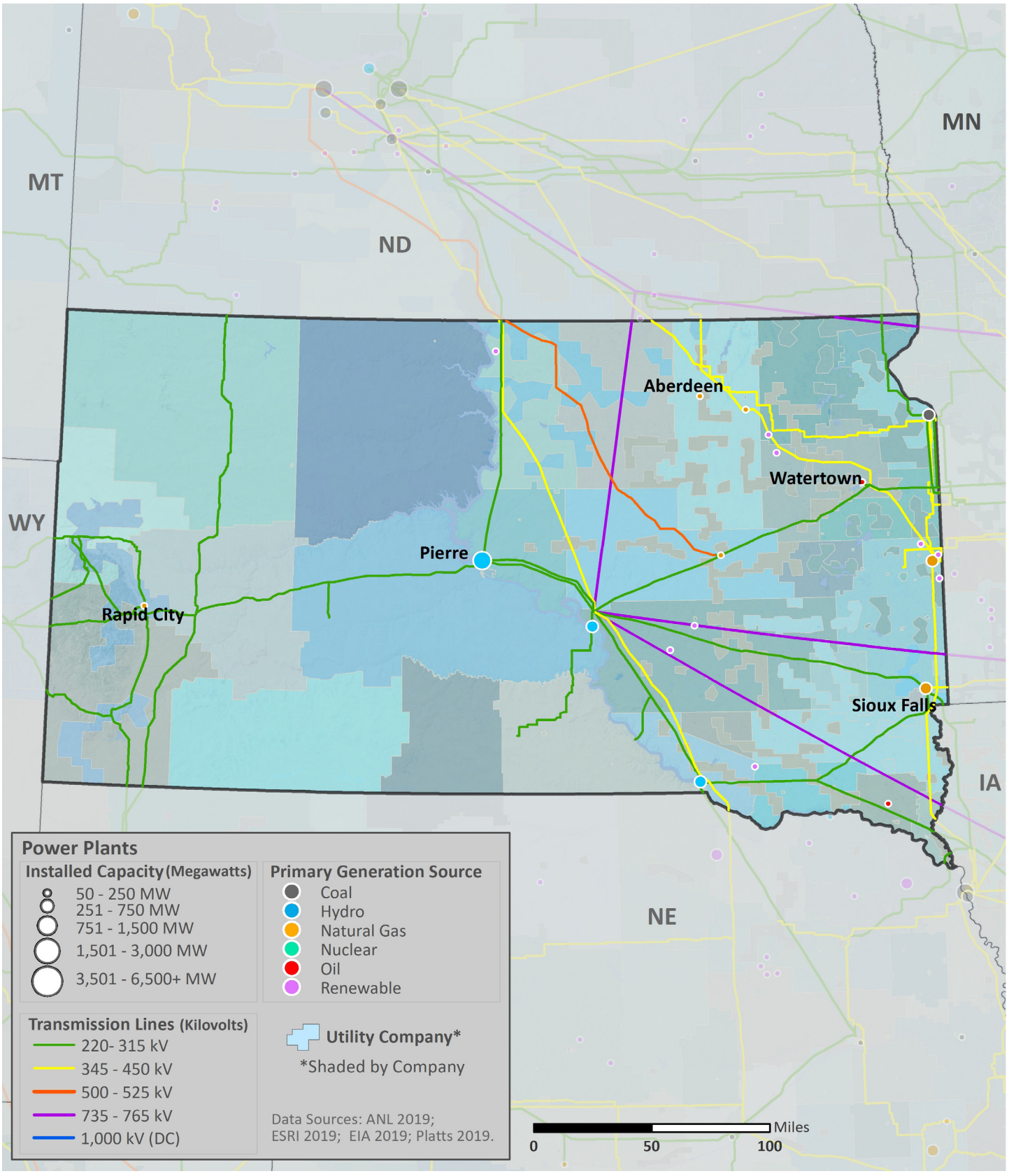
- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Winter Storms & Extreme Cold** at $14 million per year *(7th leading cause nationwide at $418 million per year)*.
- South Dakota had 217 Major Disaster Declarations, 0 Emergency Declarations, and 2 Fire Management Assistance Declarations for 15 events between 2013 and 2019.
- South Dakota registered 7% greater Heating Degree Days and 7% fewer Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Sioux Falls.

