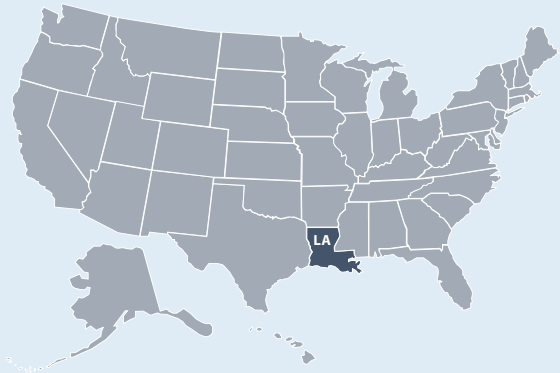
State of Louisiana
ENERGY SECTOR RISK PROFILE

U.S. DEPARTMENT OF ENERGY
Cybersecurity, Energy Security, and Emergency Response



Louisiana State Facts

POPULATION 4.66 M

HOUSING UNITS 2.08 M

BUSINESS ESTABLISHMENTS 0.11 M

ENERGY EMPLOYMENT: 128,763 jobs
PUBLIC UTILITY COMMISSION: Louisiana Public Service Commission
STATE ENERGY OFFICE: Louisiana Department of Natural Resources, State Energy Office
EMERGENCY MANAGEMENT AGENCY: Governor's Office of Homeland Security and Emergency Preparedness
AVERAGE ELECTRICITY TARIFF: 7.71 cents/kWh
ENERGY EXPENDITURES: $6,860/capita
ENERGY CONSUMPTION PER CAPITA: 960 MMBtu
(highest out of 50 states and Washington, D.C.)
GDP: $257.3 billion

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

ANNUAL ENERGY CONSUMPTION

ELECTRIC POWER: 94,190 GWh
COAL: 8,400 MSTN
NATURAL GAS: 1,571 Bcf
MOTOR GASOLINE: 62,000 Mbbl
DISTILLATE FUEL: 49,200 Mbbl

ANNUAL ENERGY PRODUCTION

ELECTRIC POWER GENERATION: 90 plants, 100.2 TWh, *24.6 GW total capacity*
- **Coal:** 4 plants, 7.4 TWh, *3.2 GW total capacity*
- **Hydro:** 1 plant, 1.4 TWh, *0.2 GW total capacity*
- **Natural Gas:** 55 plants, 69.5 TWh, *19.8 GW total capacity*
- **Nuclear:** 2 plants, 14.0 TWh, *2.2 GW total capacity*
- **Petroleum:** 5 plants, 3.2 TWh, *1.0 GW total capacity*
- **Wind & Solar:** 1 plant, 0.0 TWh, *0.0 GW total capacity*
- **Other sources:** 22 plants, 4.7 TWh, *1.4 GW total capacity*

COAL: 2,100 MSTN
NATURAL GAS: 3,230 Bcf
CRUDE OIL: 45,900 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 Louisiana'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.

