New Technical Assistance Opportunity: Regulatory Sandboxes and Other Processes to Expedite Utility Adoption of Advanced Grid Technologies

Informational Webinar with NARUC and NASEO

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January 23, 2026

Energy Technologies Area
BERKELEY LAB

This work was funded by the U.S. Department of Energy, Office of Electricity, under Contract No. DE-AC02-05CH11231.

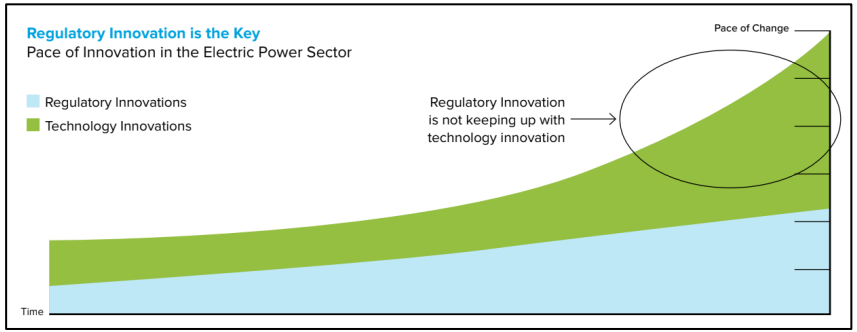
Agenda

- Introduction and Background
  - Regulatory sandboxes and similar mechanisms
  - Berkeley Lab’s research
- Technical Assistance Program Overview
  - Levels of available support
  - Application process
- Questions

Introduction and Background

The Need for Regulatory Sandbox Mechanisms

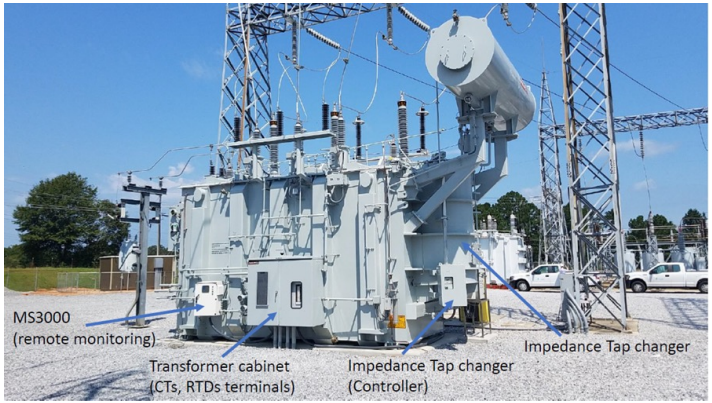
- Load growth, aging assets, variable energy resources, and increasingly severe and frequent weather events are challenging utilities to simultaneously:
  - Expand transmission and distribution (T&D) capacity
  - Improve asset management and utilization
  - Adopt new operational practices
  - Expand resilience programs
  - Maintain energy affordability
- Traditional regulatory processes can discourage utility interest in testing and deploying advanced grid technologies to help meet these challenges.
- ***Regulatory sandboxes*** **aim to bridge the gap between need and opportunity to deliver solutions at scale.**



Source: McDonnell, Gorman, and Field 2022

The Potential for Advanced Grid Technologies

- Advanced grid technologies are advanced equipment, services, and applications (both hardware and software) that enhance T&D systems by unlocking new capacity and capabilities to meet system needs.
- Examples include:
  - Dynamic line rating
  - Advanced flexible transformers
  - Advanced conductors
  - Volt/Var Optimization
- Advanced grid technologies that are commercially available today, but have not yet reached full market transformation, could be adopted within 3–5 years to increase peak capacity of U.S. T&D systems by 20–100 gigawatts (GW) at lower cost than like-for-like replacements.



