



# LDES NATIONAL CONSORTIUM

Customer Adoption Tiger  
Team Mission Statement

The National Consortium for the  
Advancement of Long Duration Energy  
Storage (LDES) Technologies

SAND2023-141540



**OTT**

Office of Technology Transitions

# Table of Contents

Purpose & Objectives ..... 2

Scope ..... 2

Leadership..... 3

Activities & Deliverables ..... 3

Questions To Be Addressed..... 4

Schedule..... 5



This project is funded by the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law (BIL), as part of the DOE Technology Commercialization Fund (TCF), administered by the Office of Technology Transitions in partnership with the Office of Clean Energy Demonstrations (OCED).

# Customer Adoption Tiger Team

## Mission Statement

### Purpose & Objectives

One of the most significant outcomes of the National Consortium will be a set of recommendations to frame multiple pathways to achieve LDES commercialization over the next decade. Commercialization refers to the steps that must be taken before technologies are successfully launched to affirm or redefine traditional approaches (i.e., pathways) addressing policies, financing, and investing, supply, production and distribution, marketing and sales, and customer support.

The purpose of the Customer Adoption Tiger Team is to assess the challenges and roadblocks that can negatively impact how customers in various markets can adopt, utilize, and benefit from LDES technologies.

The Customer Adoption Tiger Team will identify opportunities and barriers that drive or hinder the commercialization of LDES technologies as represented by the customer adoption of these technologies. Emphasis will be placed on opportunities and barriers that must be immediately addressed to enable a pathway for LDES commercialization within the next decade.

### Scope

Within the context of this Tiger Team, “customer” can refer to any person or organization with a current or future interest in using a wide range of LDES technologies for a variety of applications. The current and future needs of customers in both wholesale and retail markets across the US will be considered within this Tiger Team. The Customer Adoption Tiger Team will be actively assessing challenges and roadblocks facing a broad range of LDES technologies and developing consensus-based recommendations to define the customer-focused pathways for LDES products, projects, economics, financing, policies, and equity so that overall customer adoption for LDES is enhanced. In addition, this Tiger Team will also work to assess the potential and likelihood of partnerships that can be developed between LDES technology suppliers and manufacturers and utilities seeking utility-scale solutions that can result in increased options for end-use customers.

Information gathered directly from Teaming Partners and shared from other Tiger Teams within the National Consortium will be used to inform recommendations related to customer adoption of LDES technologies.

## Leadership

The Customer Adoption Tiger Team will be led by two leaders from a national laboratory and one Industry Advisor selected from among participating Teaming Partners. The current leadership for the Customer Adoption Tiger Team is:

- **Lab Leader:** Zhiwen Ma, National Renewable Energy Laboratory, Zhiwen.Ma@nrel.gov
- **Lab Back-Up Lead:** Will McNamara, Sandia National Laboratories, jwmcnam@sandia.gov
- **Industry Advisor:** TBD
- **Subject Matter Experts:** TBD

## Activities & Deliverables

The Customer Adoption Tiger Team will assess and define utility needs for LDES and help establish stakeholder and community interaction channels to identify various customer needs. The commercialization channels and understanding of customer needs provide information and resources intended to support LDES commercialization activities by assessing LDES technology suitability and economic impact to end users.

This Tiger Team will develop plans for Customer Adoption of LDES that include key objectives and goals along with associated infrastructure requirements that may be necessary to achieve these objectives and goals. The tiger team will involve utilities to consider LDES in their future integrated resource planning (IRPs) or other long-term plans. In addition, this Tiger Team will engage LDES technology suppliers, manufacturers, and project managers to ensure that the recommendations being developed are feasible. The Customer Adoption Tiger Team will pull information generated from other Tiger Teams to facilitate knowledge to facilitate utilities on how to assess their future requirements for LDES so that customer adoption of these technologies will be successfully enabled.



At the end, the Customer Adoption Tiger Team will assemble Industry responses regarding the implementation and adoption of LDES and generate reports/recommendations on how industry has responded, implemented or otherwise adopted the full suite of commercialization pathway recommendations. The assessment will include a measurement of impacts based on quantifiable metrics established in the recommended action plan for customer adoption of LDES technologies.

## Questions To Be Addressed

- How can customer adoption challenges be effectively evaluated? For example, how will the evaluation of adoption challenges be impacted by segmenting markets by applications and sizes of end-users? Is there a more effective approach?
- What are the barriers of customer adoption, such as LDES technologies, market trend, utility planning, return on investment, grid reliability and resilience needs, etc. What are key factors influencing decisions of LDES customer adoption?
- What impact does regional differences have on customer adoption of LDES?
- Which markets seem most primed for customer adoption of LDES technologies? Why?
- How will differences in retail and wholesale markets impact end-use customer needs?
- What are the different customer adoption expectations for:
  - FTM utility-scale installations, which are typically larger than 10 MWh
  - BTM commercial and industrial installations, which typically range from 30 kWh to 10 MWh;
  - BTM residential installations, which are usually less than 30 kWh (would these be a viable market for LDES technologies?)
- How will different LDES technologies influence different customer adoption models?
- Up to now, much of the emphasis for customer adoption has been placed on services that increase energy providers' flexibility—for instance, through firm frequency response. In the long run, where will LDES technology adoption be concentrated? What will be the impact of an increased number of build-out of solar parks and wind farms and the retirement of baseload fossil-fueled and nuclear thermal power plants?
- To what extent have state-level incentive programs driven adoption of LDES technologies (as compared with short-duration energy storage, which has clearly

benefitted)? What are the best practices that can be offered to states regarding incentive programs?

- What are the unique customer adoption considerations for LDES that are associated with virtual power plans (VPPs), in which aggregators group numerous residential batteries together, and a utility or grid operator calls on that stored power when needed, compensating the storage customers for that access. Would this become a market for LDES?

## Schedule

The Customer Adoption Tiger Team will meet on a monthly basis via a Microsoft Teams platform. Attendance will be taken at each meeting to track in-kind cost sharing contributions among Teaming Partners.

Notes from each meeting will be transcribed and shared with the Leadership Team so that commonalities across Tiger Teams can be identified. Tiger Team notes will be summarized in reports and recommendations on relevant subjects and question areas.



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