RESONANT ENERGY

Solar for Housing Authorities

MA Policy & BHA Case Study Review

May 2024

Introductions

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RESONANT ENERGY

- **Mission:** To expand access to clean energy in underinvested communities
- **Service Area:** Boston-based development company founded in 2016 building projects in MA, NY
- **Focus:** Affordable Housing, Nonprofit, Small Commercial
- **Specialty Services:** Lender & investor consent support, ITC adder and Elective Pay support

Build Local Power

Goals of this Presentation

1. Solar for Public Housing. Why Now?

2. How to Identify Buildings with Strong Solar Potential

3. Solar Financing Options

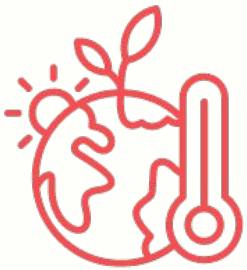
4. Boston Housing Authority (BHA) Case Studies

5. Q&A

Why Solar?

Electricity Costs:

- Electricity costs have increased by 2.5x over the last 20 years in Massachusetts (Source: Federal reserve)



Climate Goals:

- Massachusetts has set an aggressive goal of net-zero emissions by 2050 (Source: Mass.gov)

Health Benefits:

- Improvements to indoor & outdoor air quality (i.e. cooking, heating, EV rely on affordable, clean electricity.

Why Solar, Why Now?

Massachusetts Grants:

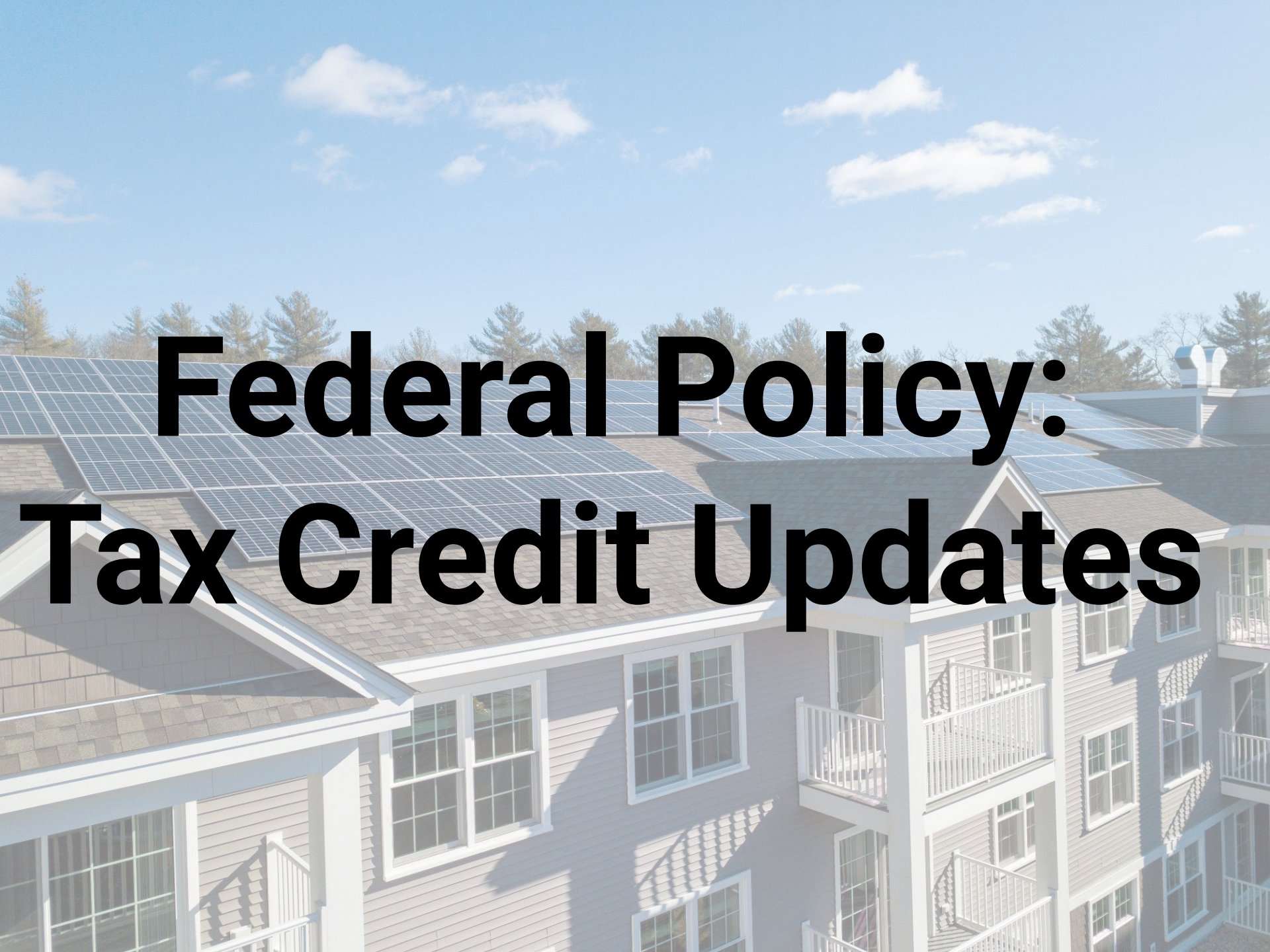
- Solar for All – **$156 million** awarded to Massachusetts.
  - 10% was earmarked for public housing in straw proposal, TBD final amount.

