



**CLEAN ENERGY**  
FINANCE AND INVESTMENT AUTHORITY

September 21, 2012

Dear Clean Energy Finance and Investment Authority Board of Directors:

We are looking forward to the next Board of Directors special meeting on Friday, September 28, 2012 3:30 to 5:00 p.m. at our offices located at 865 Brook Street Rocky Hill, CT.

We have a full agenda which includes:

- **Audit for FY 2012** – review and approval of the FY 2012 Audited Financial Statements and the Federal Single Audit Report as recommended by the Audit, Compliance and Governance Committee.
- **Updated Budget for FY 2013** – review and approval of the updated FY 2013 Budget as recommended by the Budget and Operations Committee.
- **Program Updates from the Technology Innovations and Deployment Committees**
- **C-PACE Technical Standards** – update on the proposed C-PACE Technical Standards process and documentation

Note – the FY 2012 Audited Financial Statements and the updated FY 2013 Budget will be distributed by the close of business on Monday, September 24, 2012. The respective committees and staff members are making final adjustments to these documents as a result of recent meetings.

If you have any questions, comments or concerns, please feel free to contact me at any time.

We look forward to the meeting next week. Enjoy the weekend.

Sincerely,

A handwritten signature in blue ink, appearing to read "Bryan Garcia". The signature is fluid and stylized, with a large loop at the beginning and a horizontal line extending to the right.

Bryan Garcia

President and CEO



# CLEAN ENERGY

## FINANCE AND INVESTMENT AUTHORITY

### **REVISED AGENDA**

Board of Directors of the  
Clean Energy Finance and Investment Authority  
865 Brook Street  
Rocky Hill, CT 06067

Friday, September 28, 2012 – Special Meeting  
3:30-5:00 p.m.

Staff Invited: George Bellas, Mackey Dykes, Brian Farnen, Bryan Garcia, David Goldberg, Dale Hedman, Bert Hunter, Kim Stevenson, and Bob Wall

1. Call to order
2. Public Comments – 5 minutes
3. Approval of meeting minutes for July 27, 2012\* – 5 minutes
4. Update from the President – 5 minutes
5. Audit, Compliance and Governance Committee updates and recommendations for approval\* – FY 2012 Audited Financial Statements and Federal Single Audit Report – 5 minutes
6. Budget and Operations Committee updates and recommendations for approval\* – Revised – FY 2013 Budget and Program Metrics – 60 minutes
7. Technology Innovations Committee updates – 5 minutes
8. Deployment Committee updates — 5 minutes
9. Approval of 2013 Board Meeting Schedule\* – 5 minutes
10. Adjourn

\* Denotes item requiring Board action

1. Please join my meeting, Friday, September 28, 2012 at 3:30 PM Eastern Daylight Time.  
<https://www4.gotomeeting.com/join/503782495>

2. Use your microphone and speakers (VoIP) - a headset is recommended. Or, call in using your telephone.

Dial +1 (213) 289-0010

Access Code: 503-782-495

Audio PIN: Shown after joining the meeting

Meeting ID: 503-782-495      GoToMeeting®

***Next Meeting: Friday, October 19, 2012 from 9:00-11:00 a.m.  
Clean Energy Finance and Investment Authority, 865 Brook Street, Rocky Hill, CT***



# CLEAN ENERGY

## FINANCE AND INVESTMENT AUTHORITY

### **REVISED RESOLUTIONS**

Board of Directors of the  
Clean Energy Finance and Investment Authority  
865 Brook Street  
Rocky Hill, CT 06067

Friday, September 28, 2012 – Special Meeting  
3:30-5:00 p.m.

Staff Invited: George Bellas, Mackey Dykes, Brian Farnen, Bryan Garcia, David Goldberg, Dale Hedman, Bert Hunter, Kim Stevenson, and Bob Wall

1. Call to order
2. Public Comments – 5 minutes
3. Approval of meeting minutes for July 27, 2012\* – 5 minutes

Motion to approve the minutes of the Board of Directors of July 27, 2012 Special Meeting. Second. Discussion. Vote.

4. Update from the President – 5 minutes
5. Audit, Compliance and Governance Committee updates and recommendations for approval\* – FY 2012 Audited Financial Statements and Federal Single Audit Report – 5 minutes

**WHEREAS**, Article V, Section 5.3.1(ii) of the Clean Energy Finance and Investment Authority (CEFIA) Operating Procedures requires the Audit, Compliance, and the Governance Committee (the “Committee”) to meet with the auditors to review the annual audit and formulation of an appropriate report and recommendations to the Board of Directors (the “Board”) with respect to the approval of the audit report;

**WHEREAS**, the Audit, Compliance, and the Governance Committee (the “Committee”) met with the auditors on September 20, 2012 to review and recommend for approval the Audited Financial Statements and the Federal Single Audit Report of the Clean Energy Finance and Investment Authority for the Fiscal year Ending June 30, 2012;

**NOW**, therefore be it:

**RESOLVED, that the Board hereby accepts the Committee's recommendations for approval of the Audited Financial Statements and the Federal Single Audit Report of the Clean Energy Finance and Investment Authority for the Fiscal Year Ending June 30, 2012.**

6. Budget and Operations Committee updates and recommendations for approval\* – Revised – FY 2013 Budget and Program Metrics – 60 minutes

**WHEREAS**, Article V of the Clean Energy Finance and Investment Authority (CEFIA) Operating Procedures requires the CEFIA Board of Directors (the "Board") to adopt an Annual Operating Budget for each forthcoming fiscal year;

**WHEREAS**, Article V, section 5.3.2 of the CEFIA by-laws charges the Budget and Operations Committee to recommend to the Board the annual operating budget; and

**WHEREAS**, the Board directed CEFIA staff to provide an updated Fiscal Year 2013 budget;

**WHEREAS**, the staff provided an updated Fiscal Year 2013 budget to the Budget and Operations Committee on September 21, 2012;

**WHEREAS**, the Budget and Operations Committee recommends to the Board for approval the updated Fiscal Year 2013 budget;

**NOW**, therefore be it:

**RESOLVED**, that the Board hereby approves the Budget and Operations Committee recommendation of the updated Fiscal Year 2013 budget.

7. Technology Innovations Committee updates – 5 minutes
8. Deployment Committee updates — 5 minutes
9. Approval of 2013 Board Meeting Schedule\* – 5 minutes

Motion to approve the regular meeting schedule of the Board of Directors for 2013 for the Clean Energy Finance and Investment Authority. Second, Discussion. Vote.

10. Adjourn

\* Denotes item requiring Board action

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**CLEAN ENERGY**  
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## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #1**

Call to Order

September 28, 2012





**CLEAN ENERGY**  
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## **Board of Directors of the Clean Energy Finance and Investment Authority**

**Agenda Item #2**

Public Comments

September 28, 2012



**CLEAN ENERGY**  
FINANCE AND INVESTMENT AUTHORITY

## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #3**

Approval of Meeting Minutes of July 27, 2012

September 28, 2012



**CLEAN ENERGY**  
FINANCE AND INVESTMENT AUTHORITY

## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #4**

Update from the President

September 28, 2012



- ▶ **Online Meetings** – attempting to modernize our meetings again with online capabilities through GoToMeeting
- ▶ **Residential Solar Investment Program** – continue to drive down costs and increase private investment. Launched Solarize CT – seeing further cost decreases and greater likelihood for customer acquisition
- ▶ **C-PACE** – towns coming onboard, technical standards in place, working with local banks, and developing project pipeline (i.e. condos, multifamily mixed use, commercial)
- ▶ **E-House** – dedication event and continue to wind down transition of workforce development programs



**CLEAN ENERGY**  
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## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #5**

Audit, Compliance and Governance Committee

September 28, 2012



**CLEAN ENERGY**

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## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #6**

Budget and Operations Committee

September 28, 2012



- ▶ **Updated FY 2013 Operations and Program Budget** – adjusted format to conform with new financing direction
- ▶ **Performance Metrics** – developed program performance metrics to collect and analyze data to discern progress towards strategic plan goals and objectives

- ▶ **Specification** – specifies the use of ratepayer resources for program investments (Page 1) versus incentives, grants and rebates (Page 2)
- ▶ **Operations** – highlights use of ratepayer resources for general operations and programs (Page 3) and employee staffing plan (Page 8)
- ▶ **Presentation** – projects a set of financial statements including P&L and Changes in Net Assets (Page 4), Cash Flow (Page 5), Balance Sheet (Page 6), and Utility Customer Assessment projections (Page 7)





- ▶ **Program Investments** – financing (i.e. lease and loan) programs with loan loss provisions
  - ▶ Non-Recurring Investments – \$10,450,000 of one-time non-recurring investments
  - ▶ Recurring Investments – \$5,937,700 in ongoing program investments
  - ▶ Loan Loss Provisions – 15% in loan loss provisions for investments (\$2.55 million ▶ \$5.1 million over 2 FYs)



- ▶ **Incentives, Grants and Rebates** – credit and yield enhancements, statutory programs and CCEF programs in transition or being maintained
  - ▶ Credit/Yield Enhancements – \$2,323,200 in repurposed ARRA-SEP and CEFIA
  - ▶ Federal Grants – \$1,707,000 in competitive grants won
  - ▶ Incentives, Grants, and Rebates – \$17,781,000
    - ▶ Statutory – \$13,383,000
    - ▶ Strategic – \$3,100,000
    - ▶ Transition – \$400,000
    - ▶ Maintain – \$850,000

# Budget and Operations Committee

## General Operations and Program Expenses



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- ▶ **Income** – \$32,401,500
  - ▶ Ratepayers – \$27,850,000
  - ▶ RGGI – \$2,000,000
  - ▶ Federal Grants - \$2,156,500
  - ▶ Other - \$395,000
  
- ▶ **Expenses** – \$32,006,700
  - ▶ Incentives, Grants and rebates – \$19,738,000
  - ▶ Provisions for Loan Losses – \$2,550,800
  - ▶ Program Expenses – \$5,874,100
  - ▶ Administrative Expenses – \$3,843,800 (12% of income)

# Budget and Operations Committee

## Projected Profit & Loss Statement



Total Net Assets	6/30/2012	\$ 81,280.3
<b>FY 2013 expenses over income:</b>		
Revenues	32,401.5	
Expenses, Current FY Recurring Programs	(25,326.7)	
<i>NOTE: Subtotal, Recurring Programs</i>	7,074.8	
<i>NOTE: Subtotal, Non-Recurring/Special Programs</i>	(6,680.0)	
<b>Expenditures grants and rebates approved prior to FY13</b>		\$ (17,912.1)
<b>Other</b>		\$ (13.6)
Total Net Assets	6/30/2013	\$ 63,749.4

# Budget and Operations Committee

## Projected Statement of Cash Flows



	<b>Projected 6/30/2013</b>
<b>Cash flows from operating activities</b>	
<b>CASH IN:</b>	
REVENUES	\$ 32,401.5
<b>CASH OUT:</b>	
CASH - Current FY matters	\$ (29,363.0)
	\$ 3,038.5
Expenditures grants and rebates approved prior to FY13	\$ (17,912.1)
<b>Net cash used by operating activities</b>	<b>\$ (14,873.6)</b>
<b>Cash flows from investing activities</b>	
LOAN RECOVERY	\$ 703.0
LOAN DISBURSEMENTS	\$ (16,387.7)
<b>Net cash used by investing activities</b>	<b>\$ (15,684.7)</b>
<b>Cash flows from capital activities</b>	
Purchase of furniture, equipment & software	\$ (182.0)
<b>Net cash used in operating, investing and capital activities FYE 6/30/2013</b>	<b>\$ (30,740.3)</b>
Cash and cash equiv., 7/1/2012	\$ 73,213.6
<b>Cash and cash equiv., 6/30/2013</b>	<b>\$ 42,473.3</b>

# Budget and Operations Committee

## Projected Balance Sheet



	Actual 6/30/2012	Projected 6/30/2013
<b>Assets</b>		
<b>Current assets</b>		
Cash and cash equivalents (Unrestricted)	\$ 38,823.7	\$ 25,140.5
Cash and cash equivalents (Unrestricted - held for Contingent Obligations - Prior Fiscal Years)	25,849.2	7,937.1
Cash and cash equivalents (Total Unrestricted)	64,672.9	33,077.6
Utility receivables	\$ 2,580.0	\$ 2,200.0
RGGI auction receivable	\$ 725.3	\$ 750.0
Promissory notes - solar lease program V1, current portion	\$ 670.6	\$ 670.6
Other current assets	\$ 350.3	\$ 250.0
<b>Total current assets</b>	<b>\$ 68,999.1</b>	<b>\$ 36,948.2</b>
<b>Noncurrent assets</b>		
<b>Investments</b>		
Promissory notes - All	\$ 11,365.8	\$ 27,050.5
Loan loss reserve - All	\$ (300.9)	\$ (2,818.2)
Equity/Debt investments (pre FY13)	\$ 2,155.5	\$ 2,155.5
Investments-REC's	\$ 1,429.9	\$ 1,450.0
<b>Capital assets</b>		
Furniture, Equipment & L/H Improvements	\$ 91.3	\$ 181.4
<b>Restricted cash and cash equivalents</b>		
Other restricted cash	177.0	177.0
Cash and cash equivalents (Restricted-Credit Enhancement [LLR] CEFIA Funds)		1,105.0
Cash and cash equivalents (Restricted-ARRA-Allocated-Held by CEFIA)		718.2
Cash and cash equivalents (Restricted-ARRA-Allocated-Held by Others)		\$ 500.0
Cash and cash equivalents (Restricted-ARRA-Unallocated)	\$ 8,363.7	\$ 6,895.5
TOTAL Restricted Cash & Cash Equivalents	8,540.7	9,395.7
<b>Total non current assets</b>	<b>\$ 23,282.3</b>	<b>\$ 37,414.9</b>
<b>Total assets</b>	<b>\$ 92,281.4</b>	<b>\$ 74,363.1</b>
<b>Liabilities and Net Assets</b>		
Accounts, grants payable and accrued expenses	\$ 2,637.4	\$ 2,500.0
Deferred revenue-ARRA	\$ 8,363.7	\$ 8,113.7
<b>Total liabilities</b>	<b>\$ 11,001.1</b>	<b>\$ 10,613.7</b>
<b>Net Assets:</b>		
Investment in capital assets	\$ 91.3	\$ 181.4
Restricted net assets	\$ 8,540.6	\$ 9,393.6
Unrestricted net assets	\$ 72,648.4	\$ 54,174.4
<b>Total Net Assets</b>	<b>\$ 81,280.3</b>	<b>\$ 63,749.4</b>
<b>Total Liabilities and Net Assets</b>	<b>\$ 92,281.4</b>	<b>\$ 74,363.1</b>

# Budget and Operations Committee

## Financial Statement Reporting



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Reports to the Board of Directors	Monthly	Quarterly
Statement of Income and General Operations and Program Expenses	X	
Statement of Revenues, Expenses and Change in Net Assets	X	
Statement of Cash Flows	X	
Statement of Net Assets	X	
Statement of Program Investments	X	
Statement of Incentives, Grants and Rebates	X	
Investment Portfolio Performance		X
Program Performance		X

# Program Breakdown

## FY13 Budget



	Loan	Transition	Maintain	Statutory	Operations/ Support
Operating Expenses	\$3,000	\$841	\$426	\$1,600	\$3,500
FTEs	7.9	3.4	.7	4.5	11.3

figures in thousands



# Performance Metrics



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Amount of clean energy deployed per dollar of ratepayer capital invested



Total private and ratepayer capital invested by year



Amount of clean energy deployed (i.e. MW, NW, kWh, MMBtu)



Total dollars of investment in clean energy



Ratio of private to public capital and ratio of ratepayer funds invested in subsidies versus loan programs



# Loan Programs



## Loan Programs (through end of 2014)

	CEFIA Capital	Credit Enhancements/ Incentives	Staff (FY13)	Admin* (FY13)	Private Capital	MWs	Annual MMBtus (thousands)	Loans	Annual NO <sub>x</sub> reduction (lbs)
<b>Total</b>	<b>\$23,609</b>	<b>\$8,974</b>	<b>\$1,527</b>	<b>\$1,507</b>	<b>\$173,222</b>	<b>39.1</b>	<b>193</b>	<b>4,650</b>	<b>39,664</b>
Residential	\$8,003	\$4,868	\$666	\$610	\$62,378	16	79	4,437	17,614
Commercial & Industrial	\$6,000	\$3,500	\$720	\$730	\$31,500	<b>5.0</b>	107	175	16,423
MUSH	\$1,606	\$606	\$96.7	\$152	\$9,494	3.2	7	36	2,357
Grid-Tied	\$8,000		\$43.8	\$15	\$69,850	14.9		2	6,656

\*includes consulting, legal, marketing, EM&V and computer operations, training and travel/meeting costs

dollar figures in thousands

## Loan Programs

### TARGETS

- Clean energy deployed: **35 MW**  
**175k MMBtu**
- Residential solar PV deployed: **10 MW\***
- Total dollars of investment in clean energy: **\$180 m**
- Deploy **\$150 m** of private capital leveraged by **\$30 m** of public funds by **end of 2014**
- Ratio of private capital to public funds: **5:1**
- Number of installations/loans: **4,430**
- Jobs created: **2,631**

### STAFF

- **Bert Hunter (90%)**
- Jessica Bailey (100%)
- Ben Healey (90%)
- Dale Hedman (49%)
- Ali Lieberman (90%)
- David Ljungquist (30%)
- Rick Ross (31%)
- Manager of Clean Energy Finance (24%)
- Director of Residential Programs (100%)
- Associate Director of Finance (87%)
  
- **7.9 FTEs**

\* Per Section 106 of PA 11-80, at least 30 MW of residential solar PV is to be deployed by the end of 2022 (i.e. 3 MW/year). In 6 months, CEFIA's program has over 3 MW in the project pipeline well ahead of the statutorily required target.

