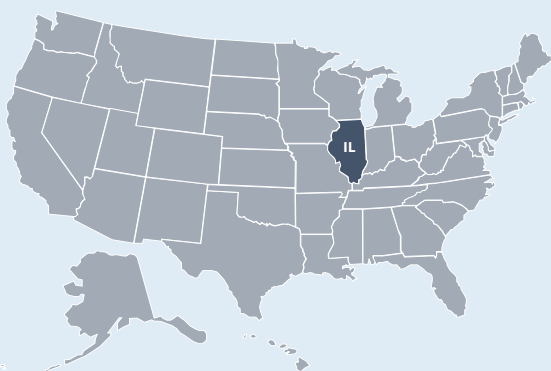




# State of Illinois ENERGY SECTOR RISK PROFILE



## Illinois State Facts



POPULATION

12.74 M



HOUSING UNITS

5.38 M



BUSINESS ESTABLISHMENTS

0.32 M

ENERGY EMPLOYMENT: 114,071 jobs

PUBLIC UTILITY COMMISSION: Illinois Commerce Commission

STATE ENERGY OFFICE: Illinois Environmental Protection Agency Office of Energy

EMERGENCY MANAGEMENT AGENCY: Illinois Emergency Management Agency

AVERAGE ELECTRICITY TARIFF: 9.60 cents/kWh

ENERGY EXPENDITURES: \$3,168/capita

ENERGY CONSUMPTION PER CAPITA: 303 MMBtu (25th highest out of 50 states and Washington, D.C.)

GDP: \$865.3 billion

Data from 2020 or most recent year available.

For more information, see the Data Sources document.

## ANNUAL ENERGY CONSUMPTION

ELECTRIC POWER: 233,030 GWh

COAL: 39,100 MSTN

NATURAL GAS: 1,106 Bcf

MOTOR GASOLINE: 108,500 Mbbl

DISTILLATE FUEL: 50,500 Mbbl

## ANNUAL ENERGY PRODUCTION

ELECTRIC POWER GENERATION: 222 plants, 184.5 TWh, 37.7 GW total capacity

Coal: 15 plants, 48.8 TWh, 11.7 GW total capacity

Hydro: 9 plants, 0.1 TWh, 0.0 GW total capacity

Natural Gas: 79 plants, 21.3 TWh, 18.8 GW total capacity

Nuclear: 6 plants, 98.7 TWh, 12.4 GW total capacity

Petroleum: 38 plants, 0.0 TWh, 0.8 GW total capacity

Wind & Solar: 50 plants, 14.5 TWh, 5.3 GW total capacity

Other sources: 25 plants, 0.9 TWh, 0.4 GW total capacity

COAL: 48,300 MSTN

NATURAL GAS: 0 Bcf

CRUDE OIL: 8,200 Mbbl

ETHANOL: 41,600 Mbbl

Data from EIA (2018, 2019).

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

## Illinois Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Tornadoes** at \$144 million per year (4th leading cause nationwide at \$2 billion per year).
- Illinois had 90 Major Disaster Declarations, 0 Emergency Declarations, and 0 Fire Management Assistance Declarations for 3 events between 2013 and 2019.
- Illinois registered 4% fewer Heating Degree Days and 12% greater Cooling Degree Days than average in 2019.
- There are 2 Fusion Centers in Illinois. The Primary Fusion Center is located in Springfield.

