Sustaining Clean Energy Initiatives by Recycling Energy Savings: RLFs

Kerry Campbell, Pennsylvania Department of Environmental Protection
Benjamin Healy, Connecticut Clean Energy Finance & Investment Authority
Jeff Wrigley, University of Utah
Nicholas Whitcombe, New York Green Bank

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Empowering you to make smart energy choices

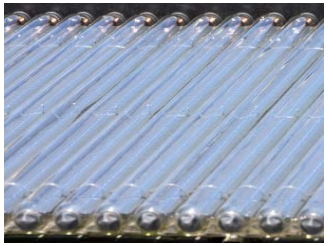
Clean Energy Finance and Investment Authority

Residential Financing Structures and Driving Demand

Better Buildings Summit
May 8, 2013

Connecticut Green Bank

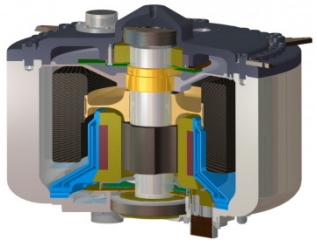
Clean Energy Defined by Public Act 11-80







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Connecticut Green Bank

Clean Energy Defined by Public Act 11-80

Equity

Grants

Loans

Special Capital Reserve Fund

Subordinated Debt

Third Party Insurance

Loan Loss Reserves

Leases, PPAs, and ESAs

Energy Savings Performance Contracts

Bonding

Commercial Property Assessed Clean Energy

On Bill Repayment

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Clean Energy Policy Goals

Need for Finance and Private Capital

- **Enable energy efficiency improvements for at least 15% of single family homes in the state by 2020** – approximately 150,000 homes at $10,000 to achieve 20% energy reduction would require an **investment of $1.5 billion**
- **Support the conversion from oil to natural gas for at least 200,000 households in the state in 8 years** – at $7,500 for an average cost of conversion with equipment for an estimated **investment of $1.5 billion**
- **Estimate potential market of over 150,000 households to install solar PV in the state** – at an average cost of $27,000,000 per system would require an **investment of $4.0 billion**

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Residential Products

Solar PV (and beyond)

CEFIA has developed financing options available to homeowners through program contractors to help make energy upgrades more affordable, including leasing and loan options with little to no out-of-pocket costs.

$85M available for homeowners across 4 products

	CT Solar Lease	CT Solar Loan	Smart-E Loan	Cozy Home Loans
Approx. Amount Available	$60M ($50M Resi.)	$5M	$28M	$2.5M
Eligible Technologies	Solar PV Solar Hot Water	Solar PV	Efficiency, HVAC All renewables (PV, SHW, Geothermal, Biomass, etc)	Efficiency, HVAC All renewables (PV, SHW, Geothermal, Biomass, etc)
Ownership	No (option to purchase)	Yes	Yes	Yes
Down Payment?	Not required if installed cost is less than $4.50/W	Minimum of 5% of net installed cost	Not required	Not required
Interest Rate	N/A (20 years)	6.49% (15 years)	4.49% (5-yr), 4.99% (7-yr), 5.99% (10-yr), 6.99% (12-yr)	5.99% (10 years)

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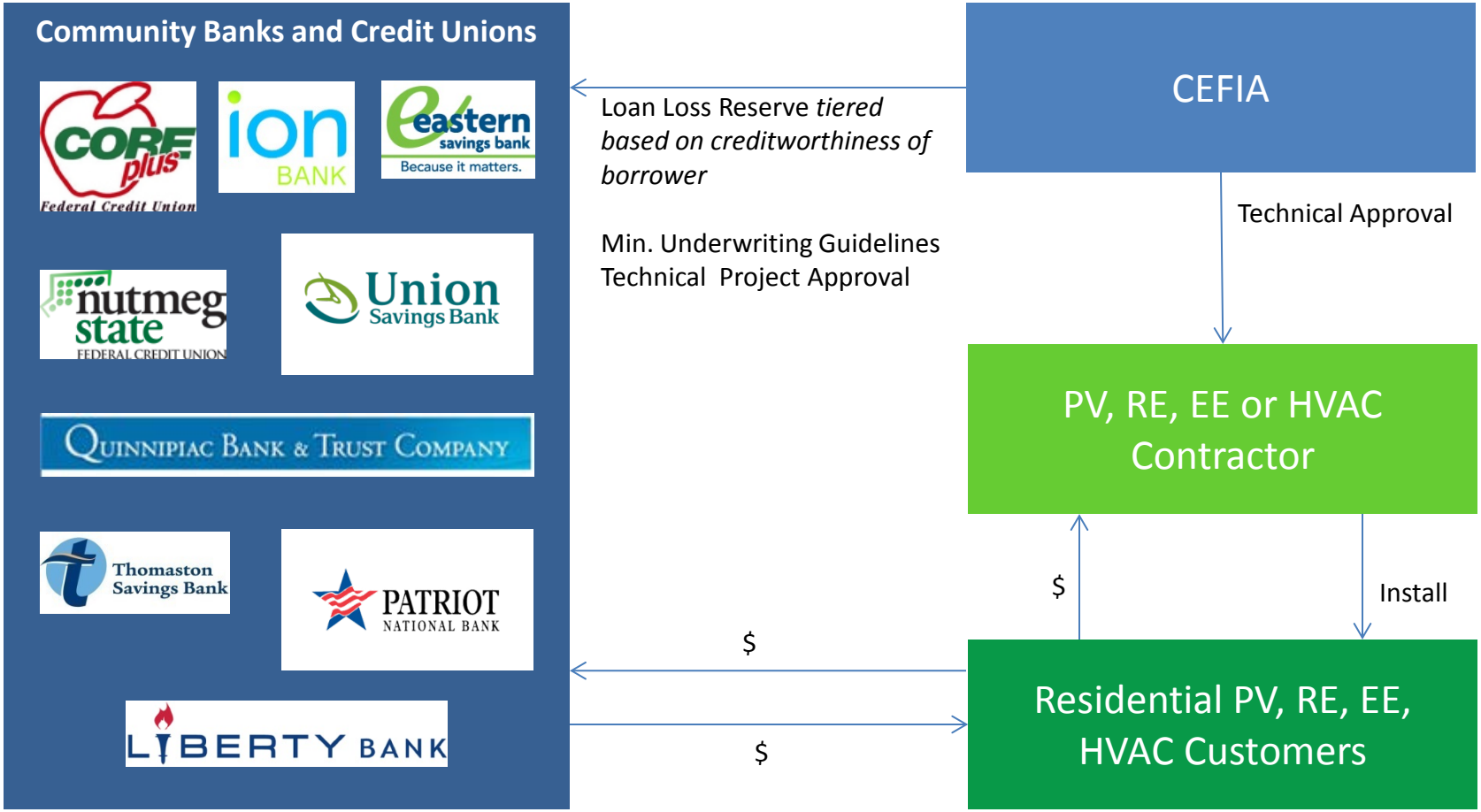
Smart-E Loan
Basic Structure

energize CONNECTICUT SMART-E LOANS



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Smart-E Loan Credit Enhancements

Deploying More Private Capital at Lower Costs

	Role	Major Risk(s)	How Addressed
CORE plus Federal Credit Union, ion BANK, eastern savings bank Because it matters., Union Savings Bank, nutmeg state FEDERAL CREDIT UNION, PATRIOT NATIONAL BANK, QUINNIPIAC BANK & TRUST COMPANY, Thomaston Savings Bank, LIBERTY BANK	Primary Lenders and Servicers	Customers can't or won't pay loan	Loan Loss Reserve Technical Origination

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CT Solar Loan
Basic Structure

CEFIA

$ from loan repayments (20%)

Sub Debt

MOSAIC

Debt

$ from loan repayments (80%) + LLR

CT Solar Loan LLC
(CEFIA Sub)

$

$ from loan repayments (100%)

Sungage & Concord

$

Contract

PV Contractor

Monthly Loan Payment

Loan Agreement

Install

Residential PV Customer

CT Solar Loan provides **local installers** an important **sales tool**, while customers can take the **30% ITC** and benefit from **long-term, low cost capital** that allows them to **own** PV

CT Solar Loan Uses Sub Debt & LLR
to Enhance Credit

	Role	Major Risk(s)	How Addressed
MOSAIC	Senior Lenders to CT Solar Loan	Not enough cash for debt service	Loan Loss Reserve Subordinated Debt
CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY	Subordinated Debt	Customers can't or won't pay loan Install / Contractor Risk - PR	Loan Loss Reserve CEFIA Rebate Sungage

