NATIONAL HOUSING TRUST

Owner/Developer IRA Bootcamp Session #4:

Resiliency and Solar Opportunities in Affordable Housing

NATIONAL HOUSING TRUST | JULY 27, 2023

AGENDA

- Welcome
  - Michael Miranda, NHT
- Climate Resiliency
  - Joshua Galloway, Frank Stone, Rebecca Arnold; New Ecology
- Solar Opportunities
  - Brian Levy, LMI Solar
- Solar For All Funding Opportunity
  - Todd Nedwick, NHT
- Preview of Upcoming Sessions

IRA Bootcamp
7.27.23

Climate Resilience and Affordable Housing

Image: Community Housing Partners

NEW ECOLOGY
Community-Based Sustainable Development

BOSTON | BALTIMORE | WILMINGTON

New Ecology works nationally to bring the benefits of sustainable development to the community level, with a concerted emphasis on underserved populations.

A mission-driven non profit, we seek to make the built environment more efficient, healthy, durable, and resilient.

CORE WORK in Buildings:

- Research & Test
- Monitor & Diagnose
- Implement & Solve
- Certify & Verify
- Train & Share

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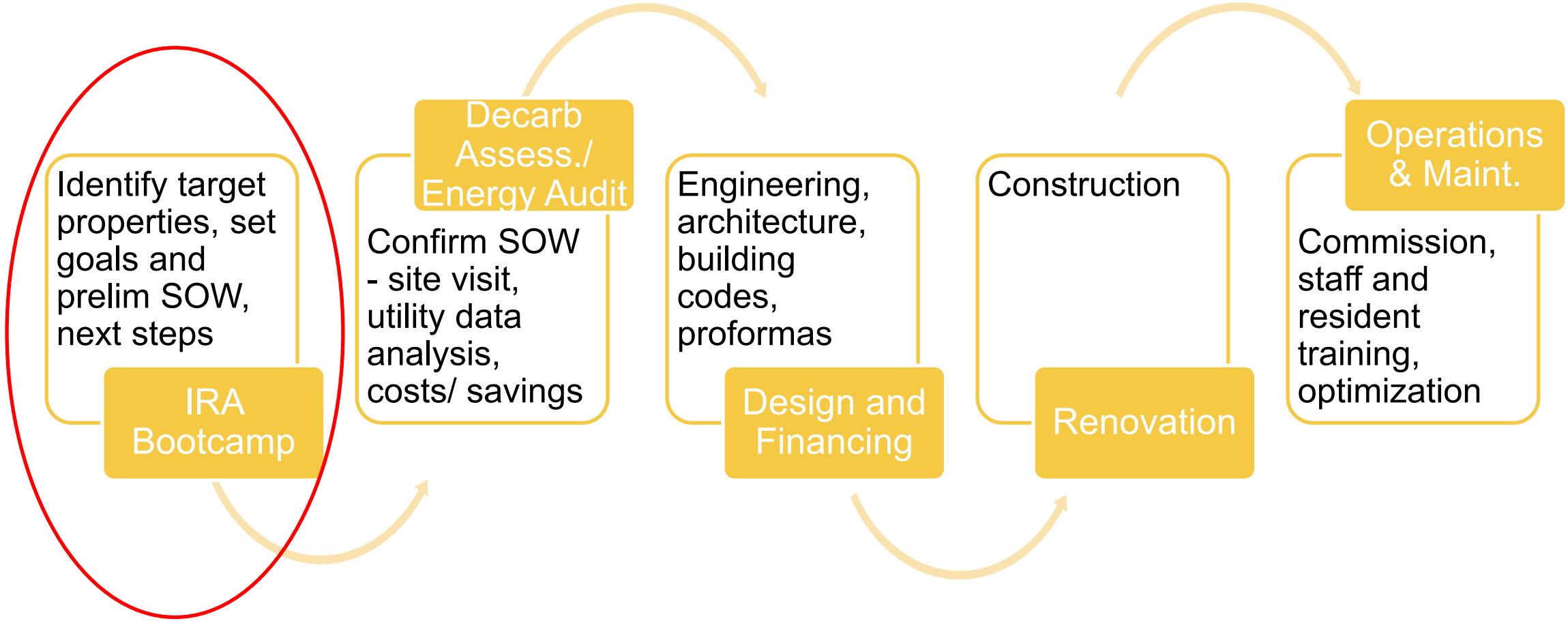
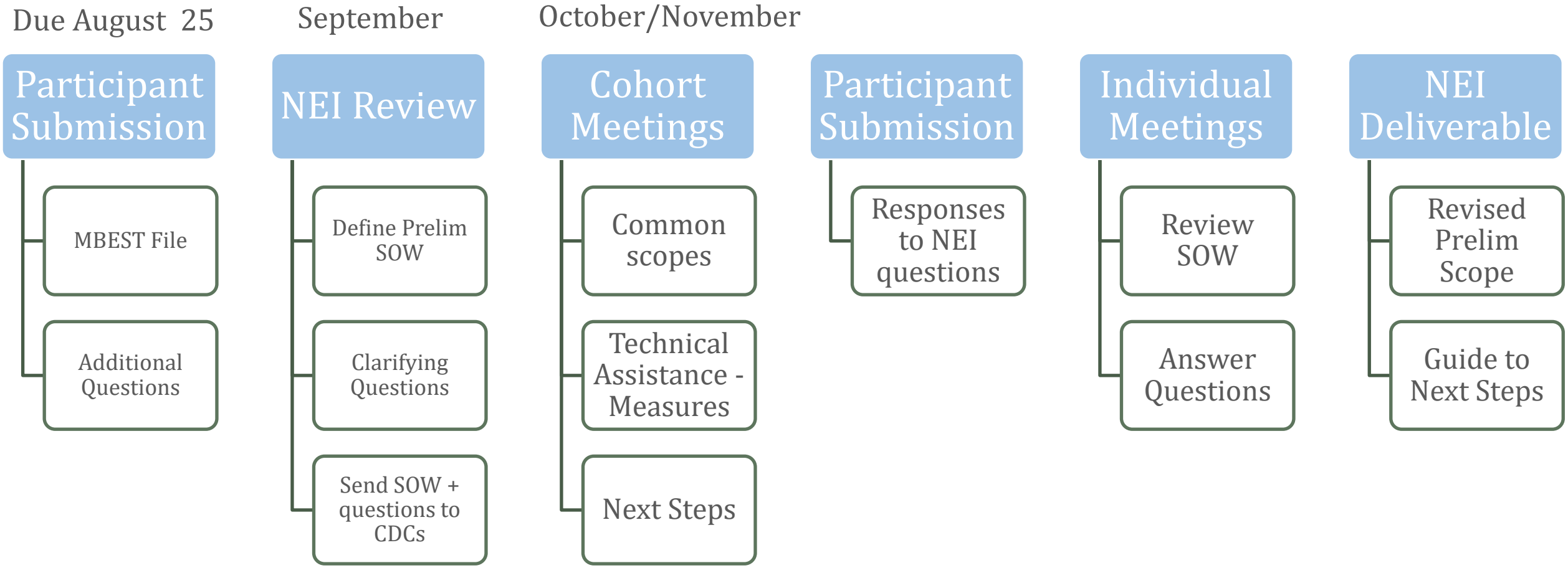
IRA Bootcamp and the Development Process



IRA Bootcamp Process



Agenda - Climate Resilience

What will we accomplish today?

- Define Resilience
- Share case studies
- Share stories from the field
- Identify resiliency resources

Where do you go from here?

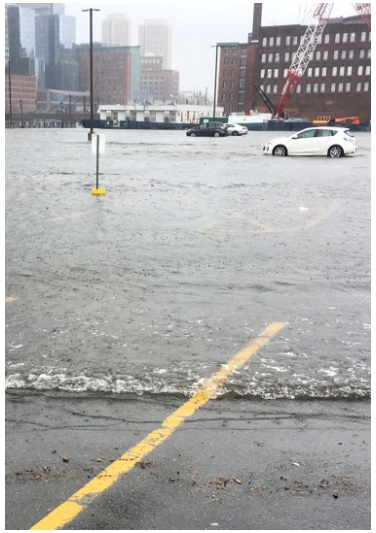
- Identify local resources
- Engage with community members and design professionals to set resilience goals
- Identify synergies between resilience, energy efficiency, electrification…
- Pursue IRA funding sources
- Implement strategies

What is Resilience?

Adapting to changing climate.

Why now?

Abnormal is the new normal.



2018 Boston flooding

What do we want our homes to be?

- Comfortable +
- Durable +
- Energy Efficient +
- Healthy +
- = Resilient

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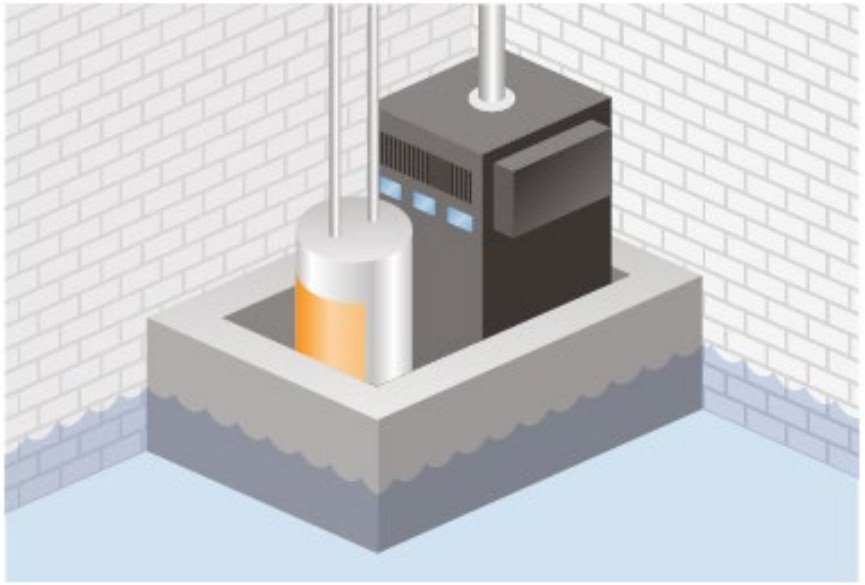
Why are we talking about this?

The Need



Because of hydrostatic pressure, component floodproofing barriers should designed to a maximum of 3 ft.

Image: Colin Hayes.

Dry component floodproofing is often an effective solution for equipment that cannot be elevated or relocated out of basements.

Image: MAP Architects, New York Engineers.

The Funding

The Green and Resilient Retrofit Program (GRRP) provides owners of HUD-assisted Multifamily housing with funding to reduce carbon emissions, improve utility efficiency, incorporate renewable energy sources, and make properties more resilient to climate hazards.

