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GSA Green Building Advisory Committee Advice Letter from the Federal Building Decarbonization Task Group

Final

April 18, 2022

Kevin Kampschroer
Chief Sustainability Officer and Director,
Office of Federal High-Performance Buildings
U.S. General Services Administration (GSA)

RE: Federal Building Decarbonization Task Group Status Update and Preliminary Recommendations

Dear Mr. Kampschroer:

This letter provides the initial findings and recommendations of the Green Building Advisory Committee on decarbonizing federal buildings, based on the work of its Federal Building Decarbonization Task Group. Please see the list of Task Group members and observers below.

Task Group Charter and Scope

The charter of the Federal Building Decarbonization Task Group was to explore opportunities and challenges for reducing the greenhouse gas emissions associated with federal buildings – in alignment with national climate goals and action plans – through strategies that include the use of renewable energy, energy efficiency, electrification, and smart building technologies at federal facilities.

The scope of the task group included individual buildings and campuses, with consideration of the impacts of supporting infrastructure, including central energy plants, distributed energy resources, and EV charging. Building decarbonization includes operational emissions, refrigerant emissions, and building life cycle emissions, including embodied carbon of materials. The task group believes it can add the most value at this time by devoting its primary attention to the decarbonization of building operations. Decarbonization can provide additional benefits such as health, water conservation, grid reliability and resilience. The primary focus of the task group was on existing buildings as well as actions that can be taken in the short term (3-5 years).

Task Group Approach

The task group completed the following activities in the execution of its work:

1. Reviewed current federal policies and executive orders regarding building decarbonization
2. Reviewed current building decarbonization roadmaps and related activities underway
3. Reviewed current federal building programs and plans for alignment with decarbonization goals
4. Organized into three sub-teams focused on key guiding principles, decarbonization barriers and solutions, and retrofit playbook development
5. Developed preliminary task group recommendations
6. Proposed next steps for the continuation of task group activities in 2022
7. Prepared and delivered a summary task group presentation to the GBAC Advisory Committee

The following information was presented and reviewed at task group meetings:

- Secretary Granholm's presentation at the Better Buildings Summit
- ASHRAE Task Group on Building Decarbonization
- America's Zero Carbon Action Plan
- NYSERDA Carbon Neutral Building Roadmap
- GSA Decarbonization Strategy and Plans
- National Roadmap for GEBs
- GSA Sustainability Scorecard
- NBI Zero Codes Presentation

Key Building Decarbonization Principles

This sub-team prepared a presentation (Appendix A) which reviews the policy context (including relevant targets and executive orders), and defines a purpose statement, key definitions and seven key federal building principles. The seven principles are:

1. Accelerate the rate of net-zero emissions building retrofits
 - Retrofit 6% of the federal portfolio each year between 2022 - 2030 to operational net zero emissions and operational net-zero emissions-ready standards to reach 50% reduction by 2030, giving preference to building renovation over new construction
2. To optimize for cost and impact, plan comprehensively to include efficiency, electrification, demand flexibility and solar/storage
 - Net-zero emissions retrofits should coincide with upgrade cycles and consider the Loading order, which varies with location and existing conditions
3. Maximize the use of onsite renewable generation
 - After above steps, consider green power purchasing through your utility, utility scale green power programs or community solar, and finally procurement of bundled Renewable Energy Certificates (RECs).
4. Consider the impacts of embodied, refrigerant and EV charging emissions
 - Create an embodied carbon in materials knowledge base, use low GWP refrigerants and reduce leakage, support managed EV charging, and minimize water use
5. Support resilience, health, and comfort
 - Incorporate resilience strategies in new construction and retrofit projects to increase passive survivability
6. Support system wide optimization to avoid unintended consequences
 - Create a roadmap to a net-zero emissions portfolio, considering the regional energy mix, and align building/site decarbonization roadmaps with utility plans.
7. Support equal opportunity job creation and training underpinned by equitable procurement practices

- Locate and retrofit buildings in locations where it will bring benefits to the local community, including access to public transportation and support for diversity, equity, and inclusion.

Barriers and Solutions

This sub-team prepared a presentation (Appendix B) which identified key barriers and solutions related to capital access and investments, workforce and building technologies and Climate Zones & Building Performance Design. The barriers in each category are summarized below and the solutions are provided in the appendix.

Capital Access & Investments Barriers

- It may be hard to justify appropriations for low economic returns, despite a strong carbon reduction.
- Banks are underwriting carbon neutral assets the same as conventional designs.
- There is currently no income or value stream associated with embodied carbon; as a result, appraisers are not giving value to sustainable & low-carbon improvements.
- There are no baseline metrics to value and budget for the social cost of carbon.

Workforce & Building Technologies Barriers

- A shortage of skilled industry professionals that understand how to design, build, and operate lower-carbon existing buildings.
- A shortage of non-structural materials for renovations with product specific EPDs that facilitate carbon accounting for the project.
- GSA PM staff resistant to adopting lower-carbon materials and management processes.
- Subcontractor operating emissions during construction and renovations not easily captured.

Climate Zones & Building Performance Design Barriers

- Variation in a building's shape and climate zone affect the ability to reduce the energy use intensity (EUI).
- Lack of local utility-scale renewables/storage and utility rate differences in many locations make carbon emissions reduction challenging.
- Current building codes often restrict FAR and heights, making on-site renewable installations difficult. They rarely require new or renovations of existing buildings to be all electric and rarely address embodied carbon.
- Embodied carbon represents a significant amount of carbon emissions related to buildings which is rarely considered in standards and during design.

