



**LDES NATIONAL
CONSORTIUM**

LDES National Consortium Workshop

Monetizing the Value of LDES and Developing Commercialization Pathways

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OCED
Office of Clean Energy Demonstrations



OTT
Office of Technology Transitions

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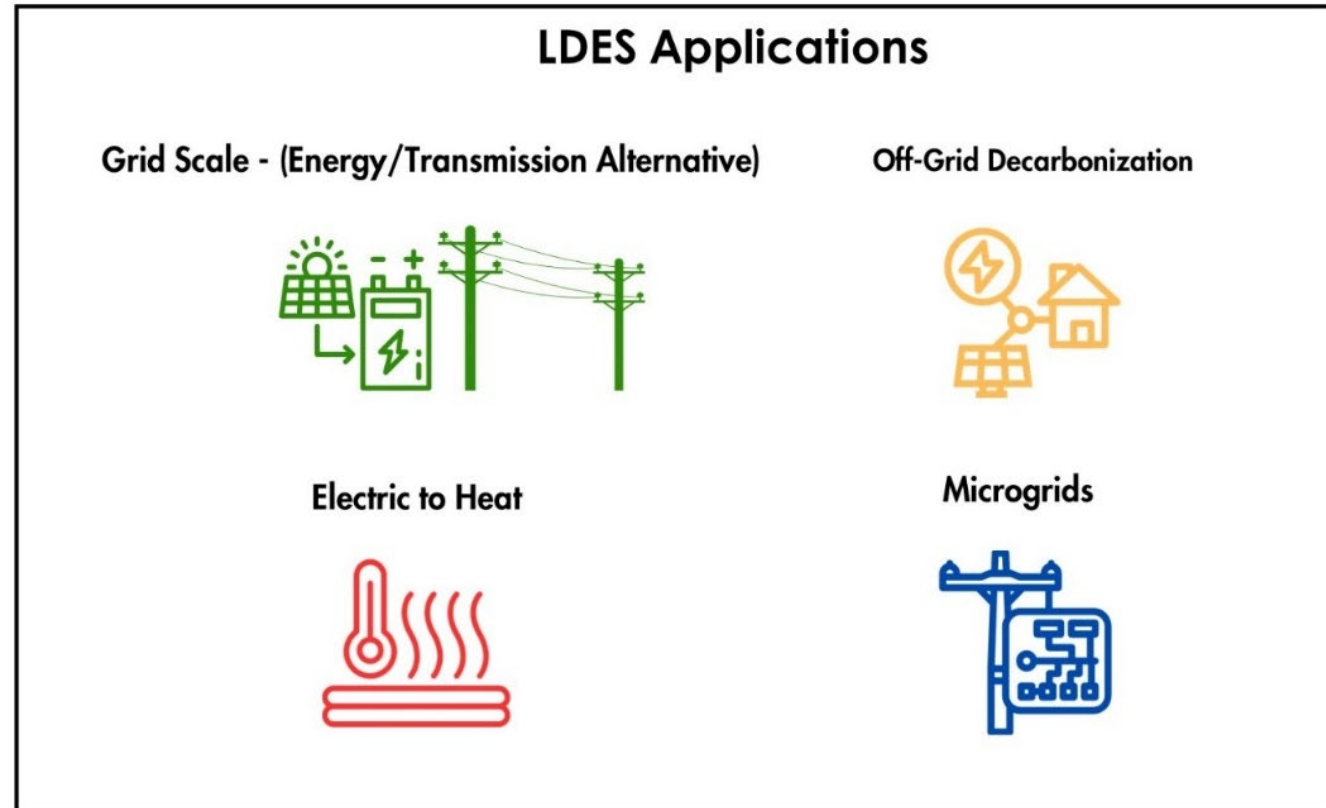


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Long duration energy storage serves four applications

- LDES resources can provide all grid services that traditional resources provide
 - Generally not financially viable
- Off grid and microgrid needs can be served with LDES
 - LDES can provide a viable alternative to backup diesel generators
 - Island nations use LDES for decarbonization
 - Storage resources provide resilience, reducing intermittency
- LDES can provide 24x7 heat for chemical manufacturing, food and beverage manufacturing, and heavy industry
 - Can be financially viable if natural gas costs are high or accurate carbon pricing



Grid participation revenue streams

1. Energy Markets

- Revenues from energy and ancillary service markets

2. Fixed payments

- These include resources adequacy payment and contracts like power purchase agreements
 - Traditional resource adequacy markets do not consider decarbonization
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- Resource adequacy markets achieve efficiency by targeting payments equal to the difference between annualized going forward costs and energy market revenues

The principle behind resource adequacy markets is lowest cost resource procurement



Potential pathways for monetizing LDES resources



- Relying more on central planning to develop pathways with least cost mix of resources
 - Resources procured would require something like bilateral contracts for viability
 - Eastern ISO resource adequacy constructs would require significant effort to evolve

- Enhancing resource adequacy markets to include decarbonization in grid mix
 - Current market clearing principles could result in significantly higher all-in electricity costs
 - These distinct from electric load carrying capacity constructs in place today (these are detrimental to LDES and decarbonization)

Key Questions for Discussion

- How do we begin conversations to evolve market constructs?
- What are regulatory hurdles to making these changes and how can regulators help to speed this process?
- What are some of the challenges facing markets that have aggressive decarbonization goals?
- Decarbonization is (will be) expensive, how do we approach the problem of paying for decarbonization?

LDES is critical for decarbonization – How do we advance policy for implementation?

