



ACHIEVING A NET-ZERO EMISSIONS FEDERAL BUILDING PORTFOLIO

*Leading Federal Building Decarbonization Strategies to
Save Dollars, Cut Emissions, and Create Healthy and
Resilient Communities*

Council on Environmental Quality

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Introduction

In 2021, as part of his ambitious climate agenda, President Biden charged the Federal Government to lead by example by using its scale and procurement power to achieve net-zero emissions by 2050. Through [Executive Order \(E.O.\) 14057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#), and President Biden's [Federal Sustainability Plan](#), the Federal Government will achieve net-zero emissions from its 300,000 Federal buildings by 2045, including a 50 percent emissions reduction by 2032.

The Federal Government is the nation's largest energy consumer and Federal buildings are a major source of the Government's greenhouse gas (GHG) emissions. By electrifying a building's systems and increasing efficiency, in combination with on-site carbon pollution-free electricity (CFE) generation, Federal agencies can greatly reduce the Federal Government's climate footprint; make Federal facilities healthier and more economical to operate; and create thousands of good-paying jobs through the advancement and manufacturing of American-made building technologies. Alongside actions to reduce operational emissions, agencies are also making significant progress to reduce the embodied emissions of their facilities through the Federal Buy Clean Initiative. Healthier, more efficient, and more resilient Federal facilities can also strengthen the vitality and livability of surrounding communities.

That's why the Biden-Harris Administration, as a part of its Investing in America agenda, is upgrading Federal buildings across the country with sustainable technologies so that they are more efficient, all-electric, and powered by 100% CFE. With once-in-a-generation funding from the Inflation Reduction Act, combined with the Administration's [Federal Building Performance Standard](#) and [Climate Smart Buildings Initiative](#), the Biden-Harris Administration expects to achieve net-zero emissions for approximately 2,000 Federal buildings by 2030.

To accelerate this transition, the White House Council on Environmental Quality's Office of the Federal Chief Sustainability Officer has developed this report highlighting proven and replicable net-zero strategies and best practices undertaken by agencies over the past two years. Through these efforts, agencies can meet the President's ambitious Federal sustainability goals while saving taxpayer money, creating good-paying jobs, and making communities healthier and more resilient. By learning from each other's experience and best practices, Federal agencies can achieve our shared goals faster and serve as models for others to follow.

Leading strategies outlined in this report:

1. Develop agency-level policies that align net-zero emissions buildings goals with the agency's mission.
2. Take action while simultaneously conducting longer-term planning.
3. Prioritize decarbonization projects that also advance mission-related priorities.
4. Establish centralized support for decarbonization at the headquarters level and provide expertise to assist agency components.
5. Employ integrated solutions that deliver on multiple sustainability priorities at once.
6. Leverage all available funding sources.
7. Provide training and educational opportunities for staff focused on building decarbonization topics.
8. Align design and construction requirements with net-zero emissions buildings goals.



Best Practices and Leading Strategies

1. Develop agency-level policies that align net-zero emissions buildings goals with the agency's mission.

Agencies are developing and implementing agency-level policies that embed the goals of E.O. 14057 into standard guidelines and procedures. This allows agencies to align the net-zero emissions buildings goals of E.O. 14057 with their missions and reinforce their decarbonization commitments and strategies with staff at all levels. This can help elevate decarbonization as a priority during intervention points in a building's lifecycle, cut costs and emissions, and ultimately deliver on President Biden's Federal sustainability goals.

For example:

- The **Department of Energy (DOE)** institutionalized E.O. 14057's net-zero goals with an [agency-wide sustainability framework](#) for minimizing or eliminating greenhouse gas emissions and incorporating clean energy sources and climate change adaptations into all [capital projects](#).
- The **Department of Defense (DoD), Office of the Secretary of Defense (OSD)** released its [Electrification of Standard Building Operations Memorandum](#), which requires full electrification of standard building operations for new construction projects and all-electric replacements for existing equipment, in March 2023. Maximizing the use of all-electric technologies leverages the Department's growing investment in microgrid technologies to support mission assurance. Each military department is developing its own service-level guidance to implement building electrification.