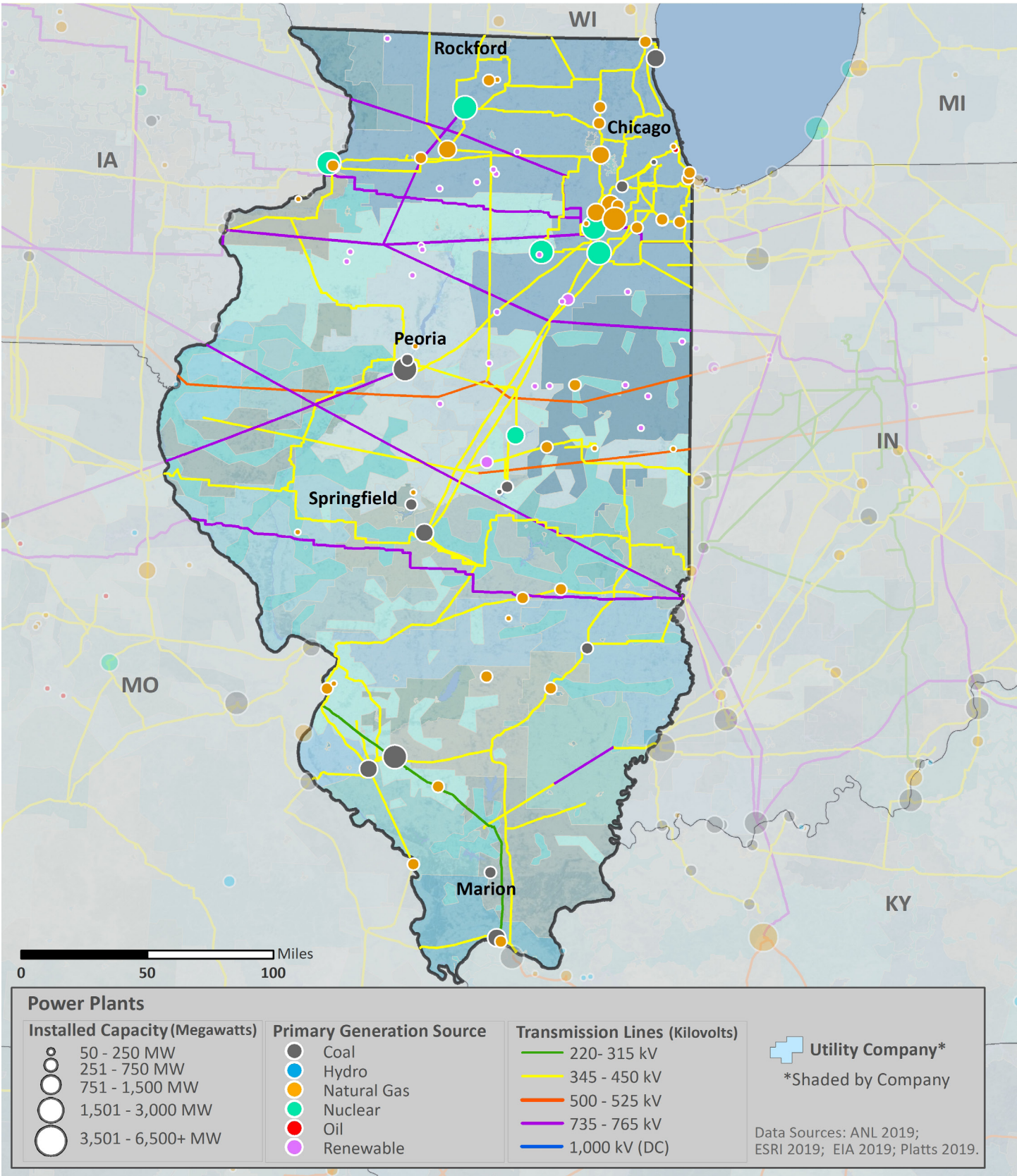
## Annualized Frequency of and Property Damage Due to Natural Hazards, 2009 – 2019

|                             | HAZARD FREQUENCY – Annualized | PROPERTY DAMAGE – Annualized (\$Million per year) |
|-----------------------------|-------------------------------|---|
| Drought                     | 4                             | \$0   |
| Earthquake (≥ 3.5 M)        | <1                            | \$0   |
| Extreme Heat                | 12                            | \$0   |
| Flood                       | 74                            | \$122   |
| Hurricane                   | 0                             | \$0   |
| Landslide                   | 0                             | \$0   |
| Thunderstorm & Lightning    | 153                           | \$58  |
| Tornado                     | 24                            | \$144   |
| Wildfire                    | 1                             | \$0   |
| Winter Storm & Extreme Cold | 39                            | \$7   |

Data Sources: NOAA and USGS



# ELECTRIC









## Electric Infrastructure

- Illinois has 77 electric utilities:
  - 3 Investor owned
  - 26 Cooperative
  - 41 Municipal
  - 7 Other utilities
- Plant retirements scheduled by 2025: 16 electric generating units totaling 3,252 MW of installed capacity.

