



The Federal Building Performance Standard

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1. Policy and Purpose

The Federal Government faces broad exposure to the mounting risks and costs already posed by the climate crisis. In responding to this crisis, the Federal Government has a once-in-a-generation economic opportunity to create and sustain jobs, support a just transition to a more sustainable economy for American workers, strengthen America's communities, protect public health, and advance environmental justice.

As the single largest land owner, energy consumer, and employer in the Nation, consistent with Executive Order (E.O.) 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*,¹ the Federal Government will lead by example to deliver a net-zero emissions building portfolio by 2045, including a 50 percent greenhouse gas (GHG) emissions reduction by 2032, prioritizing energy efficiency and electrification. Meeting those goals requires urgent action.

This decade must be a decade of climate action, and reducing emissions from Federal buildings is critical since Federal facilities drive more than 80 percent of Federal scope 1 and 2 emissions.² Additionally, reducing emissions from Federal buildings will improve air quality (both indoor and outdoor) as well as the health and well-being of occupants. Reducing Federal buildings' dependence on fossil fuels through efficiency and electrification, which increases their ability to run on locally generated renewable energy, will also strengthen U.S. energy independence and national security.

Section 510(b)(ii) of E.O. 14057 directs the Council on Environmental Quality (CEQ) to issue a Federal Building Performance Standard (BPS) to support achievement of net-zero emissions for the Federal building portfolio and as a stepping stone to achieve a 50 percent emissions reduction by 2032. The Federal BPS is a policy to reduce scope 1 on-site fossil fuel use in Federal buildings and facilities. It sets a goal for 30 percent of each agency's Federal buildings, measured by square footage, to achieve zero scope 1 emissions from on-site fossil fuel use through building electrification.

The Federal BPS promotes deep energy retrofits and strategic equipment replacement in existing buildings, campuses, and installations to meet emission and energy reduction goals. To achieve these goals and drive life cycle cost-effective, long-term solutions, agencies should use holistic approaches that consider cross benefits where efficiency can facilitate electrification, and vice versa.

Over several decades, the Federal Government has established policy and guidance to improve the energy efficiency and sustainability of Federal buildings. These include energy efficiency

¹ 86 FR 70935 (Dec. 13, 2021), <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/>.

² Scope 1 includes all direct GHG emissions from sources that are owned or controlled by the Federal agency. Scope 2 includes emissions associated with consumption of purchased or acquired electricity, steam, heating, or cooling. For more information, see CEQ, Federal GHG Accounting and Reporting Guidance (Jan. 17, 2016), https://www.sustainability.gov/pdfs/federal_ghg%20accounting_reporting_guidance.pdf. The Federal BPS applies only to scope 1 emissions from on-site fossil fuel combustion.

standards for new construction, implementation of facility-level metering infrastructure, identification and implementation of efficiency measures, use of performance contracting to drive overall reductions in portfolio energy use and emissions, and more. The Federal BPS represents another critical step forward on the trajectory to meet the President’s sustainability goals.

1.1 Authority

CEQ issues the Federal BPS pursuant to section 510(b)(ii) of E.O. 14057. Section 205 of the E.O. requires agencies to achieve net-zero emissions across their portfolio of buildings, campuses, and installations by 2045 and reduce GHG emissions by 50 percent from buildings, campuses, and installations by 2032 from 2008 levels, prioritizing energy efficiency and the elimination of on-site fossil fuel use. To achieve those goals, section 205(b) provides that agencies should use the Federal BPS to prioritize reductions in scope 1 GHG emissions.

2. Background and Impact

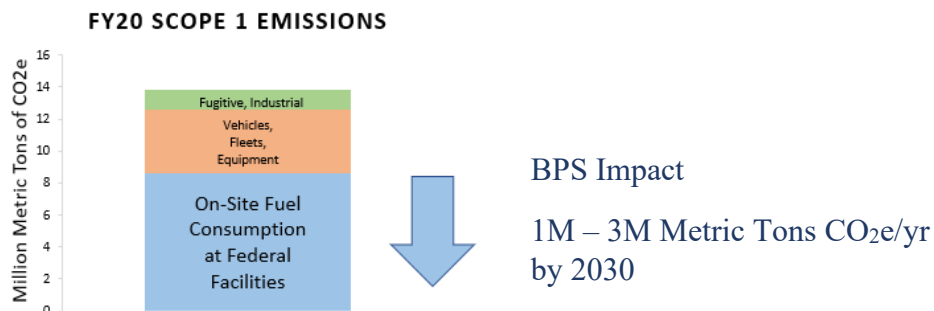
The goal of the Federal BPS is to eliminate scope 1 emissions from standard building operations—including direct emissions from space heating and cooling, water heating, cooking, backup generators used for non-emergency services (e.g., demand response³), and laundry—where all-electric technology alternatives exist. Most emissions from the facility sector are “standard operations emissions” and are subject to GHG emission reduction targets.⁴ Approximately one-third of Federal building-related GHG emissions are scope 1 emissions generated from on-site fossil fuel combustion, most commonly gas-fired equipment. In fiscal year (FY) 2020, government-wide scope 1 emissions were 13.8 million metric tons of carbon dioxide equivalent (CO₂e), and on-site fossil fuel combustion in facilities comprised 8.6 million metric tons of CO₂e, as shown in Figure 1.⁵

³ Demand response provides an opportunity for consumers to play a significant role in the operation of the electric grid by reducing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives. See the Department of Energy’s (DOE’s) demand response resources at <https://www.energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid/demand-response>.

⁴ Excluded from GHG reduction targets are emissions from non-standard operations such as vehicles, vessels, aircraft, and other equipment used by Federal Government agencies in combat support, combat service support, tactical or relief operations, training for such operations, law enforcement, emergency response, or spaceflight (including associated ground-support equipment). Non-Standard operations also include generation of electric power produced and sold commercially to other parties. See CEQ, *supra* note 2 at sec. 2.1.

