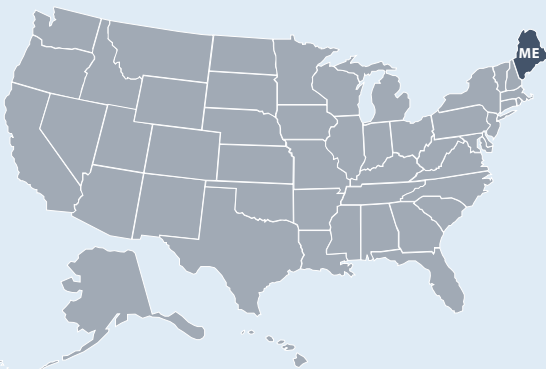




State of Maine ENERGY SECTOR RISK PROFILE



Maine State Facts



POPULATION

1.34 M



HOUSING UNITS

0.75 M



BUSINESS ESTABLISHMENTS

0.04 M

ENERGY EMPLOYMENT: 8,947 jobs

PUBLIC UTILITY COMMISSION: Maine Public Utilities Commission

STATE ENERGY OFFICE: Governor's Energy Office

EMERGENCY MANAGEMENT AGENCY: Maine Emergency

Management Agency

AVERAGE ELECTRICITY TARIFF: 13.44 cents/kWh

ENERGY EXPENDITURES: \$4,213/capita

ENERGY CONSUMPTION PER CAPITA: 294 MMBtu

(27th highest out of 50 states and Washington, D.C.)

GDP: \$64.9 billion

Data from 2020 or most recent year available.

For more information, see the Data Sources document.

ANNUAL ENERGY CONSUMPTION

ELECTRIC POWER: 18,150 GWh

COAL: 100 MSTN

NATURAL GAS: 43 Bcf

MOTOR GASOLINE: 16,800 Mbbbl

DISTILLATE FUEL: 13,400 Mbbbl

ANNUAL ENERGY PRODUCTION

ELECTRIC POWER GENERATION: 104 plants, 10.5 TWh,

5.0 GW total capacity

Coal: 0 plants

Hydro: 54 plants, 3.5 TWh, 0.7 GW total capacity

Natural Gas: 7 plants, 1.8 TWh, 1.8 GW total capacity

Nuclear: 0 plants

Petroleum: 5 plants, 0.0 TWh, 0.9 GW total capacity

Wind & Solar: 19 plants, 2.5 TWh, 0.9 GW total capacity

Other sources: 19 plants, 2.6 TWh, 0.7 GW total capacity

COAL: 0 MSTN

NATURAL GAS: 0 Bcf

CRUDE OIL: 0 Mbbbl

ETHANOL: 0 Mbbbl

Data from EIA (2018, 2019).

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

Maine Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Flooding** at \$2 million per year (leading cause nationwide at \$12 billion per year).
- Maine had 24 Major Disaster Declarations, 0 Emergency Declarations, and 0 Fire Management Assistance Declarations for 4 events between 2013 and 2019.
- Maine registered 5% fewer Heating Degree Days and 51% greater Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Augusta.