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CT Solar Lease
Basic Structure

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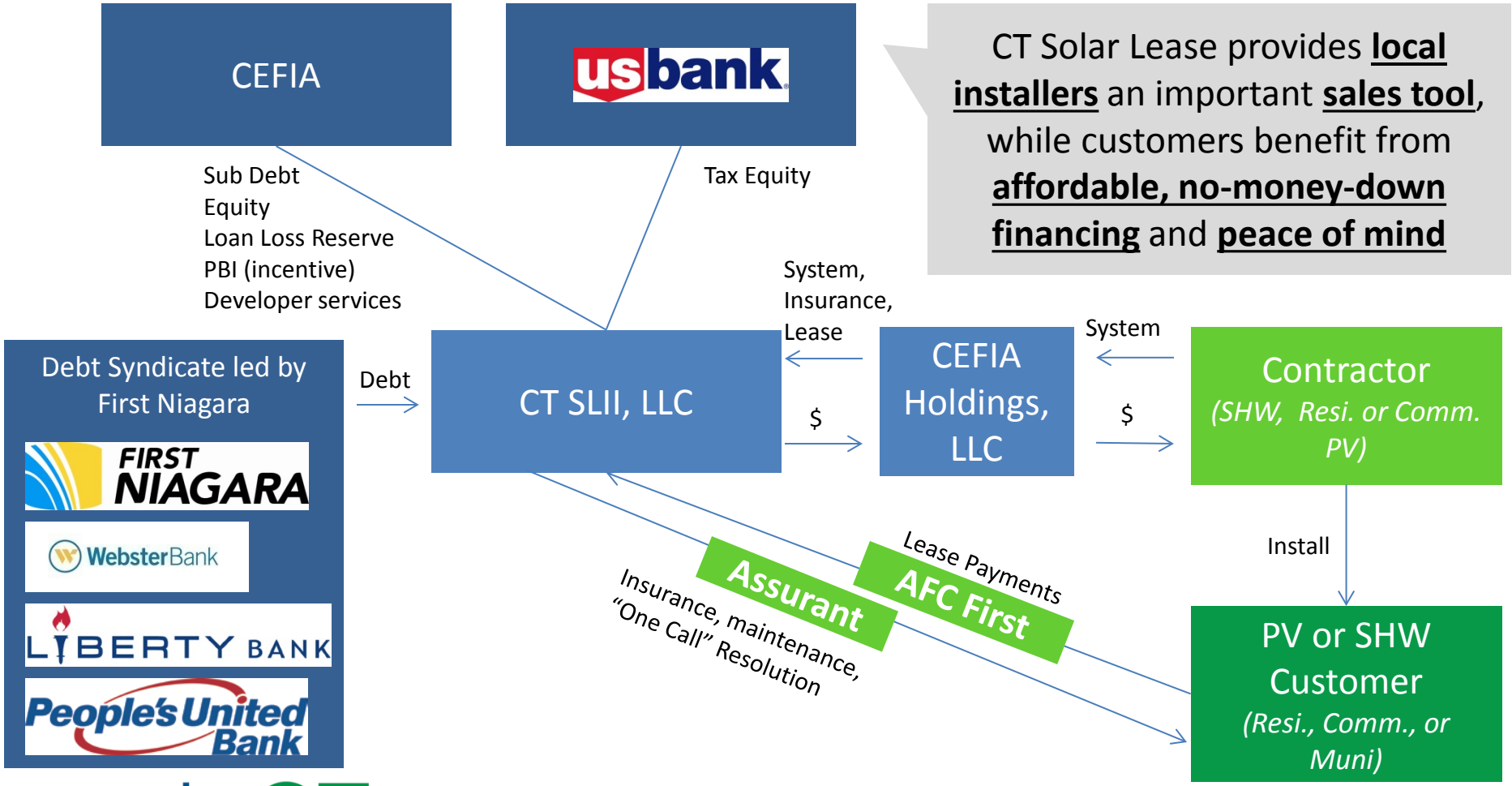
CT SOLAR LEASE



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CEFIA Drew Multiple Private Investors
into CT Solar Lease

	Role	Major Risk(s)	How Addressed
usbank	Tax Equity	Recapture caused by default	Loan Loss Reserve PBI CEFIA Equity Assurant Bundle
FIRST NIAGARA WebsterBank LIBERTY BANK People's United Bank	Lend to CT SLII *at a % of capital for "build" cost*	Not enough cash for debt service Interest rate risk	Loan Loss Reserve PBI Assurant Bundle Rate swap
CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY	Subordinated Debt Equity Fund Developer	Customers can't or won't pay lease Install / Contractor Risk - PR	Loan Loss Reserve PBI Assurant Bundle

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Marketing: Aggregating Demand ...

... Lowers Costs and Attracts Cheaper Capital

- Demand aggregation through channel marketing strategy brings scale efficiencies to installation, lowers costs of projects
- Also takes step toward obtaining scale needed to draw private capital at low costs

CEFIA Credit-Enhanced Product	Demand Aggregation	Market Transformation
CT Solar Loan CT Solar Lease II Smart-E Loans	goSolarCT.com energize CONNECTICUT Solarize CONNECTICUT ENERGIZE NORWICH	9% year-over-year reduction in residential installed $/W since 2011 150% year-over-year CAGR in installed kW since 2011

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Energize and Solarize

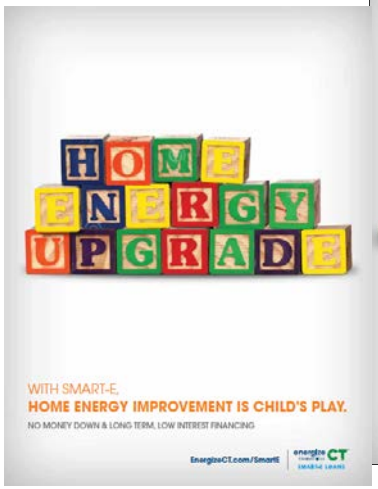
Community-Based Demand Aggregation

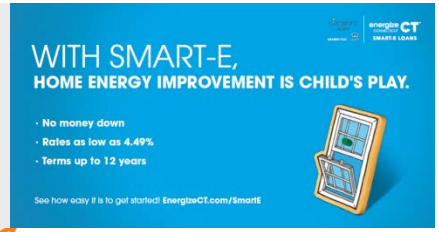
Sagewell reports

Trusted, independent advisor

Customer Acquisition
Channel Support

- Co-branded collateral for lenders, contractors and communities
- Online paid search (CEFIA)
- Facebook posts (CEFIA, partners) and e-blasts (partners)
- Print opportunities (e.g. lender statement inserts)





SMART-E LOAN

CURRAN FAMILY

- Kenny and Katie Curran
- 26 solar panels
- In the first 90 days, the solar panels paid for **40–45%** of their energy needs
- 75 kWh to 41 kWh per day saving **$xxx**

Smart-E Loan

Channel Marketing – Capital Providers

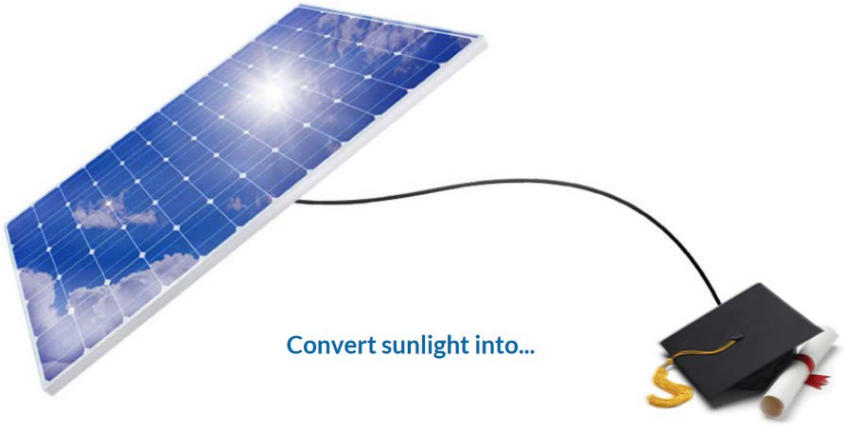
gosolarCT.com GO SOLAR. GET STARTED HERE.

