Maycroft Apartments: A Low-Income Solar+Storage Resiliency Center in DC

July 31, 2019
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THE RESILIENT POWER PROJECT

• Increase public/private investment in clean, resilient power systems (solar+storage)
• Protect low-income and vulnerable communities, with a focus on affordable housing and critical public facilities
• Engage city, state and federal policy makers to develop supportive policies and programs
• Visit www.resilient-power.org for more information and resources
SUPPORTING 100+ PROJECTS ACROSS THE COUNTRY

Portland: Assessment of 10 LMI properties including affordable housing, foodbanks, medical centers, and shelters.

DC: Largest solar+storage installation at affordable housing in the country.

California: Multiple housing properties representing hundreds of units of affordable housing.

Boston Medical Center: One of the first hospitals in the country to install storage for resiliency.

Puerto Rico: Supporting the installation of solar+storage at more than 60 medical clinics.
Webinar Speakers

Marty Mellett
Vice President of Strategic Initiatives, Jubilee Housing

Jeff Lesk
Partner, Nixon Peabody

Pranay Kohli
Managing Director, Amidus Consulting

Mellanie Lassiter
Senior Manager, Corporate Relations, Pepco

Seth Mullendore
Vice President & Project Director, Clean Energy Group (moderator)
• Jubilee Housing has worked for 45 years to create and maintain deeply affordable rental homes in Adams Morgan, Columbia Heights, and Mount Pleasant.

• Currently, Jubilee manages ten recently redeveloped properties, totaling 300 units, providing quality affordable housing to about 600 residents.

• As the city has grown and gentrified, it has become increasingly more difficult for longtime residents to stay in their communities and access the city’s prosperity.
In response, Jubilee’s work has shifted to focus on connecting people to the city’s prosperity through high-quality and attainable homes, in thriving neighborhoods with easy access to programs and services, this what we call justice housing.

According to the work of Harvard economist Raj Chetty, zip code is the single most indicator of success. This is why Jubilee focuses on developing properties in Adams Morgan, Columbia Heights, and Mount Pleasant.

We couple our deeply affordable apartments with wrap around supports such as onsite childcare, financial empowerment, and resident support services.
Affordable Housing + Community Solar

• Two-thirds of Maycroft residents earn 30% of or below the area median income, which is about 35,000 for a family of four.

• The solar array on the roof of the Maycroft along with energy generated by New Partners Solar will save Jubilee Housing’s most rent burdened residents, those earning 30% AMI or less, about $40-$50 on their monthly electricity bills for the next 15 years.

• The energy produced by the solar panels is distributed to low-income Jubilee residents thanks to the DC’s Solar For All initiative.
Why Resiliency Matters?

• As energy resiliency becomes more and more important, the district’s low income residents are getting left out of the conversation.

• The Resiliency Center, Powered by PEPCO and the rooftop solar array at Jubilee’s newest justice housing property, the Maycroft, is the first project of its kind to address the issue of resiliency for residents of affordable housing communities.

• In the event a grid shutdown, Maycroft residents will be able to shelter in place, charge cell phones, plug in medical equipment, refrigerate medicines, and prepare meals.
Jeff Lesk
– Cofounder of New Partners Community Solar
– Partner, Nixon Peabody LLP
• A Brief History of Solar for Affordable Housing
• Understanding Community Solar and Affordable Housing
• Financing Community Solar
• Scaling Community Solar to benefit more low-income residents
• Combining Solar+Storage
• Creating Resiliency
Low-Income Solar v.1

Solar on Affordable Housing Development Rooftops – Generally to Power Common Areas
Low-Income Solar v.1 ½

Solar on Affordable Housing Development Rooftops – Enough Solar to Power Residents’ Units
Low-Income Solar v.3

A New Age of Innovation
DC’s first Community Solar Project – Proof of Concept

Undertaken as a pro bono project by Nixon Peabody LLP
Origins of Community Solar

My Generation Energy Development and Management

Community Solar Garden™

Incentives
Tax Credits

Member A
Member B
Member C
Member D

SREC Sales

Utility

Virtual Net Metering:
Reduces Members’ electric bills
Proof of Concept – DC’s First Community Solar Project
Negotiating a Green Lease – Nixon Peabody’s New DC Office
Proof of Concept – DC’s First Community Solar Project

Undertaken by New Partners Community Solar (Nonprofit) SOLAR FOR ALL
How Community Solar Works

1. Solar Panels
   Sunlight falls on solar panels. The solar panels convert the sun’s energy into direct current (DC) electricity which is sent to an inverter.