Louisiana Risks and Hazards Overview

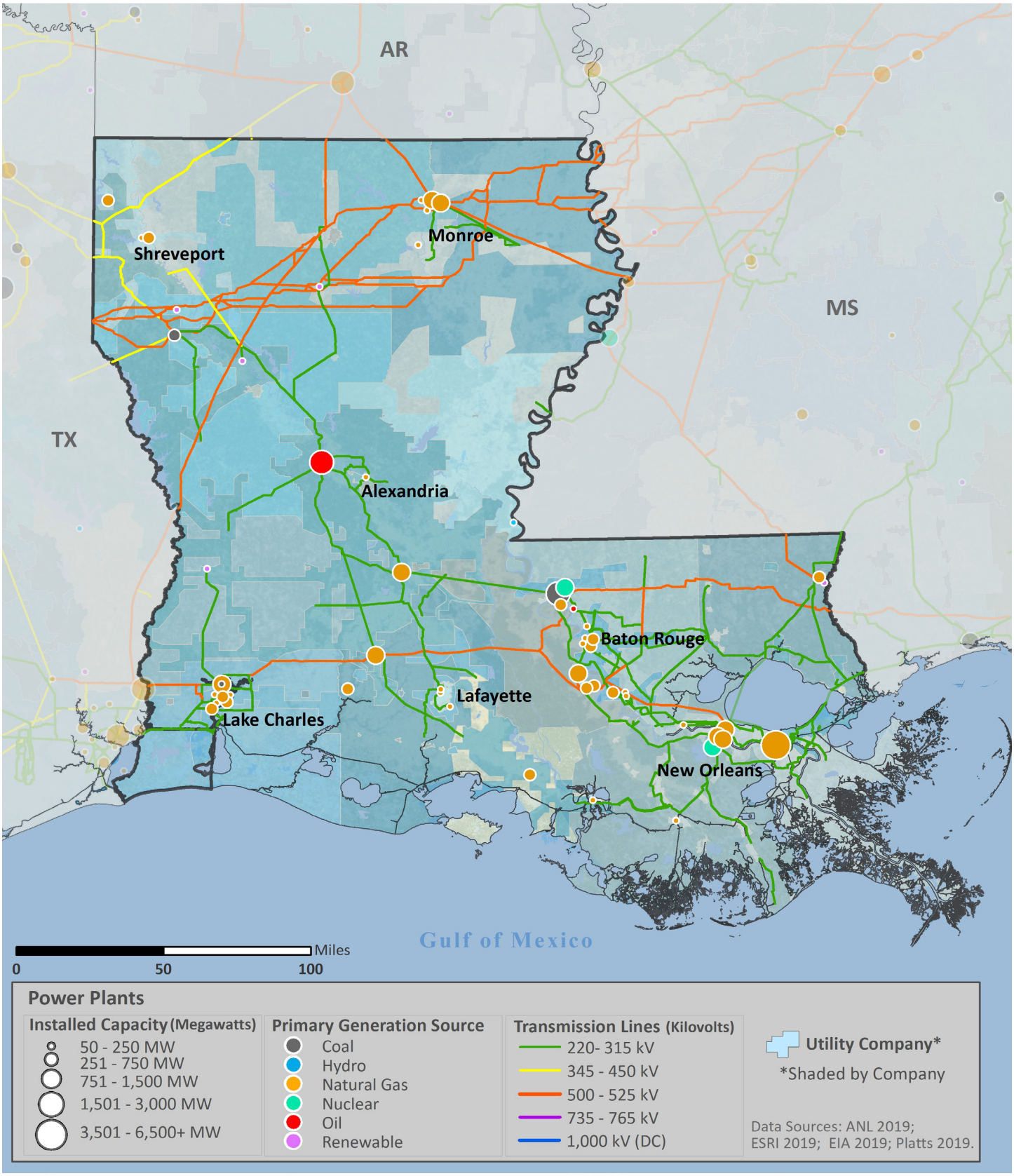
- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Flooding** at $1 billion per year *(leading cause nationwide at $12 billion per year).*
- Louisiana had 147 Major Disaster Declarations, 91 Emergency Declarations, and 0 Fire Management Assistance Declarations for 14 events between 2013 and 2019.
- Louisiana registered 16% fewer Heating Degree Days and 15% greater Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Baton Rouge.

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

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized ($Million per year)
Drought	6	$0
Earthquake (≥ 3.5 M)	<1	$0
Extreme Heat	5	$0
Flood	35	$1,001
Hurricane	1	$13
Landslide	0	$0
Thunderstorm & Lightning	93	$87
Tornado	24	$22
Wildfire	1	$0
Winter Storm & Extreme Cold	7	$1

Data Sources: NOAA and USGS

ELECTRIC


AR
MS
TX
Shreveport
Monroe
Alexandria
Baton Rouge
Lafayette
Lake Charles
New Orleans
Gulf of Mexico
Miles
0
50
100
Power Plants
Installed Capacity (Megawatts)
50 - 250 MW
251 - 750 MW
751 - 1,500 MW
1,501 - 3,000 MW
3,501 - 6,500+ MW
Primary Generation Source
Coal
Hydro
Natural Gas
Nuclear
Oil
Renewable
Transmission Lines (Kilovolts)
220- 315 kV
345 - 450 kV
500 - 525 kV
735 - 765 kV
1,000 kV (DC)
Utility Company*
*Shaded by Company
Data Sources: ANL 2019;
ESRI 2019; EIA 2019; Platts 2019.

