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Federal Opportunities to Leverage Energy Storage

How Congressional leaders can strengthen America's economy, infrastructure, and competitiveness with battery energy storage.

Investing in America's long-neglected infrastructure will create jobs, build a more resilient economy, and enhance American competitiveness. The need for economic stimulus is especially acute in the wake of the Covid-19 pandemic, which has brought hardship to millions of Americans.

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Why energy storage?

Electricity is the backbone of the economy, and the ability to store electricity is already transforming how society benefits from electric power. Energy storage is enabling hospitals and critical facilities to function despite power outages; schools and businesses to save on their electricity bills; and electric utilities to add more intermittent renewable energy onto their systems.

The growth of renewable energy in the U.S. – driven in part by the federal Production Tax Credit (PTC) and Investment Tax Credit (ITC) for wind and solar energy, respectively – has reduced greenhouse gas (GHG) emissions and accelerated our march to full power sector decarbonization. But because wind and solar aren't always available, a technology is needed to solve renewable intermittency. That technology is energy storage. By storing renewable energy when it's generated and dispatching it when it's needed, storage amplifies renewable generation and makes it an "on-demand" resource.

Energy storage is an indispensable part of a modern, resilient electrical grid. Accelerating storage deployments will help society avoid outages and economic impacts from extreme weather; integrate electric vehicles (EVs) onto the grid and maximize their benefits; and enable a stable, reliable, zeroemissions grid powered by variable renewables. Notably, energy storage projects are "shovel-ready" and can be pursued without delay to benefit local workers, businesses, and communities.

Key priority: A federal ITC for energy storage

Current federal policy allows an ITC for energy storage only when it is installed in conjunction with a solar energy system (and even then, IRS guidance is unclear). We need energy storage policy that is fuel-neutral and less narrow in its application, or we risk needlessly hindering storage deployment. And as the share of variable renewable energy grows across the country, we will need strategically placed standalone storage systems to ensure grid reliability, in addition to solar plus storage systems.

A standalone storage ITC (also known as a "storage ITC") would greatly stimulate the market for energy storage and accelerate its many benefits. A storage ITC would make America's power system more reliable, resilient, and cost-effective, modernizing the country's critical infrastructure while helping the economy recover from the pandemic.

As previously referenced, the federal ITC for solar energy has been instrumental in lowering the costs of deploying millions of solar panels across the country. In the same way, establishing an ITC for energy storage systems will be essential in driving down the costs of emerging storage technologies, while simultaneously creating demand in new markets. Further, a storage ITC would allow U.S. companies to better obtain financing, scale, create jobs, and become more competitive internationally in the fast-growing global storage market.

A federal storage ITC should:

- Include language allowing companies to opt for a direct cash payment in lieu of tax credit for energy storage projects
- Pair the timeframe for the storage ITC with other technologies eligible under Section 48

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Stationary energy storage should be included in the definition of EV charging infrastructure, eligible for all incentives and program support.

Energy storage is EV infrastructure



With transportation now accounting for the largest share of U.S. GHG emissions, reducing vehicle emissions has become a key priority. Several states and the federal government have announced plans to sharply increase the number of EVs on the road.

Stationary energy storage will be the key resource for mitigating the impact of a huge influx of EVs onto the grid – and the larger the vehicles and fleets, the more essential storage becomes. Without storage, EV charging loads could unduly stress the grid and trigger expensive grid investments, which can be avoided with (cheaper) batteries. Because energy storage is critical EV infrastructure, it should be eligible for incentives aiming to accelerate the growth and benefits of EVs.

To maximize the benefits of transportation electrification (TE), the federal government should aim to turn all EVs into full grid assets. Legislation to this effect would:

- Include stationary storage in the definition of EV charging infrastructure, eligible for all incentives and program support
- · Provide grants to DC fast-charger build-outs that include stationary energy storage
- Outfit interstate rest stops with DC fast-chargers, solar, and storage ("Electric Interstates" Program), and upgrade some to resilience centers with microgrids
- Direct DOE to help states develop Vehicle-to-Grid (V2G) Policy Roadmaps. Stationary storage is the bridge to grid interactivity until V2G technology and regulations are fully developed

Energy storage builds resilience

In a recent six-month period, power outages across the country – in Texas, California, and New York – led to crises that made national headlines. In the 15 years since Hurricane Katrina, the U.S. has experienced several "once in a century" storms, and last year climate-driven losses doubled from 2019 levels.

