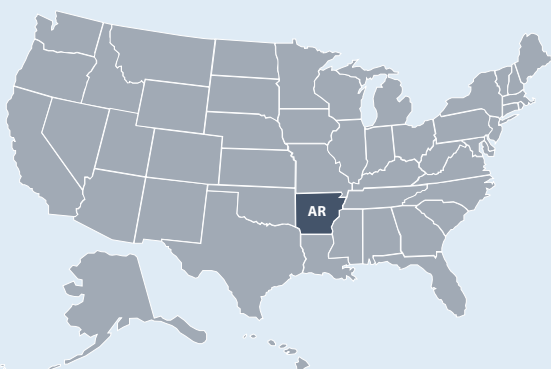




State of Arkansas

ENERGY SECTOR RISK PROFILE



Arkansas State Facts



POPULATION

3.01 M



HOUSING
UNITS

1.38 M



BUSINESS
ESTABLISHMENTS

0.07 M

ENERGY EMPLOYMENT: 27,804 jobs

PUBLIC UTILITY COMMISSION: Arkansas Public Service Commission

STATE ENERGY OFFICE: Arkansas Department of Energy and Environment, Office of Energy

EMERGENCY MANAGEMENT AGENCY: Arkansas Department of Public Safety, Division of Emergency Management

AVERAGE ELECTRICITY TARIFF: 7.78 cents/kWh

ENERGY EXPENDITURES: \$3,765/capita

ENERGY CONSUMPTION PER CAPITA: 352 MMBtu
(17th highest out of 50 states and Washington, D.C.)

GDP: \$128.4 billion

Data from 2020 or most recent year available.

For more information, see the Data Sources document.

ANNUAL ENERGY CONSUMPTION

ELECTRIC POWER: 49,600 GWh

COAL: 17,600 MSTN

NATURAL GAS: 349 Bcf

MOTOR GASOLINE: 33,500 Mbbl

DISTILLATE FUEL: 18,900 Mbbl

ANNUAL ENERGY PRODUCTION

ELECTRIC POWER GENERATION: 65 plants, 64.4 TWh,
10.9 GW total capacity

Coal: 5 plants, 23.3 TWh, 5.5 GW total capacity

Hydro: 19 plants, 4.1 TWh, 1.3 GW total capacity

Natural Gas: 17 plants, 21.8 TWh, 7.2 GW total capacity

Nuclear: 1 plant, 13.6 TWh, 1.8 GW total capacity

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

Wind & Solar: 8 plants, 0.2 TWh, 0.1 GW total capacity

Other sources: 12 plants, 1.4 TWh, 0.4 GW total capacity

COAL: 0 MSTN

NATURAL GAS: 520 Bcf

CRUDE OIL: 4,600 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 Arkansas'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.

Arkansas Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Winter Storms & Extreme Cold** at \$102 million per year (7th leading cause nationwide at \$418 million per year).
- Arkansas had 183 Major Disaster Declarations, 16 Emergency Declarations, and 0 Fire Management Assistance Declarations for 12 events between 2013 and 2019.
- Arkansas registered 6% fewer Heating Degree Days and 9% greater Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Little Rock.

