

VULNERABILITY ASSESSMENT, RESILIENCE AUDIT AND SOLAR TOOL FOR AFFORDABLE HOUSING

OVERVIEW





Climate Risk in the District

Climate Ready DC

DC's Climate Future

- Rising Temperatures & Heat
- Rainfall & Flooding
- Sea Level Rise & Flooding

DC's Climate Risks and Vulnerabilities

- Infrastructure
- Community Resources
- Vulnerable Populations
- Natural Resources





Multi-Family Housing

“By focusing on the resilience of affordable housing, we are fulfilling Climate Ready DC’s promise to address the risks that heatwaves, flooding, and severe storms poses for our most economically and physically vulnerable residents. ”

*-Tommy Wells, Director
Department of Energy and
Environment*



Establishing The DC Multi-Family Resilience & Solar Assessment Tool



Resilience is the capacity for households, communities, and regions to adapt to changing conditions and to maintain and regain functionality in the face of stress or disturbance.



The DC Multi-Family Resilience Assessment Tool





The DC Multi-Family Resilience & Solar Assessment Tool

- Initial building survey and site selection
- Pre—assessment interview
- Historical energy analysis
- On-site vulnerabilities assessment
- Custom site and property analysis and strategy output
- Tailored outcome counseling session

The DC Multi-Family Resilience & Solar Assessment Tool



Develop



Test



Refine



The DC Multi-Family Resilience & Solar Assessment Tool: How It Works



The DC Multi-Family Resilience & Solar Assessment Tool

Resilience Opportunity Assessment				
DC DOEE Resilience Audits/Solar for Affordable Housing				
Solar for All				
Category	Question	Assessment	N	
	13 Is bicycle storage onsite, covered, and at ground level?			
	14 Are grab bars present in stairways, hallways, and bathrooms?			
Resilience - Mitigation and Adaptation	15 Is the building located in a FEMA or Climate Ready DC flood zone?	Yes		
	16 Is there an elevation certificate (FEMA document describing building's elevation relative to flood zones) for the building (if yes, please provide)?	Yes		
	17 Are there stormwater catch basins located around or on the site?	No		
	18 Are stormwater and sanitary sewer systems separated at this location?	No		
	19 If known, is the size of stormwater sewer piping adequate?	No		
	20 Is more than 50% of the site, not including building footprint, impervious surface or compacted soil?	No		
	21 Does the building share a party wall(s) with neighboring buildings?	Yes		
	22 Is the exterior siding material flood damage resistant?	Yes		
	23 Is there visible evidence of rot at the exterior walls, especially near the ground?	Yes		
	24 Is there structural wood in direct contact with soil?	No		
	25 Are there ground-level apartments located below the base flood elevation (BFE, the elevation to which water is expected to rise in a 1% annual chance or 100-year flood)?	No		
		Are there basements or crawlspaces below the BFE?	No	
		Are exterior walls below the BFE made of a permeable type such as brick, stone, or rubble masonry in poor condition?	Yes	
	Are mechanical, electrical, telecom, or plumbing equipment rooms located below the BFE?			
	Are elevators located below the BFE?			
	Do drains have backflow preventers?			
	Do primary sewer lines have backflow preventers?			
	Do elevators have an elevator(s) with motor and control gear located below the BFE?			
	Do elevators have flooding sensors and second floor doors located below the BFE?			
	Do elevators have second floor doors located below the BFE?			

**Tab 1:
Project
Information**

**Tab 2:
Resilience
Assessment**

**Tab 3:
Strategies**

**Tab 4:
Energy &
Water**

**Tabs 5a&b:
Solar PV Feasibility
& Cash Flow**

1 - Project Information

2 - Resilience Assessment

3 - Strategies

4 - Energy and Water

5a - Solar

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Read instructions & input building info.

Answer Y/N/NA during walk through.

Review, select and describe property's resilience strategies.

Enter building utility rates and consumption info.

Complete solar PV Layout and capacity; and review projected Estimates.

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Pilot Case Study

Development located in Anacostia Neighborhood of Washington, D.C.

Year Built: 1963

Most Recent Year Rehabbed: 2000

Total Square Feet: 118,716

Total # Apartments: 202

Total # Stories: 2 and 3

Water Meter Configuration: 1 meter per building
Electric Meter Configuration: 220 tenant, 16 common meters



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Assessment Focus:

- Historical impact of storms, flooding and extreme heat and cold events;
- Identify energy & water efficiency, and solar and storage potential;
- Historical utility consumption.





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Resilience Opportunities/ Hazards Identified

- Stormwater management
- Flooding
- Mold
- Extreme heat
- Sewer backup
- Electric & water outages





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Recommended Measures to Improve Resilience

- Elevate equipment (protection from flood)
- Mold remediation
- Surface stormwater management
- Cool roof (protect from extreme heat & electric outage)
- Access to potable water (protect from water outage)
- Develop Emergency Management Plan
- Add high efficiency local ventilation
- Install PV system (offset common electric load) with small scale battery backup (protect from electric outage)



The DC Multi-Family Resilience & Solar Assessment Tool



Estimated Resilience Upgrade Costs

- Elevate equipment - \$50,000
- Mold remediation - \$75,000
- Surface stormwater management - \$165,000
- Cool roof - \$225,000
- Develop Emergency Management Plan – O&M
- Add high efficiency local ventilation - \$1,315,000
- Install PV system with small scale battery backup -
Funding source information provided

The DC Multi-Family Resilience & Solar Assessment Tool

Best in Class Resilience & Solar Assessment:

- Refined building conditions and resilience strategy outputs applicable to the District and affordable housing industry
- Solar Feasibility
- Cost Matrix
- Construction Estimates
- Available Funding Sources

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Phase II: Looking Ahead with Resilience





See The District of Columbia's Plan to Adapt to a Changing Climate: <https://doee.dc.gov/climateready>

Solar Can be FREE in DC!

To learn more, visit: <https://doee.dc.gov/solarforall>

