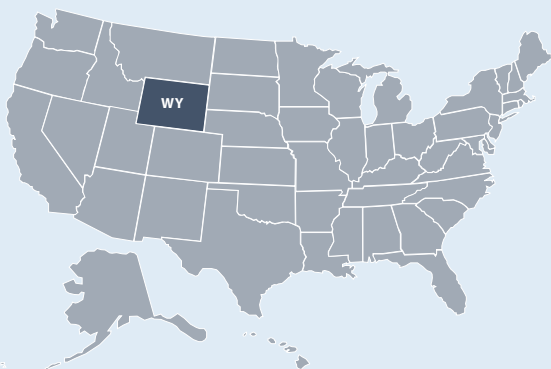




# State of Wyoming ENERGY SECTOR RISK PROFILE



## Wyoming State Facts



POPULATION

0.58 M



HOUSING UNITS

0.28 M



BUSINESS ESTABLISHMENTS

0.02 M

ENERGY EMPLOYMENT: 33,273 jobs

PUBLIC UTILITY COMMISSION: Wyoming Public Service Commission

STATE ENERGY OFFICE: Wyoming Energy Authority

EMERGENCY MANAGEMENT AGENCY: Wyoming Office of Homeland Security

AVERAGE ELECTRICITY TARIFF: 8.09 cents/kWh

ENERGY EXPENDITURES: \$7,672/capita

ENERGY CONSUMPTION PER CAPITA: 885 MMBtu (2nd highest out of 50 states and Washington, D.C.)

GDP: \$39.1 billion

Data from 2020 or most recent year available.

For more information, see the Data Sources document.

## ANNUAL ENERGY CONSUMPTION

ELECTRIC POWER: 16,860 GWh

COAL: 26,000 MSTN

NATURAL GAS: 92 Bcf

MOTOR GASOLINE: 9,000 Mbbl

DISTILLATE FUEL: 15,500 Mbbl

## ANNUAL ENERGY PRODUCTION

ELECTRIC POWER GENERATION: 67 plants, 42.1 TWh, 9.7 GW total capacity

Coal: 12 plants, 35.4 TWh, 7.3 GW total capacity

Hydro: 16 plants, 1.0 TWh, 0.3 GW total capacity

Natural Gas: 9 plants, 1.0 TWh, 0.3 GW total capacity

Nuclear: 0 plants

Petroleum: 3 plants, 0.0 TWh, 0.0 GW total capacity

Wind & Solar: 22 plants, 4.3 TWh, 1.7 GW total capacity

Other sources: 5 plants, 0.4 TWh, 0.2 GW total capacity

COAL: 316,500 MSTN

NATURAL GAS: 1,550 Bcf

CRUDE OIL: 102,200 Mbbl

ETHANOL: 0 Mbbl

Data from EIA (2018, 2019).

This State Energy Risk Profile examines the relative magnitude of the risks that the state of Wyoming'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.

## Wyoming Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Thunderstorms & Lightning** at \$7 million per year (2nd leading cause nationwide at \$2.8 billion per year).
- Wyoming had 8 Major Disaster Declarations, 0 Emergency Declarations, and 5 Fire Management Assistance Declarations for 8 events between 2013 and 2019.
- Wyoming registered 1% greater Heating Degree Days and 14% greater Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Cheyenne.

