

# Building energy - FY22

Status: NIFA REVIEW

## Project Director

Benjamin Weil

## Organization Project Number

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## Accession Number

7004884

## Start & End Date

10/01/2021

## Organization

University of Massachusetts

## To Project / Program

"Building Energy"

## Primary Critical Issue

Sustainable Energy

## Fiscal Year

2022

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### In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Municipally owned buildings often are the largest energy user in each city or town. Cities and towns are usually under-resourced but many have statutory commitments to reducing carbon emissions. In short, they have many large, inefficient buildings that will not be replaced, and they want to get to zero carbon emissions, but they don't know how.

### Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Working alone and with my Clean Energy Corps teams, I provide energy analysis and high-level energy planning to Massachusetts cities and towns. These are unique, actionable, and specific plans that municipalities use to apply for grant funding to implement. All plans, when completed, will result in zero-carbon emissions buildings. After plans are delivered, I follow up with all municipalities to aid in the pursuit of funding. Once funded, I provide technical assistance and play the role of owner's agent in educating contractors on the latest energy efficient technology and the reason for the system design choices. During and after the implementation period, I also provide verification and diagnostics to make sure that all measures were implemented correctly.

### Briefly describe how your target audience benefited from your project's activities.

Municipal officials and volunteers gained building science knowledge, better understanding of their buildings, and specific plans that will enable them to pursue zero carbon emissions operations in all major municipal buildings through many phases, that -- depending on financing availability -- may take as much as a decade to complete.

Mass DOER Green Communities Program benefits from my municipal services through the development of actionable, vetted, plans that are the basis of many grants that they fund.

Utility companies (investor owned and municipal) are able to more effectively direct their municipal and commercial energy efficiency budgets to projects that are funded by multiple sources and have benefit of being developed by an independent, non-conflicted, third party expert from the UMass Extension system.

Contractors and Engineering firms who are selected by the municipalities to implement components of the plans gain exposure to new and improved ways to use existing technology, how to specify some of the newer technology, and improved ways to specify and control the products they install.

### Briefly describe how the broader public benefited from your project's activities.

The buildings we work to improve are schools, department of public works and public safety buildings, and city halls. In all cases, our recommendations improve indoor environmental quality, reduce energy costs (and thus public budget devoted to energy expenditures), and thermal comfort. Improvements in thermal comfort and ventilation have been shown to improve cognitive abilities, reduce absences, and improve standardized test scores for school children. Similar benefits in worker productivity and worker safety are found in contexts like offices (city halls) and technical field (police, fire, DPW). More broadly, these projects serve as models for future decarbonization of existing buildings in the public and private sector. Thus, the general public benefits by increased experience and solution sets for decarbonizing buildings as demands for a zero-carbon economy increase.

## Comments (optional)

### Building Energy Outputs

- Consulting and facilitation for Utility Energy Efficiency Programs - Municipal Clean energy Extension Consulting - (22) - 125 Participants
- Research on Tree Impact on Energy Usage for DCR - Role of volunteers in urban forestry (2) - 296 Participants  
Alexander J. Elton, Richard W. Harper, Lauren F. Bullard, Eric E. Griffith & Benjamin S. Weil. Volunteer engagement in urban forestry in the United States: reviewing the literature. "Arboricultural Journal".

[Exploring urban forestry non-governmental organisations \(NGOs\) in the eastern United States](#), "Arboricultural Journal".

An earlier collaboration with Massachusetts DCR and Clark University established the impact of urban trees in reducing and shifting to earlier in the day demand peaks for air conditioning. Understanding how urban forests are expanded, protected, maintained, and advocated for, is thus important for electric grid management in the context of climate change and increased shares of renewables, along with important benefits to mental and physical health. I worked with Rick Harper and his grad student AJ Elton to review the role of volunteers in urban forestry.

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