

Worcester



Healthy, Equitable Retrofits and Training

Goal 3 of the Green Worcester Plan: Promote deep energy retrofits of existing buildings

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Capacity Building and Innovation Grant
from the MA Clean Energy Center EmPower Program**

**with supplemental support from RMI
(formerly Rocky Mountain Institute)**

EmPower program blog on the Worcester HEART Partnership:

<https://www.masscec.com/blog/empower-mass-program-update-project-spotlight-worcester-heart-partnerships-stakeholder>

(with links to media coverage)

National NAACP Centering Equity in the Sustainable Building Sector

Organizational Partners

- [Main South CDC](#),
- [Sustainable Comfort](#) (SCI)
- [Resonant Energy](#)
- [Worcester NAACP](#) **Climate and Environmental Justice Committee**
 - [Mothers Out Front Worcester](#)
 - [Neighbor to Neighbor Worcester](#)
 - [Worcester Community Action Council](#)
 - [RMI](#)

Working with CDC

- Lowers challenges
- 6 properties, already weatherized
- 19 units (one property has a basement apartment)

3 Goals:

- Retrofits for health, safety, and decarbonization that do not affect affordability for tenants
- Authentic and ongoing engagement with tenants
- Developing pathways into the green home performance space for local residents who most need jobs

Focus of this presentation:

Retrofit Study Team work to date

* Resonant Energy: Analysis of the solar potential of the 6 properties and its value

* Sustainable Comfort (SCI): Analysis of energy usage; recommended energy conservation measures with pathways to electrification