Massachusetts Policy / Incentives:

- State solar policy favors public entities + affordable housing
- SMART (Affordable Housing, Public Adders)

Federal Incentives:

- Elective Pay for Investment Tax Credit (30%)
- Low Income Communities Bonus Credit (10-20%)
- Energy Communities Bonus Credit (10%)
- ***Total:*** *up to 60% routinely possible*



Federal Policy: Tax Credit Updates

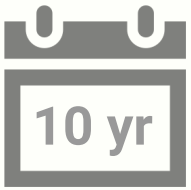
Inflation Reduction Act (IRA)

Implication for Solar on Public Housing

Signed into law in August 2022

Investment Tax Credit Increase

22% → 30%



Extends credit for ten years though 2032

Why should you care?

- Increased return on investment for ownership & third-party owned options
- Elective Pay for nonprofits & **public entities** provides cash in lieu of a tax credit.
- LI Communities Bonus Credits can boost tax credit value up to **40/50%**

Low Income Communities Bonus Credits

	Category 1: Low Income Location	Category 3: Aff. Multifamily Tenants
Tax Credit Increase	**+10%**	**+20%**
Criteria	Must be sited in a "low-income community" as defined in IRC 45D(e). Map here. i.e. New Market Tax Credit	**Must have federal subsidy (LIHTC, PBS8, etc). State PH not eligible.** Comes with requirement to distribute some savings to tenants. *Many pathways allowed.*
Limitations	• Solar projects with Tax Exempt owners (e.g. public housing) meet additional select criteria (ASC) and are much more likely to get an adder awarded. • Ideal for this reason to focus on ownership over third party owned Power Purchase Agreements.	

LI Communities Bonus Credits

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State Policy: New Grant Opportunity

EPA: Solar For All

Timeline & Implications for Affordable Housing

1. Application. DOER, MassCEC, BHA, MassHousing applied to EPA Oct. 2023. Application Summary

2. Award. EPA issued **$156 million** award to MA.

3. Program Launch. MA creates final program design and opens funding opportunity by end of 2024.

Timeline: EPA funds must be deployed 2024-2029.

Program Details

~10% for Public Housing

Program design is yet to be finalized; initial design **may cover up to 100% of upfront costs** for eligible sites (after tax credits).

Eligible sites will have a strong ratio of onsite solar potential to unit count. (townhouses + low to mid rise developments)

Identifying Your Solar Potential

Solar Potential Checklist:

- ❑ **Recent Roof Replacement: <**10 year rule of thumb.
- ❑ **Good Exposure:** No shade from other buildings or trees.
- ❑ **Favorable Design:** Size of roof surfaces and orientation.
- ❑ **Building Lifecycle:** Rehab/redev timing is best aligned with solar.
- ❑ **High Owner Paid Usage:** some buildings do not have enough owner paid electricity usage.
- ❑ **Onsite Electrical Compatible, or Ready for Upgrade:** Check for outdated electrical systems.
- ❑ **Harder in Urban Local Area Networks & "Munis":** Both make PV solar difficult and in some cases infeasible.
- ❑ **No Utility Hosting Capacity Issues:** Larger systems based in NGRID or Eversource may face Group Studies / CIPs.
- ❑ **Building Subsidy Type:** Incentive eligibility and consent process are heavily impacted by subsidy type.