2. Inverter
   The inverter converts direct current (DC) electricity into alternating current (AC) so it can be used in our homes and businesses.

3. Meter
   The meter measures the amount of electricity produced by the solar panels before the electricity is fed into the utility grid.

4. Utility Company
   The utility company keeps track of how much electricity (how many kilowatt-hours) is fed into the grid generated by the solar panels.

5. Utility Bill
   The utility does not deliver the actual electricity from the grid to individual customers. Instead it calculates the value of this electricity and provides a cash credit on the specified customer’s monthly electric bill. The customer may live nearby or across the city.
Energy Produced *Here*

Solar arrays on downtown rooftops developed by New Partners Community Solar
Energy Produced *Here*

Office building delivers electricity to utility via interconnection to grid
Energy Produced Here

Office building delivers electricity to utility

Utility distributes economic benefits as directed by NP Solar. NP Solar directs distribution to LI tenants

PEPCO
Energy Produced **Here**

Office building delivers electricity to utility

Utility gives residents a credit each month on their electric bills
Energy *Produced Here*

Office building delivers electricity to utility

Utility gives residents a credit each month on their electric bills

LI Residents Benefitted *There*
<table>
<thead>
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<th>Year</th>
<th>Calendar Month</th>
<th>Energy Produced in KWh</th>
<th>Energy Produced in $</th>
<th>Number of Subscribers</th>
<th>Billing Credit/ Household</th>
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<td>22,768</td>
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<tr>
<td>2017</td>
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<td>$2,526.00</td>
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<tr>
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<td>91</td>
<td>$22.99</td>
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<tr>
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<td><strong>$51,625.66</strong></td>
<td><strong>90</strong></td>
<td><strong>$571.32</strong></td>
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</table>
• Financing Community Solar
Three sources of financing community solar:

- **Tax equity**: energy tax credits (federal subsidy)
- **Debt**: loan serviced by sale of SRECS (state subsidy)
- **Developer equity contributions**
Federal Solar Tax Credits are **Investment Tax Credits**

State Tax Credits

**SRECs** = Solar Renewable Energy Credits – based on *production*; nexus to state RPS requirements

- **SRECs are NOT tax credits.** They are a credit against a utility’s obligation to produce or purchase renewable energy.
• Scaling Community Solar to benefit more low-income residents
Expanding Building Owner Base
Expanding Scale of Arrays
“Creating More Real Estate”  Vertical Wall- Mounted Arrays
“Creating More Real Estate”  

Solar Canopies
“Creating More Real Estate” Solar + Green Roofs
Expanding Building Types
Expanding Beneficiary Base
• Combining Solar+Storage
• Creating Resiliency
Solar + Battery Storage / Low-Income Resiliency Hub

Maycroft Apartments
1474 Columbia Road NW

- 64 affordable units at up to 60% AMI
The Resiliency Center, powered by Pepco for the Jubilee Community was developed in partnership with Jubilee Housing, Pepco, and New Partners Community Solar. It is the first of its kind in the nation’s capital providing a model that can be used throughout the District of Columbia and across the United States.

Shelter-In-Place
In the case of an electric grid emergency, residents will be able to shelter-in-place in the Maycroft. Residents will be able to remain in their apartments and will have access to essential services in the Resiliency Center, which will remain powered during the emergency.

Battery Technology
The solar array on the Maycroft rooftop feeds electricity into the utility grid for community solar. In the case of a grid emergency, an automatic switch tells the solar panels to stop feeding electricity to the grid. Instead, the solar panels will send power to the batteries of the Resiliency Center to provide emergency electricity for Maycroft residents.

Resiliency Center, powered by Pepco for the Jubilee Community
The battery storage will provide up to three days of essential services in the Resiliency Center including powering lighting, phone and medical device charging, and appliances including TV, fans, and a refrigerator for medicines.
Questions, Ideas, or Additional Information?