Start converting sunlight into savings

with affordable financing options from GoSolarCT.
Take control of your energy costs with a worry-free investment and save money for years to come.

GoSolarCT

Tools for the “Solar Curious”



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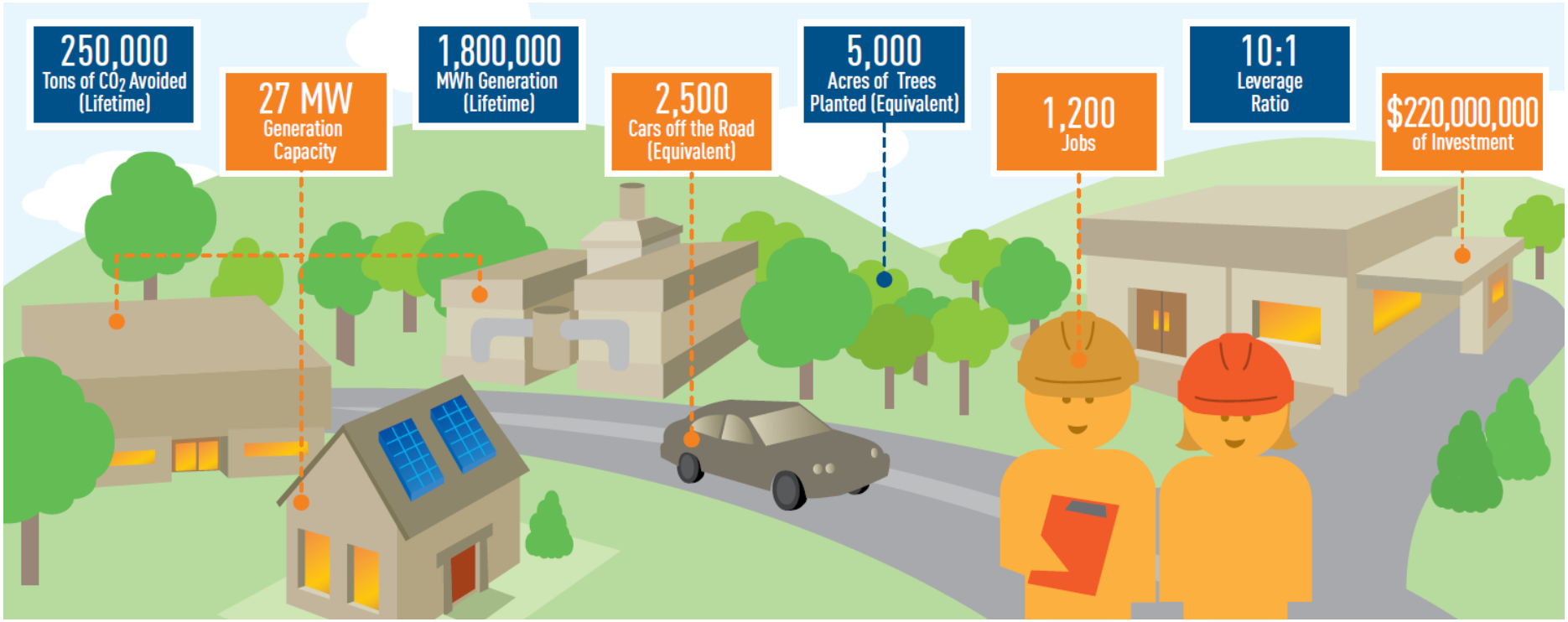
The Green Bank Model Works

Doing More, Faster and Under Budget



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Empowering you to make smart energy choices

Thank You!

Ben Healey
Senior Manager
300 Main St., 4th Floor
Stamford, CT 06901
www.ctcleanenergy.com
benjamin.healey@ctcleanenergy.com
(860) 257-2882

THE UNIVERSITY OF UTAH

Facility Operations
Energy Management Fund

Sustaining Clean Energy Initiatives by
Recycling Energy Savings: RLFs

Before the Energy Management Fund

In The Beginning…

Energy Savings Performance Contract (ESCO)

- Multiple Phases between 1998 and 2001
  - Campus wide energy conservation measures
  - New HTW/CHW plant for Health Sciences

Energy Management founded in 2001

- To ensure performance of ESCO project
- To identify other energy saving opportunities
- To provide analytical support
- To manage campus metering system

Before the Energy Management Fund

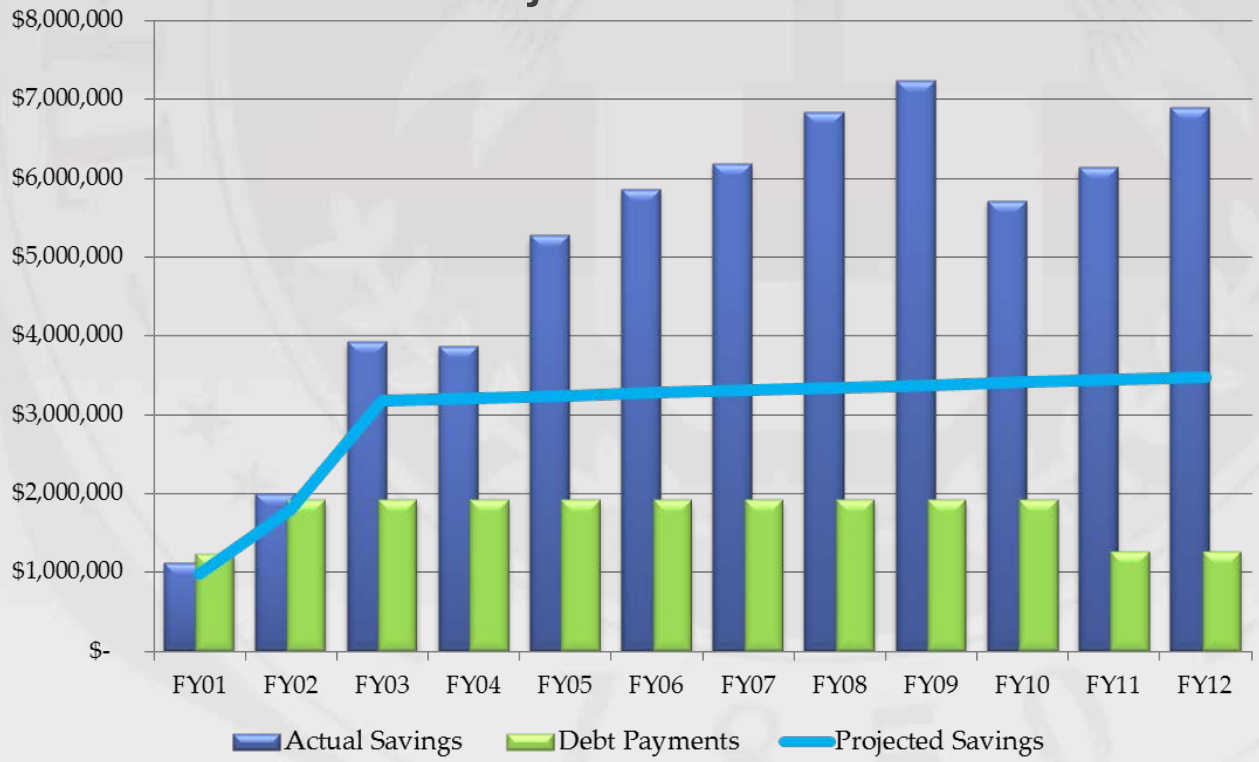
Energy Management Projects/Programs

- Retrocommissioning
  - Utility funded program
- Miscellaneous energy improvement projects
  - Maintenance funding
  - Capital improvement funding (very limited)
  - State energy program grants
- Behavioral Program

Results: **$293,000** savings from projects
$1.25M net savings from EPC/Behavioral