Electric Infrastructure

- Louisiana has 36 electric utilities:
  - *3 Investor owned*
  - *10 Cooperative*
  - *22 Municipal*
  - *1 Other utility*
- Plant retirements scheduled by 2025: 8 electric generating units totaling 1,802 MW of installed capacity.

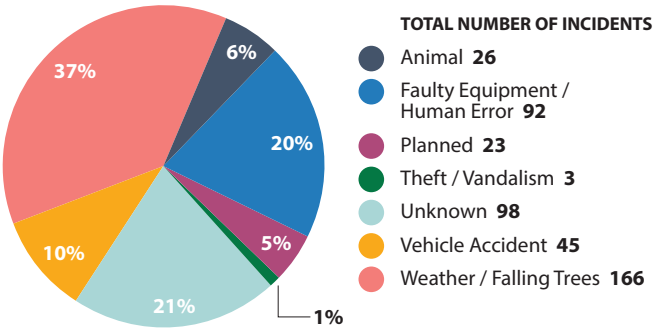
- In 2018, the average Louisiana electric customer experienced 2.1 service interruptions that lasted an average of 4.6 hours.
- In Louisiana, between 2008 and 2017:
  - *The greatest number of electric outages occurred in **August** (3rd for outages nationwide)*
  - *The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)*
  - *Electric outages affected 378,322 customers on average*

Electric Customers and Consumption by Sector, 2018

	CUSTOMERS	CONSUMPTION
Residential	87%	34%
Commercial	12%	26%
Industrial	<1%	40%
Transportation	<1%	<1%