Resilience: Solutions

- Flood Barriers ready
- Cooling Centers available
- Potable Water Stored for Emergencies
- Portable Batteries for Device Recharging

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Resilience: Solutions

- Community engagement
- Resilience Hub
- Resident comfort
- Passive survivability

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SOCIAL VULNERABILITY INDEX

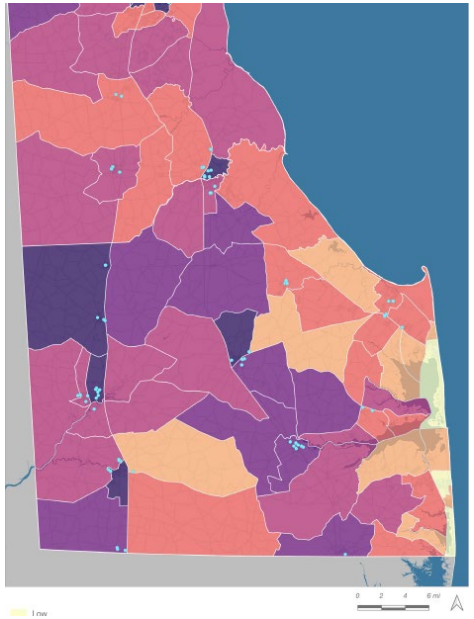

Image: DE FirstMap USGS

EMERGENCY MANAGEMENT PLAN

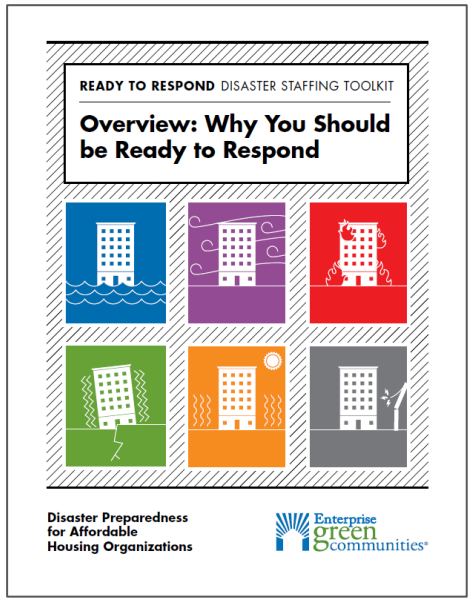

Image: Enterprise Green Communities

CAT 4 STORM SURGE

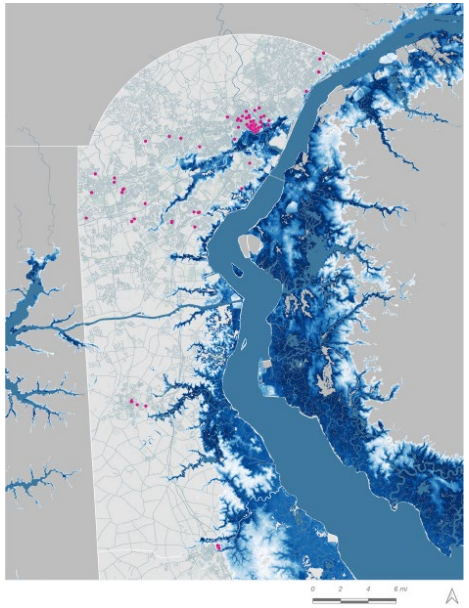

Image: DE FirstMap USGS

LOCALIZED FLOODING

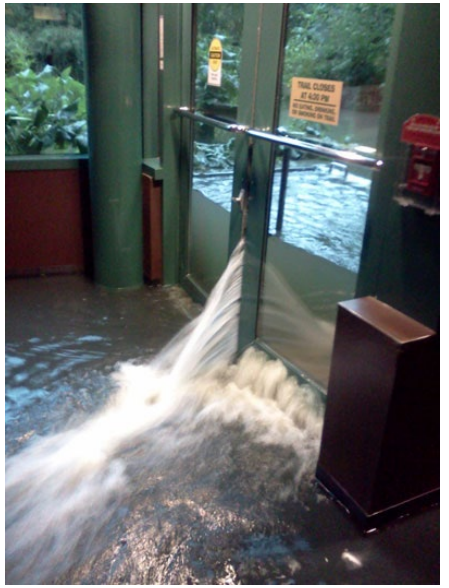

Image: Virginia Living Museum

Risk Analysis and Resilience Assessment in DE

- What is Resilience?
- How is DE affordable housing affected by a changing climate?
- How can the Resilience Assessment tool fit into DSHA processes?

Co-Benefits

Measure with Co-Benefits

- ***Insulation, Air Sealing, and Window Replacement***
  - Heating and Cooling Energy Savings, Improved Passive Survivability, Improved Wind Load Performance, Improved Comfort, Improved Functionality, Reduced Maintenance

Measure without Co-Benefits

- ***Backup Generator***
  - Increased Building Services, Increased Operations and Maintenance Costs

Multifamily Apartments

- ***Location:*** ***Salisbury, MD***
- ***Unit Count:*** ***24 Units***
- ***Year Built:*** ***1993***

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Multifamily Apartments

Assets – Desk Review:

- ***Above FEMA flood elevations (historic)***
- ***Roof area for solar PV***
- ***Nearby place of refuge –school***
- ***Planned renovation***

Multifamily Apartments

Site Conditions:

- ***Overland stormwater***
- ***Evidence of on-site flooding***
- ***Crawlspace water damage***
- ***Code minimum bldg. enclosure***
  Heat risk

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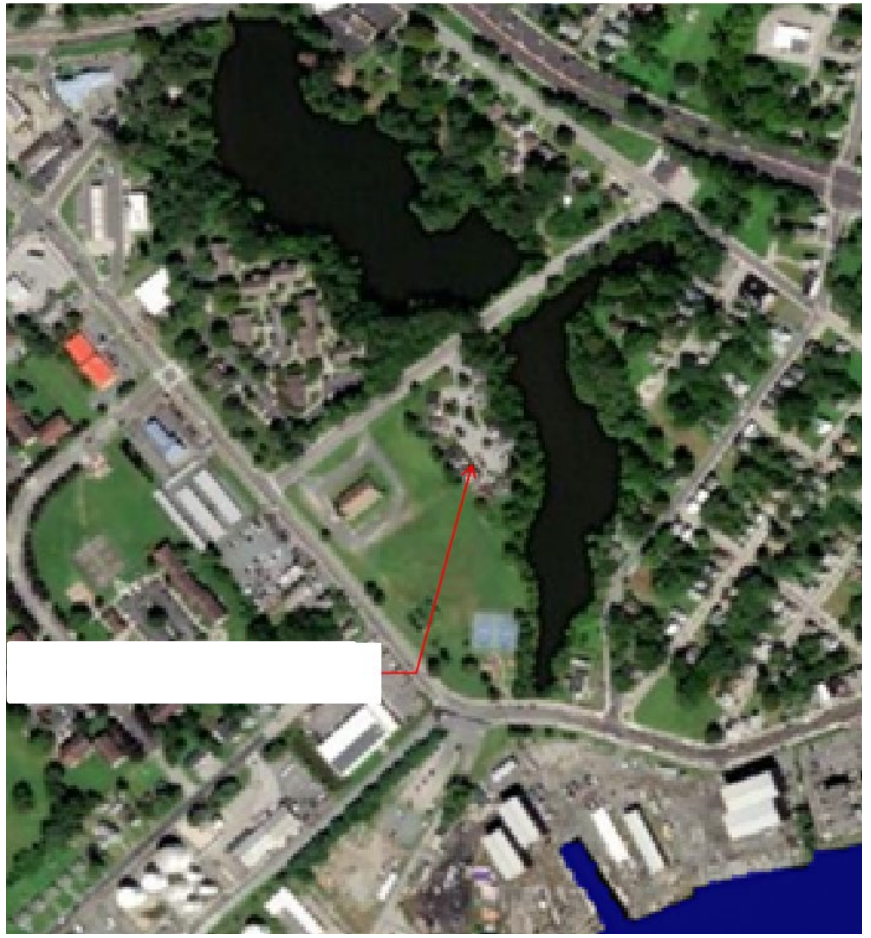
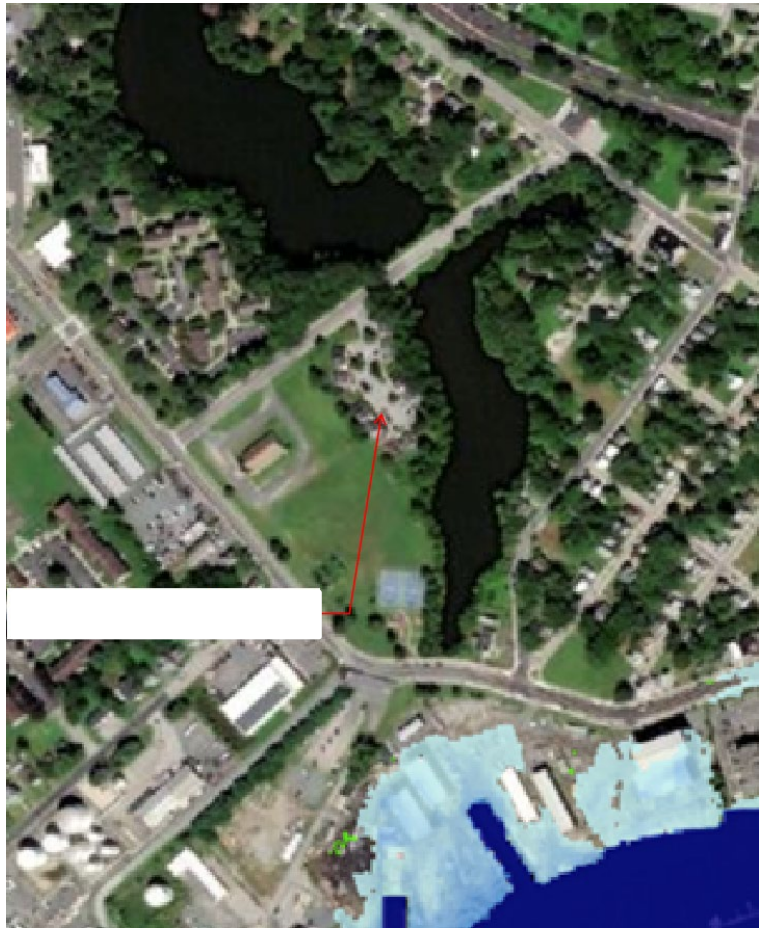
Sea Level Rise



