

# HYDROGEN ENERGY & FUEL CELLS

## Energy Resilience & Security

**Investing in hydrogen energy will increase the resilience, reliability, and security of our energy ecosystem.**

At a time when extreme weather-induced power outages are increasingly impacting communities across the country, the need for a more resilient and reliable U.S. energy system has never been greater. Hydrogen and fuel cells can help reinforce clean energy grids by providing long-term energy storage options and by offering dependable, cost-effective backup power. Hydrogen energy and fuel cells can also enhance energy security in the transportation sector, reducing petroleum imports and supplying a dependable, domestically produced source of energy.

### Improving Energy Resilience & Reliability

**Hydrogen energy and fuel cells can provide critical energy storage and back-up power capacity to the grid, American industry, and isolated communities.**

**Hydrogen is being developed to enhance the reliability of America's decarbonizing electricity grid.** Deploying hydrogen energy storage alongside renewable energy sources like wind and solar can mitigate the intermittency of renewables by offering firm, dispatchable electricity when it is needed most. Fuel cells are also being developed that can hold more energy for longer durations than batteries and can be sited in more diverse locations than pumped water storage. This potential is being demonstrated in projects across the country, including a 1,000 MW power facility in Millard County, Utah, where underground salt caverns will be used to store renewable hydrogen. This hydrogen will be fuel for gas turbines to produce electricity with zero carbon emissions.

**Fuel cells can replace diesel generators to offer cleaner, more reliable, and more cost-effective forms of backup and off-grid power.** In data centers, telecommunication towers, and microgrids across the country, fuel cells are already providing reliable backup and off-grid power. Compared with diesel generators, they offer fewer emissions, less air and noise pollution, and superior performance—thanks to fewer moving parts and a fuel source that doesn't degrade over time. In combination with renewables, hydrogen fuel cells can also supply microgrid power to communities with the highest risk of shutoffs during seasonal grid interruptions, such as high temperatures or wildfires. And this technology offers a highly reliable primary power option for remote communities and off-grid locations like military bases and camps.

**By 2030, hydrogen fuel cells can be used in up to...**



**45% of data centers**

**...with annual demand for...**



**1,500 MW of stationary power capacity**

## Increasing Energy Security

Hydrogen offers a secure, domestically produced source of fuel to power ground, water, and air transportation.

Hydrogen can help diversify the transportation fuel mix and reduce our reliance on imported oil from producers like Saudi Arabia, Russia, and Venezuela. Hydrogen fuel cells are already powering passenger vehicles and trucks with domestically sourced hydrogen and can be manufactured here in the U.S. with minimal risks of supply chain disruptions. Hydrogen-based fuels also offer a secure alternative energy future for the aviation and shipping sectors, with low-carbon fuel production plants located across the country.

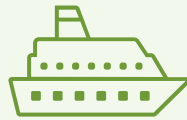
## Hydrogen Demand in the Transportation Sector by 2050

Metric Tons



Aviation

350K



Shipping

1M



Ground Transportation

27.4M

## POLICY SUPPORT

Policy support can spur the development of a vibrant hydrogen economy, increasing the resilience, reliability, and security of the U.S. energy system.

The hydrogen industry has the potential to secure America's energy future. Policymakers can support these efforts by:

- Adapting U.S. power market regulations to better enable hydrogen to provide grid services such as flexibility and energy storage.
- Developing regulations to ensure safe, reliable storage and transportation of hydrogen production with carbon capture, utilization, and storage (CCUS).
- Creating public incentives to bridge barriers to initial market launch.
- Expanding use of hydrogen across sectors and achieve economies of scale.
- Supporting infrastructure development and R&D.