



Title: Net Zero Emissions Planning & Implementation

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Net Zero Emissions Planning & Implementation -Presentation to the LAC BPU-

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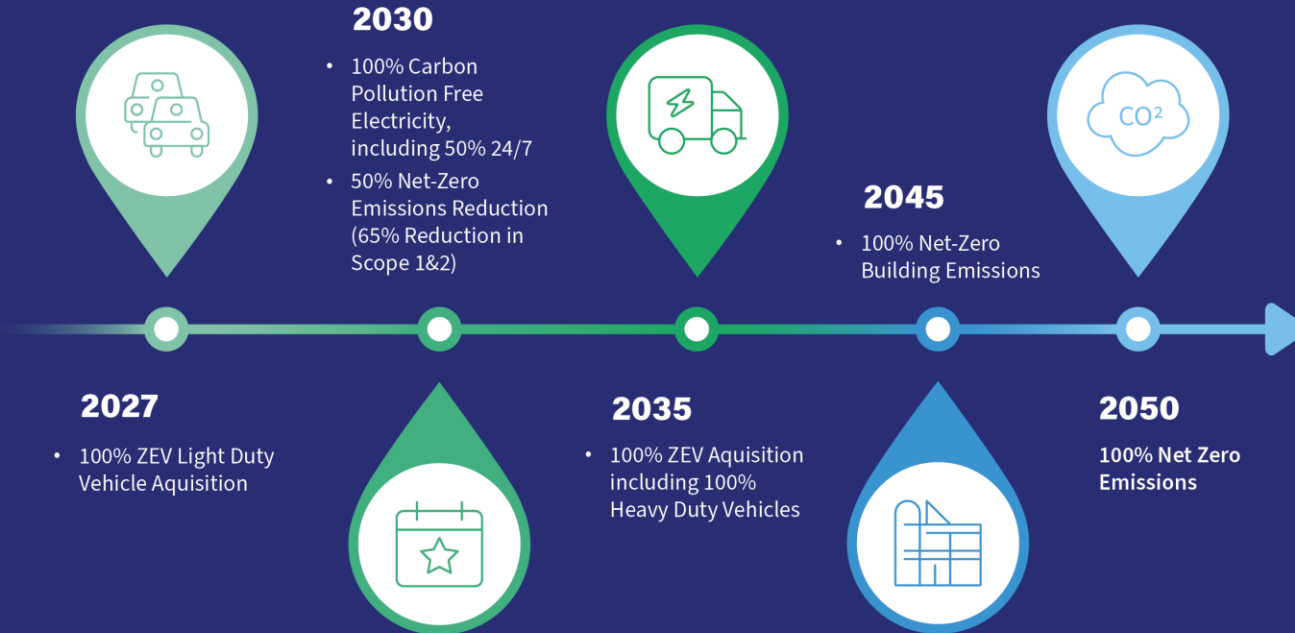
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Agenda