Annualized Frequency of and Property Damage Due to Natural Hazards, 2009–2019

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized ($Million per year)
Drought	4	$0
Earthquake (≥ 3.5 M)	<1	$0
Extreme Heat	2	$0
Flood	59	$7
Hurricane	0	$0
Landslide	0	$0
Thunderstorm & Lightning	206	$14
Tornado	14	$2
Wildfire	1	$0
Winter Storm & Extreme Cold	39	$14

Data Sources: NOAA and USGS

ELECTRIC


MT
ND
MN
WY
NE
IA
Aberdeen
Watertown
Pierre
Rapid City
Sioux Falls
Power Plants
Installed Capacity (Megawatts)
50 - 250 MW
251 - 750 MW
751 - 1,500 MW
1,501 - 3,000 MW
3,501 - 6,500+ MW
Primary Generation Source
Coal
Hydro
Natural Gas
Nuclear
Oil
Renewable
Transmission Lines (Kilovolts)
220- 315 kV
345 - 450 kV
500 - 525 kV
735 - 765 kV
1,000 kV (DC)
Utility Company*
*Shaded by Company
Data Sources: ANL 2019; ESRI 2019; EIA 2019; Platts 2019.
0
50
100
Miles

Electric Infrastructure

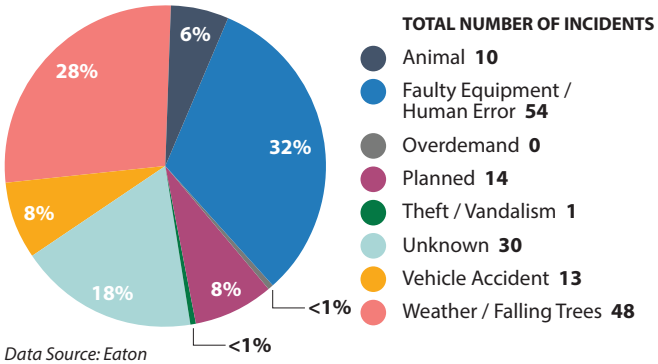
- South Dakota has 70 electric utilities:
  - *4 Investor owned*
  - *29 Cooperative*
  - *34 Municipal*
  - *3 Other utilities*
- Plant retirements scheduled by 2025: 2 electric generating units totaling 239 MW of installed capacity.
- In 2018, the average South Dakota electric customer experienced 1 service interruption that lasted an average of 1.5 hours.
- In South Dakota, between 2008 and 2017:
  - *The greatest number of electric outages occurred in **August** (3rd for outages nationwide)*
  - *The leading cause of electric outages was **Faulty Equipment or Human Error** (2nd leading cause nationwide)*
  - *Electric outages affected 35,475 customers on average*

Electric Customers and Consumption by Sector, 2018

	CUSTOMERS	CONSUMPTION
Residential	84%	39%
Commercial	15%	38%
Industrial	<1%	23%
Transportation	<1%	<1%

