Who We Are
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 for reports, newsletters, webinar recordings
Sandy and Power

“The fact that the NYU hospital is dark but Goldman Sachs is well-lit is everything that’s wrong with this country.”

“Extensive power outages during Sandy affected millions of residents and resulted in substantial economic loss to communities. Despite the size and power of Hurricane Sandy, this was not inevitable: resilient energy solutions could have helped limit power outages.”

Hurricane Sandy Rebuilding Strategy: Stronger Communities, A Resilient Region (Aug. 2013)
Power Outages & Severe Weather

Reported Power Outages by Region (2008-2014)

Top 10 Cities Likely to See Big Increases in Power Outage Risks

1. New York City
2. Philadelphia, PA
3. Jacksonville, FL
4. Virginia Beach, VA
5. Hartford, CT
6. Orlando, FL
7. Tampa, FL
8. Providence, RI
9. Miami, FL
10. New Orleans, LA
Extreme Weather Disproportionately Hurts Vulnerable & Low-Income Communities

- Extreme weather events harms low-income, elderly and disabled populations disproportionately
- Flooded counties had households at 14% below US median income.
- Drought & heat waves affected counties with households at 5% below US median income.

- **Hurricane Sandy**: 110 US fatalities and $42+ billion in property damage - costliest U.S. hurricane.
- 600,000 people live in 6 low-lying, mostly NY minority communities of South Bronx, Newtown Creek, Brooklyn Navy Yard, Red Hook, Sunset Park & Staten Island.
- In Red Hook (Brooklyn), the borough’s largest housing project, 4,000 of the 6,000 residents had no heat or water for over a week after the storm.
- No backup generators at senior centers.
Resilient Power Inequality

When it comes to reliable energy technologies to protect against power outages, there is a disparity between the haves and the have-nots.

Call it “resilient power inequality.”

Solar+ Storage New Major Market Trend—Finance Industry

“In 2014, a chorus of analyses from major financial institutions—including Bank of America, Barclays, Citigroup, Fitch Ratings, Goldman Sachs, Morgan Stanley, and UBS—found that solar-plus-battery systems pose a real and present threat to traditional utility business models.”

https://cleantechnica.com/2015/04/16/solar-plus-storage-is-coming-to-ders-says-finance-industry/

US Solar-Plus-Storage Market to Surpass $1 Billion by 2018


IHS: 9% of solar PV systems will have attached storage in 2018

Solar and Storage: The Energy Transition

Clean Energy Revolution Is Ahead of Schedule

By Noah Smith

Solar-plus-batteries are set to begin a dramatic transformation of human civilization. The transformation has already begun, but will really pick up steam during the next decade. That is great news, because cheap energy powers our economy, and because clean energy will help stop climate change.

How Resilient Solar + Storage Works

Diagram showing the components of a resilient solar and storage system:
- Solar array
- Charge controller
- Battery-based inverter
- Energy storage
- Central grid
- Utility meter
- Main circuit breaker panel
- Critical load subpanel

www.resilient-power.org
Resilient Cities – What Should Cities Do?

• Disaster preparedness planning: evaluates vulnerabilities
• Few cities assess risks & mitigation strategies re: grid outages for critical public & community facilities
• None has developed citywide resilient power strategy
• Finance solar+storage systems with little or no upfront costs
• Cities must invest in resilient power

What States Should Do: A Guide to Resilient Power Programs and Policy

First comprehensive look at the emerging resilient power movement in the Northeast:

- $400 million in new state-managed funds
- 90+ critical facilities – including emergency shelters, wastewater treatment plants, firehouses and other first responder facilities
- Moving from demonstration projects to market-based solutions
- Best practices and policy recommendations

Read the report at http://bit.ly/ResilientStates
Financing Resilient Power

- **Project & Company Financing**: How are projects financed now, where are sources of expansion capital?
- **Commercial & Green Banks**: How to provide debt in emerging tech markets?
- **Foundation Roles**: Program support, PRIs & endowment asset allocation
- **State and Local Support**: Incentives & credit enhancement reduce project risk
- **Warehouse Credit Facility**: Rolling up transactions to get to scale
- **Goal**: To calibrate a development finance strategy to the reality of early stage market – without leaving low-income & vulnerable populations behind
Public Support for Solar+Storage

Public Investments:
• Connecticut DEEP: $48 Million
• New Jersey BPU: $200 Million Energy Resilience Bank and $10 Million Energy Storage Program
• Massachusetts DOER: $40 Million Community Clean Energy Resiliency
New York NYSERDA: $40 Million NY Prize microgrids, $66 Million CHP

TOTAL: >$400 million in new NE state funds alone in last 18 months

Resilient Solar+Storage Projects to Date:
• New Jersey BPU: $3 million for 13 solar+storage projects at schools, wastewater treatment plants. Total : $12 million; State investment for round two: $6 million
• Massachusetts DOER: $26 million for 21 municipal projects, including 31 solar+storage projects at schools, wastewater plants, first responders. Total project investment: ~$52 million
• Vermont Solar+storage microgrid. Total project investment: $12.5 million

TOTAL: ~$76.5 million in solar+storage projects over the past 6 months*

*Results do not include California
Solar+Storage: The Economic Case

- Frequency regulation market participation can reduce payback period for solar+storage projects in PJM territory to 4 years.

- Resilient energy storage being provided by third party storage companies at little to no cost to developer.
Other Half of the Bill – Demand Charges

$30’s – $40’s/kW peak demand charges; in CA & NY, 400,000+ C&I accounts monthly bills consist >40% demand charges

Source: Green Charge Networks
Resilient Power Projects – Housing

- Technical assistance fund: project grants to design and deploy resilient power systems
- Demonstrate viability of clean energy + storage in affordable housing and assisted living
- Working with housing and solar+storage developers in NYC, Chicago, DC, Newark, Boulder
- Via Verde (Bronx) – 1st solar+storage project for resilient power applied to affordable housing
Resilient Power Projects – Critical Facilities

- Demonstrate viability of clean energy + storage in critical community facilities
  - Community shelters, police and fire stations, hospitals, wastewater treatment

- Working with municipalities to develop resilient power plan for critical facilities

- Municipal solar+storage project planning underway in Baltimore, Salt Lake City, Los Angeles, Duluth, DC

More information about the Resilient Power Project, its reports, webinar recordings, and other resources can be found at [www.resilient-power.org](http://www.resilient-power.org).
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