New Financing & Ownership Strategies for Solar+Storage in Low-Income Communities

March 29, 2018
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New Financing & Ownership Strategies for Solar+Storage in Low-Income Communities

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• Bracken Hendricks, CEO, Urban Ingenuity

• Jared Lang, AVP, Sustainability, National Housing Trust
Who We Are

www.cleanegroup.org

www.resilient-power.org

Clean Energy Group
Innovation in Finance, Technology & Policy

Meridian Institute
Connecting People to S tackle Problems

Clean Energy States Alliance

The JPB Foundation

Barr Foundation

11th Hour Project
The Schmidt Family Foundation

The Kresge Foundation

Surdna Foundation
Fostering sustainable communities in the United States
Resilient Power Project

- Increase public/private investment in clean, resilient power systems
- Engage city officials to develop resilient power policies/programs
- Protect low-income and vulnerable communities
- Focus on affordable housing and critical public facilities
- Advocate for state and federal supportive policies and programs
- Technical assistance for pre-development costs to help agencies/project developers get deals done
- See [www.resilient-power.org](http://www.resilient-power.org) for reports, newsletters, webinar recordings
Resilient Power Project: Supporting More than 50 Projects Across the Country

Leadership and Technical Assistance Grant Awardees

- Leadership Awardee
- Affordable Housing
- Critical Facilities
- Both

- Chicago Housing Authority: 1,900 public housing units; senior, childcare, and health centers
- Massachusetts Community Clean Energy Resiliency Initiative: 11 communities, 28 projects
- City of Boulder: emergency center, shelter, wildfire center, wastewater treatment, public housing
- New York/New Jersey: 9 multifamily affordable housing projects, community shelter
- California Multifamily Affordable Housing: AB 693 150,000 units
The Clean Energy Divide

- Hundreds of solar and storage projects
- Mainly to reduce electric bills
- Tesla/SolarCity and others target this sector
- Will grow exponentially like solar

High End Markets

LMI Markets

- Too few projects in housing/communities
- Need greater than in high end
- Unequal distribution of incentives
- Need targeted LMI strategies
Marcus Garvey Apartments (East Brooklyn)

• Year Commissioned: 2017
• Services Provided: Demand management, Demand response, Backup power
• Solar: 400kW
• Storage: 300kW/1200kWh
• Project Partners: L+M Development Partners, NYCEEC, Demand Energy, Con Edison

• Revenue from Con Edison:
  • Capacity payments
  • Performance payments (demand response events)
• **Borrower**: Demand Energy SPE
• **Loan Amount**: $1.25 million (total battery project: $1.32 million)
• **Loan type**: Construction/term loan
• **Loan Term**: 10.5 years
• **Use of proceeds**: Battery storage equipment purchase & installation
• **Collateral**: Battery storage equipment, storage-related incentives
• **Primary sources of repayment**: BQDM incentives (ConEd), demand response payments, peak shaving utility savings
Parkway Overlook (DC Housing Authority)

- **Largest solar+storage project in multifamily affordable housing in U.S.**
- **Services provided:** Frequency regulation, back-up power
- **Public-private financing** closed in February 2018
- $82MM redevelopment, 220 units in 8 buildings, plus community center
- LIHTCs, solar+storage ITCs, tax-exempt bond, solar RECs, Housing Production Trust Fund loan, DC solar+storage grant

- 717 kW solar PV, 600 kW of battery storage
- Produces a third of electricity to be used by the housing complex
- **Energy resilience:** Back-up power for on-site community center and leasing office (2 buildings)
A Resilient Power Capital Scan

- Commissioned by The Kresge Foundation, Surdna Foundation and The JPB Foundation
- Identified 5 key barriers and more than 50 recommended grant, PRI, and MRI investment opportunities in the resilient power solar and storage space.
Owning the Benefits of Solar+Storage

• “Owning the Benefits of Solar+Storage: New Ownership and Investment Models for Affordable Housing”
  o Immediate direct ownership
  o Third-party ownership flips
  o CivicPACE with third-party ownership
  o Third-party ownership under a utility-contracted payment for services agreement

www.cleanegroup.org/ceg-resources/resource/owning-the-benefits-of-solar-storage
March 29, 2018

SOLAR + STORAGE FOR LOW-INCOME COMMUNITIES
**NHT-Ingenuity Power Solar Partnership**

**Urban Ingenuity:** Project oversight, Legal, Energy & Financial Underwriting

**National Housing Trust:** Lead developer, Debt origination, Strong balance sheet

- Co-development with housers
- Treats solar as a development project
- Benefit streams allocated based on risks / reward
- Building a scalable platform in DC, CA, CO, NY, NJ, and more
## Enterprise & NHT Renewables Track Record