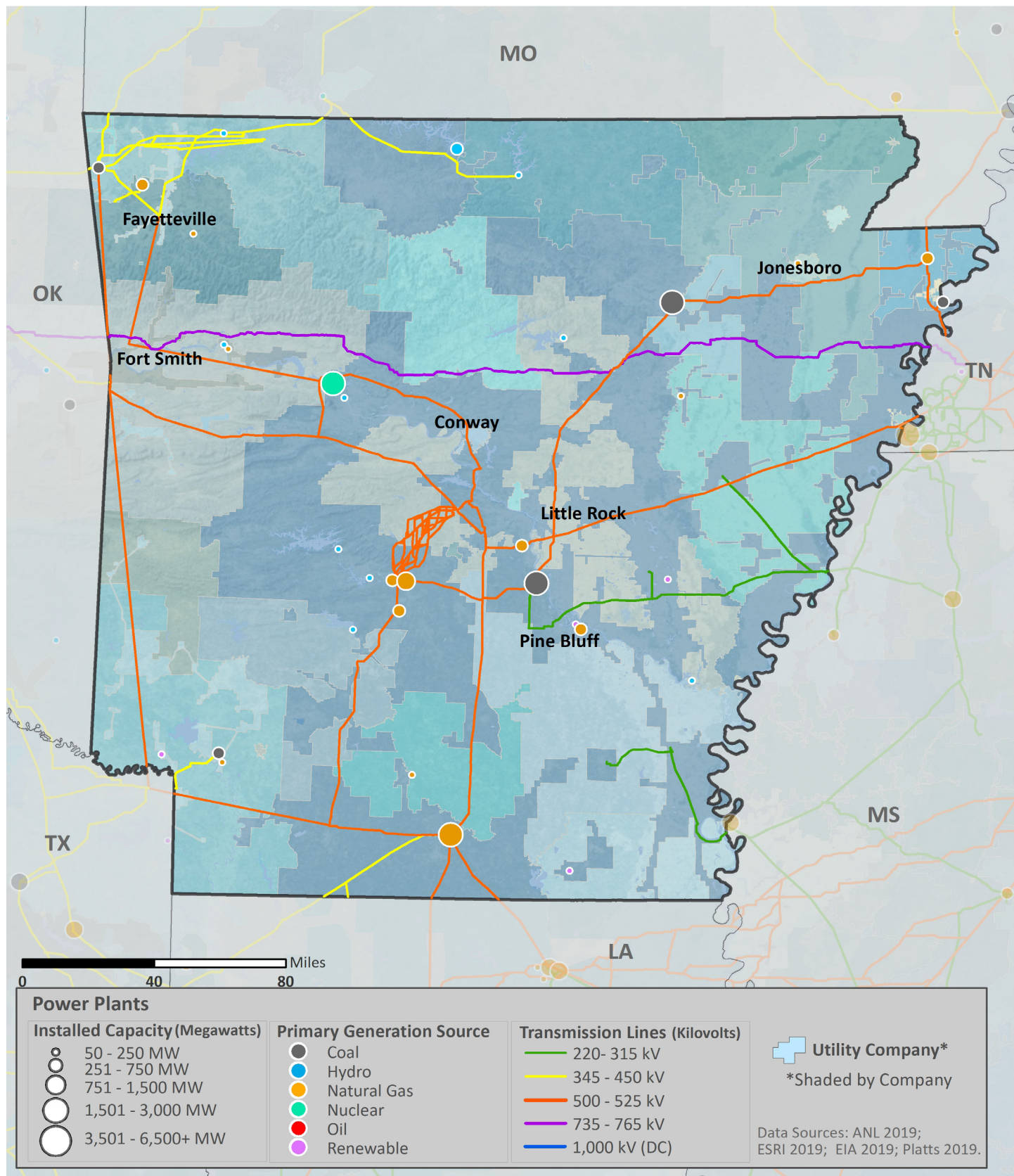
Annualized Frequency of and Property Damage Due to Natural Hazards, 2009 – 2019

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized (\$Million per year)
Drought	15	\$0
Earthquake (≥ 3.5 M)	2	\$0
Extreme Heat	13	\$0
Flood	63	\$39
Hurricane	<1	\$3
Landslide	<1	\$0
Thunderstorm & Lightning	109	\$21
Tornado	18	\$76
Wildfire	12	\$1
Winter Storm & Extreme Cold	18	\$102

Data Sources: NOAA and USGS



ELECTRIC



Electric Infrastructure

- Arkansas has 35 electric utilities:
 - 2 Investor owned
 - 17 Cooperative
 - 15 Municipal
 - 1 Other utility
- Plant retirements scheduled by 2025: 1 electric generating unit totaling 553 MW of installed capacity.

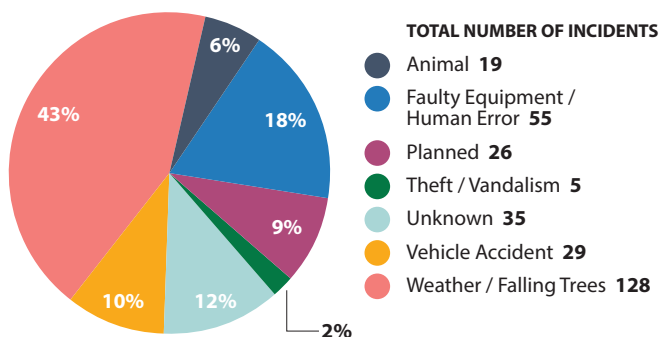
- In 2018, the average Arkansas electric customer experienced 1.7 interruptions that lasted an average of 5.4 hours.
- In Arkansas, between 2008 and 2017:
 - The greatest number of electric outages occurred in **April** (11th for outages nationwide)
 - The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)
 - Electric outages affected 188,379 customers on average