2. Take action while simultaneously conducting longer-term planning.

Agencies are working to implement priority building decarbonization projects in the short-term while simultaneously conducting longer-term assessments (including potential climate risks) and developing or updating agency-level guidelines. This approach enables agencies to pilot new net-zero emissions processes and conduct staff training while they deepen their understanding of how to expand those efforts across their portfolios, leading to more profound, confident project implementation.

For example:

- The **Department of Veterans Affairs (VA)** is executing an electrification study at Long Beach VA Medical Center that includes the social cost of greenhouse gases (SC-GHG) as an evaluation criterion. Simultaneously, VA is developing a policy to incorporate SC-GHG into the development and design of future projects. The policy will enable VA to compare mission-ready zero- or low-carbon options with more traditional solutions using a holistic lifecycle cost analysis that considers all the costs of a given project or technology.
- The **Department of Defense (DoD), Office of the Secretary of Defense (OSD)** is working with the military departments to analyze DoD's existing building inventory; assess and prioritize opportunities for electrification and deep energy retrofits; and



execute seven pilot projects. These projects will help inform electrification strategy, embodied and operational carbon reduction, policy development, and investment approaches. These initiatives—which will center mission continuity, installation resilience, and readiness of the force—will identify existing buildings that are good candidates for major retrofit projects. This will reduce greenhouse gas emissions, increase the use of clean and reliable energy, and improve indoor environmental quality, while concurrently expanding DoD’s ability to develop and implement additional net-zero emissions projects over time. DoD will use the lessons it learns from these projects to help chart a course for developing efficient, all-electric buildings that ensure DoD can continue to perform its mission in any environment.

3. Prioritize decarbonization projects that also advance mission-related priorities.

Agencies are using various methodologies to evaluate their building portfolio and select which net-zero emissions building projects to prioritize. These prioritization methodologies allow agencies to meaningfully align their sustainability objectives with their missions and operating principles, which ultimately establishes these objectives as an essential part of how an agency delivers its mission.

For example:

- The **Department of Health and Human Services (HHS)** is conducting decarbonization assessments at its facilities that have the highest on-site scope 1 greenhouse gas emissions. For example, HHS is conducting space and infrastructure evaluations at the National Institutes of Health campus in Bethesda, Maryland, which is HHS’s largest emitter of scope 1 emissions due to energy-intensive laboratories. This assessment will support both decarbonization and resilience efforts at this mission-critical facility.
- The **National Aeronautics and Space Administration (NASA)** is completing a comprehensive Agency Master Plan (AMP) to identify a mission-driven affordable property portfolio as it explores the unknown in air and space. The effort includes evaluation and prioritization of NASA’s facilities and infrastructure based on physical condition and the degree to which they are mission critical. The plan provides NASA with the ability to appropriately categorize properties for investments and divestments, while also offering the potential to identify decarbonization opportunities. For example, buildings important to the mission that are not in top operating condition will be evaluated for investment; buildings less critical to the mission or in poor condition will be considered for divestment.

4. Establish centralized support for decarbonization at the headquarters level and provide expertise to assist agency components.

Agencies are developing centralized support systems that enable their components to more readily implement building decarbonization projects. This improves efficiency and consistency across agency components and eliminates the redundancy that can arise when multiple components of the same agency develop similar, but independent, decarbonization processes. This allows agency staff to be able to focus on both the mission and on implementing decarbonized building projects.



For example:

- The **General Services Administration (GSA)** created a centralized program management office (PMO) for energy savings performance contracting to establish agency-level policies and processes, guide regions on best practices, advise on technical matters, and share lessons learned. This approach has allowed GSA to realize consistent, quality projects that deliver deep energy retrofits, building electrification, and intended outcomes. Since the establishment of the PMO in 2012, it has delivered over \$800 million in energy savings performance contracts (ESPCs). Standardizing measurement and verification practices has allowed GSA to realize nearly \$1 billion in verified savings, nearly 20 percent more than the savings guaranteed through the initially-signed contract agreements.
- The **Department of Energy (DOE)** developed the [DOE Sustainability Dashboard](#): a centralized, standardized, web-based system for tracking agency-wide sustainability data and progress. It allows individual DOE sites to provide updates throughout the year and collects energy, water, and other sustainability data, including detailed project-level information about energy conservation measures (e.g., implementation cost, cost savings, energy and water savings, and service life).