⁵ Agency greenhouse gas emissions are calculated from the agency submitted Annual Energy Data Reports. Details and background data can be found on the Department of Energy Federal Energy Management Program’s Comprehensive Annual Energy Data and Sustainability Performance data site, <https://ctsedweb.ee.doe.gov/Annual/Report/Report.aspx>.

Figure 1. The Federal BPS addresses on-site fossil fuels consumed in Federal facilities, which is the largest source of scope 1 emissions from standard operations.



The Federal BPS supports the achievement of multiple goals and requirements of E.O. 14057, including reducing agency scope 1 GHG emissions (Sec. 202); achieving net-zero emissions across each agency’s portfolio of buildings, campuses, and installations by 2045 (Sec. 205); and reducing facility GHG emissions by 50 percent by 2032, prioritizing improvement of energy efficiency and elimination of on-site fossil fuel use (Sec. 205). The Federal BPS also supports the implementation of deep energy retrofits by 2030 as required by the joint Office of Management and Budget (OMB), CEQ, and National Climate Advisor memorandum on *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (M-22-06).⁶ Electrification upgrades should use high efficiency technologies and strategies to support energy use intensity reduction targets and deep energy retrofits.

The Federal BPS is one of the most important goals for Federal facilities, uniquely focused on reducing scope 1 on-site fossil fuel emissions (also known as direct emissions or emissions from stationary combustion). The Federal BPS is not applicable to fugitive or fleet emissions. It complements Federal efficiency, carbon-free electricity procurement, and other goals and requirements for Federal facilities to reduce energy use and scope 2 emissions.⁷

To maximize emissions reductions, reduce costs, and consolidate interventions, agencies should apply the Federal BPS in conjunction with statutory Federal building fossil fuel reduction requirements,⁸ deep energy retrofits, performance contracts, operational improvements to improve energy efficiency, and use of the *Guiding Principles for Sustainable Federal Buildings*.⁹ Agencies should consider emissions reduction strategies in conjunction with other real property actions that aim to improve the use of federally owned buildings and the cost-effectiveness and efficiency of the government-wide portfolio, consistent with the President’s Management Agenda, the Federal Property Management Reform Act, OMB M-20-10, *Issuance of an*

⁶ OMB, M-22-06, sec. I.D.3 (Dec. 8, 2021), <https://www.whitehouse.gov/wp-content/uploads/2021/12/M-22-06.pdf>.

⁷ For information on additional goals, see E.O. 14057, *supra* note 1; OMB, *supra* note 5; and CEQ, Implementing Instructions for Executive Order 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (Aug. 2022), https://www.sustainability.gov/pdfs/EO_14057_Implementing_Instructions.pdf.

⁸ See 42 U.S.C. 6831–6832, 6834–6835.

⁹ CEQ, *Guiding Principles for Sustainable Federal Buildings* (Dec. 2020), https://www.sustainability.gov/pdfs/guiding_principles_for_sustainable_federal_buildings.pdf.

Addendum to the National Strategy for the Efficient Use of Real Property, and the National Strategy for the Efficient Use of Real Property.¹⁰ The Federal BPS should inform prioritization, design, and decision making for agency investments in existing facilities. Agencies should pursue beneficial electrification in the most strategic and cost-effective ways possible, taking portfolio-wide, regional, and campus-wide approaches that maximize efficiencies through multi-building, portfolio planning, and bulk purchasing approaches.

3. The Federal Building Performance Standard

This section provides the Federal BPS goal, describes its applicability, sets out the pathways to meet the goal, explains the unit of measurement, establishes emissions exclusions, and sets forth requirements for performance management and reporting.

Table 1: Federal BPS Summary

Federal BPS Summary	
3.1 Goal	By FY 2030, at least 30 percent of an agency’s applicable facilities, measured by gross square footage (GSF), achieve zero scope 1 emissions from on-site fossil fuel use through building electrification.
3.2 Applicable Facilities	All federally owned, EISA-covered facilities ¹¹ located within the United States and U.S. territories with scope 1 emissions attributed to standard building operations as of October 1, 2021, and all new facilities that have completed construction after October 1, 2021.
3.3 Pathways to meet the goal	Performance pathway: Facility achieves zero scope 1 emissions from on-site fossil fuel emissions. Alternative compliance through the prescriptive pathway: Implement all practicable electrification by upgrading system-specific equipment for space heating and domestic/service water heating system types (per Appendix 2). In addition, all cooling, cooking, backup generators used for non-emergency services (e.g., demand response), and laundry loads that do not qualify as an exclusion must be all-electric.
3.4 Unit of Measurement	The Federal BPS’s unit of measurement is the percentage of applicable facility floor area measured in gross square feet (GSF) that meets the performance or prescriptive pathways. The performance pathway’s unit of measurement is scope 1 emissions measured in metric tons of CO ₂ e per year [MT CO ₂ e/yr].

¹⁰ President’s Management Agenda, <https://www.performance.gov/pma/>; Federal Property Management Reform Act, Pub. L. No. 114-318, 130 Stat. 1608–17 (2016); OMB, M-20-10, Issuance of an Addendum to the National Strategy for the Efficient Use of Real Property (Mar. 6, 2020), <https://www.whitehouse.gov/wp-content/uploads/2020/03/M-20-10.pdf>; OMB, National Strategy for the Efficient Use of Real Property (2015), <https://obamawhitehouse.archives.gov/sites/default/files/omb/financial/national-strategy-efficient-use-real-property.pdf>.

¹¹ Such facilities are defined in section 432 of the Energy Independence and Security Act of 2007 (EISA) (42 U.S.C. § 8253(f)(2)(B)).

