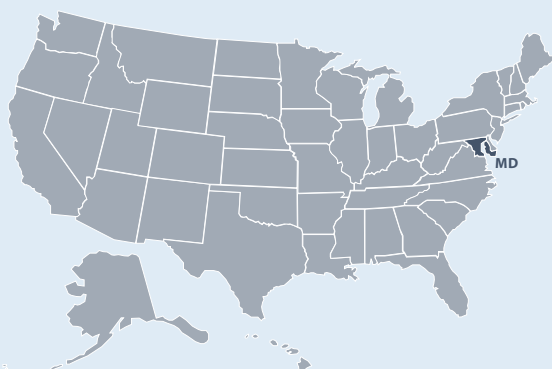




State of Maryland

ENERGY SECTOR RISK PROFILE



Maryland State Facts



POPULATION

6.04 M



HOUSING
UNITS

2.46 M



BUSINESS
ESTABLISHMENTS

0.14 M

ENERGY EMPLOYMENT: 32,473 jobs

PUBLIC UTILITY COMMISSION: Maryland Public Service Commission

STATE ENERGY OFFICE: Maryland Energy Administration

EMERGENCY MANAGEMENT AGENCY: Maryland Emergency Management Agency

AVERAGE ELECTRICITY TARIFF: 11.57 cents/kWh

ENERGY EXPENDITURES: \$3,077/capita

ENERGY CONSUMPTION PER CAPITA: 218 MMBtu
(42nd highest out of 50 states and Washington, D.C.)

GDP: \$412.6 billion

Data from 2020 or most recent year available.

For more information, see the Data Sources document.

ANNUAL ENERGY CONSUMPTION

ELECTRIC POWER: 93,870 TWh

COAL: 5,000 MSTN

NATURAL GAS: 276 Bcf

MOTOR GASOLINE: 46,400 Mbbl

DISTILLATE FUEL: 18,200 Mbbl

ANNUAL ENERGY PRODUCTION

ELECTRIC POWER GENERATION: 141 plants, 39.3 TWh,
16.1 GW total capacity

Coal: 6 plants, 5.7 TWh, 4.7 GW total capacity

Hydro: 2 plants, 2.2 TWh, 0.6 GW total capacity

Natural Gas: 19 plants, 14.6 TWh, 7.0 GW total capacity

Nuclear: 1 plant, 15.0 TWh, 1.9 GW total capacity

Petroleum: 15 plants, 0.1 TWh, 1.3 GW total capacity

Wind & Solar: 84 plants, 1.0 TWh, 0.5 GW total capacity

Other sources: 4 plants, 0.7 TWh, 10.2 GW total capacity

COAL: 1,800 MSTN

NATURAL GAS: 0 Bcf

CRUDE OIL: 0 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 Maryland'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.

Maryland Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Flooding** at \$12 million per year (leading cause nationwide at \$12 billion per year).
- Maryland had 28 Major Disaster Declarations, 0 Emergency Declarations, and 0 Fire Management Assistance Declarations for 5 events between 2013 and 2019.
- Maryland registered 15% fewer Heating Degree Days and 47% greater Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Woodlawn.