# Residential



## Residential Loan Programs (through end of 2014)

	CEFIA Capital	Credit Enhancements	Staff (FY13)	Admin* (FY13)	Private Capital	MWs	Annual MMBtus (thousands)	Loans	Annual NO <sub>x</sub> recudction (lbs)
<b>Total</b>	<b>\$8,003</b>	<b>\$4,868</b>	<b>\$666</b>	<b>\$610</b>	<b>\$62,378</b>	<b>16</b>	<b>79</b>	<b>4,437</b>	<b>17,614</b>
Solar PV Leases	\$2,130	\$2,130	\$89	\$85	\$33,372	10.9		1,551	4,850
Solar Hot Water Leases	\$258	\$258	\$118	\$110	\$4,042		4.6	374	605
Solar Loans	\$3,297	\$1,236	\$148	\$134	\$13,189	5.1		706	2,286
Energy Efficiency Loans	\$1,318	\$494	\$122	\$110	\$5,275		48.9	1,451	6,487
Multi-Family Energy Efficiency Loan Fund	\$1,000		\$80	\$73	\$3,000			5	
Low Income Energy Efficiency Loan Fund		\$750	\$109	\$98	\$3,500		25.5	350	3,386

dollar figures in thousands

\*includes consulting, legal, marketing, EM&V and computer operations, training and travel/meeting costs

## Residential Loan Programs

### TARGETS

- Clean energy deployed: **15 MW**  
**75k MMBtu**
- Residential solar PV deployed: **15 MW**
- Total dollars of investment in clean energy: **\$70 m**
- Deploy **\$60 m** of private capital leveraged by **\$12 m** of public funds by **end of 2014**
- Ratio of private capital to public funds: **5:1**
- Number of installations/loans: **4,250**
- Number of jobs created: **1,273**

### STAFF

- **Bert Hunter (40%)**
- Dale Hedman (39%)
- Ben Healey (36%)
- Ali Lieberman (41%)
- David Ljungquist (15%)
- Manager of Clean Energy Finance (11%)
- Director of Residential Programs (100%)
- Associate Director of Finance (40%)
- **3.2 FTEs**

# Old Model (CCEF) versus New Model (CEFIA)

## Comparisons for Residential Solar PV



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	CCEF	CEFIA
Period of Time	2004-2011	2012-2014
Loan Loss Reserve	-	\$3.3m
Incentive	\$46.2m	\$14.8
Loans	\$13.3m	\$5.4
Total	\$59.5m	\$23.5m
Production	13.8 MW	16.0 MW
\$ per kW	\$4,311	\$1,469

**Moving to Faster, Cheaper, and More of it along with  
Attracting More Private Capital!**

# Commercial & Industrial



## Commercial & Industrial Loan Programs (through end of 2014)

	CEFIA Capital	Credit Enhancements/ Incentives	Staff (FY13)	Admin* (FY13)	Private Capital	MW <sup>s</sup> **	MMBtus** (thousands)	Loans/ Projects	Annual NO <sub>x</sub> recudction (lbs)
<b>Total</b>	<b>\$6,000</b>	<b>\$3,500</b>	<b>\$720</b>	<b>\$730</b>	<b>\$31,500</b>	<b>5</b>	<b>107</b>	<b>175</b>	<b>16,423</b>
CPACE	\$3,500	\$1,000	\$657	\$560	\$31,500	4.4	100	175	15,227
Clean Energy Business Solutions	\$2,500	\$2,500	\$63	\$170		0.6	7	10	1,196

dollar figures in thousands

\*includes consulting, legal, marketing, EM&V and computer operations, training and travel/meeting costs  
 \*\* These are rough projections that assume 50-50 investment in renewable energy (i.e. solar PV) and energy efficiency. Energy efficiency assumes \$2.50/ft<sup>2</sup> for energy efficiency retrofit, average loan size of \$200,000, reduction in electric energy consumption of 20% (i.e. 4 kW/ft<sup>2</sup>), and conversion of kWh savings into MMBtu

## Commercial & Industrial Loan Programs

### TARGETS

- Clean Energy Deployed: **5.0 MW**  
**100k MMBtu**
- Total dollars of investment in clean energy: **\$40m**
- Deploy **\$30m** of private capital leveraged by **\$10m** of public funds by **end of 2014**
- Ratio of private capital to public funds: **3:1**
- Loans/Projects: **150**
- Number of jobs created: **572**

### STAFF

- **Jessica Bailey (100%)**
- Bert Hunter (37%)
- Ben Healey (46%)
- Ali Lieberman (41%)
- Rick Ross (32%)
- Manager of Clean Energy Finance (11%)
- CPACE Manager (100%)
- Associate Director of Finance (37%)
- **4.0 FTEs**



## MUSH Loan Programs (through end of 2014)

	CEFIA Capital	Credit Enhancements/ Incentives	Staff (FY13)	Admin* (FY13)	Private Capital	MWs	MMBtus (thousands)	Loans	Annual NO <sub>x</sub> recudction (lbs)
<b>Total</b>	<b>\$1,606</b>	<b>\$606</b>	<b>\$96.7</b>	<b>\$152</b>	<b>\$9,494</b>	<b>3.2</b>	<b>7</b>	<b>36</b>	<b>2,357</b>
Campus Efficiency Now	\$1,000		\$71.4	\$152			7	4	928
Solar PV Lease	\$606	\$606	\$25.3		\$9,494	3.2		32	1,429

\*includes consulting, legal, marketing, EM&V and computer operations, training and travel/meeting costs

dollar figures in thousands



## MUSH Loan Programs

### TARGETS

- Clean energy deployed: **5 MW**  
**5 MMBtu**
- Total dollars of investment in clean energy: **\$10m**
- Deploy **\$8m** of private capital leveraged by **\$2m** of public funds by **end of 2014**
- Ratio of private capital to public funds: **4:1**
- Loans: **30**
- Number of jobs created: **109**

### STAFF

- **Bert Hunter (8%)**
- Ben Healey (8%)
- Ali Lieberman (8%)
- David Ljungquist (15%)
- Manager of Clean Energy Finance (2%)
- Associate Director of Finance (8%)
  
- **0.5 FTEs**
- Need to hire institutional director

# Grid-Tied RE Projects

## Grid-Tied Renewable Energy Projects

### Two loans

- Bridgeport Fuel Cell - \$5m
- Colebrook Wind - \$3m

### FY14

- Micro-grid - \$5m

### STAFF

- **Dale Hedman (10%)**
- Bert Hunter (5%)
- Associate of Clean Energy Finance (5%)
- **0.2 FTEs**
- Need to hire director

# Transition Programs

## Transition Programs (through end of 2019)

	CEFIA Capital	Incentives	Staff (FY13)	Admin* (FY13)	Private Capital	Loans	Students Trained
<b>Total</b>	<b>\$2,300</b>	<b>\$500</b>	<b>\$455.5</b>	<b>\$385</b>	<b>\$7,800</b>	<b>6</b>	<b>700</b>
Alpha	\$300	\$100	\$79.7	\$115	\$1,800	2	
Op-Demo	\$2,000		\$79.7	\$270	\$6,000	4	
Education		\$400	\$12.7				700
Legacy			\$283				

\*includes consulting, legal, marketing, EM&V and computer operations, training and travel/meeting costs

dollar figures in thousands

# Maintain



<b>Maintain (FY13)</b>			
	Incentives	Staff	Admin*
<b>Total</b>	<b>\$1,450</b>	<b>\$90</b>	<b>\$336</b>
Clean Energy Communities	\$650	\$65.8	\$123
Community Innovation Grants	\$200	\$4	\$17.5
Project Opportunities Fund	\$500	\$10	\$195
Strategic Investments	\$100	\$10	

\*includes consulting, legal, marketing, EM&V and computer operations, training and travel/meeting costs

dollar figures in thousands

# Statutory Programs



Statutory Programs (FY13)					
	Incentives	Staff (FY13)	Admin* (FY13)	MWs	Loans
<b>Total</b>	<b>\$13,333</b>	<b>\$526</b>	<b>\$940</b>	<b>11</b>	<b>864</b>
Residential Solar PV Investment Program	\$9,333	\$393	\$815	6	864
Anaerobic Digester	\$2,000	\$66.7	\$62.5	.6	
CHP	\$2,000	\$66.7	\$62.5	4.5	

\*includes consulting, legal, marketing, EM&V and computer operations, training and travel/meeting costs

dollar figures in thousands



**CLEAN ENERGY**

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## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #7**

Technology Innovations Committee

September 28, 2012

- ▶ **Alpha Program** – executed contracts with Apollo Solar and Anchor Science
- ▶ **Operational Demonstration Program** – four projects in due diligence, including RPM, New England Hydropower, Fuel Cell Energy, and Owl Power Company
- ▶ **Equity and Other Projects** – closing out existing non-performing investments (i.e. Tallon Lumber) and transition existing investments (i.e. OptiWind and Acumentrics) to CI to manage
- ▶ **Connecticut Innovations** – executed MOU for CI to manage technology innovation program investments. Now in the process of transitioning investments to CI manager





**CLEAN ENERGY**  
FINANCE AND INVESTMENT AUTHORITY

## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #8**

Deployment Committee

September 28, 2012

- ▶ **Brookings Institute Report** – State Clean Energy Finance Banks: New Investment Facilities for Clean Energy Deployment
- ▶ **Campus Efficiency Now** – closed on contracts and launched the ESA program. Working with several colleges and universities to identify projects for loan financing.
- ▶ **Multifamily Energy Loan Fund** – submitted commitment letter to HUD in support of an innovative financing program with Winn Development, LISC, and CHFA that uses ESAs and credit enhancements (i.e. loss reserves and third party insurance) to finance energy efficiency on multifamily properties



**CLEAN ENERGY**  
FINANCE AND INVESTMENT AUTHORITY

## **Board of Directors of the Clean Energy Finance and Investment Authority**

### **Agenda Item #9**

Approval of 2013 Board Meeting Schedule

September 28, 2012



**CLEAN ENERGY**  
FINANCE AND INVESTMENT AUTHORITY

## **Board of Directors of the Clean Energy Finance and Investment Authority**

**Agenda Item #10**

Adjourn

September 28, 2012

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY**  
**Board of Directors**  
**Draft Minutes –Special Meeting**  
**Friday, July 27, 2012**

A special meeting of the Board of Directors of the **Clean Energy Finance and Investment Authority (“CEFIA”)** was held on July 27, 2012, at the office of CEFIA, 865 Brook Street, Rocky Hill, CT.

1. **Call to Order:** Catherine Smith, Chairperson of CEFIA, called the meeting to order at 8:37a.m. Board members participating: Mun Choi; Daniel Esty, Vice Chairperson of CEFIA and Commissioner of the Department of Energy and Environmental Protection (“DEEP”); Tom Flynn; Norma Glover; Donald Kirshbaum, State Treasurer’s Office; John Olsen; Matthew Ranelli (by phone); Catherine Smith, Chairperson of CEFIA and Commissioner of the Department of Economic and Community Development (“DECD”); and Patricia Wrice.

Member Absent: Reed Hundt.

Staff Attending: George Bellas, Mackey Dykes, Brian Farnen, Bryan Garcia, David Goldberg (by phone), Dale Hedman, Bert Hunter, Dave Ljungquist, Shelly Mondo, Kimberly Stevenson, Cheryl Samuels and Bob Wall.

Others Attending: Jessica Bailey, the Rockefeller Brothers Fund; Chris Bernard, Northeast Utilities; Katie Dykes, DEEP; Alex Kragie, DEEP; Frank Owens, Steven Hall, and Frank Wolak (Fuel Cell Energy).

2. **Public Comments:**

There were no public comments.

3. **Approval of Minutes of Meeting of June 20, 2012:**

Ms. Smith asked the Board to consider the minutes from the June 20, 2012 meeting.

**Upon a motion made by Ms. Glover, seconded by Mr. Esty, the Board members voted in favor of adopting the minutes from the June 20, 2012 meeting as presented (Mr. Flynn abstained from the vote).**

Mr. Dykes distributed the attachment to the minutes, which are copies of the budget that was adopted at the June 20, 2012 meeting. Ms. Smith noted that the Board recognizes that the budget that was adopted was a preliminary budget, and staff will be coming back as soon as possible with a revised budget that includes a financial plan and metrics. Mr. Esty noted that the Budget Committee intends to review a modified budget in more detail within the next several months and make a presentation to the Board.

#### **4. Update from the President:**

Mr. Garcia introduced and welcomed Mr. Flynn as a member of the CEFIA Board appointed by Senator McKinney. He mentioned that Mr. Flynn has already been sworn in as a member of the Board by Brian Farnen.

Mr. Garcia stated that with the support of Reed Hundt, CEFIA staff had met with Richard Kauffman, Senior Advisor of Finance to Secretary Chu of the U.S. Department of Energy ("DOE"). Staff was able to get feedback from Mr. Kauffman on the proposed financing programs being developed by CEFIA. It is hopeful that CEFIA can meet with DOE quarterly to get feedback and best practices, which are important for the design and implementation of successful programs.

Mr. Garcia reported on the joint CEFIA and Energy Efficiency Fund ("EEF") Committee. Mr. Garcia and Ms. Dykes are co-chairs of the Joint Committee. Mr. Garcia mentioned that CEFIA staff members have been assigned to serve on and participate on various committees of the EEF Board (i.e. marketing and outreach; residential; commercial and residential; evaluation, measurement and verification; and research, development and demonstration) in an effort to ensure collaboration and coordination of programs.

Mr. Garcia provided an update on the residential Solar Investment Program. He mentioned that staff has met with 25 solar installer companies to discuss program performance, CEFIA's intention to launch a solar-lease/loan financing program and to obtain feedback. Mr. Garcia noted that the message from installer companies was that they are very eager about CEFIA launching the financing program as soon as possible. He mentioned that the *Market Watch Report* is published weekly to provide a status report on the incentives so that the market can gauge funding available and timing for moving to the next step.

#### **5. Presentation of the Comprehensive Energy Strategy:**

Noting that the State's Comprehensive Energy Strategy ("CES") is still in a preliminary draft, Ms. Dykes and Mr. Kragie provided an overview of the CES and highlighted some of the things CEFIA can do to help achieve the goals of the CES. Even though the CES has not been completed and finalized, Ms. Dykes noted that it will be helpful for CEFIA to have the preliminary information while developing the CEFIA Comprehensive Plan so that CEFIA's Comprehensive Plan can align with the CES. She stated that Public Act 11-80 created for the first time the Department of Energy and Environmental Protection ("DEEP") and gave legal authority to and capacity for DEEP to identify energy opportunities for the State of Connecticut through the CES. DEEP is required to prepare the CES every three years, and DEEP intends to release the draft CES late in August. The CES will set forth a plan for all of the energy needs of the State of Connecticut, addressing all fuels and sectors to 2050. Ms. Dykes stated that public

meetings will be held throughout the state to obtain feedback and input on the CES. It is hopeful that the draft CES will be finalized in the fall.

Mr. Kragie discussed the overarching policy framework. He stated that the goal is to create a “Malloy Energy Model” and to bring Connecticut closer to cheaper, cleaner and a more reliable energy future. Mr. Kragie stated that all energy policies should reflect this focus. He noted that the CES is written for the general public but is intended for the regulators and legislators.

Some of the goals of the “Malloy Energy Model” include helping residents reduce their energy bills, making Connecticut businesses more competitive, moving away from the “subsidy” approach to a clean energy “finance” model, creating a policy framework in which the marketplace picks winners and losers and not the government, focusing on deployment at scale to drive down costs, harnessing market forces to drive down rates, leveraging private capital to extend the reach of programs, and positioning Connecticut to gain jobs in the growing clean energy sector.

Ms. Dykes and Mr. Kragie reviewed the five sectors being addressed in the CES which include: 1) transportation; 2) electricity; 3) buildings; 4) industry and 5) natural gas. They explained some of the complexities, issues, goals and commitments to each of the sectors and how CEFIA is expected to help. It was noted that CEFIA will be asked to attract capital and provide financing to help achieve the state’s goal to reduce energy consumption. CEFIA will be asked to foster the sustained commitment to long-term efficiency goals identified in the CES. Ms. Dykes explained that CEFIA can also assist by providing support to helping bring down the business energy costs and making the state more competitive. She noted that CEFIA may be able to play a role in financing programs for fuel switches and energy efficiency and can help identify strategies to drive down the costs of renewable energy supply options.

A discussion ensued on the costs for natural gas. It was noted that very conservative estimates were used to make the determination that natural gas costs will remain cheaper than oil. Ms. Dykes explained the benefits to Connecticut by expanding natural gas throughout the state. Some of the barriers of expanding the infrastructure for natural gas were discussed. A suggestion was made to add in the CES a requirement that the conduit for gas, electricity, water, communications and sewer be a coordinated effort.

It was noted that CEFIA staff has been involved in the development process of the CES.

Mr. Garcia assured the Board that the CEFIA Comprehensive Plan being developed is consistent with the CES as well as the Integrated Resource Plan. He noted that CEFIA is taking steps to attract and deploy capital to help finance the clean energy goals for the state, to make clean energy more affordable and accessible to ratepayers, and to transition away from grants and subsidies to innovative low-cost financing. Ms. Smith recognized that CEFIA is aligned with the energy policies and strategies that have come from the Governor and DEEP.

Questions arose as to how to deal with technology and other changes. Mr. Esty noted that flexibility is very important and should be embedded in the CES. He noted that the CES provides flexibility and offers a portfolio approach to customers to choose technologies rather than having the government try to steer customers in a certain direction or technology. Mr. Esty stated that the CES has to be evolving based on changing technologies and scenarios.

## **6. Overview of Clean Energy Financing Programs in Development:**

Mr. Garcia noted that in June, the Board approved a 2013 budget which included three broad areas of planning: 1) transitional programs, 2) statutory required programs, and 3) financing programs. He asked Mr. Hunter to provide an overview of the financing programs being developed by CEFIA. Mr. Hunter stated that attracting more capital in Connecticut is essential to achieving CEFIA's mission; and having the appropriate overall program design is essential to CEFIA achieving the objectives of the Governor and legislators. He discussed the importance of designing and marketing a good program. Mr. Hunter noted the need to look at customer segmentation, acquisition and conversion to ensure clean energy goals of the state can be addressed and satisfied.

Mr. Hunter talked about some of the potential challenges with the financing programs, especially with interest rates varying significantly. He noted that the key to success is trying to bring down the real cost of borrowing to consumers. Mr. Hunter explained how using methods like Commercial and Industrial Property Assessed Clean Energy ("C-PACE"), on-bill financing, solar lease and loans, and bonding with the Special Capital Reserve Fund ("SCRF") can give the capital markets more comfort and security, reduce their risk and interest rates, and enable lending and investment for longer periods of time. A discussion ensued on having a parallel program for low-income customers. Some concern was expressed with being able to structure a successful program since it may be difficult to provide incentives for landlords. The Board discussed the need to work with landlords and to market to low-income homeowners. A suggestion was made to consider pursuing better building codes (not just minimum standards) for both new buildings and retrofits in addition to appliance standards.

Mr. Hunter mentioned that staff has met with solar installers over the last several weeks, and the message has been consistent that they want help with financing and requested that CEFIA bring back the solar lease program similar to what was developed in 2008-2009. Mr. Hunter stated that staff is trying to address the need with the development of the Solar Lease II Program. Under the original program, Mr. Hunter mentioned that US Bank provided tax equity payments and AFC First coordinated the installer network and front end of the activity which resulted in approximately 850 leases with only 2 defaults. Mr. Hedman clarified that one of the leases in default has been worked out and the other is in the process of being worked out. Mr. Hunter noted that the success of the program can be attributed to the design and marketing of the program. He explained some of the differences between the original Solar Lease Program and the proposed new program. Mr. Hunter mentioned that CEFIA will be participating in the debt but on



a subordinated basis, providing credit enhancements from the repurposed American Recovery and Reinvestment Act funds and direct subsidies if needed. In response to a question, Mr. Hunter stated that CEFIA is trying to test the market and hopefully ramp down the subsidies in the CEFIA Solar Lease II program as close to zero as possible.

Mr. Garcia described the consumer view of the product and the efforts being made to increase the financing and decreasing subsidies. Through this financing structure, Mr. Garcia stated that the consumers will recognize stabilized electricity pricing.

A suggestion was made to look at partnering with institutional lenders, insurance companies, foundations or other institutions that have energy components. Mr. Hunter explained that one of the issues with using institutions with energy components is that CEFIA wants to avoid constraining installers from using the equipment of their choice, but that institutional money is being carefully considered. Mr. Hunter described the steps necessary and proposed timeline for launching the various residential programs.

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Mr. Garcia discussed the Clean Energy Solutions Program. He stated that staff is in the process of developing a clean energy financing program with DECD and CI to support their economic development objectives. Ms. Smith suggested expanding the program to larger size businesses that have a strategic importance for the state in addition to targeting to the small business level.

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Ms. Bailey discussed the development of the C-PACE Program. She noted that the program structured by CEFIA, as administrator of the program, will be based on lessons learned from other policies across the country. Ms. Bailey stated that C-PACE enables commercial and industrial property owners to access low-cost, long-term upfront financing for qualified building energy upgrades and repay the loan through a benefit assessment on their property tax. She indicated that municipalities can opt-in, establish a C-PACE district and enter into a Memorandum of Understanding (“MOU”) with CEFIA. Ms. Bailey stated that several municipalities will be ready in the next several months. She explained that local commercial and industrial companies engage contractors who would recommend energy upgrades. The interested property owner would seek approval for energy upgrades from CEFIA; and CEFIA, utilizing its tools of project aggregation and credit enhancement, would arrange the low-cost long-term financing for the energy upgrades. Repayment of the upgrades would be made through an assessment on the property taxes. Ms. Bailey explained that aggregating diversifies the risks for the investors. Through this model, there are no upfront costs to the property owners. Mr. Hunter noted the opportunity to utilize bonding authority and the Special Capital Reserve Fund. Questions arose regarding the potential increased value of a building as a result of the energy efficiencies. A suggestion was made to negotiate with the municipalities an agreement about a phase-in of added value to the building over time. Attorney Farnen indicated that it may be possible to abate the tax increase or add language into the MOU with the municipalities. Mr. Ranelli suggested that this issue be looked into because it may also require enabling legislation.

