Data Sources and National Comparisons
ENERGY SECTOR RISK PROFILES

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

ABBREVIATED UNITS

ENERGY
MMBtu Million British Thermal Units

ELECTRICITY
kWh Kilowatt-hour
GWh Gigawatt-hour
TWh Terawatt-hour
MW Megawatt
GW Gigawatt

COAL
MSTN Thousand Short Tons

NATURAL GAS
Bcf Billion Cubic Feet
MMcf/d Million Cubic Feet per Day

PETROLEUM
Mbbl Thousand Barrels
Mb/d Thousand Barrels per Day

State Facts
- Census Bureau (2020) State and County QuickFacts
- Energy Futures Initiative and NASEO (2018) U.S. Energy & Employment Report
- NARUC (2020) Regulatory Commission
- NASEO (2020) State Energy Offices
- FEMA (2020) Emergency Management Agencies
- National Association of Fusion Centers (2020) Fusion Centers
- EIA (2019) State Energy Data System

Risks and Hazards Overview
- FEMA (2019) OpenFEMA Dataset: Disaster Declarations Summary
- NOAA (2019) Climate at a Glance
- USGS (2019) Earthquake Hazards Program
- NOAA (2019) Storm Events Database

Consumption Numbers
- EIA (2018) Total Electricity Industry Retail Sales (EIA-861)
- EIA (2018) Annual Coal Consumption
- EIA (2019) Natural Gas Consumption by End Use
- EIA (2019) Prime Supplier Sales Volumes
- EIA (2019) Form-860 Power Plants

Production Numbers
- EIA (2019) Electricity: Detailed State Data (EIA-861)
- EIA (2019) Table P1 Energy Production Estimates in Physical Units

Electric
- EIA (2018) Electricity: Detailed State Data (EIA-860, EIA-861)
- Eaton (2017) Blackout and Power Outage Tracker

Natural Gas and LNG
- DOT PHMSA (2018) Pipeline Mileage and Facilities
- DOT PHMSA (2019) Distribution, Transmission & Gathering, LNG, and Liquid Accident and Incident Data
- EIA (2017) Natural Gas Processing Facilities

Petroleum
- DOT PHMSA (2018) Pipeline Mileage and Facilities
- DOT PHMSA (2019) Hazmat Incident Report Search Tool
- DOT PHMSA (2019) Distribution, Transmission & Gathering, LNG, and Liquid Accident and Incident Data
- EIA (2019) Refinery Capacity Report
- Hydrocarbon Publishing (2019) Global Refinery Shutdown Roundup

Notes
Page 1:
- A *business establishment* is a single physical location at which business is conducted or operations are performed. It is not necessarily a company, which may consist of multiple establishments.
- Electricity tariff data is an average for all consumers (residential, commercial, industrial, and transportation).
- *Total capacity* refers to the maximum power output that generating equipment can supply.
- Wind or solar plants with a nameplate capacity of 1 MW or greater, and that are connected to the power grid, are included as part of a state's annual energy production data.
- *Heating Degree Days* are a measure of how cold the temperature was on a given day or during a period of days. *Cooling Degree Days* are a measure of how hot the temperature was on a given day or during a period of days.
- Under Natural Hazards, *Other* includes extreme weather events such as dense smoke, frost / freeze, and rip currents.
- Page 2: *Utility company* includes investor-owned utilities (IOUs) and non-IOUs. For more information about utility service territories, see the American Public Power Association (APPA), Edison Electric Institute (EEI), and National Rural Electric Cooperative Association (NRECA).

Page 3:
- *Other utilities* includes retail and wholesale power marketers, federal and state government utilities, political subdivisions, and others as categorized by EIA.
- Electricity outage data is collected from multiple sources and attempts to provide an accurate picture of the total number of individual persons impacted by electric outages.
- Pages 3, 5, and 7: Each incident type is an assembly of similar causes reported in the data source.
  - *Overdemand* refers to outages that occur when the demand for electricity is greater than the supply, causing forced curtailment.
  - Explanations for the indescribable incident types are as follows:
    - *Miscellaneous / Unknown* includes releases or failures resulting from any other cause not listed or of an unknowable nature.
    - *Natural Forces* refers to damage that occurs as a result of earth movements, flooding, high winds, etc.
    - *Outside Forces* refers to pipeline failures due to activities caused by outside parties or forces (excluding excavation or naturally occurring events), such as vehicle accidents and vandalism.