Source: U.S. Department of Energy (DOE)

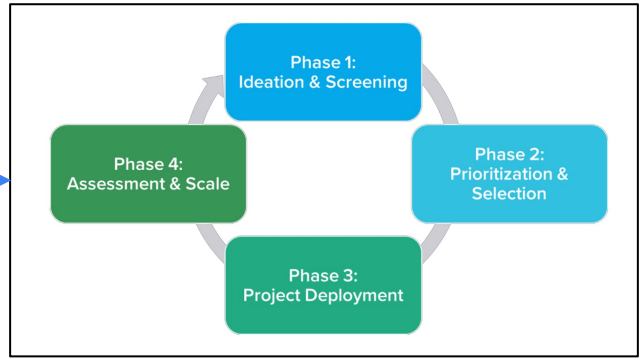
Defining Regulatory Sandboxes

Regulatory Sandboxes

Mechanisms that provide a structured environment for testing new technologies and business approaches under modified rules to increase the speed of adoption

Example

The Connecticut Innovative Energy Solutions (IES) sandbox mechanism selects cutting-edge project proposals to run for a 12- to 18-month trial period before assessing results and quickly determining scaling strategies.



Source: CT PURA

Taxonomy of Sandbox-Type Mechanisms

Funding Opportunity

Funding carveout for innovative grid transformation projects

Pilot Process

Activities to improve how pilot projects are approved and managed

Rate Case or Rulemaking

Vehicles for broader innovation efforts that may include reforms including sandbox-like initiatives

Regulatory Sandbox

Mechanism that provides a structured environment for testing new technologies and business approaches under modified rules to increase the speed of adoption

Berkeley Lab Research

Berkeley Lab published research on regulatory sandboxes and other processes to expedite adoption of advanced grid technologies.

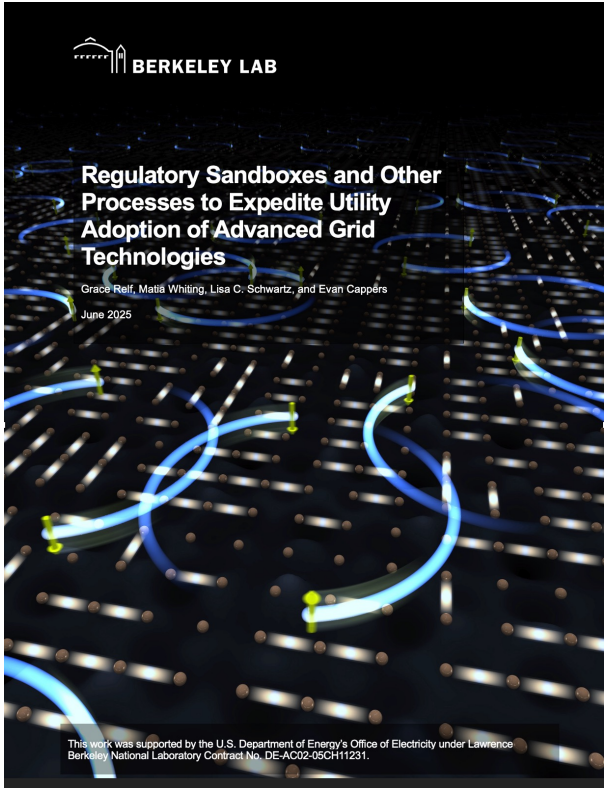
The research:

- Assesses the need for, and barriers to, utility innovation
- Identifies regulatory sandboxes and related processes
- Assesses emerging best practices

Berkeley Lab created an accompanying toolkit to support states looking to develop a sandbox.

Research available at: https://emp.lbl.gov/publications/regulatory-sandboxes-and-other

Toolkit available at: http://sandbox-navigator.lbl.gov/



Report Methodology

- Literature review & synthesis of common and key findings
- With E9 Insight, comprehensive review of regulatory proceedings & deep-dive into regulatory filings, utility innovation webpages, pilot databases, and other sources
- Structured interviews with utilities, regulators, consumer advocates, industry trade groups, and consultants
- Analysis and synthesis of findings

Organizations Interviewed
American Public Power Association (APPA)
Connecticut Public Utilities Regulatory Authority (PURA)
Current Energy Group
Duke Energy Corporation (via written correspondence)
Hawaiian Electric (HECO)
Hawaii Public Utilities Commission (HPUC)
Green Mountain Power (GMP)
Public Staff – North Carolina Utilities Commission
San Diego Gas & Electric (SDG&E)
United Illuminating
Vermont Public Utilities Commission (VT PUC)
Vermont Electric Power Company (VELCO)
WATT Coalition / Grid Strategies

Sandbox Examples

Connecticut Innovative Energy Solutions

- Reduces barriers for deploying new technologies and to facilitate collaboration between product innovators and utilities.
- Follows a four-phase process: ideation and screening, prioritization and selection, project deployment, and assessment and scaling.
- Uses thematic program cycles, three participation pathways and an innovation advisory council.