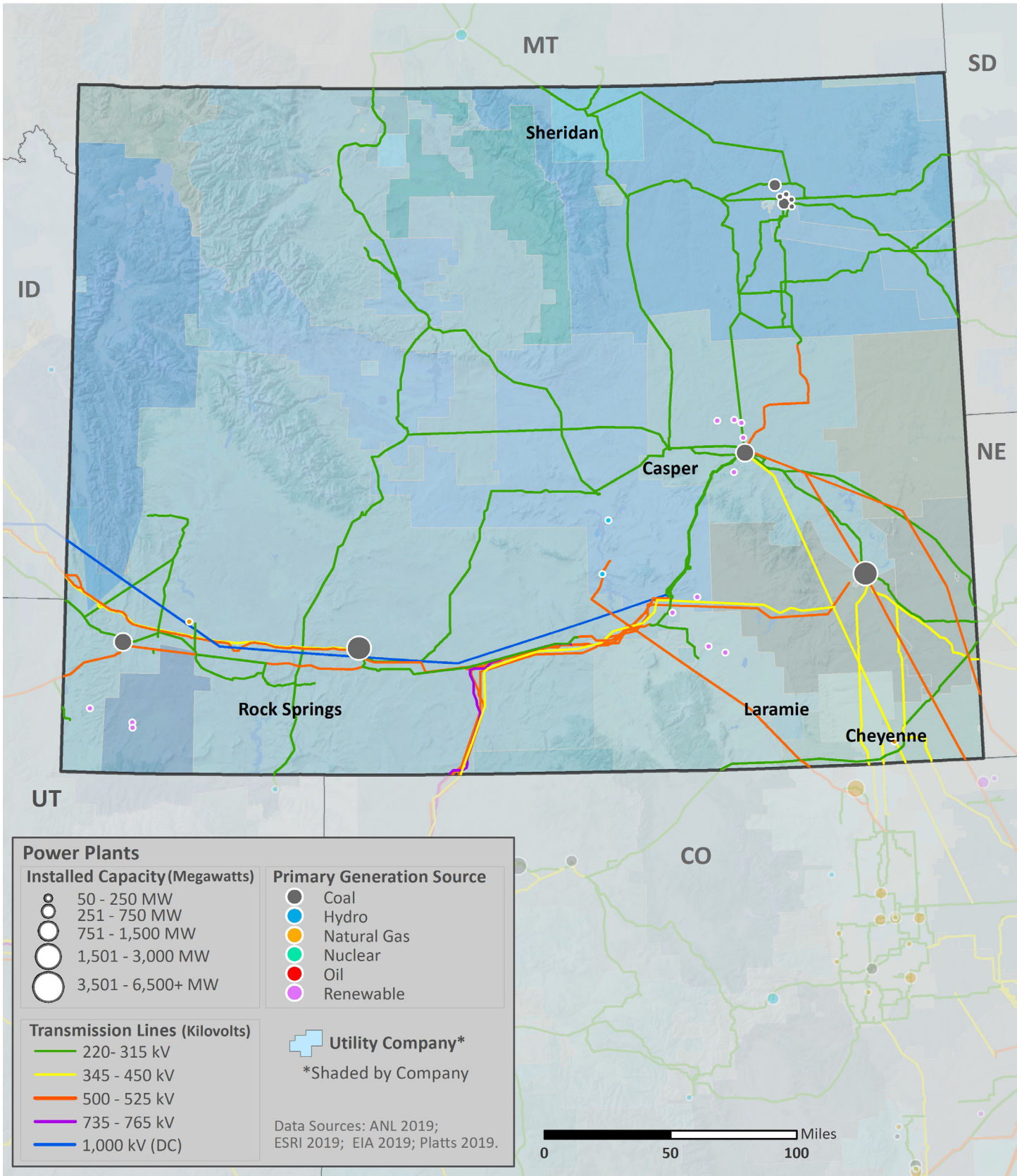
## Annualized Frequency of and Property Damage Due to Natural Hazards, 2009 – 2019

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized (\$Million per year)
Drought	0	\$0
Earthquake (≥ 3.5 M)	3	\$0
Extreme Heat	<1	\$0
Flood	19	\$3
Hurricane	0	\$0
Landslide	5	\$0
Thunderstorm & Lightning	161	\$7
Tornado	11	\$0
Wildfire	4	\$2
Winter Storm & Extreme Cold	59	\$1

Data Sources: NOAA and USGS









# ELECTRIC



## Electric Infrastructure

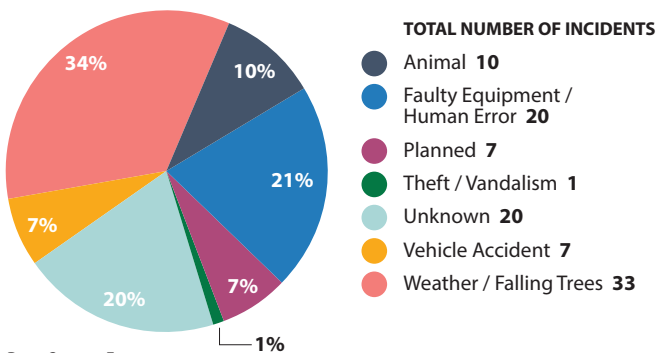
- Wyoming has 27 electric utilities:
  - 0 Investor owned
  - 13 Cooperative
  - 12 Municipal
  - 2 Other utilities
- Plant retirements scheduled by 2025: None.
- In 2018, the average Wyoming electric customer experienced 1.2 service interruptions that lasted an average of 2.2 hours.
- In Wyoming, between 2008 and 2017:
  - The greatest number of electric outages occurred in **September** (8th for outages nationwide)
  - The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)
  - Electric outages affected 23,306 customers on average

