

LDES Value: Concept and Reality

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March 12, 2021

Food for Thought

▶ **The Grid is Not a Customer**

- While we want technologies to provide system value, they must provide customer value to be deployed

▶ **It's Hard to Sell Value Stacking**

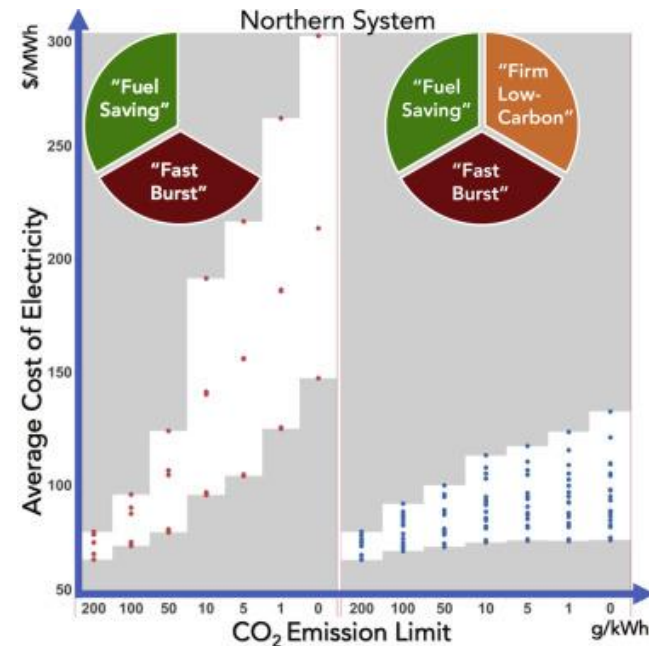
- Value stacking is great in principle, but extremely difficult in practice, especially when values are spread across different stakeholders

▶ **LDES is All About Risk**

- LDES technologies thrive at mitigating a myriad of risks including availability, delivery, and pricing

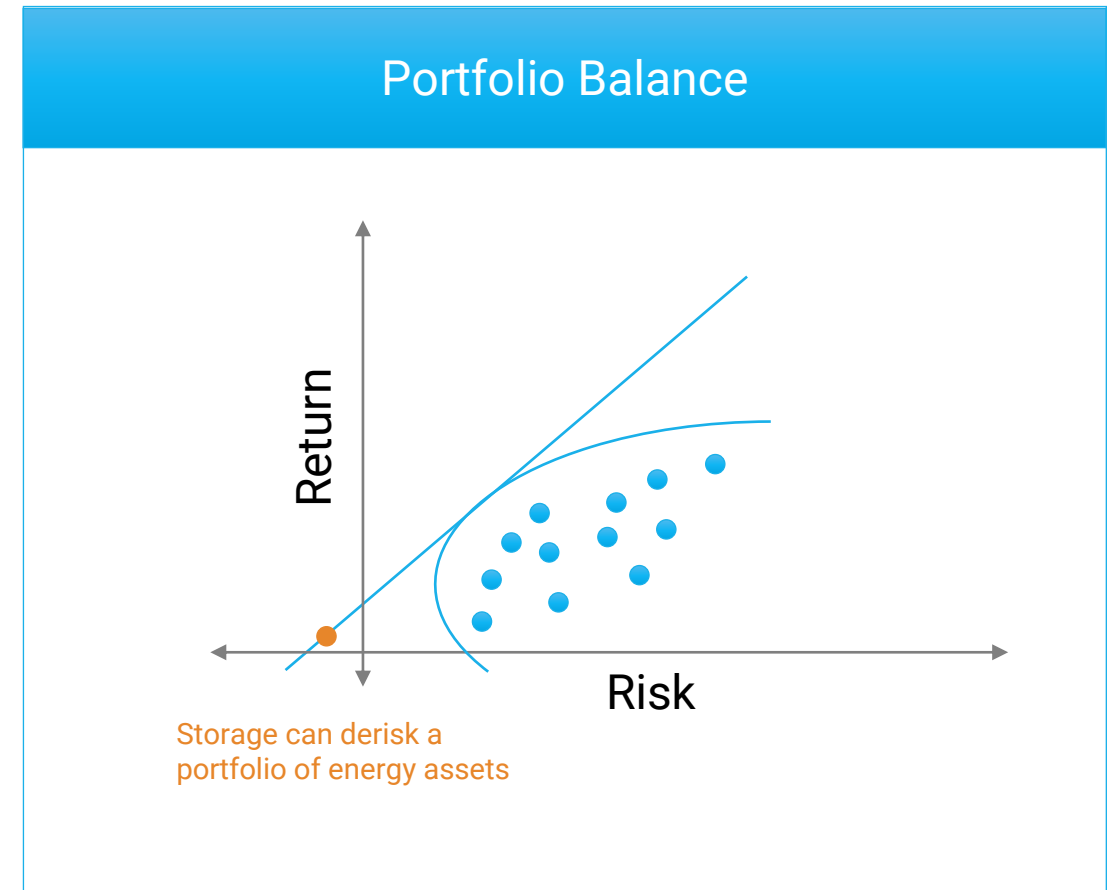
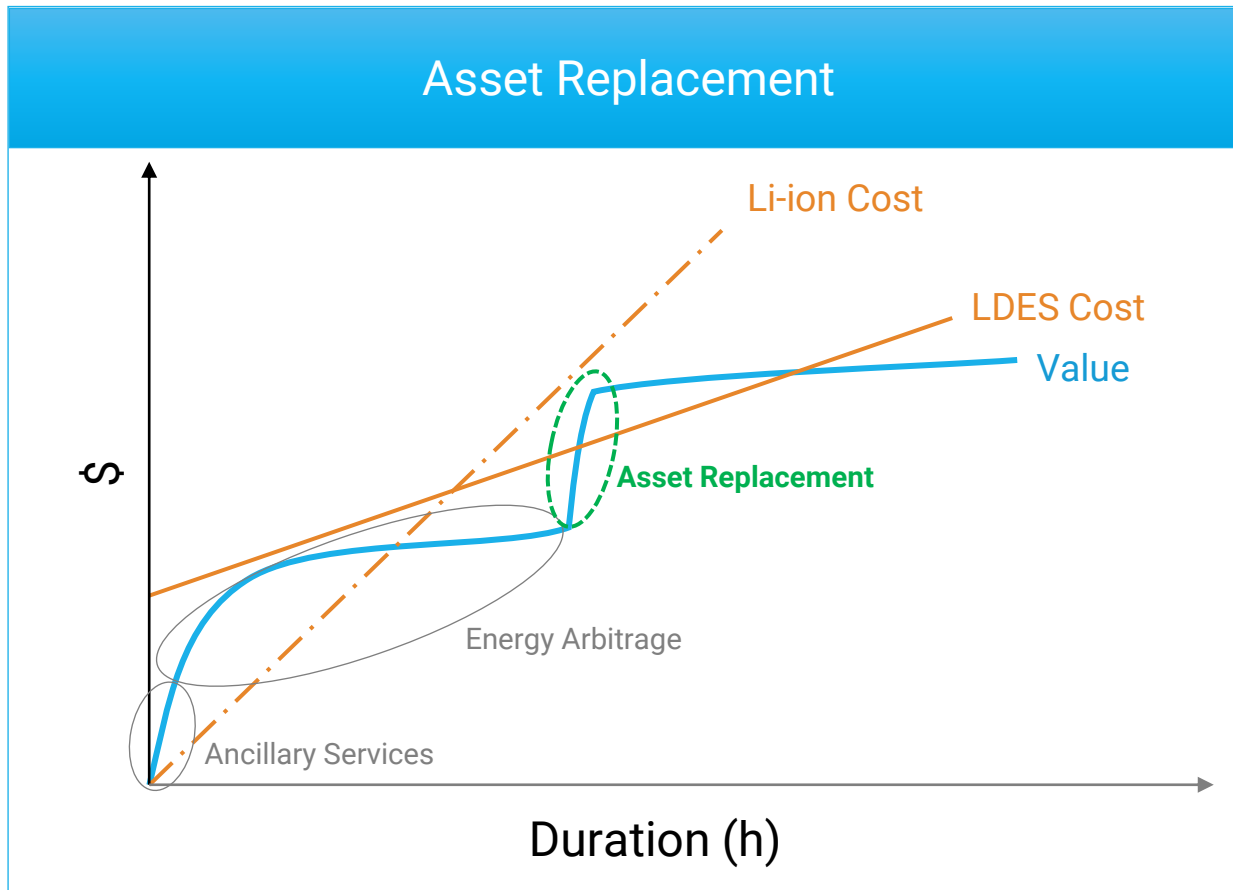
The System Level Need for LDES on an Evolving Grid is Clear