Favorable Design

	High Rises	Midrises	Townhouse Construction
Solar Viability	**Bad**	**Excellent**	**Good**
Pros for Solar	• Highest onsite common elec usage • Sometimes have sizeable parking lots • 3ph elec service	• Solid onsite common elec usage • Solid roof space • Height workable for standard crane/lifts • 3ph elec service	• Excellent roof space (pitched) • Height workable for standard crane/lifts
Cons for Solar	• limited roof space • Building height makes crane prohibitively expensive • Parking often shaded	• Indiv unit heat pump set up can dramatically limit roof space	• 1ph elec service often, which can limit system sizes • sometimes no common meters • Private market note - low onsite common usage.

Building Subsidy Considerations

Isaac

	Federal Public Housing	State Public Housing	Redevelopment Project (e.g. Voucher Conversion)
Legal Complexity	**More Difficult**	**Fairly Easy**	**Easiest**
Consent Requirements	• HUD involved with RFP • HUD requirements for contracts are onerous	• EOHLC involved with RFP • EOHLC has partners like PowerOptions, who can bypass RFP • EOHLC has legal recommendations	• **PPA:** consent may be required for PPA, depending on subsidy source. • **Purchase:** Lender consent if using replacement reserves • **Note:** HLC can grant procurement relief for redevelopment.
Additional Notes	HUD requires 50% energy savings split with them in some cases. To avoid, best bet is purchase with all energy used on site.	Many State PH sites are signed up for offsite community solar. Need to confirm usage changes re: solar	Fastest and simplest. Sec8 must comply with HAP Contract and Use Agreement requirements.

Key Insurance Considerations

State Public Housing typically self insures for property and general liability insurance.

Direct Purchase: This is a challenge for housing authorities that want to own their solar system because utility interconnection agreements require basic General Liability ($500k - $1M/yr) insurance for any system > 60 kW-AC (~90 kW-DC).

PPA: To get around this, most housing authorities have gone with third party ownership (PPAs); however most systems are under 60 kW-AC, so ownership is more of an option that many have previously thought.

Financing Options Overview

Financing & Ownership Options

	Best For	Pros	Cons
Direct Ownership	• New Construction / Rehab • Wholly Owned LIHTC / Section 8 PBV	• Simplest Contract & Consents • Receive full value of federal tax credit and all other incentives.	• High upfront cost or loan (Note: Solar 4 All grants to offset) • General Liability Insurance issue for state PH >60 kW AC • Operations and Maintenance

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Power Purchase Agreement (PPA)	• Mid-cycle LIHTC • Existing Federal / State PH • New Construction / Rehab (maxed out budget) • Indiv Systems >60 kW AC	• $0 down • Energy savings over time through clean energy source • No O&M or Insurance	• 50% lower financial benefit for **Client** in the long run • Added complexity if changing ownership of the bldg during PPA Term

