Better Buildings
U.S. DEPARTMENT OF ENERGY

Financing Renewables in Multifamily

May 27, 2015

U.S. DEPARTMENT OF ENERGY

Financing Renewables in Multifamily

Better Buildings Summit 2015
Rooms: Roosevelt 1 & 2

May 27, 2015

Agenda

Speaker	Topic
Mara Blitzer, Office of Multifamily Housing Programs, HUD	Introduction PACE in CA and HUD
Robert Sanders, Clean Energy Group, Resilient Power	Case for Renewables Overview of Funding Types
Jeff Greenberger, Affordable Community Energy, Hispanic Housing Corporation	Economics of Solar ESCOs
Jared Lang, National Housing Trust/Enterprise Preservation Corporation	Making Solar Financing Decisions: Own vs. Lease Equipment
Darien Crimmin, Winn Companies	Offsite Solar Net Metering

HUD Context

- Climate Action Plan – includes 100MW goal for renewables and affordable housing
- ~$7B annual HUD spending on utilities (rental assistance contracts and value of contract utility allowances)
- No new federal funds to support energy/water efficiency retrofits (exception: $1M TA for BBC partners)
- So we try to be creative!

Office of Multifamily Housing Programs

- Core Programs:
  - Mortgage Insurance
  - Project Based Rental Assistance, including:
    - Supportive Housing for the Elderly and Disabled
    - Rental Assistance Demonstration
- Transition to 5 Regional Centers – San Francisco will be the Regional Center for the West
  - Single Underwriter Model
  - Workload Sharing

HUD MF EE Initiatives Completed/Started

- Green Retrofit Program (GRP) ARRA Grants
- Energy Innovation Fund (EIF) ARRA Grants
- Better Buildings Challenge
  - Partners, technical assistance
  - Policy incentives re: management, expedited use of R4R, M2M deals, PRAC Shared Savings (PFS “lite”)
- PACE in CA

- <u>Related Initiatives from Fannie Mae:</u>
  - Green Preservation Plus Loan
  - MPIRE Loan
  - Pricing Reduction (10 bps)

HUD EE Initiatives Planned

- Minimum energy code standards (2009)
- Guidance on On-Bill Repayment in CA and Distributions for BBC Partners
- Guidance on PACE in CT
- Utility Allowance Methodology Update
- RAD Guidance Update
- FHA Loan Underwriting / MAP Guide Update
- Capital Needs Assessment E-tool Guidance
- Energy Use Reporting / Benchmarking

Key Policy Changes Implemented in CNA e Tool

- Utility consumption benchmarking of all properties.
  - As part of CNA via EPA's Portfolio Manager tool standard reports;
  - CNAs now required for all applications including new construction, sub-rehab;
- Minimum energy scores for some properties:
- CNA e Tool executes cost benefit analyses by component;
- ASHRAE Level II Energy Audits for properties older than 10 years provide best available data for CNA e Tool:
- Incentives for utility conservation measures, 75% of audit documented utility savings recognized in underwriting;
- Abolishes formula calculation of RfR for new construction and sub-rehab.

Snapshot of HUD's PACE Guidance

- PACE is acceptable funding for Multifamily assisted and insured property types under specified conditions.
- Applicable measures include those permanently fixed to the property (i.e. the PACE improvements cannot be removed from the property in the event of a change of ownership). Examples include upgraded insulation, solar hot water preheating and energy efficient heating equipment, solar photovoltaic (PV) rooftop systems, fuel cells, and natural gas piping installed underneath the property owner's land.
- Conditions include ASHRAE Level II energy audit and commitment to sharing data with HUD.
- HUD approval process guided either by asset management Account Executive or production Underwriter, depending on proposal.

Three types of eligible projects

1. HUD-insured mortgage or risk-share loan in first position

2. Existing HUD rental assistance contract

3. Direct loan from HUD in first position

EE Measures Permitted under PACE

- The measures proposed for the project must be permanently fixed to the property (i.e. the PACE improvements cannot be removed from the property in the event of a change of ownership).

- Examples of permanently fixed improvements include, but are not limited to upgraded insulation, solar hot water preheating and energy efficient heating equipment, solar photovoltaic (PV) rooftop systems, fuel cells, natural gas piping installed underneath the property owner's land.

- NOTE – current guidance does not specifically address water measures. However, these are acceptable under CA PACE authorization and many water measures could be considered "fixed to the property."

Complete Application Includes

- Cover letter addressing each of the PACE Approval Conditions.
- PACE Entity/locality Approval letter.
- All PACE agreements, unexecuted.
- Lender Conditional Approval (not applicable to HUD held mortgages).
- Energy audit. This must be performed by an independent third party.
- Energy audit analysis indicating projected annual savings of energy/water saving enhancements commensurate with annual assessment. This must be performed by an independent third party.
- The market assessment letter of comparable sales or appraisal.
- Owner's Counsel Opinion or letter from or on behalf of the locality/PACE administrator that provides satisfactory assurances of compliance with the Assessment Procedures.
- IF FHA loan application also pending, FHA lender should include the owner's intent to enter into the PACE program, or current inclusion in the program for refinance transactions, in the Concept Meeting package.

PACE Questions? About…

- The content of the PACE Memo: Mara Blitzer, mara.n.blitzer@hud.gov and Bob Iber, robert.g.iber@hud.gov.
- To set up a Concept Meeting for a new FHA insured loan deal in CA: Angela Corcoran, angela.m.corcoran@hud.gov and 415-489-6606.
- To request review of an asset with an existing HUD rental assistance contract in CA: send email to CA-MF@hud.gov.

Recent EEFA Report

- Not about renewables, but worth checking out
- "*Potential for Energy Savings*" identifies the maximum achievable potential savings and benefits that can be captured over the 20-year period from 2015-2034 in the multifamily affordable housing sector.
- The report estimates that energy efficiency programs in multifamily affordable housing could cut electricity usage by as much as 32 percent and natural gas by 24 percent. The study includes specific findings for Georgia, Illinois, Maryland, Michigan, Missouri, New York, Pennsylvania, and Virginia.
- See more at: http://energyefficiencyforall.org/potential-energy-savings#sthash.vRnGGYlG.dpuf

MAY 27, 2015

Better Building Challenge Summit: Financing Renewables in Multifamily

Jeff Greenberger
Affordable Community Energy, Inc.,
A Subsidiary of Hispanic Housing Development Corporation

DISCUSSION OUTLINE

1. ACE Overview
2. Weighing Owner’s Objectives
3. The Economics of Solar . . . etc.
4. Looking Into the Future

ACE OVERVIEW

HISPANIC HOUSING
DEVELOPMENT CORPORATION

ace affordable community energy

Comprehensive Retrofit Services for Affordable Housing

- Energy efficiency
- Water conservation
- Clean energy
- Resiliency (just beginning)

Created to Address Key Barriers

- Provide expertise and resources
- Provide 100% of the capital (off balance sheet, no subordination)
- Assume the risks

Mission-Driven Energy Services Company (ESCO)

- Charge below-market rate for electricity production
- Take material share of measured savings in energy and water
- Keep agreements “short”—10 years
- Transparent, open-book approach

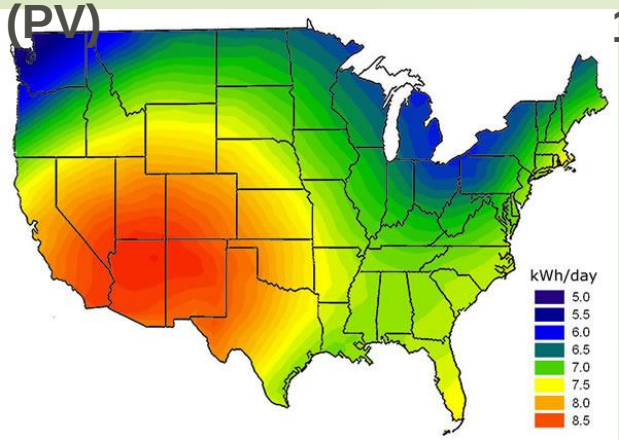
WEIGHING OWNER'S OBJECTIVES

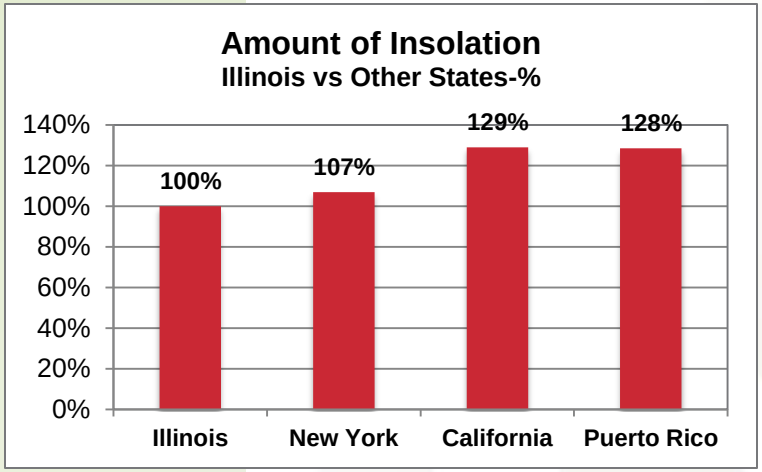
- **Ownership and Return Horizons**
  - Are you a long-term or shorter term owner?
  - Do you need short term returns or do you have a longer term return horizon?
- **Risk Tolerance**
  - Performance risk
  - Other risks (resiliency, control over cost increases, etc.)?
- **In-house Ability to Underwrite and Perform Improvements**
- **Ability to Finance the Improvements**
  - Pay from reserves?
  - How complex is the existing project capital stack?
  - Can you borrow the capital?
    - Is there an impending recapitalization event?
    - Will the proceeds cover everything else you want to do and the green improvements?
- **Physical and Other Considerations**

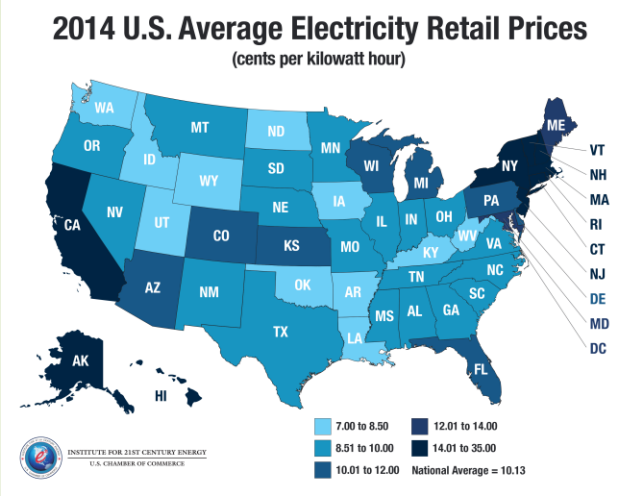
THE ECONOMICS OF SOLAR . . . ETC.