Federal BPS Summary	
	The alternative prescriptive pathway’s unit of measurement is system-specific measures (per Appendix 2).
3.5 Exclusions	Agencies can exclude on-site fossil fuel emissions resulting from mission-critical activities (including national security, as determined by the Head of the agency) and process loads (manufacturing, industrial, and commercial process loads) for which no practicable strategy exists to eliminate scope 1 emissions. Agencies must separately meter or estimate and account for those loads on a regular basis.
3.6 Performance Management and Reporting	Annual progress reporting toward the FY 2030 goal.

CEQ will update the Federal BPS goals and increase floor area targets for the period between 2030 and 2045. Consistent with E.O. 14057, by 2045, the building portfolio must achieve net-zero emissions.

3.1 Federal BPS Goal

The Federal BPS sets a goal for each agency to achieve zero scope 1 emissions from on-site fossil fuel use in at least 30 percent of applicable facilities (as defined in Section 3.2) measured by GSF by FY 2030.

3.2 Federal BPS Applicable Facilities

For the purpose of meeting the Federal BPS, “applicable facilities” are facilities, including buildings, campuses, and installations, that meet all of the following criteria:

- EISA-covered facilities, as defined by 42 U.S.C. § 8253 (f)(2)(B);¹²
- Federally owned facilities that are reported consistent with the Federal Real Properties Profile Data Dictionary¹³ instructions, as having current or future mission need;
- Facilities that report any non-zero level of scope 1 GHG emissions attributed to standard operations due to on-site combustion of natural gas, oil, or other fossil fuels as of October 1, 2021, consistent with CEQ’s Federal GHG Accounting and Reporting Guidance.¹⁴ The Federal BPS is not applicable to facilities that do not emit scope 1 emissions attributed to standard building operations as of October 1, 2021, and agencies may not count such facilities toward the Federal BPS goal. The Federal BPS does not include fugitive

¹² These requirements include the annual benchmarking of metered buildings that are, or are part of, covered facilities and the release of annual fiscal year findings to the FEMP Compliance Tracking System (CTS) including building-level emissions data. In FY 2021, covered facilities constituted 91 percent of total facility energy use.

¹³ Available at the FRPC Guidance Library, <https://www.gsa.gov/policy-regulations/policy/real-property-policy/asset-management/federal-real-property-council-frpc/frpc-guidance-library>.

¹⁴ CEQ, *supra* note 2, sec. 2.2.1.

emissions and emissions from mobile sources (e.g., vehicles),¹⁵ and agencies may exclude emissions from loads as described in Section 3.5; and

- Facilities located in the United States and U.S. territories.¹⁶

Applicable facilities also include any new facilities that have completed construction after October 1, 2021.

Agencies should plan at the portfolio, regional, campus, and installation levels, in conjunction with efforts to implement the Federal BPS at the building level. If planning at the campus or installation level (i.e., multiple buildings), the entire campus or installation must achieve zero scope 1 emissions from on-site fossil fuel use or implement all practicable electrification and electrify all cooling, cooking, backup generators used for non-emergency services (e.g., demand response), and laundry loads that do not qualify as an exclusion. Individual buildings that eliminate on-site scope 1 emissions through building electrification within a campus or installation can apply their individual building floor area towards the Federal BPS goal as long as the buildings are individually metered, or the agency can track their energy and emissions.

To determine appropriate facilities for efficient electrification and strategies such as deep energy retrofits, agencies should prioritize facilities with one or more of the following attributes:

- Long-term mission need;
- High on-site fossil-fuel use (e.g., high heating loads based on cold climate locations or building types with high cooking or hot water loads, such as dining halls, barracks, etc.);
- High operational energy use intensity or water use intensity;
- High operation and maintenance costs;
- Large footprint (gross square footage) or similar use types or characteristics that would benefit from a portfolio strategy with repetitive approaches;
- Located in an underserved community;¹⁷
- Availability of utility tariffs or programs to further improve the life cycle cost effectiveness of upgrades;
- In need of a major system replacement(s) or with equipment at the end of its useful life;
- Need for improved resilience;
- Expected space reconfiguration or occupancy change; or
- Older buildings with aging infrastructure systems that are not considered for disposition (e.g., disposal of real property, Federal transfers, public benefit conveyances, and demolitions).

¹⁵ As defined in section 2.2.1 of CEQ's Federal GHG Accounting Reporting Guidance, *id.*

¹⁶ Agencies are encouraged to consider facilities outside the United States and territories, but not required.

¹⁷ See section 2(b) of Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, 86 FR 7009 (Jan. 25, 2021), <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>.