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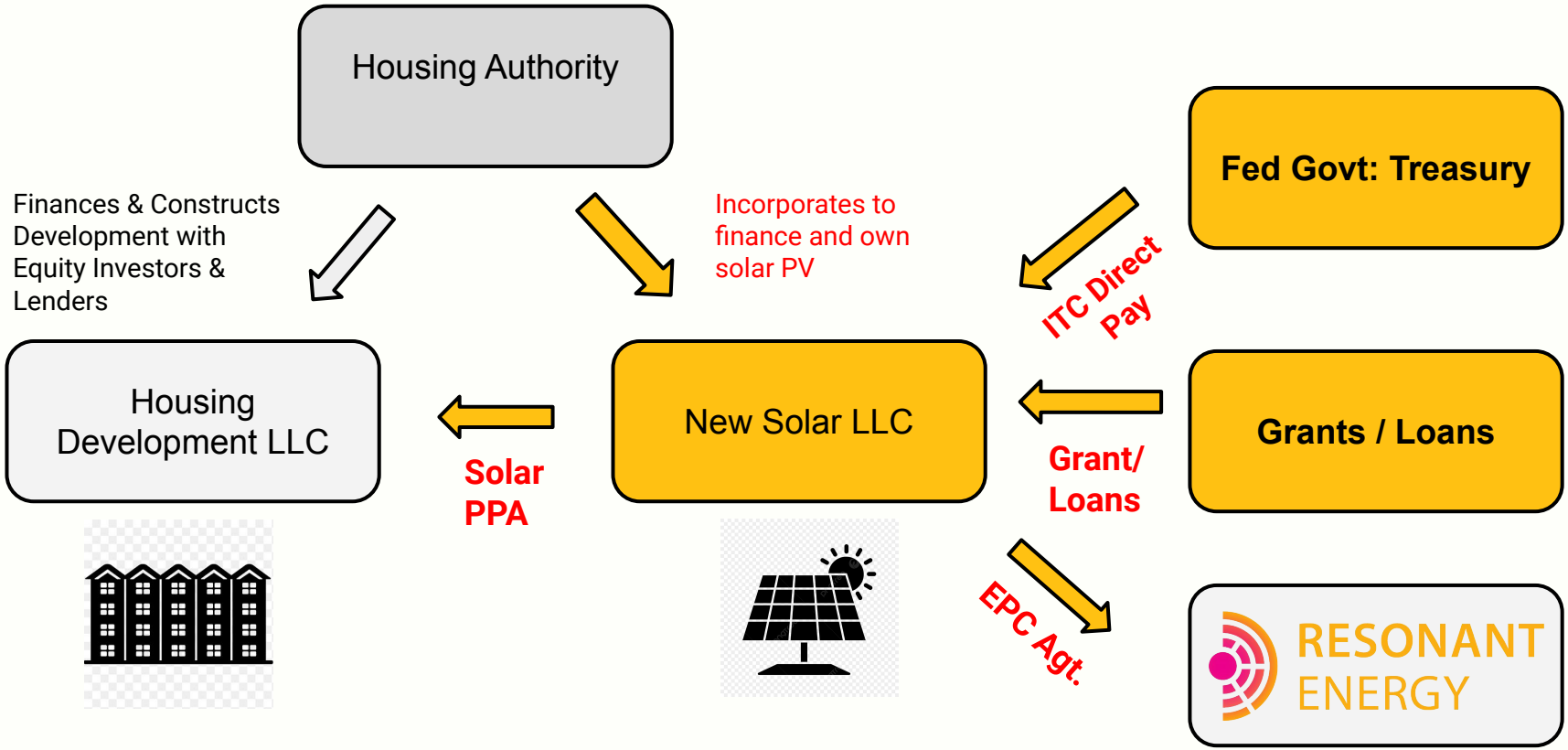
Internal Power Purchase Agreement (PPA)	• For large affiliated entity projects the PHA takes the place of the 3rd party financier. The PHA as the solar system owner can capitalize project at parent level through grants, loans, and cash on hand.	• **PHA** gets tax benefits via **Elective Pay** and all incentives • $0 down to subsidiary entity • Gets around insurance issue by insuring via the new LLC • No O&M or Insurance for **subsidiary entity**	• High upfront cost or loan (Note: SFA grants to offset) • Fed PH: HUD may have related party contracting concerns.

Internal Solar PPA Diagram



Housing Authority - Public entity that develops, owns, and operates affordable housing.
Housing Development LLC - subsidiary legal entity that owns the housing development.
Housing Authority Solar LLC - subsidiary legal entity that owns the solar PV on the roof of the building owned by Housing Development LLC.

BHA Analysis Overview

Boston Housing Authority Consulting Project Background

Resonant Energy and LISC Massachusetts have been engaged by the Boston Housing Authority (BHA) to complete a yearlong feasibility study for onsite solar PV across its housing portfolio. This feasibility study has been completed with the generous support of the Lauenstein family.

Resonant Energy and LISC Massachusetts have completed this work as a part of the Solar Technical Assistance Retrofit (STAR) Program, through which they have provided portfolio feasibility analyses to over 40 private housing developers in MA to date through an annual campaign that has been running since 2021.