Electric Customers and Consumption by Sector, 2018

	 CUSTOMERS	 CONSUMPTION
Residential 	86%	39%
Commercial 	12%	25%
Industrial 	2%	36%
Transportation 	<1%	<1%

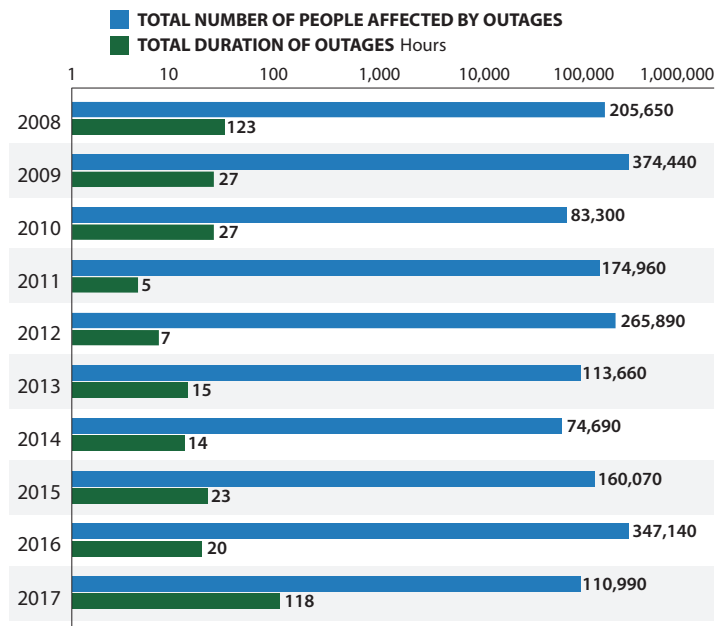
Data Source: EIA

Electric Utility-Reported Outages by Cause, 2008 – 2017



Data Source: Eaton

Electric Utility Outage Data, 2008 – 2017



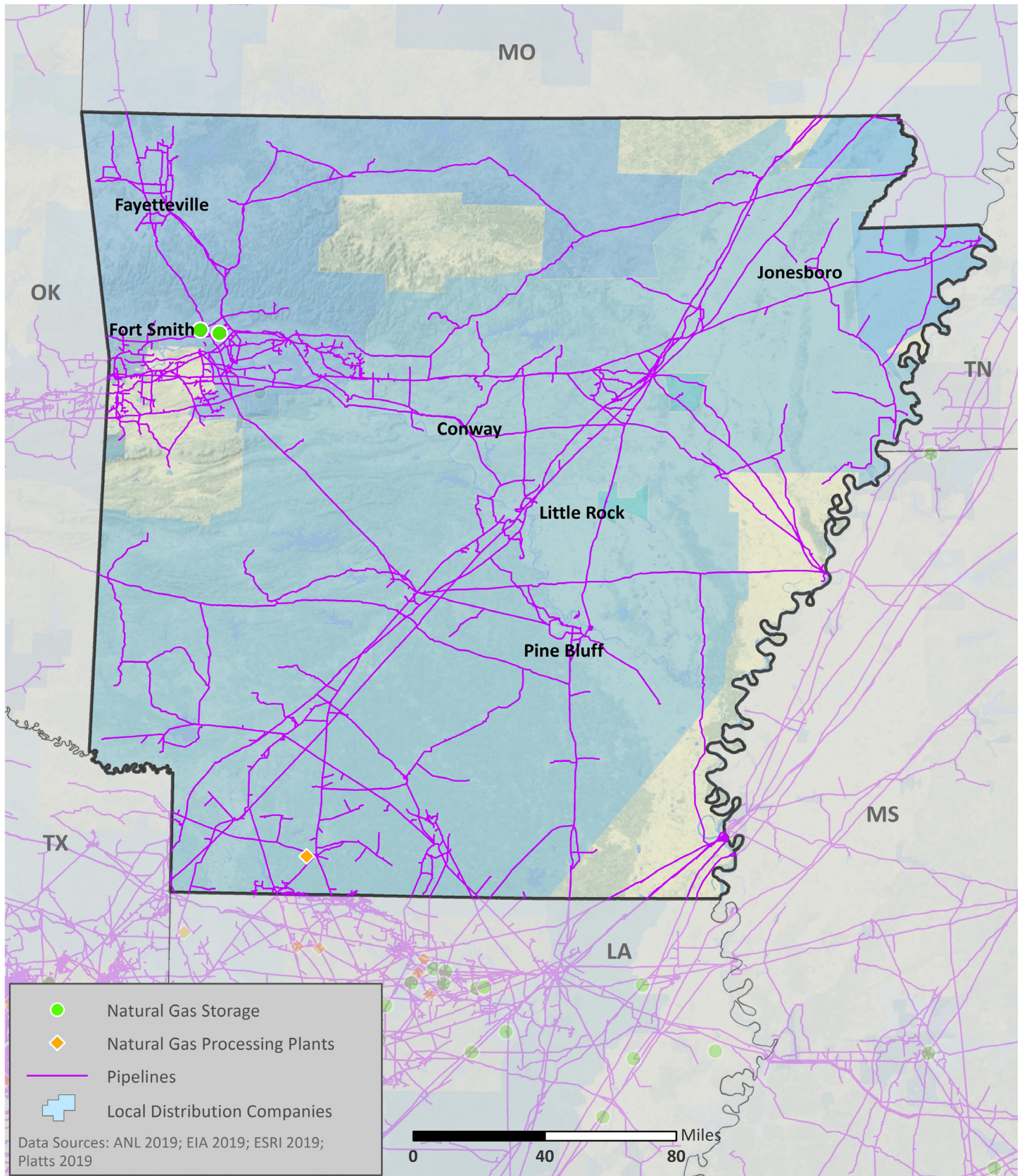
Note: This chart uses a logarithmic scale to display a very wide range of values.