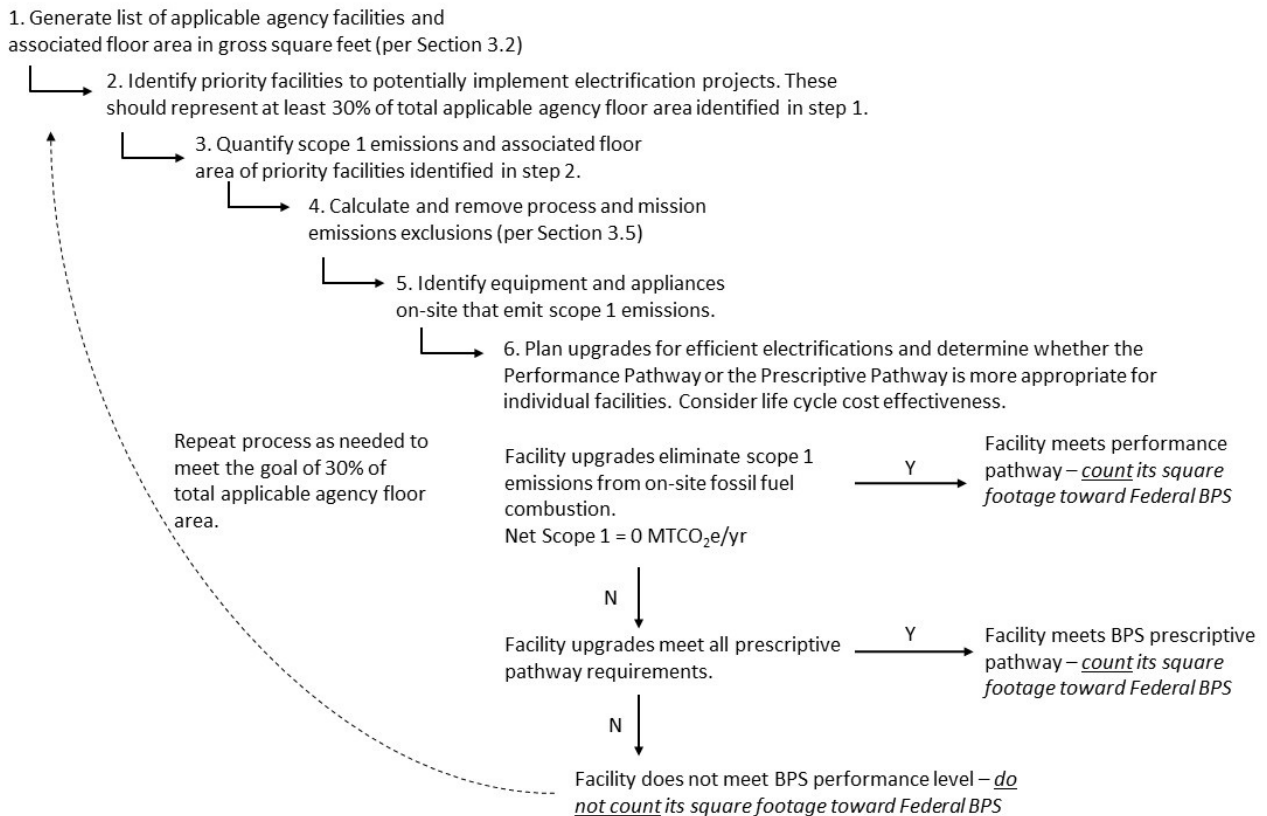
3.3 Pathways to Meet the Goal

To count toward the Federal BPS goal, facilities must achieve zero scope 1 emissions from on-site fossil fuel use through building electrification. The primary way to achieve this goal is through the performance pathway under which facilities must achieve zero scope 1 emissions, after exclusions (see Section 3.5), through efficient electrification of all equipment and appliances.

If a facility is unable to achieve zero scope 1 emissions through the performance pathway, agencies can pursue the prescriptive pathway as an alternative method of achievement. Under the prescriptive pathway, agencies must implement all practicable electrification for space and water heating as well as fully electrify all cooling, cooking, backup generators used for non-emergency services (e.g., demand response), and laundry energy loads that do not qualify for an exclusion (see Section 3.5). The prescriptive pathway recognizes that, for certain space heating and water heating loads, system configurations, or climate zones, full decarbonization may not be practicable today. For example, an agency may replace a small-sized, gas-fired packaged rooftop unit with an all-electric air-source heat pump, but in cold-climate zones, a dual fuel, gas-electric option may be justified. Additional information for space heating and water heating approaches under the prescriptive pathway is provided in Appendix 2. Agencies should only use the prescriptive pathway if a facility cannot satisfy the performance pathway.

Figure 2 describes the agency planning process to determine whether a facility can meet the Federal BPS through the performance pathway or the prescriptive pathway, or whether it does not meet the Federal BPS.

Figure 2. Agency planning process to meet the Federal BPS and determine whether a given facility meets the Federal BPS goal through the performance or prescriptive pathway.



A building or facility that receives electricity, hot or chilled water, or steam from an agency-owned district system¹⁸ for non-process loads (see Section 3.5) must include the scope 1 emissions from the district system in determining whether the agency can count the facility toward the Federal BPS goal. That is, the agency cannot count the electrified building or facility toward the Federal BPS until its agency-owned district system also eliminates scope 1 emissions from on-site fossil fuel use or implements all practicable electrification. Once both the facility and the agency-owned district system satisfy the criteria, agencies can count the square footage of the plant and the building toward the Federal BPS goal. If the district system is not agency-owned (e.g., owned by a regional utility), then those utilities are categorized as scope 2 emissions, which are not part of the Federal BPS. The agency would need to identify any on-site scope 1 emissions from a facility, and if none exist as of October 1, 2021, it is not an applicable facility. If there are on-site fossil fuel scope 1 emissions as of October 1, 2021, and the agency undertakes upgrades to the facility to meet the performance or prescriptive pathways, agencies can count the square footage of the facility toward the Federal BPS goal.

¹⁸ District energy systems are characterized by one or more central plants producing hot water, steam, or chilled water, which then flows through a network of insulated pipes to provide hot water, space heating, or air conditioning for nearby buildings. DOE, District Energy Fact Sheet (Sept. 2020), https://www.energy.gov/sites/default/files/2021/03/f83/District_Energy_Fact_Sheet.pdf.

Under both pathways, agencies should assess life cycle cost-effectiveness of improvements on a per-project basis. Agencies should align Federal BPS activities with statutory requirements (42 U.S.C. 8254) that require life cycle cost-effectiveness determinations. However, this provision does not prevent electrification measures from being installed, even if they are not life cycle cost-effective. The determination of cost-effectiveness should include the use of benefit-cost analysis in accordance with OMB Circular A-94 and other references including OMB Circular A-11, Capital Programming Guide, 10 CFR Part 436, Subpart A, and if applicable, National Institute of Standards and Technology (NIST) and the Department of Energy (DOE) Federal Energy Management Program (FEMP) “Life Cycle Costing Manual for the Federal Energy Management Program” (Handbook 135).¹⁹

If proposed facility upgrades meet the prescriptive pathway, but are not life cycle cost-effective and therefore the agency does not implement them, the agency cannot count that facility toward the Federal BPS goal. However, if the agency implements facility upgrades in alignment with the prescriptive pathway, regardless of life cycle cost-effectiveness, the agency can count that facility toward meeting the Federal BPS.