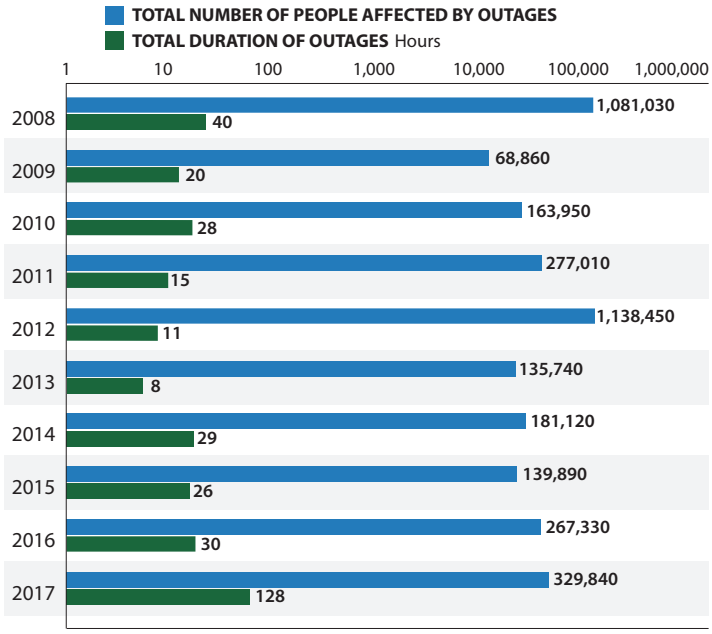
Data Source: EIA

Electric Utility-Reported Outages by Cause, 2008 – 2017



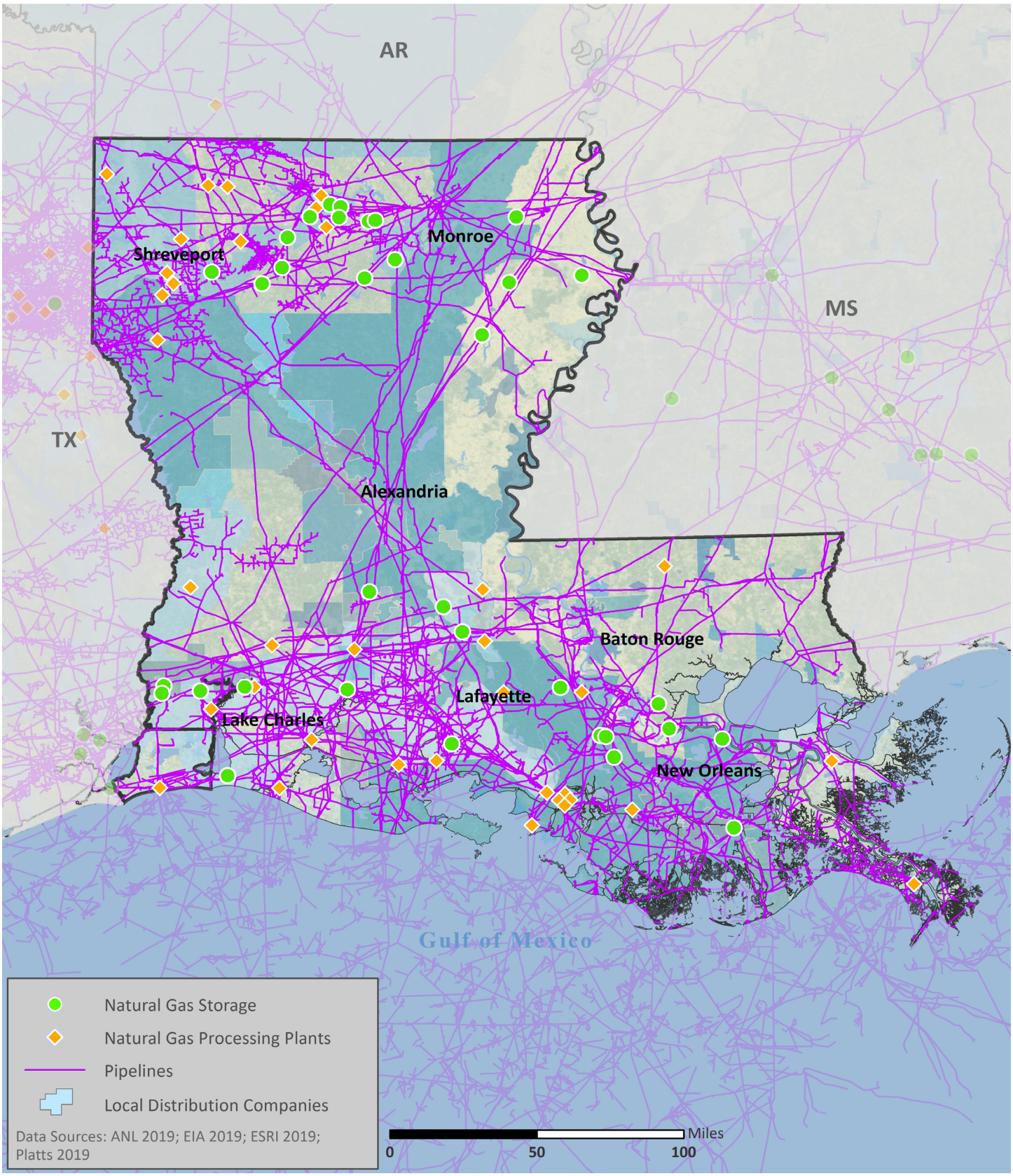
Data Source: Eaton

Electric Utility Outage Data, 2008 – 2017



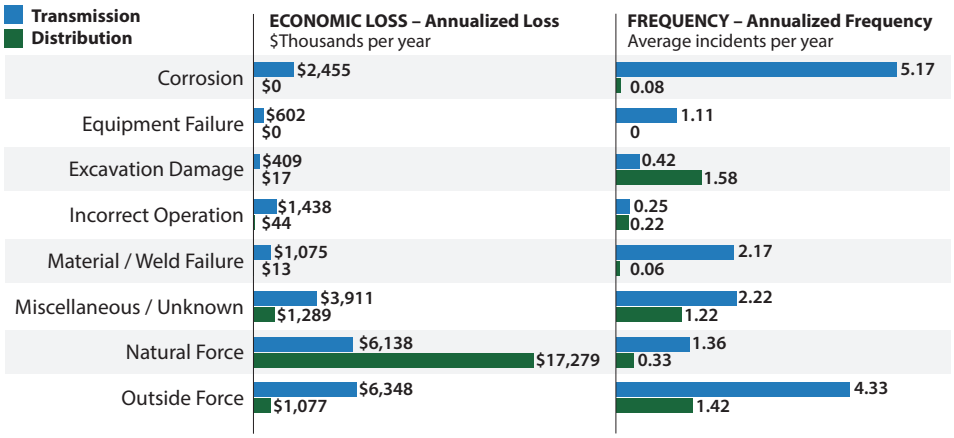
Note: This chart uses a logarithmic scale to display a very wide range of values.
Data Source: Eaton

NATURAL GAS


AR
MS
TX
Shreveport
Monroe
Alexandria
Baton Rouge
Lafayette
Lake Charles
New Orleans
Gulf of Mexico
Natural Gas Storage
Natural Gas Processing Plants
Pipelines
Local Distribution Companies
Data Sources: ANL 2019; EIA 2019; ESRI 2019; Platts 2019
Miles
0
50
100

Natural Gas Transport