Five Key Factors Affecting the Ability to Finance Renewables (PV)

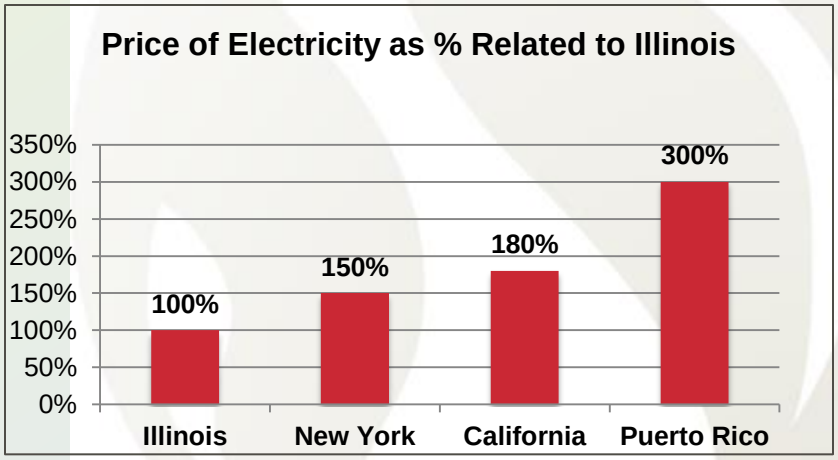
1. Amount of Solar Power Available ('insolation")







2. Price of Electricity*

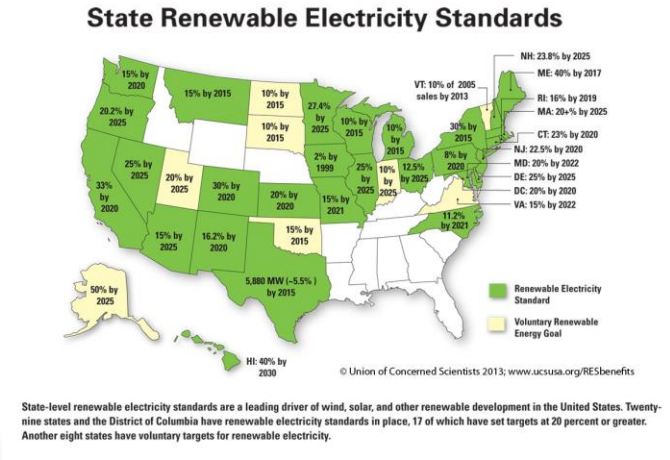


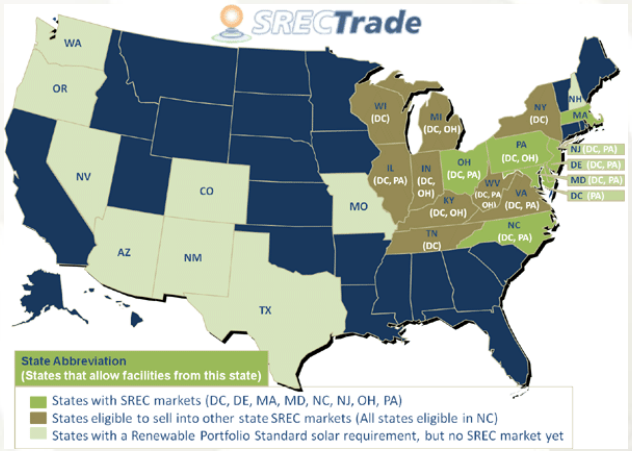
*But the price may be different if you're buying or selling.

THE ECONOMICS OF SOLAR . . . ETC.

3. Federal support; state, local and utility subsidies; regulatory environment

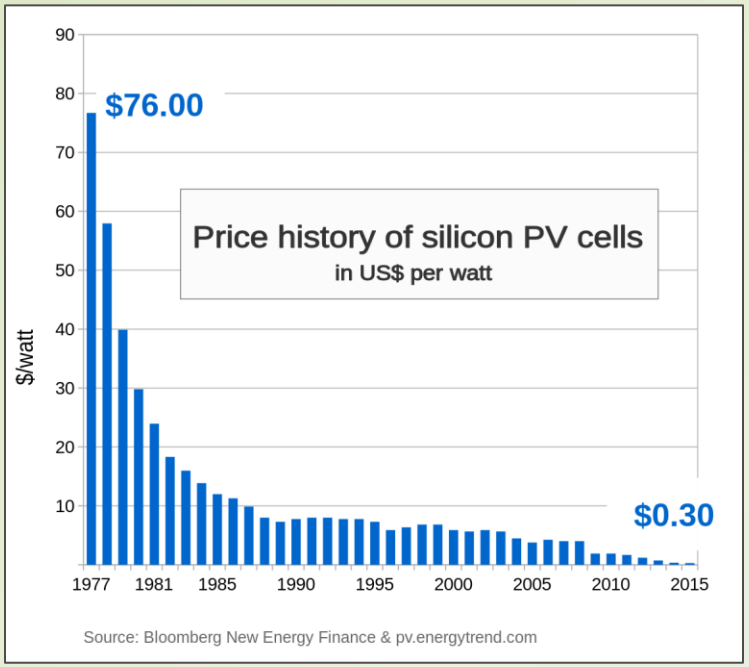
- Federal Investment Tax Credits
- Energy efficiency subsidies
  - By right
  - Availability/competitiveness
  - Relationship to cost
  - Carve out for affordable housing
- Clean energy subsidies
- Net metering regulations
- Solar Renewable Energy Credits (SREC's)/Renewable Electricity Portfolio Standards
- Ability to generate revenues from battery storage



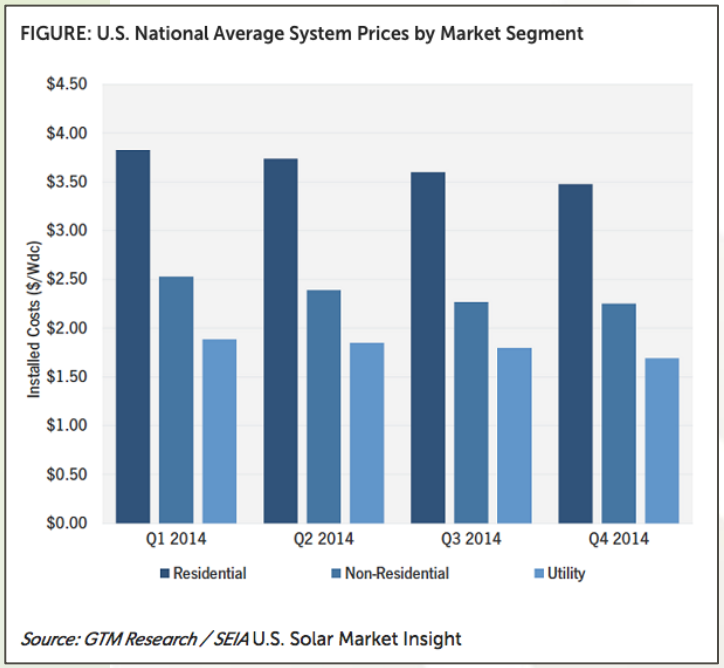


4. The Costs to Purchase and Install the Systems

The "Swanson Effect"



Total Installed Cost/kW



Installed cost will vary by location.

5. Cost (and Availability) of Financing . . . a short history

- In the beginning—3 years ago
  - Focus was on energy efficiency more than renewables
  - Problem was with underwriting the savings/production
  - Hard to get financing for either—except from brave mission-driven funders
- Now lenders
  - More comfortable financing solar production
  - Still a challenge for energy efficiency, but performance insurance products will help
  - Focusing on:
    - The credit of the owner of the system
    - The credit of the customers (if different)
  - Which brings us back to mission-driven institutions to provide credit support

5. Cost (and Availability) of Financing

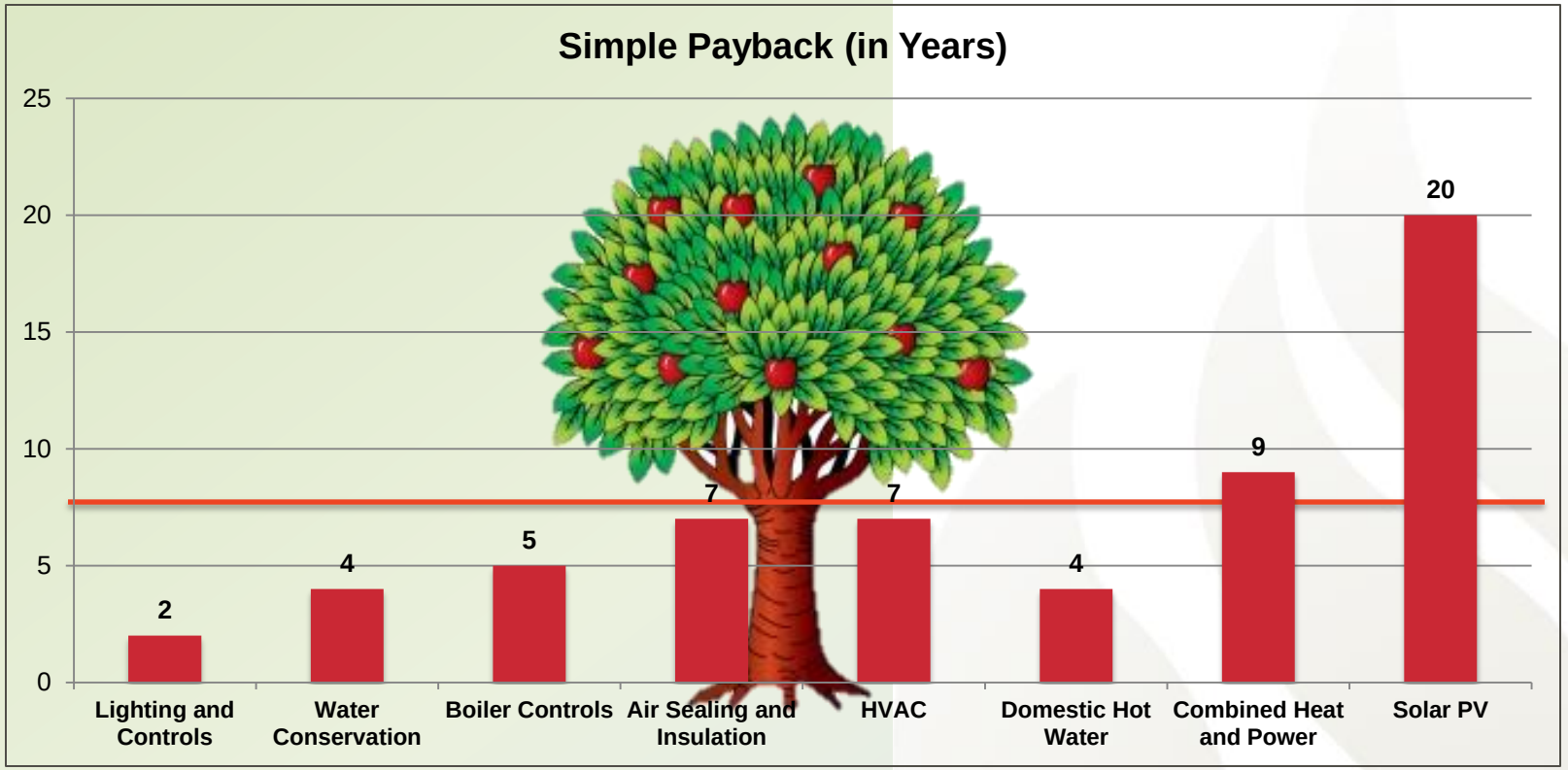
- Assume a 12-year loan at 6% for a renewable project
  - To repay it requires a 11.9% return of the loan amount—the equivalent of a 8-9 year payback
  - Subsidies, tax credits SREC's will reduce the effective cost
  - Lenders will require cash flow of at least 120% of this amount
  - Return on risk to owner/installer
- Whether you can make this work depends on all of the five factors

- Levers to improve economics
  - Other sources of "free" money (NMTC's)
  - Lower installation costs
  - Longer loan terms or lower interest rate
  - Other revenues (frequency regulation, peak load, etc.)

  - "Whole Tree" Approach

THE ECONOMICS OF SOLAR . . . ETC.