As set forth in the E.O. 14057 Implementing Instructions, each year, agencies should review the key planned strategies to meet the Federal BPS to drive proactive decision making and project identification across their portfolios. Agencies will set annual interim targets beginning with FY 2024 and review targets and progress with CEQ and OMB annually. If an agency does not meet their interim annual targets or demonstrate ongoing progress toward the FY 2030 goal of 30 percent, the agency should include an evaluation of why and a description of a proposed corrective action plan in its annual Buildings Strategic Plan.

3.4 Federal BPS Unit of Measurement

The Federal BPS’s unit of measurement is the percentage of applicable facility floor area measured in GSF that meets the performance or prescriptive pathways.

The performance pathway is measured through annual scope 1 GHG emissions from fossil fuels combusted on-site (also referred to as direct emissions or emissions from stationary combustion), expressed in units of metric tons of CO₂ equivalent per year [MT CO₂e/yr].

The alternative prescriptive pathway is measured through the implementation of specific actions (equipment upgrades) as defined in Appendix 2.

¹⁹ OMB Circular No. A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs (2015), <https://www.wbdg.org/FFC/FED/OMB/OMB-Circular-A94.pdf>; OMB Circular No. A-11, Preparation, Submission, and Execution of the Budget (Aug. 2022), <https://www.whitehouse.gov/wp-content/uploads/2018/06/a11.pdf>; OMB, Capital Programming Guide (2021), https://www.whitehouse.gov/wp-content/uploads/2021/01/capital_programming_guide.pdf; 10 FR 436, subpart A, Methodology and Procedures for Life Cycle Cost Analyses, <https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-436>; NIST, Handbook 135, Life Cycle Costing Manual for the Federal Energy Management Program (2020), <https://nvlpubs.nist.gov/nistpubs/hb/2020/NIST.HB.135-2020.pdf>.

3.5 Federal BPS Emissions Exclusions

The Federal BPS aims to eliminate scope 1 emissions attributed to standard building operations, including space heating and cooling, water heating, cooking, backup generators used for non-emergency services (e.g., demand response), and laundry, where all-electric technology alternatives exist. The Federal BPS does not include fugitive emissions and emissions from mobile sources (e.g., vehicles).²⁰ There are two acceptable forms of exclusions: emissions from mission-critical activities and emissions from process loads. Agencies must separately meter and account for those loads on a regular basis. If no submeters are currently installed, agencies can estimate loads until they install meters per DOE FEMP's Federal Metering Guidance.²¹ An acceptable method to quantify process loads where metering is not possible or cost-effective is component level verification via simulation modeling (M&V Option D).²²

1. **Mission-critical activity exclusions:** Agencies can exclude on-site fossil fuel emissions resulting from mission-critical activities. Examples of mission-critical exclusions include emissions from backup or standby emergency generator uses; laboratory research activities; equipment research and testing, such as jet engines; material heating, melting, and forming; or unique activities where non-fossil fuel alternatives could not exist such as memorial lighting (e.g., an eternal flame monument). This also includes loads attributed to activities deemed critical to national security. Agency mission-critical activity exclusions should be applied consistent with other annual reporting exclusions (e.g., the Annual Energy Report).
2. **Process load exclusions:** Process loads are loads on a building resulting from energy consumed in support of a manufacturing, industrial, or commercial process. Process loads do not include energy consumed for maintaining comfort and amenities for the occupants of the building (including space conditioning for human comfort).²³ Process loads that meet this definition and use on-site fossil fuel combustion can be excluded from the requirements of the Federal BPS. Process loads not meeting the definition above are not eligible for exclusion. Process loads that use electricity are not within the scope of the Federal BPS or the exclusion because they are already electrified.

Agencies may not use exclusions to exempt all of a building's emissions unless the Head of the agency demonstrates that all practicable energy efficiency and electrification measures have been implemented and the entire building operation is deemed critical to national security. The Head of the agency should approve exclusions for the agency as part of the agency's internal tracking.

Consistent with E.O. 14057, agencies must report *all* scope 1 and 2 emissions in their annual reporting, and as part of their overall total emissions reduction targets. Even if some facilities

²⁰ As defined in section 2.2.1. of CEQ's Federal GHG Accounting Reporting Guidance, *supra* note 2.

²¹ See DOE, Metering in Federal Buildings, <https://www.energy.gov/eere/femp/metering-federal-buildings>.

²² See DOE, Measurement and Verification Options for Federal Energy-and Water-Saving Projects, <https://www.energy.gov/eere/femp/measurement-and-verification-options-federal-energy-and-water-saving-projects>.

²³ 10 CFR 433.2.

have scope 1 load exemptions, agencies are still accountable for reporting those scope 1 emissions.

3.6 Federal BPS Performance Management and Reporting

Annually for each agency, CEQ and OMB will assess progress toward the Federal BPS goal of 30 percent by FY 2030.

To track agency progress toward the Federal BPS goal, CEQ and OMB will review the percentage of applicable facilities by floor area measured in GSF that meet either the performance or prescriptive pathway. To calculate this, agencies will need to identify:

- The total GSF of the agency’s applicable facilities, as defined in Section 3.2; and
- The total GSF of facilities that meet the Federal BPS in the current fiscal year.

Agencies will capture data in their annual Compliance Tracking System (CTS) reporting to FEMP based on forthcoming guidance from CEQ and FEMP. Reporting will begin as part of the FY 2024 CTS data report.

