TIP 448: EPRI – Low Carbon Resource Initiative (LCRI)

Context

The energy system is rapidly transforming. The change is driven by economic growth, dynamics in the relative costs of regional fuel supplies, growing deployment of renewable resources, diversity of generation sources, and increasing societal demands for clean and sustainable energy.

Looking forward, economy-wide decarbonization is emerging as a key focus for the energy systems of nations, regions, cities, corporations and individuals. Economy-wide decarbonization, however, requires substantial technology advances, a refocusing of energy investment and a dramatic acceleration of the current pace of change.

The Electric Power Research Institute (EPRI) and the Gas Technology Institute (GTI) are together addressing the need to accelerate development and demonstration of zero- and low-carbon energy technologies.

The Low-Carbon Resources Initiative (LCRI) is targeting fundamental advances in a variety of low-carbon electric generation technologies and low-carbon energy carriers. These carriers—such as hydrogen, ammonia, synthetic fuels, and biofuels—are needed to enable affordable pathways to economy-wide decarbonization by mid-century.

Project Description

The LCRI brings together diverse organizations in the energy industry with their unique perspectives on decarbonization goals. Their collective support will assist efforts to accelerate development of technologies that enable safe, affordable, reliable, resilient, and sustainable economy-wide decarbonization.

This five-year initiative provides a centralized, collaborative platform to identify and accelerate development of promising technologies from around the world, to demonstrate and assess the performance of selected key technologies and processes and identify possible improvements, and to inform key stakeholders and the public about technology pathways and options.

The Bonneville Power Administration (BPA) is a sponsor of the initiative and joined the LCRI Board Working Group (BWG) in an advisory capacity to share its unique perspective and provide input on issues and direction.

Additionally, BPA can support LCRI initiatives with a comprehensive platform to test and integrate new technologies that expand grid flexibility and understanding of potential market transactions.

Why It Matters

Accelerating the development and demonstration of low-carbon energy technologies for large-scale deployment to 2030 and beyond will help reduce long-term environmental consequences, benefitting society as a whole.

Additionally, learning from this initiative may help reduce the public costs and risks in the transition to a low-carbon energy system by guiding effective energy investments in new and repurposed assets, potentially leveraging established infrastructure, and accelerating development of the new technologies needed to make the transition viable and affordable.

By participating in this initiative, BPA will gain strategic awareness of issues addressed by the LCRI.

BPA will focus on LCRI research areas that:

- Provide insight into customer options and their potential decisions
- Inform of latest zero- and low-carbon technology developments and policies surrounding clean energy sources
- Support awareness for Transmission Planning on low carbon generation sources and potential customer uses.
- Create understanding of zero- and low-carbon generation profiles/characteristics, and its dispatchability as a resource for grid stability, demand response, etc.
- Sends a signal that BPA supports customer utilities’ demand for local, renewable, energy resources
- Responses to climate change (and the potential for drought conditions) that will require additional sources of zero- and low-carbon generation and necessitate new planning to account for possible impacts to BPA’s transmission system.

Goals and Objectives

The Low-Carbon Resources Initiative is a five-year, focused R&D commitment to develop pathways advancing low-carbon technologies for large-scale deployment. The goal of the initiative is to enable a risk-informed understanding of options and technologies enabling significant economy-wide decarbonization through global partnerships and demonstrations, applied engineering developments, and technology acceleration of the most promising options.
Deliverables

The following key deliverables will be produced by the LCRI in Phase 1 and made available to members through reports, forums and other media.

1. Industry and Stakeholder Forums
2. Stakeholder Communication Plan
3. Current State Review and Gap Analysis: Roadmap to low-carbon future to understand the past and current R&D in the technical area
4. Integrated Energy System Analysis
   a. Updated REGEN
   b. Economy-wide Decarbonization Assessments
5. LCRI: State of Technology Series
6. Defined R&D plan for each technology area that will consider technology acceleration, benchmarking, and pilot-scale demonstrations with defined milestones, metrics and a stage-gate processes.

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Project Start Date: October 2021
Project End Date: October 2025

Links
EPRI Home/LCRI
LCRI-Earth Week 2021 (YouTube)

For More Information Contact:
Technology Innovation:
Cynthia Polsky, Program Manager
chpolsky@bpa.gov

BPA Technical Representative:
Judith Estep, Chief Technology Innovation and Strategy Officer
jaestep@bpa.gov

EPRI Program Contact
Joe Stekli
jstekli@epri.com