

Harnessing the Potential of Energy Storage



Electric Companies Support Energy Storage, Are the Largest Drivers of Storage Deployment

America's electric companies are leading the clean energy transformation. They are united in their commitment to get the energy they provide as clean as they can as fast as they can, without compromising the reliability or affordability that their customers value.

Today, carbon emissions from the U.S. power sector are at their lowest level in more than 40 years—and continue to fall. At the same time, 40 percent of the nation's electricity now comes from carbon-free sources, including nuclear energy, hydropower, wind, and solar energy.

Grid-connected energy storage technologies are essential to the clean energy transformation, and they provide a range of benefits to the energy grid and to electricity customers. These technologies facilitate greater integration of renewable energy resources, such as wind and solar energy, and can help meet peak customer demand for electricity. Energy storage also can help enhance grid resilience and improve reliability by providing grid stability services and reducing transmission constraints.

Electric companies are the largest users and operators of approximately 25 gigawatts (GW) of operational storage in the country—representing 96 percent of active energy storage projects. Although pumped-storage



96%

Electric companies own, procure, or utilize 96 percent of all energy storage today.

84%

Roughly 84 percent of this is pumped hydropower storage.



hydropower accounts for approximately 84 percent of installed storage capacity, battery storage is gaining ground rapidly.

Electrochemical battery storage capacity, with lithium-ion as the dominant chemistry, increased about six-fold between 2015 and 2020, growing from 540 megawatts (MW) to 3,373 MW. The lithium-ion battery storage technologies in use today can provide energy for periods of up to 8 hours. Meanwhile, mechanical storage, with pumped storage hydro as the dominant type in this category, can store electricity longer than 8 hours. Existing energy storage technologies have limitations that will need to be overcome with other technologies in a transition to a carbon-free grid.

As more renewable energy is supplied to the grid, longer-duration storage technology is needed to achieve the full benefits of wind and solar. Advanced energy storage technologies—those with next-generation cost, reliability, and safety features that can store and discharge energy generated from zero-carbon sources for days, months, or across seasons—are needed to maximize renewable energy production, achieve deep carbon reductions, enhance resilience, and further benefit customers.

Through the Carbon-Free Technology Initiative (CFTI), EEI and its member companies are focused on implementation of federal policies that can help ensure the commercial availability of affordable, carbon-free, 24/7 power technology options, including advanced energy storage, to help the electric power industry meet net-zero carbon reduction commitments.

The Power of Energy Storage:

Energy storage has immense potential, and electric companies are using grid-connected energy storage to:

- Enhance energy diversity and reliability.
- Make the energy grid more reliable and more resilient.
- Integrate more renewables into the energy grid.
- Enhance the operational efficiency of power plants.
- Serve as reserve power in case of power outages or voltage fluctuations.
- Optimize transmission and distribution systems for customer benefit.
- Reduce demand during peak periods.
- Help manage electricity costs.



1,463
megawatts

1,463 megawatts of advanced energy storage devices were installed in 2020 alone.

544%

This is a 544 percent increase over 2015.

Our Policy Platform

All electric companies should have the ability to incorporate existing and emerging storage technologies into the energy grid as they become economical to make the energy grid more dynamic, more resilient, and more secure. Regulatory agencies should evaluate and amend outdated energy storage policies to help maintain the steady, strong transition to clean energy.

Among our policy priorities:

- State regulatory agencies should review and reassess their classification of energy storage given the rapid advancements of energy storage technologies and their multiple uses to the grid and customers.
- Electric companies should be allowed to own energy storage assets and should be able to recover the costs to enhance the reliability and resiliency of the energy grid through rates.
- FERC should initiate a process to discuss changes needed to its accounting rules to accommodate the different services that energy storage resources can provide.
- Congress should enact energy-storage-inclusive federal tax incentives.
- Federal funding should be increased significantly and federal programs expanded to support research, development, demonstration, and deployment (RDD&D) of long-duration energy storage to improve battery performance so batteries can store more energy for longer durations and to enable their commercialization.

A Win for Customers and the Energy Grid

Electric companies own and operate many different types of energy storage technologies—including pumped hydropower, batteries, thermal, compressed air, and flywheel—and use grid-connected storage to support both grid operations and customer solutions. Increasingly, electric companies are using energy storage to support and to manage all parts of the energy grid.