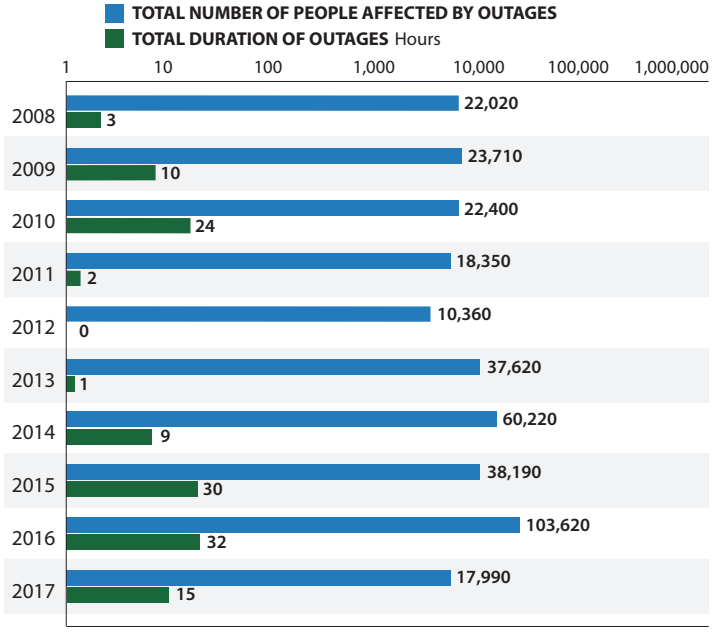
Data Source: EIA

Electric Utility-Reported Outages by Cause, 2008 – 2017



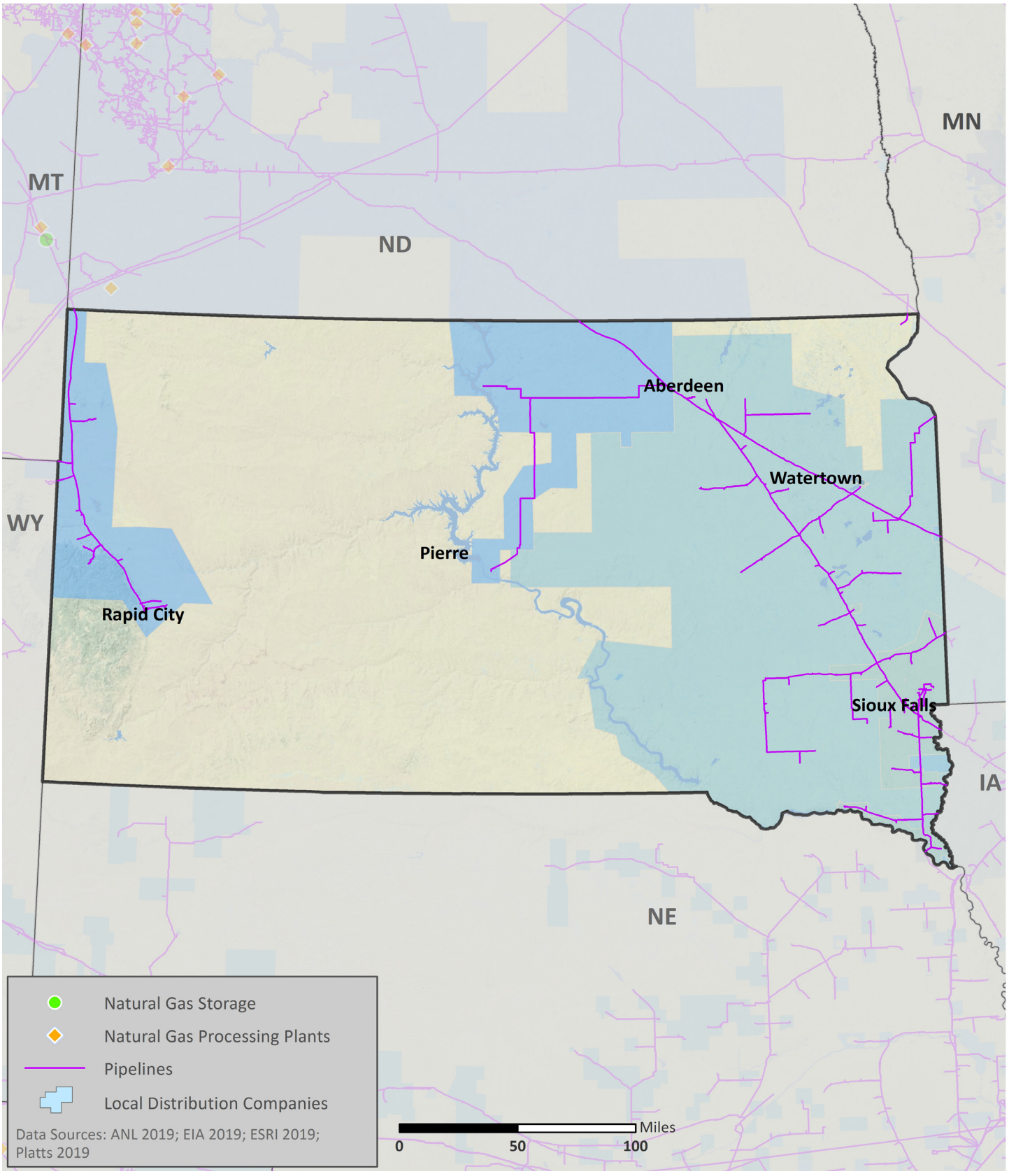
Data Source: Eaton

Electric Utility Outage Data, 2008 – 2017



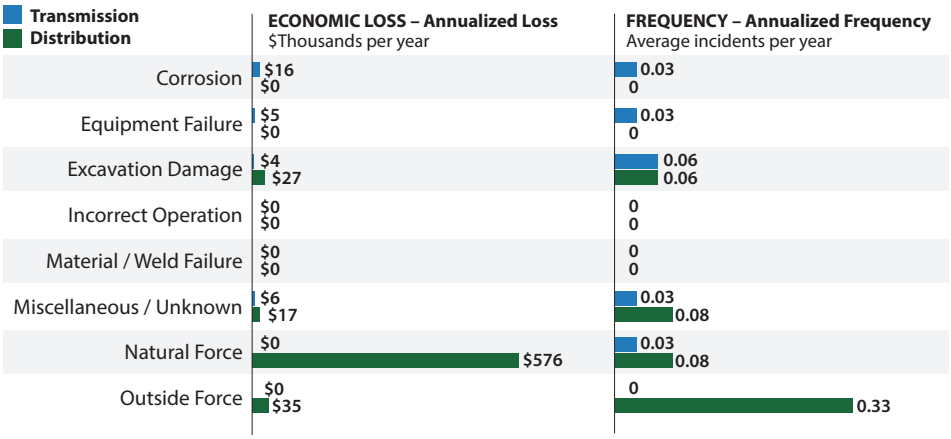
Note: This chart uses a logarithmic scale to display a very wide range of values.
Data Source: Eaton

NATURAL GAS


MT
ND
MN
WY
Aberdeen
Watertown
Pierre
Rapid City
Sioux Falls
IA
NE
Natural Gas Storage
Natural Gas Processing Plants
Pipelines
Local Distribution Companies
Data Sources: ANL 2019; EIA 2019; ESRI 2019; Platts 2019
0
50
100
Miles

Natural Gas Transport

Top Events Affecting Natural Gas Transmission and Distribution, 1984–2019



Data Source: DOT PHMSA

- As of 2018, South Dakota had:
  - *1,570 miles of natural gas transmission pipelines*
  - *4,941 miles of natural gas distribution pipelines*
- 57% of South Dakota's natural gas transmission system and 14% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, South Dakota's natural gas supply was most impacted by:
  - ***Corrosion** when transported by transmission pipelines (4th leading cause nationwide at $20.15M per year)*
  - ***Natural Forces** when transported by distribution pipelines (4th leading cause nationwide at $26.42M per year)*