Current conditions - 2022

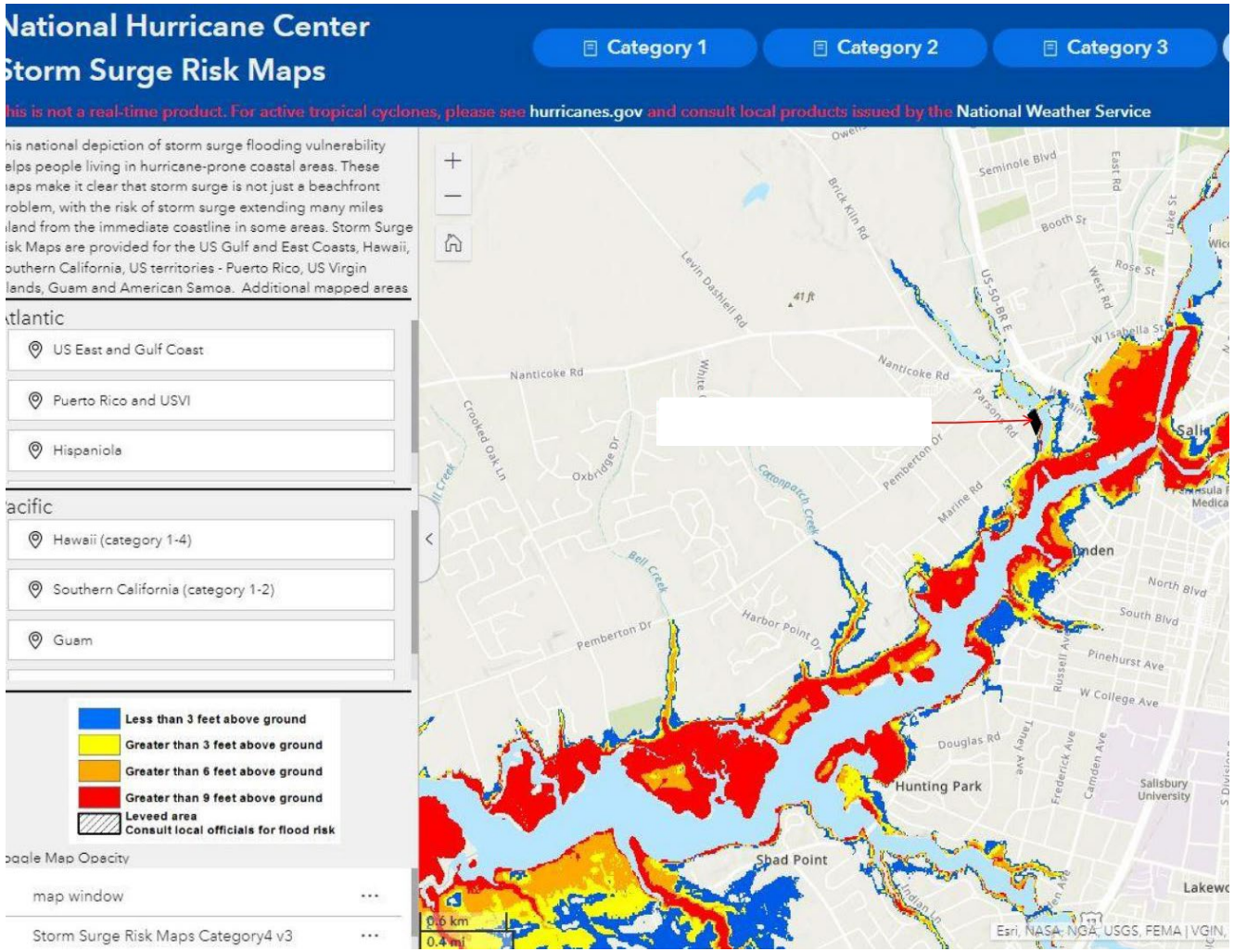


3’ of sea level rise

https://coast.noaa.gov/digitalcoast/tools/slr.html

National Oceanic and Atmospheric Administration (NOAA)

National Hurricane Center - Storm Surge Risk



Category 4 Hurricane

https://www.nhc.noaa.gov/nationalsurge/

National Oceanic and Atmospheric Administration (NOAA)

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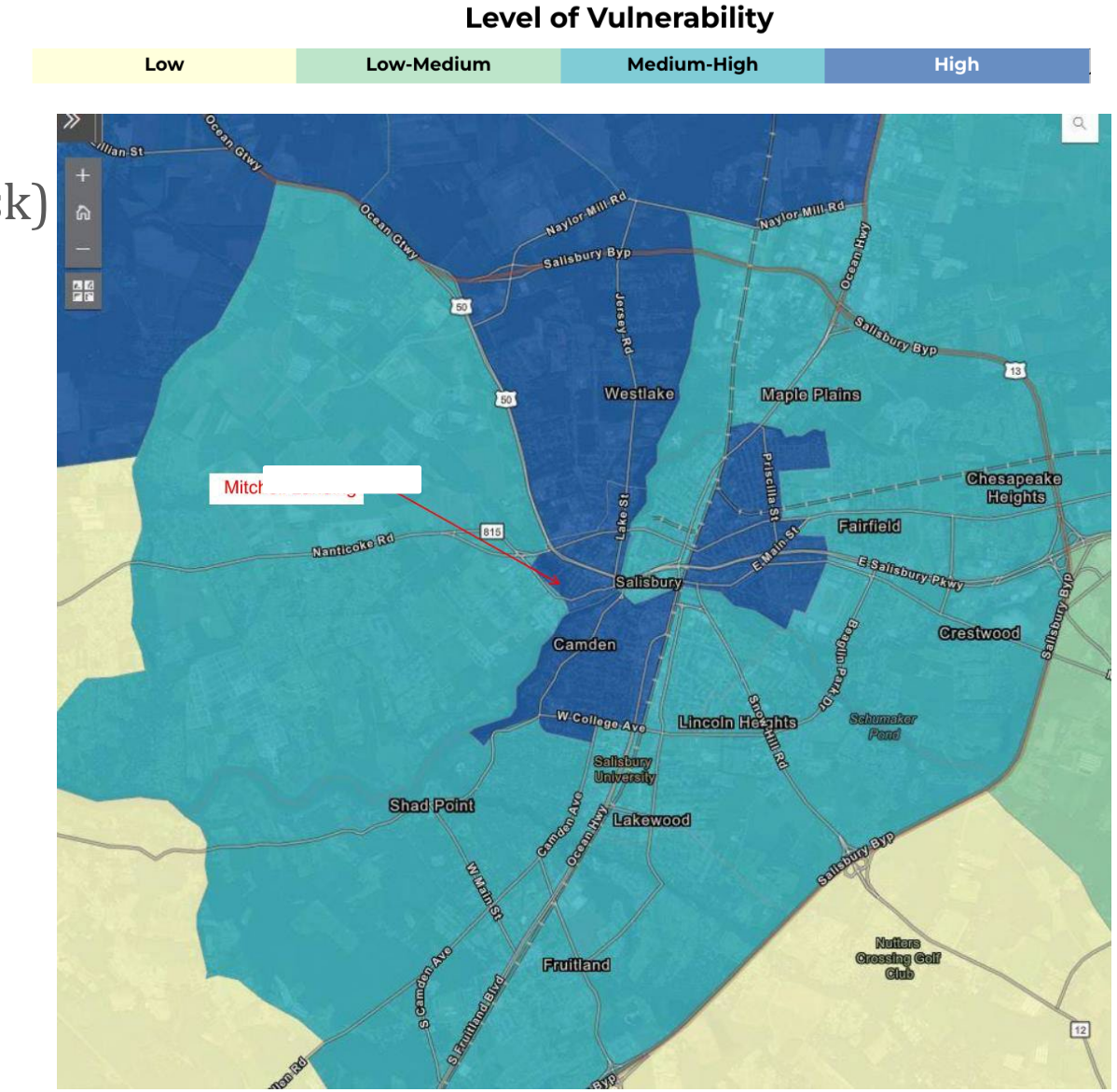
Sea Level Rise Viewer - High Tide Flooding Portal

https://coast.noaa.gov/digitalcoast/tools/slr.html

National Oceanic and Atmospheric Administration (NOAA)

Social Vulnerability Index
US CDC (property score 0.923 – 1=highest risk)

- Socioeconomic Status
  - Below Poverty
  - Unemployed
  - Income
  - No High School Diploma
- Household Composition & Disability
  - Aged 65 or Older
  - Aged 17 or Younger
  - Civilian with a Disability
  - Single-Parent Households
- Minority Status & Language
  - Minority
  - Aged 5 or Older who Speaks English “Less than Well”
- Housing Type & Transportation
  - Multi-Unit Structures
  - Mobile Homes
  - Crowding
  - No Vehicle
  - Group Quarters

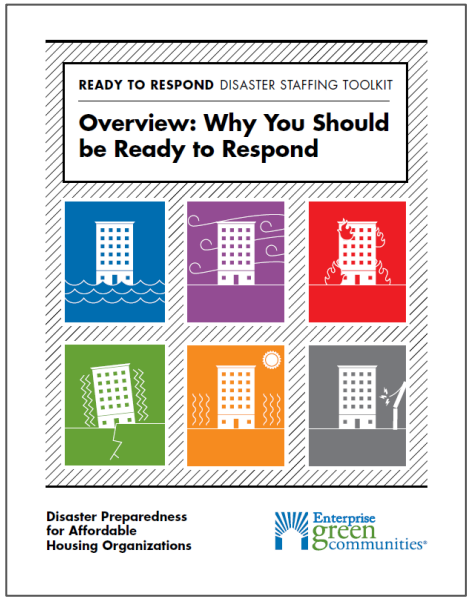


https://www.atsdr.cdc.gov/placeandhealth/svi/interactive_map.html

Solutions

Resiliency Hub

Re-grade site



Emergency Management Guide

Image: Enterprise Green Communities

Table 2: Solar PV System Description and Opportunity Summary

Solar System Capacity (kW DC)	43.7
Annual Solar Generation (kWh)	48,580

Net Investment without ITC or Additional Incentives	$109,250
Additional Incentives - approximate estimate for Solar Renewable Energy Credits (SRECs) generated on site for 2023 – for 3 years	$6,800
Net Investment with Investment Tax Credit (ITC). Based on construction beginning in 2023.	$85,215
Annual Utilitiy Saving Year 0	$7,287

Solar PV + Battery Storage

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Boston Apartments

- ***Location:*** ***Roxbury, MA***
- ***Unit Count:*** ***43 Units***
- ***Year Renovated:*** ***2006***