New Partners Community Solar
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Herb Stevens
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Genevieve Hulick
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To ensure compliance with IRS requirements, we inform you that any tax advice contained in this communication is not intended or written to be used, and cannot be used, for the purpose of (i) avoiding penalties under the Internal Revenue Code or (ii) promoting, marketing or recommending to another party any transaction or matter addressed herein.
Design Context

• Maycroft was already undergoing extensive rehab when resiliency center was proposed

• Rehab originally included a 70.2kW solar energy system; later downsized to 62.4kW due to roof conditions

• Resiliency Center designed and developed in active collaboration with the solar installer, company doing the rehab work, Jubilee Housing, and PEPCO
Technical Considerations

• Extensively discuss what loads resiliency center is expected to serve in case of grid outage
  • Involve several stakeholders: residents, Jubilee Housing, PEPCO (utility), ...

• Develop an energy model based on expectations

• Simultaneously, start thinking about
  • Space and installation logistics
  • Integration with building infrastructure (e.g. solar energy system)
  • Cost/benefit ratio
  • Replicability
  • Products (batteries, inverters, control mechanism)
### Proposed resiliency loads

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water pump</td>
</tr>
<tr>
<td>Selected exterior lighting</td>
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<td>Indoor lighting</td>
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*3 days of resiliency based on 50% availability of solar resource*
Lessons learned

1. Very important to involve all stakeholders at all stages
   - residents, property managers, utility (PEPCO in this case), solar installer: communication and perseverance are the keys

2. Patience, creativity needed in abundance
   - This is a pioneering effort in the heart of nation’s capital: unique security, design, funding, and installation challenges

3. There is a lot of genuine interest in this work
   - Happy to share knowledge and experience widely
Pranay P. Kohli  Internationally experienced energy sector executive and consultant. Has advised Fortune 100 corporations, the German, Swedish, Saudi Arabian, Turkish, and Indian Governments, The European Commission, The World Bank, and US Department of Energy (DOE) on Energy issues. Pranay serves on the Advisory Board of Maryland Clean Energy Center (MCEC), Board of Directors of Maryland-DC-Virginia Solar Energy Industry Association (MDV-SEIA), and is an Adviser to Washington DC-based Institute for Energy and Environment Research (IEER). Pranay has earned MS (Physics) and MTech (Energy Systems) degrees from Indian Institute of Technology (IIT) Delhi; has worked as a solar scientist at the Technical University of Munich (Germany), and studied business administration at Stockholm University (Sweden).

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Pepco DC: A Vital and Varied Footprint

- **1,100** Employees Working in the District*
- **693,972** District of Columbia Population Served
- **65 mi²** District of Columbia Service Territory
- **359,000** District of Columbia Electric Customers
- **637** Members of IBEW Local 1900

*Includes Pepco, PHI, Exelon Generation, Exelon Business Services Company, and Constellation
A Smarter, Stronger, Cleaner Energy Grid: 
Pepco’s Investments in 2018

INVESTED
$166 million to upgrade and expand the electric system to support a growing economy and serve new customers

INTERCONNECTED
894 solar energy projects for a total of 4,685 systems interconnected to the grid

TRIMMED TREES ALONG
252 miles of distribution lines to help reduce outages

INSPECTED MORE THAN
10,800 manholes
2,200 transformers
350 miles of lines

INSTALLLED
92 automated devices, including reclosers, smart switches and trip savers, to restore service faster
Powering Resiliency at the Maycroft

Pepco is proud to power resiliency with a first-of-its-kind $65,000 grant and pilot project with Jubilee Housing

There is a new imperative for utilities today – the need to move beyond traditional utility functions and think creatively to make the grid work for all customers while achieving the leading clean energy goals set by our local legislators.

The partnership with Jubilee Housing, SimpliPhi Power and New Partners Community Solar exemplifies the mindset needed to succeed in this new landscape.
Thank you for attending our webinar

Seth Mullendore
Vice President and Project Director
Clean Energy Group
seth@cleanegroup.org

Find us online:
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www.cleanegroup.org
www.facebook.com/clean.energy.group
@cleanenergygrp on Twitter
@Resilient_Power on Twitter
Upcoming Webinar

New York’s Energy Storage Initiative
Wednesday, August 21, 1-2pm ET

Read more and register at www.cleanegroup.org/webinars