Liftoff Opportunities Snapshot:
Long Duration Energy Storage

**Long Duration Energy Storage (LDES)** includes technologies that store energy over long periods for future use.

The U.S. grid is expected to need **225-460 GW of LDES capacity** for a net-zero economy by 2050, representing **$330 billion in cumulative capital requirements**.

**LDES represents an attractive opportunity for companies.**

1. Capital deployment opportunities are expected to total **$330 billion by 2050**.
2. LDES can tap into a diverse set of revenue streams including but not limited to energy and capacity payments, ancillary services, time-of-use arbitrage, and demand management.
3. Many LDES systems are both modular and scalable, reducing investment risk.

LDES has the potential to play a **significant role in the decarbonization by the U.S. power system**—from bulk power to resiliency and behind-the-meter applications.

LDES technologies are expected to be the **least-cost option** to provide **stability and flexibility** to the grid as variable renewables expand.
Specialization in Alternative Electric Power Subcluster by State, 2021

- High Employment Specialization and Share
- High Employment Specialization
- High Employment Share

Source: [https://clustermapping.us/](https://clustermapping.us/)

Over the next 5–10 years, LDES's cost, efficiency, and risks are expected to improve with continued R&D, economies of scale of deployment, and manufacturing/supply chain improvements resulting from modularized, industrial-scale facilities and workforces.

LDES Employment Readiness Among U.S. States

Renewables penetration drives favorable grid conditions in the Midwest, while grid reliability issues create compelling LDES opportunities in the Midwest and Southeast.

Strong policy on the west coast and in the Northeast/Mid-Atlantic is driving favorable conditions. Capacity payments in the Midcontinent Independent System Operator potentially create a favorable market.

The information in this flyer is based on the [Pathways to Commercial Liftoff: Long Duration Energy Storage](https://clustermapping.us/) report.