

Faculty Name:

Bianca Howard

Faculty Email:

bnh2111@columbia.edu

Lab:

Building Energy Research Laboratory

Project Title:

Incorporating the value of energy flexibility in building stock decarbonization pathways

Description:

Building stock decarbonization pathways in practice are typically developed a priori by a set of industry experts leading to analyzing only a few of the millions of possible solutions. To fully understand the breadth of possibilities for decarbonizing the building stock, multi-objective optimization has been used in the literature to generate pareto optimal solutions across cost and greenhouse gas emissions. However, such studies are rare and, to date, these analyses have not incorporated the ability of buildings to be energy flexible and the value that this energy flexibility can bring. This is due to the difficulty of incorporating detailed HVAC systems and controls into building stock models. The research proposed for this project will work towards incorporating these capabilities into building energy models as well as developing a framework to incorporate the various revenue streams from energy flexible behavior into an overall cost function. Once these elements are developed the models and cost function will be integrated into a multi-objective optimization for a New York City case study. This position will require knowledge of the building energy modeling software energyplus, HVAC system and controls configurations and python.

Location of Research:

Hybrid (on-site and remote)

of hrs/week:

40

Department/Program:

Mechanical Engineering

Eligibility:

MS

To apply, please contact:

Dr. Bianca Howard, b.howard@columbia.edu