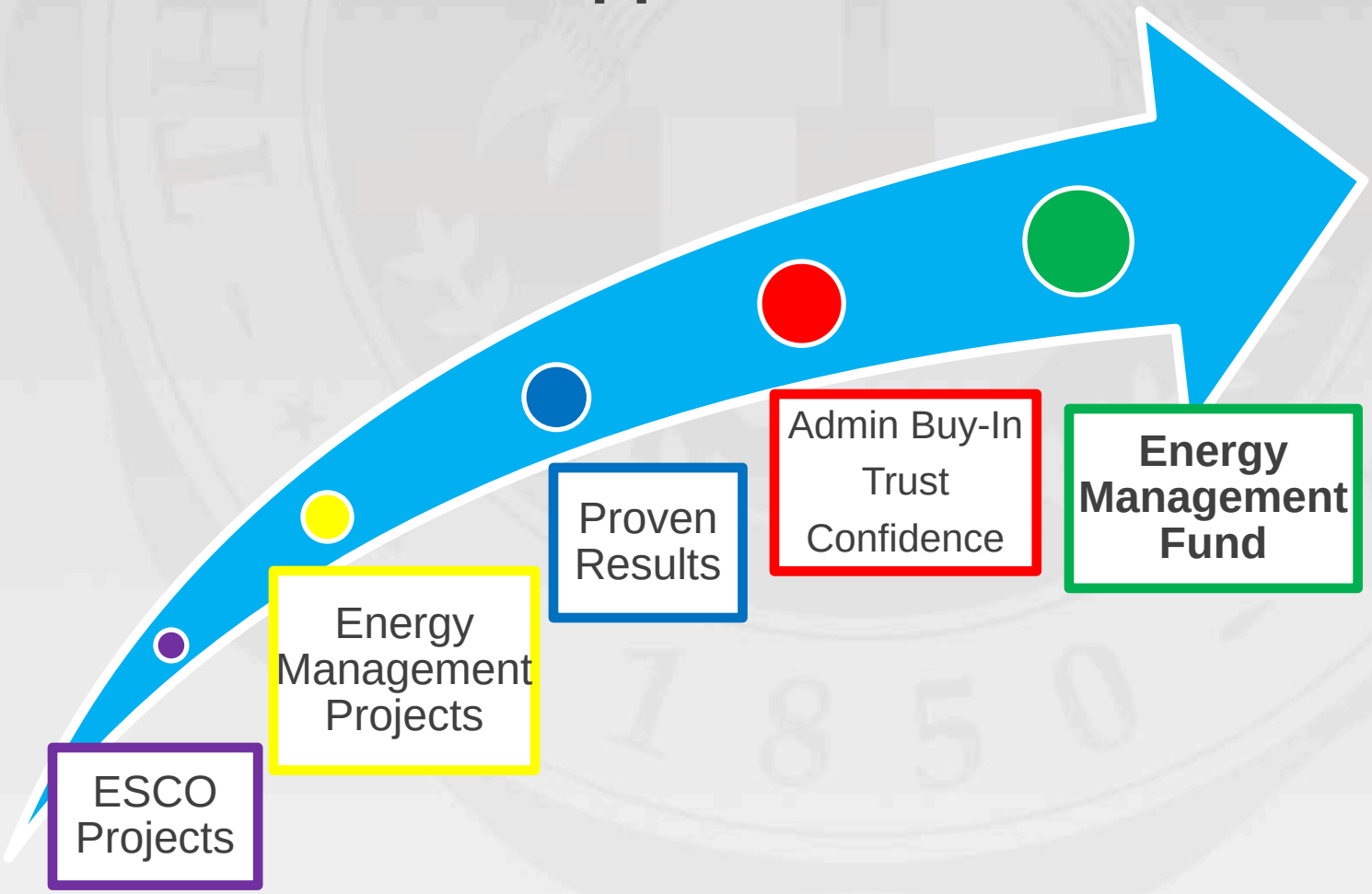
Before the Energy Management Fund

ESCO Project Performance



- Savings calculations based primarily on metered consumption
- Excess savings applied to debt retirement

The Path to Approval of the Fund



Creation of the Energy Management Fund

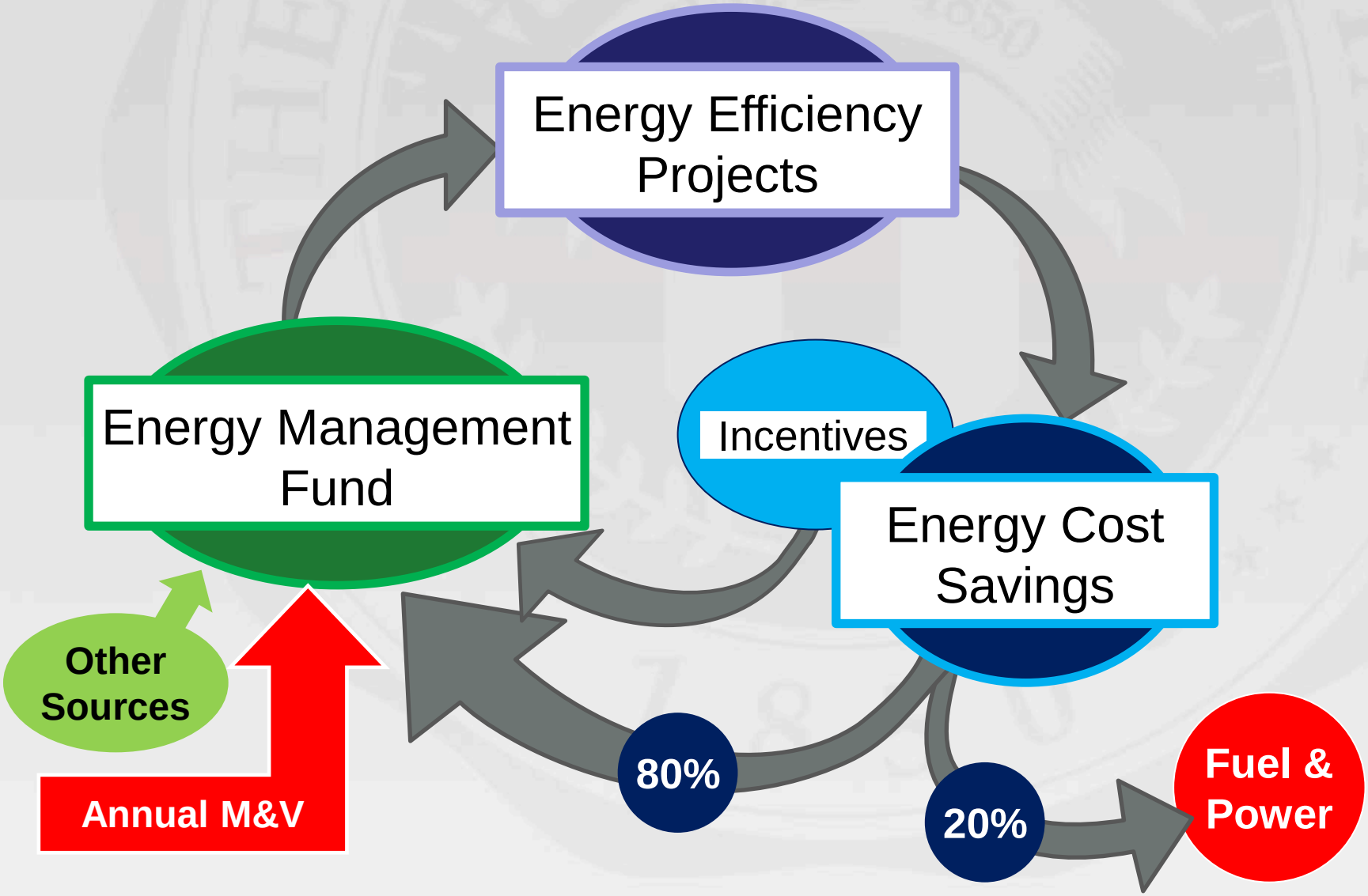
2007 Proposal Details

1. Discontinue ESCO Measurement & Verification Contract
   - M&V proved energy/cost savings
   - Allocate M&V budget to Energy Management Fund instead
     - $220,000 starting in fiscal year 2007-2008
     - To grow 1% per year
     - To continue through duration of ESCO payback
   - Use money to ***increase*** energy savings instead of measure savings

Creation of the Energy Management Fund

2007 Proposal Details

2. Establish Shared Savings Model
   - 80% of annual savings to return to Fund until project is repaid
   - 20% to Fuel & Power accounts
   - 100% to Fuel & Power accounts after project repaid
     - Total duration limited depending on project type
3. Use Other Sources to Leverage Fund
   - Utility incentives
   - Grants
   - Other university/departmental funds


Energy Efficiency Projects
Energy Management Fund
Incentives
Energy Cost Savings
Other Sources
Annual M&V
80%
20%
Fuel & Power

