



# Why Governments Should Subsidize Long Duration Energy Storage - And Where They're Getting It Right

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The Storage Gap No One's Talking About (But Should Be)

California generates enough solar power daily to light up Las Vegas for a week... at noon. But come sundown? Utilities scramble like baristas during a morning rush. This daily drama exposes our dirty little secret - we've mastered renewable energy generation but still suck at storing it long-term. Enter the unsung hero we desperately need: subsidized long duration energy storage.

What Exactly Are We Storing Here?

When energy wonks talk "long duration," they mean systems that can dispatch power for 10+ hours continuously. We're not talking about your Tesla Powerwall here. Think:

- Flow batteries that work like liquid fuel tanks for electricity
- Compressed air storage in underground salt caverns
- Green hydrogen produced from excess renewables

3 Reasons Subsidies Aren't Optional Anymore

1. The Duck Curve Is Quacking Loudly

California's infamous "duck curve" - where solar overproduction creates a midday valley and evening demand spike - cost ratepayers \$222 million in 2020 alone. Without multi-day storage solutions, this financial hemorrhage will spread nationwide faster than a TikTok dance trend.

2. Private Sector Can't Shoulder This Alone

While venture capitalists love funding sexy AI startups, energy storage projects have capital costs that would make even Wall Street bankers blush. A single grid-scale flow battery installation can run \$500 million - that's 25x what VCs typically invest in climate tech.

3. National Security Depends On It

Remember when Texas' grid collapsed during the 2021 freeze? Now imagine that scenario with prolonged cloudy/windless periods. Military bases are already investing in microgrids with 72-hour storage - shouldn't civilian infrastructure follow suit?

Where Subsidy Dollars Are Making Waves

Not all government interventions are created equal. These real-world examples show what works:

Case Study: The \$0.25/KWh Game-Changer

In 2023, the U.S. DOE launched the Long Duration Storage Shot program, offering tax credits that effectively guarantee \$0.25/kWh for 10+ hour systems. Early results?



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Form Energy's iron-air battery deployment accelerated by 18 months  
3 new compressed air facilities broke ground in Texas shale formations  
Projected 45% cost reduction in hydrogen storage by 2025

## Germany's "Energiespeicher" Push

Through their Innovation Tender Program, Germany subsidizes storage paired with renewables. The catch? Systems must provide at least 6 discharge cycles weekly. This "use it or lose it" approach boosted storage utilization rates to 82% - compared to 63% in unsubsidized projects.

## The Elephant in the Control Room

Let's address the skeptics: "Why throw money at storage when generation costs keep falling?" Here's the rub - cheap renewables without storage are like buying a Ferrari without tires. Australia learned this the hard way when a 2022 coal plant outage caused price spikes despite having 40% solar penetration.

## Storage Economics 101

Current levelized cost of storage (LCOS) for 10-hour systems:

Pumped hydro: \$0.15-\$0.20/kWh  
Lithium-ion: \$0.25-\$0.35/kWh (but degrades faster)  
Hydrogen: \$0.40-\$0.60/kWh (needs tech breakthroughs)

Subsidies bridge the gap until economies of scale kick in - much like what happened with solar panels in the 2010s.

## Future-Proofing Our Grids

The latest thermal energy storage innovations could revolutionize industrial heat:

Malta Inc's molten salt system (stores electricity as heat for days)  
Antora Energy's carbon-based thermal batteries

These technologies could decarbonize 15% of global CO2 emissions from industrial processes... if scaling costs get addressed through smart subsidies.

## When Politics Meets Physics

Here's where things get spicy. The 2024 U.S. election cycle features competing storage subsidy visions:

Proposal A: Expand the 45X tax credit to include 8+ hour systems



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Proposal B: State-level capacity payments for storage

Wild Card: FERC's proposed "storage as transmission" classification

Meanwhile, the EU's Green Deal Industrial Plan earmarks EUR34 billion for energy storage - with strict local content requirements that could spark trade disputes.

The Australia Blueprint

Down Under, the government's Underwriting New Generation Investments program combines:

Low-interest loans covering 50% of project costs

Revenue stabilization mechanisms

Streamlined permitting for co-located storage+renewables

Early winner: The 900MW South Australia Pumped Hydro project, set to provide 12 hours of storage using abandoned mine shafts.

Storage as Climate Insurance

Think of long duration storage subsidies as down payments on climate resilience. Every dollar invested today prevents:

\$2.10 in storm-related grid repairs (NOAA 2023 estimate)

\$4.80 in health costs from fossil peaker plant emissions

Priceless political headaches during energy crises

The Innovator's Dilemma

While lithium-ion batteries dominate headlines, startups are chasing alternative chemistries:

Ambri's liquid metal battery (lasts 20+ years)

ESS Inc's iron flow battery (uses low-cost materials)

Highview Power's liquid air storage (can retrofit old plants)

Subsidy structures must remain technology-agnostic to avoid picking winners - easier said than done when lobbyists swarm Capitol Hill.

When Markets Need a Nudge

The brutal truth? Energy markets weren't designed for 100-hour storage. Current capacity markets typically compensate resources that can deliver 4-hour duration - a relic from the natural gas era. Progressive regulators are now:



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Creating new asset categories for 10+ hour storage

Adjusting ancillary service requirements

Implementing time-shifted renewable credits

It's like trying to fit a nuclear reactor into a smartphone charger - possible, but you need to redesign the entire system.

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