Total Scope of Analysis

	Number Analyzed
Housing Developments	57
Approx. Buildings / Rooftops	1,365
Approx. Electricity Bills	1,343

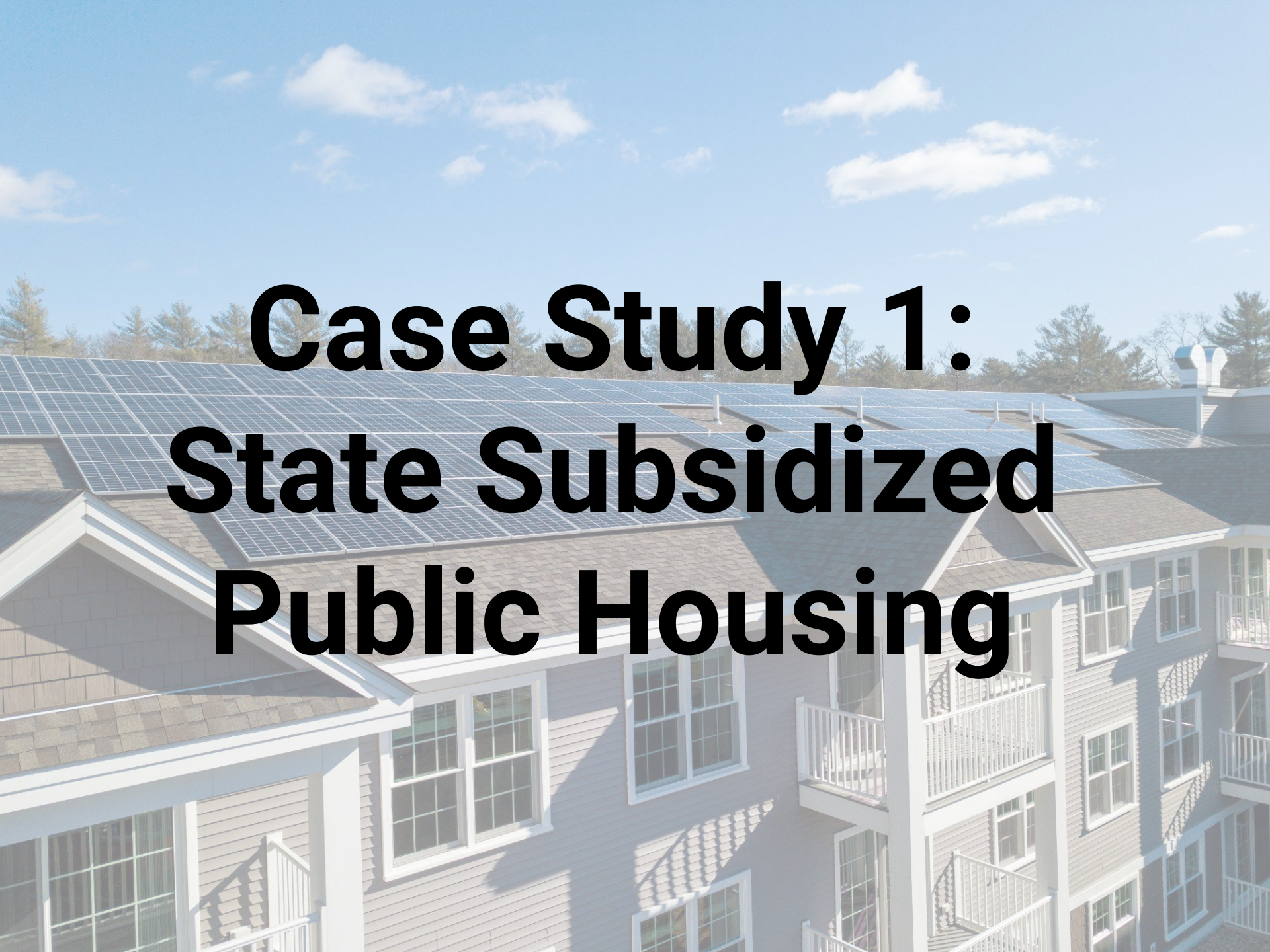
Results of Analysis

	Number
Developments with Qualified Buildings	37
Solar Systems Designed (some across multiple buildings)	142
Approx. Residential Units in Buildings with Solar Potential:	4,166