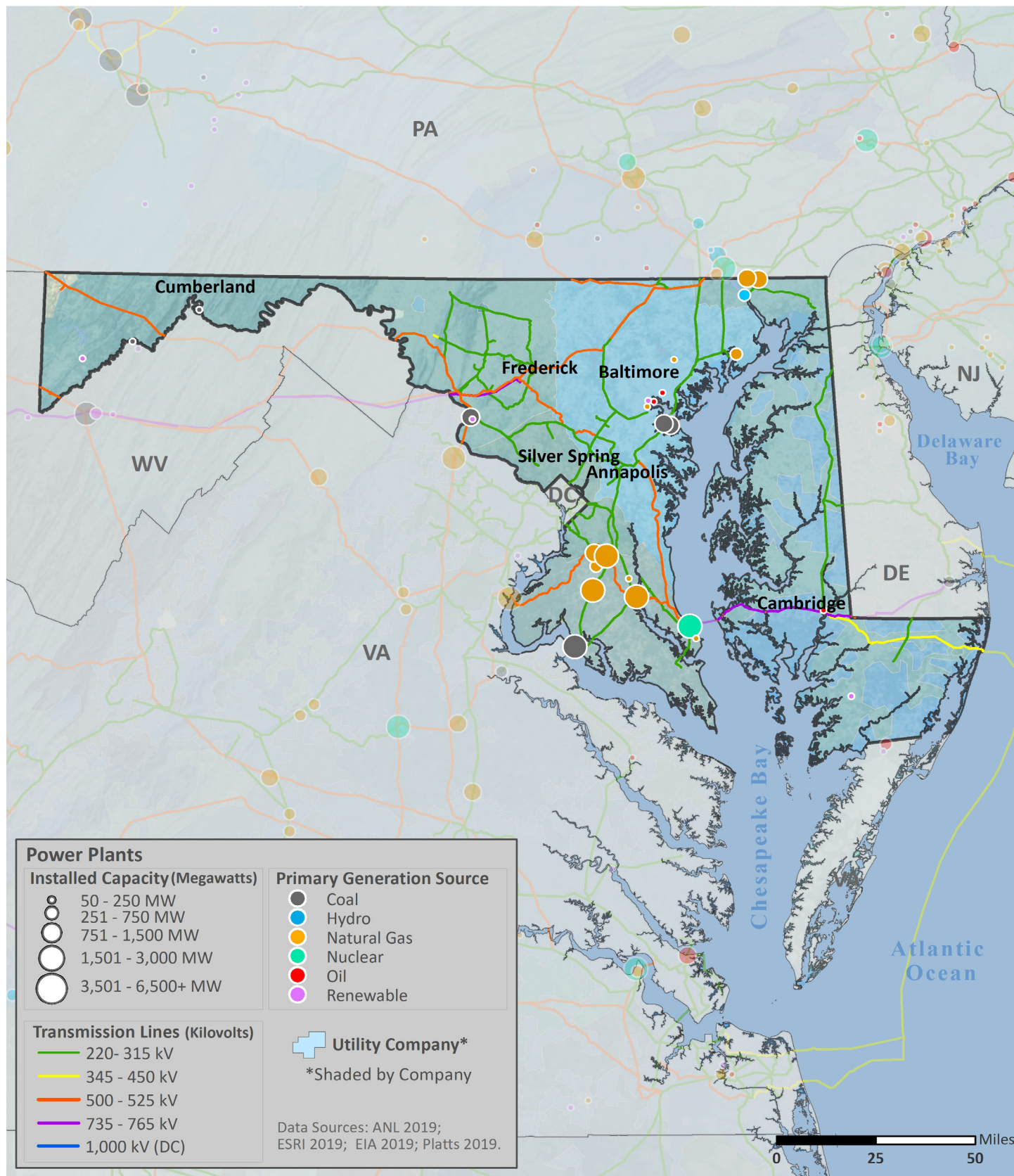
Annualized Frequency of and Property Damage Due to Natural Hazards, 2009–2019

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized (\$Million per year)
Drought	1	\$0
Earthquake (≥ 3.5 M)	<1	\$0
Extreme Heat	7	\$0
Flood	29	\$12
Hurricane	<1	\$1
Landslide	0	\$0
Thunderstorm & Lightning	67	\$4
Tornado	5	\$0
Wildfire	<1	\$0
Winter Storm & Extreme Cold	47	\$0

Data Sources: NOAA and USGS



ELECTRIC



Electric Infrastructure

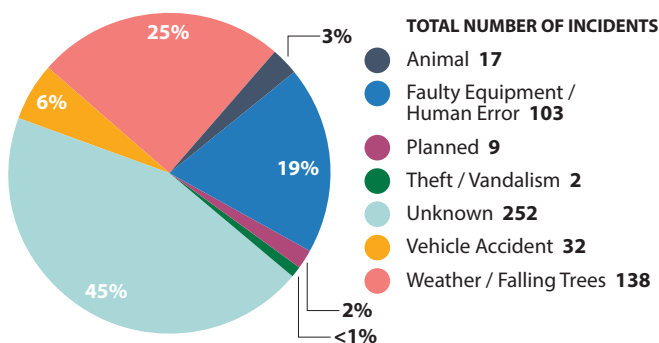
- Maryland has 14 electric utilities:
 - 1 Investor owned
 - 2 Cooperative
 - 5 Municipal
 - 6 Other utilities
- Plant retirements scheduled by 2025: 18 electric generating units totaling 623 MW of installed capacity.