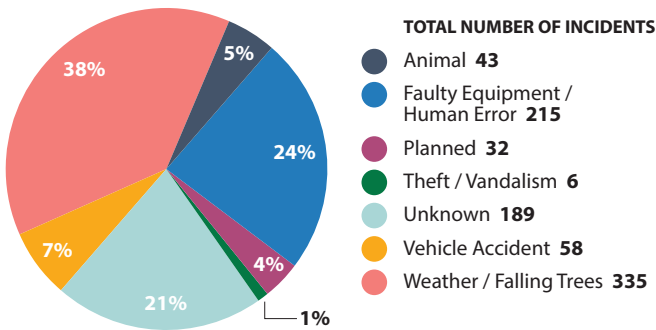
- In 2018, the average Illinois electric customer experienced 0.9 service interruptions that lasted an average of less than 1 hour.
- In Illinois, between 2008 and 2017:
  - The greatest number of electric outages occurred in **July** (leading month for outages nationwide)
  - The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)
  - Electric outages affected 624,486 customers on average

### Electric Customers and Consumption by Sector, 2018

|  |  CUSTOMERS |  CONSUMPTION |
|--|---|---|
| Residential     | 89%   | 33%   |
| Commercial      | 10%   | 36%   |
| Industrial      | <1%   | 31%   |
| Transportation  | <1%   | <1%   |

