

Decarbonizing an Existing Federal Office Building

Decarbonization Plan for a Federal Office Building

Washington D.C.

The Federal office building is 1.5 million square feet with historical designation status. The project team is pursuing the Department of Energy's Zero Carbon standard using the Passive House building standard as the building science path to deliver the optimum decarbonization possible for this building. The physics-based model was operationalized using the building's real-time metered energy data. A calibrated prediction of building performance in a physics-based environment is the most reliable approach to reducing the investment risks of decarbonization.

[Full Report with Performance Results](#)



For Illustrative Purposes Only

Owner's Project Goals

The Federal agency goals are to achieve zero carbon by 2045. The agency owns or leases over 363 million square feet of space that covers nearly 8400 buildings in 2200 communities. The agency has deep reserves of real time data on their existing buildings. This project represents the use of real time data to calibrate physics-based models to predict a building's optimum decarbonization potential.

Operational Carbon Metrics

- Optimum Target EUI of 16.5 kBtu/sf/yr representing the most cost-effective path to zero carbon.
- Whole-building electrification

Occupant Health Targets

- 0.35 air changes per hour minimum
- Airtightness of .03 CFM50/SF or 0.4 ACH50

Decarbonization Plan

The Decarbonization Plan includes an Operational Model, which is a highly calibrated dynamic building energy model. The model is calibrated to <1% of building performance and indicates a baseline EUI of 85.0 kBtu/sf/yr.

The Plan also includes an Optimum Model, which applies Passive House building science to the Operational Model. The Optimum Model represents the best pre-renewable performance possible based on proven building science, which is targeted at an EUI of 16.5 kBtu/sf/yr.

Finally, the plan includes Step Models, which are the phased Decarbonization Execution models, transforming the existing building to its Optimum Decarbonization potential, while respecting building triggers of life cycle, deferred maintenance, planned renovations, change in use, and other opportunities to transform the building.

The Decarbonization Plan de-risks investments in reducing carbon emissions in existing buildings.

Existing Building

Commercial Office
1.5mm square feet
\$450mm-\$550mm

Project Team

AUROS Group
Gensler
Arup

Project Reference

NDA – references may be available upon request.



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