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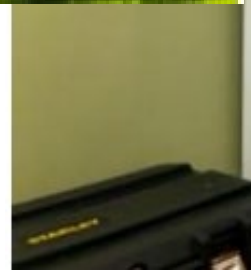
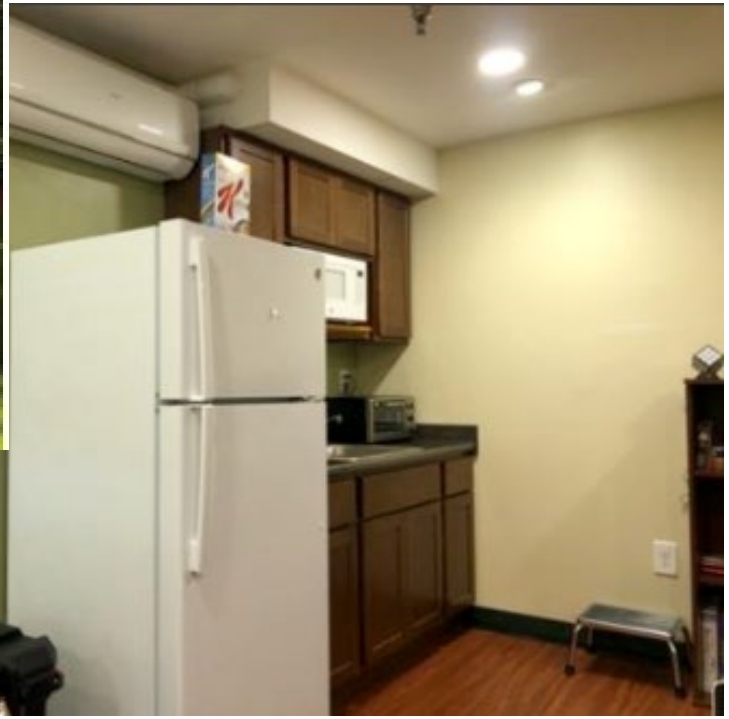
Boston Apartments

Assets:

- ***Recent Renovation***
- ***ADA Accessible***
- ***Cooling/Community Room in Basement***
- ***Fiber Optic Internet***
- ***Roof Mounted Solar Thermal System (DHW)***





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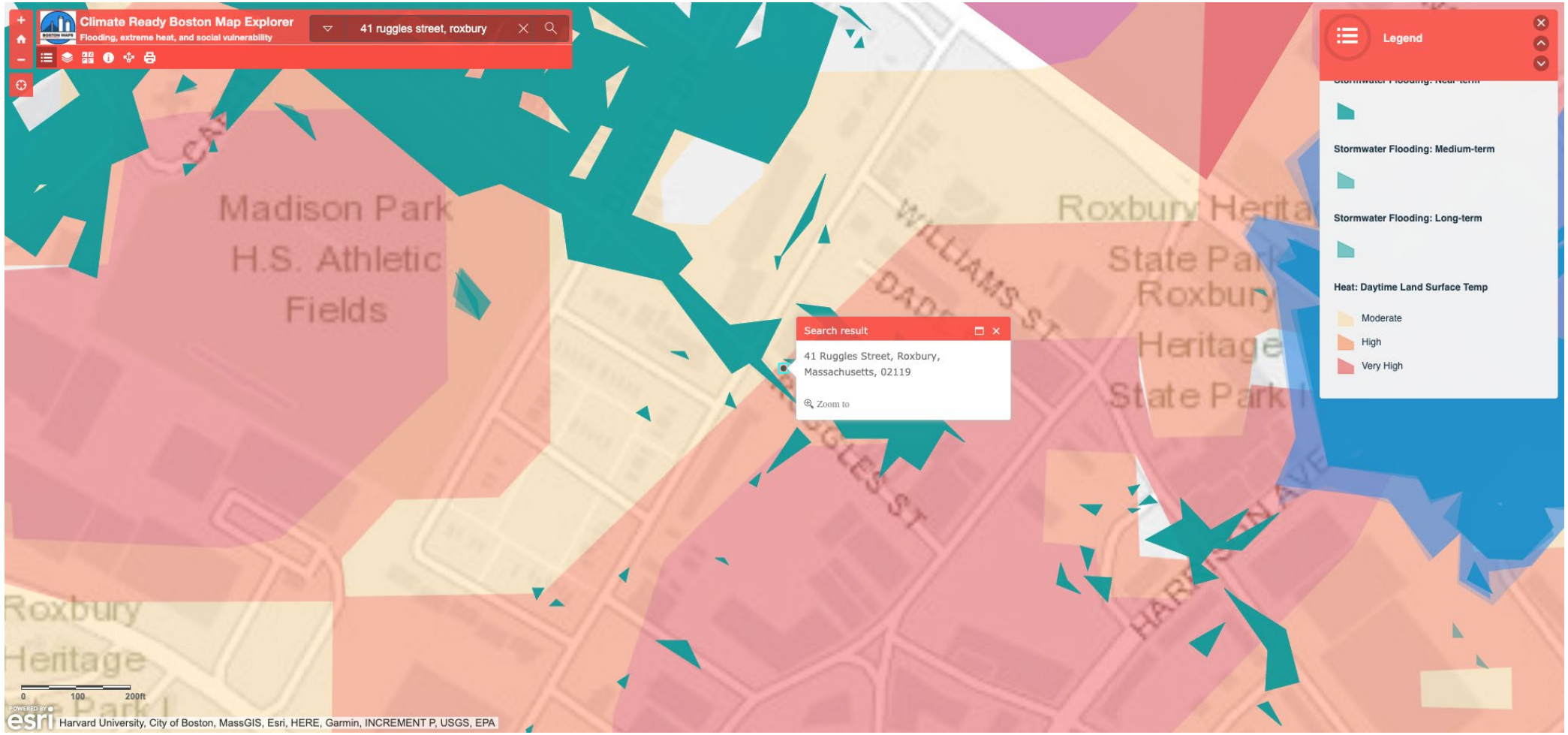
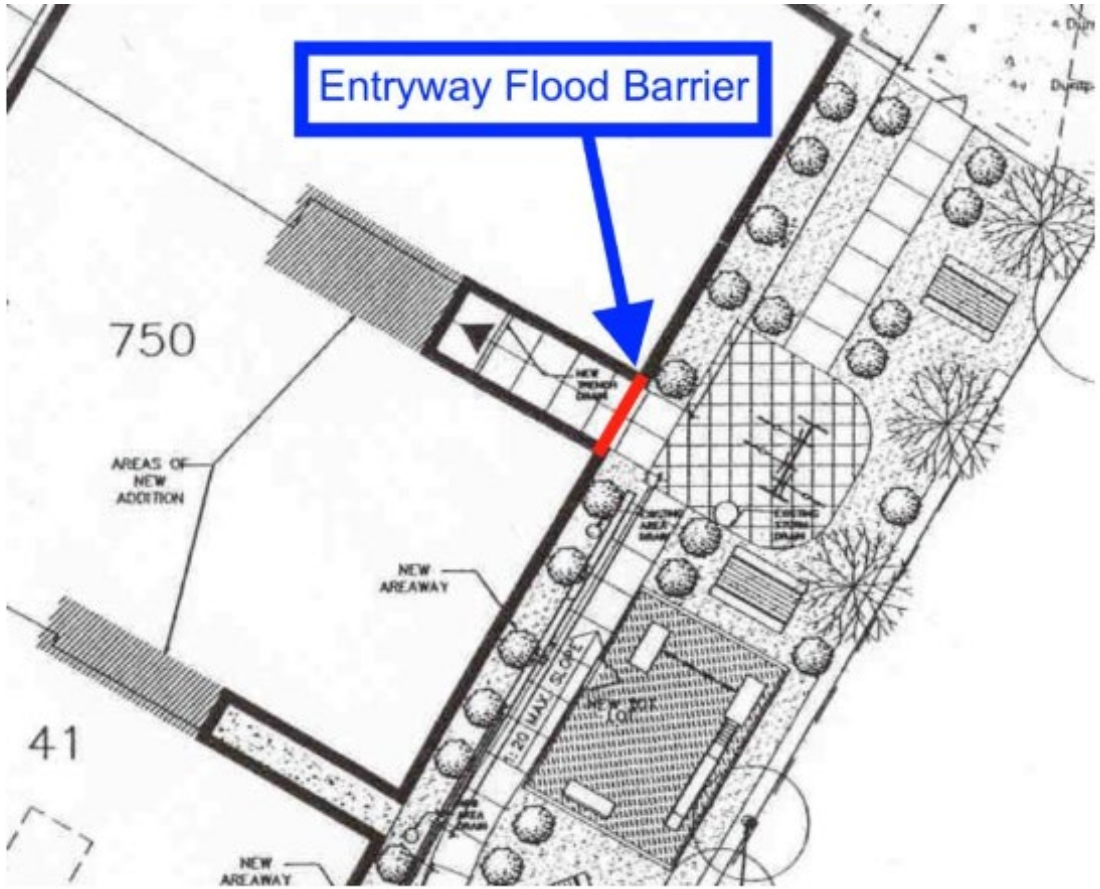
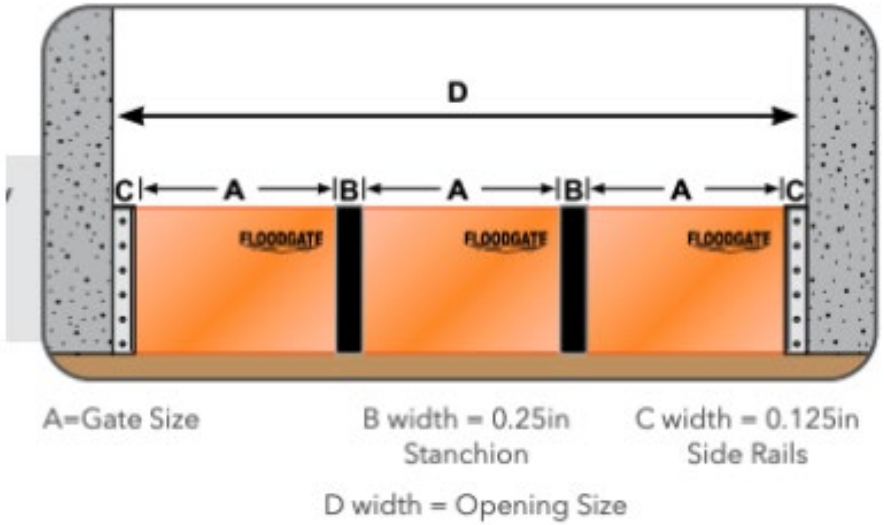
Risk Factors



Solutions





Collapsible Carboys

Battery Backup for Community Room

Chelsea, MA Apartments

- ***Location:*** ***Chelsea, MA***
- ***Unit Count:*** ***48 Units***
- ***Year Built:*** ***2007***

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Chelsea, MA Apartments

- ***Assets:***
- ***Space of Refuge***
- ***Solar PV installed***
- ***Neighboring Multifamily properties***