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



Data Source: DOT PHMSA

- As of 2018, Louisiana had:
  - *24,490 miles of natural gas transmission pipelines*
  - *27,672 miles of natural gas distribution pipelines*
- 61% of Louisiana's natural gas transmission system and 32% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Louisiana's natural gas supply was most impacted by:
  - ***Outside Forces** when transported by transmission pipelines (3rd leading cause nationwide at $20.65M 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

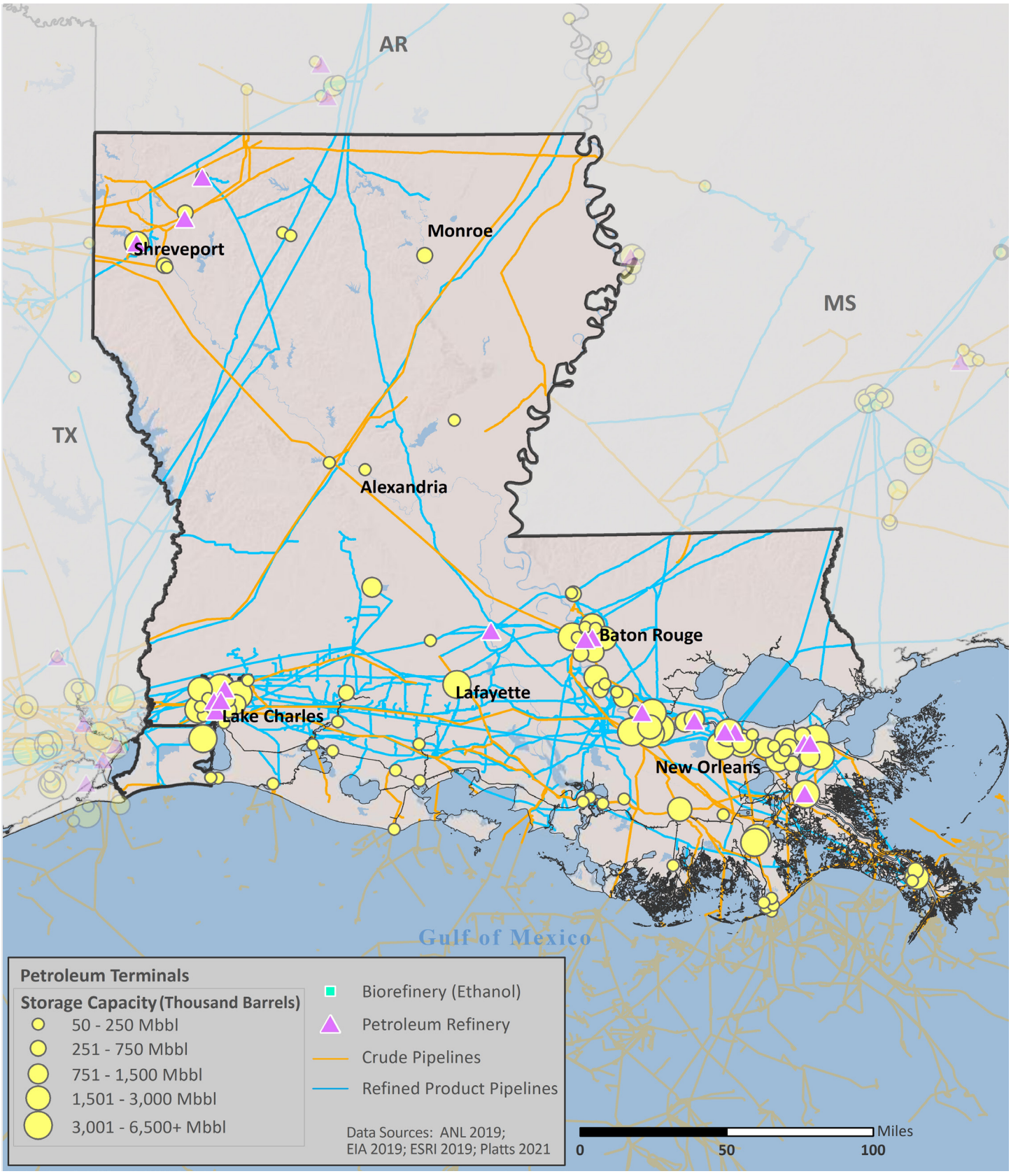
Natural Gas Customers and Consumption by Sector, 2018