<table>
<thead>
<tr>
<th>Project</th>
<th>Scope</th>
<th>Enterprise Role</th>
<th>NHT Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHT Renewable DC 5 (2014)</td>
<td>• 500 kW</td>
<td>Debt and grant funding</td>
<td>Sponsor equity, ownership, guarantees, installation, and ongoing operation</td>
</tr>
<tr>
<td></td>
<td>• $1.5 M investment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Square Renewable (2016)</td>
<td>• 500 kW</td>
<td>Tax equity and debt</td>
<td>Sponsor equity, ownership, guarantees, installation, and ongoing operation</td>
</tr>
<tr>
<td></td>
<td>• $1.5 M investment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nixon Community Solar (2016)</td>
<td>• 800 kW</td>
<td>Tax equity</td>
<td>Debt</td>
</tr>
<tr>
<td></td>
<td>• $1 M investment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denver Housing Authority Community Solar (2017)</td>
<td>• 2 MW</td>
<td>Debt</td>
<td>Co-developer (with housing authority)</td>
</tr>
<tr>
<td></td>
<td>• $3 M investment</td>
<td></td>
<td></td>
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<tr>
<td>LINC Housing Solar (2018)</td>
<td>• 2 MW</td>
<td>Debt</td>
<td>Developer</td>
</tr>
<tr>
<td></td>
<td>• $2 M investment</td>
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# Urban Ingenuity Track Record

<table>
<thead>
<tr>
<th>Project</th>
<th>Scope</th>
<th>UI Role</th>
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</thead>
<tbody>
<tr>
<td>DC PACE Program (2013 – present)</td>
<td>• Appx. $35 M in financing closed to date</td>
<td>Program administrator; UI helped design and now runs the program under contract to DOEE</td>
</tr>
<tr>
<td></td>
<td>• 1 MW+ solar PV installed or in construction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• First use of PACE for low-income housing and first use of tax-exempt PACE nationwide</td>
<td></td>
</tr>
<tr>
<td>DOEE Microgrid Grant</td>
<td>• 3-year grant to explore feasibility of district energy across DC</td>
<td>Lead investigator on grant</td>
</tr>
<tr>
<td></td>
<td>• Identified and screened 75 candidate sites</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ‘Microgrid extension’ TA and predevelopment services provided to owners / developers of promising sites</td>
<td></td>
</tr>
<tr>
<td>TA for Solar + Storage at a DC public housing redevelopment</td>
<td>• Led analysis to design a 700 kW solar + 500 kW / kWh battery system</td>
<td>Technical assistance, project management (with design and support from Optony and AF Mensah)</td>
</tr>
</tbody>
</table>
Options for Deploying Solar + Storage

I. Property-level installation
   1. Direct purchase by property
   2. Lease or PPA at property-level
   3. Fold into a planned recapitalization

II. Portfolio-scale project development
    1. Houser ownership with tax equity investor
    2. Houser Development with NHT-IP ownership
Purchase vs. Lease: Case Study

PROJECT: St. Denis Apartments
DEVELOPER: NHT/Enterprise
LOCATION: Mount Pleasant, Washington, DC
CERTIFICATIONS: Enterprise Green Communities
NUMBER OF APARTMENTS: 32
SYSTEM SIZE: 15 KW
SYSTEM COST: $50,000
## Purchase vs. Lease: Financials

### Purchasing

<table>
<thead>
<tr>
<th>System Size (kW)</th>
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<tbody>
<tr>
<td>Estimated Output (kwh)</td>
<td>20,000</td>
</tr>
<tr>
<td>Power Price / kwh</td>
<td>0.14</td>
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</table>

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<thead>
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<tbody>
<tr>
<td>Equity Investment</td>
<td>$ (50,000)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Federal Tax Credit (30%)</td>
<td>$ 15,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income (Savings and Incentives)</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
</tr>
<tr>
<td>Net Cash Flow</td>
<td>$ (35,000)</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
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<tr>
<td>10-Year NPV</td>
<td>$20,564</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Payback</td>
<td>4 Years</td>
<td></td>
<td></td>
<td></td>
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### Leasing

<table>
<thead>
<tr>
<th>System Size (kW)</th>
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<tbody>
<tr>
<td>Equity Investment</td>
<td>$ (5,000)</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
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<tr>
<td>Income (Savings and Incentives)</td>
<td>$ 1,000</td>
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<td>$ 1,000</td>
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<td>$ (5,000)</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
<td>$ 1,000</td>
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<tr>
<td>10-Year NPV</td>
<td>$2,226</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Payback</td>
<td>5 Years</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Owning and operating solar across multiple properties
2. Setting up standardized leases with the property partnerships
3. Opening projects up to new income streams
4. Aggregating multiple projects in one financing to access economies of scale
5. Potential for development fees makes the benefit worth the brain damage
Portfolio Solar Project Ownership

Managing Partner: Solar Manager LLC (1% ownership, 95% after flip)  
Limited Partner: Tax Equity Investor (99% ownership, 5% after flip)

Solar Project SPE

- Property #1
- Property #2
- Property #...