The “Whole Tree” Approach

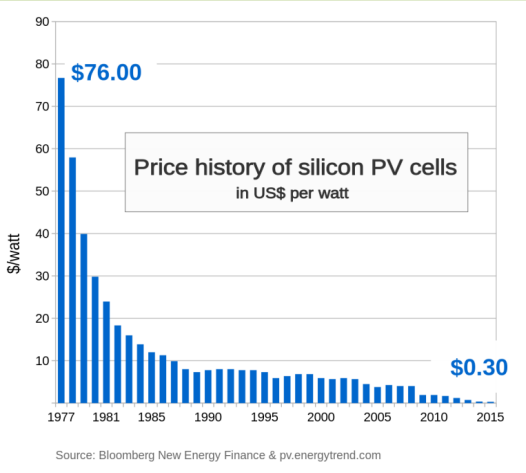


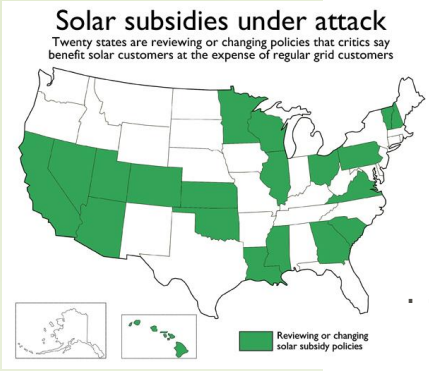
Weighted average payback has to be shorter than the term of the ESA/PPA.

LOOKING INTO THE FUTURE

What I Think I Know

- It will continue to be a race between falling installation costs and shrinking subsidies . . .





. . . but utility costs will continue to rise.

December 10, 2014

ComEd gets $245 million rate hike

- Water conservation will be increasingly important.
- More and more people will realize that Climate Change is not a political issue . . . which should be a good thing.

Some Other Critical Questions

- Will lenders increasingly be more comfortable with the risk/reward of renewables (and energy efficiency)?
- How will politics affect Federal policies? State policies?
- What's the next break-through technology?

DISCUSSION

RESILIENT

POWER

A Project of Clean Energy Group

Financing Resilient Power

2015 Better Buildings Summit

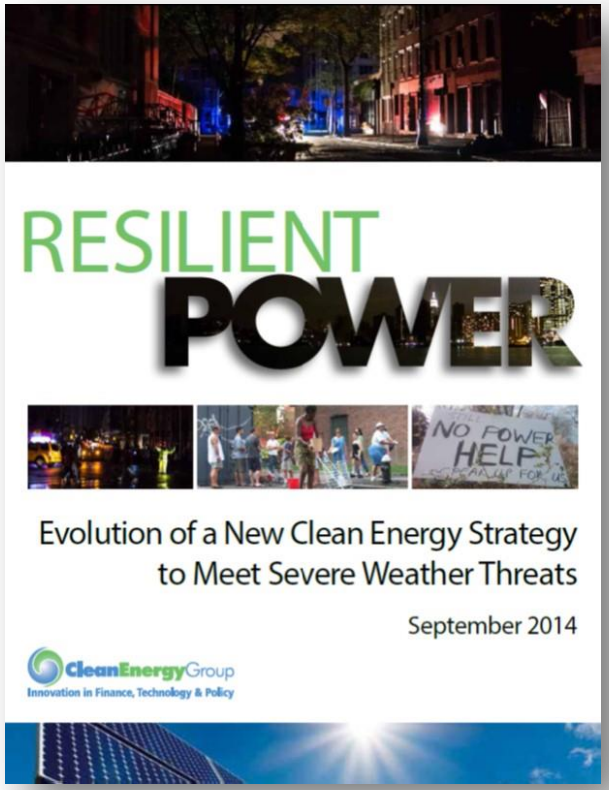
May 27, 2015

CleanEnergyGroup

Innovation in Finance, Technology & Policy

Robert Sanders
Senior Finance Director
Clean Energy Group

Who We Are



CleanEnergyGroup
Innovation in Finance, Technology & Policy

Meridian Institute
Connecting People to Solve Problems

CleanEnergy States Alliance

THE JPB FOUNDATION

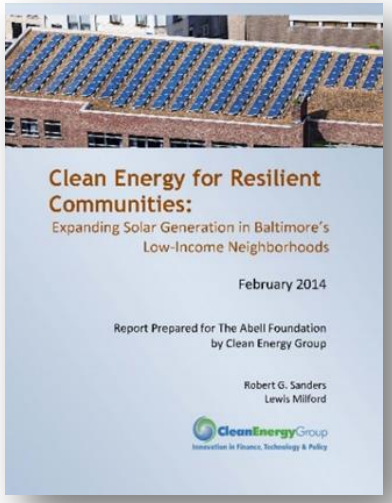
SURDNA FOUNDATION
Fostering sustainable communities in the United States

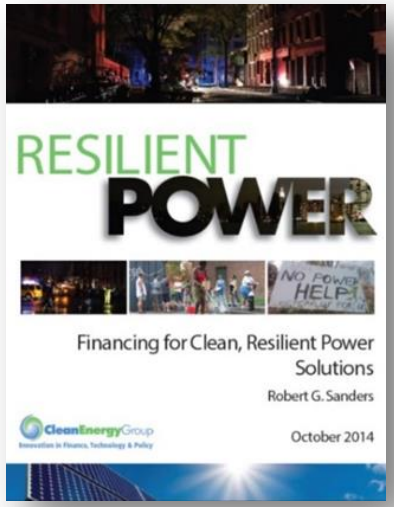
THE KRESGE FOUNDATION

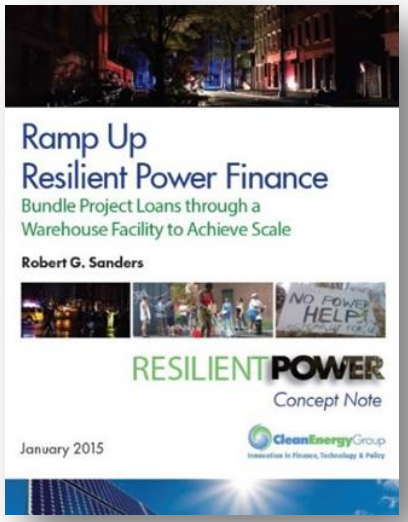
www.resilient-power.org
www.cleanegroup.org

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





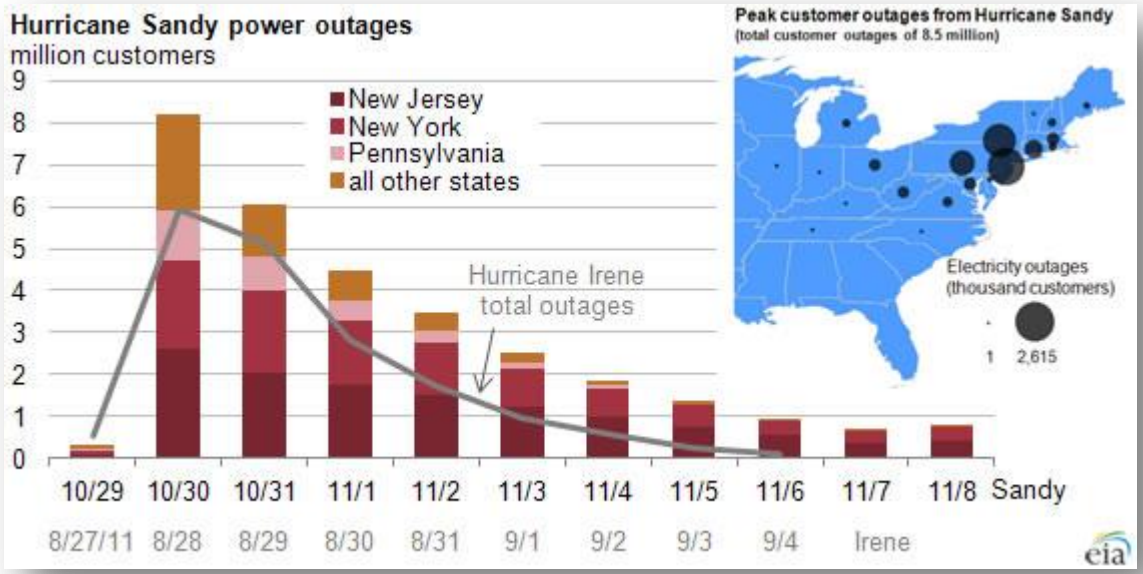


Sandy and Power

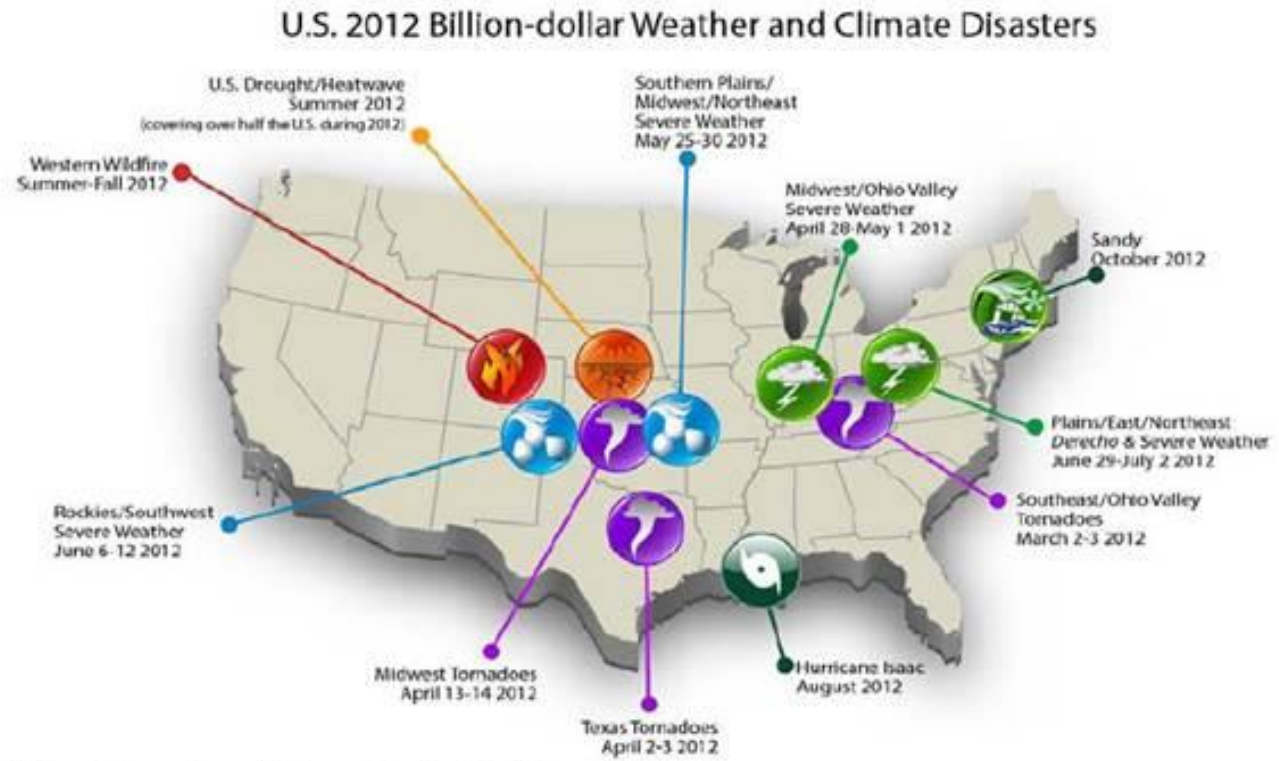
"The fact that the NYU hospital is dark but Goldman Sachs is well-lit is everything that's wrong with this country."