	CUSTOMERS	CONSUMPTION
Residential	94%	3%
Commercial	6%	2%
Industrial	<1%	79%
Transportation	<1%	<1%
Electric Power	<1%	16%
Other	<1%	<1%

Data Source: EIA

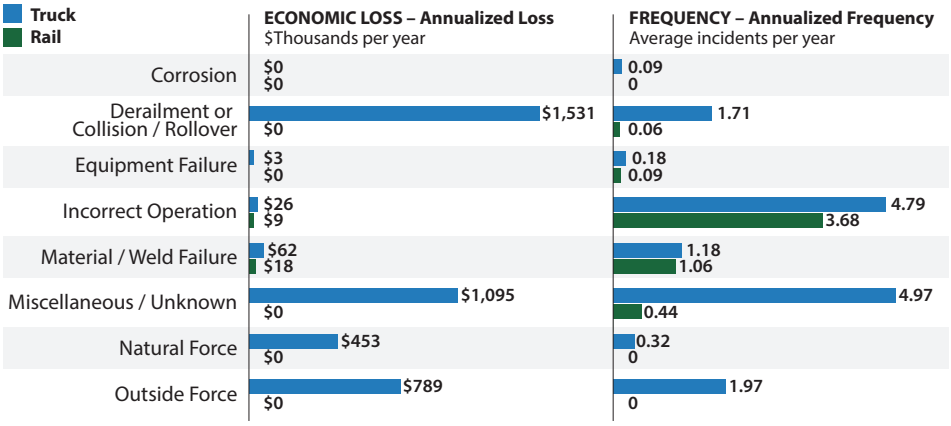
- Louisiana has 36 natural gas processing facilities with a total capacity of 9,344 MMcf/d.
- Louisiana has 4 liquefied natural gas (LNG) facilities with a total storage capacity of 10,925,420 barrels.

PETROLEUM


AR
MS
TX
Shreveport
Monroe
Alexandria
Baton Rouge
Lafayette
Lake Charles
New Orleans
Gulf of Mexico
Petroleum Terminals
Storage Capacity (Thousand Barrels)
50 - 250 Mbbl
251 - 750 Mbbl
751 - 1,500 Mbbl
1,501 - 3,000 Mbbl
3,001 - 6,500+ Mbbl
Biorefinery (Ethanol)
Petroleum Refinery
Crude Pipelines
Refined Product Pipelines
Data Sources: ANL 2019; EIA 2019; ESRI 2019; Platts 2021
Miles
0
50
100