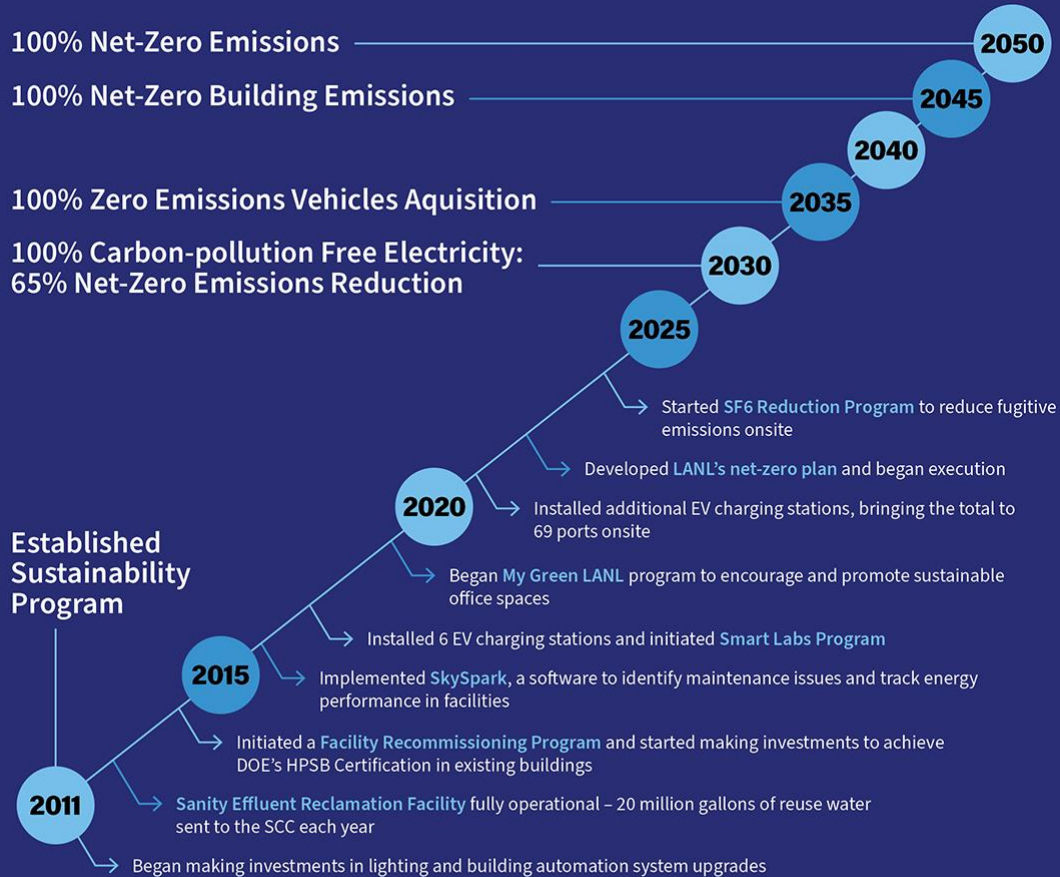
1. LANL's Net Zero Goals
2. Progress to Date
3. Net Zero Strategies