Ms. Bailey described the groups formed to help design the program, including a municipal working group, a program guidelines working group, a capital sourcing working group and a marketing, education and outreach working group.

Mr. Hunter explained the flow of the project funds and noted that CEFIA is the focal point. The municipalities will be involved with CEFIA in its role as Program Administrator, and not the lenders. He noted that it is hopeful that the program will be launched in January 2013.

In response to a question, staff indicated that C-PACE is for existing structures and not new construction. Staff was asked to look into whether C-PACE can apply to help fund incremental efficiencies on new construction.

**7. Deployment Committee Updates and Recommendations for Approval: Campus Efficiency Now Proposal:**

Mr. Garcia stated that the Deployment Committee met on July 23 and recommends the approval of CEFIA's first financing program for Campus Efficiency Now. He mentioned that the program is consistent with the public policy direction of Public Act 11-80, supportive of the Integrated Resource Plan and an integral component of CEFIA's Comprehensive Plan. CEFIA has developed a pilot program to work with the Connecticut Conference of Independent Colleges ("CCIC") and GreenerU, Inc. ("GreenerU") to attract and build demand for energy efficiency measures and demonstrate the use of an energy savings agreement to finance projects. When this financing model has been proven, CEFIA intends to take the energy savings agreement to other colleges, universities and across other market segments. He explained that the pilot program can help identify opportunities for larger, more extensive capital intensive projects with greater capital investments and allow CEFIA to use other tools such as the Special Capital Reserve Fund in collaboration with the Connecticut Health and Educational Facilities Authority.

It was noted that approximately 16 colleges and universities have been identified but 5 colleges and universities will be participating in the pilot program. Mr. Garcia explained that GreenerU has experience doing these types of projects in the Northeast region. Mr. Hunter discussed some of the benefits of the program, including immediate cash flow, no up-front costs to the universities/colleges, energy efficient programs can be implemented quickly with little staff time involved, and at the end of the 5-year term the colleges own the energy efficiency measures with no further obligations. He reviewed the financing structure of the program. Mr. Hunter stated that the total loan facility will not exceed \$1,000,000. The financing for the pilot would cover approximately 3 to 5 projects and is anticipated to generate a 7 percent internal rate of return for CEFIA. Mr. Hunter stated that projects must meet pre-agreed criteria and loan advances will be staged. He indicated that CEFIA will have a security interest in the assets of the to be incorporated subsidiary of GreenerU (the borrower) being established for this pilot program. Mr. Hunter stated that 80 percent of any excess cash flow after paying all

expenses will be paid to CEFIA, and the remaining 20 percent will be paid to the GreenerU subsidiary. In response to a question, it was noted that the energy efficiency measures to be funded are things that can be accomplished within a few months.

Mr. Kirshbaum noted that the Deployment Committee discussed and recognized the risks involved while at the same time recognizing that part of CEFIA's mission is to take on more risks and do pilot programs like this. In order to avoid the appearance of a conflict of interest because the firm with which Mr. Ranelli works has done some work on this issue, Mr. Ranelli indicated that he will be abstaining from the vote.

**Upon a motion made by Ms. Wrice, seconded by Mr. Olsen, the Board members voted in favor of adopting the following resolution regarding the Campus Efficiency Now Program (Mr. Ranelli abstained from the vote, and Ms. Smith was not present for the vote).**

**WHEREAS**, the Clean Energy Finance and Investment Authority ("CEFIA") and the Connecticut Conference of Independent Colleges ("CCIC") both recognize the benefits of cooperation in accelerating energy efficiency and renewable energy implementation in Connecticut, resulting in cleaner, cheaper and more reliable sources of energy and have engaged in a memorandum of understanding to support such cooperation;

**WHEREAS**, it is CEFIA's intention to assist CCIC in helping its members to meet goals for clean energy by providing educational opportunities about the clean energy marketplace and tailored financial products for its members to support building upgrades through the work of qualified contractors and service providers to be selected and engaged directly by the CCIC member institutions;

**WHEREAS**, CEFIA and GreenerU, Inc. ("GreenerU") both recognize the benefits of cooperation in accelerating energy efficiency and renewable energy implementation in Connecticut, resulting in cleaner, cheaper and more reliable sources of energy;

**WHEREAS**, CEFIA and GreenerU desire to execute a term sheet that will lead to definitive legal documentation for a loan finance arrangement in an amount not to exceed one million dollars (\$1,000,000) establishing the pilot Campus Efficiency Now program; and

**WHEREAS**, the CEFIA Deployment Committee recommends to the CEFIA Board of Directors (1) the selection of GreenerU and a to be established wholly owned Connecticut subsidiary of GreenerU ("OpCo") as program partners for the Campus Efficiency Now pilot program as a Strategic Selection and Award, and (2) approval for GreenerU whereby CEFIA would make loans to OpCo in an aggregate amount not to exceed one million dollars (\$1,000,000) for the purpose of enabling OpCo to implement clean energy projects at CCIC member colleges and universities.

**NOW**, therefore be it:

**RESOLVED**, that the CEFIA Board of Directors approves the selection of GreenerU and OpCo as program partners for the Campus Efficiency Now pilot program as a Strategic Selection and Award pursuant to the CEFIA Operating Procedures Section XII given the uniqueness, special capabilities and strategic importance of its partners (i.e. CCIC and GreenerU) as well as its timeliness and potential for a multi-phase follow-on investment in clean energy for Connecticut's colleges and universities.

**RESOLVED**, that the CEFIA Board of Directors grants approval for CEFIA to enter into a Term Sheet (per Attachment 1) and definitive legal documentation with GreenerU whereby CEFIA would make loans to OpCo in an aggregate amount not to exceed one million dollars \$1,000,000 (under a loan facility to be available for loan advances for a period of up to 18 months from transaction closing) for the purpose of enabling OpCo to implement clean energy projects for CCIC member colleges and universities. The loans will be repaid to CEFIA with interest over a 5-year term at an annual effective yield of 7.00% utilizing cash flows derived from payments by the CCIC participating college and universities under Energy Savings Agreements ("ESAs") with OpCo of equivalent duration and a target internal rate of return for CEFIA of 7.00%, with such loans being limited in recourse to the cash flows derived from the ESAs as described in the attached Term Sheet.

**RESOLVED**, that the Board of Directors' action is consistent with CEFIA's purposes as codified in Section 16-245n(d)(1) of the Connecticut General Statutes, its board approved Resolution of Purposes and CEFIA's Comprehensive Plan.

**RESOLVED**, that the proper CEFIA officers are authorized and empowered to do all other acts and execute and deliver all other documents as they shall deem necessary and desirable to effect this Resolution.

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8. **Budget and Operations Committee Updates and Recommendations for Approval: CEFIA Handbook and C-PACE Director Position Description:**

Mr. Dykes discussed the recommended revisions to the CEFIA Handbook. He summarized that the changes enable the President and CEO to designate someone to share personnel-related responsibilities. Mr. Dykes explained that the responsibilities that can be designated include all personnel matters with the exception of personnel recommendations to the Board (i.e. merit pools). The Board requested that the President and CEO provide the designation of personnel-related responsibilities in writing. Changes are also being requested to the language for e-mail disclaimers.

**Upon a motion made by Mr. Olsen, seconded by Mr. Choi, the Board members voted in favor of adopting the following resolution approving the changes to the CEFIA Employee Handbook (Ms. Smith was not present for the vote):**

**RESOLVED**, that the Board of Directors of the Clean Energy Finance and Investment Authority (“CEFIA”) approves the changes to the CEFIA Employee Handbook as presented.

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Mr. Esty stated that in accordance with CEFIA’s Operating Procedures, the Board is required to approve new director-level positions, and the Board is being asked to consider the position description for Director of Commercial and Industrial PACE.

**Upon a motion made by Mr. Choi, seconded by Mr. Olsen, the Board members voted in favor of adopting the following resolution approving the position description of Director of Commercial and Industrial PACE (Ms. Smith was not present for the vote):**

**RESOLVED**, that the Board of Directors of the Clean Energy Finance and Investment Authority (“CEFIA”) as required by the Operating Procedures of CEFIA, approves the new director-level position description for Director of Commercial and Industrial PACE.

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**9. Technology Innovations Committee Updates:**

Mr. Choi, Chairperson of the Technology Innovations Committee (“Technology Committee”), noted that Supplement One to the Memorandum of Understanding between CI and CEFIA to transfer the administration of the Alpha and Operational Demonstration Programs to CI has been finalized and includes three Alpha program projects and four Operational Demonstration program projects. Mr. Choi mentioned that \$2,000,000 of private funding has been leveraged with CEFIA’s funds for one of the Alpha projects. He recognized the efforts and work provided by Ms. Price and Stevenson on these programs.

**10. Audit Compliance and Governance Committee Updates:**

Mr. Olsen, Chairperson of the Audit Compliance and Governance Committee (“Audit Committee”), mentioned that the Audit Committee met on June 6, 2012 and reviewed the fiscal year 2012 plan for auditing CEFIA’s financial statements with Marcum, CEFIA’s independent auditor. The audited financial statements will be presented to the board in September. The audit from the State Auditors of Public Accounts for fiscal year 2011 has been completed and there were no findings for CEFIA.

11. **Adjournment:** Upon a motion made by Mr. Choi, seconded by Mr. Olsen, the Board members voted unanimously in favor of adjourning the July 27, 2012 meeting at 10:35 a.m.

Respectfully submitted,

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Catherine Smith, Chairperson



# Memo

**To:** Bryan Garcia, Mackey Dykes, Karen Harris, Dale Hedman, Ed Kranich, Neil McCarthy

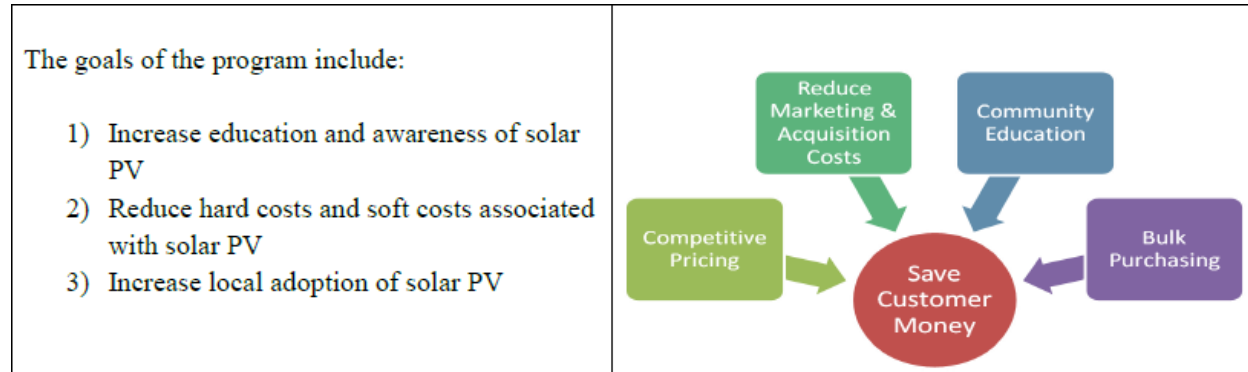
**From:** Ben Healey, Bob Wall, Robert Schmitt, and Toni Bouchard

**Date:** September 11, 2012

**Re:** Solarize Connecticut Program Update

## OVERVIEW OF THE PROGRAM

[Solarize Connecticut](#) is a pilot program designed to encourage the adoption of residential solar PV by deploying a coordinated education, marketing and outreach effort, combined with a tiered pricing structure that provides increased savings to homeowners as more people in a given community go solar. Based on a proven model already deployed in Oregon and Massachusetts, Solarize Connecticut aggregates homeowners across selected towns, utilizing grassroots networks to lower customer acquisition costs and thus the final price homeowners must pay.



## CUSTOMER ACQUISITION – A SIGNIFICANT “SOFT” COST

According to the U.S. Department of Energy, customer acquisition costs for residential solar PV average about \$0.67/W across the country. In reporting even lower numbers – ranging from \$0.25 to \$0.50/W – the developer SunEdison has set the current industry standard. Via Solarize Connecticut, CEFIA hopes to demonstrate that yet lower costs are achievable when community outreach happens together in partnership with a competitively procured, sole-source installer who commits to a tiered pricing strategy. CEFIA’s approach is as follows:

- CEFIA has matched a \$200,000 grant from the John Merck Fund to SmartPower to implement the Solarize Connecticut pilot (for a total of \$400,000 invested).<sup>1</sup>

<sup>1</sup> JMF’s grant to SmartPower funds work in both CT and MA. SmartPower is responsible for ensuring it brings a total of \$200,000 in outside resources to its work in Connecticut to match CEFIA’s contribution.

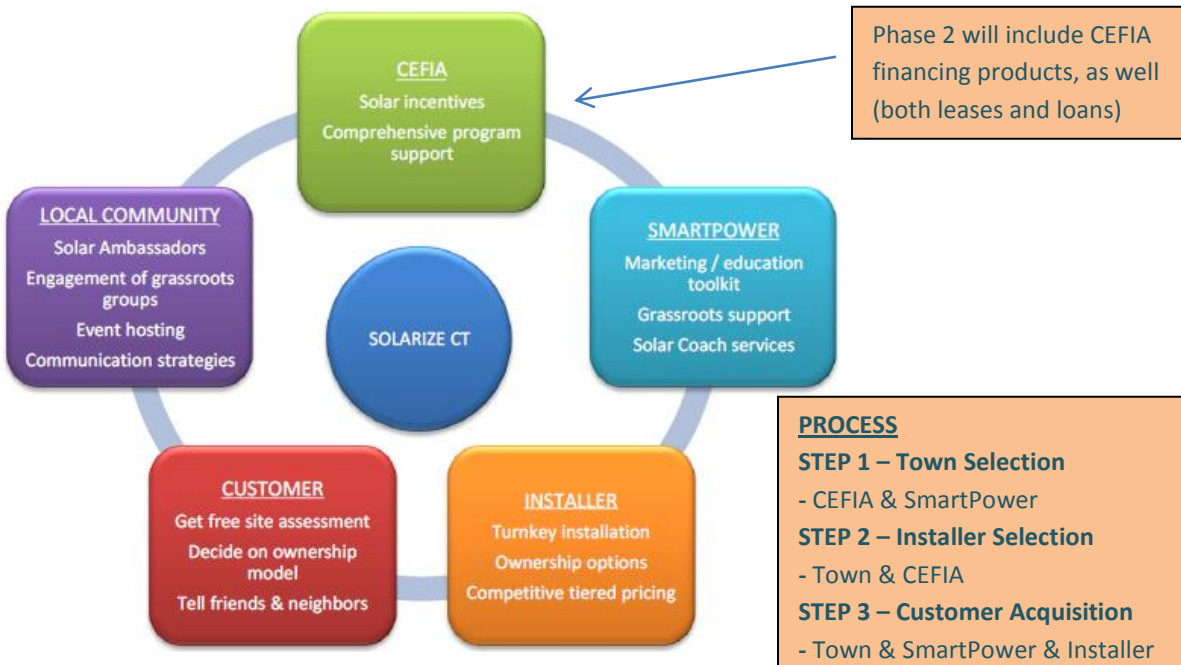
- Over the course of the pilot, CEFIA's goal is to achieve 300 new residential solar PV customers (contracted and approved for incentives) across eight towns, each with an average system size of 7 kW.
- If SmartPower can achieve this objective, the resulting customer acquisition cost will be **\$0.19/W** (i.e. \$400K / 300 customers / 7kW), significantly below even SunEdison's numbers.

CEFIA is rolling out the Solarize Connecticut pilot in two phases, each with four towns. The first phase began in June, 2012 with a Request for Information (RFI) released to the 100 towns in Connecticut that are either designated as "clean energy communities" or have taken the municipal clean energy pledge. Out of those 100 towns, 10 applied to become Solarize communities, and CEFIA staff chose four (Durham, Fairfield, Portland, and Westport). More information on the town selection process follows below. The first phase continued with the release of a Request for Proposals (RFP) to the Connecticut solar PV installer base in July, 2012, inviting installers to apply to serve as the sole-source provider of residential solar PV within each selected community, from August through December 2012. Guided by the preferences of local leadership from each selected community, CEFIA staff identified the following installers to serve each town over the course of this first pilot phase:

- Durham: [BeFree Solar](#)
- Fairfield: [Astrum Solar](#)
- Portland: [Real Goods Solar](#)
- Westport: [Encon Solar](#)

More information on the installer selection process follows below, as well. This first pilot phase runs through the end of 2012. This fall, CEFIA will pick four new communities to participate in the second pilot phase, and again with guidance from local leadership, identify four installers to serve those communities. Phase 2 will kick off in March or April, 2013 and run until June, 2013.

The following diagram demonstrates the roles of the various program partners involved in the first phase of the Solarize Connecticut pilot:





## TOWN SELECTION

According to the RFI released to the communities, CEFIA staff (together with representatives from SmartPower and the John Merck Fund) evaluated town proposals based on the following criteria:

- **Overall quality;**
- **Team:** degree of proposed team's experience and the breadth of partnerships and level of commitment identified in proposal;
- **Marketing Ideas:** overall quality of marketing and outreach thinking, incorporating lessons learned from Solarize Massachusetts;
- **Additional resources:** extent to which additional resources (both financial and otherwise) are identified and potentially committed to the program;
- **Permitting:** degree to which a community outlines the permitting process for solar PV projects and indicates a willingness to streamline processes or costs;
- **Proposed methodology:** ability of proposal to drive community adoption of PV projects in order to drive down cost of residential PV installations;
- **Demonstration of innovative concepts:** additional consideration given to communities that provide innovative outreach, marketing, and educational proposals, including engagement with unique community networks and groups; and
- **Commitment to clean energy and sustainability:** overall record of expanding renewable energy and energy efficiency initiatives in the community.

In addition, CEFIA and SmartPower reserved the right to consider geographic, demographic and economic diversity as important evaluation criteria for the Solarize pilot phase, in order to test the viability of the program's strategic approach across different types of communities.

The review team found that all ten towns that submitted proposals demonstrated significant strengths (including a commitment by all ten to work with CEFIA to streamline their permitting processes according to our recommended best practices). In the end, our decision making came down to the difference in specific commitments made by individuals and organizations identified in the towns' proposals, a few innovative outreach ideas (such as solar house parties, GIS support, etc.), and the various towns' historical records of success in pushing grassroots adoption of local sustainability measures. Durham, Fairfield, Portland, and Westport emerged as the winners, but CEFIA staff encouraged the remaining six towns to reapply for the second pilot phase, and we gave specific feedback to each to help strengthen their revised proposals.

Across the selected towns, early Solarize volunteers tend to be comprised of members of local clean energy task forces, [Neighbor to Neighbor](#) team members (for both Westport and Portland, that is, including both town and external N2N outreach partners), First Selectmen & Selectwomen, municipal staff (often part of each town's energy task force) and solar enthusiasts. Collectively, these volunteers are for the most part environmentalists who are active in various local sustainability initiatives, but volunteers also include energy professionals, engineers, academics, journalists, realtors, retirees, and other interested citizens.