Management of the Fund

- Energy Management has (almost) complete autonomy
  - Limited oversight
  - Semiannual reporting to Administration
  - No project approval process
  - Energy Manager decides what projects will be done
- Must follow fund rules…

Management of the Fund

Management of the Fund

Simplicity

- Project Development
  - In-house expertise for simple projects
    - Utility tools for scoping and calculating savings
  - Facilities Engineers for larger projects
  - Consultants for larger projects/retrocommissioning
- Implementation
  - Maintenance projects as much as possible
    - Less restrictive design & procurement
- Measurement & Verification
  - No M&V, savings based on design calculations
    - Will change as campus metering improves
- Documentation

Using the Fund

Types of Projects

- Projects with associated energy savings
  - Retrocommissioning
  - Efficiency improvements
    - Lighting, HVAC, etc
  - Conservation projects
    - Computer mgmt, envelope improvements, etc.
- Programs & projects without energy savings
  - Ongoing verification of ESCO savings (simplified)
    - Calculated in-house and verified by 3rd party
  - Maintenance and expansion of campus metering
  - Engineering studies to determine opportunities

Using the Fund

Sources of Projects

In addition to Energy Management:

- Construction Project Delivery group (PMs)
- Campus Utility Services
  - Facility Engineers
  - Facility Coordinators
- Students
  - Sustainable Campus Initiative Fund (SCIF)
- Vendors

Using the Fund

Leveraging Funds

- Using other funds to leverage EMF
  - Departmental funds
  - Sustainable Campus Initiative Fund
  - State 0% Revolving Loan Fund
- Using EMF as leverage in other projects
  - Capital improvement projects
    - Cover incremental cost of higher energy efficiency
- SCIF
  - Mutual leveraging between EM & SCIF funds

THE UNIVERSITY OF UTAH

Tracking & Capturing Savings

Screenshots of Cash Flow Summary

ENERGY MANAGEMENT PROJECTS	TOTAL PROJECT COSTS						ENERGY SAVINGS					
PROJECTS	TOTAL COST	OTHER FUNDING	ENERGY MGMT COST	Project Completion	Max Years of Savings	To Date Years of Savings	Annual kWh Savings	To Date kWh Savings	Avg Monthly kW Savings	Retired kW Savings	Annual DTH Savings	To Date DTH Savings
533 RETROCOMMISSIONING (DFCM Grant)	$ 64,500.00	$ 64,500.00	$ -	12/31/2007	5	5.00	721,724	3,608,620		68.8		-
570 RETROCOMMISSIONING (DFCM Grant)	$ 61,083.34	$ 22,880.00	$ 38,203.34	12/31/2007	5	5.00	202,790	1,013,950		82.4		-
302 EAST HTW PLANT COMBUSTION IMP	$ 60,000.00	$ -	$ 60,000.00	1/31/2008	5	5.00		-			7,122.5	35,612.5
063 EMCB LIGHTING (DFCM Grant)	$ 121,225.94	$ 90,000.00	$ 31,225.94	1/31/2008	10	6.24	285,433	1,780,633	30.0			-
091-098 HPER LIGHTING (DFCM Grant)	$ 137,995.56	$ 144,124.00	$ (6,128.44)	1/31/2008	10	6.24	841,279	5,248,198	59.0			-
303 LIGHTING	$ 35,540.00	$ -	$ 35,540.00	6/30/2008	10	5.82	168,355	980,610	18.6			-
555 HCI COMPUTER MGMT SOFTWARE	$ 7,740.00	$ -	$ 7,740.00	7/31/2008	5	5.00	34,080	170,400				-
072 LAW LIBRARY LIGHTING	$ 44,540.00	$ -	$ 44,540.00	12/31/2008	10	5.32	98,543	524,303	30.0			-
029 FIELDHOUSE LIGHTING												
565 EEJMRB DELAMPING												
350 USB REMODEL (contribut												
040 SSB HVAC IMPROVEMEN												
062 WARNOCK LED LIGHTING												
105 ANNEX BOILER CONTRO												
077 CRCC LAMP REPLACEME												
032 STADIUM LIGHTING CON												
025 BEH COMPUTER MGMT S												
065 MBH LIGHTING												
105 ANNEX & 026 CSW PIPE												
090 HUNTSMAN LIGHTING												
052 ALUMNI PIPE INSULATIO												
008 EMERY LIGHTING												
092 HPER CLASSROOM LT C												
054 OSH PIPE INSULATION												
849 RED BUTTE LED LIGHTIN												
210 DEE GLEN SMITH COND.												

ENERGY MANAGEMENT PROJECTS	COST SAVINGS				TO-DATE SAVINGS		BENEFIT TO ENERGY MANAGEMENT		
PROJECTS	MONTHLY COST SAVINGS (80%)	MONTHLY COST SAVINGS (20%)	MONTHS OF SAVINGS	TOTAL ENERGY COST SAVINGS	TO ENERGY MGMT	TO FUEL & POWER	NET COST AFTER PAYBACK	INCENTIVE	TOTAL NET COST AFTER INCENTIVE
533 RETROCOMMISSIONING (DFCM Grant)	$ 3,066.67	$ 766.67	18	$ 55,200.06	$ 55,200.06	$ 13,800.02	$ (55,200.06)	$ -	$ (55,200.06)
570 RETROCOMMISSIONING (DFCM Grant)	$ 536.69	$ 134.17	60	$ 32,201.40	$ 32,201.40	$ 8,050.35	$ 6,001.94	$ -	$ 6,001.94
302 EAST HTW PLANT COMBUSTION IMP	$ 3,333.33	$ 833.33	18	$ 59,999.94	$ 59,999.94	$ 14,999.99	$ 0.06	$ -	$ 0.06
063 EMCB LIGHTING (DFCM Grant)	$ 788.82	$ 197.21	60	$ 47,329.20	$ 47,329.20	$ 11,832.30	$ (16,103.26)	$ 97,780.75	$ (113,884.01)
091-098 HPER LIGHTING (DFCM Grant)	$ 2,085.82	$ 521.46	60	$ 125,149.20	$ 125,149.20	$ 31,287.30	$ (131,277.64)	$ 110,996.44	$ (242,274.08)
303 LIGHTING	$ 470.73	$ 117.68	60	$ 28,243.80	$ 28,243.80	$ 7,060.95	$ 7,296.20	$ 17,770.00	$ (10,473.80)
555 HCI COMPUTER MGMT SOFTWARE	$ 65.20	$ 16.30	60	$ 3,912.00	$ 3,912.00	$ 978.00	$ 3,828.00	$ 3,870.00	$ (42.00)
072 LAW LIBRARY LIGHTING	$ 677.40	$ 169.35	60	$ 40,644.00	$ 40,644.00	$ 10,161.00	$ 3,896.00	$ 35,632.00	$ (31,736.00)
029 FIELDHOUSE LIGHTING	$ 1,398.95	$ 349.74	60	$ 83,937.00	$ 82,538.05	$ 20,634.51	$ 25,191.34	$ 83,249.60	$ (58,058.26)
565 EEJMRB DELAMPING	$ 533.33	$ 133.33	12	$ 6,399.96	$ 6,399.96	$ 1,599.99	$ (6,135.96)	$ -	$ (6,135.96)
350 USB REMODEL (contribution for ECMs)	$ 2,000.00	$ 500.00	60	$ 120,000.00	$ 106,000.00	$ 26,500.00	$ 134,937.02	$ -	$ 134,937.02
040 SSB HVAC IMPROVEMENTS	$ 6,100.03	$ 1,525.01	18	$ 109,800.54	$ 109,800.54	$ 27,450.14	$ (8,311.67)	$ -	$ (8,311.67)
062 WARNOCK LED LIGHTING	$ 247.40	$ 61.85	60	$ 14,844.00	$ 11,875.20	$ 2,968.80	$ (956.70)	$ -	$ (956.70)
105 ANNEX BOILER CONTROLS	$ 916.40	$ 229.10	12	$ 10,996.80	$ 10,996.80	$ 2,749.20	$ (6,496.80)	$ -	$ (6,496.80)
077 CRCC LAMP REPLACEMENT	$ 337.20	$ 84.30	12	$ 4,046.40	$ 4,046.40	$ 1,011.60	$ (658.62)	$ -	$ (658.62)
032 STADIUM LIGHTING CONTROLS (Dept Funding)	$ 666.67	$ 166.67	60	$ 40,000.20	$ 31,333.49	$ 7,833.37	$ 2,520.57	$ 1,627.03	$ 893.54
025 BEH COMPUTER MGMT SOFTWARE	$ 706.93	$ 176.73	6	$ 4,241.58	$ 4,241.58	$ 1,060.40	$ (2,876.58)	$ -	$ (2,876.58)
065 MBH LIGHTING	$ 637.20	$ 159.30	60	$ 38,232.00	$ 29,311.20	$ 7,327.80	$ 32,632.88	$ 37,991.65	$ (5,358.77)
105 ANNEX & 026 CSW PIPE INSULATION	$ 148.40	$ 37.10	24	$ 3,561.60	$ 3,561.60	$ 890.40	$ (32.60)	$ -	$ (32.60)
090 HUNTSMAN LIGHTING	$ 67.05	$ 16.76	60	$ 4,023.00	$ 2,950.20	$ 737.55	$ 1,161.00	$ 1,256.23	$ (95.23)
052 ALUMNI PIPE INSULATION	$ 74.88	$ 18.72	36	$ 2,695.68	$ 2,695.68	$ 673.92	$ (410.68)	$ -	$ (410.68)
008 EMERY LIGHTING	$ 323.94	$ 80.99	60	$ 19,436.40	$ 13,929.42	$ 3,482.36	$ 19,127.47	$ 35,528.78	$ (16,401.31)
092 HPER CLASSROOM LT CONTROL	$ 58.85	$ 14.71	60	$ 3,531.00	$ 2,471.70	$ 617.92	$ 18,309.51	$ -	$ 18,309.51
054 OSH PIPE INSULATION	$ 36.27	$ 9.07	60	$ 2,176.20	$ 1,523.34	$ 380.84	$ 543.80	$ -	$ 543.80
849 RED BUTTE LED LIGHTING	$ 121.80	$ 30.45	60	$ 7,308.00	$ 4,750.20	$ 1,187.55	$ 1,827.70	$ 2,718.30	$ (890.60)
210 DEE GLEN SMITH COND. BOILERS	$ 898.33	$ 224.58	66	$ 59,289.78	$ 24,254.91	$ 6,063.73	$ 5,710.22	$ 16,243.50	$ (10,533.28)