Data Source: Eaton



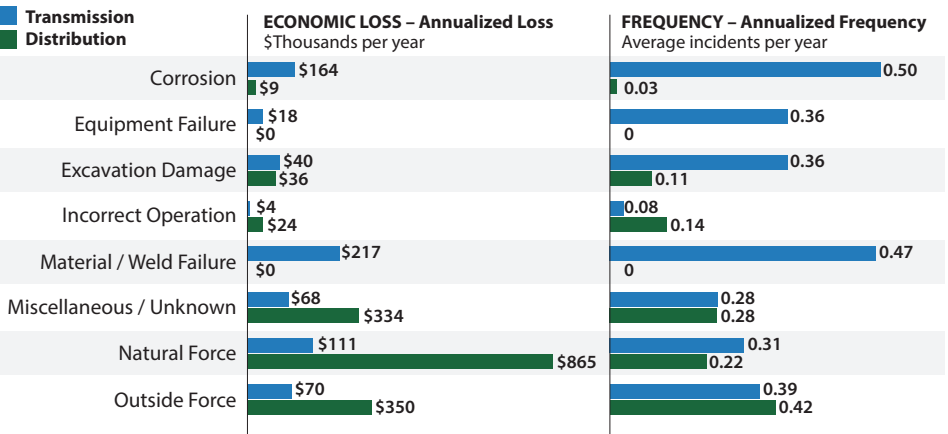


NATURAL GAS



Natural Gas Transport

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

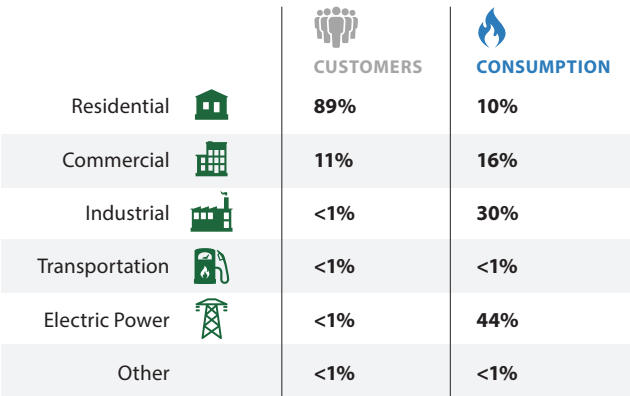


Data Source: DOT PHMSA

- As of 2018, Arkansas had:
 - 7,216 miles of natural gas transmission pipelines
 - 20,573 miles of natural gas distribution pipelines
- 63% of Arkansas’s natural gas transmission system and 52% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Arkansas’s natural gas supply was most impacted by:
 - Material Failures** when transported by transmission pipelines (leading cause nationwide at \$28.43M 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