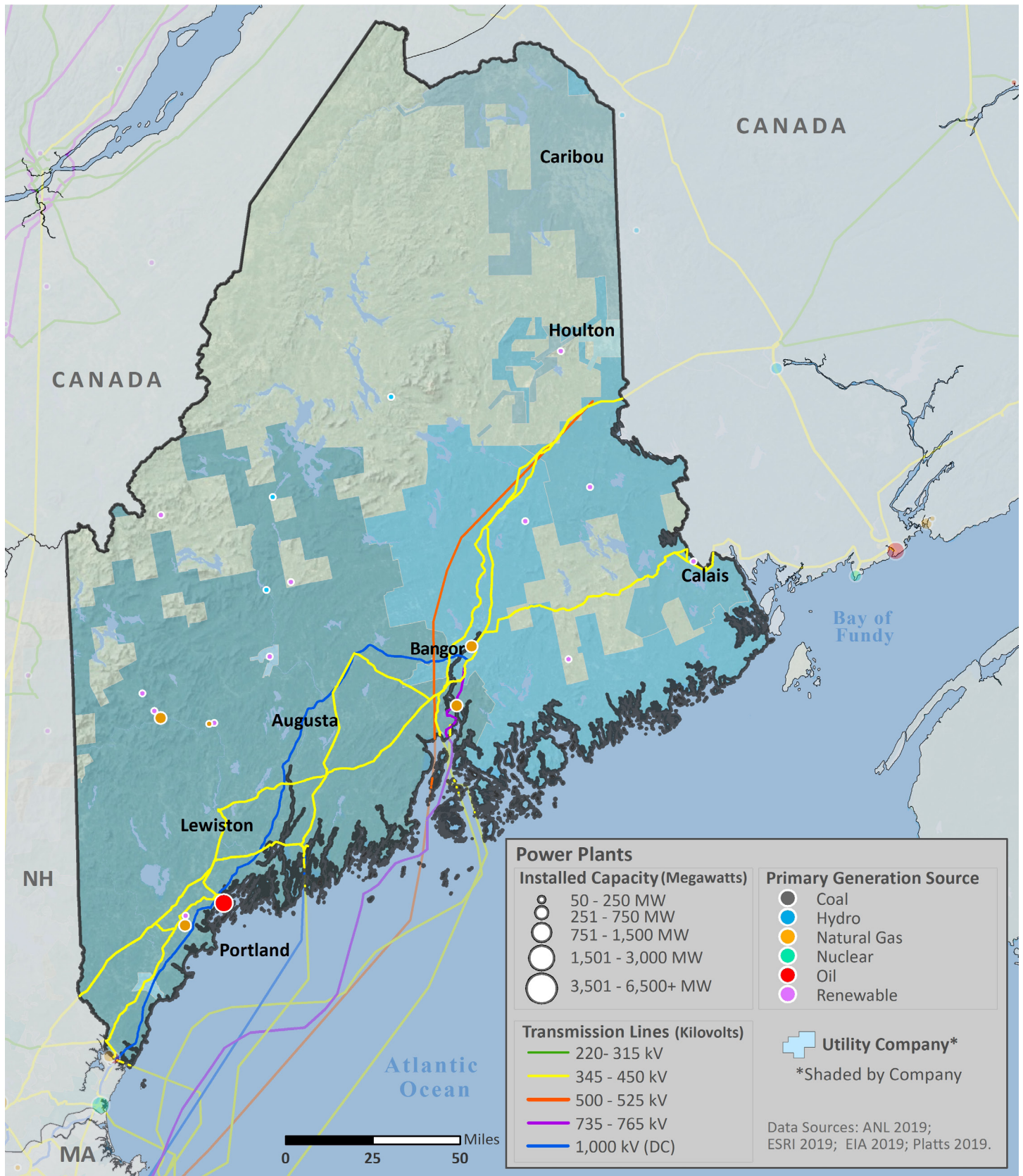
Annualized Frequency of and Property Damage Due to Natural Hazards, 2009–2019

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized (\$Million per year)
Drought	0	\$0
Earthquake (≥ 3.5 M)	<1	\$0
Extreme Heat	<1	\$0
Flood	21	\$2
Hurricane	<1	\$0
Landslide	0	\$0
Thunderstorm & Lightning	30	\$1
Tornado	2	\$0
Wildfire	0	\$0
Winter Storm & Extreme Cold	23	\$0

Data Sources: NOAA and USGS



ELECTRIC









Electric Infrastructure

- Maine has 15 electric utilities:
 - 2 Investor owned
 - 2 Cooperative
 - 5 Municipal
 - 6 Other utilities
- Plant retirements scheduled by 2025: 6 electric generating units totaling 63 MW of installed capacity.