Tracking & Capturing Savings

Project Data: Dance Theater LED Cyclorama Lighting

INDIVIDUAL PROJECT SUMMARY							STATUS:	CLOSED
PROJECT:	028 MARRIOTT DANCE STAGE LEDs					COMPLETION DATE:		3/31/2012
Work Order #	12-097694							
PROJECT DESCRIPTION:							**UTILITY ACCOUNT IMPACT:**	
Replace existing halogen cyclorama lighting with LED.							100%	ELECTRIC
							0%	FUEL
							0%	WATER
PROJECT COSTS								
TOTAL PROJECT COST:		$ 60,819.80						
OTHER FUNDING:		$ 12,146.00						
NET FUNDING FROM ENERGY MANAGEMENT		$ 48,673.80						
INCENTIVE FUNDS:		$ 48,585.85		Self Direct Credit (bundles with T12 Roundup)				
ENERGY SAVINGS	Elec (kW)	Elec (kWh)	Gas (DTH)					
TOTAL SAVINGS	87.2	164,593	0.0					
COST SAVINGS		Electricity	Gas	TOTAL	ROI (years)	ROI (months)	Total to EM	
ANNUAL COST SAVINGS		$ 10,287.06	$ -	$ 10,287.06	1.2	14.17		
80% ENERGY SAVINGS TO ENERGY MGMT		$ 8,229.65	$ -	$ 8,229.65	7.4	88.68		
Monthly Energy Savings To Energy Mgmt		$ 685.80	$ -	**$ 685.80**		**24**	$ 16,459.30	
20% SAVINGS TO UTILITY ACCOUNT		$ 2,057.41	$ -	$ 2,057.41				

Tracking & Capturing Savings

Project Data: Health Sciences Education Evaporative Cooling

INDIVIDUAL PROJECT SUMMARY							STATUS:	CLOSED
PROJECT:	575 Evaporative Cooling					COMPLETION DATE:		8/31/2013
Work Order #	CPD 21441							
PROJECT DESCRIPTION:							**UTILITY ACCOUNT IMPACT:**	
Add new evap sections to 3 air handlers. Sections added to supply side at outlet of AHUs.							100%	ELECTRIC
							0%	FUEL
							0%	WATER
PROJECT COSTS								
TOTAL PROJECT COST:		$ 205,853						
OTHER FUNDING:		$ 178,903	**DFCM State Facility Energy Efficiency Fund Loan (0%)**					
NET FUNDING FROM ENERGY MANAGEMENT		$ 26,950						
ENERGY SAVINGS	Elec (kW)	Elec (kWh)	Gas (DTH)					
TOTAL SAVINGS	0.0	675,000	0.0	>>>Use blended rate to account for demand savings				
COST SAVINGS		Electricity	Gas	TOTAL	ROI (years)	ROI (months)	Total to EM	
ANNUAL COST SAVINGS		$ 47,200.00	$ -	$ 47,200.00				
80% ENERGY SAVINGS TO ENERGY MGMT		$ 37,760.00	$ -	$ 37,760.00	5.5	65.42		
Monthly Energy Savings To Energy Mgmt		$ 3,146.67	$ -	**$ 3,146.67**		**9**	$ 28,320.00	
20% SAVINGS TO UTILITY ACCOUNT		$ 9,440.00	$ -	$ 9,440.00				
Monthly Energy Savings To Power Account		$ 786.67	$ -	**$ 786.67**		**9**	$ 7,080.00	
SFEEF LOAN BALANCE		$ 178,903						
QUARTERLY PAYMENTS AMOUNT		$ 11,800						
NUMBER OF QUARTERLY PAYMENTS		15.2						

Tracking & Capturing Savings

Project Data: Fieldhouse LED Lighting

INDIVIDUAL PROJECT SUMMARY							STATUS:	OPEN
PROJECT:	212 SEFH LED Lighting					COMPLETION DATE:		6/320/14
Work Order #								
PROJECT DESCRIPTION:							**UTILITY ACCOUNT IMPACT:**	
Replace 875 watt MH fixtures with 539 watt LED fixtures							100%	ELECTRIC
							0%	FUEL
							0%	WATER
PROJECT COSTS								
TOTAL PROJECT COST:		$265,000.00						
OTHER FUNDING:		$ 66,250.00		25% covered by Athletics through monthly bill add-on				
NET FUNDING FROM ENERGY MANAGEMENT		$198,750.00						
INCENTIVE FUNDS:		$212,000.00		RMP Bill Credit				
ENERGY SAVINGS	Elec (kW)	Elec (kWh)	Gas (DTH)					
TOTAL SAVINGS	54.0	330,439	0.0					
COST SAVINGS		Electricity	Gas	TOTAL	ROI (years)	ROI (months)	Total to EM	
ANNUAL COST SAVINGS		$ 16,250.00	$ -	$ 16,250.00				
100% ENERGY SAVINGS TO ATHLETICS		$ 16,250.00	$ -	$ 16,250.00	4.1	49.00		

Results

Energy Management Fund Inflow History					
	M&V	Energy Savings	Incentives	Other In	Total Inflows
FY08	$ 220,000.00	$ 5,000.00			$ 225,000.00
FY09	$ 222,200.00	$ 137,062.87	$ 303,012.30	$ 10,000.00	$ 672,275.17
FY10	$ 224,422.00	$ 176,269.94	$ 48,594.78	$ (252,100.00)	$ 197,186.72
FY11	$ 226,666.22	$ 232,023.83	$ 68,137.10	$ 53,756.41	$ 580,583.56
FY12	$ 228,932.66	$ 217,337.18	$ 74,041.55	$ 103,529.89	$ 623,841.28
FY13	$ 231,211.32	$ 233,403.68	$ 209,868.32	$ 3,076.90	$ 677,560.22
FY14	$ 233,533.53	$ 109,678.79	$ 165,223.21	$ 10,065.00	$ 518,500.53
TOTAL	$ 1,586,965.73	$ 1,110,776.29	$ 868,877.26	$ (71,671.80)	$ 3,494,947.48

