State of New Mexico
ENERGY SECTOR RISK PROFILE

This State Energy Risk Profile examines the relative magnitude of the risks that the State of New Mexico’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.

The Risk Profile highlights risk considerations relating to the electric, petroleum and natural gas infrastructures to become more aware of risks to these energy systems and assets.

NEW MEXICO STATE FACTS

<table>
<thead>
<tr>
<th>State Overview</th>
<th>Annual Energy Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population: 2.09 million (1% total U.S.)</td>
<td>Electric Power Generation: 36.6 TWh (1% total U.S.)</td>
</tr>
<tr>
<td>Housing Units: 0.91 million (1% total U.S.)</td>
<td>Coal: 25 TWh, 68% [4.4 GW total capacity]</td>
</tr>
<tr>
<td>Business Establishments: 0.04 million (1% total U.S.)</td>
<td>Petroleum: 0 TWh, 0% [0 GW total capacity]</td>
</tr>
</tbody>
</table>

### Annual Energy Consumption
- Electric Power: 23.2 TWh (1% total U.S.)
- Coal: 14,500 MSTN (2% total U.S.)
- Natural Gas: 1,205 Bcf (5% total U.S.)
- Motor Gasoline: 20,900 Mbarrels (1% total U.S.)
- Distillate Fuel: 14,700 Mbarrels (1% total U.S.)

### Annual Energy Production
- Coal: 25 TWh, 68% [4.4 GW total capacity]
- Petroleum: 0 TWh, 0% [0 GW total capacity]
- Natural Gas: 8.8 TWh, 24% [3.8 GW total capacity]
- Nuclear: 0 TWh, 0% [0 GW total capacity]
- Hydro: 0.2 TWh, <1% [0.1 GW total capacity]
- Other Renewable: 2.2 TWh, 6% [0.9 GW total capacity]
- Coal: 22,500 MSTN (2% total U.S.)
- Natural Gas: 1,220 Bcf (5% total U.S.)
- Crude Oil: 85,200 Mbarrels (4% total U.S.)
- Ethanol: 600 Mbarrels (<1% total U.S.)

NATURAL HAZARDS OVERVIEW

#### Annual Frequency of Occurrence of Natural Hazards in New Mexico (1996–2014)

<table>
<thead>
<tr>
<th>Natural Hazard</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>6</td>
</tr>
<tr>
<td>Earthquake</td>
<td>3</td>
</tr>
<tr>
<td>Extreme Heat</td>
<td>28</td>
</tr>
<tr>
<td>Flood</td>
<td>0</td>
</tr>
<tr>
<td>Hurricane</td>
<td>7</td>
</tr>
<tr>
<td>Landslide</td>
<td>5</td>
</tr>
<tr>
<td>Thunderstorm &amp; Lightning</td>
<td>3</td>
</tr>
<tr>
<td>Tornado</td>
<td>20</td>
</tr>
<tr>
<td>Wildfire</td>
<td>85</td>
</tr>
</tbody>
</table>

#### Annualized Property Loss due to Natural Hazards in New Mexico (1996–2014)

- Drought: $0.8 million per year
- Earthquake: $0.0 million per year
- Extreme Heat: $0.0 million per year
- Flood: $0.0 million per year
- Hurricane: $0.0 million per year
- Landslide: $0.0 million per year
- Thunderstorm & Lightning: $3.7 million per year
- Tornado: $5.9 million per year
- Wildfire: $3.0 million per year
- Wildfire & Extreme Cold: $0.5 million per year

- According to NOAA, the most common natural hazard in New Mexico is Thunderstorm & Lightning, which occurs once every 4.3 days on the average during the months of March to October.
- The second-most common natural hazard in New Mexico is Flood, which occurs once every 13.1 days on the average.
- As reported by NOAA, the natural hazard in New Mexico that caused the greatest overall property loss during 1996 to 2014 is Thunderstorm & Lightning at $5.9 million per year.
- The natural hazard with the second-highest property loss in New Mexico is Flood at $3.7 million per year.
**Electric Power Plants:** 62 (<1% total U.S.)
- Coal-fired: 3 (<1% total U.S.)
- Petroleum-fired: 2 (<1% total U.S.)
- Natural Gas-fired: 23 (1% total U.S.)
- Nuclear: 0 (0% total U.S.)
- Hydro-electric: 5 (<1% total U.S.)
- Other Renewable: 29 (1% total U.S.)

**Transmission Lines:**
- High-Voltage (>230 kV): 890 Miles
- Low-Voltage (<230 kV): 1,537 Miles
Electric Transmission

- According to NERC, the leading cause of electric transmission outages in New Mexico is **Transmission Line Faults and Overloads**.
- New Mexico experienced **23 electric transmission outages** from 1992 to 2009, affecting a total of **1,198,802** electric customers.
- **Natural Disaster - Wildfire** affected the largest number of electric customers as a result of electric transmission outages.

### Electric Customers Disrupted by NERC-Reported Electric Transmission Outages by Cause (1992–2009)

![Bar chart showing electric customers disrupted by cause](image)

Data Source: NERC

### Number of NERC-Reported Electric Transmission Outages by Cause (1992–2009)

![Pie chart showing cause distribution](image)

Data Source: NERC

Electric Distribution

### Electric Utility Reported Power Outages by Month (2008–2013)

![Bar chart showing monthly outages](image)

Data Source: Eaton

- Between 2008 and 2013, the greatest number of electric outages in New Mexico has occurred during the month of **December**.
- The leading cause of electric outages in New Mexico during 2008 to 2013 was **Weather/Falling Trees**.
- On average, the number of people affected annually by electric outages during 2008 to 2013 in New Mexico was **65,687**.
- The average duration of electric outages in New Mexico during 2008 to 2013 was **1,533 minutes** or **25.6 hours** a year.