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National Consumption by Sector, 2018

Electric Customers and Consumption

	CUSTOMERS	CONSUMPTION
Residential	87%	35%
Commercial	12%	38%
Industrial	<1%	27%
Transportation	<1%	<1%

Data Source: EIA

Natural Gas Customers and Consumption

	CUSTOMERS	CONSUMPTION
Residential	92%	18%
Commercial	7%	13%
Industrial	<1%	30%
Transportation	<1%	<1%
Electric Power	<1%	39%
Other	<1%	<1%

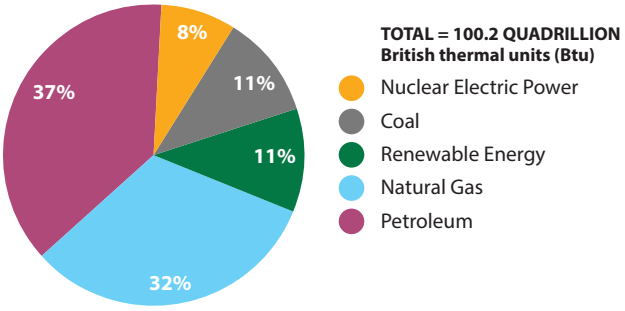
Data Source: EIA

Petroleum Consumption

	CONSUMPTION
Residential	3%
Commercial	2%
Industrial	26%
Transportation	68%
Electric Power	<1%

Data Source: EIA

U.S. Primary Energy Consumption By Energy Source, 2019



Note: Sum of components may not equal 100% because of independent rounding.
Data Source: U.S. Energy Information Administration, Monthly Energy Review, Table 1.3 and 10.1, February 2021.

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Natural Hazards

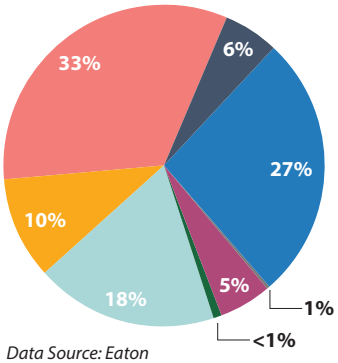
Annualized Frequency of and Property Damage Due to Natural Hazards, 2009–2019

	HAZARD FREQUENCY – Annualized	PROPERTY DAMAGE – Annualized ($Million per year)
Drought	285	$111
Earthquake (≥ 3.5 M)	1,414	$578
Extreme Heat	179	$2
Flood	1,917	$12,080
Hurricane	32	$1,940
Landslide	74	$79
Thunderstorm & Lightning	5,958	$2,828
Tornado	681	$2,047
Wildfire	275	$2,098
Winter Storm & Extreme Cold	1,710	$418
Other	347	$2

Note: The vast majority of earthquakes occurred in Alaska and California.
Data Sources: NOAA and USGS

Electric

Electric Utility-Reported Outages by Cause, 2008–2017



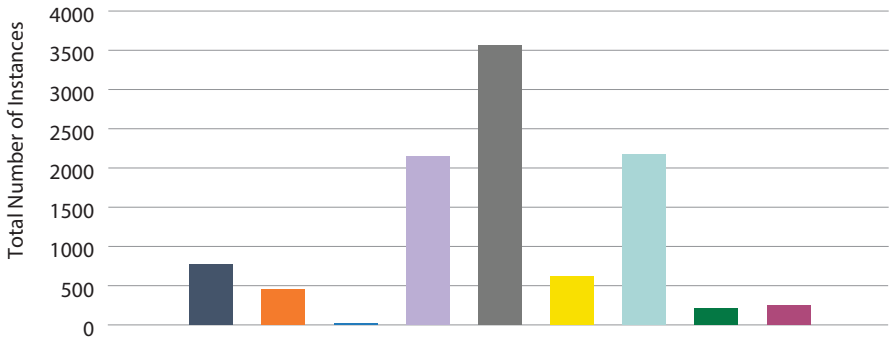
TOTAL NUMBER OF INCIDENTS

- Animal **1,884**
- Faulty Equipment / Human Error **8,626**
- Overdemand **47**
- Planned **1,776**
- Theft / Vandalism **210**
- Unknown **5,982**
- Vehicle Accident **3,356**
- Weather / Falling Trees **10,661**

Data Source: Eaton

Petroleum Refineries

Causes and Frequency of Petroleum Refinery Disruptions, 2009–2019



- Equipment Failure / Damage / Interruption **767**
- Fire and / or Explosion **450**
- Fuel Supply Problem **8**
- General Outage / Repair / Closure **2,147**
- Loss of Containment / Flaring **3,561**
- Loss of Electric Power or Other Utility Service **616**
- Maintenance / Turnaround **2,175**
- Refinery Shutdown / Conversion **204**
- Weather or Natural Disaster **250**