New York Reforming the Energy Vision Demos

- Allows utilities to develop new business models and effectively unlock new revenue streams and private investments.
- Encourages flexibility, innovation, partnerships, customer engagement, market creation, scalability and cost recovery.

Hawaii Innovative Pilot Framework

- Expedites review of pilot proposals for new technologies, programs, and business models that support goals in areas such as resilience.
- Complements elements of a performance-based regulation framework targeted at cost control.

Notable Examples from Abroad

- The U.K's Office of Gas and Electricity Markets (OFGEM) developed an Energy Regulation Sandbox in 2017 as part of its performance-based regulation framework.
  - The sandbox enables demonstrations and trials in the regulated electric and gas sectors, particularly those that may require modified or reduced regulations in order to move forward.
- The Ontario Energy Board established an Innovation Sandbox in 2016 to support achievement of the goals identified in its Strategic Blueprint document.
  - The sandbox aims to better support innovation by introducing a simpler, less adversarial, and quicker way to trial new technologies and services.
- The Singapore Energy Market Authority created a regulatory sandbox in 2017.
  - The sandbox is a means of formalizing a previous effort to identify regulatory barriers to innovation on an ad hoc basis.

Source: OEB

Findings

Sandboxes have grown over time in the U.S. electricity sector	• 12 ongoing examples of sandbox mechanisms • Sandbox types are varied
Sandboxes have demonstrated value	• Interviewees expressed enthusiasm for sandboxes • Sandboxes are particularly good for creating a willingness to learn and an environment for experimentation
Programmatic focuses are varied	• Sandbox programs most commonly focus on demand-side resources • Sandboxes can enable deployment of customer-sited batteries, distribution management technologies, modeling tools, and microgrids
Sandbox design can be improved to increase impact	• A stronger focus on advanced grid technologies may encourage more sandbox projects • Scaling of programs isn't well documented and may need more focus

Sandboxes can:

- **Advance innovation**
- **Increase information collection and sharing**
- **Improve economic outcomes**
- **Enhance grid reliability and resilience**
- **Better meet customer needs**
- **Expand access to technologies**

New Technical Assistance Opportunity

Technical Assistance Overview

- The U.S. Department of Energy's Office of Electricity is supporting Berkeley Lab to provide technical assistance for **public utility commissions, state energy offices,** municipal utilities, and rural electric cooperatives to consider, develop, and implement regulatory sandboxes or other innovative approaches like pilots and novel programs for deployment of advanced grid technologies for T&D systems.
    - In the context of utilities whose rates are not state-regulated, a sandbox is a mechanism for testing new programs, technologies, and business models outside of traditional approaches.
- Technical assistance is available at three levels:
    - Sandbox Exploration – Educational briefings
    - Sandbox Expert Assistance – Deeper support for navigating limited sandbox and innovation vehicle design and implementation challenges
    - Sandbox Deep Dive – Sustained engagement to build a sandbox or other innovative approach from the ground up and address implementation challenges

Sandbox Exploration

Objectives

- Increase understanding of the potential value, design, and operation of sandbox mechanisms and other innovation vehicles to facilitate adoption of advanced grid technologies
- Improve understanding of sandbox mechanisms and other innovative approaches to help support achievement of state and utility objectives such as scaling advanced grid technologies to improve grid reliability and affordability

Activities

- **Tailored, virtual educational briefings to:**
  - Identify ways sandboxes and other innovation vehicles may help address electricity sector challenges in your jurisdiction
  - Articulate benefits of sandboxes and similar mechanisms in relation to various stakeholder interests
  - Explore projects deployed in other jurisdictions to address similar challenges
  - Improve stakeholder engagement by responding to questions and concerns and illustrating possible mitigations

Availability

- We anticipate providing Exploration services to about five states or utilities per year
- We also can provide general informational webinars to states and utilities throughout the country

Sandbox Exploration

Request Sandbox Exploration services at any time by email.