### Electric Customers and Consumption by Sector, 2018

	 CUSTOMERS	 CONSUMPTION
Residential 	80%	16%
Commercial 	17%	22%
Industrial 	3%	61%
Transportation 	<1%	<1%

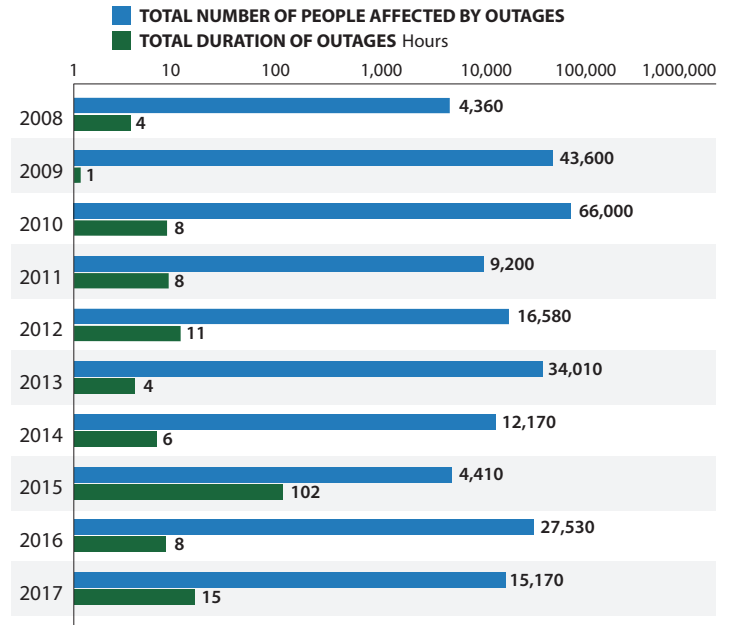
Data Source: EIA

### Electric Utility-Reported Outages by Cause, 2008 – 2017



Data Source: Eaton

### Electric Utility Outage Data, 2008 – 2017

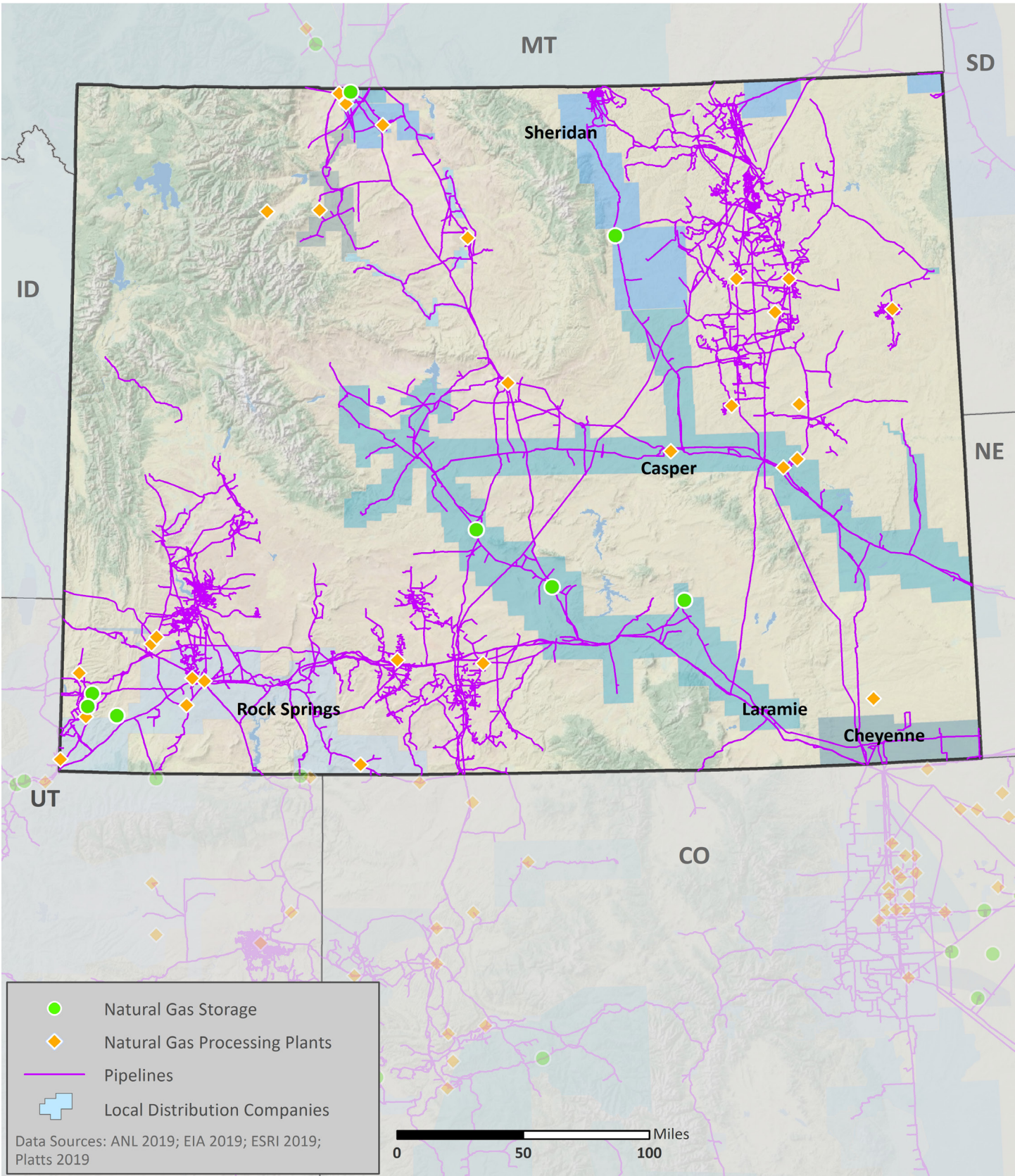


Note: This chart uses a logarithmic scale to display a very wide range of values.  
Data Source: Eaton



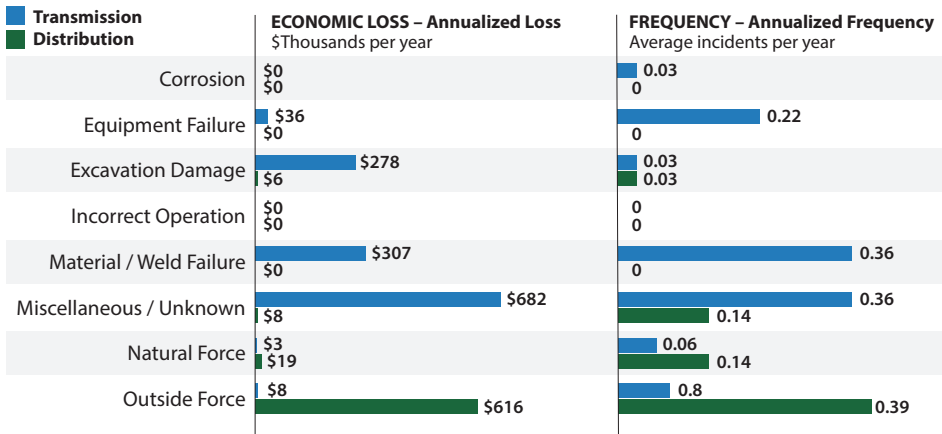


# NATURAL GAS



## Natural Gas Transport

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



Data Source: DOT PHMSA

- As of 2018, Wyoming had:
  - 6,838 miles of natural gas transmission pipelines
  - 5,429 miles of natural gas distribution pipelines
- 29% of Wyoming’s natural gas transmission system and 43% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Wyoming’s natural gas supply was most impacted by:
  - **Miscellaneous or Unknown** events when transported by transmission pipelines (5th leading cause nationwide at \$16.77M per year)
  - **Outside Forces** when transported by distribution pipelines (leading cause nationwide at \$76.59M per year)

## Natural Gas Processing and Liquefied Natural Gas

### Natural Gas Customers and Consumption by Sector, 2018

	CUSTOMERS	CONSUMPTION
Residential	88%	13%
Commercial	11%	14%
Industrial	<1%	68%
Transportation	<1%	<1%
Electric Power	<1%	5%
Other	<1%	<1%

