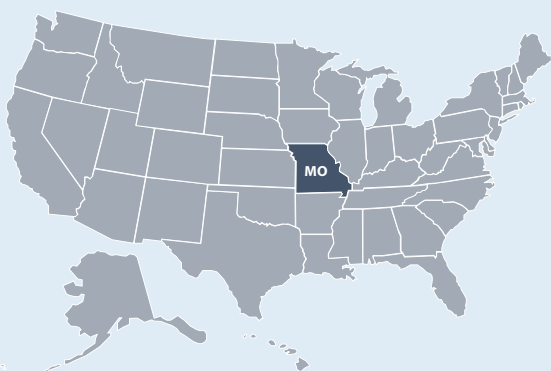




# State of Missouri ENERGY SECTOR RISK PROFILE



## Missouri State Facts



POPULATION

6.13 M



HOUSING UNITS

2.81 M



BUSINESS ESTABLISHMENTS

0.16 M

**ENERGY EMPLOYMENT:** 46,658 jobs  
**PUBLIC UTILITY COMMISSION:** Missouri Public Service Commission  
**STATE ENERGY OFFICE:** Missouri Department of Natural Resources, Division of Energy  
**EMERGENCY MANAGEMENT AGENCY:** Missouri Department of Public Safety – State Emergency Management Agency  
**AVERAGE ELECTRICITY TARIFF:** 9.93 cents/kWh  
**ENERGY EXPENDITURES:** \$3,464/capita  
**ENERGY CONSUMPTION PER CAPITA:** 283 MMBtu (28th highest out of 50 states and Washington, D.C.)  
**GDP:** \$318.9 billion

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

## ANNUAL ENERGY CONSUMPTION

**ELECTRIC POWER:** 82,060 GWh  
**COAL:** 37,900 MSTN  
**NATURAL GAS:** 309 Bcf  
**MOTOR GASOLINE:** 68,600 Mbbl  
**DISTILLATE FUEL:** 33,900 Mbbl

## ANNUAL ENERGY PRODUCTION

**ELECTRIC POWER GENERATION:** 144 plants, 78.3 TWh, 23.1 GW total capacity  
**Coal:** 11 plants, 55.7 TWh, 11.1 GW total capacity  
**Hydro:** 6 plants, 2.2 TWh, 0.5 GW total capacity  
**Natural Gas:** 41 plants, 7.7 TWh, 7.3 GW total capacity  
**Nuclear:** 1 plant, 9.2 TWh, 1.2 GW total capacity  
**Petroleum:** 49 plants, 0.1 TWh, 1.3 GW total capacity  
**Wind & Solar:** 26 plants, 3.0 TWh, 1.0 GW total capacity  
**Other sources:** 10 plants, 0.5 TWh, 0.6 GW total capacity  
**COAL:** 200 MSTN  
**NATURAL GAS:** 0 Bcf  
**CRUDE OIL:** 0 Mbbl  
**ETHANOL:** 6,200 Mbbl

Data from EIA (2018, 2019).

This State Energy Risk Profile examines the relative magnitude of the risks that the state of Missouri’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.

## Missouri Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Tornadoes** at \$360 million per year (4th leading cause nationwide at \$2 billion per year).
- Missouri had 353 Major Disaster Declarations, 74 Emergency Declarations, and 0 Fire Management Assistance Declarations for 9 events between 2013 and 2019.
- Missouri registered 3% fewer Heating Degree Days and 7% greater Cooling Degree Days than average in 2019.
- There are 3 Fusion Centers in Missouri. The Primary Fusion Center is located in Jefferson City.

