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

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Annualized Frequency</th>
<th>Property Damage – Annualized ($Million per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>6</td>
<td>$0</td>
</tr>
<tr>
<td>Earthquake (≥ 3.5 M)</td>
<td>&lt;1</td>
<td>$0</td>
</tr>
<tr>
<td>Extreme Heat</td>
<td>5</td>
<td>$0</td>
</tr>
<tr>
<td>Flood</td>
<td>35</td>
<td>$1,001</td>
</tr>
<tr>
<td>Hurricane</td>
<td>1</td>
<td>$13</td>
</tr>
<tr>
<td>Landslide</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Thunderstorm &amp; Lightning</td>
<td>93</td>
<td>$87</td>
</tr>
<tr>
<td>Tornado</td>
<td>24</td>
<td>$22</td>
</tr>
<tr>
<td>Wildfire</td>
<td>1</td>
<td>$0</td>
</tr>
<tr>
<td>Winter Storm &amp; Extreme Cold</td>
<td>7</td>
<td>$1</td>
</tr>
</tbody>
</table>

Data Sources: NOAA and USGS
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.

Electric Customers and Consumption by Sector, 2018

<table>
<thead>
<tr>
<th>Sector</th>
<th>Customers</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>87%</td>
<td>34%</td>
</tr>
<tr>
<td>Commercial</td>
<td>12%</td>
<td>26%</td>
</tr>
<tr>
<td>Industrial</td>
<td>&lt;1%</td>
<td>40%</td>
</tr>
<tr>
<td>Transportation</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Data Source: EIA

Electric Utility-Reported Outages by Cause, 2008 – 2017

- 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
State of Louisiana | ENERGY SECTOR RISK PROFILE

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

- 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

- 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 Transport

Top Events Affecting Petroleum Transport by Truck and Rail, 1986 – 2019

- **Corrosion**
  - **Truck**: $0
  - **Rail**: $0
  - **Frequency**: 0.09 average incidents per year
  - **Economic Loss**: $0 thousands per year

- **Failure / Damage / Interruption**
  - **Truck**: $3
  - **Rail**: $0
  - **Frequency**: 0.06 average incidents per year
  - **Economic Loss**: $1,531 thousands per year

- **Flaring**
  - **Truck**: $0
  - **Rail**: $0
  - **Frequency**: 1.71 average incidents per year
  - **Economic Loss**: $0 thousands per year

- **Loss of Electric Power or Other Utility Service**
  - **Truck**: $0
  - **Rail**: $0
  - **Frequency**: 0.09 average incidents per year
  - **Economic Loss**: $1,095 thousands per year

- **Maintenance / Turnaround**
  - **Truck**: $56
  - **Rail**: $9
  - **Frequency**: 1.18 average incidents per year
  - **Economic Loss**: $3.68 thousands per year

- **Refrinery Shutdown / Conversion**
  - **Truck**: $0
  - **Rail**: $0
  - **Frequency**: 1.06 average incidents per year
  - **Economic Loss**: $4.79 thousands per year

- **Weather or Natural Disaster**
  - **Truck**: $0
  - **Rail**: $0
  - **Frequency**: 0.44 average incidents per year
  - **Economic Loss**: $4.97 thousands per year

- **All Other Causes**
  - **Truck**: $0
  - **Rail**: $0
  - **Frequency**: 0.32 average incidents per year
  - **Economic Loss**: $0 thousands per year

- **Outside Force**
  - **Truck**: $0
  - **Rail**: $0
  - **Frequency**: 1.97 average incidents per year
  - **Economic Loss**: $5,789 thousands per year

Data Source: DOT PHMSA

Top Events Affecting Crude Oil and Refined Product Pipelines, 1986 – 2019

- **Corrosion
  - Crude Pipelines**: $1,342
  - **Product Pipelines**: $721
  - **Frequency**: 2 average incidents per year
  - **Economic Loss**: $7,913 thousands per year

- **Equipment Failure**
  - Crude Pipelines**: $1,111
  - **Product Pipelines**: $123
  - **Frequency**: 1.56 average incidents per year
  - **Economic Loss**: $1,464 thousands per year

- **Flaring**
  - Crude Pipelines**: $549
  - **Product Pipelines**: $17
  - **Frequency**: 1.15 average incidents per year
  - **Economic Loss**: $721 thousands per year

- **Incorrect Operation**
  - Crude Pipelines**: $1,112
  - **Product Pipelines**: $494
  - **Frequency**: 0.85 average incidents per year
  - **Economic Loss**: $1,342 thousands per year

- **Material / Weld Failure**
  - Crude Pipelines**: $3,999
  - **Product Pipelines**: $46
  - **Frequency**: 0.97 average incidents per year
  - **Economic Loss**: $111 thousands per year

- **Material / Weld Failure**
  - Crude Pipelines**: $2,323
  - **Product Pipelines**: $46
  - **Frequency**: 0.74 average incidents per year
  - **Economic Loss**: $1,003 thousands per year

- **Natural Force**
  - Crude Pipelines**: $527
  - **Product Pipelines**: $1,003
  - **Frequency**: 0.21 average incidents per year
  - **Economic Loss**: $721 thousands per year

- **Outside Force**
  - Crude Pipelines**: $627
  - **Product Pipelines**: $1,003
  - **Frequency**: 0.21 average incidents per year
  - **Economic Loss**: $721 thousands per year

Data Source: DOT PHMSA

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

- **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.**

Data Source: Hydrocarbon Publishing