**A simple summary table of the 10 towns that applied follows on the next page.**

**SUMMARY TABLE OF SOLARIZE CONNECTICUT PILOT PHASE ONE TOWN SELECTION**

Town	Selected for Pilot	Utility	Population	Households	Median Household Income	# Current Residential Solar PV Project Installs	Percent Residential Solar PV Project Installs per Households	Current Installed Capacity Residential Solar PV Projects (kW STC)	Residential Solar PV Project Installed Capacity per Households (kW STC / # households)	# Current CTCEO Sign-Ups	Percent of CTCEO Sign-Ups per Households
Canton	-	CL&P	8,840	3,863	\$79,499	13	0.34%	81.16	0.02	217	5.6%
Chester	-	CL&P	3,743	1,576	\$89,521	10	0.63%	62.62	0.04	182	11.5%
Durham	Yes	CL&P	6,627	2,424	\$92,319	21	0.87%	172.80	0.07	95	3.9%
Fairfield	Yes	UI	57,340	19,973	\$103,754	38	0.19%	240.30	0.01	813	4.1%
Kent	-	CL&P	2,858	1,217	\$71,008	17	1.40%	116.10	0.10	78	6.4%
Mansfield	-	CL&P	20,720	5,680	\$71,017	37	0.65%	246.18	0.04	459	8.1%
Newtown	-	CL&P	27,560	8,704	\$105,744	32	0.37%	253.62	0.03	432	5.0%
Portland	Yes	CL&P	8,732	3,839	\$77,362	14	0.36%	80.53	0.02	261	6.8%
Westport	Yes	CL&P	25,749	9,459	\$160,451	39	0.41%	244.48	0.03	466	4.9%
Windham	-	CL&P	22,857	8,862	\$40,983	8	0.09%	46.39	0.01	176	2.0%
Total	-	-	185,026	65,597	-	229	-	1,544.17	-	3,179	-
<b>TOTALS FOR SELECTED TOWNS</b>											
Town	Selected for Pilot	Utility	Population	Households	Median Household Income	# Current Residential Solar PV Project Installs	Percent Residential Solar PV Project Installs per Households	Current Installed Capacity Residential Solar PV Projects (kW STC)	Residential Solar PV Project Installed Capacity per Households (kW STC / # households)	# Current CTCEO Sign-Ups	Percent of CTCEO Sign-Ups per Households
Durham	Yes	CL&P	6,627	2,424	\$92,319	21	0.87%	172.80	0.07	95	3.9%
Fairfield	Yes	UI	57,340	19,973	\$103,754	38	0.19%	240.30	0.01	813	4.1%
Portland	Yes	CL&P	8,732	3,839	\$77,362	14	0.36%	80.53	0.02	261	6.8%
Westport	Yes	CL&P	25,749	9,459	\$160,451	39	0.41%	244.48	0.03	466	4.9%
Total	-	-	98,448	35,695	-	112	-	738	-	1,635	-

In terms of human resources, the town selection process required substantial staff time. More than 80% of Ben's time went towards this effort over the month of June, and Bob and Robert contributed significant amounts of their time, as well. In addition, other CEFIA staff contributed key support towards both communications and legal processes necessary to get the program up and running, making this a fairly intensive launch.

Having said that, now that the initial legwork is done, we do believe future iterations of Solarize Connecticut could require less CEFIA involvement at the outset (although, in general, it is still too early to draw major conclusions along these lines). For one, an online application could potentially streamline the community engagement process, with fewer CEFIA resources dedicated to town selection. Instead, CEFIA could provide support to SmartPower in understanding the background dynamic of towns that choose to apply, with SmartPower then leading the process of getting motivated communities up and running. Such a process would free up internal staff resources to focus on the more technical installer selection process instead. Essentially, given that we now have all the explanatory language in place regarding program design, CEFIA's initial role in Solarize could simply be to help SmartPower articulate the key components necessary for towns to get started on their own, including:

- The support of the chief executive, and the identification of a Municipal Representative / project manager;
- Commitments from clearly identified Solar Ambassadors (both individuals and organizations);
- A local marketing and outreach strategy; and
- Buy-in for the key elements of the Solarize Connecticut program design (use of a sole-source installer, a time-limited approach to drive urgency and uptake, tiered pricing, etc.).

Of course, as suggested above, towns would still require significant support through the installer selection process, even with the use of CEFIA's installer RFP as a template. Technical questions regarding solar PV, as well as concerns regarding financing, are beyond most towns' expertise, and initial marketing support from CEFIA and / or SmartPower will almost undoubtedly remain necessary to help jumpstart local Solarize campaigns, no matter how motivated a community is.

Regardless, at this point, we have identified a few key lessons learned that are worth noting:

- Allow towns more time for their responses to our RFI;
- Allow multi-town applications, especially for smaller communities;
- Limit the number of pages in town proposals to encourage clarity and focus;
- Develop a concise and standardized permitting survey *through the RFI*;
- Require identification of a municipal representative and a project manager (this is a local Solarize point person who could also be the municipal representative) in the RFI response;
- Require identification of the installer RFP review team and potential review dates to expedite scheduling; and
- Require identification of the ultimate local decision-maker and process for installer selection purposes.

Finally, as a note of caution not to get ahead of ourselves, it is worth recognizing here that we have yet to go through the initial pilot phase, so these suggestions and lessons learned are at best quite preliminary.

## **INSTALLER SELECTION**

Through an RFP process, CEFIA solicited proposals from installers for each of the four selected towns. The RFP requested that installers submit “competitive, tiered pricing for a direct-ownership model, a leasing or power purchase agreement model, or both a direct-ownership model and a leasing or power purchase agreement model for residential solar PV installations.” In addition, installers’ proposals had to contain their own community-based marketing ideas, highlights of their Connecticut installation experience, descriptions of various potential cost adders (note: for the selected Solarize installers, these adders are listed at the end of this document), and plans for how they would handle non-feasible customer sites. Installers had the opportunity to bid on all of the communities but could be selected to serve no more than two. Furthermore, a consortium consisting of more than one installer was allowed to bid collectively on any given community.

As per the RFP, both local Solarize community leadership and CEFIA staff participated in the evaluation of all the proposals (in total, 20 installers applied to serve at least one of the four towns, of which only one installer was deemed ineligible outright). The evaluation criteria consisted of the following:

- **Overall quality and value:** overall quality of proposal and specified equipment;
- **Experience:** degree of installer’s experience and proficiency in the scope of work, including demonstrated experience in developing, designing and installing residential solar PV systems;
- **Implementation:** ability to provide timely, quality customer service and installations, as well as ability to work well with the chosen community;
- **Price structure:** Purchase Price (\$/kW) and / or Lease / PPA Price (\$/kWh) for increasing tiers of capacity contracted within the community. In addition, the value offered by the proposed equipment, price adders, price escalators, and contract terms and conditions;
- **Demonstration of innovative concepts:** additional consideration given to installers that provide innovative business models, or have options for other technologies such as solar hot water and energy efficiency;
- **Marketing plan:** ability of proposal to drive community adoption

**A simple summary table of the 20 installers that applied follows on the next page.**

SUMMARY TABLE OF SOLARIZE CONNECTICUT PILOT PHASE ONE INSTALLER SELECTION

Installer	Current Residential Solar PV Project Installs	Current Residential Solar PV Project Installed Capacity	Purchasing Price for 1-25 kW (\$/kW)	Purchasing Price for 250+ kW (\$/kW)	Financing Provider	Lease/PPA Price for 1-25 kW (\$/kWh)	Lease/PPA Price for 250+ kW (\$/kWh)	Plan for Non-Feasible Solarize Site
AllGreenit	8	44.99	\$3.90	\$3.10	Purchasing: FHA Loan	-	-	Geothermal; efficiency installs
Astrum	16	128.14	\$4.00	\$3.55	Purchasing: EnerBank USA Lease: Constellation	\$0.125	\$0.072	None
Befree	59	469.20	\$4.50	\$3.60	Purchasing: Admirals Bank, SunPower loan	-	-	In-house solar thermal & EE capability
C-TecSolar	7	42.92	\$4.25	\$3.42	Unclear if / how C-Tec is providing financing	-	-	In-house solar thermal capability
DCS Energy	17	80.75	\$3.40	\$3.00	Purchasing: Admirals Bank; Lease: Sungevity	\$0.180	\$0.140	In-house solar thermal capability
Encon	39	250.58	\$3.99	\$3.47	Purchasing: Admirals Bank, SunPower loan; in talks with Sungevity re: lease	-	-	Partnership with Ecosolar & Ecologic
Giuffrida	3	17.32	\$4.85	\$4.40	None	-	-	In-house EE evaluation
Lighthouse Solar	0	0	\$3.85	\$3.67	Purchasing: Admirals Bank	-	-	Referrals
Mercury	22	125.15	\$4.85	\$3.90	In-house	\$0.159	\$0.104	Energy efficiency
PurePoint	18	116.78	\$3.83	\$3.35	None	-	-	None
Real Goods	596	4,188.64	\$3.96	\$3.61	Purchasing: SunPower loan (if those panels are chosen)	-	-	Solar thermal through referral to Anthem
Renewable Resources	0	0	\$3.60	\$3.25	Webster, Admirals Bank, EnerBankUSA	\$0.105	\$0.105	None
Ross Solar	170	1,287.69	\$3.94	\$3.67	Undisclosed	-	-	None
Skyview	0	0	\$3.75	\$3.25	Purchasing: Fire Energy USA	-	-	Promise to partner with HES vendor
Sound Solar	7	40.34	\$4.15	\$3.95	None	-	-	In-house solar thermal capability & partnership with EnergyPRZ
Southport Power	0	0	\$4.68	\$3.71	Undisclosed	\$0.216	\$0.192	None
Sunlight Solar	538	3,312.17	\$4.30	\$3.90	Working with SunRun on lease option	-	-	Referrals
Sun-Wind	3	14.29	\$4.90	\$4.70	None	-	-	In-house solar thermal capability
Vanguard Energy	0	0	\$4.00	\$3.35	None	-	-	None
Waldo	103	732.38	\$4.65	\$3.95	Purchasing: CHIF loan, SunPower loan	-	-	In-house solar thermal capability
Total	1,606	10,851	-	-	-	-	-	-

After two full days of meetings with local representatives (a half day in early August for each of the four towns) to evaluate the proposals, it became clear that local leaders desired interviews with the most competitive installers. A full day of installer interviews occurred on August 10, and the towns selected their chosen installers the following week. Again, as we identified earlier (and highlighted on the chart on the previous page), the selected installers are:

- Durham: BeFree Solar
- Fairfield: Astrum Solar
- Portland: Real Goods Solar
- Westport: Encon Solar

In terms of human resource requirements to manage the installer selection process, this piece was if anything more intense than the town selection. Getting the RFP into good shape was a significant amount of work, involving a number of difficult decisions (i.e. RSIP steps, installer consortia, the number of towns an installer could bid on, requirements with regard to providing financing options, etc.). Once the installer proposals came back in, the demands on CEFIA staff only increased – scheduling with towns, running introductory meetings, summarizing and evaluating proposals, scheduling interviews, and otherwise answering process questions non-stop from both towns and installers. As opposed to the town selection process (which could evolve to become a self-selection process with the support of SmartPower in the future),<sup>2</sup> CEFIA's role is clearly quite critical during the installer selection step. In terms of staff time, especially with Ben stepping off the project at the end of July, work on Solarize Connecticut ate up a majority of Bob and Robert's time over the course of August, not to mention Bill Colonis' contributions (via contract).

Again looking towards the future, it seems straightforward enough to imagine turning the installer RFP into an online application (perhaps with a nominal fee to ensure only serious bidders apply), which towns or other interested parties could release on their own. Using our RFP as a template, they could solicit bids from installers and make use of the evaluation criteria we have developed to help them organize the responses. At that point, however, CEFIA staff would still have to be quite engaged. Our current process has revealed that towns need a great deal of support in order to get comfortable with choosing a sole-source installer, and it is unlikely we could automate that support or expertise. Nonetheless, if CEFIA staff were to serve as a standby resource who could respond to inquiries as they came in, this might be a feasible approach.

Furthermore, even after the installer selection process, there is an argument to be made that the presence of CEFIA staff is critical throughout the kickoff phase, since we both have strong relationships with the towns that can help jumpstart action, and we don't want to relinquish our identity from the program (an important lesson learned from the Communities program).

Overall, we have again identified a few key lessons learned that are worth noting here:

- Allow installers more time to respond to our RFP;
- Develop standardized fields / assumptions for financing options;

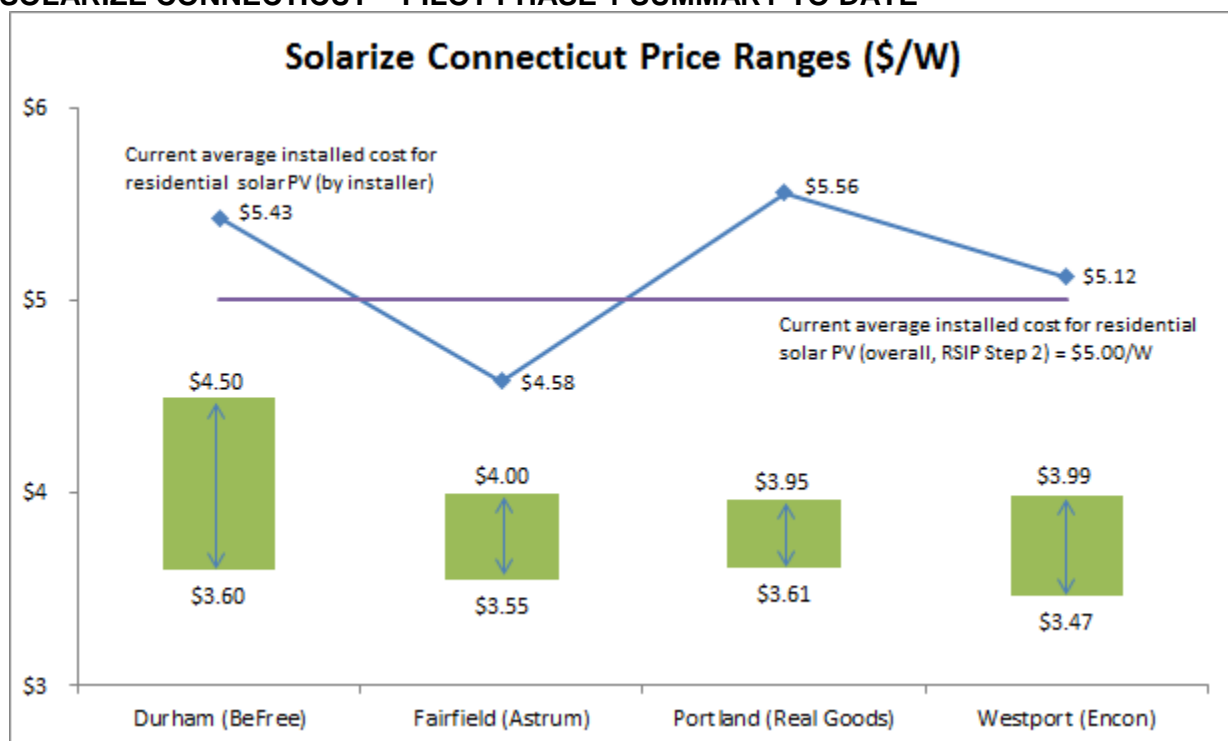
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<sup>2</sup> It is worth noting that being "selected" as opposed to "signing up" appears to help motivate town leaders, advocates and solar ambassadors. It may be worth the small amount of time to "choose" towns in order to benefit from the commitment it appears to generate, even if the number of communities in the future is much larger.

- Provide installers with a manual rebate calculation spreadsheet to ensure standardization of pricing;
- Build time into the review process for installer interviews;
- Develop solar thermal and energy efficiency options more fully;
- Revisit list of adders to ensure comprehensiveness and comparability;
- Require identification of U.S.-manufactured components;
- Require provision of customer service information; and
- Determine whether or not to allow towns to negotiate with installers outside of their RFP responses.

Once more, though, a note of caution not to get ahead of ourselves: these suggestions and lessons learned come without the benefit of having gone through even the meat of the first pilot phase, and might require serious revision by the time we are done learning from it.

### SOLARIZE CONNECTICUT – PILOT PHASE 1 SUMMARY TO DATE



The chart above summarizes where we stand at the moment. It is exciting to think that we are potentially looking at prices significantly below current average installed costs in Connecticut (between 10 – 30% less!), but this is all prospective – cost adders (again, listed on the final page of this document) could increase prices on a case-by-case basis, and we won't know what the ultimate costs will be until we know where each town lands in terms of the final pricing tier achieved. Still, we feel very positively about the process we have run so far, and believe we are well positioned to meet with a high level of success in the first phase of this pilot.

### OTHER FUTURE CONSIDERATIONS / OPPORTUNITIES

Before closing, then, we would like to touch on one final note worth mentioning. Based on the Massachusetts experience, upwards of 80% of the leads generated through Solarize Connecticut will very likely not be feasible sites for solar PV. We have asked each installer to identify their plan for non-feasible sites, focusing on the possibility of solar thermal installations

or energy efficiency improvements. Although their RFP responses varied, this is a ripe opportunity. Whether built into Solarize itself, either through our chosen installers or through a referral system, or even via a CEFIA-coordinated follow-up approach using a secondary contractor, we need to make sure these leads do not get lost, but that instead we have a mechanism to capture and convert them. This is a subject worth more discussion, and potentially the allocation of further funding in collaboration with supportive foundation partners.



**SUMMARY TABLE OF SOLARIZE CONNECTICUT PILOT PHASE ONE TOWNS & INSTALLERS**

Town	Installer	# Current Residential Solar PV Project Installs	Percent Residential Solar PV Project Installs per Households	Current Installed Capacity Residential Solar PV Projects	Residential Solar PV Project Installed Capacity per Households (kW STC / # households)	Purchasing Price for 1-25 kW (\$/kW)	Purchasing Price for 250+ kW (\$/kW)	Lease/PPA Price for 1-25 kW (\$/kWh)	Lease/PPA Price for 250+ kW (\$/kWh)
Durham	BeFree	21	0.87%	172.80	0.07	\$4.50	\$3.60	-	-
Fairfield	Astrum	38	0.19%	240.30	0.01	\$4.00	\$3.55	\$0.125	\$0.072
Portland	Real Goods	14	0.36%	80.53	0.02	\$3.96	\$3.61	-	-
Westport	Encon	39	0.41%	244.48	0.03	\$3.99	\$3.47	-	-
<b>Total</b>	-	<b>112</b>	-	<b>738.11</b>	-	-	-	-	-

**COST ADDERS FOR SELECTED INSTALLERS**

		Westport	Portland	Fairfield	Durham
		Encon	Real Goods	Astrum	BeFree
Description	Unit	Price			
Trenching	\$/ft.	\$25.00	-	-	-
Sistering Rafters	\$/W	\$0.25	-	-	\$0.20
Flat Roof	\$/W	-	-	\$0.50	-
Roof Pitch >30	\$/w	\$0.15	\$0.15	-	\$0.35
Greater than 22ft Ground to roof access	\$/W	\$0.05	-	-	-
Standing Seam Roof	\$/W	\$0.05	\$0.25	-	-
Cedar Shake	\$/W	\$0.25	-	-	-
>50' conduit Run	\$/ft.	\$4.00	\$500 / project	-	-
Breaker Panel Upgrade (200A)	\$/W	\$1500 / unit	-	\$0.20	\$0.25
Breaker Panel Upgrade (400A)	\$/unit	\$2,500.00	-	-	-
Multiple arrays	\$/W	\$0.10	\$300 / project	-	-
Micro-inverters	\$/W	\$0.25	\$0.25	-	-
Ground Mount (multi-pole)	\$/W	\$0.50	\$1.50	\$0.90	\$1.25
Ground Mount (top of pole)	\$/W	-	-	\$1.20	-
Carport	\$/W	\$2.00	-	-	-
Solar Awning	\$/W	\$1.00	-	-	-
Systems >= 4.0 kW & <5kW	\$/W	-	-	\$0.25	-
Systems < 4.0kW	\$/W	\$0.35	-	\$0.50	-
5 year monitoring extension	\$/Unit	\$90.00	-	-	-
5 year Consumption Monitoring	\$/Unit	\$115.00	-	-	-
Extended Inverter Warranties (20 Years)	\$/W	\$0.25	-	-	-
American Made (SolarWorld)	\$/W	\$0.19	-	\$0.10	-
Systems greater than 10kW-AC (Utility Fee)	\$/W	\$900 / project	-	\$0.20	-
Flat Roof Single-Ply Membrane	\$/W	\$0.10	-	-	-
Load Center/Subpanel up to 125A	\$/Unit	\$200.00	-	-	-
Load Center/Subpanel greater than 125A	\$/Unit	\$250.00	-	-	-
Tilt Up Racking	\$/W	\$0.05	-	-	-
Grounding Rod	\$/Unit	\$60.00	-	-	-
High Efficiency (SunPower)	\$/W	\$1.35	\$1.00	-	\$1.00
High Efficiency - All Black (SunPower)	\$/W	\$1.60	-	-	-
Standard Efficiency -All Black (Siliken)	\$/W	\$0.05	-	-	-
PE Stamped Letter of Approval	\$/W	\$0.10	-	-	-
Post/Stand/Flashing	\$/W	\$0.12	-	-	-
Rodent Screening	\$/W	\$0.10	-	-	-
Sun Frame (custom mounting)	\$/W	-	\$0.15	-	-



# Market Watch Report

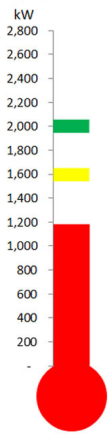
## Residential Solar Investment Program

**Program Data as of September 13, 2012**

**Race to the Rooftop**

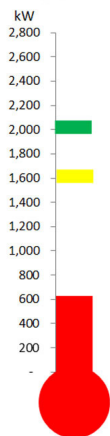
### REBATE

42% of Goal



### LEASE

22% of Goal



The **YELLOW BAR** at 1,600 kW represents a point in time when CEFA staff will make a recommendation on the Step 3 funding and incentive level to the Deployment Committee for consideration. The **GREEN BAR** at 2,000 kW represents a point in time when the Deployment Committee and CEFA staff will propose Step 3 funding and incentive level to the Board of Directors for consideration and approval.