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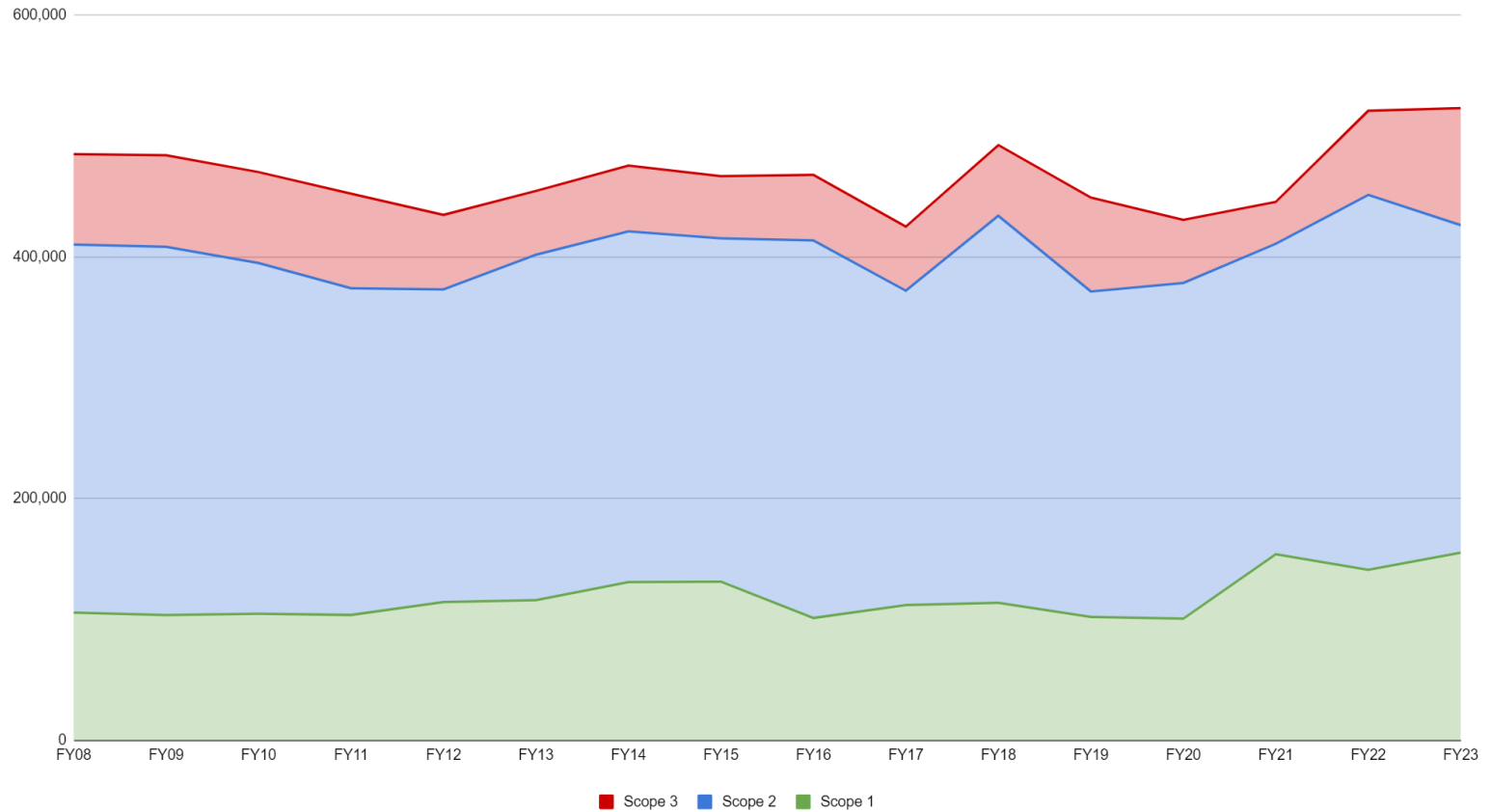
ROAD TO NET-ZERO BY 2050