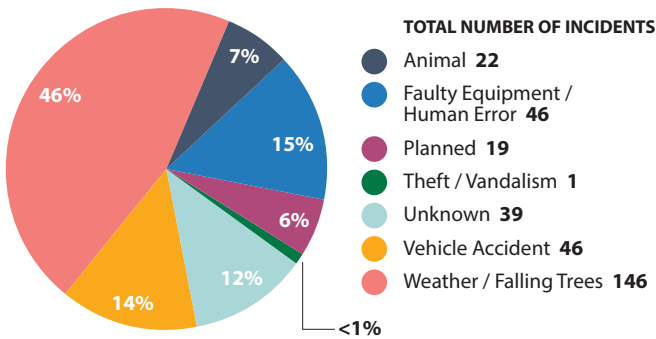
- In 2018, the average Maine electric customer experienced 2.8 service interruptions that lasted an average of 11.1 hours.
- In Maine, between 2008 and 2017:
 - The greatest number of electric outages occurred in **December** (4th for outages nationwide)
 - The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)
 - Electric outages affected 436,391 customers on average

Electric Customers and Consumption by Sector, 2018

	 CUSTOMERS	 CONSUMPTION
Residential 	88%	39%
Commercial 	12%	36%
Industrial 	<1%	25%
Transportation 	<1%	<1%

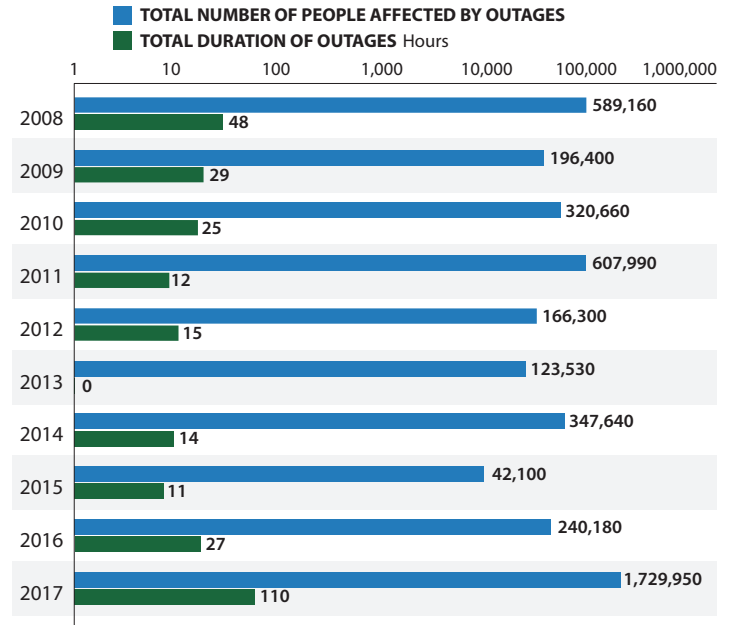
Data Source: EIA

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

	ECONOMIC LOSS – Annualized Loss \$Thousands per year	FREQUENCY – Annualized Frequency Average incidents per year
Corrosion	\$0	0
Equipment Failure	\$3	0.03
Excavation Damage	\$7	0.03
Incorrect Operation	\$0	0
Material / Weld Failure	\$0	0
Miscellaneous / Unknown	\$0	0
Natural Force	\$0	0
Outside Force	\$5	0.03

Data Source: DOT PHMSA

- As of 2018, Maine had:
 - 507 miles of natural gas transmission pipelines
 - 1,285 miles of natural gas distribution pipelines
- 8% of Maine’s natural gas transmission system and 2% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Maine’s natural gas supply was most impacted by:
 - **Equipment Failures** when transported by transmission pipelines (7th leading cause nationwide at \$5.13M per year)
 - **Excavation Damage** when transported by distribution pipelines (5th leading cause nationwide at \$16.56M per year)

Natural Gas Processing and Liquefied Natural Gas

Natural Gas Customers and Consumption by Sector, 2018

	CUSTOMERS	CONSUMPTION
Residential	73%	7%
Commercial	27%	21%
Industrial	<1%	42%
Transportation	<1%	<1%
Electric Power	<1%	30%
Other	<1%	<1%

Data Source: EIA

- Maine has 0 natural gas processing facilities.
- Maine has 1 liquefied natural gas (LNG) facility with a total storage capacity of 3,536 barrels.



