

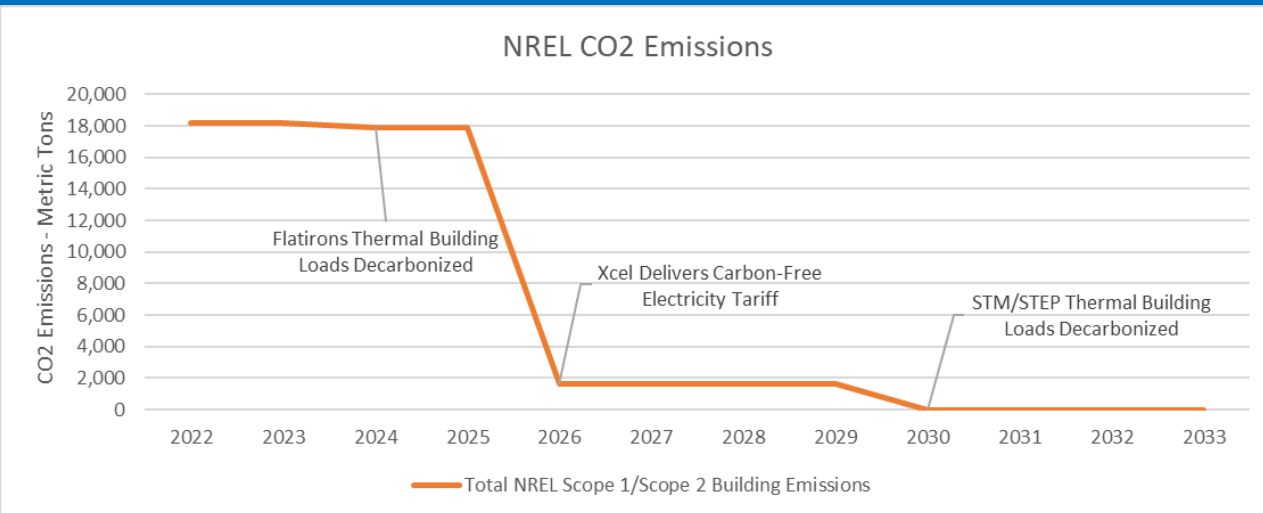
Cutting Edge Case Studies- Performance Contracting

*Michael Mungal, Federal Project Executive, Oak Ridge National Laboratory
August 8, 2024 ISWG Meeting*



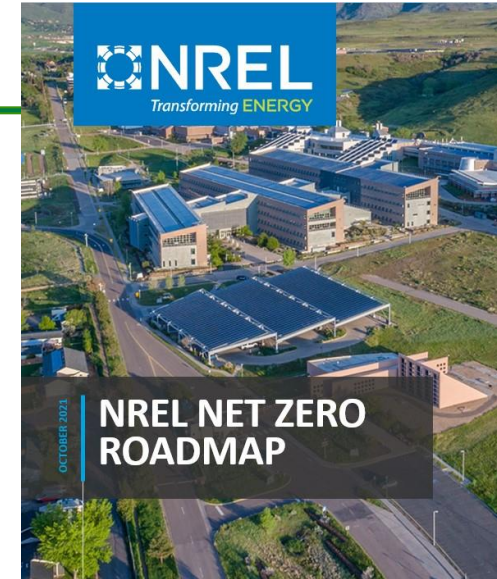
NREL Net Zero Goals

- **End of FY24**
Flatirons campus to operate at 100% net zero emissions (Scope 1 and 2 only)
- **End of FY26**
South Table Mountain campus to operate at 85% net zero emissions (Scope 1 and 2 only)
- **End of FY30**
South Table Mountain campus to operate at 100% net zero emissions (Scope 1 and 2 only)



Net Zero Roadmap

- Outlined 19 initiatives addressing power and thermal
- Forecasted Investment and Impact



NREL will model how to decarbonize smart campuses



Flatirons Campus



STM Campus

ESPC Case Study: National Renewable Energy Laboratory (2023)

Quick Facts:

- Location: Flatirons Campus, Arvada, Colorado
- Implementation Amount: \$5.1M
- Contract Term: 24.5 years
- Total Guaranteed Savings: \$6.5M
- Estimated GHG Emission Reductions: 266 tons/yr CO₂e

Energy Conservation Measures:

- Flatirons Campus site-wide electrification
 - Includes air-source heat pump, electric boiler, infrared heaters, and variable refrigerant flow systems
- HVAC controls
- Building envelope upgrades
- Water conservation measures



NREL leveraged \$4.29M of IRA funds to electrify the Flatirons Campus, bundled with energy efficiency upgrades and combined into a single ESPC project. NREL is using ESPC to support [Net Zero NREL](#) goals.