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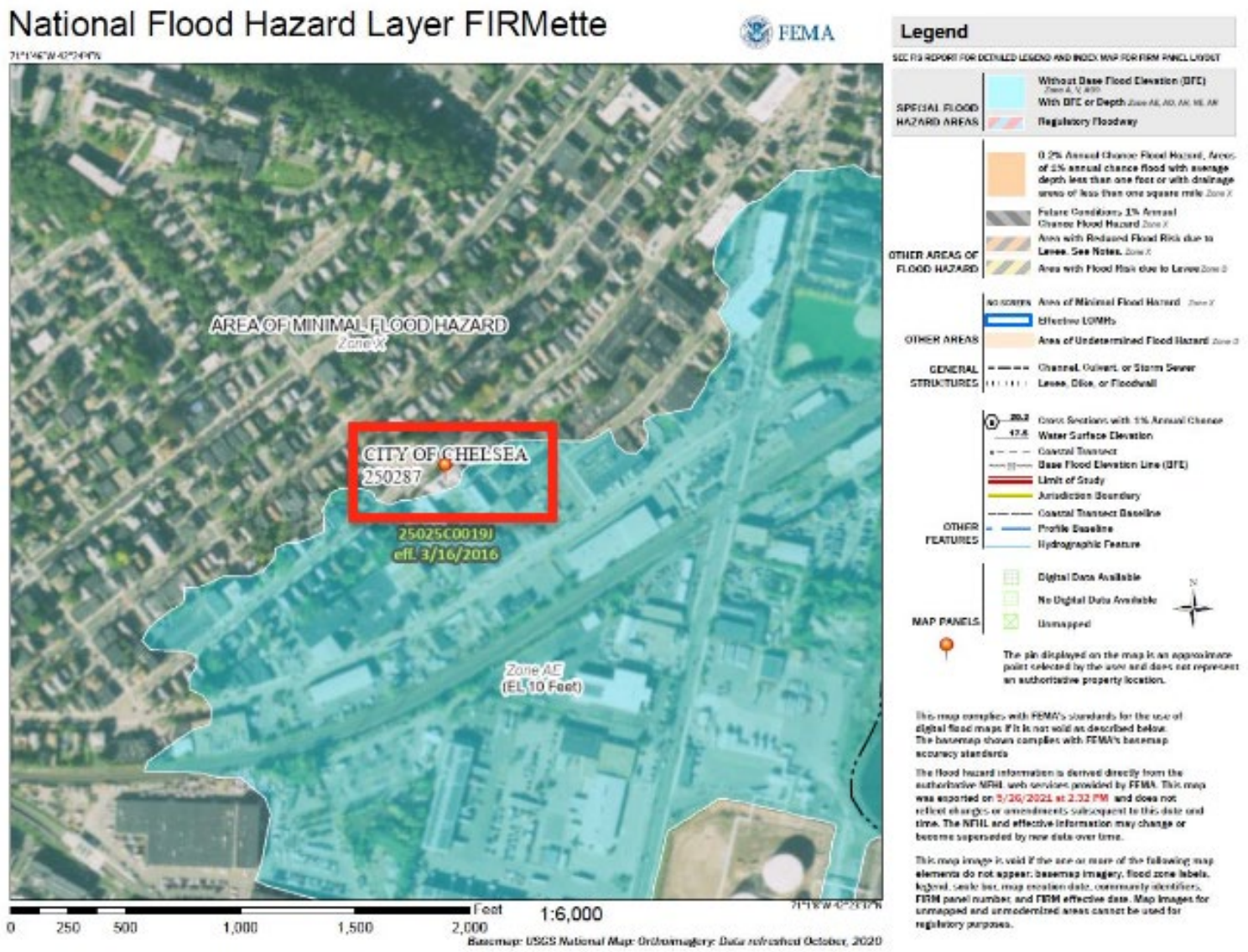
Chelsea, MA Apartments

- ***Risks:***
- ***Floodplain Exposure***
- ***Sewage – Storm and sanitary sewers not fully separated***
- ***Heat***



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Chelsea, MA Apartments

- ***Risks:***
- ***Floodplain Exposure***
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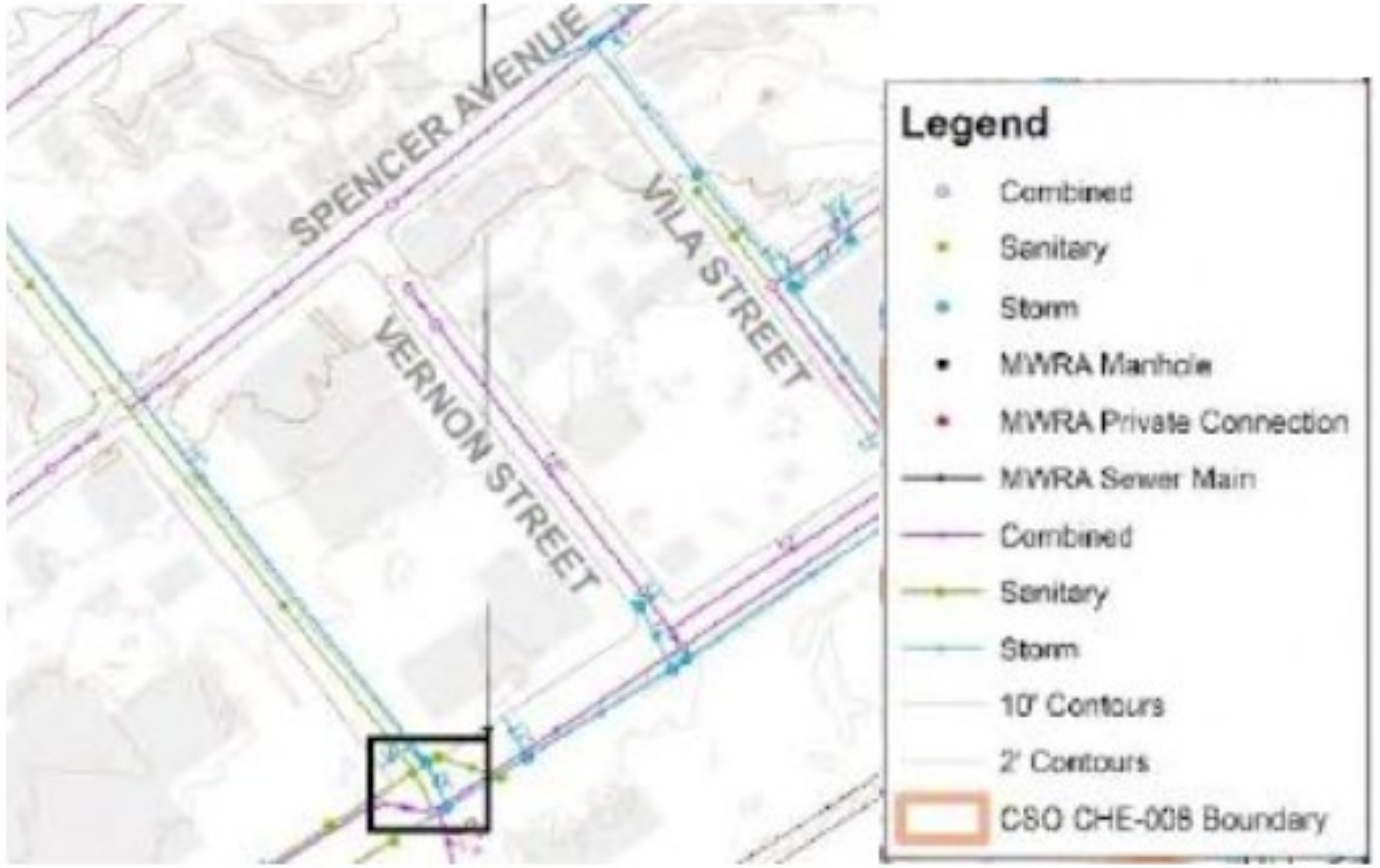
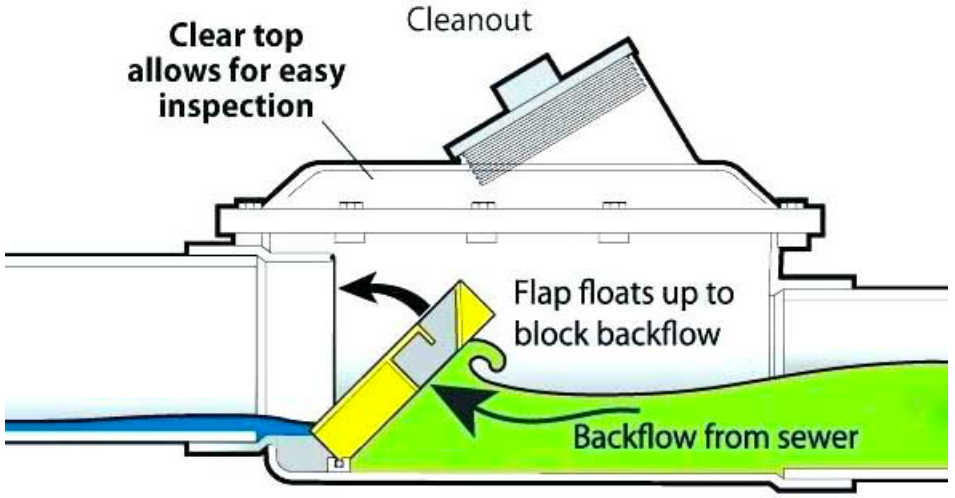


Source: *Dewberry Presentation Slide on Chelsea Storm Sewer Separation Project Status, January 2020*

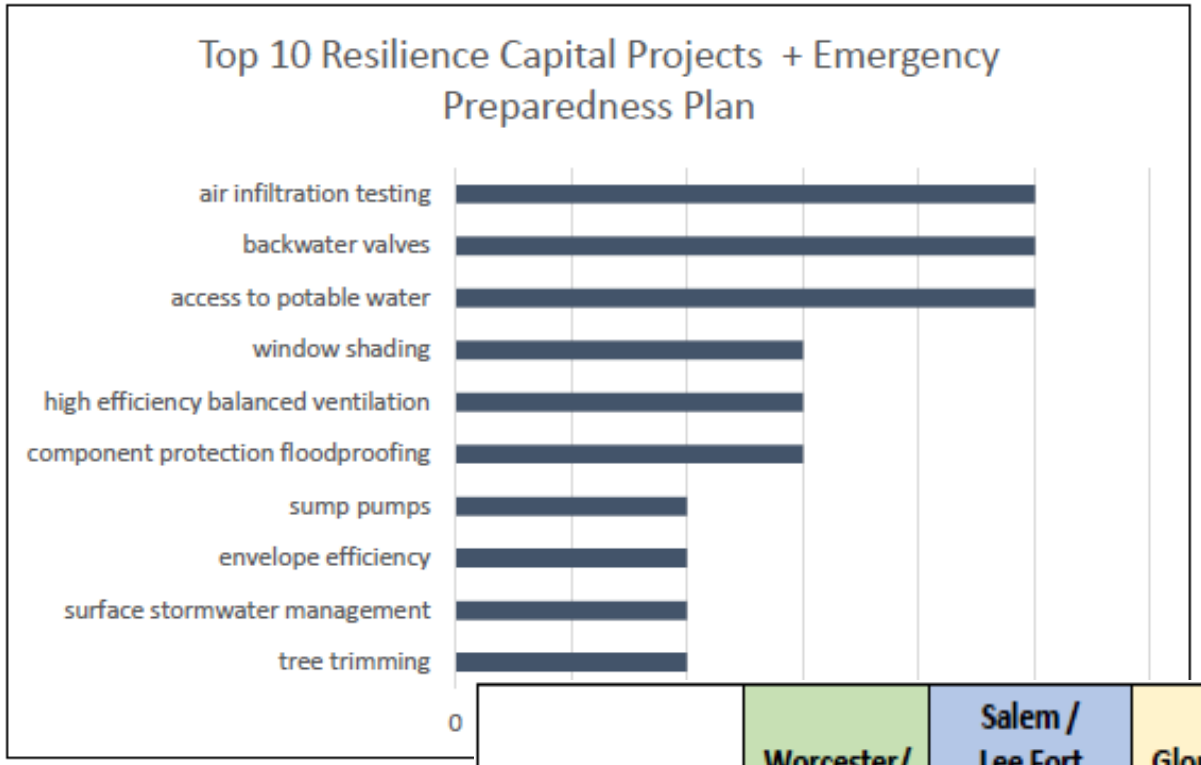
Solutions



Collapsible Carboys

Battery Backup for Community Room

Pilot Site Assessment Results



Recommendation	Worcester/ John Law (8 units)	Salem / Lee Fort Terrace (43 units)	Gloucester / Riverdale (160 units)	Chicopee/ Birch Bark Place (72 units)	Arlington/ Menotomy Manor (183 units)	Measure Total	Range
Total	$42,560	$193,960	$3,140,200	$331,140	$825,660	$4,533,520	
$ per unit	$5,320	$4,511	$19,626	$4,599	$4,512	$9,732	