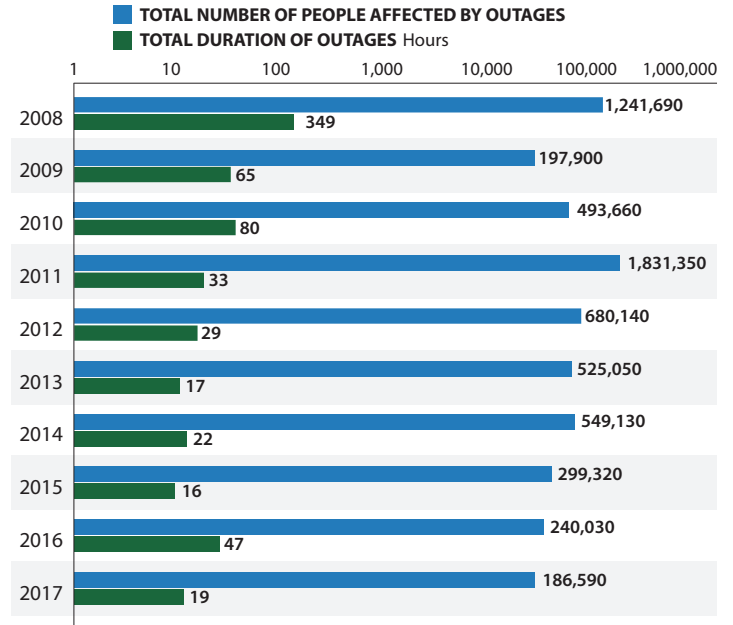
Data Source: EIA

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



Data Source: Eaton

### Electric Utility Outage Data, 2008 – 2017

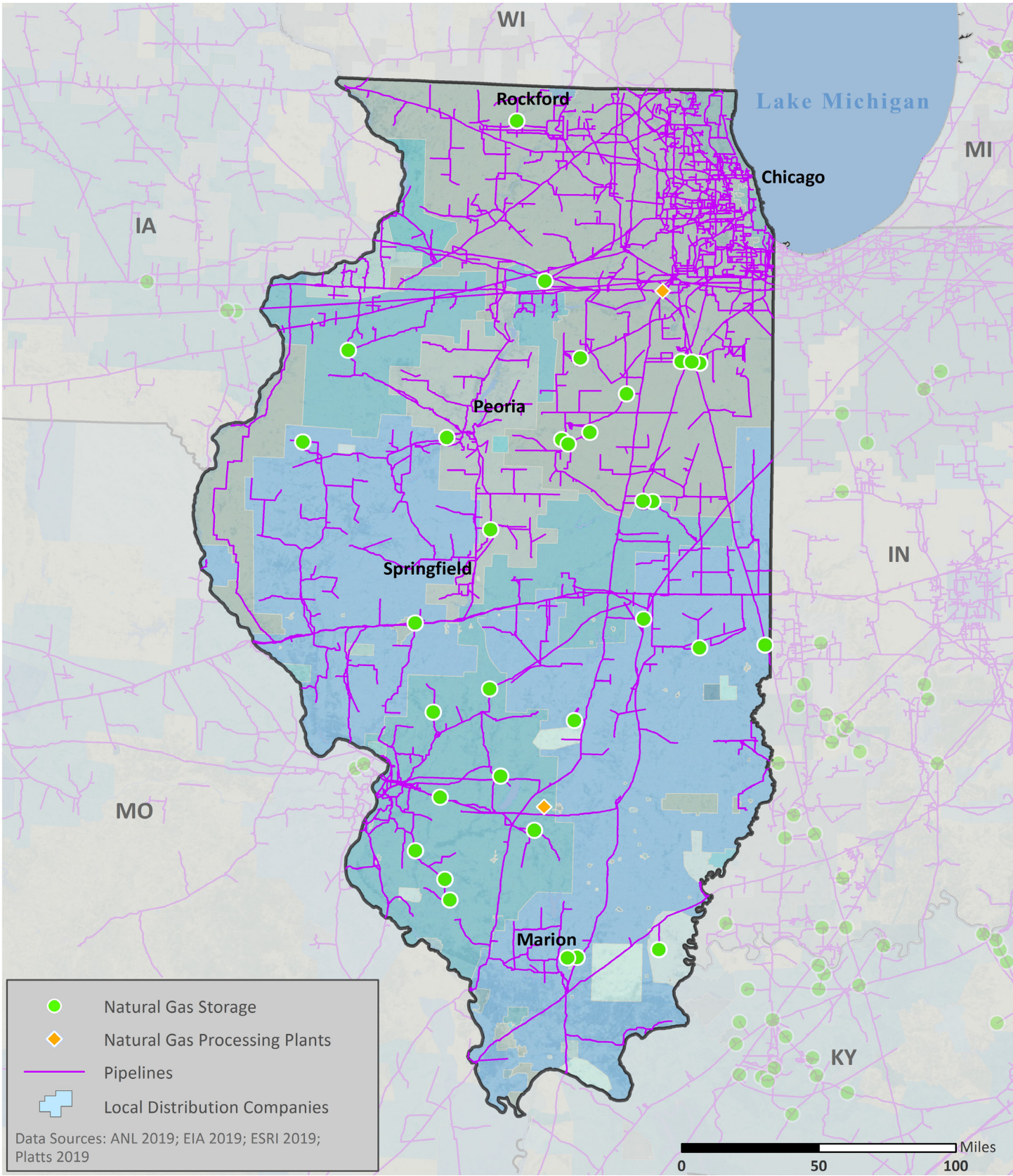


Note: This chart uses a logarithmic scale to display a very wide range of values.  
Data Source: Eaton



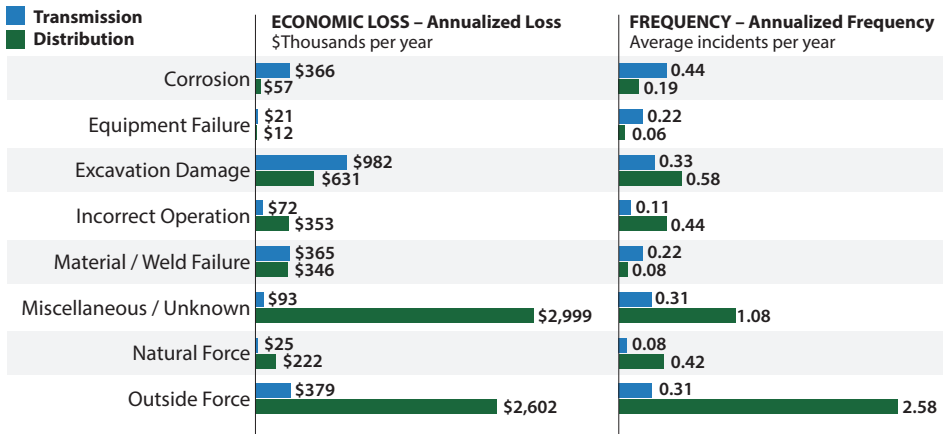


# NATURAL GAS



## Natural Gas Transport

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



Data Source: DOT PHMSA

- As of 2018, Illinois had:
  - 9,197 miles of natural gas transmission pipelines
  - 62,168 miles of natural gas distribution pipelines
- 70% of Illinois’s natural gas transmission system and 25% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Illinois’s natural gas supply was most impacted by:
  - **Excavation Damage** when transported by transmission pipelines (6th leading cause nationwide at \$6.41M 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    | 92%       | 40%         |
| Commercial     | 7%        | 22%         |
| Industrial     | <1%       | 24%         |
| Transportation | <1%       | <1%         |
| Electric Power | <1%       | 14%         |
| Other          | <1%       | <1%         |