Building Retrofit Playbook

This sub-team prepared a presentation (Appendix C) summarizing a draft building retrofit checklist for small and large federal office buildings undergoing major equipment replacement and building envelope repair. The checklist is based on the key decarbonization principles and solutions and considers grid emissions, climate zones, energy costs, health, and resiliency.

The building retrofit checklist incorporates the following decarbonization measures:

- Passive Efficiency

- Active Efficiency
- Building Controls and Energy Analytics
- Building Operations
- Water Conservation
- Electrification
- On-site Renewables
- Off-site Renewables
- Demand Flexibility
- Embodied Carbon and Refrigerants
- Resilience, Health and Equity

Several existing tools were identified which could further support building decarbonization retrofit projects including:

- ESPC ENABLE process (FEMP)
- Commercial Building Energy Saver Pro (LBNL)
- Integrated Systems Packages (LBNL)
- Controller Retuning (PNNL)
- Healthy Buildings & Energy Support Tool (PNNL)
- Reopt Lite Tool (NREL)
- Water Project Screening Tool (FEMP).

Task Group Recommendations

The task group presented the following set of recommendations to the GBAC Advisory Committee:

1. Incorporate the key decarbonization principles into GSA policy and practices
2. Update P100 building standards to drive building decarbonization
3. Complete development of the building decarbonization scorecard and test with GSA and other federal agency staff
4. Develop an approach for portfolio-level implementation planning, based on facility-level technical assessments, carbon emissions impact analysis and lifecycle cost/benefit analysis incorporating health, equity, and resilience impacts

Task Group Next Steps

The following actions were recommended as next steps for the task group:

1. Produce an advice letter summarizing the task group's activities, deliverables, recommendations, and next steps.
2. Work with GSA staff to incorporate the key principles, solutions and tools into policy and practices
3. Continue the task group with a focus on providing input to GSA on:
 - P100 building standard enhancement
 - Building decarbonization scorecard development and evaluation
 - Decarbonization pilot project selection
 - Portfolio-level decarbonization project prioritization and implementation planning

Task Group Continuation

The GBAC Advisory Committee passed the following resolution to continue the work of the federal building decarbonization task group:

[that the] Decarbonization Task Group [is] to continue its work to produce an advice letter with a target by the end of the year, [the] Task Group would like to work with GSA to integrate solutions and tools, and to continue the Task Group to support P100 road mapping.

The task group reconvened in January and has organized into two sub-teams focused on building prioritization and project implementation. The task group will also support the development of future versions of the P100 building standard as requested.

Green Building Advisory Committee Recommendations

The Green Building Advisory Committee offers the following recommendations to GSA for decarbonizing federal buildings based on the work of the Federal Building Decarbonization Task Group:

1. Incorporate the key decarbonization principles into GSA policy and practices
2. Update P100 building standards to drive building decarbonization
3. Continue the work of the federal building decarbonization task group with a primary focus on accelerating net zero emissions building retrofits, initially across the GSA building portfolio, through sub-teams dedicated to building prioritization and project implementation.
4. Align the work of the task group sub-teams with the activities of GSA, DOE, FEMP and other teams currently supporting federal building decarbonization goals and activities.

Thank you for your careful consideration of this Advice Letter and for the opportunity to recommend these essential policies to GSA. On behalf of the Green Building Advisory Committee, I respectfully submit these recommendations for your consideration.

Sincerely,

David Kaneda, Chair
Green Building Advisory Committee

Clay Nesler, Co-Chair
Federal Building Decarbonization Task Group

Kent Peterson, Co-Chair
Federal Building Decarbonization Task Group

Timothy Unruh, PhD, Former Co-Chair
Federal Building Decarbonization Task Group

Task Group Members and Observers

GBAC - Members and Designees

- Clay Nesler- Co-Chair, World Resource Institute
- Kent Peterson - Co-Chair, P2S
- Cara Carmichael - CEQ
- David Kaneda - IDeAs Consulting
- Ralph DiNola - NBI
- Fernando Arias - Clark Construction
- Jane Rohde - JSR Associates
- John Park - VA
- Kevin Bates - Sharp Development
- Nael Nmail, Jay Wrobel, Skye Schell - DOE, FEMP
- Timothy Unruh - National Association of Energy Service Companies
- Victor Olgyay, Mark Kresowik - RMI

GSA

- Don Horn - OFHPGB
- Ken Sandler - OFHPGB
- Kevin Kampschroer - OFHPGB
- Kinga Porst Hydras - OFHPGB
- Krystal Brumfield - Associate Administrator, OGP
- Lance Davis - PCAE
- Lariza Sepulveda - PMA/OFHPGB
- Matthew Harbeson - GSA
- Meredith Holland - OFHPGB (contractor)
- Michael Bloom - OFHPGB, Designated Federal Officer
- Mishal Ahmad - OFHPGB
- Sonal Larsen - Office of the Administrator

Observers

- Alice Yates - ASHRAE
- Christopher Lindsay - IAPMO
- Dannie Dilonno - Branch Pattern
- Greg Johnson - American Wood Council
- Jake Jackson - Pioneer Public Affairs
- Jeffrey Mang - Policy Consultant
- Jessica Shipley - Regulatory Assistance Project (RAP)
- Lois Vitt Sale - Wight and company