Electric Customers and Consumption by Sector, 2018

	 CUSTOMERS	 CONSUMPTION
Residential 	90%	45%
Commercial 	10%	48%
Industrial 	<1%	6%
Transportation 	<1%	<1%

Data Source: EIA

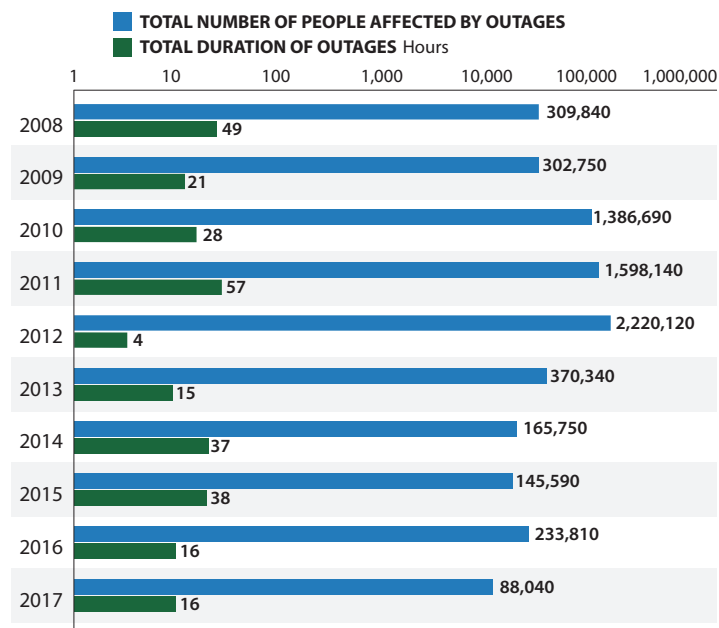
Electric Utility-Reported Outages by Cause, 2008 – 2017



Data Source: Eaton

- In 2018, the average Maryland electric customer experienced 1.3 service interruptions that lasted an average of 5.6 hours.
- In Maryland, between 2008 and 2017:
 - The greatest number of electric outages occurred in **July** (leading month for outages nationwide)
 - The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)
 - Electric outages affected 682,107 customers on average