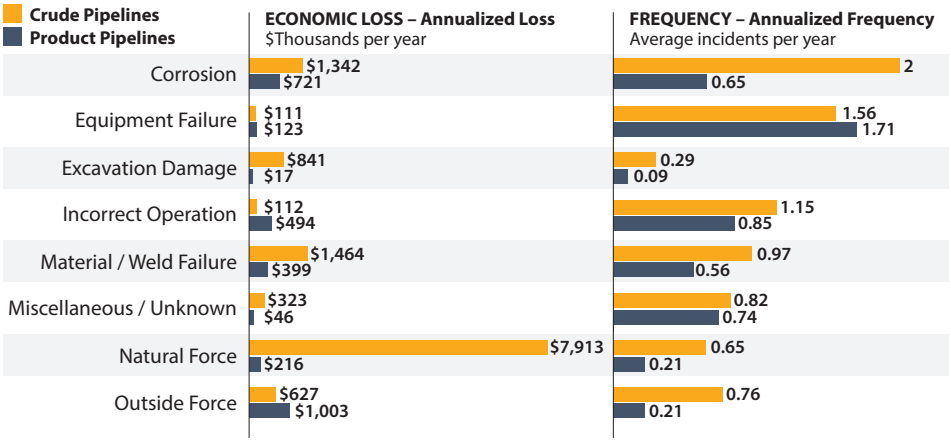
Petroleum Transport

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



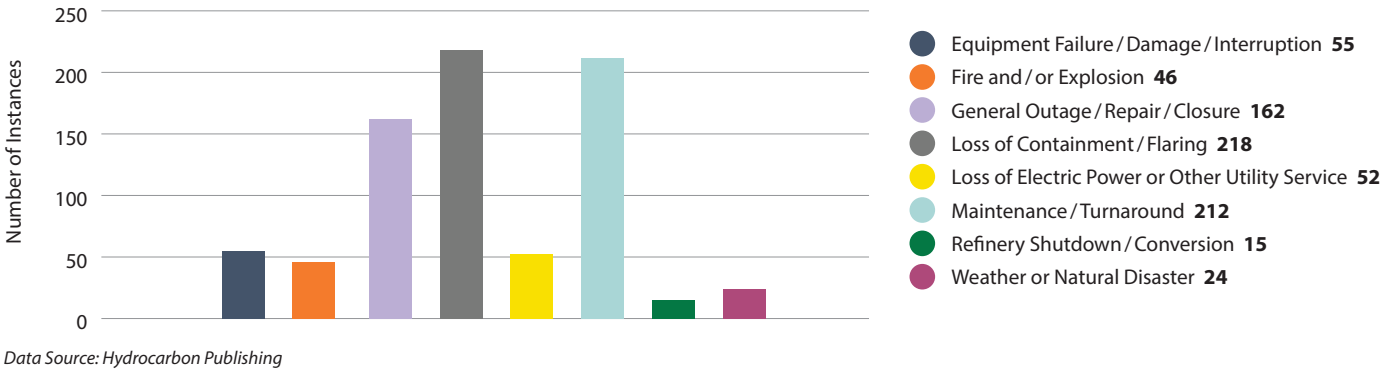
Data Source: DOT PHMSA

- As of 2018, Louisiana had:
  - *4,017 miles of crude oil pipelines*
  - *1,699 miles of refined product pipelines*
  - *0 miles of biofuels pipelines*
- 57% of Louisiana's petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Louisiana's petroleum supply was most impacted by:
  - ***Derailments, Collisions, or Rollovers*** *when transported by truck (8th leading cause nationwide at $0.07M per year)*
  - ***Material Failures*** *when transported by rail (5th leading cause nationwide at $0.05M per year)*
  - ***Natural Forces*** *when transported by crude pipelines (2nd leading cause nationwide at $15.24M 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

- Louisiana has 17 petroleum refineries with a total operable capacity of 3,326 Mb/d.
- Between 2009 and 2019, the leading cause of petroleum refinery disruptions in Louisiana was:
  - ***Loss of Containment or Flaring*** *(leading cause nationwide)*

Causes and Frequency of Petroleum Refinery Disruptions, 2009–2019



Data Source: Hydrocarbon Publishing