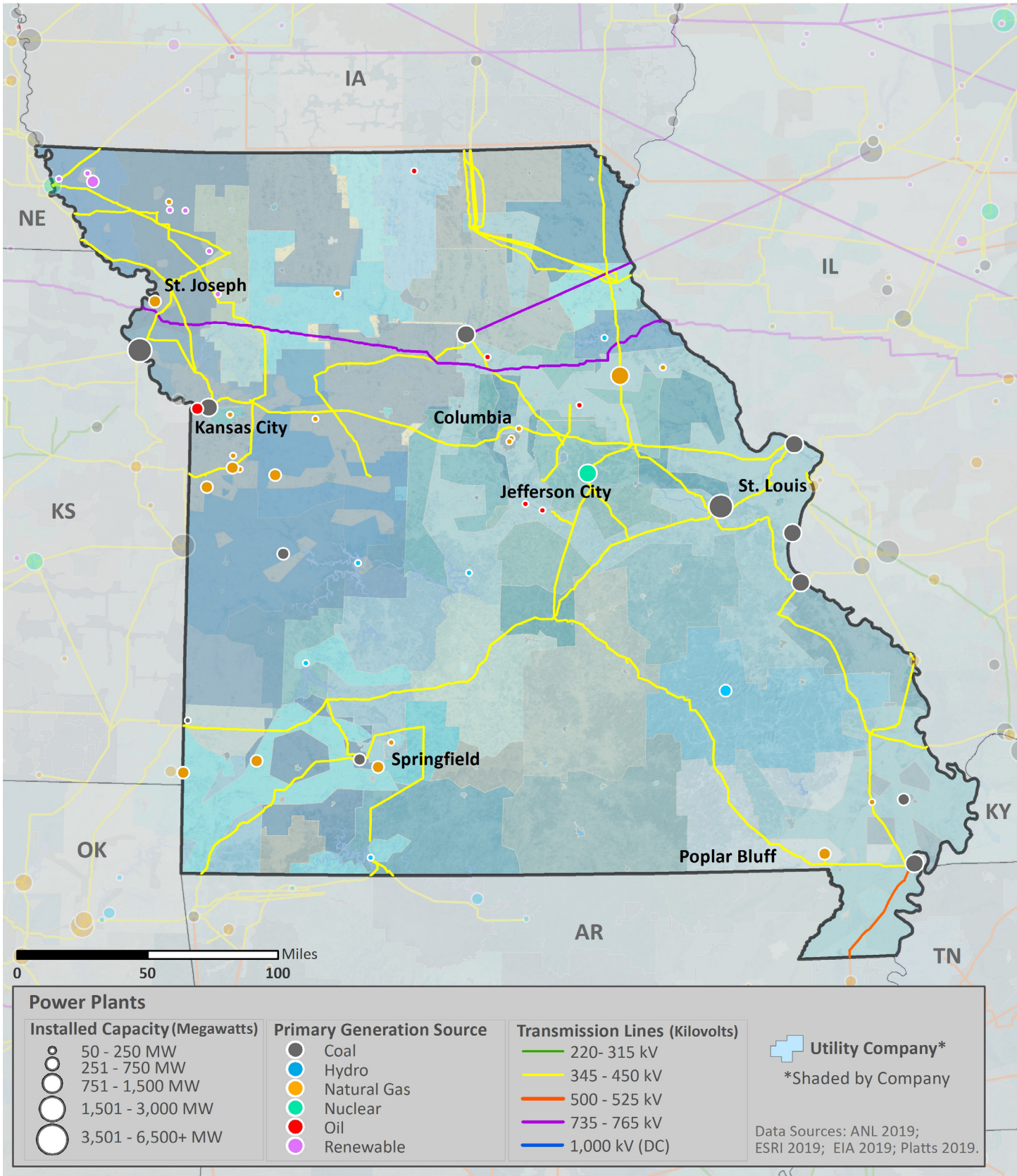
## Annualized Frequency of and Property Damage Due to Natural Hazards, 2009–2019

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized (\$Million per year)
Drought	8	\$1
Earthquake (≥ 3.5 M)	1	\$0
Extreme Heat	15	\$0
Flood	69	\$79
Hurricane	0	\$0
Landslide	0	\$0
Thunderstorm & Lightning	141	\$21
Tornado	23	\$360
Wildfire	3	\$0
Winter Storm & Extreme Cold	27	\$19

Data Sources: NOAA and USGS



# ELECTRIC









## Electric Infrastructure

- Missouri has 132 electric utilities:
  - 5 Investor owned
  - 44 Cooperative
  - 80 Municipal
  - 3 Other utilities
- Plant retirements scheduled by 2025: 14 electric generating units totaling 1,526 MW of installed capacity.