Solar Feasibility Study Findings

Property Type	Development Count (BHA Owned)	Building Count	Unit Count	Bldgs w/ Suitable Roof Age*	New Solar Potential kW-DC	New Solar Production Potential kWh/yr	Total Usage (kWh/yr)	% Usage Offset
Federal PH	39	307	5,110	211	3,835	4,207,860	36,696,334	11.5%
State PH	11	223	1,596	35	2,280	2,522,839	12,552,422	20.1%
Section 8 PBV	6	19	385	19	754	826,023	4,801,515	17.2%
BHA Main Office	0	1	0	1	0	0	913,212	0.0%
TOTAL	**56**	**550**	**7,091**	**266**	**6,869**	**7,556,721**	**54,050,271**	**14%**

14% of all current electricity usage could be covered by solar at the BHA



Case Study 1: State Subsidized Public Housing

West Broadway

Number of Units: 486

Date Built: 1949

Roof Age: 2019

Subsidy Type: State Public Housing

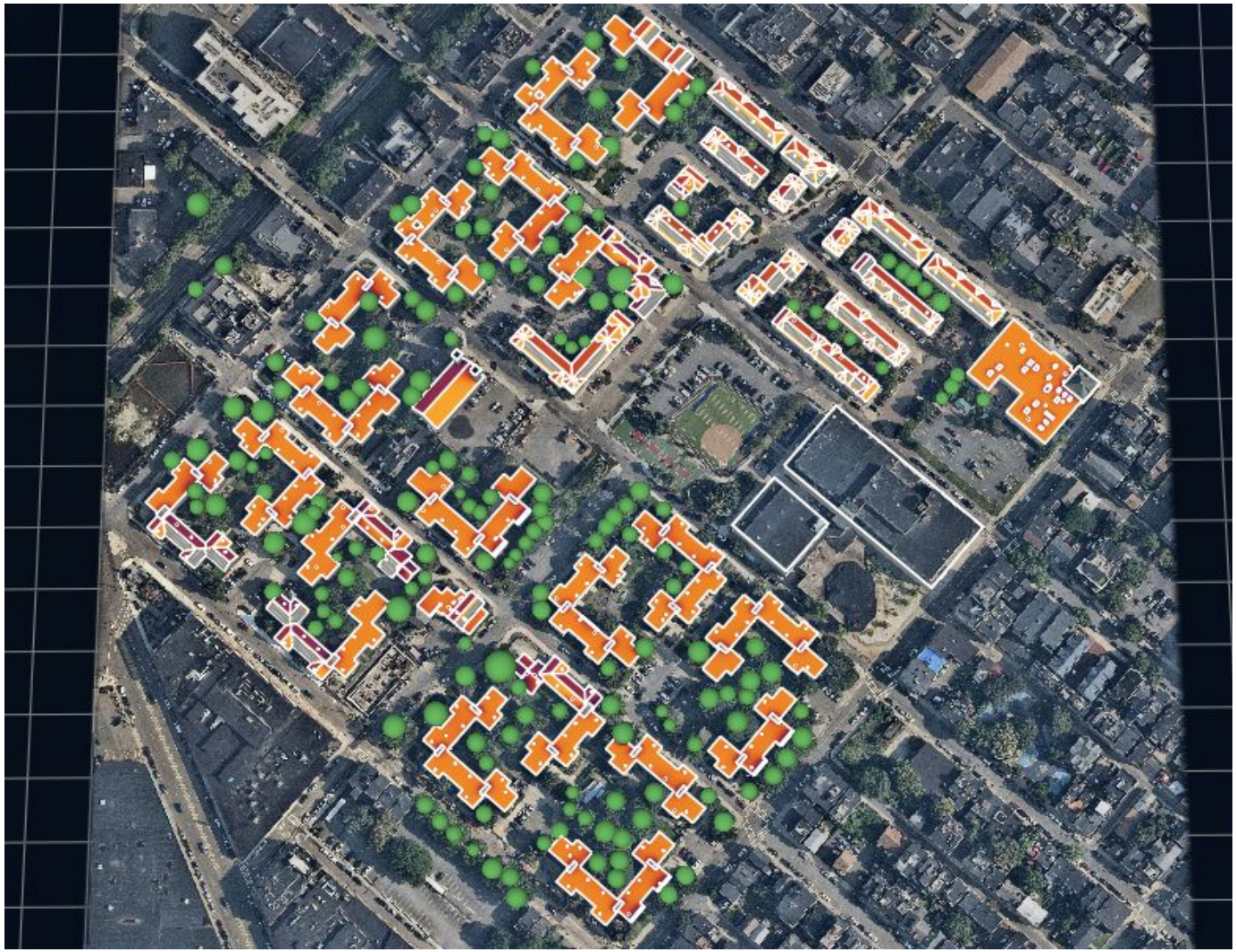
Electricity Usage: Owner Paid

(one meter for campus)