DOE is also using sustainability budget crosscuts, a process that requires DOE programs to identify their overall budgets for sustainability and climate and provide a narrative addressing accomplishments, challenges, and future activities across multiple sustainability topics, including net-zero buildings, to DOE headquarters. Through this process, DOE headquarters is ensuring that its components identify adequate sustainability resources and improving transparency.

- The **Department of Homeland Security (DHS)** is in the process of creating a Performance Contracting Center of Expertise (PCCE) to support acceleration of projects that integrate energy efficiency, microgrids, and CFE technology. Additionally, DHS has formed a Portfolio Transformation Office (PTO) to administer its Inflation Reduction Act (IRA) funding to support sustainability and environmental projects. Both of these entities are intended to help DHS components successfully execute building decarbonization projects.

5. Employ integrated solutions that deliver on multiple sustainability priorities at once.

Agencies are integrating net-zero emissions building strategies with the other goals of E.O. 14057. For example, agencies are working to understand how fleet electrification and electric vehicle (EV) charging infrastructure, CFE procurement, and the use of low-embodied carbon materials intersect with building decarbonization efforts, in order to develop a holistic approach. Increasing on-site clean electricity generation, upgrading to the latest American-made energy efficiency and EV technology, and transitioning to clean, carbon-free electricity advance the Biden-Harris Administration's commitment to improve the health and overall well-being of communities across the country.

For example:



- The **General Services Administration (GSA)** is taking an “efficiency first” approach to meeting E.O. 14057’s net-zero emissions buildings goals, recognizing that energy reductions enable electrification efforts and reduce the need for more electrical infrastructure. [GSA’s plan to electrify the Ronald Reagan Building and International Trade Center](#) in Washington, DC, exemplifies this approach: GSA modified the existing ESPC and leveraged IRA funding to cut energy use almost 50 percent (building on top of a 39 percent reduction that GSA achieved in the first phase of the contract), before converting the building to electric heating and hot water equipment, thereby eliminating on-site combustion emissions.
- The **Department of Homeland Security (DHS)** integrates resilience, energy, and sustainability considerations into DHS’s net-zero emission facilities roadmap, which provides each component with guidance to address these topics and achieve greenhouse gas emissions targets. DHS’s NEXUS approach brings together the critical components for success: a dedicated team of experts, stakeholders and partners, smart funding strategies, focused targets, and the necessary tools and data. The agency developed a Resilience Baseline Assessment Scoring (RBAS) tool, a [Building Assessment Tool \(BAT\)](#), and a Consolidated Asset Portfolio and Sustainability Information System (CAPSIS) to enable success across each of its sustainability priorities.

6. Leverage all available funding sources.

Energy efficiency and CFE are often life-cycle cost effective; at the same time, individual projects typically require advanced planning and identification of appropriate funding sources. Federal agencies are demonstrating success by combining their traditional streams of funding (e.g., appropriations) with other contract models (e.g., performance contracting). By bundling funding sources, agencies are demonstrating how to deliver on decarbonized building projects.

For example:

- The **Department of Defense (DoD), Department of the Navy** used multiple contracting mechanisms over 20 years to achieve net-zero electricity for its Marine Corps Logistics Base Albany and expand the Base’s resilience capabilities. The Corps successfully used a combination of third-party financing via ESPCs, leasing mechanisms with the local utility to host solar power for the local grid, and appropriations to achieve a resilient and modernized Base. This initiative enhanced the Base’s energy security through partnerships with the local community, modernized its utility infrastructure, utilized renewable energy sources, and implemented energy efficiency upgrades.
- The **Department of Health and Human Services (HHS)** updated its capital planning process to account for the decreased financial risk of more energy efficient properties, on the basis that they are less dependent on utility services and therefore face less risk from climate hazards. HHS is considering a revision of its Capital Projects Prioritization (CPP) model, which guides its advanced capital planning efforts, to include new evaluation criteria related to sustainability and climate resilience and new scoring factors related to facility efficiency.
- The **Department of Energy (DOE) Federal Energy Management Program (FEMP)** provides grant funding through its [Assisting Federal Facilities with Energy Conservation Technologies](#) (AFPECT) program to help Federal agencies implement net-zero emissions



building projects. This funding can be used in conjunction with all other available funding sources to expand a project's scope and outcomes. The AFFECT program has increased in size to \$250 million with funding from the Bipartisan Infrastructure law. In January 2024, [DOE-FEMP awarded over \\$104 million in funding to 31 projects](#) to reduce greenhouse gas emissions.