Natural Gas Processing and Liquefied Natural Gas

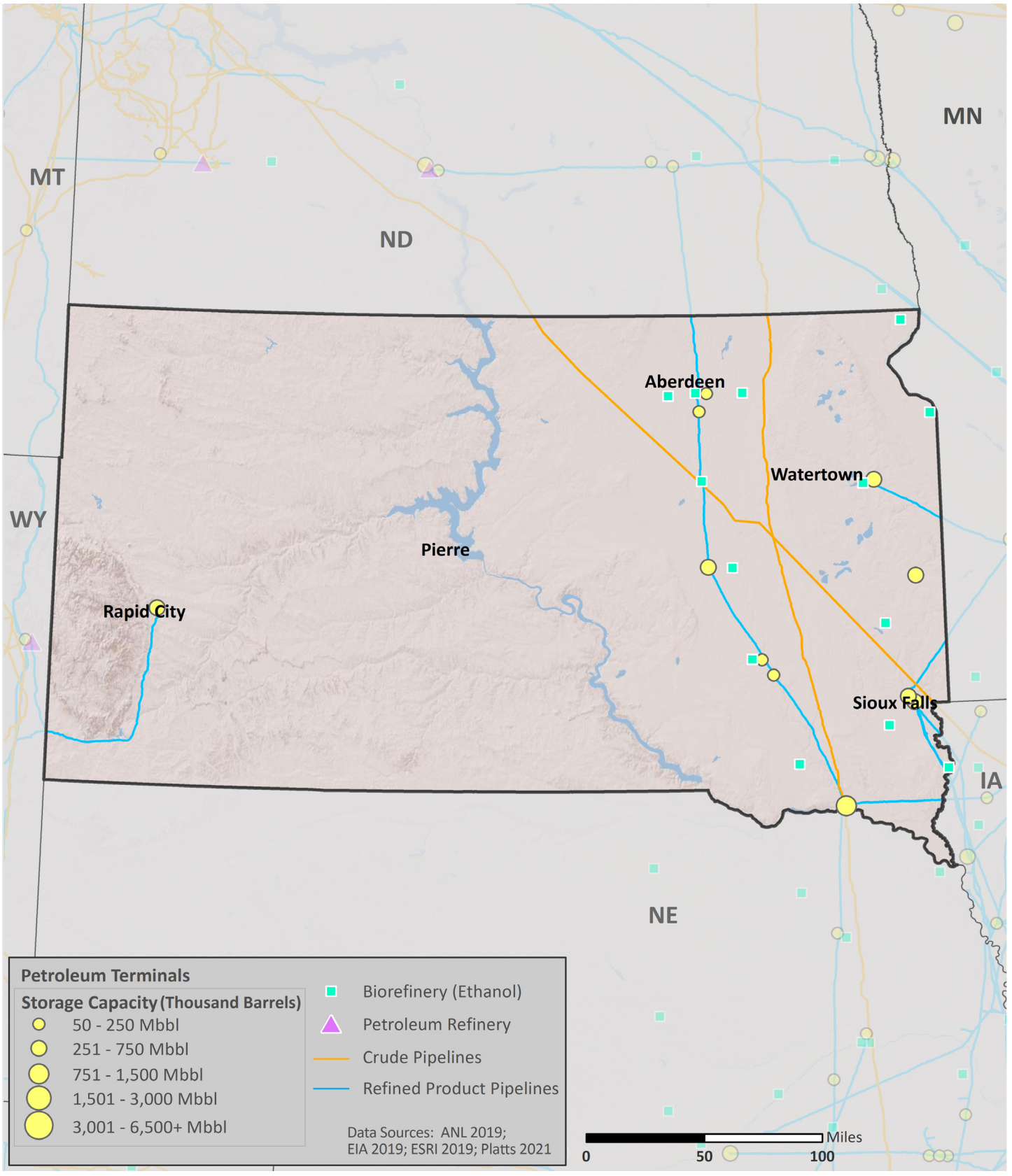
Natural Gas Customers and Consumption by Sector, 2018

	CUSTOMERS	CONSUMPTION
Residential	88%	17%
Commercial	12%	15%
Industrial	<1%	56%
Transportation	<1%	<1%
Electric Power	<1%	11%
Other	<1%	<1%