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Break Out Session

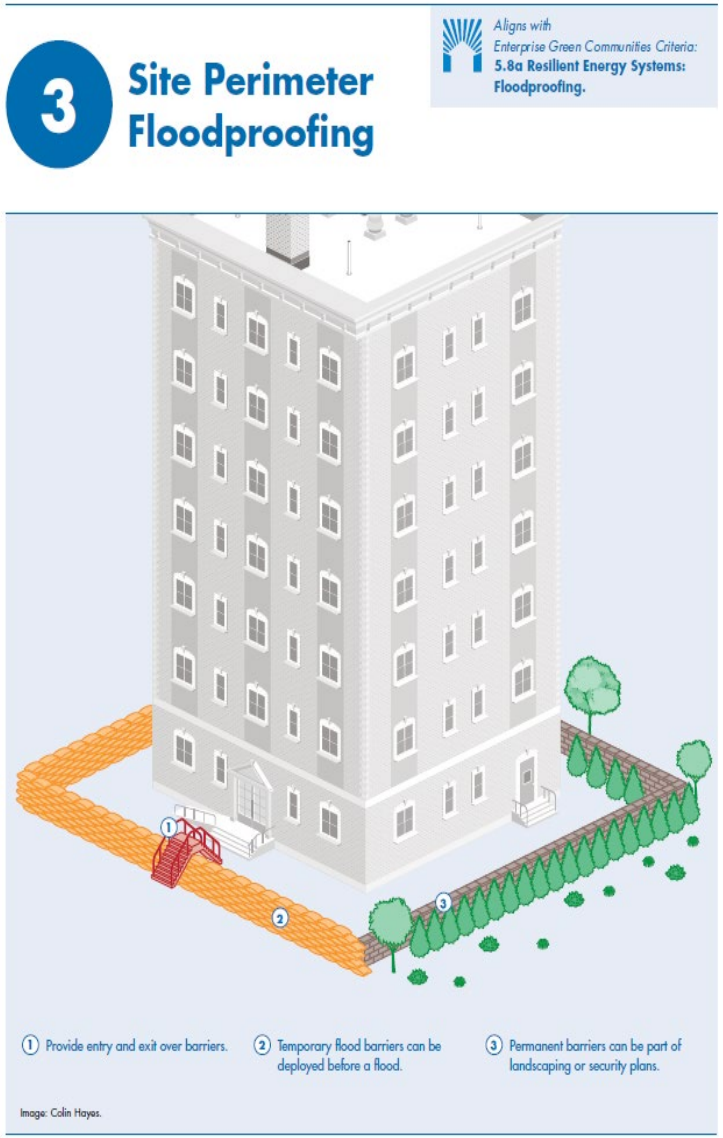
How does resilience fit into your work?

Breakout Rooms:

Cohorts 4 and 5 are alphabetical by the first letter of the organization's name, with numbers at the top of the alphabet

Cohort Discussion

Moderator & Scribe - New Ecology
Reporter - Cohort Member



Tools – Regional to Local

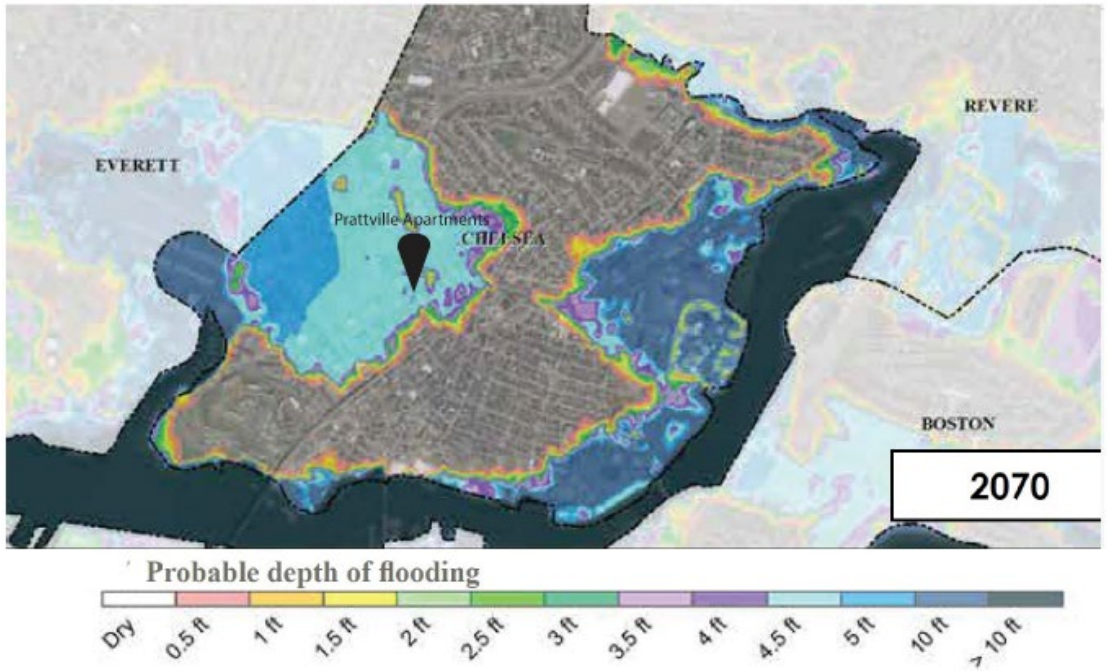


Figure 4- 2070 Depth Projection from BH-FRM and development location within the Chelsea city map. Source of Map: Designing Coastal Community Infrastructure for Climate Change – City of Chelsea report issued: January 2017.

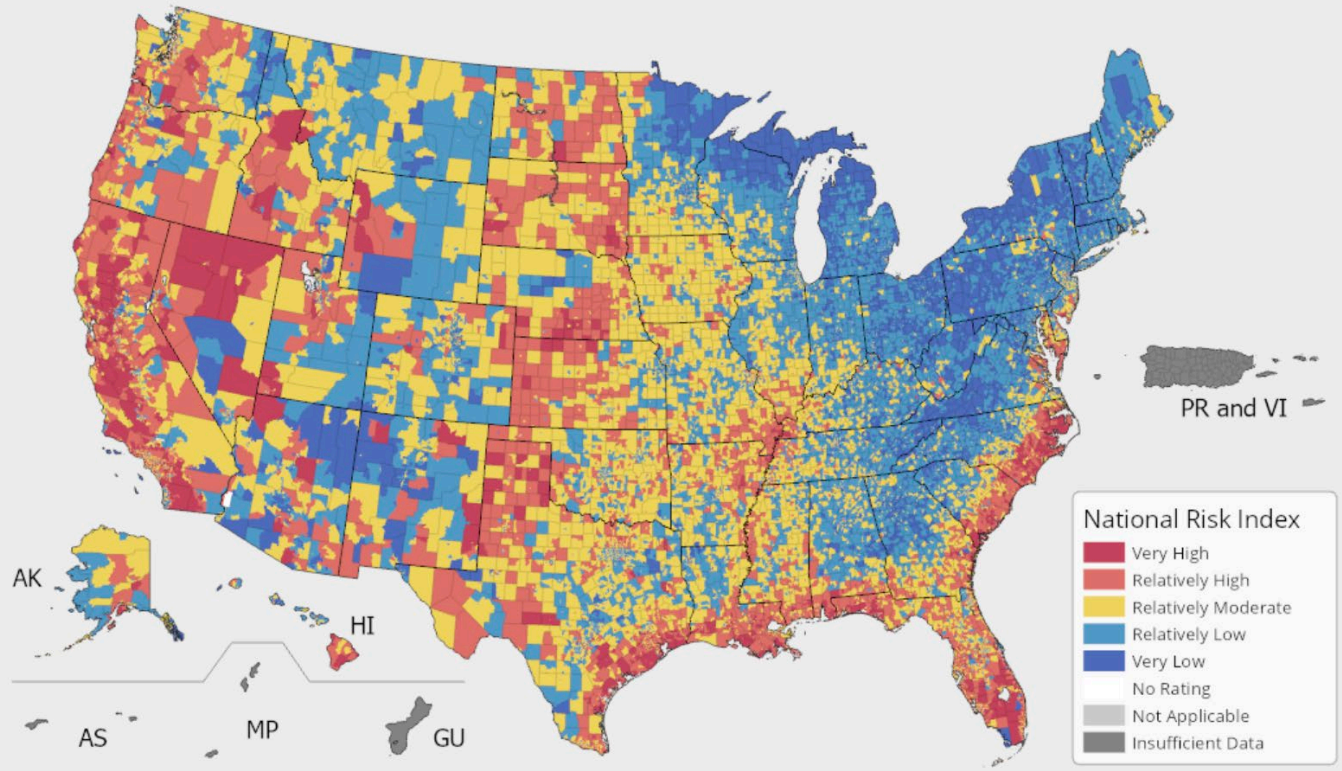
Figure 5- Typical penetrations along the foundation walls

Tools – FEMA Risk Hazards Tool

Required by HUD GRRP Program
(or a HUD approved alternative)

https://hazards.fema.gov/nri/

The Risk Index leverages available source data for natural hazard and community risk factors to develop **a baseline risk measurement** for each United States county and Census tract.