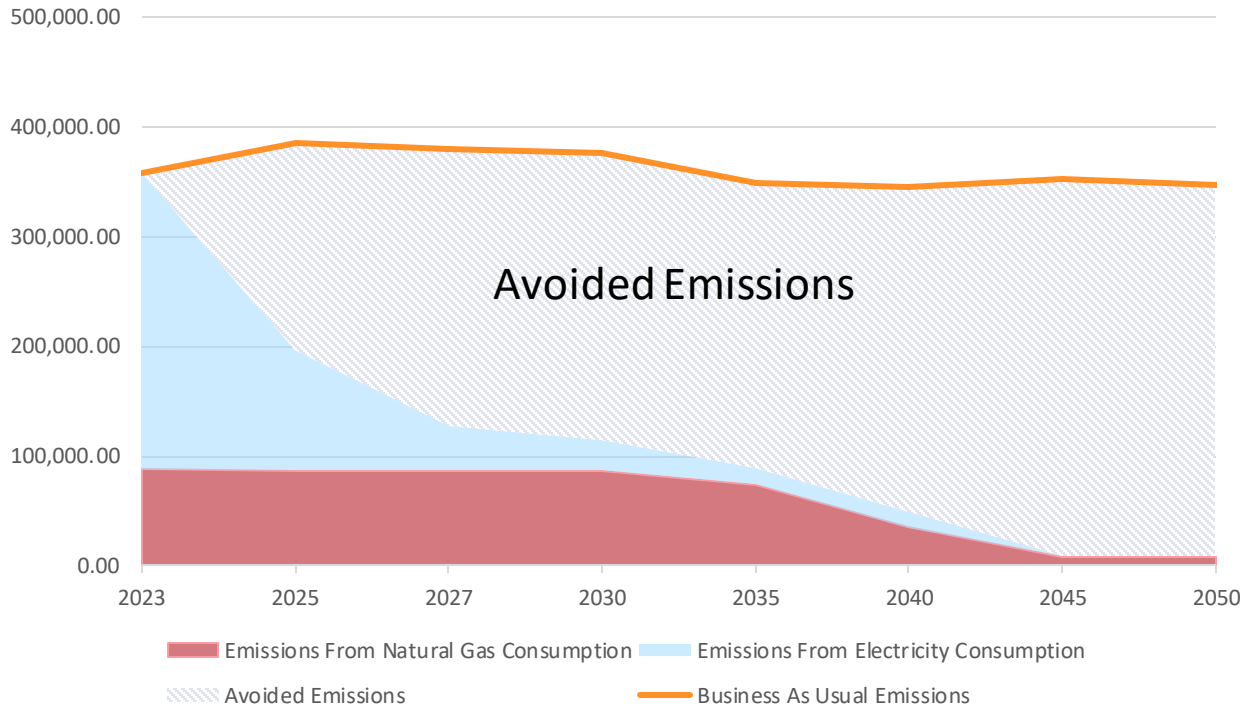
Progress to date



Greenhouse Gas Emissions by Scope: FY08 to Present



Buildings Emissions Forecast



LANL Decarbonization & Sustainability Strategies



Greening the grid to meet Scope 1 and 2 emission reduction goals through **Sourcing CFE Energy through the LAPP**



Building the next-generation of LANL facilities to sustainable **New Facility Design Standards**



Connecting LANL research to decarbonized operations through an **Energy Technology Incubator**



Ensuring on-site energy production has minimal emissions through **On-site Generation Decarbonization** of the CGTG system and installation of solar PV



Continuing and expanding ongoing efforts related to **Facility Energy and Electrification Retrofits**



Improving resiliency and supporting 100% carbon-pollution-free electricity usage on a 24/7 basis with **Grid Interactive Operations**

Three Priority Strategies



Greening the grid: decarbonize LANL's electricity supply through the Los Alamos Power Pool



Net-Zero Buildings: Ensure new buildings are Net-Zero Ready and retrofit existing buildings to minimize Scope 1 emissions



Living laboratory: Leverage LANL's clean energy R&D expertise to deploy technologies at on-site

Greening the grid

- Continue and grow the unique partnership between DOE, NNSA, Triad, and LAC
- Actively pursue carbon-pollution free electricity resources
 - Foxtail Flats PPA
- Explore local and regional partnerships
- Update infrastructure (physical and digital) to accommodate variable renewable energy resources

Net Zero Buildings

- Buildings account for a significant share of LANL's emissions
- Nearly 600k square feet of new all-electric buildings planned in the next 5 years
- Study underway to evaluate feasibility of electrification of gas-heated buildings
- Conceptual design in process for long-term decarbonization of TA-3 steam system
- Reduction in programmatic Sulfur Hexafluoride emissions of 10,000 mTCO₂e in FY23

Continued Work in Phase 2

Phase I Strategies	Phase II Tasks
On-site Generation Decarbonization	On Site Generation & Storage Assessments
Energy Technology Incubator	Decarbonization & R&D Alignment
Facility Energy and Electrification Retrofits	Decarbonization Scenario Modeling for Steam Plant EV Infrastructure Plan Improved Facility Upgrade Planning, Technical Assessment, and Support
New Facility Design Standards	Design Support on Planned New Construction
Grid Interactive Operations Sourcing CFE Energy through the LAPP	Enhanced Sustainability Reporting, Dashboards & Real-Time Energy Consumption Analysis for Campus



Change Management Support & Facilitate Implementation with Internal Stakeholders

Hydrogen at LANL

- Fuel cell bus scheduled for October delivery
 - Dispenser currently out for bid
- Analyzing H₂ options for decarbonizing steam production and CGTG
 - CGTG could take up to 11,000 kg per day at 30% blend
- R&D deployment opportunities through LANL's fuel cell program

Questions?