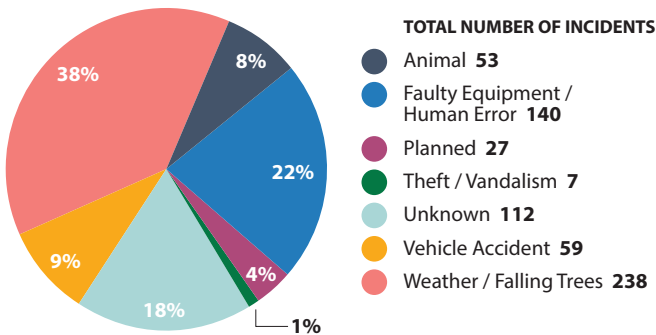
- In 2018, the average Missouri electric customer experienced 0.9 service interruptions that lasted an average of 2.5 hours.
- In Missouri, between 2008 and 2017:
  - The greatest number of electric outages occurred in **June** (2nd for outages nationwide)
  - The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)
  - Electric outages affected 250,582 customers on average

### Electric Customers and Consumption by Sector, 2018

	 CUSTOMERS	 CONSUMPTION
Residential 	88%	46%
Commercial 	12%	38%
Industrial 	<1%	16%
Transportation 	<1%	<1%

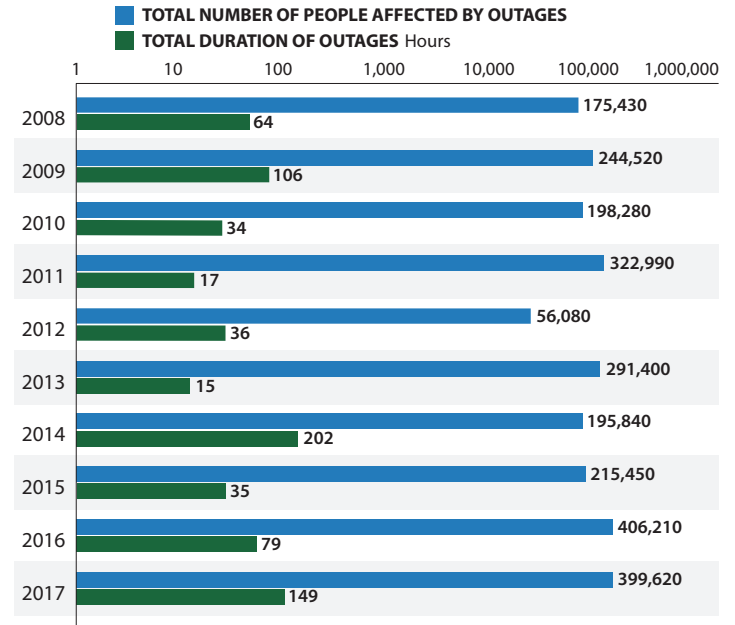
Data Source: EIA

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



Data Source: Eaton

### Electric Utility Outage Data, 2008 – 2017

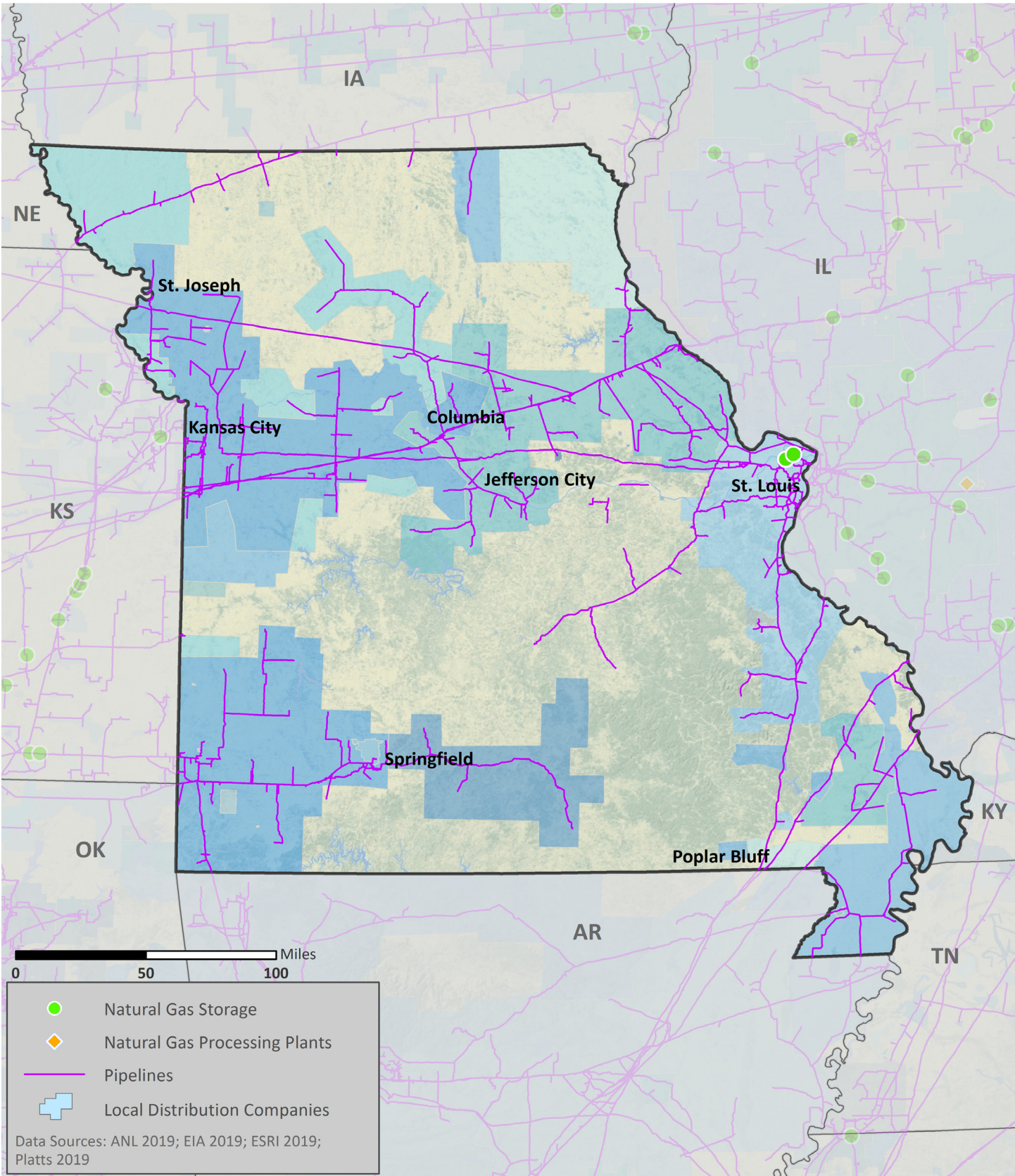


Note: This chart uses a logarithmic scale to display a very wide range of values.  
Data Source: Eaton