### Executive Summary

- **Installation Progress** – nearly 70% of projects in Step 1 have either been completed or are in progress (71% for rebate and 19% for PBI). Nearly 30% of projects in Step 2 have either been completed or are in progress (42% for rebate and 4% for PBI).
- **Installed Costs Decreasing** – overall installed costs per kW are down by 5% from Step 1 to Step 2. There is an installed cost decrease of 5% for rebate installers and an increase of 4% for PBI installers.
- **Investment Increasing** – nearly \$16 million has been invested in residential solar PV since the start of the Residential Solar Investment Program with over \$5 million in incentives provided by CEFA. This is leading to the deployment of over 3 MW of new clean energy resources – 10% of the Section 106 of Public Act 11-80 target in the first 6 months of the program.

Step 2 - Effective 5/18/2012	Rebate	PBI	Total	Average
Applications Received	187	92	279	
Applications Approved	174	86	260	
Applications In Progress	44	3	47	
Applications Completed	34	1	35	
Total Cost	\$5,988,356	\$3,091,023	\$9,079,380	
Total kW STC	1,184.6	628.8	1,813.4	
Average System Size kW STC	6.8	7.3		7.0
Cost / kW STC	\$5,055	\$4,916		\$5,007
Average Total Cost	\$34,416	\$35,942		\$34,921
Total Incentive Amount	\$1,894,439	\$1,160,108	\$3,054,547	
Incentive / kW STC	\$1,599	\$1,845		\$1,684
ZREC Equivalent Incentive Price	\$0.106	\$0.113		
Rooftop Solar Capacity Remaining	1,615.4 kW	2,171.2 kW	3,786.6 kW	

Applications Received – the total number of applications submitted by installers and received by CEFA through PowerClerk.

Applications Approved – the total number of applications received and approved by CEFA staff for project incentives.

Applications In Progress – the total number of projects that have received 60% in upfront incentives for delivery of materials to the site.

Applications Completed – the total number of projects that have received 100% in incentives after inspection and completion of the project.

ZREC Equivalent Incentive Price - Given the total system cost, total incentive and total capacity (stc) of all Approved applications, the ZREC Equivalent Price is determined by calculating the net present ZREC Equivalent Price from a 15 years stream of payments that equals net present value of CEFA's incentive.

## About the Clean Energy Finance and Investment Authority

CEFIA was established by Connecticut's General Assembly on July 1, 2011 as a part of Public Act 11-80. This new quasi-public agency supersedes the former Connecticut Clean Energy Fund. CEFIA's mission is to help ensure Connecticut's energy security and community prosperity by realizing its environmental and economic opportunities through clean energy finance and investments. As the nation's first full-scale clean energy finance authority, CEFIA will leverage public and private funds to drive investment and scale-up clean energy deployment in Connecticut.

## Historical Program Data (Previous Steps)

<b>Step 1 - Fully Subscribed</b>	<b>Rebate</b>	<b>PBI</b>	<b>Total</b>	<b>Average</b>
<b>Applications Received</b>	161	16	177	
<b>Applications Approved</b>	161	16	177	
<b>Applications In Progress</b>	53	3	56	
<b>Applications Completed</b>	62	0	62	
<b>Total Cost</b>	\$5,707,382	\$594,599	\$6,301,980	
<b>Total kW STC</b>	1,067.4	125.5	1,192.9	
<b>Average System Size kW STC</b>	6.6	7.8		6.7
<b>Cost / kW STC</b>	\$5,347	\$4,737		\$5,283
<b>Average Total Cost</b>	\$35,450	\$37,162		\$35,604
<b>Total Incentive Amount</b>	\$1,879,917	\$229,999	\$2,109,916	
<b>Incentive / kW STC</b>	\$1,761	\$1,832		\$1,769
<b>ZREC Equivalent Incentive Price</b>	\$0.115	\$0.113		

Based on estimated lifetime system production under Step 1, current residential deployment represents an average levelized cost of solar energy within the range of \$0.223 - \$0.240 / kWh. Of that total, CEFIA's support accounts for \$0.074 - \$0.085 / kWh.

## Environmental Factors - Calculated based upon all Approved Applications

<b>Lifetime CO<sub>2</sub> Reduction</b>	<b>Lifetime NO<sub>x</sub> Reduction</b>	<b>Lifetime SO<sub>2</sub> Reduction</b>	<b>Annual Cars off the Road</b>	<b>Equivalent Acres of Trees Planted</b>
74,077,756 lbs.	33,574 lbs.	30,717 lbs.	247	494



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**DRAFT 5.0**

## **Technical Standards**

Prepared for:

**Clean Energy Finance and Investment Authority**  
**865 Brook Street**  
**Rocky Hill, CT 06067**

In Response to Professional Services Agreement #1683

### ***Program Design Assistance For C-PACE Program***

Prepared by:

**Buonicore Partners, LLC**

In consultation with:

Celtic Energy, Inc.  
MJBennett, PLLC  
Renewable Funding, LLC  
Sustainable Real Estate Solutions, Inc.  
Sustento Group, LLC

Glastonbury, CT  
Birmingham, MI  
Oakland, CA  
Trumbull, CT  
Los Angeles, CA

September 13, 2012

## **Section I – Technical Standards Overview**

The methodology in these technical standards is designed to provide a flexible framework within which to qualify and manage the myriad eligible energy improvement projects applying for C-PACE funding. It also designed to ensure that projects funded through the C-PACE program perform as predicted.

Energy improvements are defined in the PACE statute as “any renovation or retrofitting of qualifying commercial real property to reduce energy consumption or installation of a renewable energy system to service qualifying commercial property, provided such renovation, retrofit or installation is permanently fixed to such qualifying property.” A qualifying commercial real property includes any commercial (including multifamily with five or more units) or industrial property, regardless of ownership.

Projects can range from installation of a single energy conservation measure (ECM), such as a new high efficiency boiler or a renewable energy system, to a whole building energy upgrade involving multiple interactive ECMs.

These proposed standards envision a two track application review to be conducted by CEFIA or its designated representative. A FAST TRACK review will likely be chosen for:

- less technically complex projects that may involve, for example, only one or two targeted ECMs (such as replacement of an old inefficient furnace past its useful life with a new high efficiency furnace) or,
- projects where a recent comprehensive energy audit has already been conducted by a qualified professional or,
- Clean Energy Efficiency Fund (CEEF) approved projects.

More comprehensive review will be required for all other project submittals (refer to Section II).

In all cases, information obtained from the responsible parties including the application, application review, project implementation, and energy savings measurement and verification (M&V) will be entered into a web-based CEFIA Data Management Platform (CDMP). The CDMP platform will facilitate uploading of key project data from responsible parties via excel spreadsheets and appending supporting documents in PDF file format. This data will also support the technical and financial underwriting process required to meet the reporting requirements of the multiple interdependent stakeholders, including but not limited to CEFIA management, lenders, building owners/managers and/or insurers (refer to Section VIII).

The technical methodology incorporated into the review process relies upon three established industry protocols:

1. ASTM E2797-11, Building Energy Performance Assessment (BEPA) Standard<sup>(1)</sup> directed at data collection and baseline calculations for the energy audit;
2. ASHRAE Level I, Level II and Level III Energy Audit Guidelines<sup>(2)</sup>; and
3. International Performance Measurement and Verification Protocol (IPMVP).<sup>(3)</sup>

- (1) ASTM Standard Practice E2797-11, Building Energy Performance Assessment, published by ASTM, Conshohocken, PA, February 2011.
- (2) Procedures for Commercial Building Energy Audits, 2<sup>nd</sup> Edition, published by American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Atlanta, GA, 2011.
- (3) Efficiency Valuation Organization, "International Performance Measurement and Verification Protocol, Concepts and Options for Determining Energy and Water Savings," Volume 1, EVO 10000 – 1:2012, January 2012.

DRAFT

## Section II – Candidate Project Evaluation and Review Process

Candidate project proposals submitted to CEFIA will be classified into one of the following four categories:

- (1) project proposals based upon the results from a recent (less than 3 years old) ASHRAE Level II or Level III ( or equivalent) energy audit;
- (2) project proposals focused on replacement/upgrading of a specific building energy-using component (“targeted ECM”);
- (3) CEEF-approved projects seeking C-PACE financing;
- (4) project proposals without a specific plan, but with a goal to improve the building’s energy efficiency and take advantage of C-PACE financing.

Project proposals in categories (1) through (3) will likely be eligible for CEFIA’s FAST TRACK review process. Project proposals in category (4) are required to undergo a full assessment. Final approval on the candidate’s project review path is the responsibility of CEFIA or a program administrator working at the direction of CEFIA.

### Full Assessment

Projects undergoing comprehensive review (refer to Figure 1) will begin with a screening step conducted by CEFIA to cost effectively eliminate projects where potential energy savings are not acceptable. This determination will be based on the applicant’s submittal of building energy use and cost data collected according to the ASTM E 2797-11 (“ASTM BEPA”) standard protocol in conjunction with an ASHRAE Level I audit. CEFIA, using its CDMP, will assess how the building’s current energy use intensity (kBtu/ft<sup>2</sup>) and energy cost (\$/ft<sup>2</sup>) compares with relevant peer buildings (“benchmarking”). If the results determine the project savings do not meet CEFIA’s minimum requirements, it will be rejected.

If benchmarking indicates there is potential to achieve an acceptable level of energy savings, CEFIA will advise the applicant to conduct an ASHRAE Level II or Level III energy audit or equivalent (refer to Section III). The audit, conducted by a CEFIA-approved energy auditor, will identify and recommend ECMs, determine project cost and expected energy savings, and evaluate key financial metrics. It is expected that most energy audits will be ASHRAE Level II. However, the final decision on audit level (ASHRAE Level II or Level III or equivalent) rests with CEFIA. In making this determination, CEFIA may consider a number of factors, including but not limited to, a project’s anticipated total capital investment and/or financing and insurance partner requirements.

Assuming the ECMs are eligible under the C-PACE program (refer to Section IV) and the energy savings and financial metrics meet CEFIA’s minimum requirements, the project will be deemed qualified. If not, the applicant’s proposal will be denied (although the probability of a denial at this stage of the review process is low).



Qualified projects then proceed to securing C-PACE financing. Depending upon the nature of the project and stakeholder requirements, CEFIA will assess whether energy savings insurance, if available, is appropriate for the project (refer to Section VI).

Once financing is in place, a CEFIA-approved energy contractor or energy service company (refer to Section VII) is retained by the applicant to execute the project and, once the ECMs are installed, to measure and verify the energy savings (refer to Section V).

All key project data is entered in the CEFIA Data Management Platform (CDMP) by those responsible for the various tasks (refer to Section VIII). At the minimum, this platform will contain information collected from the applicant's submittal, the project development and review process, project installation and energy savings M&V. The platform will also facilitate reporting to all interdependent stakeholders, including but not limited to CEFIA management, lenders, building owners/managers and/or insurers.

### **FAST TRACK Review**

If an ASHRAE Level II or Level III energy audit (or equivalent) was conducted within the previous three (3) years and specific recommendations were provided on ECMs, including a projection of energy savings, or if a targeted inefficient energy-using system is being replaced (for example, an old unit that is past its useful life or if the facility is proposing to install a renewable energy system), or if the project already has been approved by CEEF, then CEFIA may employ the FAST TRACK review process.

The FAST TRACK process reduces the level of "soft costs" incurred by the applicant and accelerates the review process to reach C-PACE financing. The process differs from the full assessment process in two ways (refer to Figure 1). First, the screening step is replaced with a step designed to confirm the applicant's proposal. Second, there is no need for a comprehensive energy audit. Assuming the applicant's proposal is confirmed, the remaining steps are the same as in a full assessment.

The applicant's proposal must be reviewed and confirmed by a CEFIA-approved third party energy auditor. The energy auditor is to collect energy use data as appropriate following the ASTM BEPA standard and conduct a targeted ASHRAE Level I assessment to confirm that the proposed energy efficiency project is currently valid. For example, in the case of a targeted ECM, the auditor should at the minimum inspect the existing unit that is being replaced; confirm the projected energy savings achievable with the proposed new, high efficiency unit; confirm project cost; and evaluate key financial metrics. The energy auditor will enter pertinent data in the CDMP. CEFIA would review the project and make a determination on whether or not the project is qualified for C-PACE funding.

## Section III - Audit Requirements

As a condition of financing, C\_PACE legislation requires performance of an energy audit or renewable energy feasibility analysis that assesses the expected energy cost savings of the energy improvements over their useful life. CEFIA, in consultation with the applicant, will determine the minimum required energy audit scope of work (ASHRAE Level I, Level II or Level III) consistent with the C-PACE program technical standards. Regardless of the audit level, energy use data collection and analysis should be in substantial compliance with the ASTM E2797-11 standard. The principal objectives of the energy audit are to:

- identify and recommend, in collaboration with the property owner/manager, C-PACE-eligible ECMs (see Section IV);
- estimate the useful life of each ECM;
- assess total project capital cost;
- determine the energy savings that can confidently be achieved (energy savings should be determined by the difference between projected energy use after the ECMs are installed and the projected baseline energy use under similar conditions); and
- determine the project's key financial metrics, including ROI, IRR, NPV and payback time based on the anticipated term of the C-PACE loan (the financial analysis performed should reflect any rebates or incentives offered by utilities operating in the State of Connecticut).

In estimating the total project cost eligible for C-PACE funding (from upfront energy audits or renewable energy feasibility studies, to the design and installation of the energy improvements, to verification of the energy savings achieved), the energy auditor may also include the cost of a maintenance contract for the energy improvements, up to but not exceeding a five (5) year contract.

Completed energy audit data is to be populated in CEFIA's Data Management Platform (CDMP) to enable CEFIA to validate that the scope of work met the required technical standards, ECMs met C-PACE program eligibility requirements, the recommended ECMs were technically and financially feasible, and all stakeholder underwriting data needs were satisfied.

### *ASHRAE Level I Energy Audit*

An ASHRAE Level I energy audit consists of a walk-through analysis to assess a building's energy cost and efficiency by analyzing utility energy bills (using ASTM BEPA Methodology to establish the building's baseline energy use) and conducting a brief on-site survey of the building. The walk-through may be targeted at a specific building component that is intended to be replaced or upgraded or added (such as in the case of installing a solar energy system) and include a general walk-through checking all major energy-using systems. Operational metrics of building equipment are typically limited to data collection of nameplates, but may be more detailed if that data are readily available. Level I energy analysis should at the minimum identify ECMs and the associated potential energy savings, the estimated cost of the ECMs, and specify where further consideration and more rigorous investigation is warranted.

### *ASHRAE Level II Energy Audit*

An ASHRAE Level II energy audit is a more detailed investigation and includes a more comprehensive building survey and energy analysis than a Level I audit. It also includes more detailed financial analysis. In addition to nameplate data collection, empirical data may also be acquired through various field measurements using handheld devices. The Level II audit should at the minimum identify and provide the investment and cost savings analysis of all recommended ECMs that meet CEFIA's and the owner's constraints and economic criteria, along with a discussion of any changes to operation and maintenance procedures. Detailed financial analysis includes ROI, IRR, NPV and payback period determination reflecting C-PACE financing. Sufficient detail on projected energy savings is provided to justify project implementation.

### *ASHRAE Level III Energy Audit*

The ASHRAE Level III energy audit (often referred to as an "investment grade audit") is generally applicable to projects that are very capital intensive and demand more detailed field data gathering as well as more rigorous engineering analysis. The Level III energy audit provides even more comprehensive project investment and cost savings calculations to bring a higher level of confidence that may be required for major capital investment decisions. Data collection may involve field measurements acquired through data loggers and/or an existing energy management system.

### *ASTM BEPA*

The ASTM Building Energy Performance Assessment (BEPA) protocol established a standardized methodology for building energy use data collection, compilation and analysis. The methodology is intended to fill data collection and analysis gaps in the ASHRAE energy audit guidelines and establish a sound building energy use baseline. The ASTM BEPA methodology standardized a number of major variables associated with data collection and analysis. This includes, for example, the time frame over which energy use data should be collected [*three years or back to the last "major renovation" if completed in less than three years, with a minimum of one year if reliability criteria are met*]; what constitutes a "major renovation" [*defined as a building renovation that either involves expansion (or reduction) of a building's gross floor area by 10% or more or that impacts total building energy use by more than 10%*]; how building energy use should be normalized [*by gross floor area in square feet and by using the mean value of the statistically evaluated independent variables that impact energy use in the building energy use equation*]; and what weather data needs to be collected [*heating degree days and cooling degree days should be collected for a minimum 10 year period from the weather station nearest the building and that has historical data available*].

CEFIA has the ultimate responsibility to approve the appropriate level of energy audit for a particular project, depending upon the nature of the proposed project and supporting information.

## Section IV – Eligible / Ineligible Measures

### Common Eligible Energy Conservation Measures

Pursuant to C-PACE legislation, eligible measures must at the minimum achieve an energy savings (over the useful life of the energy improvements) to [total project] investment ratio greater than one and be permanently affixed to the property. In addition to the ECM eligibility review, CEFIA will also review projected improvements in energy efficiency to ensure that the uppermost practically achievable and commercially acceptable improvement is attained.

The following list of predominant, long-standing, proven energy efficiency technologies is intended as a reference list for C-PACE applicants. If not included on this list, CEFIA will review proposed ECM(s) and accept them on a case-by-case basis.

- High efficiency lighting
- Heating ventilation air conditioning (HVAC) upgrades
- New automated building and HVAC controls
- Variable speed drives (VSDs) on motors fans and pumps
- High efficiency chillers
- High efficiency boilers and furnaces
- High efficiency hot water heating systems
- Combustion and burner upgrades
- Fuel switching
- Water conservation measures to the extent they save energy
- Heat recovery and steam traps
- Building enclosure/envelope improvements
- Building automation (energy management) systems
- Renewable energy systems.