West Broadway (Flat) - 1,356 kW

2,796 Panels | **Ballast Racking**

West Broadway (Sloped) - 389 kW



949 Panels | **Mechanical Racking**

Solar Production Overview - West Broadway

Address	**81 Orton Marotta Way**
System Size (kW DC)	**1,745**
Output (kWh/Yr)	**1,808,374**
Usage (kWh/Yr)	**3,886,320**
Covered By Solar (%)	**46.5%**
Excess Production (kWh/Yr)	**0**

*Equivalent total CO_2 reduction of **128 acres of forest** preserved.*

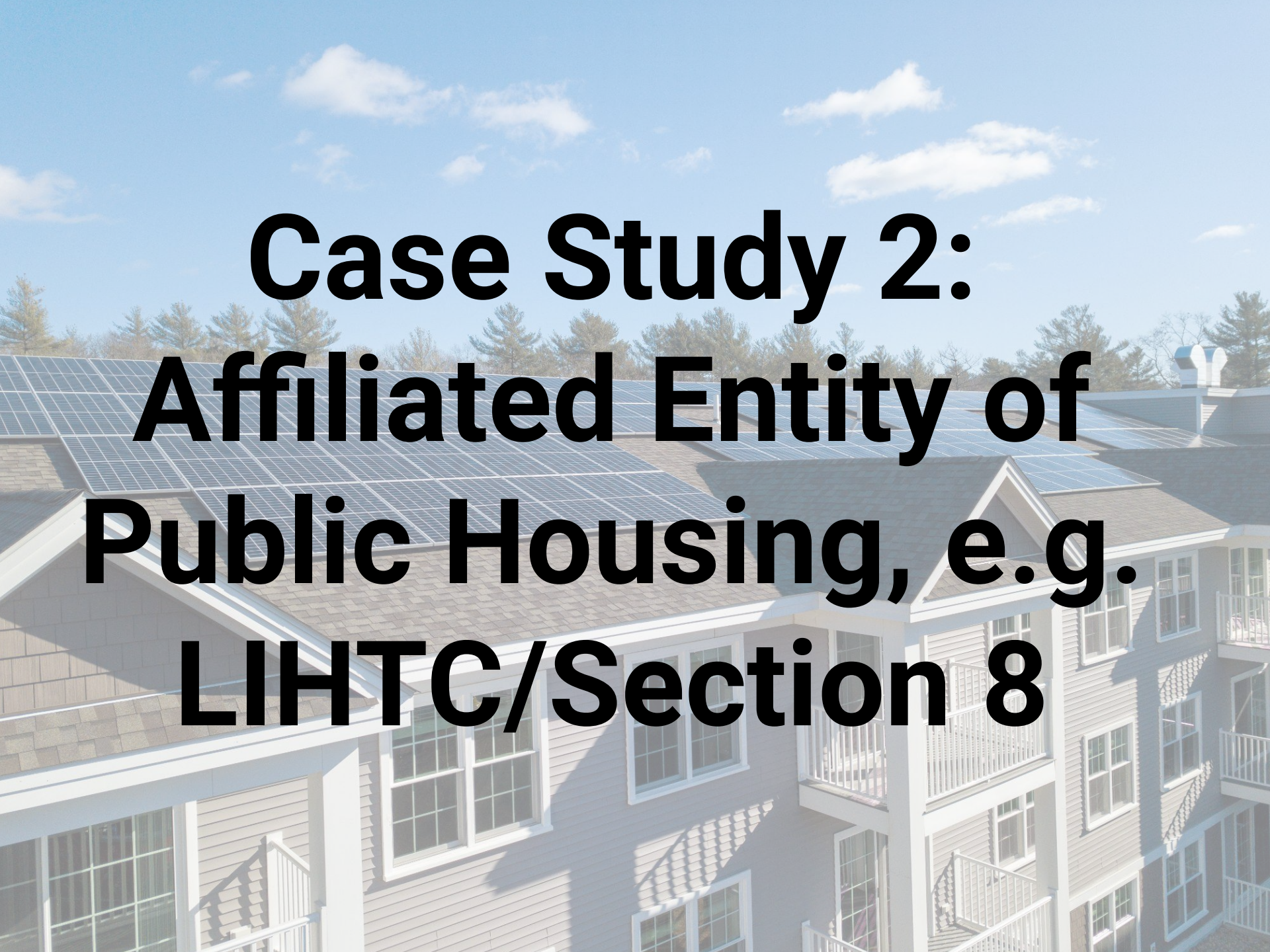
West Broadway Tax Credit Calculation

Tax Credit Type	Tax Credit Amount (%)	Eligibility & Background Information
Base Tax Credit	**30%**	All projects of this size automatically are eligible for 30% through 2032.
Category 1 Bonus Tax Credit	**+10%**	Project is eligible because it's **in a NMTC eligible census tract**. This is a competitive application. (It is not eligible for Category 3 because it has no federal subsidy attached to it)
TOTAL	**40%**	

Financial Options Summary
West Broadway (30 sites) - 40% ITC

	Power Purchase (PPA)	Direct Purchase
Upfront Cost	**1,622**	**1,622**
Year-One Savings	**$44,215**	**$2,551,865**
Lifetime Net Benefit	**$3,126,824**	**$8,227,763**
IRR	**N/A**	**12.24%**
PPA Discount	**14.5%**	**N/A**

Note: because of the single meter, this would be treated as a single interconnection well above 60 kW-AC. It may be best as a PPA or Internal PPA for insurance reasons.



Case Study 2: Affiliated Entity of Public Housing, e.g. LIHTC/Section 8

Lower Mills

Number of Units:	179
Date Built:	1970s
Roof Age:	Planned 2024
Subsidy Type:	LIHTC
Electricity Usage:	Owner Paid

Lower Mills Tax Credit Calculation

Tax Credit Type	Tax Credit Amount (%)	Eligibility & Background Information
Base Tax Credit	**30%**	All projects of this size automatically are eligible for 30% through 2032.
Category 3 Bonus Tax Credit	**+20%**	Project is eligible because it has two forms of federal housing subsidy **(LIHTC + PBS8)**. This is a competitive application.
TOTAL	**50%**	