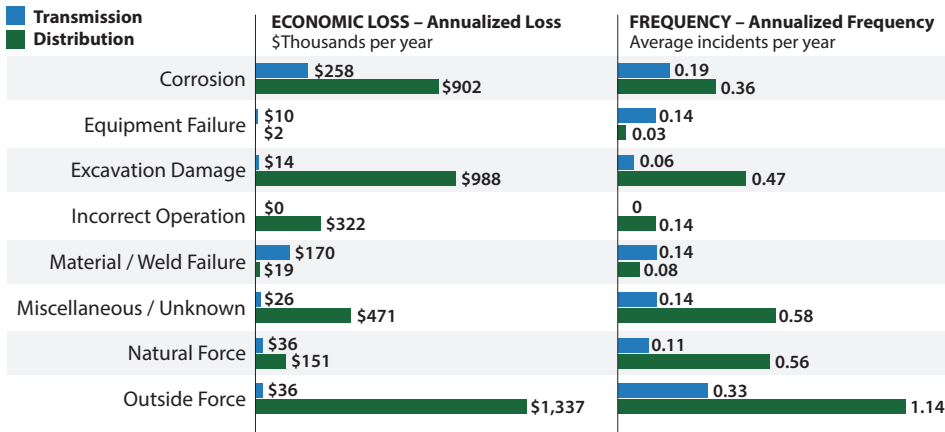


# NATURAL GAS



## Natural Gas Transport

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

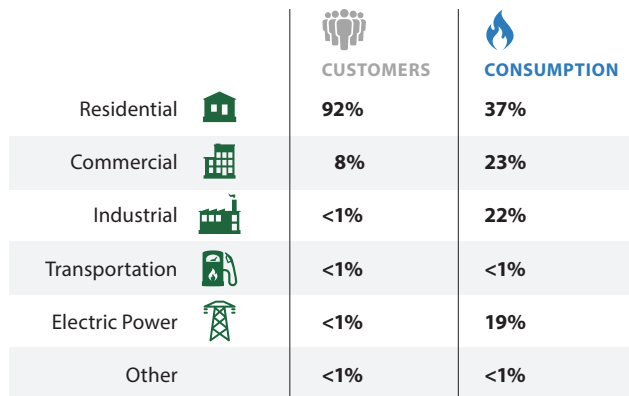


Data Source: DOT PHMSA

- As of 2018, Missouri had:
  - 4,580 miles of natural gas transmission pipelines
  - 27,979 miles of natural gas distribution pipelines
- 66% of Missouri’s natural gas transmission system and 16% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Missouri’s natural gas supply was most impacted by:
  - **Corrosion** when transported by transmission pipelines (4th leading cause nationwide at \$20.15M 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