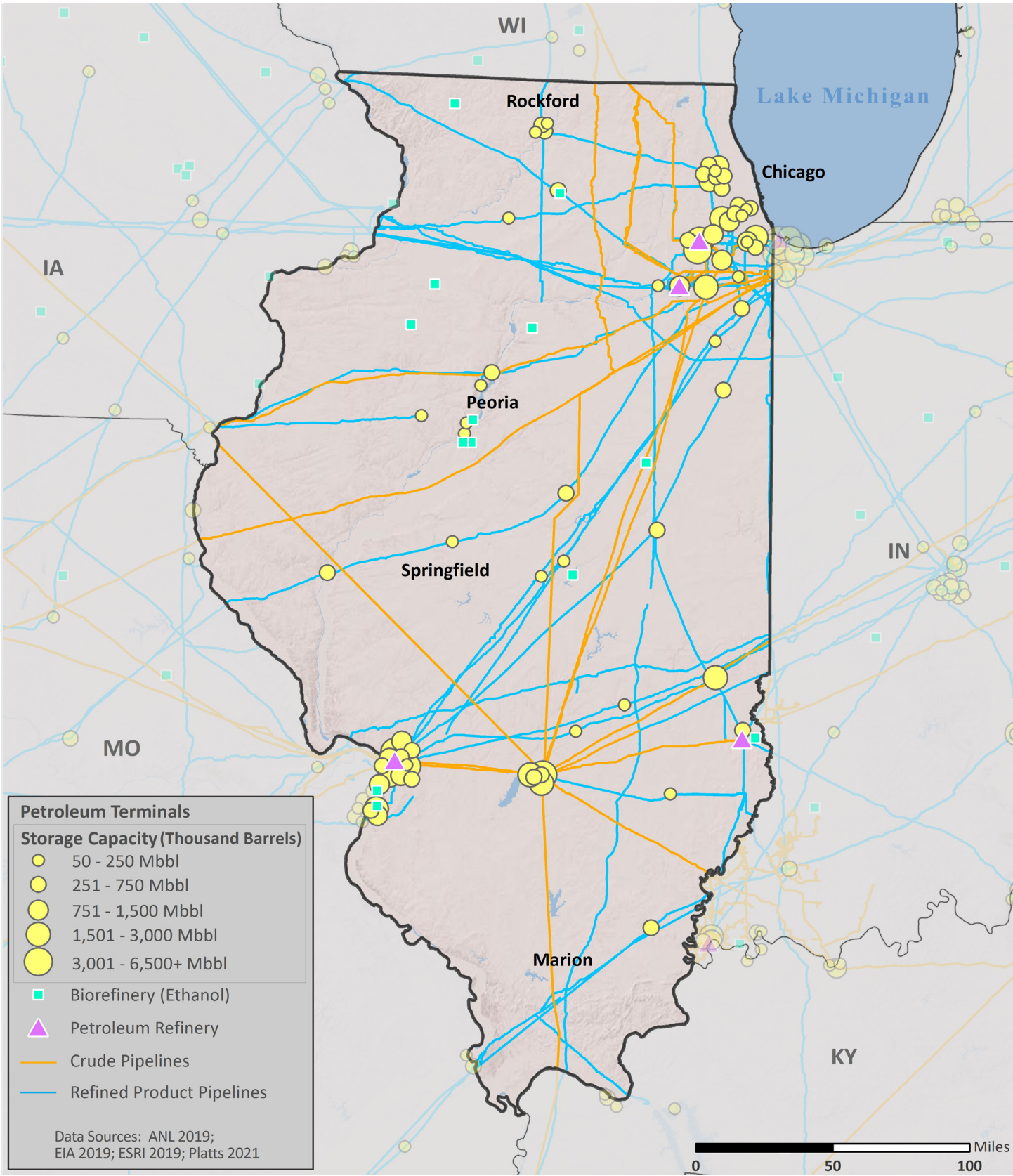
Data Source: EIA

- Illinois has 2 natural gas processing facilities with a total capacity of 2,102 MMcf/d.
- Illinois has 1 liquefied natural gas (LNG) facility with a total storage capacity of 580,000 barrels.