Agencies will set annual progress targets in consultation with CEQ and OMB, beginning with FY 2024. CEQ and OMB will review progress annually and assess satisfaction in FY 2030.

4. Refinements and Revisions to the Federal BPS Policy

CEQ may revise this guidance and the requirements of the Federal BPS, taking into consideration advances in building technologies and the market, as well as actions necessary to promote continued progress toward the goal of achieving a net-zero emissions building portfolio by FY 2045.

No later than 2028, CEQ will update the Federal BPS goals and increase floor area targets for years FY 2038 and FY 2045, or earlier. Consistent with E.O. 14057, by 2045, the building portfolio must achieve net-zero emissions. CEQ will periodically revise the prescriptive pathway criteria as supported by developments in building technology, market availability, and cost-effectiveness.

5. Resources

Resources to help agencies meet the Federal BPS include the following:

- DOE’s [Building Data Tools](#) provide a comprehensive suite of tools for accessing, managing, analyzing, and sharing building energy data.
- DOE’s [Better Buildings Decarbonization Resource Hub](#) includes resources for energy efficiency measures, goal- and target-setting for decarbonization initiatives, using emerging technologies, stakeholder engagement, and financing.
- The General Services Administration’s [Sustainable Facilities Tool](#) includes resources for upgrading building systems (e.g., HVAC) including key strategies, case studies, and suggestions for cost-effective upgrades.

- The American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) [Decarbonization Related Policies, Briefs, and Standards](#) website includes resources for building decarbonization, resiliency, energy efficiency, including specific briefs on refrigerants and energy metrics.
- EPA's [Benchmarking Policies and Building Performance Standards](#) website includes resources and tools to help agencies implement the Federal BPS, including links to ENERGY STAR Portfolio Manager, which estimates and tracks building energy use and emissions.

Appendix 1: Definitions

Applicable facilities: For the purpose of meeting the Federal BPS, applicable facilities are defined as all federally owned, EISA-covered facilities²⁴ located in the United States and U.S. territories with scope 1 emissions attributed to standard building operations as of October 1, 2021, and all new facilities that have completed construction after October 1, 2021.

Building Performance Standard (BPS): Outcome-based policies and laws aimed at reducing the carbon impact of the built environment by requiring existing buildings to meet energy- or GHG emissions-based performance targets.²⁵

Deep energy retrofit: A deep energy retrofit leverages whole building approaches and integrative design to maximize energy efficiency and emissions reductions. As defined in the E.O. 14057 Implementing Instructions, a deep energy retrofit must reduce annual site energy use intensity by at least 40 percent from a pre-renovation, FY 2019 baseline (FY 2019 represents the most recent year of pre-pandemic levels of facility operations).²⁶

District energy system: District energy systems are characterized by one or more central plants producing hot water, steam, or chilled water, which then flows through a network of insulated pipes to provide hot water, space heating, or air conditioning for nearby buildings.²⁷

Fugitive emissions: Emissions that result from intentional or unintentional releases of GHGs from within the agency's organizational boundary.²⁸

Net-zero emissions: Reducing GHG emissions to as close to zero as possible, and balancing remaining emissions with an equivalent amount of emission removal, through natural carbon sinks, carbon capture and storage, direct air capture, or other methods.²⁹ As CEQ and OMB have not yet provided guidance on the appropriate use of emissions removal technologies, agencies should not employ emissions removal strategies or offsets at this time.

Net-zero emissions building: A building that is designed and operated so that, when connected to a regional electrical grid fully serviced by carbon pollution-free electricity (CFE), the scope 1 and 2 GHG emissions from all operational end uses are zero on an annual basis.³⁰ For the purpose of the Federal BPS, the net-zero emissions building definition does not include fugitive emissions and mobile sources (e.g., vehicles),³¹ and agencies may exclude emissions from

²⁴ Such facilities are defined in section 432 of EISA (42 U.S.C. § 8253(f)(2)(B)).

²⁵ DOE, Building Energy Codes Program Building Performance Standards, <https://www.energycodes.gov/BPS>.

²⁶ CEQ, *supra* note 7, sec. 4.4.7.

²⁷ DOE, *supra* note 18.

²⁸ CEQ, *supra* note 2, at sec. 2.2.1.

²⁹ OMB, *supra* note 6, at sec. VII.

³⁰ CEQ, *supra* note 7, sec. 4.4.10.

³¹ As defined in section 2.2.1 of CEQ, Federal GHG Accounting Reporting Guidance, *supra* note 2.

process loads as described in Section 3.5. Agencies are still accountable for those scope 1 emissions through other E.O. 14057 agency annual reporting requirements.

Net-zero emissions building portfolio: A Federal net-zero emissions portfolio under E.O. 14057 is one where, at an agency level, the targeted scope 1 and scope 2 GHG emissions from all facilities are reduced by the maximum extent feasible, and then the remaining emissions are balanced so the annual emissions equal zero.³²

Performance contracts: Performance contracts are public-private sector partnerships between an agency and either an energy services company or a utility to implement energy and water efficiency improvements in Federal facilities.

Performance pathway: The primary approach to meet the Federal BPS that is based on calculated scope 1 emissions.

Practicable electrification: For the purpose of the Federal BPS, practicable electrification means replacement of fossil fuel consuming systems and equipment with electricity consuming systems and equipment, where practicable, based on (1) cost-effectiveness, (2) market availability, and (3) performance. The prescriptive measures provided in Tables A-1 and A-2 provide equipment recommendations that address market availability and performance. Agencies should perform life cycle cost-effectiveness analysis on a per-project basis to determine cost-effectiveness, as described in Section 3.3.

Prescriptive pathway: An alternative approach to meet the Federal BPS that is based on system-specific electrification requirements.