"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)



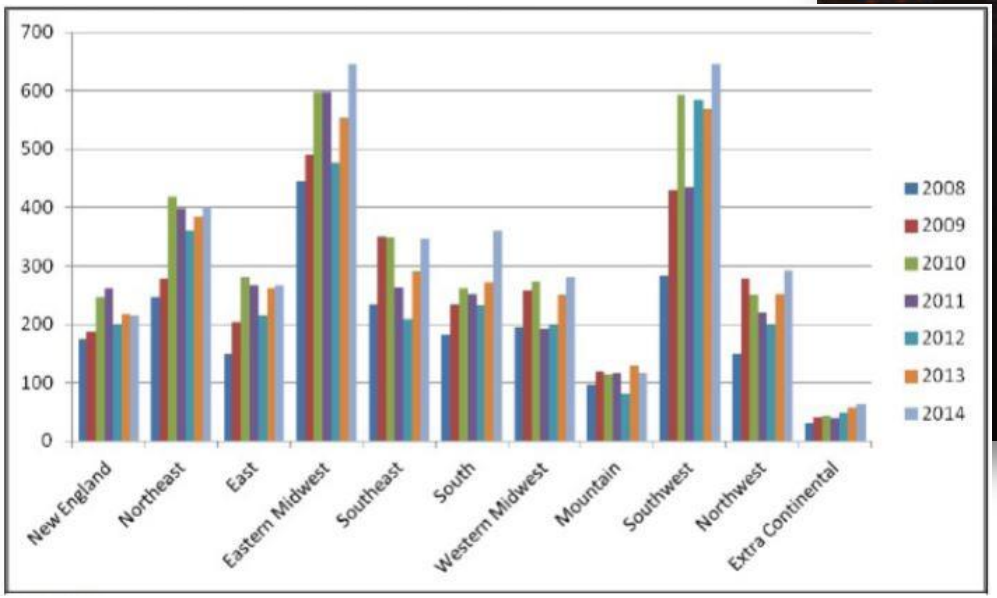
Extreme Weather Events & Power Outages



Source: National Oceanic and Atmospheric Administration

Power Outages & Severe Weather

Reported Power Outages by Region (2008-2014)



Extreme Weather Disproportionately Hurts Vulnerable & Low-Income Communities

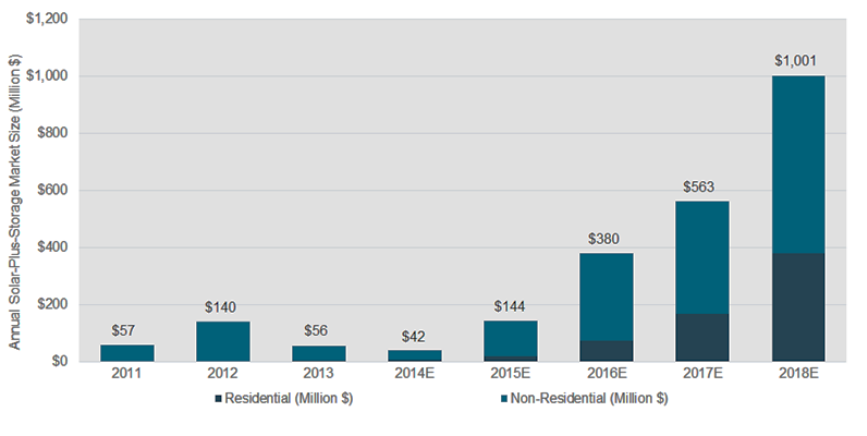
- Extreme weather events harm low-income, elderly and disabled populations disproportionately
- Flooded counties had households at 14% below US median income.
- Drought & heat waves affected counties with households at 5% below US median income.

- **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.

Solar+ Storage New Major Market Trend—Finance Industry

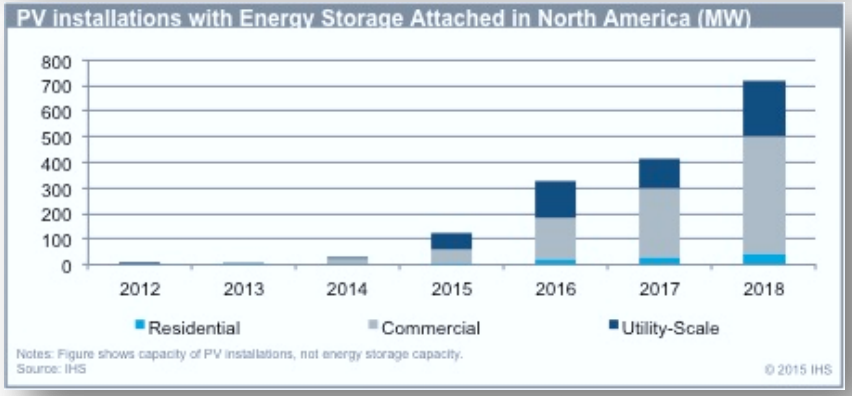
"In 2014, a chorus of analyses from major financial institutions—including Bank of America, Barclays, Citigroup, Fitch Ratings, Goldman Sachs, Morgan Stanley, and UBS—found that solar-plus-battery systems pose a real and present threat to traditional utility business models."

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

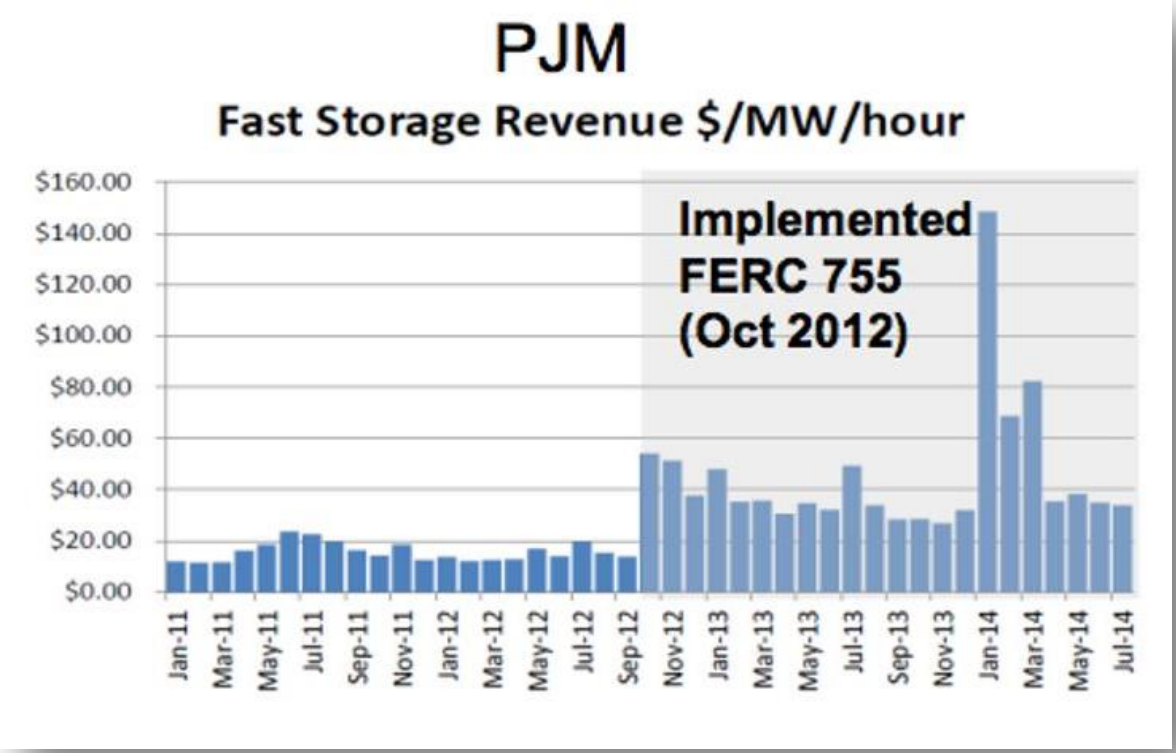
http://www.greentechmedia.com/articles/read/US-Solar-Plus-Storage-Market-to-Surpass-1-Billion-by-2018



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

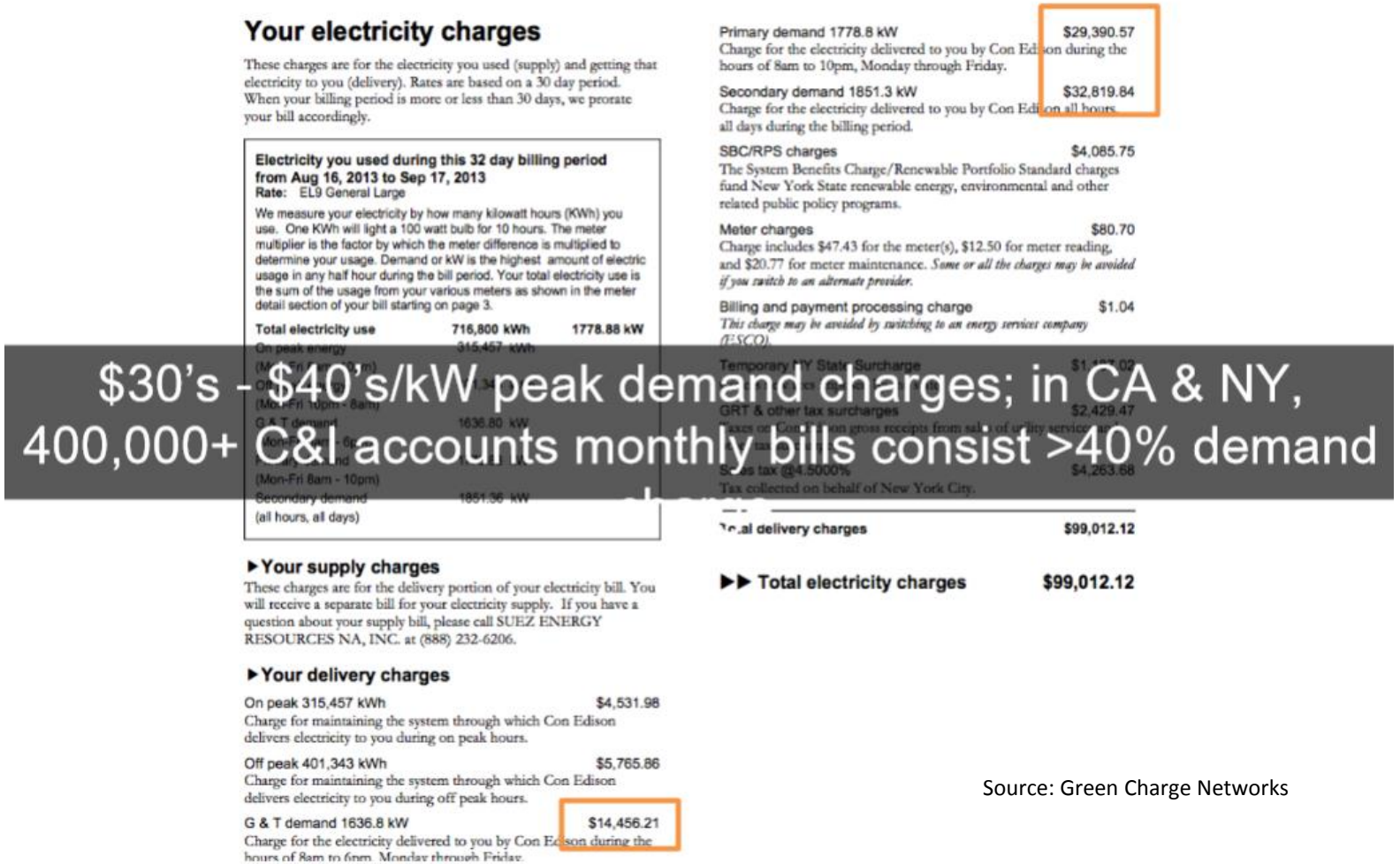
http://www.utilitydive.com/news/ihs-9-of-solar-pv-systems-will-have-attached-storage-in-2018/375636/

Solar + Storage: The Economic Case



- Frequency regulation market participation can reduce payback period for solar plus 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



Your electricity charges

These charges are for the electricity you used (supply) and getting that electricity to you (delivery). Rates are based on a 30 day period. When your billing period is more or less than 30 days, we prorate your bill accordingly.