- The **General Services Administration (GSA)** is leveraging multiple funding mechanisms including DOE-FEMP AFFECT grants, performance contracting, \$2.15 billion in IRA funding through its low-embodied carbon materials program, and annual appropriations to deliver decarbonized buildings. For example, GSA expects to leverage performance contracting to more than [double its \\$975 million investment](#) provided by IRA funding to deploy a total of \$1.9 billion in private and public funding to support sustainable technology implementation. Blended funding is further exemplified by the decarbonization efforts at GSA's [Denver Federal Center](#) and the grid-interactive [Oklahoma City Federal Building](#). Moreover, GSA has [committed that no funds provided with the IRA will be used to install fossil fuel-based equipment](#), ensuring every dollar of IRA funding will go toward meeting E.O. 14057's goal of achieving a net-zero emissions buildings portfolio by 2045.

Additionally, GSA amended its standard performance contracting language to incorporate reductions in scope 1 and 2 greenhouse gas emissions and move buildings toward decarbonization. GSA is focusing on creating projects that advance its energy reduction, electrification, and net-zero goals. [GSA's latest round of ESPCs](#) containing these contracting provisions were met with a positive response from the market, indicating that vendors can deliver both energy cost savings and decarbonization solutions.

7. Provide training and educational opportunities for staff focused on building decarbonization topics.

Successfully meeting the goals of E.O. 14057 requires a Federal workforce with the skills and knowledge to create, implement, and maintain net-zero emissions building projects. Agencies are enhancing training opportunities and establishing communities of practice to support the successful implementation of these projects.

For example:

- The **Department of Energy (DOE) Federal Energy Management Program (FEMP)** develops training and educational opportunities to support the government workforce in understanding the principles and concepts of building decarbonization and learning how to successfully prioritize and implement projects. For example, DOE-FEMP's [Decarbonization Considerations](#) is a series of on-demand, accredited trainings that cover decarbonization within grid-interactive efficient buildings, performance contracting, resilience planning, and on-site and off-site distributed energy projects.

8. Align design and construction requirements with net-zero emissions buildings goals.

Agencies are updating their standard building design and construction protocols and processes, in addition to their policies, to advance building decarbonization goals alongside other E.O.



14057 priorities. Ensuring these protocols become “business-as-usual” is one of the most effective means of institutionalizing building decarbonization strategies.

For example:

- The **Department of the Air Force (DAF)** is creating a comprehensive net-zero framework that supports its mission and addresses legal and policy requirements. The framework intends to establish an official definition of “net-zero” for DAF, define the scope of DAF’s net-zero policy, outline key strategies to reach DAF’s net-zero targets, and reconcile the net-zero requirements of multiple authorities including E.O. 14057, the National Defense Authorization Act for Fiscal Year 2022, the [Federal Building Performance Standard](#), the Department of Defense Electrification of Standard Building Operations Memorandum, and the [DAF Climate Action Plan](#). DAF has conducted numerous internal stakeholder engagements to develop the framework, including meetings with the Office of the Secretary of Defense, the Army, the Navy, the Marine Corps, and the Department of Energy.
- The **General Services Administration (GSA)** is updating the [Facilities Standards for the Public Buildings Service \(P100\)](#), which it uses to set performance-based standards and prescriptive requirements for GSA buildings. GSA plans to release an updated version of P100 in 2024 that will reflect E.O. 14057’s building decarbonization principles in both its guidance for building operations and with respect to the selection of low-embodied carbon materials.

Conclusion

President Biden has charged the Federal Government to lead by example by achieving net-zero emissions from its 300,000 Federal buildings by 2045, including a 50 percent emissions reduction by 2032. Agencies are making meaningful progress towards meeting the net-zero emissions buildings goals of E.O. 14057. There are numerous and varied approaches being utilized, often in conjunction with one another, across agencies to maximize impact and align the efforts within and on behalf of an agency’s mission. The highlighted actions in this report can be used to expand and accelerate agency action towards meeting the net-zero emissions buildings goals. By taking these actions, Federal agencies can help achieve the President’s Federal sustainability goals while creating thousands of good-paying jobs, saving taxpayer money, and making communities healthier and more resilient.