

Energy Advisory Services for Los Alamos National Lab



Work developing the sustainability strategy and follow-up analysis helped the client develop an actionable roadmap and is informing solid next steps for achieving campus decarbonization.

Client

Los Alamos National Lab

Location

New Mexico, USA

Contract Value

USD 4MM

Years

2022-present

Project Overview

In light of Executive Order (EO) 14057, the AECOM team supported Los Alamos National Lab (LANL) with the development of a net-zero emissions roadmap. The roadmap identifies opportunities to align net-zero projects with LANL's mission and overcome barriers to meeting LANL's decarbonization goals. Building off this roadmap, in Phase II, AECOM is providing engineering and consulting services to advance the strategies identified in the roadmap.

Given the unique characteristics of LANL's campus and mission, seven tasks were identified to address the various barriers to achieving net-zero emissions.

- 1. DECARBONIZE THE STEAM PLANT.** AECOM developed and modeled solutions for the decarbonization of the campus's primary steam plant. The preferred solution was chosen in a strategy selection workshop, and concluded in a conceptual design report and cost estimation.
- 2. IMPLEMENT ZERO-CARBON HEATING AND COOLING.** The team developed material to support a broad based replacement of LANL HVAC systems with electrified solutions. This work included: 1) Technical: evaluated facilities not served by steam plants to develop recommendations for HVAC decarbonization, as well as energy efficiency enabling measures. 2) Financial Planning: A lifecycle cost calculator that considers the cost of carbon was developed to assist decision making. 3) Process improvements: A set of interviews was conducted to develop a memorandum to document LANL's current project processes and how they could be improved to increase the speed and efficiency of decarbonization and energy efficiency work.
- 3. DEVELOP SUSTAINABILITY REPORTING DASHBOARDS.** AECOM is developing a dashboard to track metrics and monitor LANL's progress in meeting their sustainability goals, aid in their project selection process, and streamline required DOE reporting.
- 4. CAMPUS ELECTRIFICATION TECHNO-ECONOMIC ANALYSIS.** To assess the total cost for electrifying LANL's facilities, for both heating systems and the electrical grid infrastructure to support the increased demand, AECOM developed a database of existing LANL assets (e.g., HVAC systems, transformers, substations) and developed cost estimates for systems that would need to be replaced for full campus electrification. This algorithmic approach to cost estimating allowed the creation of a database and dashboard visualization, and to support implementation, a TEA memo was developed to identify opportunities for cost savings (e.g., building envelope improvements to downsize electrified heating peak demand).
- 5. RECOMMENDATIONS FOR ON-SITE GENERATION AND STORAGE.** AECOM identified potential opportunities for on-site, carbon-free electric generation and storage projects on the LANL campus, including battery storage sites and hydrogen fueling stations. Siting balanced technical, geological, security, and regulatory requirements.



Energy Advisory Services for Los Alamos National Lab *(continued)*

6. **DECARBONIZATION R&D.** AECOM worked with LANL to develop a R&D test bed program to pilot potential decarbonization technologies that are being developed by LANL researchers.
7. **INSTITUTIONAL CHANGE MANAGEMENT SUPPORT.** Realizing the full benefits of LANL's sustainability and decarbonization work requires stakeholders to shift attitudes, and ultimately change behaviors. AECOM is developing a change management program that considers the needs and experiences of employees, to inspire new conversations and behaviors. AECOM also developed a communications plan for upcoming communications around sustainability and decarbonization.

Client Benefits

- AECOM's work on the project strategy and analytics was essential for LANL to develop an actionable roadmap to ensure alignment with DOE, Executive Order, and internal mission-related sustainability goals, including a report of over 30 sustainability technologies and policies and their potential impact on LANL's sustainability goals.
- The team's second phase of work includes collecting information, conducting analyses, and collaborating with LANL staff that will inform LANL's actionable and discrete next steps for achieving campus decarbonization.

Work Performed

Through this project, AECOM is working closely with LANL specialists to plan for the implementation of decarbonization projects which includes:

- Delivering memorandums on how to approach the decarbonization of HVAC systems (including the primary steam plant) and how to increase the speed and impact of efficiency and decarbonization projects.
- Supporting long-term planning efforts through detailed analysis, strategy development, and initial engineering studies for major required upgrades (e.g., steam plant decarbonization, heating system electrification and grid upgrade assessments).
- Improving how decisions are made at LANL through increased data analytics and visualization capabilities.
- Developing a communications plan to direct and facilitate communication with LANL staff on sustainability and decarbonization values, projects, and initiatives.