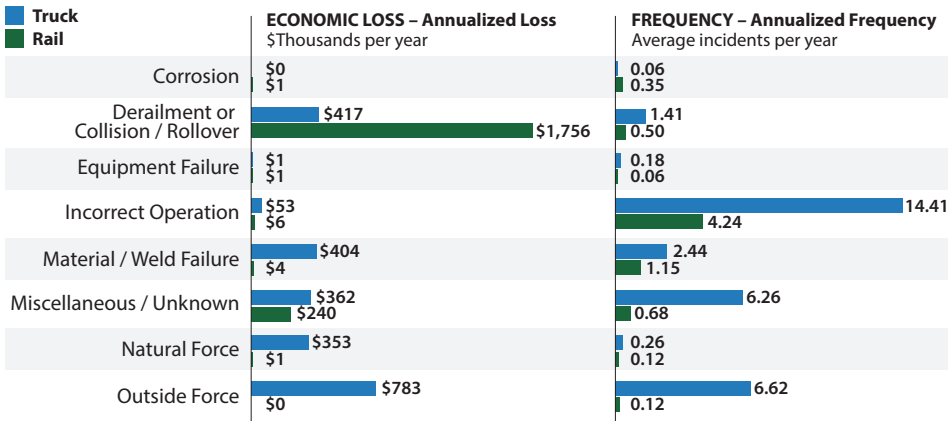


# PETROLEUM



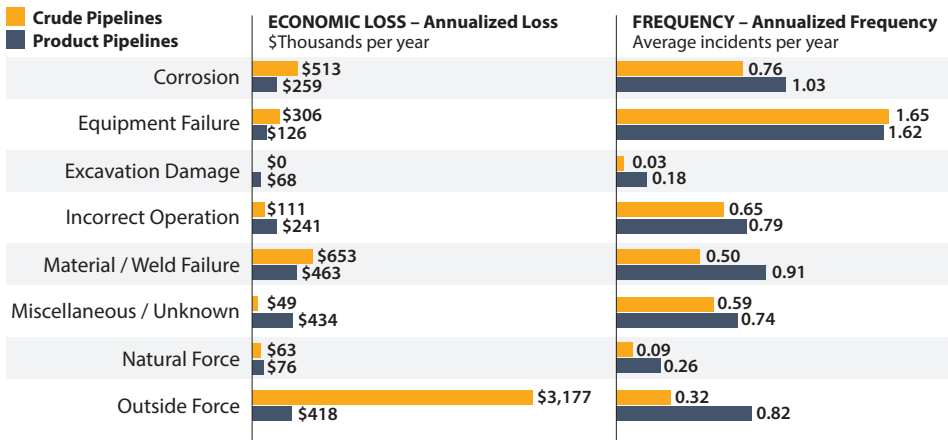
## Petroleum Transport

### 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



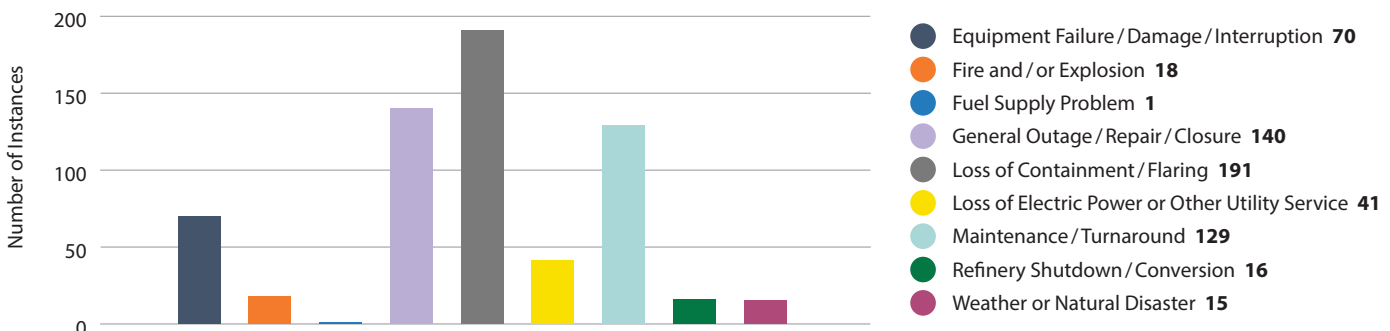
Data Source: DOT PHMSA

- As of 2018, Illinois had:
  - 3,160 miles of crude oil pipelines
  - 3,698 miles of refined product pipelines
  - 0 miles of biofuels pipelines
- 65% of Illinois’s petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Illinois’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)
  - **Outside Forces** when transported by crude pipelines (4th leading cause nationwide at \$8.71M 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

- Illinois has 4 petroleum refineries with a total operable capacity of 1,018.9 Mb/d.
- Between 2009 and 2019, the leading cause of petroleum refinery disruptions in Illinois was:
  - **Loss of Containment or Flaring** (leading cause nationwide)

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



Data Source: Hydrocarbon Publishing