



NET ZERO LABS | PILOT PROJECTS

INL has allotted \$3.6 million (in indirect funding) for net-zero projects and program oversight and integration. To ensure technical, economical and timely solutions, these funds were focused on systems modeling and efforts related to landfill emissions characterization; natural gas to electric conversion; building architecture design templates; power grid infrastructure; a small modular nuclear reactor to replace carbon-emitting electricity (52% of total INL emissions); and establishing an integrated secure microgrid system to include nuclear with existing renewables, battery storage and hydrogen production.

NETL has committed more than \$4 million on efforts to reduce our carbon footprint and to posture itself to achieve net-zero emissions. In the near term, this includes electric vehicle charging stations, Climate Vulnerability Assessment and Resilience Plan, sustainability projects under the Climate Adaptation and Resilience Plan, and efficiency upgrades to our Center for Artificial Intelligence and Machine Learning facility (CAML), which consolidates two data centers into one thus improving PUE from 2.5 to 1.3-1.4. In addition, we are investing in carbon dioxide removal technologies, including initial design of our \$25M Direct Air Capture Test Center.

NREL is spending nearly \$2 million to initiate the decarbonization efforts. This includes the development of NREL's digital twin capability, a platform that allows decision makers to evaluate decarbonization investments and scenarios to optimize emissions, cost, and time savings for achieving net-zero emissions. This fiscal year, NREL invested in technical assessments from the decarbonization roadmap including new non-carbon campus free heating and cooling district, renewable back-up power systems, and procurement opportunity of solar and energy storage through a power purchase agreement. Facility investments on NREL's new multi-purpose laboratory Facility RAIL now includes electrical infrastructure to support microgrid functionality. Additionally, to reduce Scope 2 emissions, NREL has purchased electricity through the Windsource program.

PNNL is investing nearly \$3 million toward its decarbonization and energy resilience goals. PNNL is retrofitting three buildings (BIL, PSL, Auditorium) to replace gas-fired heating equipment, improve facility reliability, and reduce energy use and associated carbon emissions. The Lab has begun design on two district energy systems that will reduce emissions by 25%. The scope of these projects includes replacing natural gas heat in existing and planned buildings with electric heat pump systems and connecting our facilities to district energy systems to gain additional efficiency. Additional actions are being taken to drive institutional changes in operation such as updating building design standards to align with net-zero goals, identifying measures to address fugitive gas emissions from existing and new research equipment, and modeling campus buildings to assist with co-design for optimized operations.