RESONANT ENERGY



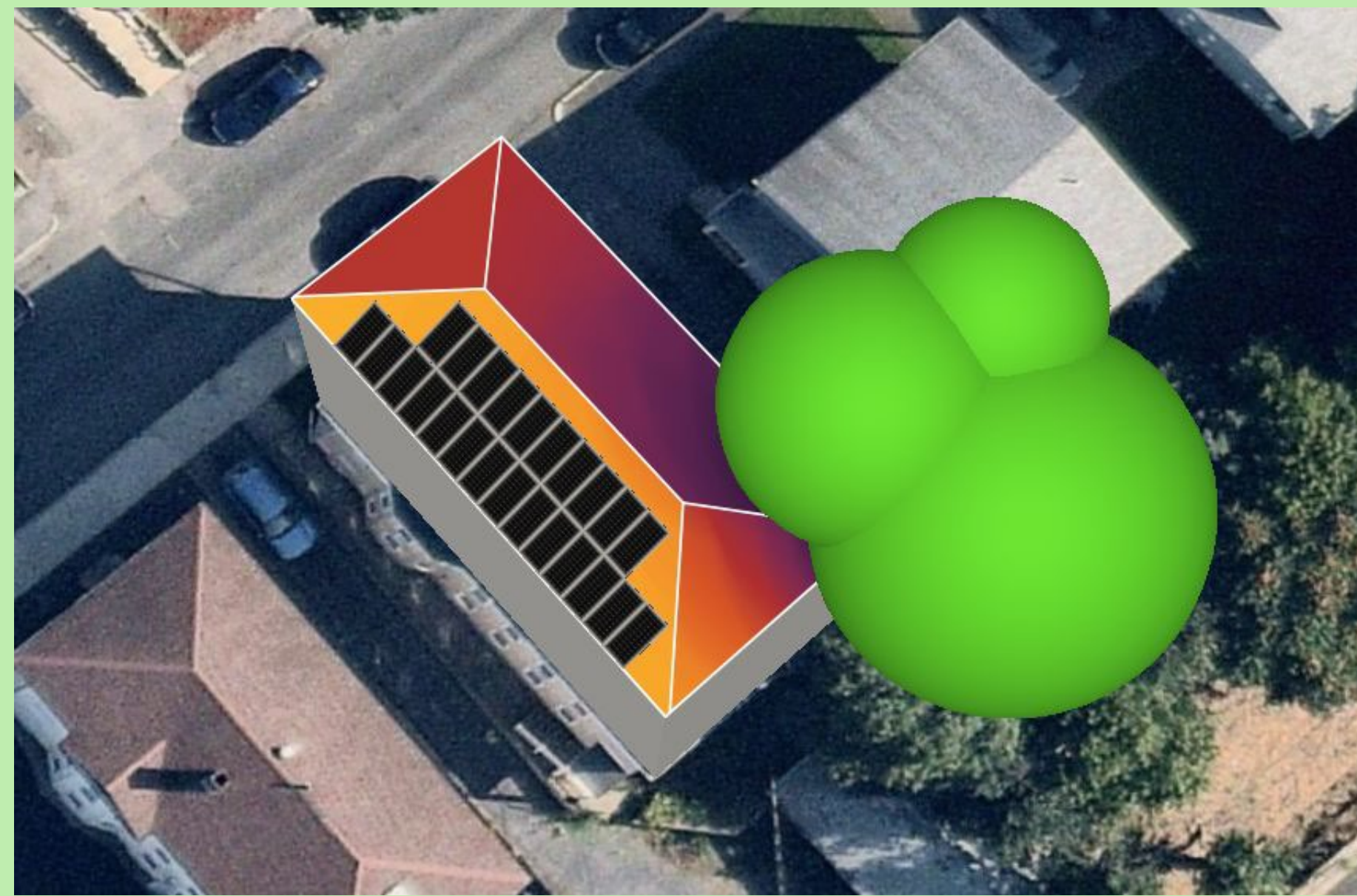
Some considerations

- CDC prefers direct purchase of the solar array over a 3rd party Power Purchase Agreement
- Solar installs will be connected to the meter for common areas in the multi-unit properties
- Most benefits go to the property owner, but the state solar incentive program (SMART) allows 15% of a solar array's electricity generation to be sent for free to low-income tenants living in affordable housing developments.
- An adder in the program offsets that loss to the owner, who will still receive at least 100% of the value of the electricity.

Summary analysis of solar potential for all 6 buildings / year

Solar production compared to electric usage in common areas				
	System Size (kW DC)	Output / year (kWh/ yr)	Usage ^[SEP] (kWh / yr)	Excess Production ^[SEP] (kWh/ yr)
totals for all 6 properties	70.8	82,085	41,454	59,416

Financing recommendation					
	System size (Kw DC)	Cost to MSCDC (\$/ Watt)	Grant amount to increase viability	After grant	Internal Rate of Return (IRR)
Totals for all 6 properties	75.7 (after tree removal)	\$277,085	\$122,873	\$154,211	11.99%



Summary financials

# of eligible projects	6
Eligible Kw-DC	71
Upfront Cost	\$267,683
Year one savings	\$16,763
Lifetime net benefit	\$524,577

The hitch:

Of the 6 properties, 3 roofs are 11 years old; one is 10 years old, and two are of unknown age

Roofs would need to be replaced before the panels had reached half their lifetime



SUSTAINABLE
COMFORT



SCI constructed a calibrated energy model of each building type based on site observations, utility bill analysis and CDC plans

* Collected utility data for both power consumption and natural gas use for 19 units in 6 triple deckers

* Grouped the 6 triple-deckers into 3 model types to reflect significant commonalities

Direct metered gas, hydronic baseboard boilers, no co-generative units — 3 UNITS

Master metered gas, hydronic baseboard boilers, with co-generative units — 2 UNITS

Occupied basement, direct metered gas, hydronic baseboard boilers, no co-generative units — 1 UNIT

* Documented information in detail about the building envelope, mechanical systems, lighting and appliances in apartment units and common areas

NEXT STEPS

Pilot the recommendations of Resonant Energy & Sustainable Comfort;
assess in 6 months—1 year

(more ambitious)

Develop a city-wide pilot that includes, in addition to the MSCDC pilot, a variety of other affordable housing retrofit projects at different stages of development

Draft concept for city-wide project:

Do foundational work that would prepare the city to benefit from significant green investments to come.

- Map out pathways to lower the carbon footprint of Worcester's affordable housing stock including electrification
- Identify short-term and long-term investments
- Develop a city-wide policy platform to get resources allocated equitably
- Develop a workforce development initiative matched to specific green job needs over the next 2-5 years.

QUESTIONS?

COMMENTS?

THANK YOU FOR YOUR INTEREST IN THE WORCESTER HEART PARTNERSHIP!