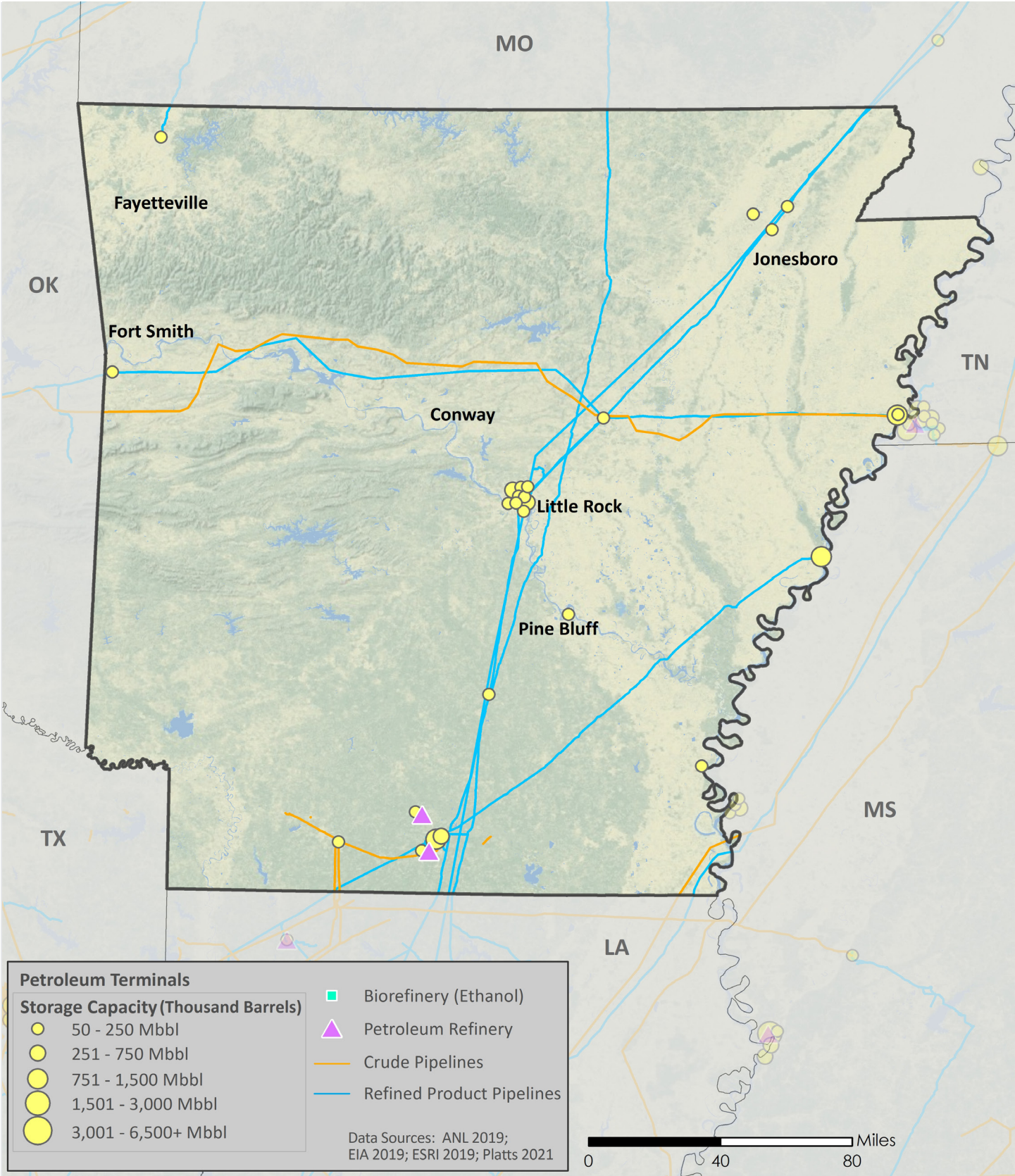
Data Source: EIA

- Arkansas has 1 natural gas processing facility with a total capacity of 12 MMcf/d.
- Arkansas has 0 liquefied natural gas (LNG) facilities.