- ▶ Studies have shown that “firm, low-carbon” resources like LDES are necessary for minimizing power costs on a deeply decarbonized grid
 - Reduces average modeled systemwide costs
 - Decreases variability in modeled outcomes



How Does LDES Deliver Value?

- ▶ LDES technologies shine in risk mitigation roles which can take two key forms



Who Does LDES Provide Value To?

- ▶ Customers will have specific needs and pain points (i.e. not “The Grid”)
- ▶ “Value stacking” sounds attractive, but may be difficult to capture, especially if values accrue to different customers

Customer Type	Source of Revenue	LDES Value Hypothesis
Load	Business operations	Bill savings / Savings over other backup options
Generator	Offtake agreements	Increase contract value
Load Serving Entity	Power sales	Physical hedge to reduce market exposure or meet capacity obligations
Regulated Utility	PUC enabled Rate of Return	Investment opportunity as NWA or capacity

LDES Applications Coming into Focus

Capacity Resource for LSEs



Seeking 500 MWs for long duration storage

The eight joint CCAs are seeking to acquire up to 500 MWs of capacity, energy and any associated ancillary products, and resource adequacy ("Full Toll") and/or simply Resource Adequacy ("RA Only").

Interconnection Maximization for Developers



L.A. Looks to Break Price Records With Massive Solar-Battery Project

The cheapest U.S. solar PPAs have been coming out of places like West Texas, but developer 8minute Solar has put the spotlight back on California.

JEFF ST. JOHN | JULY 01, 2019

8minute's project with LADWP will include about 65 MW of **additional solar PV beyond its nameplate capacity** to serve the battery storage to be added to the project, because the Kern County transmission corridor, already the home of about 1 GW of solar PV, has a maximum capacity for how much power it can carry to Los Angeles.

Backup Power for Critical Loads



The Value of Battery Storage in Military Microgrids:

An Assessment for ESTCP

Jeffrey Marqusee, Dan Olis, William Becker, and Sean Ericson
National Renewable Energy Laboratory

Craig Schultz
ICF

Design and production by Noblis, Inc.

July 2020

Risk Management for Energy Marketers

Large Scale, Long Duration Energy Storage, and the Future of Renewables Generation

White Paper



Through this analysis, we provide a quantitative framework to demonstrate the ability of storage to manage risk and return for wind farms exposed to volume and basis risk factors... The results are persistent across the wind farms modeled and demonstrate the impact of bulk energy storage technologies to **effectively manage risks and maximize returns.**