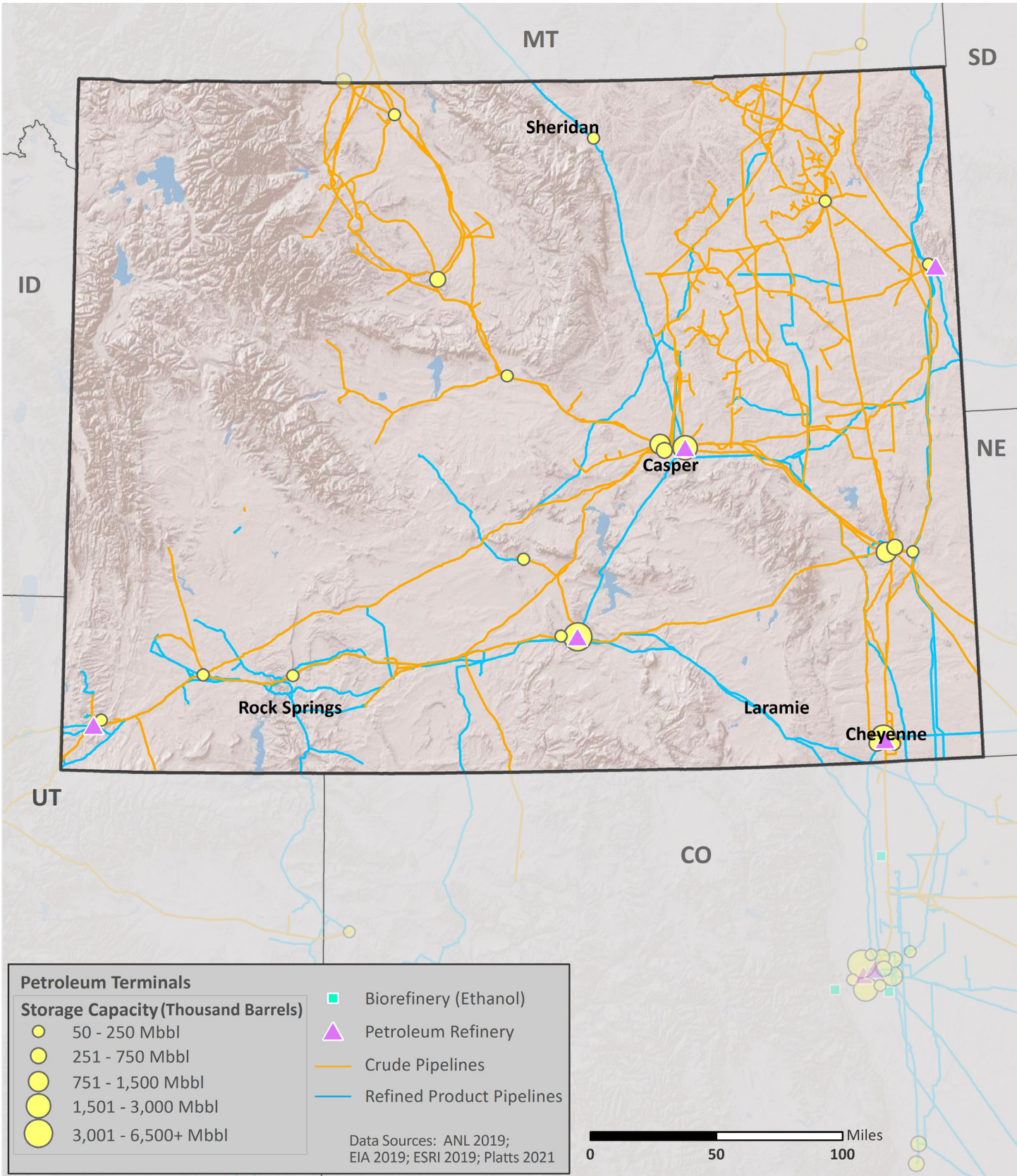
Data Source: EIA

- Wyoming has 28 natural gas processing facilities with a total capacity of 5,979 MMcf/d.
- Wyoming has 2 liquefied natural gas (LNG) facilities with a total storage capacity of 6,051 barrels.