Outflow Summary			
		Outflows	% of Total
(Projects with returns)	EE Projects	$ 2,053,830.06	69.1%
(Projects without returns)	Metering	$ 572,677.87	19.3%
	M&V	$ 258,221.29	8.7%
	Other	$ 88,247.35	3.0%
TOTAL PROJECTS		$ 2,972,976.57	

Results

Project Energy Savings Summary (Savings to Date)

Project Group	kWh Savings	Avg Monthly kW Savings	DTH Savings
FY08	12,461,701	258.8	35,612.5
FY09	3,540,562	145.5	-
FY10	12,698,628	676.6	19,582.8
FY11	2,325,473	143.3	43,059.9
FY12	2,901,491	292.9	9,984.1
FY13	484,432	57.8	539.4
FY14	74,017	33.1	750.9
TOTAL	34,486,304	1,608.0	109,529.7

Project Energy Cost Savings Summary

Project Group	Energy Savings to Energy Mgmt	Energy Savings to Fuel & Power	Maximum Savings to Energy Mgmt	% Paid Back
Retired Projects (no longer saving)	$ 216,505	$ 54,126	$ 216,505	100%
Repaid Projects (still saving)	$ 393,248	$ 98,312	$ 393,248	100%
Projects Still in Payback				
FY09	$ 82,538	$ 20,635	$ 83,937	98%
FY10	$ 199,395	$ 49,849	$ 242,243	82%
FY11	$ 115,669	$ 28,917	$ 230,360	50%
FY12	$ 134,280	$ 33,570	$ 245,752	55%
FY13	$ 17,474	$ 4,369	$ 90,977	19%
FY14	$ 2,672	$ 668	$ 96,116	3%
TOTAL	$ 1,161,782	$ 290,445	$ 1,599,138	73%

Results

Simple Payback by Fiscal Year (Total Project Cost / Total Annual Cost Savings)

Project Year	EE Project Cost	Annual Cost Savings	Simple Payback (years)
FY08	$ 480,345	$ 154,236	3.1
FY09	$ 161,672	$ 40,128	4.0
FY10	$ 604,974	$ 184,824	3.3
FY11	$ 425,710	$ 147,300	2.9
FY12	$ 436,200	$ 109,920	4.0
FY13	$ 136,474	$ 28,152	4.8
Overall	**$ 2,245,375**	**$ 664,560**	**3.4**

Simple Payback by Fiscal Year (Cost to EMF* / 80% Cost Savings)

Project Year	Cost to EMF	Annual Cost Savings	Simple Payback (years)
FY08	$ (67,706)	$ 123,389	0.0
FY09	$ 38,921	$ 32,102	1.2
FY10	$ 490,670	$ 147,859	3.3
FY11	$ 291,343	$ 117,840	2.5
FY12	$ 51,113	$ 87,936	0.6
FY13	$ 100,349	$ 22,522	4.5
Overall	**$ 904,690**	**$ 531,648**	**1.7**

Summary of Results (2008-2013)

- ✓ EE Projects Completed: **76**
  Cost: **$2.4 million**
- ✓ Energy Saved: **34.5 million kWh**
  1.6 MW demand reduction
  109,000 DTH
- ✓ Energy Costs Avoided: **$1.45 million** (to date)
- ✓ Emissions Saved: **18,000 metric tons**
- ✓ Incentives Received: **$870,000** (to date)
- ✓ Savings Recycled: **$1.16 million**

Benefits of Revolving Energy Management Fund

- ✓ No need to request funding for individual projects
- ✓ Energy projects don't have to compete for funding against maintenance and capital improvements
- ✓ Faster growth than through appropriation alone
- ✓ Eventually 100% self-supporting fund
- ✓ Low risk - Minimizes need for oversight and approvals
- ✓ Streamlined approach
  Lower overhead, faster implementation
- ✓ Limited coordination between departments
- ✓ Creates opportunities for leveraging

For More Information Go To…

http://www4.eere.energy.gov/challenge/implementation-model/university-of-utah

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Home » University of Utah - Implementation Model

UNIVERSITY OF UTAH - IMPLEMENTATION MODEL

UNIVERSITY OF UTAH

Image Courtesy of the University of Utah

Implementation Model: Internal Green Revolving Fund

ORGANIZATION TYPE
Public University

BARRIER
Energy efficiency projects were being funded piecemeal from a general fund, with savings disappearing back into the general facilities budget

SOLUTION
Implemented an internal Green Revolving Fund (GRF) to allocate savings from current energy efficiency projects to invest in future energy efficiency projects

OUTCOME


Pennsylvania
Green Energy Loan Fund

Better Buildings Summit

May 8, 2014

Program Genesis

- 2009 American Recovery and Reinvestment Act
  - SEP provided $96 million to Pennsylvania
  - Most used for grants, for large renewable energy deployment projects
  - Supplemented existing program for residential solar rebates
  - $24 million invested in 2 loan programs

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ARRA Loan Programs

- Keystone HELP
  - $12 million used for interest rate buydowns, LLR
    - Residential energy efficiency upgrades
- Pennsylvania Green Energy Loan Fund (GELF)
  - $12 million for capitalization of a RLF
    - Commercial building energy efficiency projects
  - 3rd Party: The Reinvestment Fund

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The Reinvestment Fund

- Private, nonprofit community development financial institution
- Founded in 1985 - energy lending since 1993
- Sustainable Development Fund – $32 million of funding to promote renewable energy and energy efficiency projects and market development
- EnergyWorks Loan Fund - For energy projects in Philadelphia metropolitan area
- TRF has access to multiple sources of capital

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GELF - Four Types of Eligible Projects

NOTE: All financed projects must reduce energy use by **25%**

1. Single or limited energy retrofits or the replacement of a single piece of equipment or system in an existing occupied building
    - Energy analysis must show that replacement equipment/system will use 25% less energy than existing equipment/system

2. Extensive whole building energy retrofits in an existing occupied building
    - Audit must show ECMs will reduce total building energy consumption by 25%

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Four Types of Projects (continued)

3. Energy efficient gut rehab of an existing building that is either currently unoccupied or will be renovated for a different use
    - Energy modeling must show that rehabbed building will use 25% less energy than similar buildings according to US DOE's Commercial Building Energy Consumption Survey
4. Energy efficient new construction of a building or addition
    - Energy modeling must show that new building will use 25% less energy than were it built to the current building energy code

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GELF Portfolio

- 9 Loan Projects for building retrofits so far:
  - 3 Residential Multi-Family, 3 Commercial, 3 Public
  - Nearly 1.5 million square feet of building space
  - $10 million GELF budget
  - $28 million energy budget
  - $223 million total project budget
- 1 Loan Project, $400,000 provided to Esperanza College and Eastern University has been repaid in full

Project Highlights

- Ambler Boiler House – gut rehab of a polluted industrial building into 42,000 s.f. of prime office space next to the Ambler train station, with energy use 44% lower than average office building.

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Project Highlights (continued)

- Esperanza College - gut rehab of 17,400 square feet of unfinished warehouse space into classrooms, labs and offices for Esperanza College and Eastern University.

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Project Highlights (continued)

- 1400 Spring Garden project in Philadelphia - gut rehab of the former Pennsylvania State Office Building in Philadelphia into 204 rental apartments and 3,700 square feet of office space. The total size of the building is 355,883 square feet.

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Project Highlights (continued)

- Paseo Verde - new construction of a mixed-income, mixed-use, transit oriented, green development that features 163 affordable and workforce housing units above 30,000 square feet of retail and community facility space.
- Directly adjacent to the Temple University Regional Rail train station.

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Project Highlights (continued)

- Hilton Homewood Suites Hotel - new construction of a 10-story, 136 suite, extended-stay hotel in West Philadelphia.

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GELF Post-ARRA

- DEP-TRF grant agreement amended post-ARRA to operate the program “In perpetuity”
  - Operate until funds depleted
  - Separate accounting
  - Quarterly reporting
    - Summary of projects
    - Process and Financial data for DOE (PAGE)
    - Marketing Report
  - Continue to commit any available funding into new loan projects
  - Maintain a list of candidate projects

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For More Information

Kerry Campbell

Pennsylvania DEP

Phone: 717-772-5985

Email: kcampbell@pa.gov

Website: www.dep.state.pa.us

The Reinvestment Fund

www.trfund.com

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Sustaining Clean Energy Initiatives: New York Green Bank

www.greenbank.ny.gov

NY Green Bank is an integral part of a broader state energy strategy

"New York State needs an expanded and diversified supply of clean energy to move ahead in the 21st century…a $1 billion NY Green Bank offers a cost-effective market mechanism to capitalize on this opportunity, unleashing green technologies and the many benefits that will come with them."