ESPC Case Study: National Renewable Energy Laboratory (2024)

Quick Facts:

- Location: S. Table Mountain Campus, Golden, Colorado
- Implementation Amount: \$7.1M
- Contract Term: 23.4 years
- Total Guaranteed Savings: >\$13.9M
- Estimated GHG Emission Reductions: 328 tons/yr CO₂e

Energy Conservation Measures:

- HVAC controls
- Lab ventilation and Smart Labs upgrades
- Building envelope upgrades
- LED lighting
- Solar PV – repair 1.1 MW and 524 kW systems, with reserve account for ongoing maintenance/upgrades
- Site Entrance Building 30kW PV and microgrid



Sitewide energy efficiency upgrades at NREL's South Table Mountain campus are funded by energy savings, utility rebates, and avoided cost appropriations to reduce energy use by 14%.

ESPC Supporting NREL Decarbonization

Challenges included:

- **Low energy rates, efficient operations**
 - High demand charges helped
- **Complex labs, researcher control of spaces**
 - Limited scope for lab setbacks/controls
- **Unconventional ‘central plant’ configuration**
- **Cost of electrification (GSHP, etc.)**
 - Deferred electrification of STM until funds available
- **Funding availability for avoided costs**
 - Used IRA and available GPP funds; AFFECT planned for HFC/microgrid expansion at STM



Photo 19088 May 11, 2015 photo credit Dennis Shroeder

Lessons Learned

- **Electrification candidates**
 - Stand-alone systems
 - Understand heating requirements
- **Efficient electrification**
- **Opportunities for resilience**
- **ESPCs are an option but requires creativity**



Photo 61825 May 31, 2019 photo credit Josh Bauer

Other Lessons Learned

- Engagement throughout the process
- Engineering review
- Use of Energy Management Information System (EMIS)
- Having projects in the capital planning system
- Critical trust with DOE Golden Field Office
- Having FEMP support

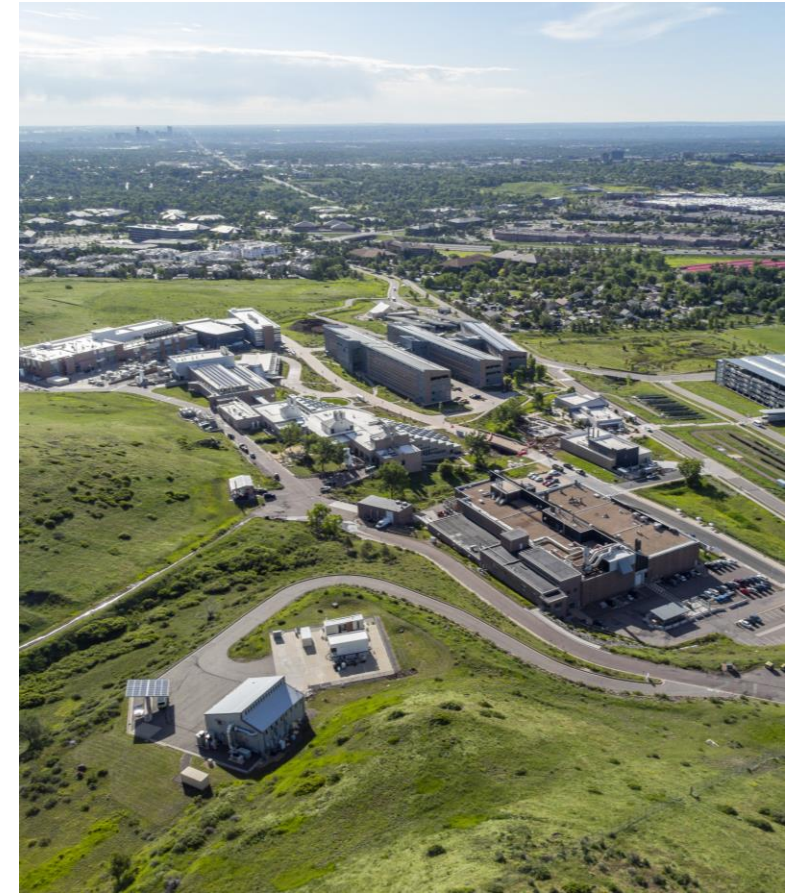


Photo by Joshua Bauer, Bryan Bechtold, NREL, 80544

Energy Performance Contracting Center of Expertise

Benefits of establishing a center of expertise

- Building out pipeline to understand previous performance contracting efforts
- Meeting with agencies and HQ offices to determine areas of need and support opportunities
- Identify and secure contracting resources to support PC efforts

Project support

- Strategizing across agency portfolios
- Advising how to effectively apply appropriations to performance contracts in development
- Provide customized agency training

If agencies are interested in developing an Energy Performance Contract Center of Expertise, FEMP can assist you in standing up one.

Agencies with Centralized Performance Contracting Operations

- ***US Department of Defense***
 - US Army Corps of Engineers (USACE) and Army's Office of Energy Initiatives (OEA)
 - Air Force Civil Engineering Command (AFCEC) and Air Force's Office of Energy Assurance (OEA)
 - Naval Facility Assurance Command (NAVFAC)
- ***General Services Administration (GSA)***
 - HQ or Regional Contracting Officers (CO) award performance contracts; regional COs administer contracts
- ***US Department of Commerce***
 - Census Bureau awards performance contracts; sub-agency COs administer contracts
- ***US Bureau of Prisons***
- ***Veterans Administration***
- ***Department of Homeland Security***

Questions & Answers