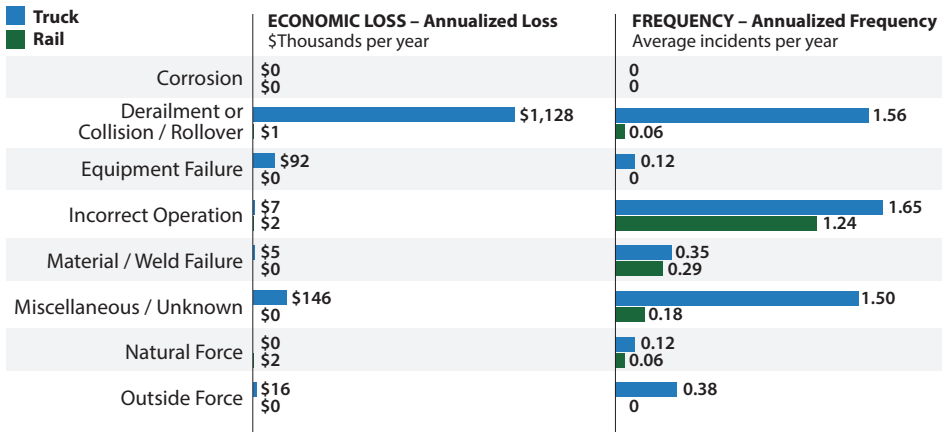


# PETROLEUM



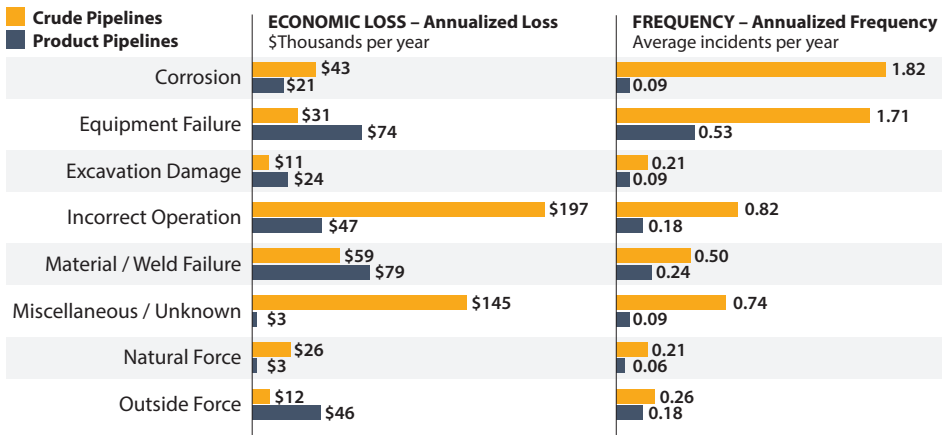
## Petroleum Transport

### 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



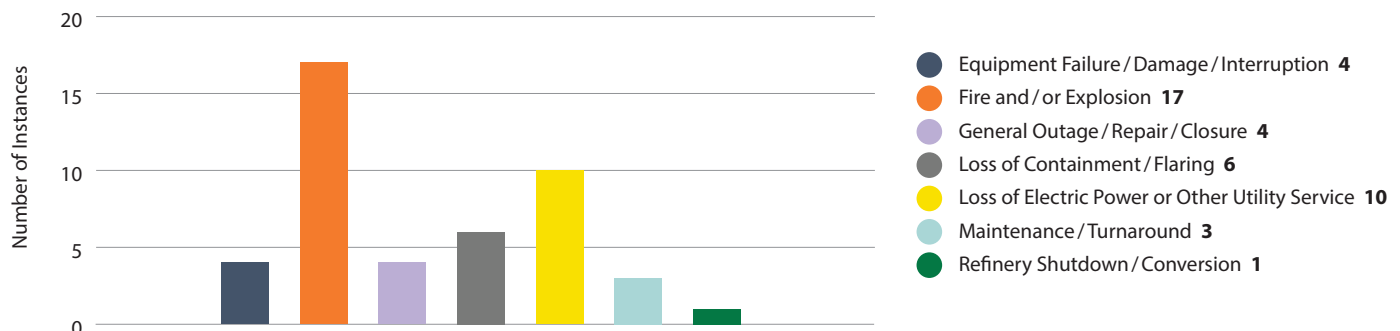
Data Source: DOT PHMSA

- As of 2018, Wyoming had:
  - 4,257 miles of crude oil pipelines
  - 1,379 miles of refined product pipelines
  - 0 miles of biofuels pipelines
- 58% of Wyoming’s petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Wyoming’s petroleum supply was most impacted by:
  - **Derailments, Collisions, or Rollovers** when transported by truck (8th leading cause nationwide at \$0.07M per year)
  - **Incorrect Operations** when transported by rail (4th leading cause nationwide at \$2.02M per year)
  - **Incorrect Operations** when transported by crude pipelines (6th leading cause nationwide at \$4.23M per year)
  - **Material Failures** when transported by product pipelines (4th leading cause nationwide at \$9.47M per year)
- Disruptions in other states may impact supply.

## Petroleum Refineries

- Wyoming has 5 petroleum refineries with a total operable capacity of 168.5 Mb/d.
- Between 2009 and 2019, the leading cause of petroleum refinery disruptions in Wyoming was:
  - **Fires and/or Explosions** (6th leading cause nationwide)

### Causes and Frequency of Petroleum Refinery Disruptions, 2009 – 2019



Data Source: Hydrocarbon Publishing