When electric companies own and operate energy storage, the energy grid and customer benefits are maximized by:

- **Enhancing energy diversity and reliability:** Energy storage helps electric companies integrate diverse generation assets, including universal or large-scale wind and solar energy projects. Given the near instantaneous output from many forms of energy storage, the technology also can help natural gas plants provide the fast-ramping capacity and instant backup power that is necessary to maintain balance between energy supply and demand.
- **Optimizing transmission and distribution systems:** Electric transmission infrastructure is the backbone of the nation's energy grid and plays an important role in integrating more clean energy and more renewables. Electric companies place new energy storage assets on their transmission and distribution systems in locations that provide optimal cost-effective performance, and they are responsible for interconnecting and operating these assets safely and reliably.

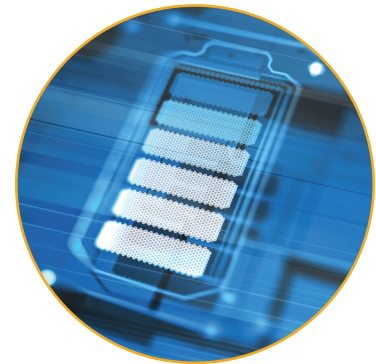
Energy storage technologies offer a variety of grid and customer services¹ that allow operators to manage variability in supply and demand; to increase energy grid flexibility, reliability, and resiliency; and to support generation, transmission, distribution, and customers' energy management.

Electric companies can deploy energy storage assets in the most economically efficient manner given their unique ability to look at the grid holistically and to determine the right type, size, and location of the asset.

As Energy Storage Technologies Evolve, Public Policies Must Be Modernized

Electric companies are highly regulated at both the federal and state levels. As more energy storage is deployed and as the technologies evolve, it is critical that public policies and regulations keep pace.

¹Energy storage can provide ancillary services supplied by generation, which include load following, reactive power-voltage regulation, system protective services, loss compensation service, system control, load dispatch services, and energy imbalance services. Energy storage can provide the following customer services: load shifting, emergency backup, microgrid support.



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Battery storage is the main technology driving the energy storage market today, and **electric companies are the market's main drivers.**



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~65%

In 2020, electric companies represented approximately 65 percent of total investment in battery storage technology.

The Federal Policy Landscape

At the federal level, the Federal Energy Regulatory Commission (FERC) has taken several actions designed to help enable energy storage to be a competitive technology. In 2017, FERC issued a guiding policy statement regarding the ability of energy storage resources to provide services and to seek to recover their costs through both cost-based and market-based rates concurrently. Since then, FERC has issued two orders, FERC Order 841 and Order 2222, requiring regional transmission organizations (RTOs) and independent system operators (ISOs) to modify their market rules to help ensure that energy storage resources can participate in the market on a comparable basis with other resources. More work remains to be done at the Commission regarding the classification and accounting for energy storage resources.

The State Policy Landscape

In many states, the regulations governing the classification of energy storage were developed years ago when pumped-storage hydropower was the only economically viable technology. However, energy storage technologies have significantly evolved in recent years, and the pace of research and innovation in new, cutting-edge applications is increasing.

The capability of these new energy storage technologies does not fit singularly into the traditional regulatory classification categories of generation, transmission, distribution, or load. A battery technology can serve a variety of functions that fit into all categories within the span of a day. For example, battery storage can charge from the energy grid and act as load. It can discharge into the grid and act as generation. And, it can serve transmission or distribution functions and provide relevant services.

In states that have restructured their electricity markets, energy storage technologies often are classified as generation only. In these states, electric companies are not able to own generation, and, as a result of this classification, many cannot own energy storage. This precludes electric companies from investing in proven critical assets to help sustain grid performance under all operating conditions. Some restructured states, including California, Massachusetts, and New York, do allow electric companies to own energy storage, but the technology's uses are limited by the specific market constructs.

Classification rules in restructured states should be reviewed within the context of grid reliability and performance, so that electric companies are able to own energy storage resources to serve customers and to receive appropriate compensation for investment in these assets.

Allowing electric companies to own and operate grid-connected storage in all states will ensure that the multiple uses and benefits of energy storage can be maximized cost-effectively.

Learn More



Carbon-Free Technology Initiative

The Carbon-Free Technology Initiative is focused on implementing federal policies that support affordable, commercially available, 24/7 carbon-free technologies within the next decade. Learn more at carbonfreetech.org.



Electric Perspectives

Electric Perspectives, EEI's flagship publication, provides insights on the transformation underway across the electric power industry. Available in print and accessible online at electricperspectives.com.



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The **Edison Electric Institute** (EEI) is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for more than 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports more than 7 million jobs in communities across the United States. In addition to our U.S. members, EEI has more than 65 international electric companies with operations in more than 90 countries, as International Members, and hundreds of industry suppliers and related organizations as Associate Members.

Organized in 1933, EEI provides public policy leadership, strategic business intelligence, and essential conferences and forums.

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