-Governor Andrew M. Cuomo

"The Green Bank is just one component of the State's new chapter on energy policy that focuses on enabling self-sustaining private markets and reducing dependence on subsidies."

-Richard Kauffman, Chairman of Energy & Finance

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Capitalized and open for business

January 2013:

- ✓ Governor Cuomo announced initiative in 2013 State of the State

Mid-2013:

- ✓ Market survey to identify financing barriers and potential
- ✓ Based on survey conclusions, NYSERDA filed a petition for initial capitalization

December 2013:

- ✓ PSC issued order approving initial capitalization ($218 million)
  - ✓ Initial capitalization sources: Regional Greenhouse Gas Initiative (RGGI) auction proceeds and repurposed utility surcharges

February 2014:

- ✓ Formally opened for business with request for transaction proposals from private sector

Late 2014:

- ✓ Clean energy proceeding expected to secure stream of funding to reach $1 billion

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NY market opportunity estimated to be $85 billion

NY-Based Clean Energy Markets

Selected Technologies	Est. Market Size ($B)
Energy Efficiency	$55
Solar PV	$13
Combined Heat & Power (CHP)	$8
Biomass	$4
Onshore Wind	$4
Anaerobic Digesters (ADG)	<$1

Source: Booz – NY Green Bank Final Report

$85B

Sizeable Investment Opportunities

- ✓ $85B directional estimate of NY-based projects is arguably conservative - excludes potential for:
  - ✓ Further technology improvement
  - ✓ Utility scale generation, fuel cells, charging stations, solar hot water systems, and other emerging clean technologies

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Why so much unrealized potential?

Developers say there's a lack of lender / investor interest

Lenders / investors say there's a lack of supply

There are exceptions – certain sectors actively financed

- ✓ Utility scale projects
- ✓ Certain residential rooftop lease / PPA portfolios

→ $ billions in each are financed each year

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What do utility scale and residential rooftop have in common?

- ✓ Deep-pocketed, well-versed investor base
- ✓ Standardized financing and structuring methodologies
- ✓ Either large single projects or large homogeneous pools of similar credits utilizing standardized contracts
  - Size matters
  - Standardization matters
- ✓ Rating agency criteria for utility scale → a road map
  - First residential rooftop transaction recently rated
- ✓ Developers know upfront what can and cannot be financed
  - Targeted origination to drive volume and scale

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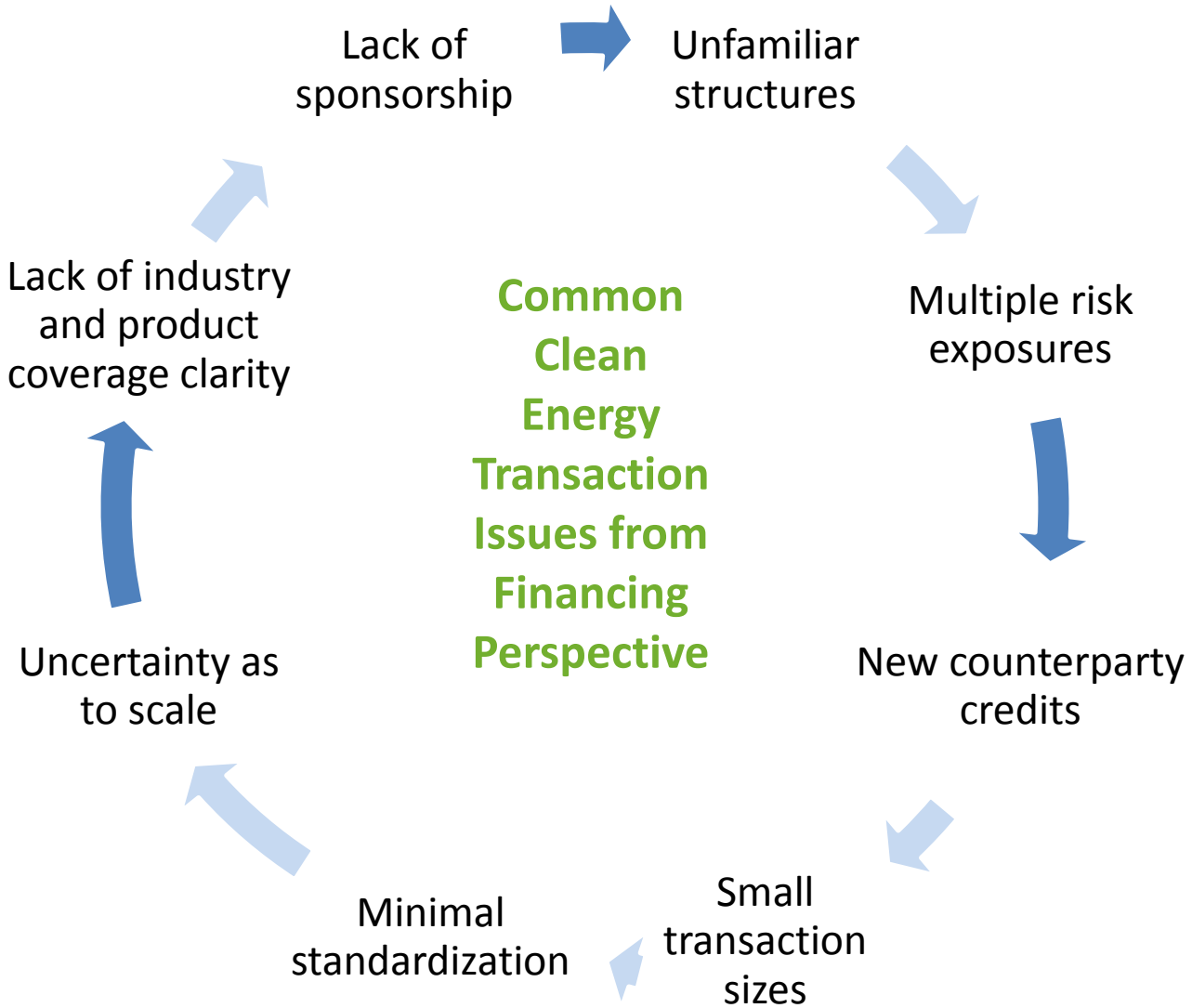
Issues with creditworthy non-utility scale and non-residential rooftop



Lowering the barriers / motivating more private market investment

- ✓Provide credit enhancement
- ✓Support aggregation via programmatic approaches
- ✓Promote standardization
  - Contracts /documents (PPA's, leases, loans, O&M, servicing, EPC, warranties)
  - Installation practices
  - Servicing practices
  - Credit underwriting methodologies
- ✓ Promote data collection

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Support the transition from illiquid to more liquid financial markets

Understanding

- Precedent transactions
- Investor education
- Data collection

Scale

- Standardization
- Increased volumes

Liquidity

- Multiple buyers
- Reduced pricing premiums

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Proposals sought from private sector that meet investment criteria

At a minimum, NY Green Bank transactions will:

- ✓ Have **expected financial returns** such that the revenues of the NY Green Bank on a portfolio basis will be in excess of expected portfolio losses;
- ✓ Be expected to **contribute to financial market transformation** in terms of scale, improved private sector participation, level of awareness and confidence in clean energy investments, and/or other aspects of market transformation; and
- ✓ Have the potential for **energy savings and/or clean energy generation** that will contribute to greenhouse gas reductions in support of New York's clean energy policies.

Proposals will need to address each of the above criteria

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NY Green Bank roles

NY Green Bank seeks to support transactions that **with scale and experience can ultimately be financed by the private sector**

What we will do:

- ✓ Support development of liquidity in markets
- ✓ Be creative in supporting creditworthy transactions
- ✓ Develop and incubate new structures
- ✓ Support standardization and aggregation for distribution

What we won't do:

- × Support transactions without private capital involvement
- × Accept credit and/or project risks that will be unacceptable to the private market
  - × Take technology risks that are not commercially proven
- × Offer direct subsidies
- × Pursue one-off transactions without the ability to replicate

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NY Green Bank wants to hear from the private sector

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Discussion

www.greenbank.ny.gov

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