Electricity you used during this 32 day billing period
from Aug 16, 2013 to Sep 17, 2013
Rate: EL9 General Large

We measure your electricity by how many kilowatt hours (KWh) you use. One KWh will light a 100 watt bulb for 10 hours. The meter multiplier is the factor by which the meter difference is multiplied to determine your usage. Demand or kW is the highest amount of electric usage in any half hour during the bill period. Your total electricity use is the sum of the usage from your various meters as shown in the meter detail section of your bill starting on page 3.

Total electricity use	**716,800 kWh**	**1778.88 kW**
On peak energy	315,457 kWh	
(Mon-Fri 8am - 10pm)		
Off peak energy	401,343 kWh	
(Mon-Fri 10pm - 8am)		
G & T demand	1636.80 kW	
(Mon-Fri 6am - 6pm)		
Peak demand	1778.88 kW	
(Mon-Fri 8am - 10pm)		
Secondary demand	1851.36 kW	
(all hours, all days)		

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

▸Your supply charges

These charges are for the delivery portion of your electricity bill. You will receive a separate bill for your electricity supply. If you have a question about your supply bill, please call SUEZ ENERGY RESOURCES NA, INC. at (888) 232-6206.

▸Your delivery charges

On peak 315,457 kWh — $4,531.98
Charge for maintaining the system through which Con Edison delivers electricity to you during on peak hours.

Off peak 401,343 kWh — $5,765.86
Charge for maintaining the system through which Con Edison delivers electricity to you during off peak hours.

G & T demand 1636.8 kW — $14,456.21
Charge for the electricity delivered to you by Con Edison during the hours of 8am to 6pm, Monday through Friday.

Primary demand 1778.8 kW — $29,390.57
Charge for the electricity delivered to you by Con Edison during the hours of 8am to 10pm, Monday through Friday.

Secondary demand 1851.3 kW — $32,819.84
Charge for the electricity delivered to you by Con Edison all hours all days during the billing period.

SBC/RPS charges — $4,085.75
The System Benefits Charge/Renewable Portfolio Standard charges fund New York State renewable energy, environmental and other related public policy programs.

Meter charges — $80.70
Charge includes $47.43 for the meter(s), $12.50 for meter reading, and $20.77 for meter maintenance. *Some or all the charges may be avoided if you switch to an alternate provider.*

Billing and payment processing charge — $1.04
This charge may be avoided by switching to an energy services company (ESCO).

Temporary NY State Surcharge — $1,437.02

GRT & other tax surcharges — $2,429.47

Taxes on Con Edison gross receipts from sales of utility service and

Sales tax @4.5000% — $4,263.68
Tax collected on behalf of New York City.

Total delivery charges — $99,012.12

▸▸ Total electricity charges — $99,012.12

Source: Green Charge Networks

Need for More Power Resilient Solutions

- Critical need for reliable distributed generation (DG) & resiliency in hospitals, affordable housing, police, fire stations, schools, hospitals, community centers, gas stations
- Protect vulnerable populations
- Distributed solar with batteries, CHP, fuel cells can provide life-saving power
- DG a democratizing force through community projects
- Resilient DG is both climate mitigation and adaptation

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:

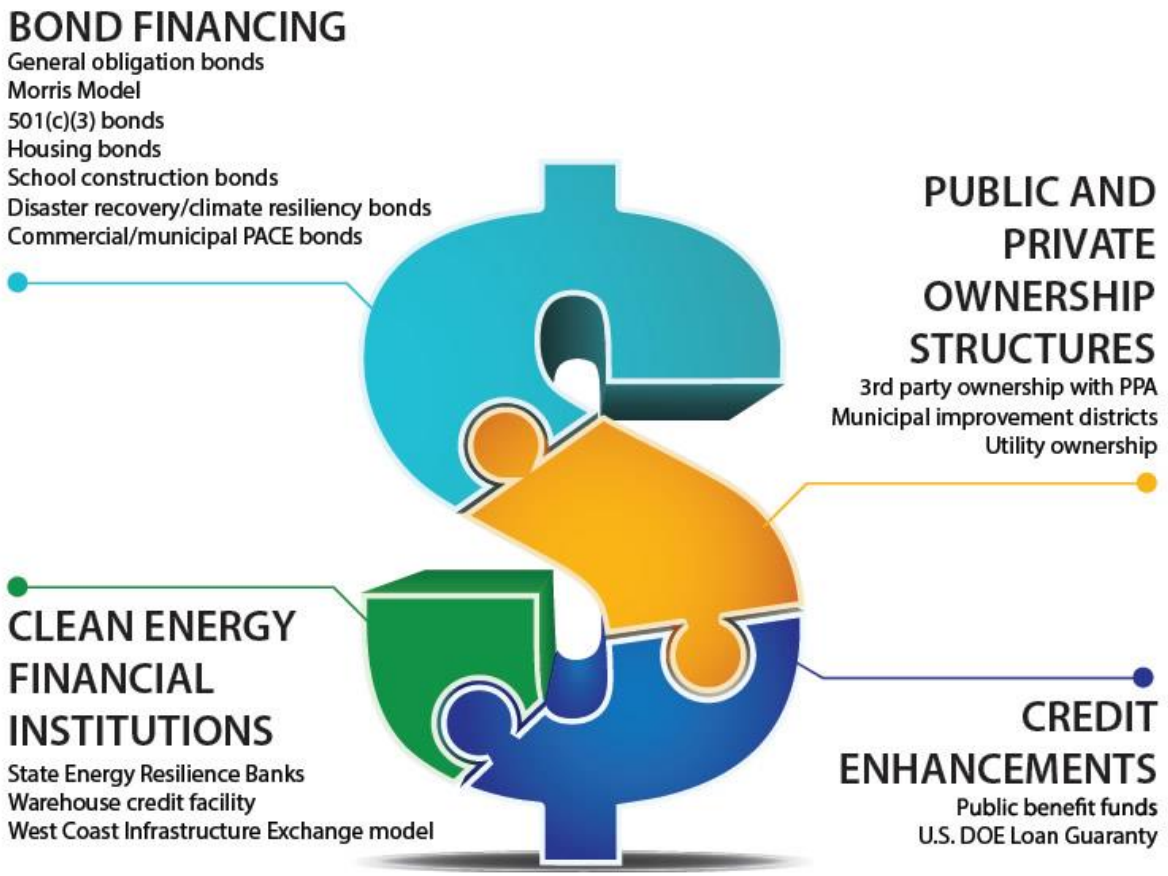
- **New Jersey** BPU: $3 million for 13 solar+storage projects at schools, wastewater treatment plants. **Total : $12 million;** State investment for round two: **$6 million**
- **Massachusetts** DOER: $26 million for 21 municipal projects, including 31 solar+storage projects at schools, wastewater plants, 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*

Innovative Financing Models

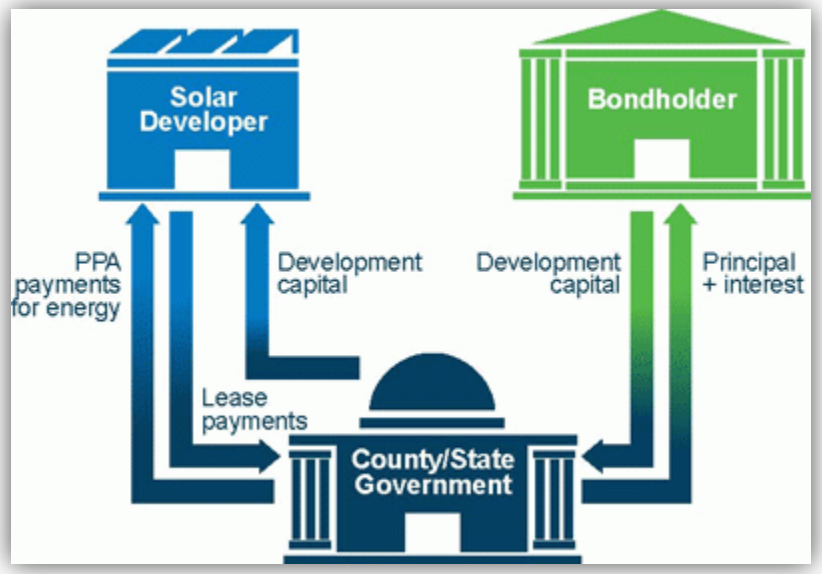
- Once decision is made to pursue resilient power project – how do you finance it?
- Municipalities, housing/ community developers have broad range of options.



Source: Clean Energy Group

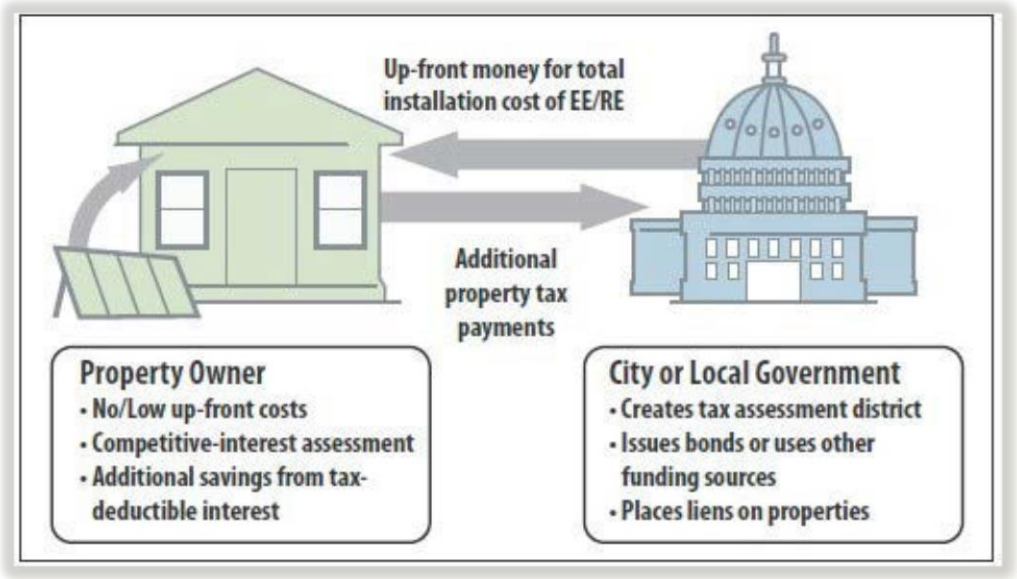
Bond Financing

- Existing bond tools can be used to finance pooled resilient power projects
  - GO bonds: NYC City Controller – multi-billion dollar "Green Bond Program"
  - 501(c)(3) bonds: hospitals, universities, affordable housing, community facilities
  - School construction bonds
  - Disaster recovery/ resiliency bonds: NYC Green Bond Program, Louisiana PSC ($315M of bonds by a LA bond authority for disaster recovery & reserves for future storms
- Morris Model:
  - Innovative public-private financing for solar on public buildings
  - Hybrid model: public entity issues a government bond, transfers low cost capital to developer for lower PPA price.
  - Bonds are issued for a pool of projects



Bond Financing

- C-PACE bonds:
  - Provides states & municipalities with financing for CE building projects
  - Bonds are repaid by property assessments added to building owners' property taxes.