Process load (or process energy use/emissions): The load on a building resulting from energy consumed in support of a manufacturing, industrial, or commercial process. Process loads do not include energy consumed for maintaining comfort and amenities for the occupants of the building (including space conditioning for human comfort).³³

Scope 1 emissions: Direct GHG emissions from sources that are owned or controlled by the Federal agency. Emissions that are primarily associated with fuel combustion for (owned) generation of electricity, heat, cooling, or steam; fuel combustion for agency-controlled mobile sources; intentional or unintentional GHG releases, i.e., fugitive emissions; and manufacturing, industrial, and laboratory processes energy.³⁴

Scope 2 emissions: Indirect GHG emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency.³⁵

³² CEQ, *supra* note 7, sec. 4.4.3.

³³ 10 CFR 433.2.

³⁴ CEQ, *supra* note 2, at sec. 2.2.1, E-6.

³⁵ *Id.* at sec. 2.2.2, E-6.

Stationary combustion: Burning of fuels to generate electricity, steam, heat, or power in stationary equipment, such as boilers and furnaces.³⁶

³⁶ *Id.* at E-6.

Appendix 2: Federal Building Performance Standard Prescriptive Pathway

Overview

This appendix outlines the prescriptive pathway that agencies can use as an alternative compliance pathway to meet the Federal BPS. Under the prescriptive pathway, agencies must implement all practicable electrification by upgrading system-specific equipment for space heating and domestic/service water heating system types as well as all cooling, cooking, backup generators used for non-emergency services (e.g., demand response), and laundry loads that do not qualify as an exclusion must be all-electric.

The prescriptive pathway recognizes that, for certain space heating and domestic/service water heating loads or system configurations, full electrification may not be practicable. For the purpose of the Federal BPS, practicability is defined with respect to (1) cost-effectiveness, (2) market availability, and (3) performance. The prescriptive measures provided in Tables A-1 and A-2 provide equipment recommendations that address market availability and performance. Agencies should perform life cycle cost-effectiveness analysis on a per-project basis to determine cost-effectiveness, as described in Section 3.3.

1. Market availability (per tables A-1 and A-2 below): The prescriptive pathway for the Federal BPS accounts for factors such as technical maturity of the technology, in-application performance, the number of manufacturers and models available for electric equipment offerings at the time of issuance, the capacity and maturity of those manufacturers, and relevant procurement barriers.
2. Performance (per tables A-1 and A-2 below): The prescriptive pathway for the Federal BPS accounts for factors such as industry capacity for quality installation and maintenance, technology reliability, load capacity, and relevant climatic constraints.

CEQ and DOE have taken these considerations into account and created prescriptive measures for specific pre-existing space heating and domestic/service water heating system types, as provided in Table A-1 Federal BPS Space Heating Prescriptive Measures and Table A-2 Federal BPS Domestic/Service Water Heating Prescriptive Measures. CEQ and DOE will update regularly Tables A-1 and A-2 to reflect current market availability and performance advancements.

Once a facility meets the prescriptive pathway, agencies will not have to reassess under updated prescriptive measures until the building has plans to upgrade any remaining on-site fossil fuel-based equipment and appliances or undertakes retrofits that impact on-site fossil fuel use. All covered facilities should continue to be evaluated consistent with statutory requirements.³⁷

³⁷ Agencies must conduct comprehensive energy and water evaluations of covered facilities every 4 years pursuant to section 432 of EISA and implement life cycle cost effective measures within 2 years from evaluation pursuant to section 1001 of the Energy Act of 2020 (42 U.S.C. § 8253(f)(3)).

Federal BPS Prescriptive Measures

To satisfy the Federal BPS under the prescriptive pathway, agencies must fully electrify all cooling, cooking, backup generators used for non-emergency services (e.g., demand response), and laundry loads that do not qualify for an exclusion (see Section 3.5) in applicable facilities. Agencies then must upgrade facilities to comply with the prescriptive measures for space and domestic/service water heating systems to the greatest extent practicable.

The prescriptive measures are not intended to address every circumstance, but rather to give directional guidance. CEQ, with support from DOE, will provide technical resources and support on the application of the prescriptive pathway to a facility or equipment.

Agencies should consider integrative design strategies to reduce heating loads in conjunction with equipment replacement. For example, equipment electrification bundled with envelope improvements (e.g., adding wall or roof insulation, weatherization, or upgrading windows) can allow for smaller sized and less expensive equipment, reducing energy use and operating costs, improving occupant comfort, and reducing emissions.

Table A-1. Federal BPS Space Heating Prescriptive Measures

Pre-existing System	Federal BPS Prescriptive Measures	Considerations
Gas-fired packaged rooftop unit (RTU)	<p>Replace gas-fired packaged RTU systems with air-source heat pump RTUs, water-to-air heat pumps, or variable refrigerant flow (VRF) systems.</p> <p>Dual fuel heat pump RTUs are permitted where it is not practical to fully electrify due to cold-climate zones, large system size requirements, or mission-critical uses. Agencies should determine dual fuel applicability based on a site-specific evaluation that considers the heating load, technological availability at the time of replacement, and climate considerations throughout the heating season.</p>	<p>Some heat pump models report heating capacity at 0°F to 10°F outdoor air temperature, although there is no standardized cold-climate specification for RTUs or VRF systems.</p> <p>When available, dual fuel gas-electric heat pump RTUs are a relatively straightforward retrofit for gas-fired RTUs.</p>
Gas furnaces	<p>Replace split-system ACs and gas furnaces with ducted split-system heat pumps or ducted mini-split heat pumps.</p> <p>Gas furnaces may continue to be used for backup heating only if</p>	<p>Split-system heat pumps are available for both residential (1-5 ton) and light commercial (6-20 ton) capacities, although cold-climate certifications are only available for residential-style models. Cold-climate heat pump solutions are available for residential capacities (up to 5 tons) and can</p>