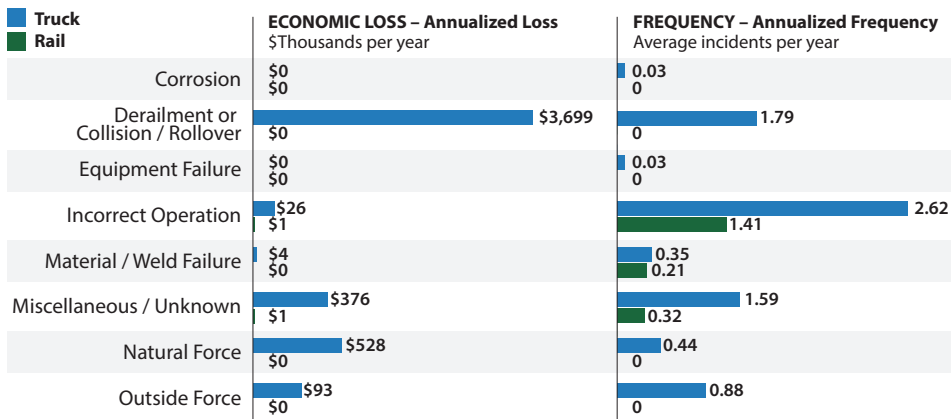


PETROLEUM



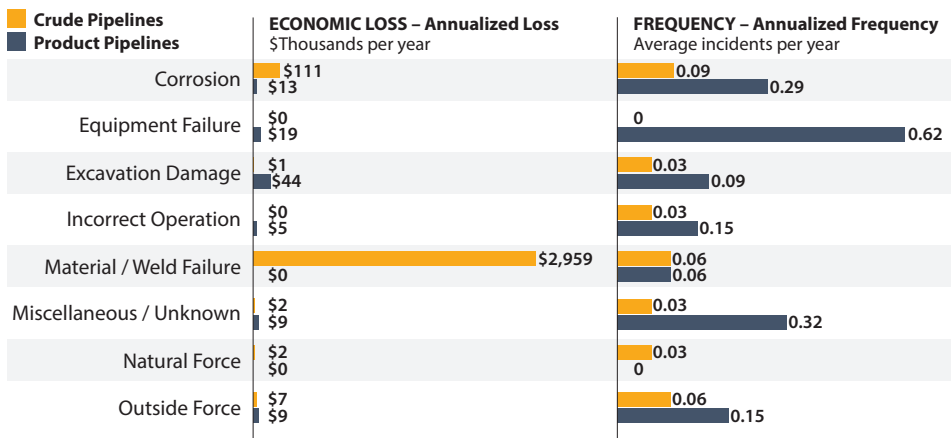
Petroleum Transport

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



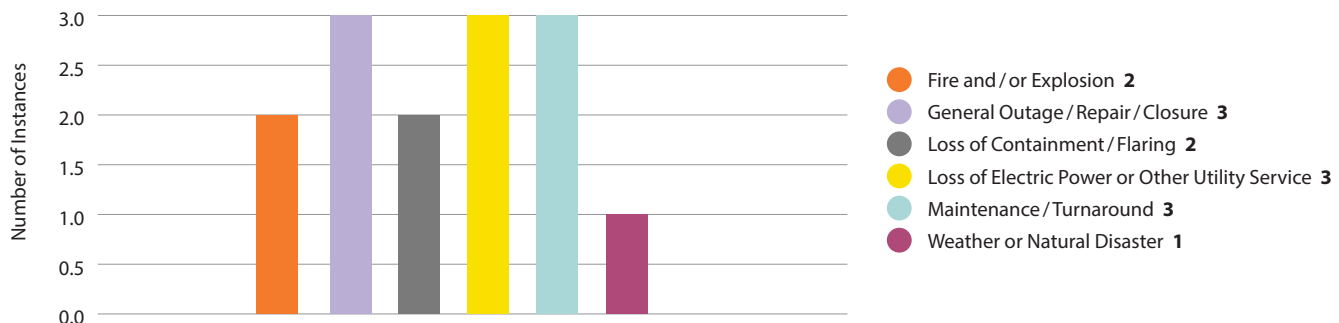
Data Source: DOT PHMSA

- As of 2018, Arkansas had:
 - 756 miles of crude oil pipelines
 - 459 miles of refined product pipelines
 - 0 miles of biofuels pipelines
- 48% of Arkansas's petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Arkansas'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)
 - Material Failures** when transported by crude pipelines (leading cause nationwide at \$41.36M per year)
 - Excavation Damage** when transported by product pipelines (5th leading cause nationwide at \$5.74M per year)
- Disruptions in other states may impact supply.

Petroleum Refineries

- Arkansas has 2 petroleum refineries with a total operable capacity of 90.5 Mb/d.
- Between 2009 and 2019, the leading causes of petroleum refinery disruptions in Arkansas were:
 - General Outages, Repairs, or Closures** (3rd leading cause nationwide)
 - Loss of Electric Power or Other Utility Services** (5th leading cause nationwide)
 - Maintenance** (2nd leading cause nationwide)

Causes and Frequency of Petroleum Refinery Disruptions, 2009 – 2019



Data Source: Hydrocarbon Publishing