Note: Category 3 comes with a 5-year tenant benefit requirement, which can most easily be met by increases to replacement reserves or resident services budgets.

Lower Mills 2262 Dorchester Avenue

131.9 kW

272 Panels | **Ballast Racking**

Solar Production Overview - Lower Mills

Address	2262 Dorchester Avenue
System Size (kW DC)	**131.9**
Output (kWh/Yr)	**146,167**
Usage (kWh/Yr)	**735,720**
Covered By Solar (%)	**20%**
Excess Production (kWh/Yr)	**0**

*Equivalent total CO_2 reduction of **128 acres of forest** preserved.*

Financial Options Summary
Lower Mills (1 site) - 50% ITC

	Power Purchase (PPA)	Direct Purchase
Upfront Cost	$0	$385,206
Year-One Savings	$9,998	$262,327
Lifetime Net Benefit	$443,291	$1,455,233
IRR	N/A	14.8%
Effective Discount	35%	N/A

Takeaways

Takeaways & Next Steps

- **Current Policy:** The IRA has significantly improved solar economics for public housing, including up to 60% back via “elective pay” tax credits.

- **New Potential Funding:** Solar for All EPA funding may provide remaining 50% of cost of solar in 2024-2029 via MassCEC, DOER, MHFA and BHA out of a $156M MA state pot to further improve economics.

- **Timelines:** Solar is complex to procure, contract, and permit. It is relatively simple to install. Small investments to start planning & permitting early will go a long way to accelerating timelines.

Resonant Solar Portfolio Analysis

	Cost
< 15 Buildings	$500/Site
> 15 Buildings	$350/Site

Resonant provides:

- Analysis of all electricity bills,
- Preliminary solar system designs and production estimates,
- Financial and legal analysis with pathways for implementation,
- Guidance on Solar For All and Investment Tax Credit applications

Note: In the next year, there will likely be significant new technical assistance funding to support analysis; however, there will be benefits to getting projects moving as early as possible for securing grant funds.

Thank You

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