

# Climate Change and Energy

## Highlights from the New York State Climate Impacts Assessment

Energy powers New York State's economy, moves people and goods, keeps homes and workplaces at a livable temperature, and runs critical infrastructure that keeps people healthy and safe. Reliable energy systems are easy to take for granted, but many parts of these systems are at risk from climate hazards.

### Climate Change Impacts on New York State's Energy

The state's energy system is vulnerable to several key climate hazards that can have wide-ranging impacts on how energy is produced, transmitted, and used:

- **Increasing temperatures.** Rising temperatures can make natural gas-fired, oil-fired, wind, and solar resources less efficient at generating electricity. More frequent and intense extreme heat and multiday heat waves could also result in substantial increases in energy use and cause parts of the electrical grid to fail, leading to power outages.
- **Changes in precipitation.** Climate change is projected to lead to more extreme precipitation events in the state. Heavy rain and flooding can damage energy infrastructure, impair operations, and prevent workers from accessing and fixing equipment. More variability in precipitation, including both heavy rain and short-term drought, could have impacts on hydrogeneration.
- **Sea level rise.** Salt water from sea level rise can corrode infrastructure. Increased coastal flooding can block access to energy facilities. Higher sea levels also worsen coastal flooding during a storm event, posing further risks to energy infrastructure. Much of the state's fuel infrastructure is in coastal areas, making it particularly vulnerable to the effects of sea level rise.
- **Storms with high winds.** High winds can damage above-ground electricity transmission and distribution lines as well as utility poles, or cause transmission towers to buckle. A particularly large or long-lasting storm or high wind event could curtail a large amount of wind generation.



*Winds from Hurricane Irene downed trees, which fell on power lines, as shown in this picture taken in the Riverdale section of the Bronx.*

### Climate Change and Energy Demand

As New York State's climate changes, rising temperatures are also expected to increase the demand for cooling and decrease the demand for heating over time. This is projected to raise annual electricity demand and lower natural gas demand. Heat waves also increase the demand for electricity needed to cool buildings and run critical equipment. These changing patterns of energy demand can strain energy supply and delivery systems,



especially when demand is highest. Demand beyond what the power transmission and distribution lines are designed for may also lead to infrastructure failure, power outages, and energy price increases.

## **Adaptation and Resilience Strategies**

Utilities and agencies charged with safeguarding energy generation and supply systems are engaged in planning and policy-setting activities that take climate hazards into account. For example, the New York Independent System Operator (the entity responsible for operating the state electricity grid) has incorporated future climate change into all planning and electric system demand activities. More adaptation and resilience actions include:

- Protecting infrastructure, such as by installing flood protection systems and moving critical energy infrastructure away from floodways and to higher elevations.
- Newer technologies that improve the resilience of the electric system, such as microgrids, equipment that can control demand during periods of high use, and systems that can help utilities manage and respond to power outages.
- Investing in new energy infrastructure and strengthening current energy infrastructure to withstand future heat waves, incorporating climate models into energy planning, and deploying strategies that help monitor and manage energy demand.

Over time, electricity supply in the state is expected to include more emission-free resources, such as solar, offshore wind, and battery storage. In the coming years, the transmission system will expand to accommodate more renewable energy and electrification of systems. Given these changes, ensuring the electric grid is resilient to climate change will become even more critical to meeting New York State's energy needs in the coming decades.

## **Learn More**

Explore the New York State Climate Impacts Assessment at <https://nysclimateimpacts.org/>.

## **Climate Equity and Justice**

Climate change impacts can amplify existing inequities in the energy system. Some communities have higher energy costs than others and may have energy infrastructure that is in poorer condition. Both urban and rural low-income households spend roughly three times as much of their income, compared to higher-income households, on energy. At the same time, these communities are often more susceptible to climate hazards like extreme storms and heat waves. Research has also shown that power is slower to be restored to rural and Black communities in the aftermath of outages.

Electricity access is also generally lower on Tribal reservations than elsewhere. No major power plants are located on Tribal lands in New York State, and many reservations have homes scattered over large areas, far from a utility grid. These factors contribute to disproportionate vulnerabilities to climate change impacts.

Addressing existing energy injustices can help reduce climate impacts on these already-burdened communities. Energy assistance programs that help make energy services more affordable, energy efficiency and weatherization programs that help reduce customers' energy demand and costs, and workforce training programs are examples of strategies that can help address inequities. As New York State's energy system adapts to a changing climate, community involvement will also be important to ensure that all communities share in the benefits and burdens of the changing energy system.