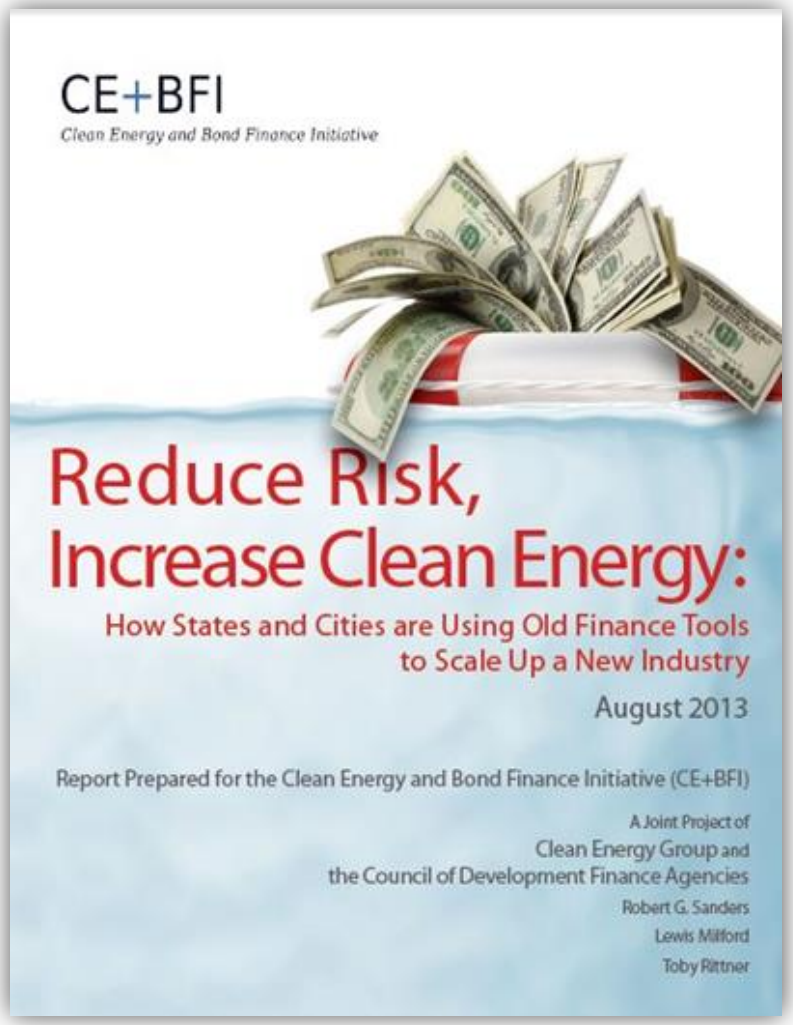
Clean Energy Finance Institutions

NJ Energy Resilience Bank:

- First-in-the-nation Energy Resilience Bank (ERB).
- Designed to address a repeat of the devastating impacts of SuperStorm Sandy:
- $200 million of CDBG-DR funds for municipalities to finance clean resilient power solutions.
- For critical public facilities, initially clean water/ wastewater treatment facilities
- Other critical facilities: public housing, schools used as emergency shelters, hospitals, emergency response facilities, etc.
- Jointly managed by NJ BPU and NJ EDA
- Direct loans and grants, but can also provide credit enhancement for bond issuances, etc. A model other states should evaluate for possible replication.

Credit Enhancement

- New framework for CE investment being built by states providing credit enhancement
- "Reduce Risk, Increase Clean Energy"
  - States are playing an important transitional role to a time when CE securities are a readily traded asset class
  - By reducing risk for investors, states are also reducing the cost of financing and securing long term fixed rate capital for CE
  - http://www.cleanegroup.org/assets/Uploads/2013-Files/Reports/CEBFI-Reduce-Risk-Increase-Clean-Energy-Report-August2013.pdf



Public & Private Ownership Structures

- Over the past decade, companies such as SolarCity transformed residential solar PV by providing lease financing.
- Third-party ownership is largely responsible for tremendous growth in residential solar in recent years.
  - **Can lease financing (3rd party ownership) accomplish for energy storage what it did for residential solar PV?**

Third-Party Ownership

- Solar Grid Storage & other storage developers are proving the model out for commercial, government & nonprofit entities.
  - Eliminates upfront costs to host
  - Transfers development & performance risk to the private developer.
- These companies' business models have benefited greatly from new FERC rules:
  - Owners of solar + storage systems can receive additional revenue streams from providing ancillary grid services:
    - E.g., demand response, frequency regulation services
    - ISOs need to pay sellers for frequency regulation-related performance payments for faster, more accurate response to dispatch signals
  - These new business models can make it much easier for customers to include storage using third party leasing and PPA financing.

Hybrid Approach is Needed

- Financing is just one key public resource that is needed to accelerate the deployment of resilient power for critical facilities and infrastructure.
  - Technical assistance
  - Targeted support for pre-development costs
  - Consistent, supportive policy
- Goal: To calibrate a development finance strategy to the reality of early stage market – without leaving low-income & vulnerable populations behind

RESILIENT POWER

A Project of Clean Energy Group

Sign up for the RPP e-Distribution List to get notices of future webinars and the monthly *Resilient Power Project Newsletter*: http://bit.ly/RPPNews-Sign-UP

More information about the Resilient Power Project, its reports, webinar recordings, and other resources can be found at www.resilient-power.org.

Contact Info

Robert Sanders
Senior Finance Director
Clean Energy Group
Email: Rsanders@cleanegroup.org
Phone: (215) 870-3257

www.cleanegroup.org
www.cesa.org
www.resilient-power.org

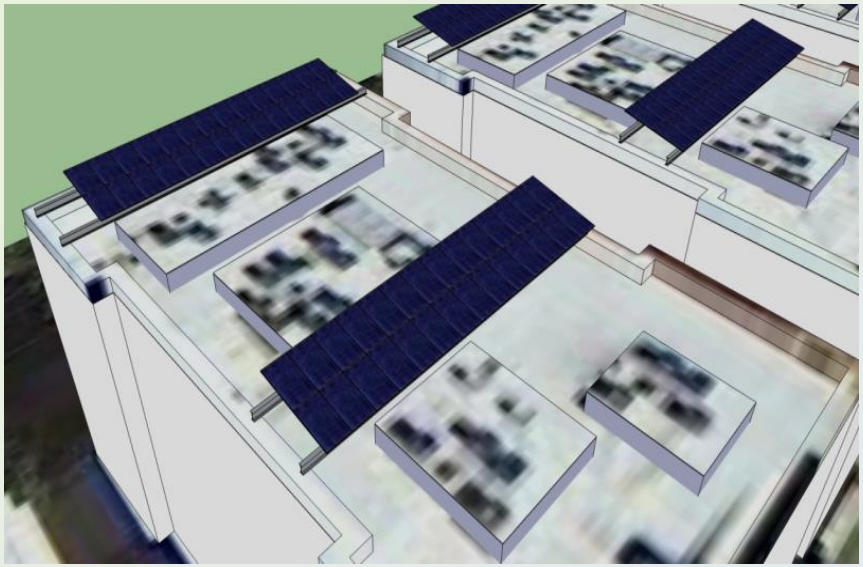
Why Purchase Versus Lease Solar?

Jared Lang
National Housing Trust
Washington, D.C.

National Housing Trust / Enterprise Preservation Corporation

- Own & Operate approximately 30 affordable rental properties along the East Coast and Illinois; often with a local partner.
- 1/3 of properties are green certified
- Typically reduce energy consumption >20%

Extensive Solar Owner



Presentation outline

1. Purchase versus lease options
2. Portfolio-scale solar
3. What's on the horizon?

Purchase

vs.

Lease

Why Purchase?

Benefits

1. Energy Savings
2. Environmental benefit
3. Local energy production
4. Price stability

Challenges

1. Roof Condition and Structural Reviews
2. Up-front Capital
3. Approvals
4. Construction Risk
5. O&M

Why Lease?

Benefits

1. No installation costs
2. No O&M
3. Energy Savings, but much less
4. Environmental benefit
5. Local energy production
6. Price stability

Challenges

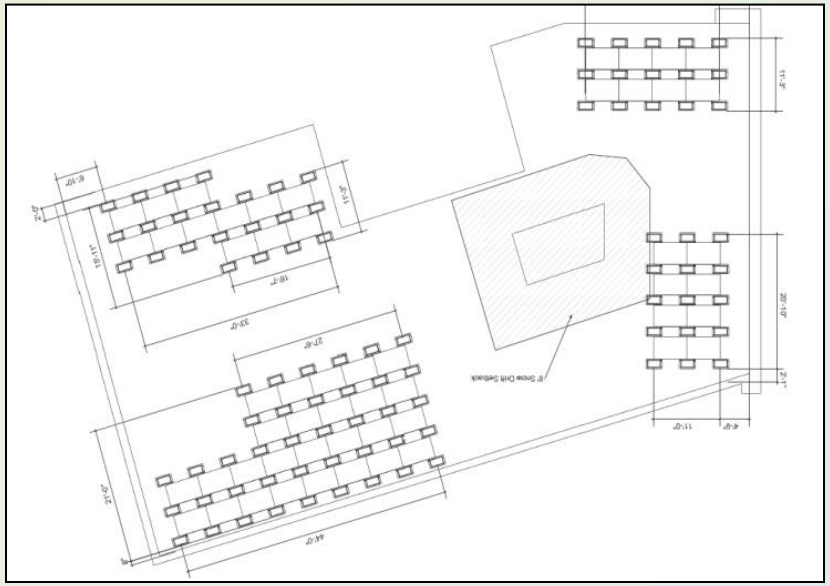
1. Roof Condition and Structural Reviews
2. Legal fees associated with onerous approvals
3. 3rd-party owning an asset on your roof
4. Less energy savings (must share)
5. Basic maintenance

Property Savings

	Purchase	Lease
	Savings + Incentives	Savings (10% Discount)
Year 1	$10,000	$1,000
Year 2	$10,000	$1,000
Year 3	$10,000	$1,000
Year 4	$10,000	$1,000
Year 5	$10,000	$1,000
Year 6	$10,000	$1,000
Year 7	$10,000	$1,000
Year 8	$10,000	$1,000
Year 9	$10,000	$1,000
Year 10	$10,000	$1,000
Year 11	$10,000	$1,000
Year 12	$10,000	$1,000
Year 13	$10,000	$1,000
Year 14	$10,000	$1,000
Year 15	$10,000	$1,000
Year 16	$10,000	$1,000
Year 17	$10,000	$1,000
Year 18	$10,000	$1,000
Year 19	$10,000	$1,000
Year 20	$10,000	$1,000
Total Savings	**$200,000**	**$20,000**

St. Dennis 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



St. Dennis Financials

Solar PV Example

System Size (kW)	15
Estimated Output (kwh/year)	20,000
Power Price / kwh	0.14

	2014	2015	2016	2017	2018	2019
Purchase Option						
Equity Investment	$ (50,000)					
Federal Tax Credit (30%)	$ 15,000					
Income (Savings and Credits)		$ 9,000	$ 9,000	$ 9,000	$ 9,000	$ 9,000
Net Cash Flow	**$ (35,000)**	**$ 9,000**	**$ 9,000**	**$ 9,000**	**$ 9,000**	**$ 9,000**

