This State Energy Risk Profile examines the relative magnitude of the risks that the Washington, D.C.’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.

**WASHINGTON, D.C. FACTS**

<table>
<thead>
<tr>
<th>State Overview</th>
<th>Annual Energy Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population: 0.65 million (&lt;1% total U.S.)</td>
<td>Electric Power Generation: 0.1 TWh (&lt;1% total U.S.)</td>
</tr>
<tr>
<td>Housing Units: 0.30 million (&lt;1% total U.S.)</td>
<td>Coal: 0 TWh, 0% [0 GW total capacity]</td>
</tr>
<tr>
<td>Business Establishments: 0.02 million (&lt;1% total U.S.)</td>
<td>Petroleum: 0 TWh, 0% [0 GW total capacity]</td>
</tr>
<tr>
<td>Annual Energy Consumption</td>
<td>Natural Gas: 0.1 TWh, 100% [0.01 GW total capacity]</td>
</tr>
<tr>
<td>Electric Power: 11.3 TWh (1% total U.S.)</td>
<td>Nuclear: 0 TWh, 0% [0 GW total capacity]</td>
</tr>
<tr>
<td>Coal: 0 MSTN (0% total U.S.)</td>
<td>Hydros: 0 TWh, 0% [0 GW total capacity]</td>
</tr>
<tr>
<td>Natural Gas: 101 Bcf (&lt;1% total U.S.)</td>
<td>Other Renewable: 0 TWh, 0% [0 GW total capacity]</td>
</tr>
<tr>
<td>Motor Gasoline: 1,700 Mbarrels (&lt;1% total U.S.)</td>
<td>Coal: 0 MSTN (0% total U.S.)</td>
</tr>
<tr>
<td>Distillate Fuel: 700 Mbarrels (&lt;1% total U.S.)</td>
<td>Natural Gas: 0 Bcf (0% total U.S.)</td>
</tr>
</tbody>
</table>

**NATURAL HAZARDS OVERVIEW**

- According to NOAA, the most common natural hazard in Washington, D.C. is Thunderstorm & Lightning, which occurs once every 49.3 days on the average during the months of March to October.
- The second-most common natural hazard in Washington, D.C. is Winter Storm & Extreme Cold, which occurs once every 70.2 days on the average during the months of October to March.
- As reported by NOAA, the natural hazard in Washington, D.C. that caused the greatest overall property loss during 1996 to 2014 is Hurricane at $5.4 million per year.
- The natural hazard with the second-highest property loss in Washington, D.C. is Flood at $1.2 million per year.
Electric Power Plants: 1 (<1% total U.S.)
- Coal-fired: 0 (0% total U.S.)
- Petroleum-fired: 0 (0% total U.S.)
- Natural Gas-fired: 1 (<1% total U.S.)
- Nuclear: 0 (0% total U.S.)
- Hydro-electric: 0 (0% total U.S.)
- Other Renewable: 0 (0% total U.S.)

Transmission Lines:
- High-Voltage (>230 kV): 25 Miles
- Low-Voltage (<230 kV): 45 Miles
## Electric Transmission

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

<table>
<thead>
<tr>
<th>Cause</th>
<th>Outages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faulty Equipment / Human Error</td>
<td>269,000</td>
</tr>
<tr>
<td>Severe Weather - Ice Storm</td>
<td>18,819</td>
</tr>
<tr>
<td>Transmission Line Faults and Overloads</td>
<td>823</td>
</tr>
<tr>
<td>Unknown Cause</td>
<td>41,400</td>
</tr>
<tr>
<td>Fuel Supply Deficiency</td>
<td>0</td>
</tr>
<tr>
<td>All Other Causes</td>
<td>0</td>
</tr>
</tbody>
</table>

Data Source: NERC

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

- **Severe Weather – Ice Storms** affected the largest number of electric customers as a result of electric transmission outages.

- According to NERC, the leading cause of electric transmission outages in Washington, D.C. is **Faulty Equipment/Human Error**.
- Washington, D.C. experienced **11 electric transmission outages** from 1992 to 2009, affecting a total of **330,042 electric customers**.

NOTE: # of Incidents – The number within each pie chart piece is the number of outages attributable to each cause.

### Electric Distribution

- Insufficient public data are available on electric distribution incidents for Washington D.C.
**PETROLEUM**

**Petroleum Infrastructure Overview**
- Refineries: 0 (0% total U.S.)
- Terminals: 0 (0% total U.S.)
- Crude Pipelines: 0 Miles (0% total U.S.)
- Product Pipelines: 540 Miles (0% total U.S.)
- Bio-Refineries (Ethanol): 0 (0% total U.S.)

Data Sources: ACE 2012; ANL 2013; EIA 2014; ESRI 2012; NPWS 2011.
Petroleum Transport

The leading event type affecting the transport of petroleum product by truck in Washington D.C. during 1986 to 2014 was Miscellaneous/Unknown for truck transport, with an average 3.5 incidents per year. According to public data available from DOT PHMSA, there was no movement of petroleum by rail in Washington D.C. during 1986 to 2014.

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

- Insufficient public data are available on product pipeline incidents for Washington D.C. There are no crude oil pipelines in Washington D.C.
NATURAL GAS

Natural Gas Infrastructure Overview
Gas Wells: 0 (0% total U.S.)
Processing Plants: 0 (0% total U.S.)
Storage Fields: 0 (0% total U.S.)
Interstate Pipelines: 20 Miles (<1% total U.S.)
Local Distribution Companies: 1 (<1% total U.S.)
Natural Gas Transport

The leading event type affecting natural gas pipelines in Washington, D.C. during 1986 to 2014 was Outside Force, with an average 0.29 incidents per year (or one incident every 3.4 years).


Data Source: DOT PHMSA
**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**

**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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