The following end use savings technologies are generally more applicable to industrial facilities:

- New automated process controls
- Heat recovery from process air and water
- Cogeneration used for peak shaving
- Process equipment upgrades
- Process changes.

Shown below are key aspects of some of the most commonly applied technologies listed above, with their typical simple payback range. These payback periods are only provided for informational purposes and should not be construed as a requirement for C-PACE funding eligibility.

*Lighting* (2 to 3 year simple payback):

- Daylight controls and natural day lighting designed to reduce energy and improve visual comfort
- Upgrades for existing fluorescent fixtures including electronic ballasts, T8 lamps, and reflectors
- Meeting rooms and other intermittently occupied spaces can garner significant energy savings with the use of timers and occupancy sensors
- Smaller impact opportunities including security lighting, stairwell lighting, exterior night-time security lighting and exit signs.

*Motors* (3 to 5 year simple payback):

- High efficiency electric motor replacements usually pay back when a motor is running for long periods at high load, or at the end of motor life
- The cost premium over standard motors normally can be recovered in less than 2 years
- Motor sizing to the actual load profile to improve efficiency and control electrical power factor.

*Variable Speed Drives* (3 to 5 year simple payback):

- Applied to motors, pumps and fans
- Matches motor use to variable operating load
- Can save up to 40 percent in power consumption
- Can be packaged with controls
- Extends motor life.

*HVAC* (2 to 8 year simple payback)

- New packaged units can increase efficiency and indoor comfort
- Proper sizing of HVAC equipment is a major opportunity, since full-load operation is more efficient than part load operation - consider fan capacity reduction or staging of 2 smaller units rather than partial loading of one large unit
- Install VSDs on HVAC motors
- Balance air and water supply systems to remove trouble spots demanding inefficient system operation
- Improve maintenance
- Eliminate simultaneous heating and cooling
- Install economizers and direct digital controls
- Variable air volume conversions versus constant air flow
- Ventilation reduction
- Unoccupied shutdown or temperature setback/setup (controls).

*Chillers* (5 to 10 year simple payback):

- New chiller models can be up to 30-40 percent more efficient than existing equipment.
- Upgrade lead chiller(s) (base load) to high efficiency
- Manage chiller and condenser settings to minimize compressor energy

- Optimize pumping energy for distribution of chilled water
- Optimize HVAC operation to:
  - Improve temperature/humidity control
  - Eliminate unnecessary cooling loads
- CFC reclamation program/inventory - chiller replacement may achieve both CFC management and energy efficiency objectives.

*Boilers (1 to 5 year simple payback):*

- Replace steam with hot water boilers for hot water heating loads
- Improve maintenance
- Optimize operation/staging in multiple boiler plants
- Optimize boiler controls
- Tune or replace burners
- Add small “pony” boilers for low loads:
  - Reduced fuel consumption/energy costs
  - Reduced emissions
  - Reduced maintenance costs
  - Higher reliability.

*Heat Recovery (2 to 4 year simple payback):*

- Heat recovery devices to capture waste heat from water, process heat and exhaust air to re-use it for preheating:
  - building intake air
  - boiler combustion air
  - boiler feed-water
  - inlet water for domestic hot water.

*New Automated Building and HVAC Controls (3 to 5 year simple payback):*

- Old controls may still be pneumatic systems based on compressed air - new electronic controls are more precise and reliable, with greater capabilities.
- Can automate lighting, chiller, boiler and HVAC operation:
  - Load shedding
  - Optimal start/stop/warm up
  - Ventilation control.
- Whole-building energy management systems may come with other advanced control technologies:
  - security, fire and life safety
  - alarm monitoring and report generation
  - preventive maintenance scheduling
- Remote monitoring/metering capabilities may be attractive.

*Building Shell and Fenestration* (3 to 10 year simple payback):

- Roof insulation, combined with reflective roof coatings in warm climates, reduces energy consumption
- Review building pressurization for proper ventilation:
  - Balance exhaust and intake air quantities
  - Add weather-stripping on doors and windows
  - Seal cracks and unnecessary openings
- Window films to reduce solar heat gain and/or heat loss
- Replace windows with more energy efficient glazing.

### **Renewable Energy Technologies for Commercial Property (PA 11-80)**

The following are the described Class I and Class II renewable technologies per Public Act 11-80. Class I renewable energy sources applicable to commercial and industrial property upgrades - energy derived from:

- Solar power
- Wind Power
- Geothermal Power
- Fuel Cell
- Methane Gas from landfills
- Low emission advanced renewable energy conversion technologies
- A run-of-the river hydropower facility with operation after 7/1/2003\*
- Sustainable Biomass Facility\*.

Class II renewable energy sources applicable to commercial and industrial property upgrades - energy derived from:

- Trash-to-Energy facility
- Biomass Facility with operation before 7/1/98\*
- A run-of-the river hydropower facility with operation prior to 7/1/2003\*.

\*See PA-11-80 for additional details

### **Ineligible Measures**

All C-PACE related improvements must be permanently affixed to the commercial property and part of a retrofit to existing infrastructure. The following items will not be considered as efficiency measures under the C-PACE program:

- Appliances, e.g., refrigerators, dishwashers, etc.
- Plug load devices
- Vending machine controls
- Any package of measures with a weighted average effective useful life (EUL) that does not meet or exceed the life of the loan

- Any package of measures that does not achieve an energy savings (over the life of the loan) to [total project] investment ratio  $> 1$
- Any measure that is easily removed or not permanently installed
- Any measure that does not result in improved water or energy efficiency or renewable energy generation
- Extending natural gas lines to the property line to enable a PACE-eligible gas conversion project.

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## Section V - Performance Measurement & Verification of Energy Savings

The purpose of performance measurement and verification (M&V) is to ensure that baseline and normalized energy use and cost performance is calculated in a technically sound, consistent and transparent manner, which in turn is used to determine energy savings. To accomplish this goal, CEFIA requires all C-PACE applicants to incorporate in their projects an M&V plan directed at project commissioning, and be responsible for its execution. Further, depending upon stakeholder reporting requirements (including CEFIA, the building owner/manager, lender and/or insurer), recurring M&V may also need to be performed.

To accomplish this goal, CEFIA may require C-PACE applicants to base their M&V plan on the International Performance Measurement and Verification Protocol (IPMVP). The IPMVP's fundamental concept stems from the fact that energy savings cannot be measured directly. Savings in this context are *the absence of energy use* (or “avoided energy use”) that would have occurred without the ECMs installed.

The IPMVP provides four options for determining energy savings. These include:

- Option A. Retrofit Isolation: Key Parameter Measurement
- Option B. Retrofit Isolation: All Parameter Measurement
- Option C. Whole Facility
- Option D. Calibrated Simulation.

Options A and B focus on the performance of specific ECMs that can be measured in isolation from the rest of the building. In Option A, the key energy use parameter is measured, but other minor effects can be estimated. For example, Option A might include a lighting retrofit, where an electric meter can isolate and measure electricity use for the lighting, but where the relatively minor interactive effect of less cooling in summer and more heating in winter is estimated. Reduced lighting loads will reduce air conditioning energy consumption (a cooling bonus), but increase heating consumption (a heating penalty). In Option B, all parameters necessary to evaluate energy use are measured. This might, for example, be the case with installation of a variable speed drive and controls to a motor, with a power meter installed on the electrical supply to the motor.

Options C and D are used when energy use of the ECMs installed is not easily measured in isolation from the rest of building operations, or there is little measured baseline energy data, among other reasons. The Option C approach assesses savings at the whole facility level. The measured and verified energy savings in the desired reporting period (e.g., 12 months after the ECMs have been installed) is determined from the difference between the actual (measured) energy use in the reporting period and the projected energy use in this same reporting period assuming the ECMs had not been installed. The analysis reflects changes in the independent variables impacting building energy use (such as weather, occupancy, operating hours, etc.) for each month in reporting period as compared to the baseline. Option C is commonly applied for

whole building retrofits involving multiple ECMs that may be interactive. Option D uses computer simulations and building modeling (e.g., U.S. DOE 2.2- based software), and is usually applied when baseline year energy data are not available or considered reliable.

While it is expected that contractors will rely substantially on IPMVP Options A, B, C or D for M&V, CEFIA may approve exceptions depending on the specific nature and size of the project. For example, in cases where a targeted ECM is being installed (such as sole replacement of an existing inefficient unit that is past its useful life with a new high efficiency unit), CEFIA may also approve M&V using a methodology based on calculations and supported, as appropriate, with field measurements, to verify the energy savings.

For all C-PACE funded projects, contractors are to prepare an energy savings M&V plan that at the minimum provides a description of the required commissioning activities to ensure the ECMs are operating as projected by the manufacturer and as projected in the energy audit.

Within the pre-agreed upon period after ECM installation, the party responsible for project implementation (or any subsequent party approved in advance by CEFIA) is to collect post-project energy use data and other pertinent data in accordance with the M&V plan. The responsible party is required to enter such data into the CDMP. Recurring M&V reporting may be required by project stakeholders (CEFIA, building owner/manager, lender, or insurer). If so, the applicant will submit at the agreed upon frequency (and as also specified in the M&V plan) an energy savings verification report that describes the resultant actual energy savings in the reporting period compared to the projected energy savings.

CEFIA and CEEF intend to develop an MOU to determine how CEFIA M&V protocols, data formatting and data management can be compatible with the protocols used by CEEF program administrators.

## SECTION VI - Energy Savings Insurance

### Background

CEFIA has determined that for certain projects energy savings insurance (ESI) may serve as a strategic risk transfer tool that can aid in the underwriting, funding and success of a proposed project. As such, it may provide the following important benefits:

- Underwriting can provide a third party check on projected energy savings;
- Insurance may result in a credit enhancement in the project funding process;
- ESI can provide a building owner or operator with confidence that projected energy savings will be realized.

While ESI may not be appropriate for all projects, CEFIA has developed the following guidance for the C-PACE program.

### Project scenarios where it is unlikely that ESI would be applicable:

- *For relatively small projects incurring costs of less than \$300,000.* (Rationale: For such projects, the cost of ESI may represent a relatively significant percentage of total project cost. For example, assume a \$300,000 project (including, financing, legal and administrative costs) with projected annual savings of ~\$50,000 for 10 years. At today's prices the premium would likely be on the order of 5% of the projected energy savings, per year for 10 years, or  $(5\% \times \$50,000/\text{year} \times 10 \text{ years} = \$500,000)$  yielding a total premium of approximately \$25,000. This would represent almost 10% of the total project cost.)
- *For projects with a payback period of less than 3 years.* (Rationale: CEFIA will have determined that energy savings for such projects will be significant and variations in the final outcome will be minor.)
- *For projects solely involving fuel switching, i.e., oil to natural gas.* (Rationale: CEFIA will have determined from relatively straight forward calculations that at current and projected prices for natural gas, combined with high efficiency newer equipment, backed by a reputable manufacturer's guarantee, such projects will not require ESI.)
- *If a single and targeted ECM is being installed, e.g., high efficiency chiller, accompanied by a reputable manufacturer's performance guarantee.* (Rationale: Similar to fuel switching, such projects generally involve technically straight forward calculations that can provide confidence in the projected energy savings.)
- *If an energy savings performance guarantee is obtained from an investment grade energy services company.* (Rationale: Such companies will need to have the financial resources to back their energy savings guarantee.)

**Project scenarios where CEFIA may determine that ESI could be applicable:**

- *Where the payback period is greater than 3 years.*
- *Where the project cost is greater than \$300,000.*
- *For projects involving the installation of multiple energy conservation measures that may have interactive energy use implications, e.g., where the measurement and verification of the projected energy savings will be at the more difficult and complex whole-building level.*
- *If the project developer (ESCO) lacks sufficient financial resources to provide or back their energy savings performance guarantee.*
- *If a lender is considering requiring ESI as a condition to fund the project.*
- *If a lender considers ESI as a credit enhancement that can make the project more financially attractive.*

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## **SECTION VII - Qualifications for Participating ESCOs, Auditors and Contractors**

A C-PACE qualified project will typically involve a CEFIA-approved energy auditor, energy service company (ESCO) that may also conduct the energy audit, and/or installation contractor. Each must have sufficient knowledge, experience and expertise in assisting property owners with energy efficiency upgrades.

Depending on the scope and complexity of the project, the energy auditor, ESCO and/or installation contractor may be required by CEFIA to demonstrate some or all of the following general qualifications for implementing energy efficiency solutions in their respective area(s) of expertise:

1. Demonstrated experience and working knowledge of energy efficiency auditing using the ASHRAE energy audit guidelines, supported by ASTM BEPA data collection and analysis methodology, for commercial property projects, and familiarity with the processes, statutes, and codes governing the C-PACE program.
2. Have on staff, or access to, at least one licensed Connecticut Professional Engineer and, depending on the services being offered, have access to at least one Certified Energy Manager (CEM) and/or one Certified Measurement & Verification Professional (CMVP).
3. Experience and knowledge of building operational characteristics and energy systems.
4. Have a written quality assurance/quality control program for the products/services offered.
5. Provide at least three (3) references of successfully completed projects demonstrating expertise.

### *Qualified Auditor*

A qualified energy auditor will have broad experience with all types of energy efficiency projects, such as lighting, HVAC, building envelope, domestic hot water and energy equipment controls. Individuals responsible for conducting audits will have at least three (3) years experience performing audits on commercial buildings. The technical expertise and experience of the audit team selected for the project should be evident in the resumes provided to CEFIA. Since energy auditors need to be objective and dedicated to ensure that the recommended ECMs are beneficial and cost effective for clients, the auditor is to identify to CEFIA prior to execution of an audit any financial relationships with equipment vendors or service companies. With respect to the references provided to CEFIA supporting energy audit expertise, information on the type building and client contact information should be included.

### *Qualified Energy Service Company*

A qualified energy service company/contractor will have demonstrated experience with energy efficiency projects and provide CEFIA with a representative list of past projects involving building energy efficiency upgrades. The qualified energy service company/contractor must

demonstrate the technical expertise and experience of the team selected for the project by providing resumes that include a list of projects worked on. Sufficient information must also be provided to CEFIA to demonstrate the firm's organizational and financial stability. If an energy savings performance guarantee is being provided and the company does not have sufficient financial resources to support the guarantee, energy savings insurance (or its equivalent) may be used to satisfy this shortcoming.

#### *CEFIA Contractor Pre-qualification*

As the program develops, CEFIA may determine that it would be appropriate to develop pre-qualified, pre-approved list of C-PACE contractors (energy auditors, energy service companies and installation contractors). If such is the case, CEFIA will issue a Request for Qualifications and develop a process to evaluate firms that respond. In view of the work involved to develop such a program and the fact that the C-PACE program is still in its infancy, CEFIA at this time will evaluate qualifications on a case-by-case basis.

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## Section VIII: Data Management, Program Information Management, Reporting and Analytics

To ensure the success of the C-PACE program, data needs to be uniformly collected over the full life cycle of a project, from initial building screening, through energy auditing, project development, project implementation and post-implementation energy savings measurement and verification. Projects undergoing both full assessment and FAST TRACK will be tracked in the CDMP.

Sample data that will be collected in the CDMP includes, but is not limited to:

- Candidate project information
- Performance baseline determination consistent with ASTM BEPA methodology
- Benchmarking results comparing candidate performance to peer buildings
- Key energy audit data consistent with ASHRAE guidelines
- ECM data
- Key financial metrics
- Contractor information
- Project implementation data
- M&V data
- Scheduling information
- CEFIA project approval/denial information.

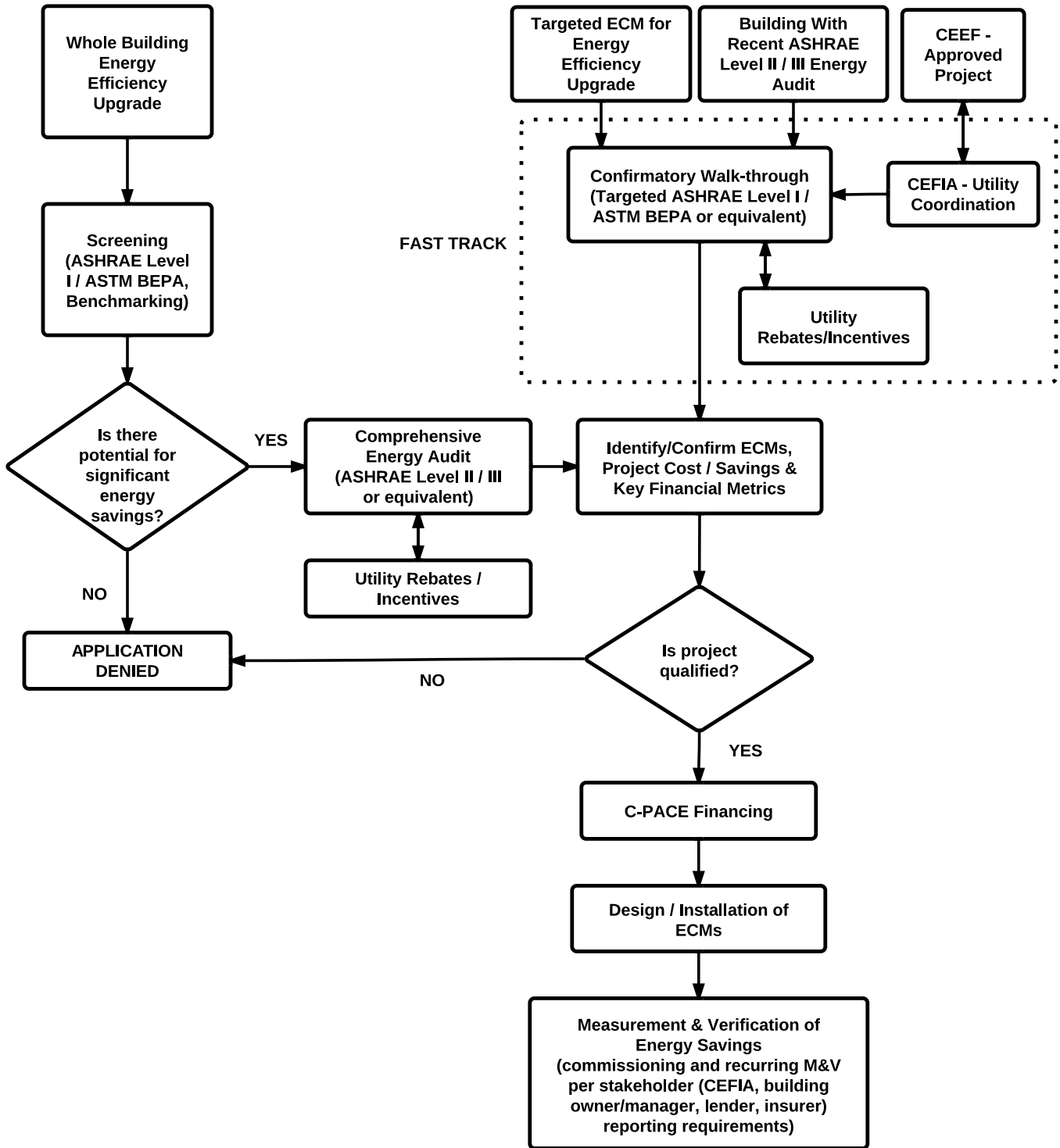
The CDMP platform will facilitate uploading of key project data (see above) via excel spreadsheets, appending supporting documents, e.g., ECM data sheets, onsite photographs, modeling and data logging results, etc., in PDF file format. The platform will also have report generation and analytics capabilities across the project life cycle to keep CEFIA management informed and to support as necessary the technical and financial underwriting process needed to meet the reporting requirements of the multiple interdependent stakeholders.