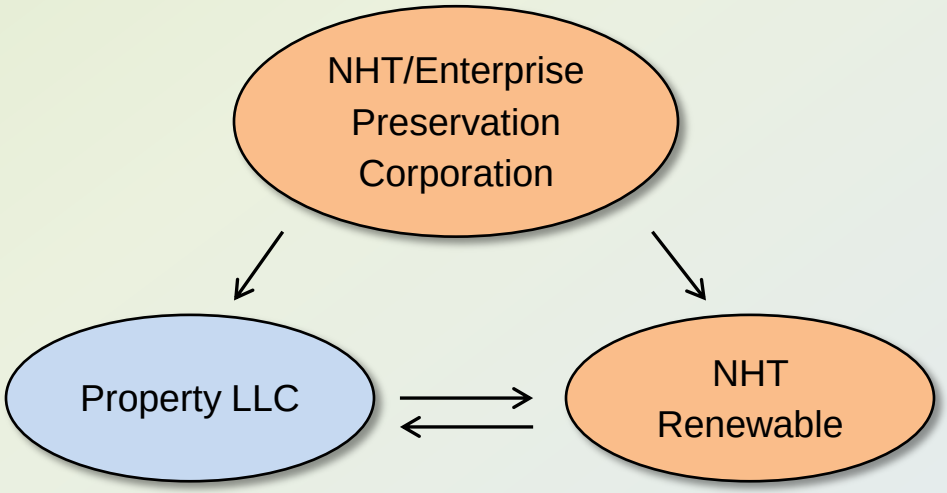
Payback	4 Years

	2014	2015	2016	2017	2018	2019
Leasing Option						
Equity Investment	$ (5,000)					
Income (Savings)		$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000
Net Cash Flow	**$ (5,000)**	**$ 1,000**	**$ 1,000**	**$ 1,000**	**$ 1,000**	**$ 1,000**

Payback	5 Years

NHT Renewable Model

1. Owning and operating solar at the portfolio-level (5 properties)
2. Setting up leases with the property partnerships
3. Opening projects up to new income streams
4. Aggregating multiple properties
5. Making the benefit worth the brain damage



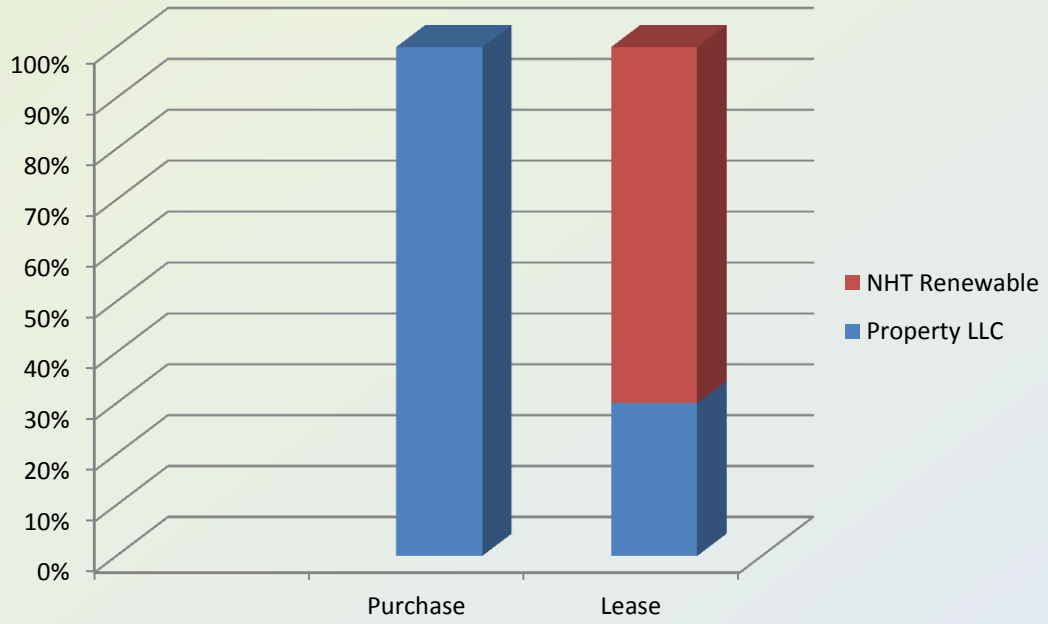
NHT Renewable (Hybrid)

Benefits

1. Environmental benefit
2. Energy Savings
3. New income streams
4. Local energy production
5. Price stability
6. Properties:
   No upfront cost or O&M

Challenges

1. Roof Condition and Structural Reviews
1. Up-front Capital
2. Approvals
3. Construction Risk
4. O&M



Renewable Project Scope

NHT/Properties Impacted: 5
Solar Thermal Systems: 2
Solar Photovoltaic Systems: 4
Total Project Cost: $1.25 million
Photovoltaic: 300,000 kw/year
Thermal: 10,000 therms/year
Project Installation: Q2 2014

R Street Apartments

Meridian Manor

Galen Terrace

Copeland Manor

St. Dennis Apartments

NHT Renewable Financials

NHT Renewable

System Size	
Photovoltaic (kW)	250
Thermal (Therms)	10,000
Estimated Output (kwh)	500,000

	2014	2015	2016	2017	2018	2019
Financials						
Equity Investment	$(1,250,000)					
Federal Tax Credit (30%)	$ 375,000					
Income (Savings and Credits)		$ 210,000	$ 210,000	$ 210,000	$ 210,000	$ 210,000
Net Cash Flow	**$ (875,000)**	**$ 210,000**	**$ 210,000**	**$ 210,000**	**$ 210,000**	**$ 210,000**

Payback	4-5 Years

What's Next?

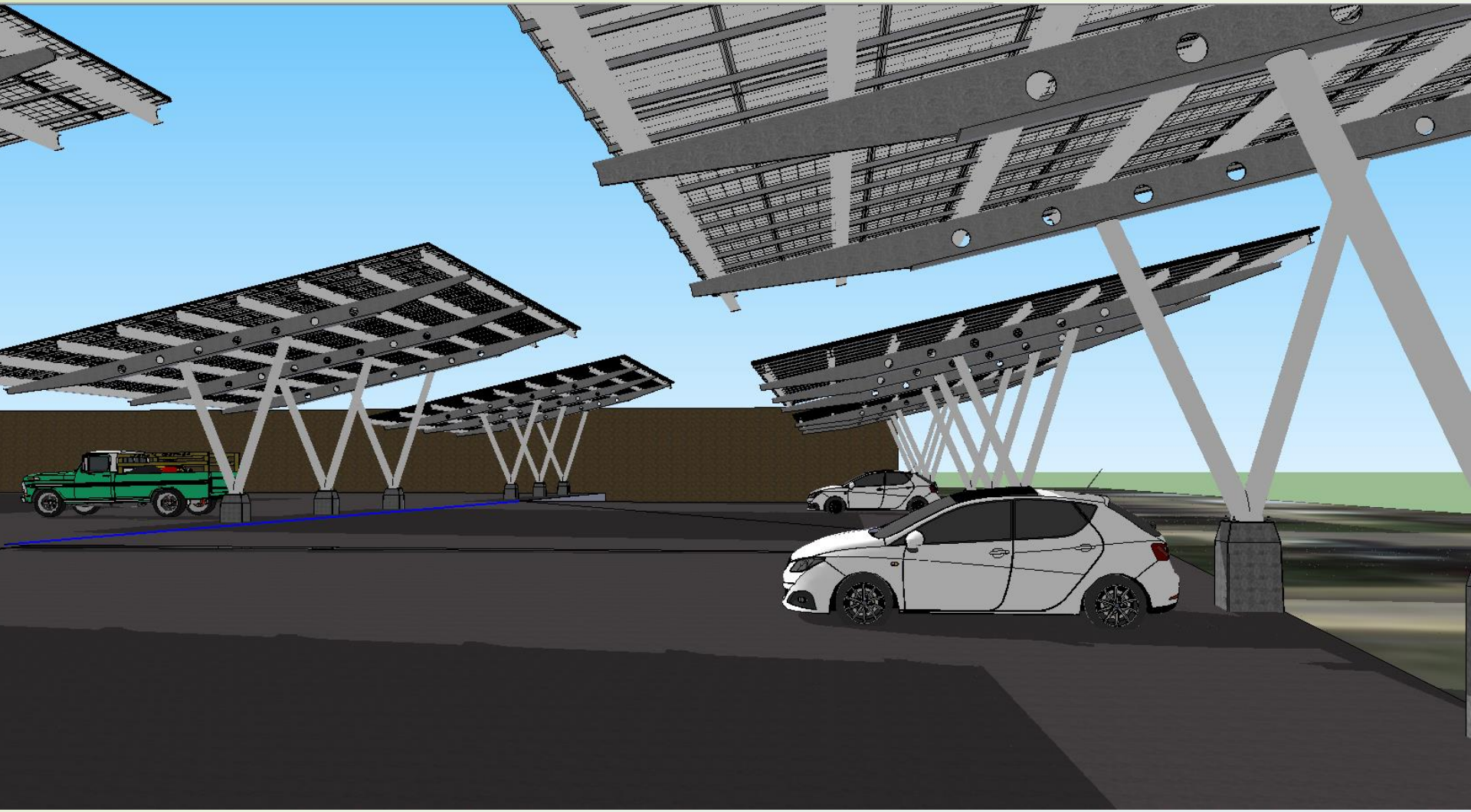
Challenges

- 30% Federal Tax Credit sunsets in end of 2016
- Property Investor Lender Consent
- Volatility of SREC Incentive Market

Opportunities

- Portfolio-scale projects
- Community Solar
- Carports
- Solar Development Services

Channel Square Carport Design



For additional information, contact:

Jared Lang
Sustainable Development Manager
National Housing Trust
jlang@nhtinc.org
(202) 333-8931 x115

WinnCompanies

Solar Photovoltaic to Benefit Affordable Housing

Darien Crimmin
Vice President of Energy & Sustainability
dcrimmin@winnco.com

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WinnCompanies

Develops, acquires, and manages a diverse portfolio of properties across the United States.

Largest manager of affordable housing in the country

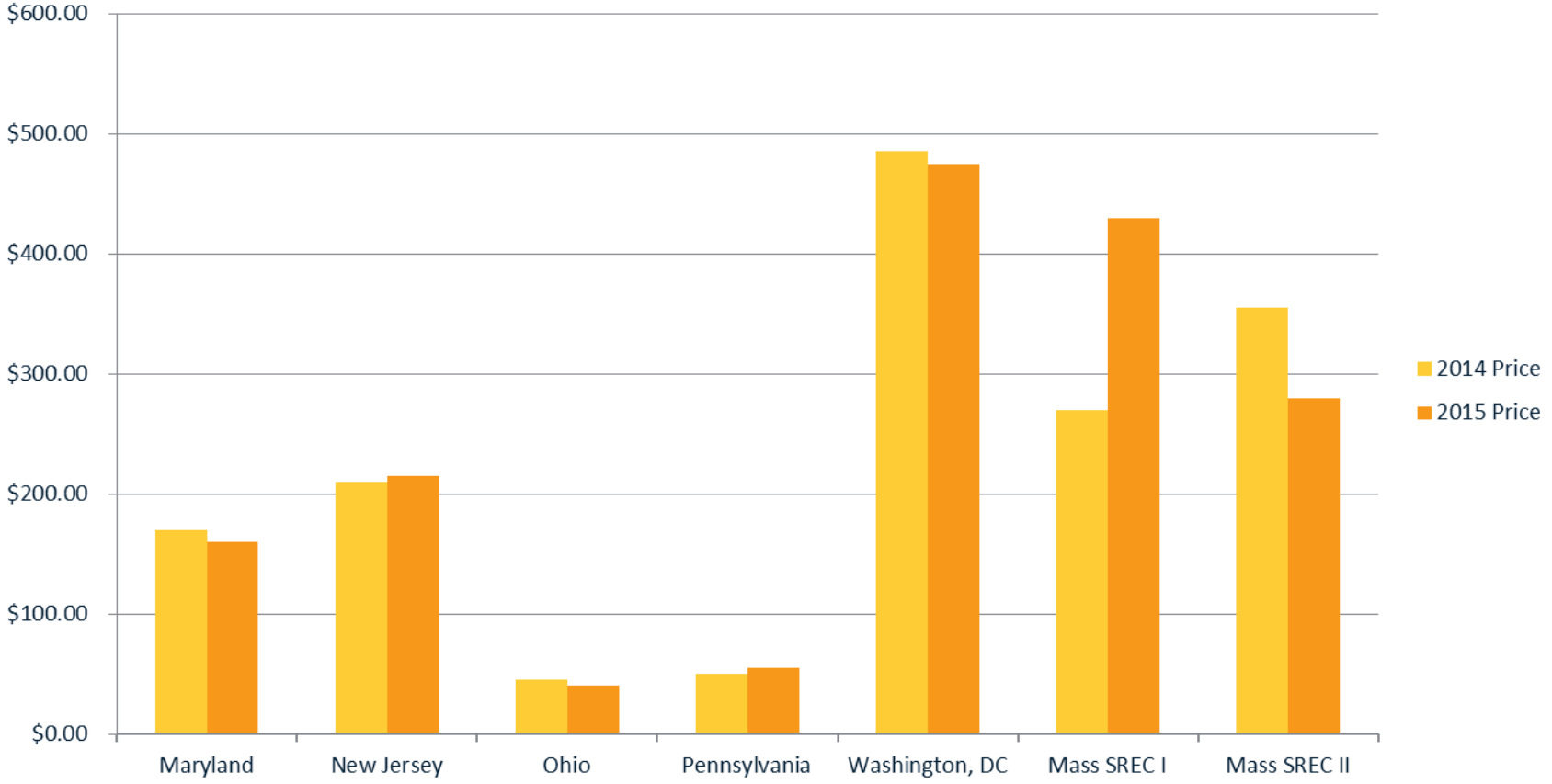
President's challenge – 100 MW to benefit affordable housing by 2020