Pre-existing System	Federal BPS Prescriptive Measures	Considerations
	cold-climate heat pumps that function in heat pump mode to meet demand in colder climate zones are not commercial-available. The primary system must be electrified.	operate down to -15°F outdoor air temperature. Larger furnaces/air handling units (AHUs) may not have direct heat pump equivalents. Heat pump replacement of larger capacity furnaces/AHUs may have space constraints (i.e., mechanical closet size).
Low temperature boilers (110°F to 140°F), Medium temperature boilers (150°F to 180°F), Steam boiler systems	Conversion to air-to-water and water-to-water heat pumps, including heat recovery chillers where simultaneous chilled water and hot water loads are common throughout the year. Consider ground-source heat exchangers. Decommission hydronic heating system and conversion to VRF or distributed ductless split-system systems.	Comparisons of size, weight, and installation complexity to conventional boiler and chiller systems will vary. Most hydronic heat pump systems provide lower hot water supply temperatures (110-140°F) than traditional boilers. Buildings may require weatherization to reduce heating loads and radiator redesign to meet building heating needs without replacing hot water piping. Auxiliary electric resistance or gas-fired boilers may be needed for colder climates as boosters.
Air Handling Units (AHUs) with reheat or perimeter space heating	Assess current heating source within AHU or variable air volume (VAV) boxes. If served by hydronic loop, consider hydronic heat pump solutions described above. If served by electric resistance heating elements, consider additional energy efficiency measures to minimize consumption. Major renovation projects could consider conversion to VRF, ground-source heat pumps (GSHP), or other heat pump options.	
Campus/district chilled water and steam systems	Transition buildings from steam or medium temperature hot water (over 160°F) to low temperature hot water (less than 140°F) and use large heat recovery chillers to generate hot and cold water.	Conversion to a low temperature piping network requires updates to building distribution systems as well as larger central system piping. Moving to a decentralized system may present space constraints at each building

Pre-existing System	Federal BPS Prescriptive Measures	Considerations
	<p>Use a centralized well field with large centralized hydronic heat pumps that distribute hot or cold water to each building or an ambient hydronic loop between the well field and buildings with water-source heat pumps at each building.</p> <p>Transition individual buildings from the campus or district energy system to a decentralized system with heat pumps located at each building.</p>	<p>and could pose challenges for the performance of the overall district system.</p>
<p>Packaged terminal air conditioner (PTAC)</p>	<p>Replace PTACs with packaged terminal heat pumps (PTHPs).</p> <p>Major renovation projects could consider switching from PTAC/PTHP system designs to centralized systems, such as commercial unitary heat pumps (CUHPs), VRFs, or other options.</p>	<p>Very limited availability of cold-climate PTHPs.</p> <p>Consider ventilation impacts when using PTAC/PTHPs, and assess whether ventilation requirements should be fulfilled by a secondary system such as a Dedicated Outdoor Air System (DOAS).</p>
<p>Gas-fired unit heaters, radiant heaters, and other miscellaneous heating systems</p>	<p>Replace with electric resistance and electric radiant options.</p> <p>Consider installing ductless split-system heat pumps, VRF, and PTHPs in place of or in combination with electric resistance and radiant options.</p>	
<p>Ventilation make-up air units</p>	<p>Replace with heat pump and other electric make-up air units and DOAS units.</p>	<p>Rate of make-up air cubic feet per minute (cfm) and anticipated outdoor conditions will dictate retrofit selection.</p>
<p>Combined Heat and Power (CHP)</p>	<p>Replace gas-fired CHP systems at large buildings or campuses with electric heat pump solutions, which could include one or more strategies:</p> <ol style="list-style-type: none"> 1) Use large air-to-water, water-to-water, or heat recovery chillers; 2) Use a centralized well field with hydronic heat pumps either 	<p>Few case studies and analyses have been done to evaluate the energy, cost, emissions, space and resilience impacts with campus-wide heat recovery chillers and/or a decentralized heat pump strategy.</p> <p>Electrification upgrades should be considered towards the end of life of key CHP equipment.</p>

Pre-existing System	Federal BPS Prescriptive Measures	Considerations
	centrally located or distributed at each building; or 3) Transition individual buildings from campus/district energy systems to decentralized all-electric heating systems located at each building.	Buildings/campuses with steam or medium temperature hot water (>160°F) may need to transition to low temperature hot water (<140°F). Moving to a decentralized system may present space constraints at each building.

Table A-2. Federal BPS Domestic/Service Water Heating Prescriptive Measures

Pre-existing System	Federal BPS Prescriptive Measures	Considerations
Gas hot water boiler for central domestic hot water (DHW)	Heat pump water heater (HPWH) depending on temperature and appropriately sized storage and booster tanks to meet application and recovery needs. ³⁸	Commercial buildings with high hot water loads (e.g., food service, lodging, gyms, dormitories, healthcare) typically have large storage water heaters with high recovery rates. Size of heat pump and storage need to be matched to anticipated loads to ensure sufficient hot water and good recovery.
Gas resistance water heater for smaller DHW applications	HPWH can suffice for most light-commercial applications. Instantaneous electric water heater for small hot water loads (point-of-use) and eliminate recirculation pumping.	Residential and light commercial HPWHs are available today from major manufacturers with storage capacities of 40-120 gallons.
Small electric storage/point-of use systems	Electric models required. Small point-of-use water heaters (e.g., office kitchenettes, under-sink units in washrooms) commonly use electricity today.	Unlikely to convert to heat pumps due to technical, economic, or physical feasibility constraints.

³⁸ If lowering the temperature of central DHW, facilities must follow all supply and storage guidelines under ASHRAE 188 to inhibit the growth of opportunistic pathogens like *Legionella*, which is the bacteria that causes Legionnaire’s disease.