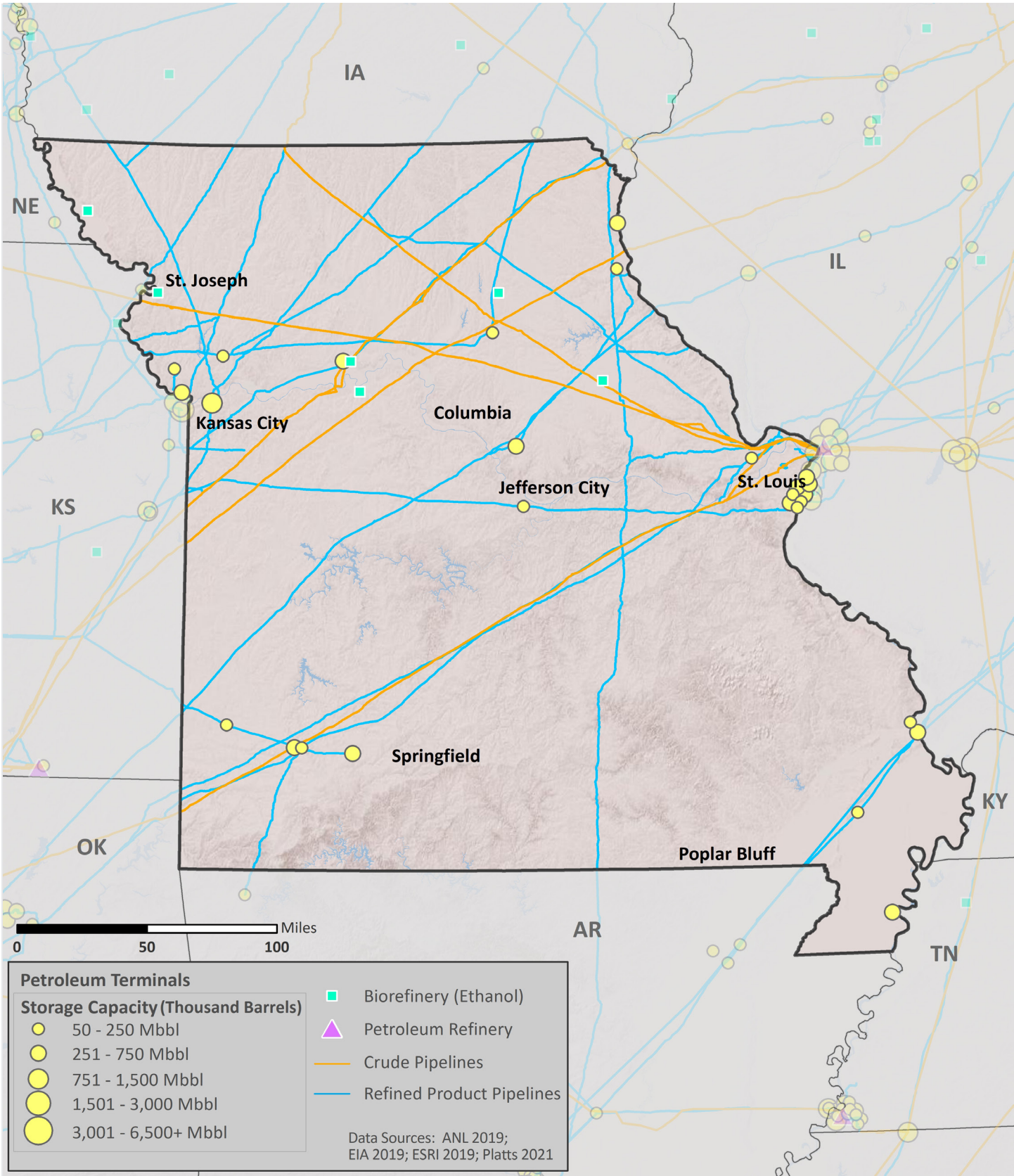
Data Source: EIA

- Missouri has 0 natural gas processing facilities.
- Missouri has 0 liquefied natural gas (LNG) facilities with a total storage capacity of 0 barrels.



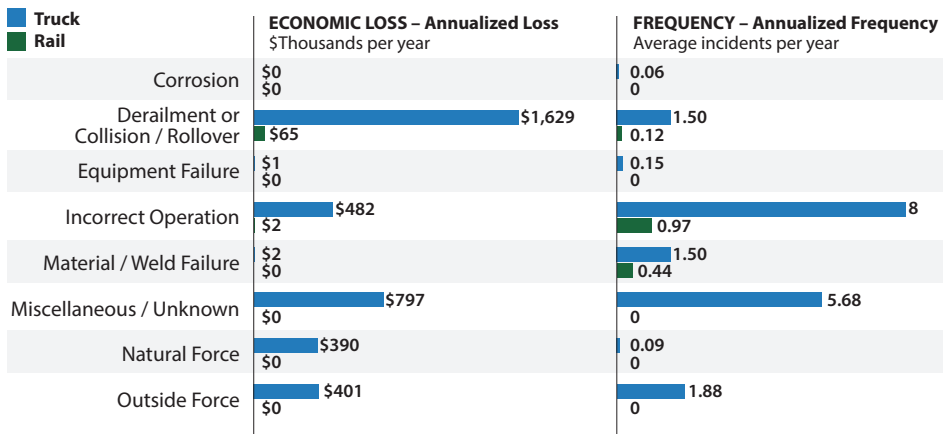


# PETROLEUM



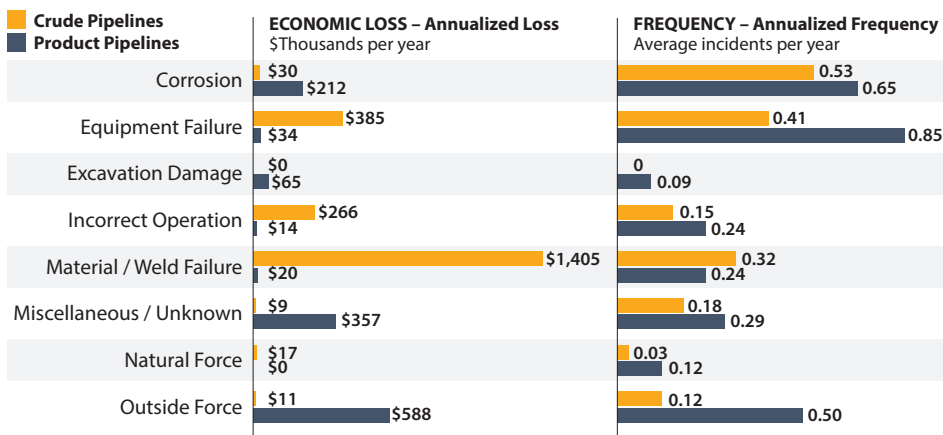
## Petroleum Transport

### 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, Missouri had:
  - 1,844 miles of crude oil pipelines
  - 1,916 miles of refined product pipelines
  - 0 miles of biofuels pipelines
- 62% of Missouri’s petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Missouri’s petroleum supply was most impacted by:
  - **Derailments, Collisions, or Rollovers** when transported by truck (8th leading cause nationwide at \$0.07M per year)
  - **Derailments, Collisions, or Rollovers** when transported by rail (leading cause nationwide at \$19.71M per year)
  - **Material Failures** when transported by crude pipelines (leading cause nationwide at \$41.36M per year)
  - **Outside Forces** when transported by product pipelines (leading cause nationwide at \$19.06M per year)
- Disruptions in other states may impact supply.

## Petroleum Refineries

- There are no operating petroleum refineries in Missouri.