### Causes of Electric-Utility Reported Outages (2008–2013)

- **Animal**: 34
- **Faulty Equipment / Human Error**: 26
- **Overload**: 10
- **Planned**: 8
- **Theft / Vandalism**: 9
- **Unknown**: 9
- **Vehicle Accident**: 2
- **Weather / Falling Trees**: 0

### Utility Outage Data (2008–2013)

![Chart showing outage statistics](image)

Data Source: Eaton

- NOTE: # of Incidents – The number within each pie slice is the number of event incidents attributable to each cause.
PETROLEUM

Petroleum Infrastructure Overview
Refineries: 2 (1% total U.S.)
Terminals: 16 (1% total U.S.)
Crude Pipelines: 1,074 Miles (2% total U.S.)
Product Pipelines: 15,120 Miles (2% total U.S.)
Bio-Refineries (Ethanol): 1 (<1% total U.S.)
Petroleum Transport

Top Events Affecting Petroleum Transport by Truck and Rail (1986–2014)

The leading event type affecting the transport of petroleum product by rail and truck in New Mexico during 1986 to 2014 was Incorrect Operation for rail transport and Miscellaneous/Unknown for truck transport, with an average 0.7 (or one incident every 1.4 years) and 8.3 incidents per year, respectively.

Top Events Affecting Crude Oil and Refined Product Pipelines in New Mexico (1986–2014)

The leading event type affecting crude oil pipeline and petroleum product pipelines in New Mexico during 1986 to 2014 was Corrosion for crude oil pipelines and Miscellaneous/Unknown for product pipelines, with an average 1.1 and 0.28 (or one incident every 3.6 years) incidents per year, respectively.

Petroleum Refinery

The leading cause of petroleum refinery disruptions in New Mexico from 2003 to 2014 was Maintenance/Turnaround. New Mexico’s petroleum refineries experienced 31 major incidents from 2003 to 2014. The average production impact from disruptions of New Mexico’s refineries from 2003 to 2014 is 16.6 thousand barrels per day.


Average Production Impact (thousand barrels per day) from Petroleum Refinery Outages in New Mexico (2003–2014)

Data Source: DOT PHMSA

Produced by Department of Energy (DOE), Office of Electricity Delivery & Energy Reliability (OE)
NATURAL GAS

Natural Gas Infrastructure Overview
Gas Wells: 27,957 (6% total U.S.)
Processing Plants: 23 (4% total U.S.)
Storage Fields: 3 (1% total U.S.)
Interstate Pipelines: 9,720 Miles (2% total U.S.)
Local Distribution Companies: 27 (2% total U.S.)

Produced by Department of Energy (DOE), Office of Electricity Delivery & Energy Reliability (OE)
Natural Gas Transport

The leading event type affecting natural gas transmission and distribution pipelines in New Mexico during 1986 to 2014 was Outside Force for Transmission Pipelines and Outside Force for Distribution Pipelines, with an average 0.48 (or one incident every 2.1 years) and 1.16 incidents per year, respectively.

Top Events Affecting Natural Gas Transmission and Distribution in New Mexico (1986–2014)

Natural Gas Processing

According to data derived from DOE’s Energy Assurance Daily, the leading cause of natural gas processing plant disruptions in New Mexico from 2005 to 2014 is Fire and/or Explosion.

New Mexico’s natural gas processing plants experienced 1 disruptions from 2005 to 2014.

The average production impact from disruptions of New Mexico’s natural gas processing plants from 2005 to 2014 is 70 million cubic feet per day (MMcfd).
DATA SOURCES

Overview Information

- Census Bureau (2012) State and County QuickFacts [http://quickfacts.census.gov/qfd/download_data.html]

Production Numbers


Consumption Numbers


Electricity

- Platts (2014 Q2) Transmission Lines (Miles by Voltage Level)
- Platts (2014 Q2) Power Plants (Production and Capacity by Type)

Petroleum

- Argonne National Laboratory (2012) Petroleum Terminal Database
- Argonne National Laboratory (2014) Ethanol Plants
- NPMS (2011) Petroleum Product Pipeline (Miles of Interstate Pipeline)
- NPMS (2011) Crude Pipeline (Miles of Interstate Pipeline)

Natural Gas

- EIA (2013) Number of Producing Gas Wells [http://www.eia.gov/dnav/ng/ng_prod_wells_s1_a.htm]
- NPMS (2011) Natural Gas Pipeline (Miles of Interstate Pipeline)
- Platts (2014 Q2) Local Distribution Companies (LDCs)

Event Related


*The NERC disturbance reports are not published after 2009.

Notes

- Natural Hazard, Other, includes extreme weather events such as astronomical low tide, dense smoke, frost/freeze, and rip currents.
- Each incident type is an assembly of similar causes reported in the data source. Explanations for the indescribable incident types are below.
  - Outside Force refers to pipeline failures due to vehicular accident, sabotage, or vandalism.
  - Natural Forces refers to damage that occurs as a result of naturally occurring events (e.g., earth movements, flooding, high winds, etc.)
  - Miscellaneous/Unknown includes releases or failures resulting from any other cause not listed or of an unknowable nature.
  - Overdemand refers to outages that occur when the demand for electricity is greater than the supply, causing forced curtailment.
  - Number (#) of Incidents – The number within each pie chart piece is the number of outages attributable to each cause.

FOR MORE INFORMATION CONTACT:
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