Power agreements / leases

- Housing owner gets devt fee
- New income + option for tenant benefits
- Housing developer can be in ownership of SPE
  - Makes guarantees
  - Takes on performance risk
  - Puts in equity and gets returns
Illustrative Project: *Portfolio Solar + Battery*

**Bldg. Type:** Affordable Multifamily Housing (8 sites)

**Solar PV:** 1 MW

**Battery Size:** 350 kW / kWh

**Location:** Washington D.C.

### Sources and Uses

<table>
<thead>
<tr>
<th>Sources</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Tax Equity</td>
<td>$1,200,000.00</td>
</tr>
<tr>
<td>Debt</td>
<td>$2,200,000.00</td>
</tr>
<tr>
<td>Sponsor Equity</td>
<td>$600,000.00</td>
</tr>
<tr>
<td><strong>Total Sources</strong></td>
<td><strong>$4,000,000.00</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Uses</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>Solar PV</td>
<td>$3,200,000.00</td>
</tr>
<tr>
<td>Battery</td>
<td>$800,000</td>
</tr>
<tr>
<td><strong>Total Uses</strong></td>
<td><strong>$4,000,000.00</strong></td>
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</tbody>
</table>

### 10-Year Project Benefits*

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Developer Fees (Y1)</td>
<td>$400,000</td>
</tr>
<tr>
<td>Initial Investment</td>
<td>($600,000)</td>
</tr>
<tr>
<td>Returns on Equity</td>
<td>$900,000</td>
</tr>
<tr>
<td>Savings</td>
<td>$625,000</td>
</tr>
</tbody>
</table>

*Fees and returns allocated between houser and co-developer
**Illustrative Project: Portfolio Solar + Battery**

### Solar PV + Battery Example

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
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</thead>
<tbody>
<tr>
<td>Income (Energy Payments)</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Income (Solar Credits)</td>
<td>$270,000</td>
<td>$270,000</td>
<td>$270,000</td>
<td>$270,000</td>
<td>$270,000</td>
<td>$270,000</td>
</tr>
<tr>
<td>Income (Ancillary Services)</td>
<td>$130,000</td>
<td>$130,000</td>
<td>$130,000</td>
<td>$130,000</td>
<td>$130,000</td>
<td>$130,000</td>
</tr>
<tr>
<td>Operating Expenses</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
</tr>
<tr>
<td>NOI</td>
<td>$400,000</td>
<td>$400,000</td>
<td>$400,000</td>
<td>$400,000</td>
<td>$400,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>Debt Service</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
</tr>
<tr>
<td>DSCR</td>
<td>1.33</td>
<td>1.33</td>
<td>1.33</td>
<td>1.33</td>
<td>1.33</td>
<td>1.33</td>
</tr>
</tbody>
</table>

| Available for Returns  | $(600,000) | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 |
| Sponsor Equity IRR     | 12%      |         |         |         |         |         |

<table>
<thead>
<tr>
<th></th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
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</thead>
<tbody>
<tr>
<td>Income (Energy Payments)</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
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<td>$130,000</td>
<td>$130,000</td>
<td>$130,000</td>
<td>$130,000</td>
</tr>
<tr>
<td>Operating Expenses</td>
<td>$(110,000)</td>
<td>$(110,000)</td>
<td>$(110,000)</td>
<td>$(110,000)</td>
<td>$(110,000)</td>
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<tr>
<td>NOI</td>
<td>$390,000</td>
<td>$390,000</td>
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<td>$390,000</td>
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<td>$390,000</td>
</tr>
<tr>
<td>Debt Service</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
<td>$(300,000)</td>
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<tr>
<td>DSCR</td>
<td>1.30</td>
<td>1.30</td>
<td>1.30</td>
<td>1.30</td>
<td>1.30</td>
<td>1.30</td>
</tr>
</tbody>
</table>

| Available for Returns  | $90,000  | $90,000  | $90,000  | $90,000  | $90,000  | $90,000  |
Challenge: Battery storage can eliminate disruption to entire communities during electricity grid outages, but is too expensive, complex, and physically large for housing owners to routinely use for entire buildings.

Solution: Community Resilience Hubs / powering select critical loads

- Practical interim step toward powering every unit in a building
- Smaller battery size and lower cost
- Support common area loads (emergency lighting, elevators, etc.)
- Create cooling / heating shelters in community centers
- Maintain power for site management offices to allow operations to continue
Solar and Resilience: Case Study

Opportunity for Innovation:
- Large solar PV (multiple rooftops and ground-mount)
- Battery storage
- Larger rehab including many EE measures

Solving to the Challenge:
- Finance solar + battery as part of 4% LIHTC deal
- How to capture benefits with tenant metering
- Underwriting storage
Designing a Resilience Hub

Project Design:

- Feasibility analysis and initial design by Optony (solar) and AF Mensah (battery)
- Appx. 700 kW of solar PV
- 500 kW / kWh of battery storage
  - Powers community center and site office during outages
  - Potential for several hours of resilience each day during sustained blackouts.

Status: System designs and economics incorporated into project plans prior to closing, construction now underway.
How can we help?

✓ Provide technical assistance
✓ Co-develop solar projects
✓ Key role
  • Bring financing and legal structure to deal
  • Library of document templates
  • Tasks lists and deliverables
  • Securing property investors & lender approvals

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FERC Order 841: Leveling the Playing Field for Energy Storage Resource Market Participation
Wednesday, April 4, 1-2pm ET

FERC and Clean Energy
Thursday, April 26, 1-2pm ET

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