To facilitate this critical C-PACE objective, CEFIA will deploy, and require all stakeholders to use the CDMP. Standardizing on the CDMP ensures that all program interdependent stakeholders (CEFIA, building owners/managers, energy service companies, energy auditors, installation contractors, lenders and insurers) maintain *cost effective* access to the key performance analytics needed to facilitate project success and drive continuous C-PACE program improvement by all participants.

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Figure 1

## C-PACE PROGRAM PROJECT ROUTING OVERVIEW





**CLEAN ENERGY FINANCE AND  
INVESTMENT AUTHORITY**  
(A Component Unit of the State of Connecticut)

**FINANCIAL STATEMENTS**

**JUNE 30, 2012**

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY**

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## INDEPENDENT AUDITORS' REPORT

To the Board of Directors  
**Clean Energy Finance and Investment Authority**

We have audited the accompanying statement of net assets of the Clean Energy Finance and Investment Authority (a component unit of the State of Connecticut) as of June 30, 2012 and the related statements of revenue, expenditures and changes in net assets and cash flows for the year then ended. These financial statements are the responsibility of Clean Energy Finance and Investment Authority's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Fund's internal control over financial reporting. Accordingly, we express no such opinion. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the Clean Energy Finance and Investment Authority as of June 30, 2012 and the respective changes in financial position, and, where applicable, cash flows thereof for the year then ended in conformity with accounting principles generally accepted in the United States of America.

In accordance with *Government Auditing Standards*, we have also issued a report dated \_\_\_\_\_, 2012 on our consideration of Clean Energy Finance and Investment Authority's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance of other matters and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* and should be considered in conjunction with this report in assessing the results of our audit.

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis on pages 2 through 5 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operations, economic, or historical context. We have applied certain limited procedures to the required supplemental information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquires of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquires, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Hartford, CT  
\_\_\_\_\_, 2012

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY****MANAGEMENT'S DISCUSSION AND ANALYSIS**

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The following Management's Discussion and Analysis (MD&A) provides an overview of the financial performance of the Clean Energy Finance and Investment Authority (CEFIA) (a Component Unit of the State of Connecticut) for the fiscal year ended June 30, 2012. The information contained in this MD&A should be considered in conjunction with the information contained in the financial statements and notes to the financial statements included in the "Financial Statements" section of this report.

**Financial Statements Presented in this Report**

CEFIA is a quasi-public agency of the State of Connecticut established on July 1, 2011 by Section 16-245n of the Connecticut General Statutes, created to promote investment in renewable energy sources and energy efficiency in accordance with a comprehensive plan developed by CEFIA to foster the growth, development and commercialization of renewable energy sources and related enterprises, and to stimulate demand for renewable energy and the deployment of renewable energy sources, which serve end-use customers in the State. CEFIA constitutes the successor agency to Connecticut Innovations for the purposes of administering the clean energy fund in accordance with section 4-38d of the Connecticut General Statutes and therefore the net assets of such fund were transferred to the newly created CEFIA as of July 1, 2011.

The financial statements include: Statement of Net Assets, Statement of Revenues, Expenses and Changes in Net Assets, and the Statement of Cash Flows. The Statement of Net Assets provides a measure of CEFIA's economic resources. The Statement of Revenues, Expenses and Changes in Net Assets measures the transactions for the periods presented and the impact of those transactions on the resources of CEFIA. The Statement of Cash Flows reconciles the changes in cash and cash equivalents with the activities of CEFIA for the periods presented. The activities are classified as to operating, investing and noncapital financing.

Notes to the financial statements provide additional detailed information to supplement the basis for reporting and nature of key assets and liabilities.

**Financial Highlights of Fiscal 2012**

In our discussion of the 2012 financial highlights below, management has elected to utilize the 2011 financial results of the Connecticut Clean Energy Fund, the predecessor entity to Clean Energy Finance and Investment Authority, as a benchmark for comparing its 2012 activities.

**Net Assets**

From the base of \$72.8 transferred from the State of Connecticut, net assets increased by \$8.4 million to \$81.2 million at June 30, 2012 and cash and cash equivalents increased by \$13.3 million in 2012 to \$73.2 million. Cash increased primarily as a result of an increase in utility assessment revenues, and grant awards received during 2012.

## CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

### MANAGEMENT'S DISCUSSION AND ANALYSIS

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As of June 30, 2012, the Board of Directors designated \$25.8 million in net assets to fund outstanding grant commitments as described in Note 10. These grants are expected to be paid over the next fiscal year.

Other assets are composed primarily of utility customer assessments receivables, Regional Greenhouse Gas Initiative (RGGI) auction receivables. The promissory note portfolio of \$11.7 million as of June 30, 2012 and \$10.7 million as of July 1, 2011 funded a residential photovoltaic equipment lease program which ended during 2012.

The following table summarizes the net assets at June 30, 2012 and July 1, 2011 (in thousands):

	2012	2011	Increase (Decrease)
Cash, certificates of deposit	\$ 73,214	\$ 59,899	\$ 13,315
Investments	2,155	1,699	456
Promissory notes	11,736	10,663	1,073
Other assets	5,071	4,735	336
<b>Total assets</b>	<u>92,176</u>	<u>76,996</u>	<u>15,180</u>
Current liabilities	2,625	4,216	(1,591)
Deferred revenue	8,363	--	8,363
<b>Total liabilities</b>	<u>10,988</u>	<u>4,216</u>	<u>6,772</u>
Invested in capital assets	91	--	91
Restricted	8,541	234	8,307
Unrestricted	72,556	72,546	10
<b>Total net assets</b>	<u>\$ 81,188</u>	<u>\$ 72,780</u>	<u>\$ 8,408</u>

#### Changes in Net Assets

Revenues from utility customer assessments were \$27.0 million for 2012 compared to \$28.4 million in 2011.

Revenue from interest on cash deposits increased \$.03 million to \$.14 million in 2012. Interest on short-term investments and cash deposits decreased due to the increase in the average cash balance on hand and changes in interest rates. CEFIA received \$2.0 million from the state in RGGI auction proceeds during the year.

# CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

## MANAGEMENT'S DISCUSSION AND ANALYSIS

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Total expenditures for grants and programs in 2012 were \$31.1 million, an increase of \$3 million from the prior year. Grant and program expenditures fluctuate from year to year as they are based on the achievement of contract milestones by the grantee. During 2012, CEFIA committed a total of \$30.4 million for new grants and programs.

General and administrative expenses decreased by \$48,000 from \$1.436 million to \$1.388 million.

Net gains in program investments increased by \$315,000 as a result in adjustments to the valuation of equity and debt investments.

The following table summarizes the changes in net assets between June 30, 2012 and 2011 (in thousands):

	2012	2011	Increase (Decrease)
Revenues	<u>\$ 40,483</u>	<u>\$ 36,391</u>	<u>\$ 4,092</u>
Operating expenses:			
Grants and programs	31,122	28,026	3,096
General and administrative expense	<u>1,388</u>	<u>1,436</u>	<u>(48)</u>
Total operating expenses	<u>32,510</u>	<u>29,462</u>	<u>3,048</u>
<b>Operating income</b>	7,973	6,929	1,044
Net change in unrealized appreciation in fair value of investments	435	(58)	493
Net realized (loss) gain on investments	<u>--</u>	<u>178</u>	<u>(178)</u>
<b>Net change in net assets</b>	<u><u>\$ 8,408</u></u>	<u><u>\$ 7,049</u></u>	<u><u>\$ 1,359</u></u>

## CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

## STATEMENT OF NET ASSETS

JUNE 30, 2012

**Assets****Current Assets**

Cash and cash equivalents	\$ 64,672,910
Accounts receivable	725,259
Utility customer assessments receivable	2,580,042
Other assets	350,302
Current portion of solar lease notes	<u>670,645</u>

**Total Current Assets** 68,999,158

**Non-Current Assets**

Portfolio investments, less current portion	✓ 2,155,525
Solar lease notes, less current portion	11,064,879
Renewable energy credits	✓ 1,324,614
Capital assets, net of depreciation and amortization	✓ 91,329
Restricted cash and cash equivalents	<u>8,540,684</u>

**Total Non-Current Assets** ✓ 23,177,031

**Total Assets** \$ 92,176,189

*The accompanying notes are an integral part of these financial statements.*



## CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

## STATEMENT OF NET ASSETS (CONTINUED)

JUNE 30, 2012

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**Liabilities and Net Assets****Liabilities**

Accounts payable and accrued expenses	\$ 2,624,861
Deferred revenue	<u>8,363,119</u>

**Total Liabilities**✓ 10,987,980**Net Assets**

Invested in capital assets	✓ 91,329
Restricted net assets	8,540,684
Unrestricted net assets	<u>72,556,196</u>

**Total Net Assets**✓ 81,188,209**Total Liabilities and Net Assets**\$ 92,176,189

*The accompanying notes are an integral part of these financial statements.*

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY**

**STATEMENT OF REVENUES, EXPENSES  
AND CHANGES IN NET ASSETS**

**FOR THE YEAR ENDED JUNE 30, 2012**

<b>Operating Revenues</b>	
Utility customer assessments	\$ 27,025,088
Grant Revenue	10,399,196
RGGI auction income	2,052,748
Interest on solar lease notes	589,007
Interest on short-term investments	140,786
Other income	<u>276,652</u>
<b>Total Revenues</b>	<u>40,483,477</u>
<b>Operating Expenses</b>	
General and administrative expenses	1,387,854
Grants and programs	<u>31,122,355</u>
<b>Total Expenses</b>	<u>32,510,209</u>
<b>Operating Income</b>	<u>7,973,268</u>
<b>Nonoperating Expenses</b>	
Unrealized gain on investments	<u>434,702</u>
<b>Income before transfers in from State of Connecticut</b>	<u>8,407,970</u>
Transfers in from State of Connecticut	<u>72,780,239</u>
<b>Change in Net Assets</b>	81,188,209
<b>Net Assets - Beginning of year</b>	<u>--</u>
<b>Net Assets - End of year</b>	<u>\$ 81,188,209</u>

*The accompanying notes are an integral part of these financial statements.*

# CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

## STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED JUNE 30, 2012

<b>Cash Flows from Operating Activities</b>	
Utility ratepayer assessments	\$ 26,851,993
Interest on short-term investments and cash deposits	118,680
Interest on solar lease notes	634,070
Grants	16,935,799
RGGI auctions	1,817,122
Return of principal on investments	603,197
Other income	288,354
Grant and program expenditures	(26,012,455)
General and administrative expenditures	(6,113,770)
Purchase on solar lease notes	<u>(1,710,659)</u>
<b>Net Cash Provided by Operating Activities</b>	<u>13,412,331</u>
<b>Cash Flows from Investing Activities</b>	
Purchase of capital assets	<u>(97,773)</u>
<b>Net Cash Used in Investing Activities</b>	<u>(97,773)</u>
<b>Cash Flows from Noncapital Financing Activities</b>	
Transfer from State of Connecticut	<u>59,899,036</u>
<b>Net Cash Provided by Noncapital Financing Activities</b>	<u>59,899,036</u>
<b>Net Increase in Cash and Cash Equivalents</b>	73,213,594
<b>Cash and Cash Equivalents - Beginning</b>	<u>--</u>
<b>Cash and Cash Equivalents - Ending</b>	<u>\$ 73,213,594</u>
<b>Reconciliation of Operating Income to Net Cash</b>	
<b>Provided by Operating Activities</b>	
Operating income	\$ 8,407,970
Adjustments to reconcile operating income	
to net cash provided by operating activities:	
Depreciation	6,444
Unrealized (gain) on investments	(434,702)
Changes in operating assets and liabilities:	
Other assets and due from related parties	6,986
Investments	(1,346,722)
Accounts payable and accrued expenses and	
due to related parties	<u>6,772,356</u>
<b>Net Cash Provided by Operating Activities</b>	<u>\$ 13,412,332</u>

*The accompanying notes are an integral part of these financial statements.*

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY****NOTES TO FINANCIAL STATEMENTS****FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 1 - NATURE OF BUSINESS AND SIGNIFICANT ACCOUNTING POLICIES*****NATURE OF OPERATIONS***

The Clean Energy Finance and Investment Authority (CEFIA) was established in July 2011 under Title 16, Sec. 16-245n of the General Statutes of the State of Connecticut as the successor entity of the Connecticut Clean Energy Fund. CEFIA, a component unit of the State of Connecticut, was created to promote energy efficiency and investment in renewable energy sources in accordance with a comprehensive plan developed by it to foster the growth, development and commercialization of renewable energy sources and related enterprises and stimulate demand for renewable energy and deployment of renewable energy sources which serve end-use customers in the State. CEFIA constitutes the successor agency to Connecticut Innovations for the purposes of administering the clean energy fund in accordance with section 4-38d of the Connecticut General Statutes and therefore the net assets of such fund were transferred to the newly created CEFIA as of July 1, 2011. As described in Note 5, the Fund is administered by Connecticut Innovations, Incorporated.

The Department of Public Utility Control assesses a charge per kilowatt-hour to each end-use customer of electric services in the State, which is paid to CEFIA. CEFIA may deploy the funds for grants, direct or equity investments, contracts or other actions which support energy efficiency projects and research, development, manufacture, commercialization, deployment and installation of renewable energy technologies.

Accounting principles generally accepted in the United States of America require that the reporting entity include the primary government and its component units, entities for which the government is considered to be financially accountable, all organizations for which the primary government is financially accountable, and other organizations which by the nature and significance of their relationship with the primary government would cause the financial statements to be incomplete or misleading if excluded. Blended component units, although legally separate entities, are, in substance, part of the government's operations; therefore, data from these units are combined with data of the primary government. Based on these criteria, there are no component units requiring inclusion in these financial statements.

***MEASUREMENT FOCUS, BASIS OF ACCOUNTING AND FINANCIAL STATEMENT PRESENTATION***

CEFIA is considered to be an enterprise fund. Enterprise funds are used to account for governmental activities that are similar to those found in the private sector in which the determination of net income is necessary or useful to sound financial administration.

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY****NOTES TO FINANCIAL STATEMENTS****FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 1 - NATURE OF BUSINESS AND SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)**

In its accounting and financial reporting, CEFIA follows the pronouncements of the Governmental Accounting Standards Board (GASB). CEFIA also follows the pronouncements of all applicable Financial Accounting Standards Board (FASB) issued on or before November 30, 1989, unless they conflict with or contradict GASB pronouncements. Finally, CEFIA follows all FASB pronouncements issued after November 30, 1989, except where they conflict or contradict GASB pronouncements.

***BASIS OF PRESENTATION***

CEFIA's financial statements are reported using the economic resources measurement focus and accrual basis of accounting. Revenues are recognized when earned, and expenses are recognized when the liability is incurred, regardless of the timing of the related cash flows.

***OPERATING VS. NON-OPERATING REVENUE (EXPENSE)***

CEFIA distinguishes operating revenues and expenses from non-operating items. Operating revenues consist of utility customer assessments and other revenue generated in connection with investments renewable energy programs. Operating expenses consist of operating costs, including depreciation on capital assets and grants and programs. Non-operating revenue consists of investment gains and losses.

***USE OF ESTIMATES***

Management uses estimates and assumptions in preparing these financial statements in accordance with accounting principles generally accepted in the United States of America. Those estimates and assumptions affect the certain reported amounts and disclosures in the financial statements. The most significant estimates are the determination of the fair value of its investments. Actual results could vary from the estimates that were used.

***CASH AND CASH EQUIVALENTS***

Cash equivalents consist of cash and highly liquid short-term investments with an original term of 90 days and are recorded at cost, which approximates market value.

***CAPITAL ASSETS***

Capital asset acquisitions exceeding \$500 are capitalized at cost. Maintenance and repair expenses are charged to operations when incurred. Depreciation is computed using straight-line methods over the estimated useful lives of the assets, which range from two to five years. Leasehold improvements are amortized over the shorter of their useful life or the lease term.

## CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

FOR THE YEAR ENDED JUNE 30, 2012

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**NOTE 1 - NATURE OF BUSINESS AND SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)**

For capital assets sold or otherwise disposed of, the cost and related accumulated depreciation and amortization are removed from the accounts, and any related gain or loss is reflected in income for the period.

***PORTFOLIO INVESTMENTS***

CEFIA carries all investments at fair value as determined by an independent valuation committee using United States Private Equity Valuation Guidelines promulgated by the Private Equity Investment Guidelines Group. In the absence of readily determinable market values, the Committee gives consideration to pertinent information about the companies comprising these investments, including, but not limited to, recent sales prices of the issuer's securities, sales growth, progress toward business goals and other operating data. CEFIA has applied procedures in arriving at the estimate of the value of such securities that it believes are reasonable and appropriate. Management reserves the right to establish a reserve in addition to the recommended reserve from the valuation committee to further account for current market conditions and volatility. Due to the inherent uncertainty of valuation, those estimated values may differ significantly from the amounts ultimately realized from the investments, and the differences could be material. CEFIA reports gains as realized and unrealized consistent with the practice of venture capital firms. The calculation of realized gains and losses is independent of the calculation of the net change in investment value.

All of CEFIA's portfolio investments are uninsured and unregistered, and are held in the administrator's name.

***NET ASSETS***

Net assets of CEFIA are presented in the following three categories:

- *Net Assets Invested in Capital Assets* represent capital assets, net of accumulated depreciation that are attributable to those particular assets.
- *Restricted Net Assets* represent assets whose use is restricted through external restrictions imposed by creditors, grantors, contributors and the like, or through restrictions imposed by laws or through constitutional provisions or enabling legislature.
- *Unrestricted Net Assets* represent assets which do not meet the definition of the two preceding categories.

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY****NOTES TO FINANCIAL STATEMENTS****FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 1 - NATURE OF BUSINESS AND SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)*****GRANTS AND PROGRAMS***

Expenditures for grants and programs are recorded upon the submission of invoices and other supporting documentation and approval by management. Salaries, benefits and overhead expenses are allocated to program expenses based on job functions.

***SUBSEQUENT EVENTS***

CEFIA has performed a review of events subsequent to the balance sheet date through \_\_\_\_\_, 2012, the date of the financial statements where available to be issued. No events requiring recording or disclosure in the financial statements were identified.

**NOTE 2 - FAIR VALUE MEASUREMENTS**

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. In determining fair value, CEFIA utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs. CEFIA also considers nonperformance risk in the overall assessment of fair value.

Auditing Standards Codification (ASC) 820 establishes a three tier valuation hierarchy for fair value disclosure purposes. This hierarchy is based on the transparency of the inputs utilized for the valuation. The three levels are defined as follows:

Level 1: Unadjusted quoted prices in active markets that are accessible at the measurement date for identical assets of liabilities.

Level 2: Inputs other than quotes prices in active markets for identical assets and liabilities that are observable either directly or indirectly for substantially the full term of the asset or liability. Level 2 inputs include the following:

- Quotes prices for similar assets and liabilities in active markets
- Quotes prices for identical or similar assets or liabilities in markets that are not active
- Observable inputs other than quotes prices that are used in the valuation of the asset or liability (e.g., interest rate and yield curve quotes at commonly quotes intervals)

# CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

### FOR THE YEAR ENDED JUNE 30, 2012

#### NOTE 2 - FAIR VALUE MEASUREMENTS

- Inputs that are derived principally from or corroborated by observed market data by correlation or other means

Level 3: Unobservable inputs for the asset or liability (supported by little or no market activity). Level 3 inputs include management's own assumptions about the assumptions that market participants would use in pricing the asset or liability (including assumptions about risk).

The asset or liability's fair value measurement level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Valuation techniques used need to maximize the use of observable inputs and minimize the use of unobservable inputs.

