



## At a Glance

- NOAA National Centers for Environmental Information (NCEI) offers relevant climate and weather data, products, and services from NOAA satellite, radar, and in situ observing systems that support the energy and utilities sector.
- Climate and weather remain the largest and costliest variables to the \$295 billion U.S. energy sector as they influence energy demand, production and distribution, and pose a risk to infrastructure.
- Energy and utility companies rely on NCEI's data to predict energy demand, strategic planning, risk management, and protection of assets.

## Sector Overview

Energy systems, including thermal (e.g. coal, gas, petroleum), nuclear, and renewables (e.g. hydroelectric, solar, wind), are the backbone of modern infrastructure and society and support a range of critical services including emergency response, healthcare, telecommunications, and more.

All aspects of energy, from generation to distribution to customer consumption, are influenced by climate and weather. Temperature variations affect energy demand, drought limits the generation capacity of water-dependent energy systems; blizzards cause service disruptions, and extreme events like wildfires, floods, and tropical storms, can damage physical assets and impact operations.

This demonstrates why climate and weather remain the largest and costliest variables to the \$295 billion U.S. energy system (GDP, 2017). Energy and utility companies rely on NCEI's data to optimize planning and operations, avoid risk, and provide reliable and safe services.



NCEI – it's my observation portal. I need these data to be able to create the types of [energy] diagnostics that we produce.

– Dr. Michael Ventrice, Meteorological Scientist, IBM's the Weather Company

# Select Applications of NCEI's Data in Energy and Utilities

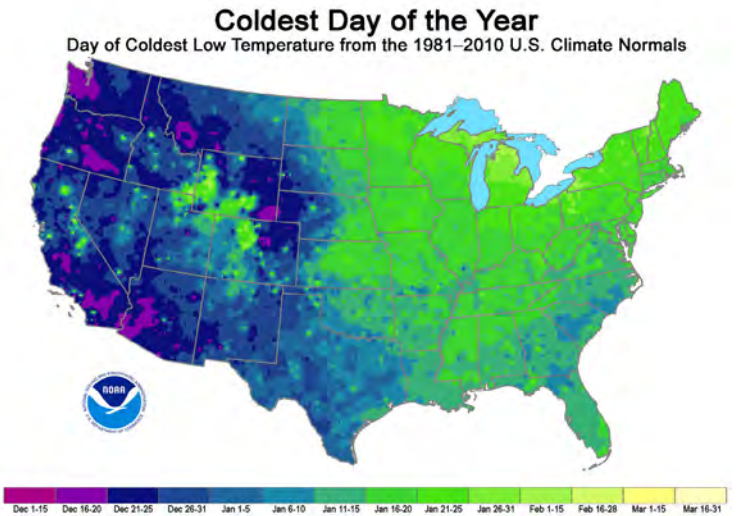
## Energy Demand Forecasting

Temperature is one of the main determinants for energy demand. Energy companies analyze historical temperature data, among other variables, to predict future energy demand. They rely on several historical sources from NCEI including Climate Normals and the Automated Surface Observing System (ASOS).

Accurate load forecasting is crucial because erroneous predictions can lead to power outages and interruptions to critical services like healthcare. Weather and climate information also plays an increasingly significant role in solar and wind energy management which can support improved short-term and long-term predictions.

Many types of power sector entities use NCEI data, from private companies and government bodies to non-profits and trade groups. They use data to scrutinize past events to forecast usage, reduce carbon emissions, save energy, plan for emergencies, and improve their financial performance.

**Image: Climate Normals are NCEI's latest 30-year average of climatological variables, including temperature and precipitation.**

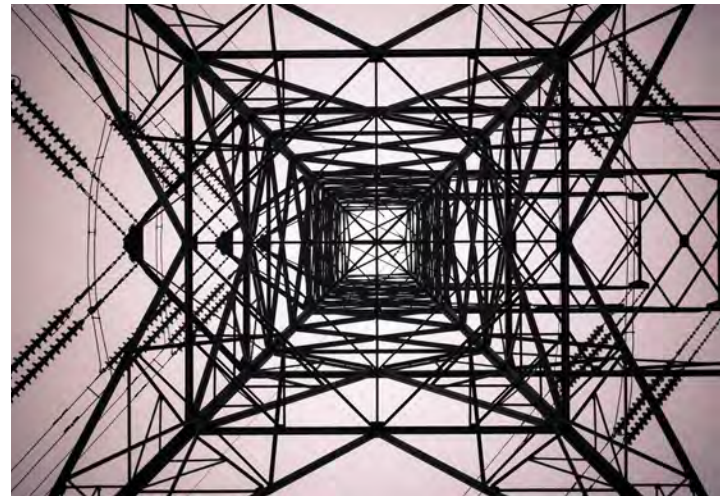


## Avoided Liabilities from Extreme Events

Energy infrastructure is prone to damage and liabilities from a range of hazards. In 2007 a combination of dry conditions and strong winds created ideal conditions that spawned and sustained massive fires in California that burned over 300,000 acres, or 13% of San Diego Gas and Electric's (SDG&E) service territory. These fires were caused by the utility's electrical distribution system, thereby resulting in \$2 billion in liabilities and hundreds of settlement cases.

The utility took proactive measures to mitigate future wildfire risk, by partnering with NCEI's Western Regional Climate Center, among other stakeholders, to create a fire hazard index using a 30-year historical hourly weather analysis.

In May 2014, when dry and windy conditions were similar to those of 2007, the utility preemptively shut down circuits to its distribution grid. None of the ensuing wildfires were attributed to SDG&E thereby potentially avoiding hundreds of millions of dollars in liabilities.



NOAA National Centers for Environmental (NCEI), part of the U.S. Department of Commerce, provides access to one of the most significant archives of comprehensive oceanic, atmospheric, and geophysical data on Earth. From the depths of the ocean to the surface of the sun and from million-year-old ice cores to near-real-time satellite images, NCEI hosts over 37 petabytes of data. Public and private sectors rely on NCEI's authoritative and trusted information to create economic opportunity, mitigate climate- and weather-related losses, and preserve ecological resources.



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