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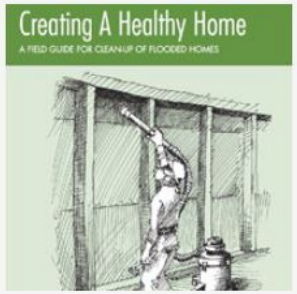
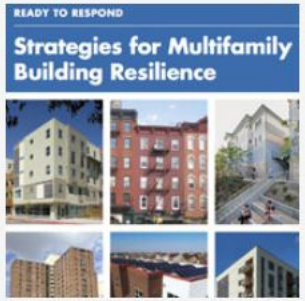
Tools – Enterprise Community Partners

Disaster Staffing Toolkit



Creating a Healthy Home: A Field Guide for Clean-up of Flooded Homes



Strategies for Multifamily Building Resilience

https://www.enterprisecommunity.org/solutions-and-innovation/tools

USDN Guide to Developing Resilience Hubs

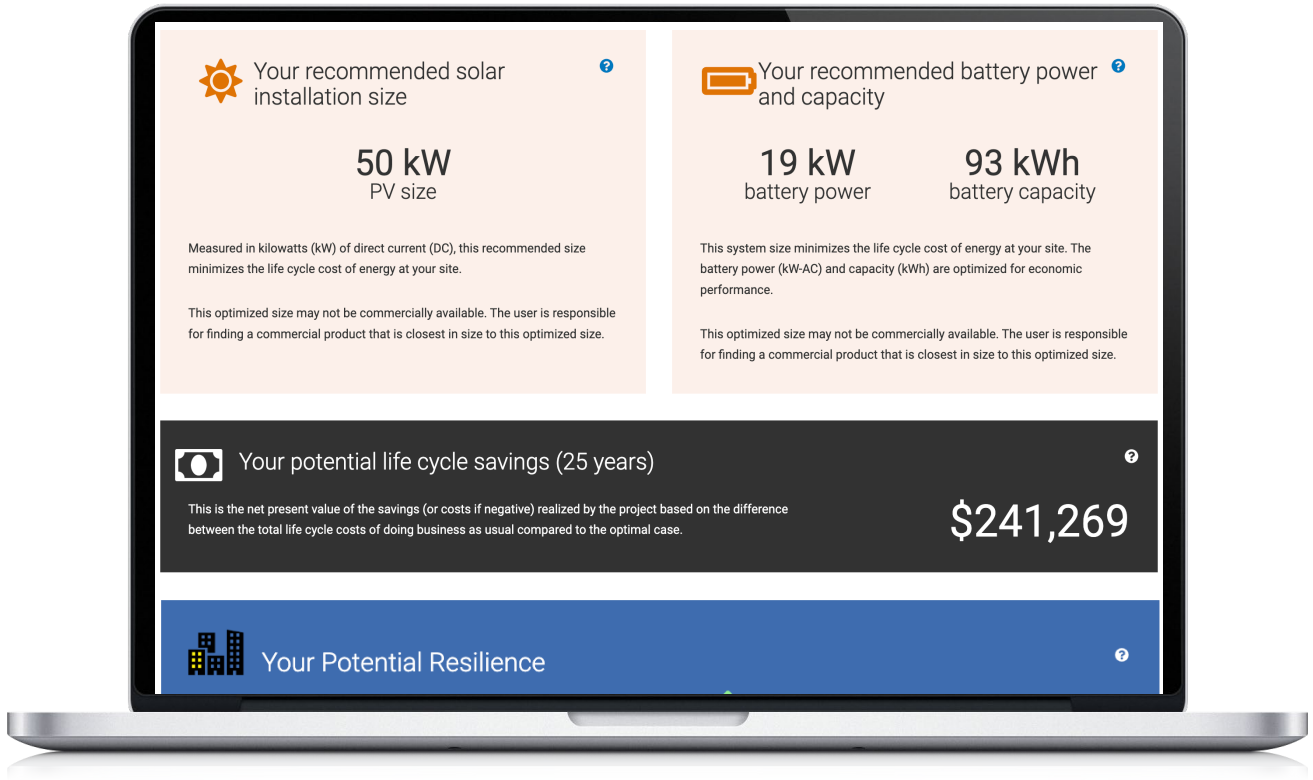
- Support for resilience hubs
  - *The risk of power disruptions*
  - *The potential for the site to serve as a place of refuge for nearby areas that could be inundated by storm surge*

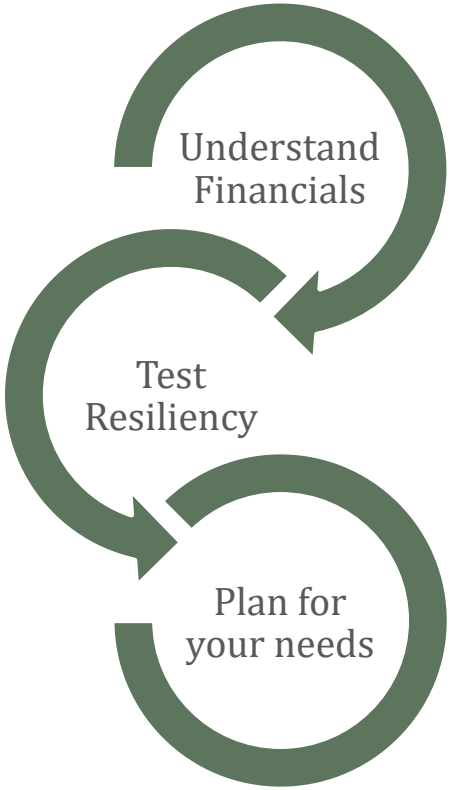
- Function of resilience hubs
  - *Providing a space of refuge for cooling or heating, charging communications devices, refrigerating medicines and providing food and water*

- Urban Sustainability Directors Network Resource
  - *A step-by-step guide to creating and operating resilience hubs to support residents and distribute resources before, during and after a natural hazard event*

Link to USDN Tool

REopt: Renewable Energy Integration & Optimization Tool from the National Renewable Energy Laboratory (NREL)





[Link to REopt Tool]

Tools

The following design tools and materials can help teams understand risks and prepare responses to risks*:*

- ***NOAA National Hurricane Center Storm Surge Risk Maps***
- ***With FEMA flood maps as a secondary resource***
- ***REopt: Renewable Energy Integration & Optimization***
- ***CHARM (Climate Hazard Adaptation and Resiliency Masterplan) Resources***
- ***Urban Sustainability Directors Network (USDN) – Guide to Developing Resilience Hubs***
- ***https://doee.dc.gov/climateready***
- ***A summary document on the above tools is available here***

Resiliency

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Questions and Discussion

SOLAR FOR AFFORDABLE HOUSING

- Welcome
  - Brian Levy, Principal, LMI Solar (Brian@LMIsolar.com)
- Solar: Overview of the Solar Portfolio Approach
- Solar: Technical
- Solar: Financial
- Solar: Legal
- Special Topics

SOLAR: TECHNICAL

Step 1: Scoping the portfolio:

- Site address with property boundaries and any 'no use' areas marked
- Roof age
  - Less than 5 years old; canopy options
- Metering: master vs common + individually metered units
  - Focus on master & common meters
  - Individual tenant meters could be candidate for community solar
- Utility rate ($/kWh) & loads
  - 1 recent utility bill with annual load; see slide ‘calculating utility rates’ below
- Solar capacity (roof, roof canopy, carport, and ground)
  - Costs vary from $2-4.50/W; Type of installation depends on utility costs & incentives
- Utility regs
  - Can we oversize systems; NEM, ANEM & community interconnection options
- Lenders on the project
- Federal assistance on property (LIHTC, etc)
  - This will inform IRA tax credits

Step 2: The rest of the steps! Please refer to solar task list (Packet)

SOLAR: FINANCIAL

The 5 potential financial benefit streams from solar:

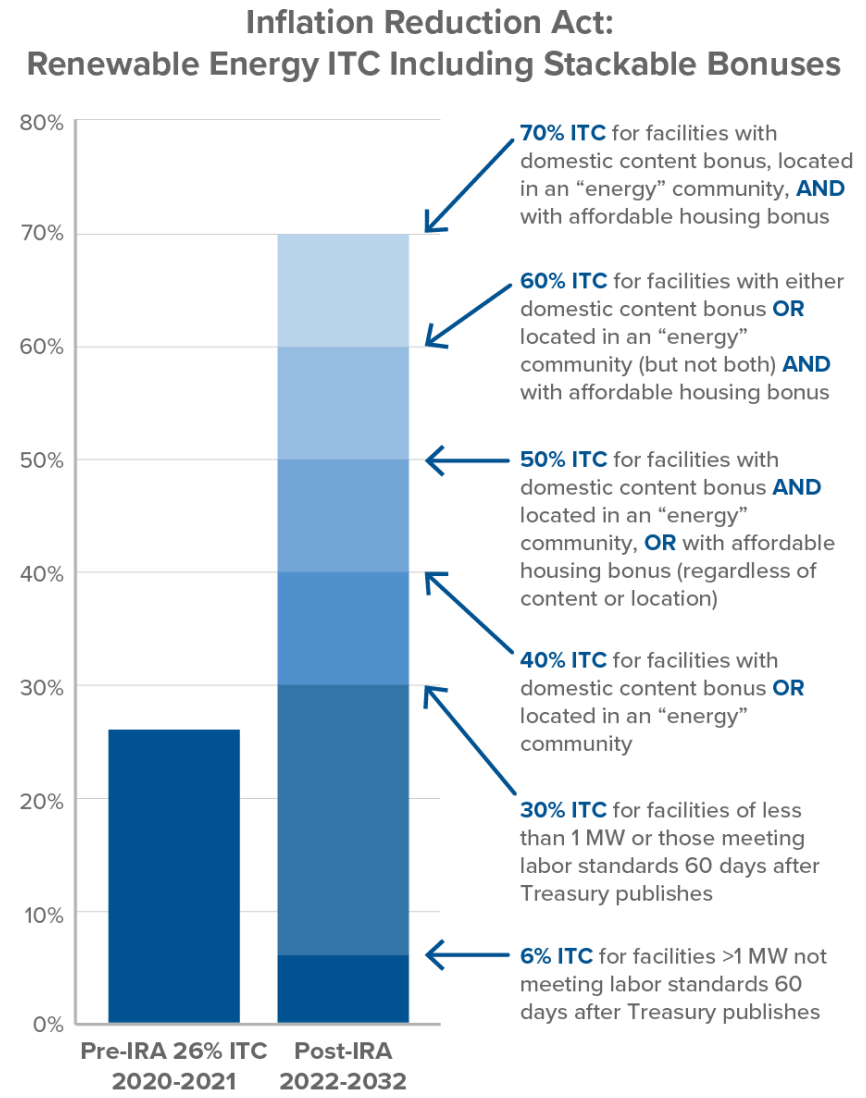
- Property level electricity savings
- State SRECs (Solar Renewable Energy Credit)
- Federal tax credits (ITC, LIHTC)
- Federal & state depreciation
- Grants

IRA ITC Incentives

- Base ITC: now 30%
- Low Income census tract (Cat 1), or tribal lands (Cat 2): 10%
- Low Income housing (Cat 3) OR 'Low Income Benefit Project' (Cat 4): 20%
- 'Energy Community': 10%
- Domestic Content 10%

And more: 4% LIHTC + 50% ITC = near 100% cost coverage

- See model tab (Packet)



Source: Novogradac

NOVOGRADAC®

SOLAR: FINANCIAL

IRA ITC Monetization

- For non-profits, new ‘Direct Pay’ option
  - Final guidance expected early fall
  - Sell the tax credits; leaves depreciation value unmonetized
- For everyone else, ‘Tax Credit Transfer’ option

Sample Solar Proforma review (Packet)

- Model A:
  - 1MW portfolio, NEM
  - Non-profit SPE ownership with consultant fee
  - SPE sells power to properties at a discount with PPA’s
  - No SRECs (base model) and with SRECs (DC)
  - IRA 30% + 20% adder for low income buildings
  - Utilize IRS Direct Pay for non-profits
  - Modeled first unlevered (best practice)

SOLAR: TO OWN or NOT TO OWN

You Own It

- Technical: tasks per task list. Add'l client time and consultant fee to cover tasks.