Include a description of the presentation and information you're requesting and the desired timeframe
Grace Relf (gerelf@lbl.gov).

Sandbox Expert Assistance

Objectives

- Help states and utilities answer specific questions and overcome challenges in designing and implementing sandbox-type mechanisms or other innovative approaches for scaling advanced grid technologies to improve reliability and affordability
- Support states and utilities in refining existing sandbox mechanisms or other innovation vehicles

Activities

- **Deeper engagement (several months) on limited questions or challenges, such as:**
  - Modification of a straw sandbox framework to meet state and utility needs
  - Design of stakeholder engagement processes
  - Review of specific elements of an existing sandbox framework or other innovative approach
- Technical assistance tasks could include:
  - Virtual educational sessions, research presentations, and consultations on key questions
  - Development of tailored resources and materials
  - Real-time problem solving, such as support responding to innovator questions
- These are examples, and states are encouraged to identify other assistance needs

Availability

- We anticipate providing Expert Assistance services to two to three states or utilities per year

Sandbox Expert Assistance

Apply for Sandbox Expert Assistance using a short form online.

https://forms.gle/WccZvEBmEEA9cj987

Sandbox Deep Dive

Objectives

- Build a regulatory sandbox mechanism or other innovative approach from the ground up
- Support the sandbox or innovation vehicle design process and initial implementation once developed

Activities

- **Sustained support (6–12 months) to develop and begin implementing a sandbox or other innovative approach for testing and scaling advanced grid technologies**
  - Development of a straw regulatory sandbox or other innovation vehicle framework based on state or utility needs, barriers to innovation, and overarching goals and objectives
  - Development of streamlined templates for project applications, staff project reviews, and project reporting and evaluations
  - Establishing internal staff processes
  - Consultations during general stakeholder engagement or specific working group processes and initial sandbox implementation periods

Availability

- We anticipate providing Deep Dive services to two states or utilities per year

Sandbox Deep Dive

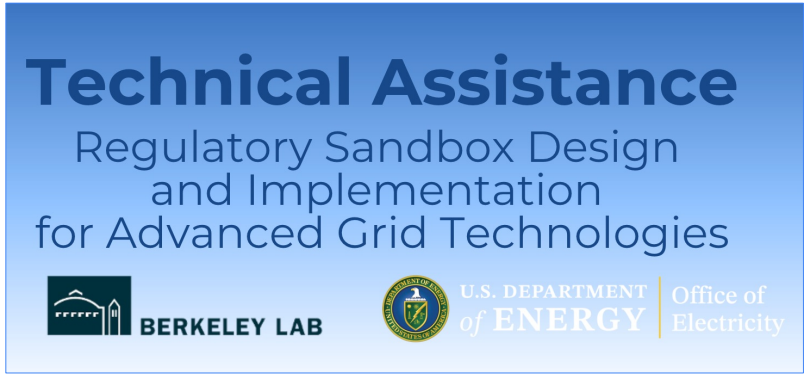
Apply for Sandbox Deep Dive assistance using a short form online.

https://forms.gle/WccZvEBmEEA9cj987

Applying Online

The application form requests information on:

- Participating personnel and contact information
- Limited background and description of how regulatory sandboxes or other innovation approaches can support state or utility objectives
- Type of assistance requested & high-level description of the request
  - Desired outcomes of the technical assistance
  - Project timeline
- The organization's role in implementing a sandbox or similar mechanism



Selection Criteria

When reviewing applications, Berkeley Lab will consider:

- Ability of the requestor to support sandbox implementation or otherwise act on the technical assistance requested
- Whether identified objectives for the sandbox or other innovation vehicle are aligned with DOE interests such as support for testing and scaling advanced grid technologies that improve electricity reliability and affordability
- Whether the requested technical assistance is likely to have a significant impact on reliability and affordability
- Whether the technical assistance request is within Berkeley Lab's capabilities to support
- Geographic diversity of requestors
- Proposed schedule allows for sufficient time to address the request

Additional Application Notes

Tips

- Fill out each question to the best of your ability
- Provide links to any supporting information (e.g., legislation, staff white papers, regulatory proceedings)
- Applications are encouraged by February 13th, but will be considered after this date
- Find more information at: https://emp.lbl.gov/regulatory-sandbox
- Direct questions to Grace Relf (gerelf@lbl.gov)

Questions

Contacts

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Lisa Schwartz: lcschwartz@lbl.gov, 510-926-1091

For more information

Download publications: https://emp.lbl.gov/publications
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Acknowledgements

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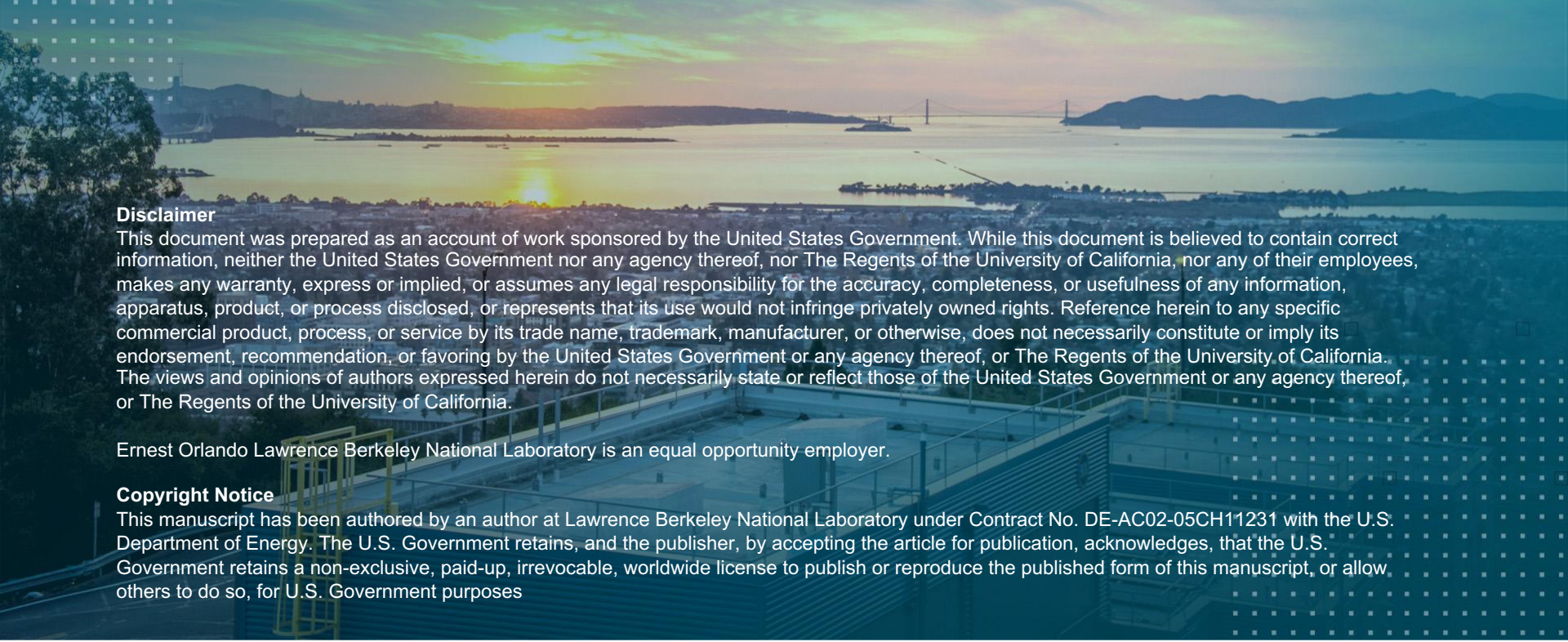

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