Electric Utility Outage Data, 2008 – 2017

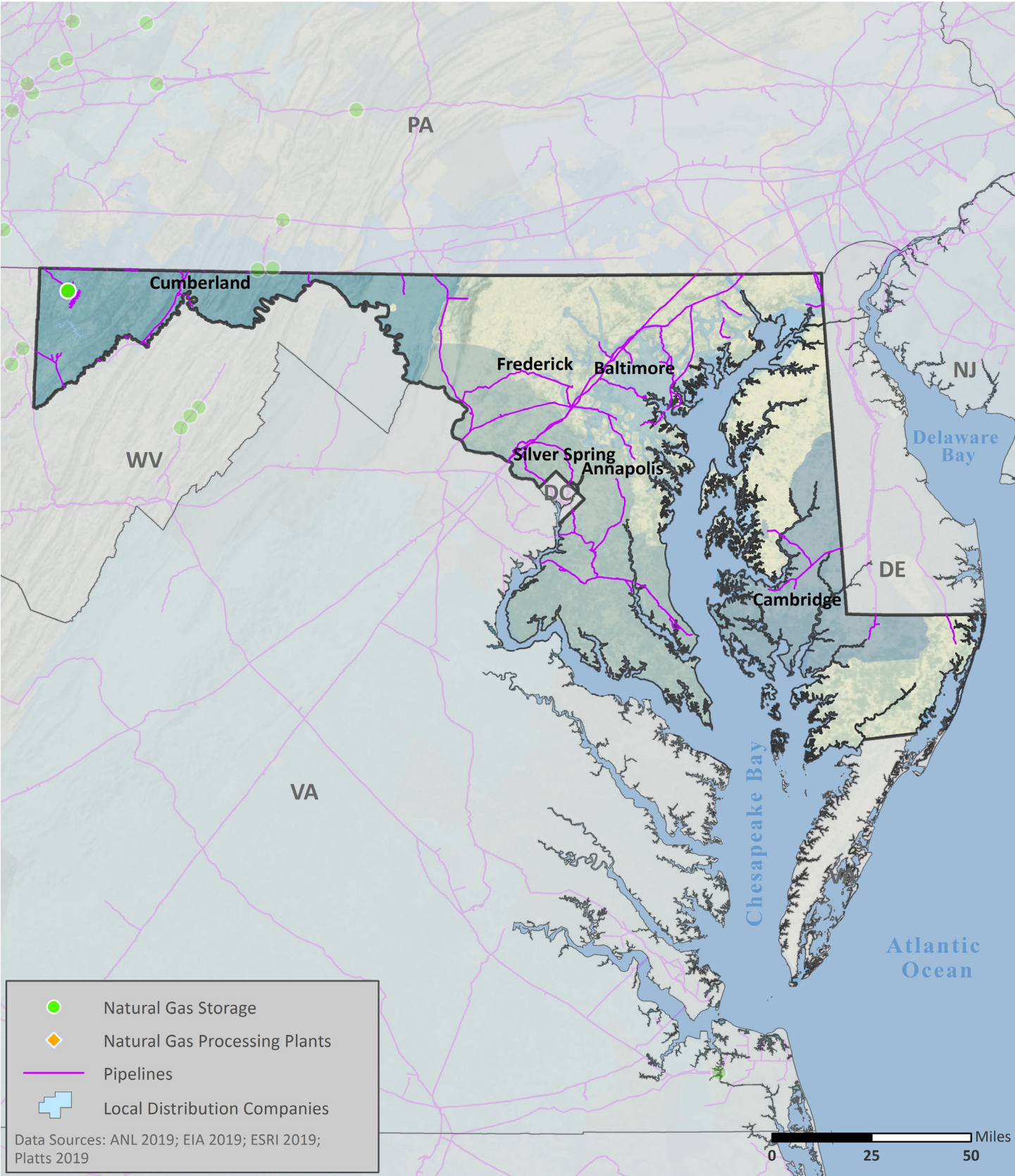


Note: This chart uses a logarithmic scale to display a very wide range of values.
Data Source: Eaton



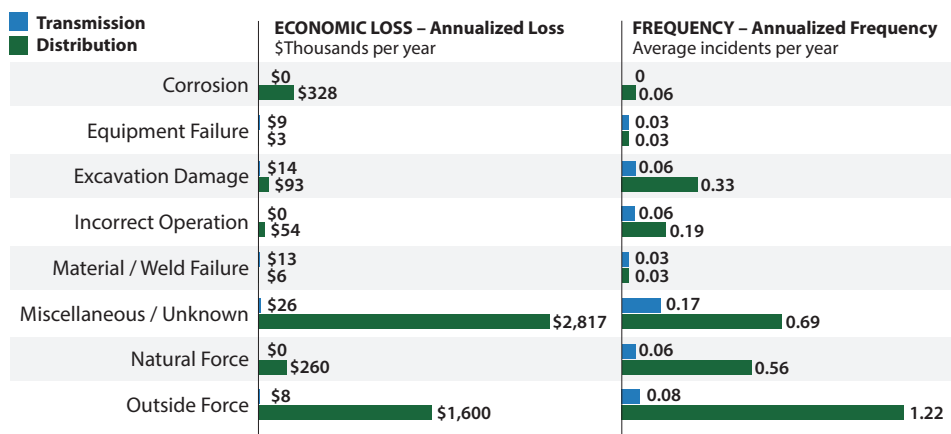


NATURAL GAS



Natural Gas Transport

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



Data Source: DOT PHMSA

- As of 2018, Maryland had:
 - 996 miles of natural gas transmission pipelines
 - 15,162 miles of natural gas distribution pipelines
- 52% of Maryland's natural gas transmission system and 22% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Maryland'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)
 - **Miscellaneous or Unknown** events when transported by distribution pipelines (2nd leading cause nationwide at \$67.89M per year)