Data Source: Hydrocarbon Publishing

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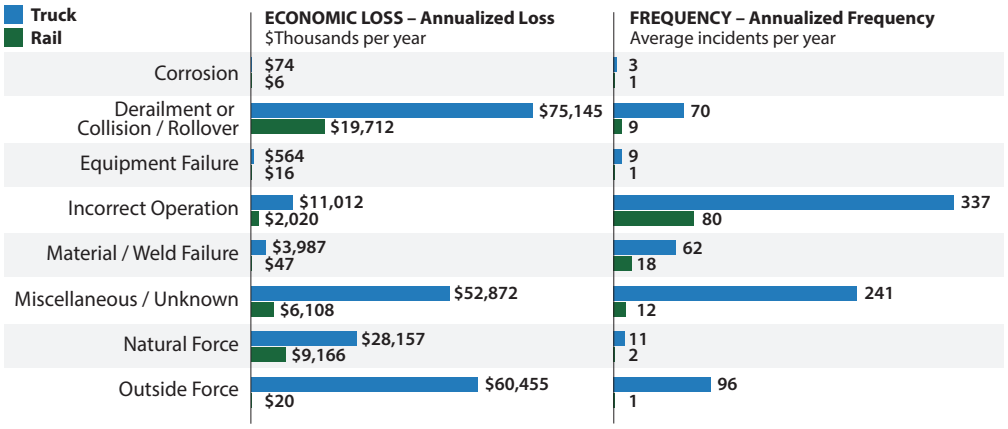
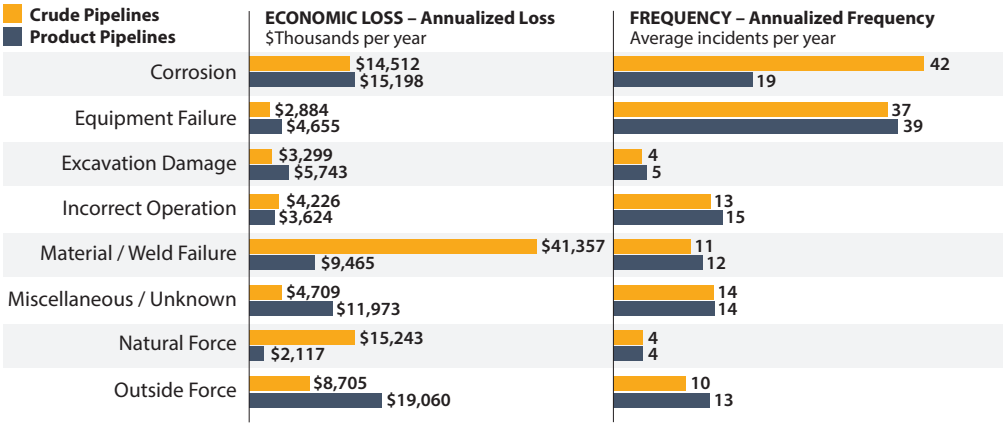
Petroleum and Natural Gas Transport

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



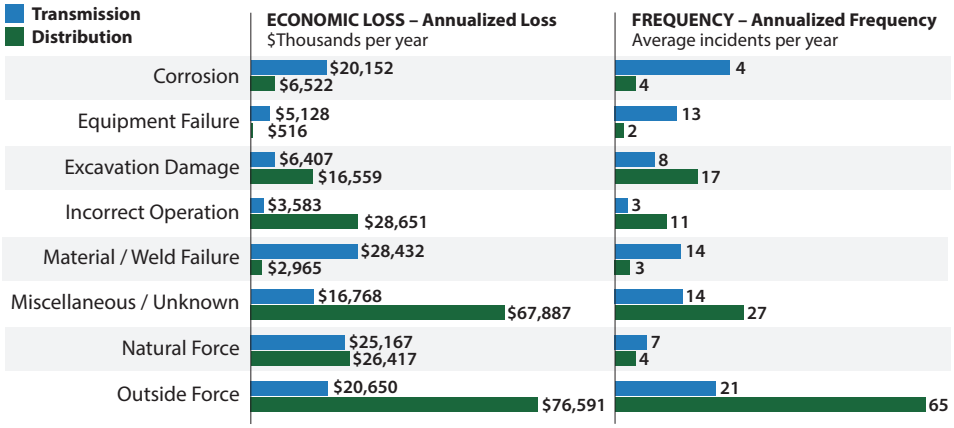
Data Source: DOT PHMSA

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



Data Source: DOT PHMSA

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



Data Source: DOT PHMSA

FOR MORE INFORMATION CONTACT
Office of Cybersecurity, Energy Security, and Emergency Response
U.S. Department of Energy
Email: energyresponsecenter@hq.doe.gov
Website: https://www.energy.gov/ceser