Solar experience from 2007-2015 and beyond…

Solar Incentives

- 30% Federal Tax Credits
- MACRS depreciation
- State level rebates & production based incentive
  - California MASH program & NYSERDA (grants)
  - Solar Renewable Energy Certificates (SRECs)
- Net Metering

SRECS in Various States



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Solar Pricing

Dramatic reduction in pricing improves economic returns

- 2008 – Winn Solar (820 kW)
  - $7.19/watt (construction); $9.05/watt (TDC)
- 2012 – Winn Solar II (293 kW)
  - $3.72/watt (construction); $4.80/watt (TDC)
- 2014 – Winn Solar 3 (479 kW)
  - $2.99/watt (construction); $4.10/watt (TDC)
- 2015 – Winn Solar IV (1137 kW)
  - $2.25/watt (construction); $3.20/watt (TDC)

2012 Winn Solar Example

293 kW Solar PV, 1278 Yingli panels, single roof

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2012 Winn Solar Example

- TDC = $1,310,000
- Installation Cost = $1,091,001 / Soft Costs = $220,675
- $760,000 loan (10 years @ 6%, recourse)
- 30% Federal Investment Tax Credit (grant) = $388,772

- Winn Solar II LLC lease roof space and sells electricity to the site through a Power Purchase Agreement (PPA)
  - PPA Income = $52,447/year
  - Estimated SREC Income = $80,000/year

Offsite Solar Net Metering

Host Customer = Offsite solar facility
Size = 1 megawatt (DC)
Annual production = 1,250,000 kWh

Host produces more solar electricity than it consumes (via "net meter"). Utility credits host account with value of net metered credits

Example Value of Net Metered Credits = $0.20/kwh

Annual value = 1,250,000 kwh x $0.20/kwh = $250,000

$250,000 in credits

Payment supports financing of solar facility

$200,000 payment (20% discount)

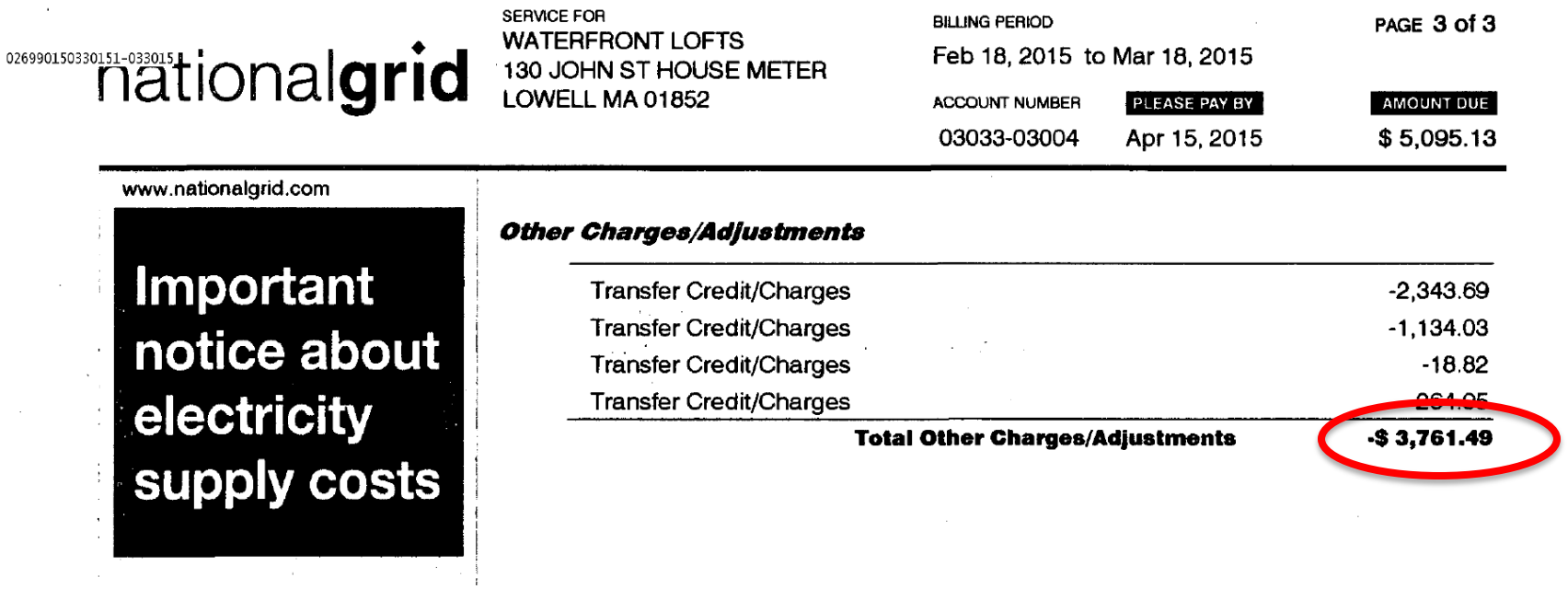
Sale of credits from multiple housing customers via Net Metering Purchase Agreement.

Off-taker = utility customer in same load zone. Greater SREC incentive given to affordable housing

Solar Net Metering Credits

- **Net Metering Credits (NMC) are dollar credits per kilowatt hour** produced by a solar facility
- In Utility Interconnection process for a new solar facility,
  - A Host Customer is designated – may be the solar developer, or virtual host
  - Net solar production in KWH is credited at approximately the current retail rate
  - Credits are transferred monthly to one or several "Off-Taker" electric accounts

Credits on NGRID bill



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nationalgrid

SERVICE FOR
WATERFRONT LOFTS
130 JOHN ST HOUSE METER
LOWELL MA 01852

BILLING PERIOD
Feb 18, 2015 to Mar 18, 2015

PAGE 3 of 3

ACCOUNT NUMBER	PLEASE PAY BY	AMOUNT DUE
03033-03004	Apr 15, 2015	$ 5,095.13

www.nationalgrid.com

Important notice about electricity supply costs

Other Charges/Adjustments

Transfer Credit/Charges	-2,343.69
Transfer Credit/Charges	-1,134.03
Transfer Credit/Charges	-18.82
Transfer Credit/Charges	[illegible]
Total Other Charges/Adjustments	**-$ 3,761.49**

$3,761 in credits received x 85% = **$3,196** owed

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Virtual Net Metering Example

- 839 KW, 1,048,750 KWH/yr, $ 199,262 NMC/yr
- NMC allocation to two multifamily meters (54% and 46%)
- 15% Discount to sites

Month	Monthly Solar Production Curve	Monthly Production (kWh)	Monthly NMC	A. 54% NMC to Wat Lofts	B. Projected 2015 Elec Costs	C. NGRID minus NMC (Col. B + A)	D. Payments to NGRID (AUM)	E. NMC Payments to OME - 85% of Column A	F. Total Monthly Payment (Col.D + E)	Total Savings
Jan	5.0%	52,582	$ (9,990)	$ (5,395)	$ 10,675	$ 5,280	$ 5,280	$ 4,586	$ 9,866	$ (809)
Feb	6.5%	68,418	$ (12,999)	$ (7,020)	$ 10,287	$ 3,268	$ 3,268	$ 5,967	$ 9,234	$ (1,053)
Mar	8.5%	88,961	$ (16,903)	$ (9,127)	$ 9,752	$ 625	$ 625	$ 7,758	$ 8,383	$ (1,369)
Apr	9.4%	98,777	$ (18,768)	$ (10,135)	$ 9,105	$ (1,029)	$ -	$ 8,614	$ 8,614	$ (491)
May	11.3%	118,999	$ (22,610)	$ (12,209)	$ 7,828	$ (4,381)	$ -	$ 10,378	$ 10,378	$ 2,550
Jun	10.9%	114,566	$ (21,768)	$ (11,755)	$ 10,985	$ (769)	$ -	$ 9,991	$ 9,991	$ (994)
Jul	11.8%	123,691	$ (23,501)	$ (12,691)	$ 14,517	$ 1,826	$ -	$ 10,787	$ 10,787	$ (3,730)
Aug	10.9%	114,313	$ (21,720)	$ (11,729)	$ 15,575	$ 3,846	$ -	$ 9,969	$ 9,969	$ (5,606)
Sep	9.0%	94,729	$ (17,998)	$ (9,719)	$ 14,447	$ 4,728	$ 4,221	$ 8,261	$ 12,482	$ (1,965)
Oct	7.2%	75,295	$ (14,306)	$ (7,725)	$ 11,319	$ 3,594	$ 3,594	$ 6,566	$ 10,160	$ (1,159)
Nov	5.0%	52,532	$ (9,981)	$ (5,390)	$ 9,211	$ 3,821	$ 3,821	$ 4,581	$ 8,403	$ (808)
Dec	4.4%	45,888	$ (8,719)	$ (4,708)	$ 9,831	$ 5,123	$ 5,123	$ 4,002	$ 9,125	$ (706)
Total	100.0%	1,048,750	$(199,263)	$ (107,602)	**$ 133,533**		**$ 25,931**	**$ 91,461**	**$ 117,393**	**$ (16,140)**

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Property level savings

Solar Deal	Off-taker Distribution	Annual NMC	Discount	Payment to Host	Savings
Gardner	One Site; 10 accounts	$ 33,774	$.13 fixed	$ 28,145	$ 5,629
Hubbardston	Two Sites; 2 Accounts	$ 199,263	15%	$ 169,373	$ 29,889
East Bridgewater	One Site; 1 Account	$ 60,119	20%	$ 48,095	$ 12,024
WinnSolar 3	Two Sites; 2 Accounts	$ 104,000	10%	$ 93,600	$ 10,400
Brimfield Solar	Four Sites; 22 Accounts	$ 160,550	20%	$ 128,440	$ 32,110
Fairhaven	Two Sites; 2 Accounts	$ 115,343	15%	$ 98,041	$ 17,301
Westminster	Five Sites; 9 Accounts	$ 174,040	15%	$ 147,934	$ 26,106
Boston	Two sites; 3 Accounts	$ 117,258	10%	$ 105,533	$ 11,726
Beverly	One Site; 2 Accounts	$ 250,000	15%	$ 212,500	$ 37,500
Total		**$ 1,214,346**		**$ 1,031,661**	**$ 182,685**

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Questions…

Solar Photovoltaic to Benefit Affordable Housing

Darien Crimmin
Vice President of Energy & Sustainability
dcrimmin@winnco.com



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