Natural Gas Processing and Liquefied Natural Gas

Natural Gas Customers and Consumption by Sector, 2018

	 CUSTOMERS	 CONSUMPTION
Residential 	94%	33%
Commercial 	6%	30%
Industrial 	<1%	6%
Transportation 	<1%	<1%
Electric Power 	<1%	31%
Other	<1%	<1%

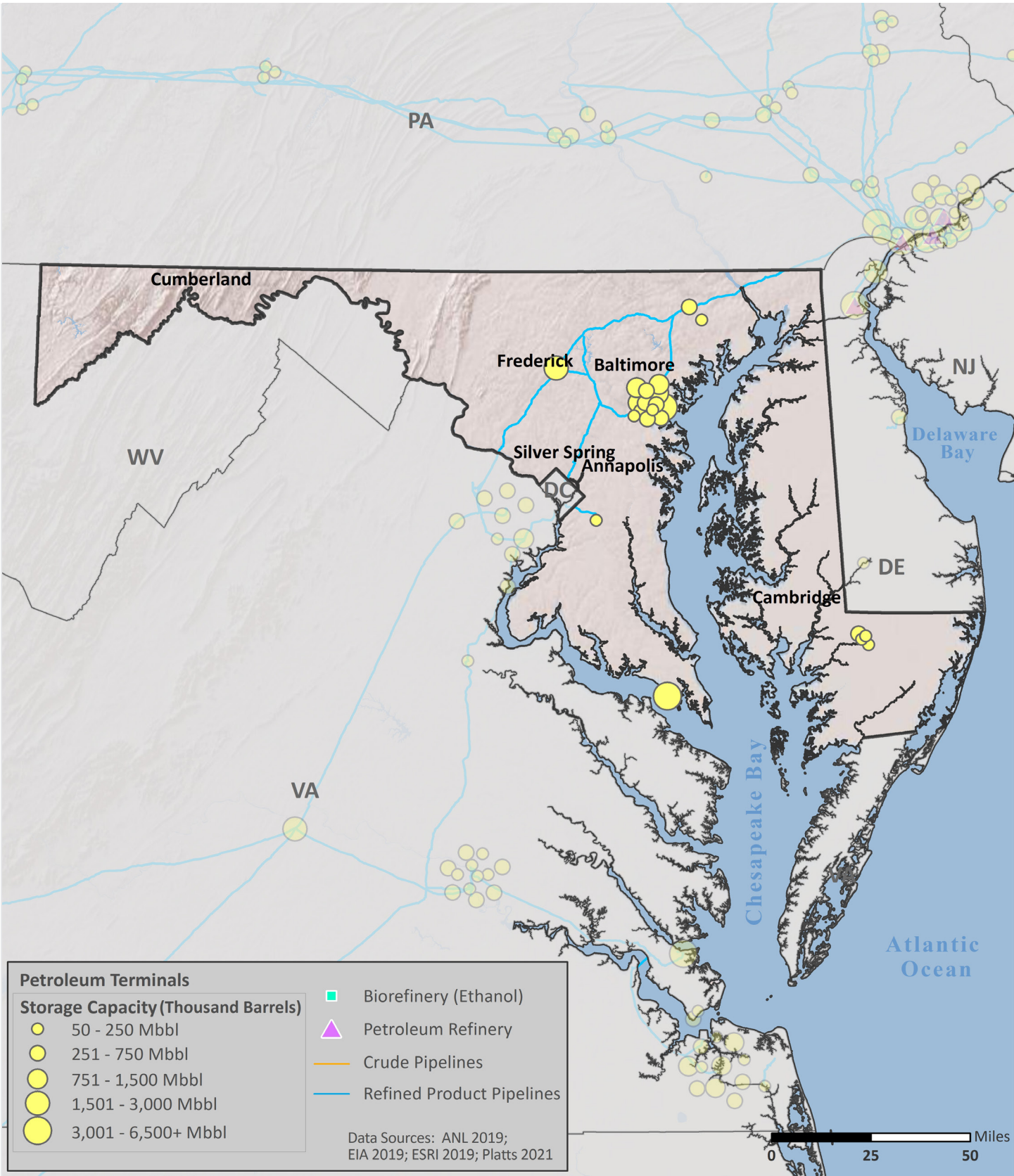
Data Source: EIA

- Maryland has 0 natural gas processing facilities.
- Maryland has 2 liquefied natural gas (LNG) facilities with a total storage capacity of 4,640,000 barrels.



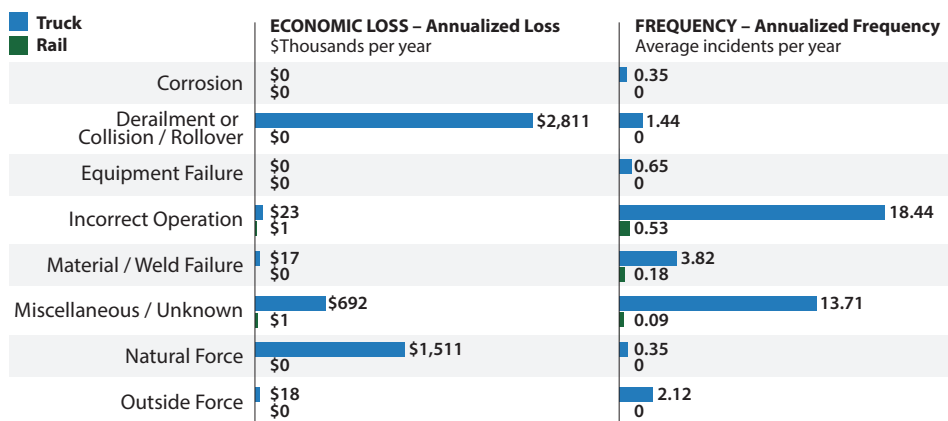


PETROLEUM



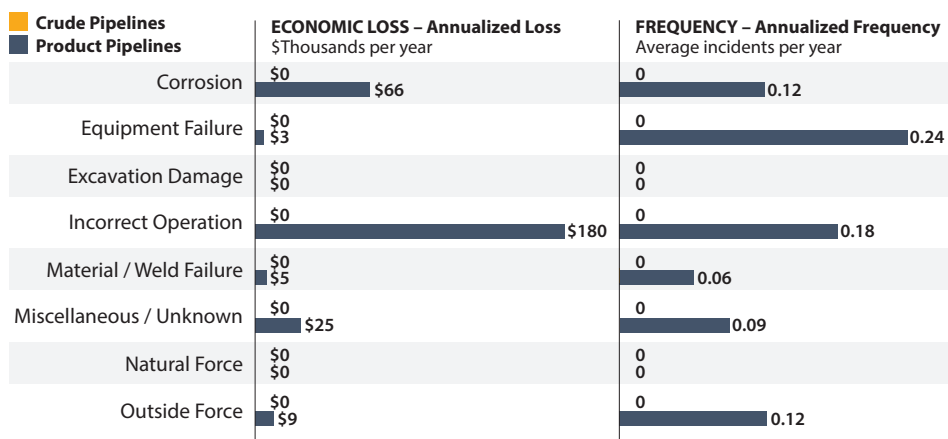
Petroleum Transport

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, Maryland had:
 - 0 miles of crude oil pipelines
 - 320 miles of refined product pipelines
 - 0 miles of biofuels pipelines
- 78% of Maryland's petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Maryland'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 product pipelines (7th leading cause nationwide at \$3.62M per year)
- Disruptions in other states may impact supply.

Petroleum Refineries

- There are no operating petroleum refineries in Maryland.