+ Financial: Discounted or free locked electricity rate, SREC's, Federal Tax Credits, any Grants, and Depreciation (if you have tax liability)

- Financial:
  - Full project costs incurred
    - Must cash flow through PTO & tax season
    - Construction & Perm Debt may be required (and debt guarantees)
    - Equity (banks will require something)
  - Yearly costs: O&M, insurance, SREC mgmt, asset manager expenses

3rd Party Ownership

+ Technical: 3rd party takes care of all scoping, construction, legal, O&M. Minimized (but non-0) staff time.

+ Financial: Discounted or free locked electricity rate; Modest development fee to owner often possible.

SOLAR: LEGAL CONSIDERATIONS

- Ownership Concept: setup a SPE under a non-profit organization that finances and owns solar, monetizes the tax credits with Direct Pay, maintains the solar, and has solar site control (PPA's or leases) on each of the portfolio properties.
    - The SPE can be with the client (ownership), or another partner (NHT etc)
    - If you own, see 'legal' tasks on task list

- Alternative: 3rd party for-profit ownership that can monetize all ITC *and* depreciation

- Lender consents (SNDA's) and investor consent typically required on all solar projects
    - Enjoy 3-12+ months of dental work
    - Discuss the *State of Fannie*

SOLAR: ADDITIONAL TOPICS

- HUD utility allowance (UA) guidance
  - Scope: Property is tenant metered + Solar power assigned to tenant meters
  - When tenant electricity bill goes down, and utility allowances are recalculated, benefits could be lost.
  - July 2022 HUD guidance memo on UA clarifies (Packet)
- What about small or scattered sites?
- What about battery storage?
  - Qualifies under IRA-ITC
  - Best use cases: high demand charges, frequent grid outages, vulnerable tenants

CALCULATING ENERGY RATES

	12/22	7/22
Non-Res MGT-LV IIB		
Usage kWh	**19481**	**22062**
Customer Chg	46	46
Demand Chg	220	207
Demand Chg	59	114
DistributionEnergy Chg	0.023802	0.023738
Franchise Chg	0.00062	0.00062
MD Services Chg	0.00015	0.00015
EmPower Chg	0.00677	0.00677
Montgom Cty Tax	0.01132	0.01132
Admin Credit	-0.00019	0.00000
Transmission Energy Chg	0.0056	0.00482
On Peak/Int Peak/Off Peak Weighted Avg	0.1582353	0.1142583891
Avg Rate w/out demand or customer charges	**0.20630**	**0.16167**

- Note winter & summer rates may vary, examine bills from both seasons
- Do not calculate $/kWh rate with any demand or 'customer charge'

Your electric bill for the period
Account number: 5501 9670 425 **November 8, 2022 to December 7, 2022**

Your meter records electric energy use in hourly intervals. Your bill is the total of all hourly intervals recorded during your billing period.
End and start date kWh meter readings are provided for informational purposes only.
Please visit My Account at pepco.com to view your energy use data.

Your next bill period is scheduled to end on January 9, 2023

Delivery Charges: These charges reflect the cost of bringing electricity to you.
Current charges for 30 days, **winter rates in effect.**

Type of charge	How we calculate this charge	Amount($)
Distribution Services:		
Customer Charge		46.24
Energy Charge	19481 kWh X $0.0238020 per kWh	463.69
Maximum Demand	66.00 kW X $3.3359000 per kW	220.17
Pepco Federal Tax Credit		8.19–
Franchise Tax (Delivery)	19481 kWh X $0.0006200 per kWh	12.08
Universal Service Charge		24.56
MD Environmental Surcharge	19481 kWh X $0.0001520 per kWh	2.96
EmPOWER Maryland Charge	19481 kWh X $0.0067670 per kWh	131.83
Gross Receipts Tax	at 2.0408%	18.23
Montgomery County Energy Tax	19481 kWh X $0.0113177 per kWh	220.48
Administrative Credit	19481 kWh X $0.0001900- per kWh	3.70–
Total Electric Delivery Charges		**1,128.35**

Supply Charges: These charges reflect the cost of producing electricity for you.

Billing Period: Nov 8, 2022 to Dec 7, 2022 (30 days)

Type of charge	How we calculate this charge	Amount($)
Transmission Services:		
Energy Charge	19481 kWh X $0.0056000 per kWh	109.09
Maximum Demand	66.00 kW X $0.9022000 per kW	59.55
Gross Receipts Tax	at 2.0408%	3.44
Generation Services:		
On-Peak Energy	4318 kWh X $0.1582353 per kWh	683.26

TERMS

- NEM: Net Energy Metering: an electricity billing mechanism that allows consumers who generate some or all of their own electricity to use that electricity anytime, instead of when it is generated.

- ANEM: Aggregate Net Energy Metering: a billing mechanism that allows an owner (typically a non-profit or a farm) of multiple properties to assign excess solar production from one site to meters located on other sites. A form of community solar.

- Community Solar: Community solar is a form of utility solar interconnection, and a utility-level program that allows a ratepayer to receive credit on their electricity bills for the power produced from an offsite solar array, offsetting electricity costs. Most (41) states have some form of community solar program. More information here:
  - https://data.nrel.gov/submissions/215

- SREC: Solar Renewable Energy Credit: a financial instrument issued at the state level which allows you to earn money for the electricity generated by solar. You can earn 1 SREC for every MWh of electricity you generate. SREC values vary greatly by state, and not all states have SREC markets. More information here:
  - https://news.energysage.com/srecs-complete-overview/

- PPA: Power Purchase Agreement: an agreement between a solar owner and a client to sell/buy power at a set rate, often 15-20 years.

- SPE: Special Purpose Entity: a legal entity set up for (in this case) ownership of solar assets

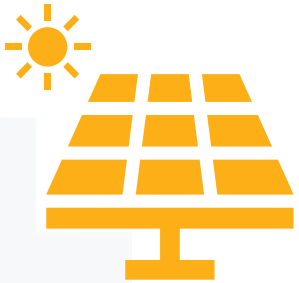
- KwH: Kilowatt hour: unit of electricity, 1000 watts for 1 hr

EPA'S SOLAR FOR ALL

$7 billion is available

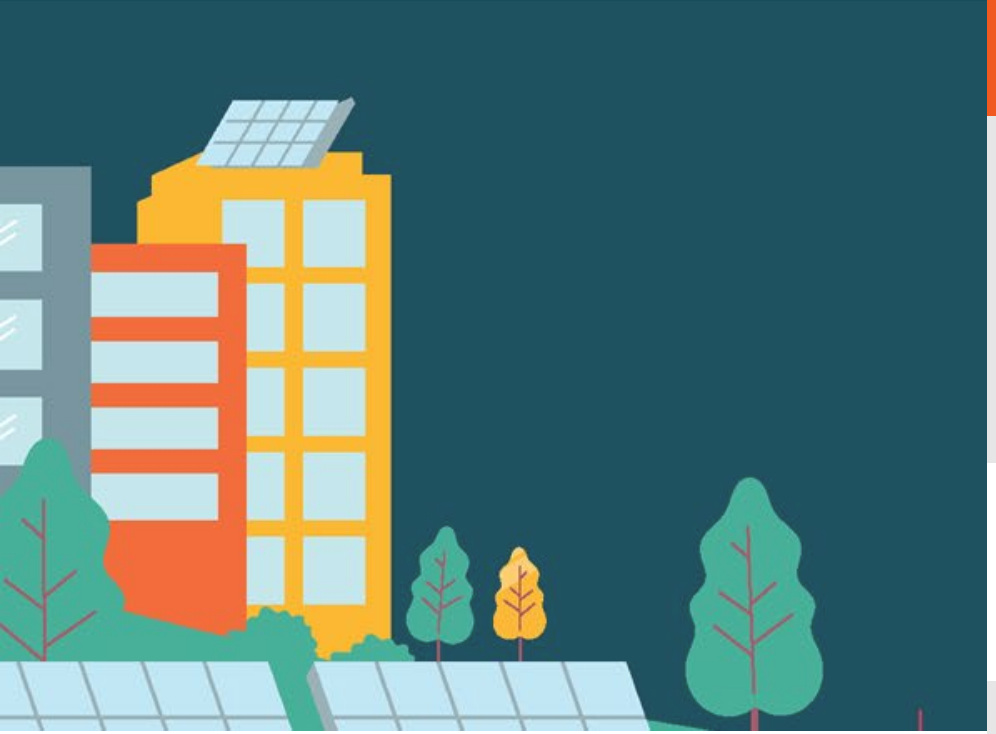
Up to 60 **states, territories, Tribal governments, municipalities, and eligible non-profits** will receive funding. Eligible non-profits must be financial institutions, such as Green Banks and CDFIs.

Ensure low-income and disadvantaged communities have access to affordable, resilient, and clean solar energy. Grantees can expand existing programs or design new ones.



Subsidies and financial assistance for rooftop and residential-serving projects, including community solar. Provide technical assistance such as workforce development and community outreach

Deadline to apply is September 26, 2023



Session dates and topics are subject to change

Please continue to complete MBEST for your 4 properties & reach out with any questions

Upcoming Sessions

August 31, 1-2:30 PM ET	**Clean Energy Tax Credits** • Overview of tax credits most relevant to affordable housing • Understanding the latest Treasury/IRS guidance on tax credit eligibility and process
TBD	**Update on DOE's Home Energy Rebate programs** • Latest information on program implementation, including the process for accessing funding
TBD	**Engaging Residents** • How to include residents and center their needs throughout the implementation of IRA opportunities

Thank you!
Questions?