Data Source: EIA

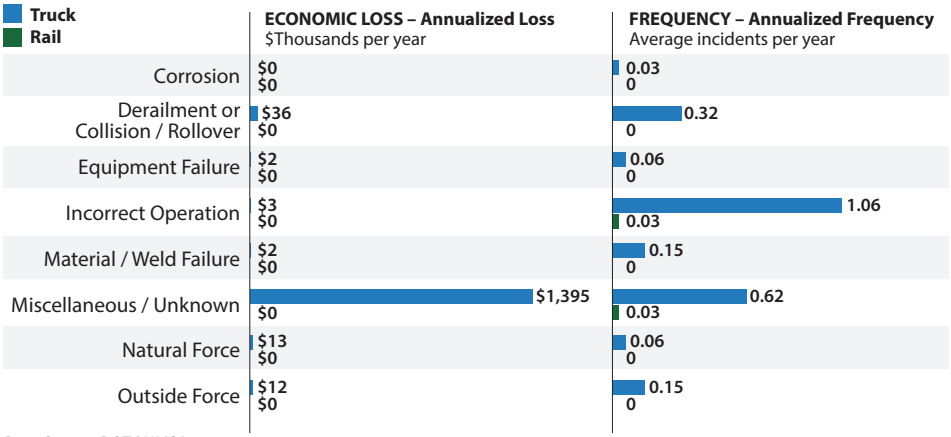
- South Dakota has 0 natural gas processing facilities.
- South Dakota has 0 liquefied natural gas (LNG) facilities.

PETROLEUM


MN
MT
ND
WY
NE
IA
Aberdeen
Watertown
Pierre
Rapid City
Sioux Falls
Petroleum Terminals
Storage Capacity (Thousand Barrels)
50 - 250 Mbbl
251 - 750 Mbbl
751 - 1,500 Mbbl
1,501 - 3,000 Mbbl
3,001 - 6,500+ Mbbl
Biorefinery (Ethanol)
Petroleum Refinery
Crude Pipelines
Refined Product Pipelines
Data Sources: ANL 2019;
EIA 2019; ESRI 2019; Platts 2021
0
50
100
Miles

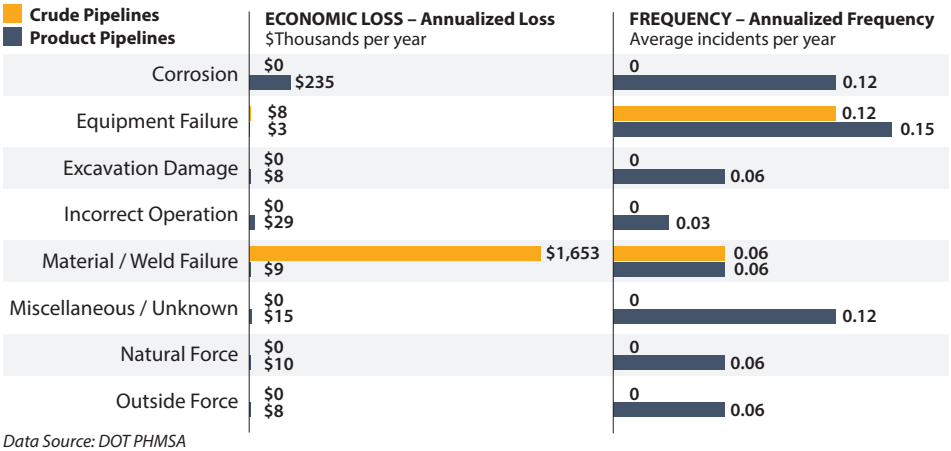
Petroleum Transport

Top Events Affecting Petroleum Transport by Truck and Rail, 1986 – 2019



Data Source: DOT PHMSA

Top Events Affecting Crude Oil and Refined Product Pipelines, 1986 – 2019



Data Source: DOT PHMSA

- As of 2018, South Dakota had:
  - *495 miles of crude oil pipelines*
  - *500 miles of refined product pipelines*
  - *0 miles of biofuels pipelines*
- 43% of South Dakota's petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, South Dakota's petroleum supply was most impacted by:
  - ***Miscellaneous or Unknown*** *events when transported by truck (3rd leading cause nationwide at $52.87M per year)*
  - ***Incorrect Operations*** *when transported by rail (4th leading cause nationwide at $2.02M per year)*
  - ***Material Failures*** *when transported by crude pipelines (leading cause nationwide at $41.36M per year)*
  - ***Corrosion*** *when transported by product pipelines (2nd leading cause nationwide at $15.2M per year)*
- Disruptions in other states may impact supply.

Petroleum Refineries

- There are no operating petroleum refineries in South Dakota.