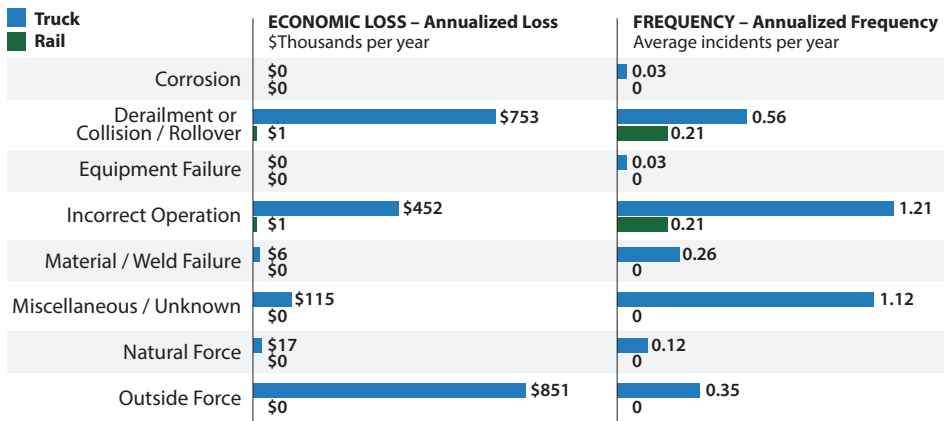


PETROLEUM



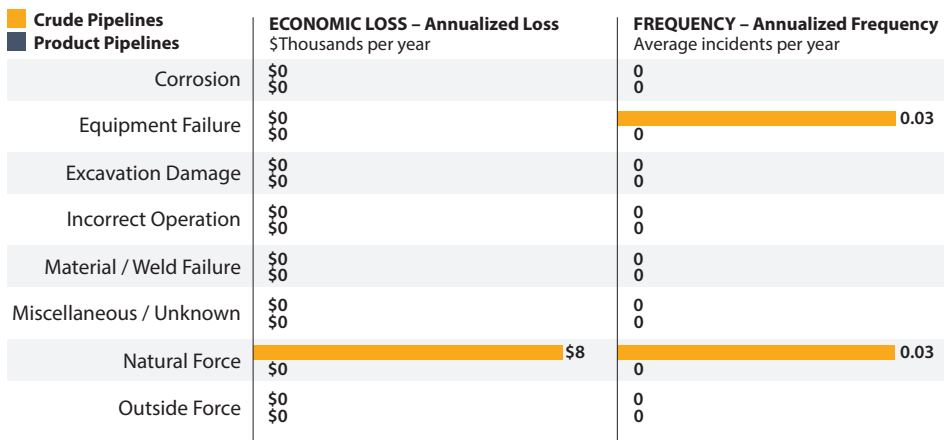
Petroleum Transport

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, Maine had:
 - 144 miles of crude oil pipelines
 - 125 miles of refined product pipelines
 - 0 miles of biofuels pipelines
- 90% of Maine’s petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Maine’s petroleum supply was most impacted by:
 - **Outside Forces** when transported by truck (2nd leading cause nationwide at \$60.45M per year)
 - **Derailments, Collisions, or Rollovers** when transported by rail (leading cause nationwide at \$19.71M per year)
 - **Natural Forces** when transported by crude pipelines (2nd leading cause nationwide at \$15.24M per year)
- Disruptions in other states may impact supply.

Petroleum Refineries

- There are no operating petroleum refineries in Maine.