The U.S. now ranks worst among all developed nations in outage frequency. With recent advancements in clean, distributed technologies like solar and battery storage, that is simply unacceptable. Solar and storage are already protecting communities across the nation, providing clean resilience and safe, reliable backup power year-round.

States will lead on building a more resilient electrical grid. But DOE and FEMA can support and catalyze state efforts by establishing a template "Resilience Framework" upon which state resilience roadmaps can be built. Stem recently published a first-of-its-kind <u>Clean Resilience Roadmap</u> whose framework and tools may be a helpful resource.

Federal resilience legislation should authorize and fund the DOE to:

- Work with FEMA to create a national standard Resilience Framework consisting of
 - A language for specifying and quantifying Resilience Service Levels (RSL), i.e.,
 "how much" resilience
 - Research and case studies on how to value resilience
 - RSL definitions and valuation methodology for all federal programs (e.g., FEMA grants)
- Provide technical assistance and tools to states for using the Resilience Framework to develop regulations and markets
- Allocate disaster relief funds to study potential reduced disaster costs with resilient grid investments

Energy storage is key to improving grid resilience in the U.S., which now ranks worst among all developed nations in outage frequency.





Energy storage can solve solar integration issues but federal policy must unlock its potential as a flexible resource.

Energy storage is a flexible resource



Renewable energy is essential for economy-wide decarbonization, but increasing solar generation poses three key challenges for electrical grids: fast ramp-up periods in late afternoon/ evening (when solar output drops but system loads peak); mid-day solar overgeneration; and moment-to-moment intermittency. Energy storage can solve all three problems! But policies must unlock its potential as a flexible resource.

To empower energy storage as a flexible resource, federal legislation should:

- · Direct DOE to
 - Gather the latest examples of flexible resource mechanisms
 - Publish a report with templates for each type of energy market
 - Provide tools and technical assistance to states
- Direct FERC to require each wholesale market to create a flexible capacity product

A vision for federal policymaking

Because energy storage has matured far beyond the "demo" stage, federal storage policy should shift its focus from hardware and basic research to accelerating market development. The goal should be to create the markets and programs that make the best use of current technology and drive innovation in business models and software intelligence.

At the highest level, the mission of the federal government should be to unlock "full storage value" in all 50 states – removing market and policy barriers so that storage can provide its full range of services to customers, utilities and the grid, and receive fair compensation for those services.

Grid modernization and clean energy technology deployment are increasingly recognized as a key factor in global competitiveness. And one thing is certain -- a decarbonized economy can't be achieved without energy storage. The country that maximizes the value of storage in the lowest-carbon, most resilient, most cost-efficient electricity system will out-compete everyone else.

Federal storage policy should accelerate market development, driving innovation in business models and software intelligence.



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About Stem, Inc.

Founded in 2009, Stem is a global leader in artificial intelligence (AI)-driven energy storage. We deliver and operate smart battery storage systems that reduce energy costs and help build a cleaner, more resilient grid. Our customers include energy service companies (ESCOs) and project developers, state and federal agencies, critical facilities, electric utilities and cooperatives, and large and mid-sized businesses. We currently have more than 950 energy storage systems operating or contracted across 260-plus cities, representing more than 1 gigawatt-hour (GWh) in operation.

Stem has been at the forward edge of nearly every major federal and state storage policy development in North America, including FERC Order 2222 and New York's groundbreaking energy storage target and roadmap. Stem also recently published a first-of-its-kind <u>Clean Resilience</u> <u>Roadmap</u> providing regulators with a framework and tools to realize a more resilient electrical grid.

Contact

Chris Mathey VP, Federal Policy & Business Development Stem

E: chris.mathey@stem.com M: 703-969-1516