The preceding methods described may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, although CEFIA believes its valuation method are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

The following table sets forth by level, within the fair value hierarchy, CEFIA's fair value measurements at June 30, 2012:

	Level 1	Level 2	Level 3	Total
Cash and				
cash equivalents	\$ 73,213,594	\$ --	\$ --	\$ 73,213,594
Portfolio investments	<u>--</u>	<u>--</u>	<u>2,155,525</u>	<u>2,155,525</u>
	<u>\$ 73,213,594</u>	<u>\$ --</u>	<u>\$ 2,155,525</u>	<u>\$ 75,369,119</u>

The following is a reconciliation of the beginning and ending balances of recurring fair value measurements recognized in the accompanying statements of net assets available for benefits using significant unobservable (Level 3) inputs:

Balance - beginning of year	\$ 1,698,715
Purchases, issuances and settlements - net	<u>456,810</u>
Balance - end of year	<u>\$ 2,155,525</u>



**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY**

**NOTES TO FINANCIAL STATEMENTS**

**FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 3 - CASH AND CASH EQUIVALENTS**

The following is a summary of cash and cash equivalents at June 30, 2011:

Checking	\$ 4,050,160
State Treasurer's Short-Term Investment Fund	<u>60,687,137</u>
Unrestricted cash and cash equivalents	64,737,297
Checking - restricted	112,588
State Treasurer's Short-Term Investment Fund - restricted	<u>8,363,709</u>
Total cash and cash equivalents	<u>\$ 73,213,594</u>

***STATE TREASURER'S SHORT-TERM INVESTMENT FUND***

The State Treasurer's Investment Fund is an investment pool. The value of CEFIA's position in the pool is the same as the value of pool shares. Regulatory oversight is provided by an investment advisory council and the State Treasurer's Cash Management Board.

***INVESTMENT MATURITIES***

The State Treasurer's Short-Term Investment Fund has no maturity date and is available for withdrawal on demand.

***INTEREST RATE RISK***

CEFIA manages its exposure to declines in fair value by limiting the average maturity of its cash and cash equivalents to no more than one year.

***CREDIT RISK***

Connecticut General Statutes authorize CEFIA to invest in obligations of the U.S. Treasury including its agencies and instrumentalities, commercial paper, banker's acceptance, repurchase agreements and the State Treasurer's Short-Term Investment Fund.

Investment ratings for the Fund's investments are as follows:

	Moody's Investors Service	Standard & Poor's
State Treasurer's Short-Term Investment Fund	Aaa	AAAm

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY****NOTES TO FINANCIAL STATEMENTS****FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 3 - CASH AND CASH EQUIVALENTS (CONTINUED)*****CONCENTRATION OF CREDIT RISK***

CEFIA's investment policy does not limit the investment in any one investment vehicle. The State Treasurer's Short-term Investment Fund is not subject to this disclosure.

***CUSTODIAL CREDIT RISK - DEPOSITS***

In the case of deposits, this represents the risk that, in the event of a bank failure, CEFIA's deposits may not be returned to it. CEFIA does not have a deposit policy for custodial credit risk. As of June 30, 2012, \$3,335,361 of CEFIA's bank balance was exposed to custodial credit risk because it was not covered under federal depository insurance or collateralized.

***CUSTODIAL CREDIT RISK - INVESTMENTS***

For an investment, this represents the risk that, in the event of the failure of the counterparty, the Fund will not be able to recover the value of the investment. As of June 30, 2012, the Fund has no reportable custodial risk.

**NOTE 4 - PORTFOLIO INVESTMENTS**

CEFIA invests in emerging companies, which, in the event the company becomes successful, could represent a significant portion of the investment balances at a given time. Securities held at June 30, 2012 represent investments in two companies.

**NOTE 5 - RELATED PARTY TRANSACTIONS AND OPERATING LEASES*****RELATED PARTY TRANSACTIONS***

CEFIA utilizes the services of Connecticut Innovations, Incorporated (CI), as provided in the General Statutes of the State of Connecticut. The CI provides services to CEFIA, at cost, for its operations. Such services include, but are not limited to, staff for accounting and information technology support, office space, equipment, supplies and insurance. Expenses billed to CEFIA by CI totaled \$1,868,098 for the year ended June 30, 2012. As of June 30, 2012, amounts due to Connecticut Innovations Incorporated, totaled \$94,340.

Pursuant to state statute, CEFIA is subject to a mandated fringe benefit charge as fringe benefits are paid at the state level. The rate charged for fiscal year 2012 in the aggregate comprised 63.0% of gross salaries.

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY**

**NOTES TO FINANCIAL STATEMENTS**

**FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 5 - RELATED PARTY TRANSACTIONS AND OPERATING LEASES (CONTINUED)**

***OPERATING LEASES***

CEFIA sub leases its main office space from Connecticut Innovations, Inc. under a non-cancellable Memorandum of Understanding (MOU). The MOU calls for monthly payments of \$11,575, with escalating payments through December 2020.

In addition, CEFIA leases office equipment on a month-to-month basis. Rent expense related to the office equipment for the year ended June 30, 2012 was \$799.

Future minimum lease payments on leases are as follows:

<u>Years ending June 30,</u>	
2013	\$ 171,785
2014	176,837
2015	181,890
2016	186,942
2017	191,995
Thereafter	<u>711,139</u>
	<u>\$ 1,620,588</u>

Rent expense for the year ended June 30, 2012 was \$161,612.

# CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

FOR THE YEAR ENDED JUNE 30, 2012

### NOTE 6 - CAPITAL ASSETS

Capital asset activity for fiscal year 2012 is as follows:

	Balance, July 1, 2011	Additions	Deletions	Adjustments	Balance, June 30, 2012
Capital assets being depreciated:					
Furniture and equipment	\$ --	\$ 13,049	\$ --	\$ --	\$ 13,049
Computer hardware and software	--	28,460	--	--	28,460
Leasehold improvements	--	56,224	--	--	56,224
	<u>--</u>	<u>97,733</u>	<u>--</u>	<u>--</u>	<u>97,733</u>
Less accumulated depreciation and amortization:					
Furniture and equipment	--	626	--	--	\$ 626
Computer hardware and software	--	3,847	--	--	3,847
Leasehold improvements	--	1,971	--	--	1,971
	<u>--</u>	<u>6,444</u>	<u>--</u>	<u>--</u>	<u>6,444</u>
Capital assets, net	<u>\$ --</u>	<u>\$ 91,289</u>	<u>\$ --</u>	<u>\$ --</u>	<u>\$ 91,289</u>

### NOTE 7 - GRANT PROGRAMS

For the year ended June 30, 2012, CEFIA received grant funds from the U.S. Department of Energy to provide various energy programs to eligible recipients under the grants. Funds received under the grants totaled \$16,115,813 and grant expenditures totaled \$10,398,391 for the year ended June 30, 2012.

### NOTE 8 - COMMITMENTS

As of June 30, 2012, the Board of Directors has committed a portion of the net assets to fund grants for specific projects in the following areas:

Fuel cells	\$ 6,320,367
Solar	8,082,471
Geothermal and Solar Thermal	1,095,689
Other technologies	246,340
Project 150 and Predevelopment Program	7,487,145
Operation Demonstration Program	1,397,895
Education and outreach	1,219,336
	<u>\$ 25,849,243</u>

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY****NOTES TO FINANCIAL STATEMENTS****FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 8 – COMMITMENTS (CONTINUED)**

These grants are expected to be paid over the next two fiscal years.

**NOTE 9 - PENSION PLAN**

All employees of the CEFIA participate in the State Employees' Retirement System (SERS), which is administered by the State Employees' Retirement Commission. The Corporation has no liability for pension costs other than the annual contribution. In addition, an actuarial study was performed on the plan as a whole and does not separate information for employees of the Corporation. Therefore, certain pension disclosures otherwise required pursuant to accounting principles generally accepted in the United States of America are omitted. Information on the total plan funding status and progress, contribution required and trend information can be found in the State of Connecticut's Comprehensive Annual Financial Report.

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY**

**NOTES TO FINANCIAL STATEMENTS**

**FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 9 - PENSION PLAN (CONTINUED)**

***PLAN DESCRIPTION***

SERS is a single-employer defined benefit public employee retirement system (PERS) established in 1939 and governed by Sections 5-152 to 5-192 of the Connecticut General Statutes. Employees are covered under one of three tiers. Tier I requires an employee contribution of either 2% or 5% of salary, depending on the plan. Tier II is a noncontributory plan. Tier IIA requires an employee contribution of 2% of salary. The Corporation's contribution is determined by applying a state mandated percentage to eligible salaries and wages. Members who joined the retirement system prior to July 1, 1984 are generally enrolled in Tier I. Members who joined the retirement system after July 1, 1984 are enrolled in Tier II. Employees first hired on or after July 1, 1997 are members of Tier IIA. Employees rehired on or after July 1, 1997 are also members of Tier IIA unless the application of SERS service bridging provisions mandates their placement in either Tier I or Tier II. Tier I employees who retire at or after age 65 with 10 years of credited service, or at age 55 with 25 years of service, are eligible for an annual retirement benefit payable monthly for life, in an amount of 2% of the annual average earnings (which are based on the three highest years of service). In most cases, this is reduced to 1% for the first \$4,800 of salary upon receipt of Social Security benefits. Employees at age 55 with 10 years but less than 25 years of service, or at age 70 with 5 years of service, are entitled to a reduced benefit. Tier II and Tier IIA employees who retire at or after age 60 with 25 years of service, or at age 62 with 5 years of service, or at age 70 with 5 years of service, or at age 55 with 10 years of service with reduced benefits are entitled to an annual retirement benefit payable monthly for life, in an amount of 1.33% of the average earnings plus 0.5% of the average annual earnings in excess of the salary breakpoint in the year of retirement for each year of credited service. In addition, any years of service over 35 would be at 1.63%. All Tier I members are vested after 10 years. Effective July 1, 1997, all Tier II and Tier IIA members are vested after 5 years and may retire at age 62 with 5 years of actual state service. All plans provide for death and disability benefits. The total payroll and the payroll for employees of the Corporation covered by SERS for the years ended June 30, 2012, was \$1,541,308.

***CONTRIBUTIONS MADE***

CEFIA's contribution is determined by applying a State mandated percentage to eligible salaries and wages as follows:

Contributions made:

By employees	\$	59,034
Percent of current year covered payroll		3.8%
By CEFIA	\$	601,014
Percent of current year covered payroll		39.0%

**CLEAN ENERGY FINANCE AND INVESTMENT AUTHORITY****NOTES TO FINANCIAL STATEMENTS****FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 10 - RESTRICTED NET ASSETS**

As discussed in Note 1, the Fund has a contractual commitment of \$176,975 to fund the maintenance of a fuel cell for a municipality in the State of Connecticut and \$ 8,363,709 to fund credit enhancements in support of the Residential Clean Energy Financing Program and the Clean Energy Financial Innovation Program under the American Recovery and Reinvestment Act.

**NOTE 11 - RISK MANAGEMENT**

CEFIA is subject to normal risks associated with its operations including property damage, personal injury and employee dishonesty. All risks are managed through the purchase of commercial insurance. There have been no losses exceeding insurance coverage, and there have been no decreases in insurance coverage over the last three years.

**NOTE 12 - RENEWABLE ENERGY CREDITS**

CEFIA owns Class 1 Renewable Energy Certificates (RECs) that are generated by certain renewable energy facilities for which CEFIA provided the initial funding. CEFIA has entered into agreements to sell a total of 20,000 REC's generated through December 31, 2013 at a price of \$15.00 per REC, totaling \$300,000.

RECs trade on the New England Power Pool (NEPOOL) market. The market price of Connecticut Class 1 RECs as of June 30, 2012 ranged from \$29.00 to \$31.00. However CEFIA's inventory as of June 30, 2012 has been priced at the sales price per the agreements. Based on historical performance, management believes that the RECs it will receive from its funded facilities through December 31, 2013 will exceed its commitment to sell under this agreement.

**NOTE 13 - DEFERRED REVENUE**

The amount represents unspent grant funds received by CEFIA under the American Recovery and Reinvestment Act program. These monies, \$8,363,709, will fund credit enhancements in support of Residential Clean Energy Financing Program and Clean Energy Financial Innovation Program under the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5

**REPORT ON INTERNAL CONTROL OVER FINANCIAL  
REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED  
ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN  
ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS***

To the Board of Directors  
**Clean Energy Finance and Investment Authority**

We have audited the balance sheet and statement of net assets of the Connecticut Clean Energy Fund, a special revenue fund of the State of Connecticut, as of June 30, 2012 and the related statement of revenues, expenditures and changes in fund balance and statement of activities for the year then ended, and have issued our report thereon dated September \_\_, 2012. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

***INTERNAL CONTROL OVER FINANCIAL REPORTING***

Management of the Clean Energy Finance and Investment Authority is responsible for establishing and maintaining effective internal control over financial reporting. In planning and performing our audit, we considered the Clean Energy Finance and Investment Authority's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of Clean Energy Finance and Investment Authority's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of Clean Energy Finance and Investment Authority's internal control over financial reporting.

*A deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over financial reporting that might be deficiencies, significant deficiencies, or material weaknesses. We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses, as defined above.



***COMPLIANCE AND OTHER MATTERS***

As part of obtaining reasonable assurance about whether Clean Energy Finance and Investment Authority's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws and regulations, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

This report is intended for the information and use of the Board of Directors, management and the State of Connecticut and is not intended to be and should not be used by anyone other than those specified parties.

Hartford, CT  
\_\_\_\_\_, 2012

**CLEAN ENERGY FINANCE AND  
INVESTMENT AUTHORITY**  
(A Component Unit of the State of Connecticut)

**FEDERAL SINGLE AUDIT**

**JUNE 30, 2012**

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**CLEAN ENERGY FINANCE AND  
INVESTMENT AUTHORITY**

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**REPORT ON INTERNAL CONTROL OVER FINANCIAL  
REPORTING AND ON COMPLIANCE AND OTHER  
MATTERS BASED ON AN AUDIT OF FINANCIAL  
STATEMENTS PERFORMED IN ACCORDANCE WITH  
GOVERNMENT AUDITING STANDARDS**

Board of Trustees  
Clean Energy Finance and Investment Authority

We have audited the financial statements of the Clean Energy Finance and Investment Authority (CEFIA) as of and for the year ended June 30, 2012, and have issued our report thereon dated \_\_\_\_\_, 2011. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

***INTERNAL CONTROL OVER FINANCIAL REPORTING***

Management of CEFIA is responsible for establishing and maintaining effective internal control over financial reporting. In planning and performing our audit, we considered CEFIA's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of CEFIA's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of CEFIA's internal control over financial reporting.

*A deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. *A material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over financial reporting that might be deficiencies, significant deficiencies, or material weaknesses. We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses, as defined above.

*COMPLIANCE AND OTHER MATTERS*

As part of obtaining reasonable assurance about whether CEFIA's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

This report is intended solely for the information and use of the Board of Trustees, management and federal awarding agencies and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

Hartford, CT  
\_\_\_\_\_, 2012

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**REPORT ON COMPLIANCE WITH REQUIREMENTS  
THAT COULD HAVE A DIRECT AND MATERIAL  
EFFECT ON EACH MAJOR PROGRAM AND ON  
INTERNAL CONTROL OVER COMPLIANCE IN  
ACCORDANCE WITH OMB CIRCULAR A-133 AND  
ON THE SCHEDULE OF EXPENDITURES OF  
FEDERAL AWARDS**

Board of Trustees  
Clean Energy Finance and Investment Authority

***COMPLIANCE***

We have audited the Clean Energy Finance and Investment Authority (CEFIA) with the types of compliance requirements described in the *OMB Circular A-133 Compliance Supplement* that could have a direct and material effect on each of CEFIA's major federal programs for the year ended June 30, 2012. The CEFIA's major federal programs are identified in the summary of auditor's results section of the accompanying schedule of findings and questioned costs. Compliance with the requirements of laws, regulations, contracts and grants applicable to each of its major federal programs is the responsibility of CEFIA's management. Our responsibility is to express an opinion on CEFIA's compliance based on our audit.

We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and OMB Circular A-133, *Audits of States, Local Governments and Non-Profit Organizations*. Those standards and OMB Circular A-133 require that we plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about CEFIA's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion. Our audit does not provide a legal determination of CEFIA's compliance with those requirements.

In our opinion, Clean Energy Finance and Investment Authority complied, in all material respects, with the compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended June 30, 2012.

## ***INTERNAL CONTROL OVER COMPLIANCE***

Management of CEFIA is responsible for establishing and maintaining effective internal control over compliance with the requirements of laws, regulations, contracts, and grants applicable to federal programs. In planning and performing our audit, we considered CEFIA's internal control over compliance with the requirements that could have a direct and material effect on a major federal program to determine the auditing procedures for the purpose of expressing our opinion on compliance and to test and report on internal control over compliance in accordance with OMB Circular A-133, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, we do not express an opinion on the effectiveness of CEFIA's internal control over compliance.

*A deficiency in internal control over compliance* exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program on a timely basis. A material weakness in internal control over compliance is a deficiency, or combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis.

Our consideration of internal control over compliance was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over compliance that might be deficiencies, significant deficiencies, or material weaknesses. We did not identify any deficiencies in internal control over compliance that we consider to be *material weaknesses*, as defined above.

## ***SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS***

We have audited the basic financial statements of Clean Energy Finance and Investment Authority as of and for the year ended June 30, 2012, and have issued our report thereon dated \_\_\_\_\_, 2012. Our audit was performed for the purpose of forming an opinion on the basic financial statements taken as a whole. The accompanying schedule of expenditures of federal awards is presented for purposes of additional analysis as required by OMB Circular A-133 and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, is fairly stated, in all material respects, in relation to the basic financial statements taken as a whole.

This report is intended for the information of the Board of Trustees, management and federal awarding agencies and is not intended to be and should not be used by anyone other than these specified parties.

Hartford, CT  
\_\_\_\_\_, 2012

**CLEAN ENERGY FINANCE AND  
INVESTMENT AUTHORITY**

**SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS**

**FOR THE YEAR ENDED JUNE 30, 2012**

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Federal Grantor/ Program Title	CFDA Number	Expenditures
Department of Energy		
State Energy Program (Recovery Act)	81.041	\$ 8,784,035
Energy Efficiency and Conservation Block Grant Program (EECBG) (Recovery Act)	81.128	<u>1,569,420</u>
<b>Total Expenditures of Federal Awards</b>		<u><u>\$ 10,353,455</u></u>

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*See Notes to Schedule of Expenditures of Federal Awards.*



**CLEAN ENERGY FINANCE AND  
INVESTMENT AUTHORITY**

**NOTES TO SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS**

**FOR THE YEAR ENDED JUNE 30, 2012**

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**NOTE 1 - SIGNIFICANT ACCOUNTING POLICIES**

***BASIS OF PRESENTATION***

The accompanying schedule of expenditures of federal awards includes the federal grant activity of Connecticut Clean Energy Fund (CEFIA) and is presented on the accrual basis. The information in this schedule is presented in accordance with the requirements of OMB Circular A-133, *Audits of States, Local Governments and Non-Profit Organizations*.

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**CLEAN ENERGY FINANCE AND  
INVESTMENT AUTHORITY**

**SCHEDULE OF FINDINGS AND QUESTIONED COSTS**

**FOR THE YEAR ENDED JUNE 30, 2012**

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**SECTION I - SUMMARY OF AUDITOR'S RESULTS**

*Financial Statements*

Type of auditor's report issued: unqualified

Internal control over financial reporting:

- Material weakness(es) identified?            \_\_\_ yes                              x   no
- Significant deficiency(ies) identified?        \_\_\_ yes                              x   none reported

Noncompliance material to financial statements noted?

\_\_\_ yes                              x   no

*Federal Awards*

Internal control over major programs:

- Material weakness(es) identified?            \_\_\_ yes                              x   no
- Significant deficiency(ies) identified?        \_\_\_ yes                              x   none reported

Type of auditor's report issued on compliance for major programs: unqualified.

Any audit finding disclosed that are required to be reported in accordance with Section 510(a) of OMB Circular A-133?

\_\_\_ yes                              x   no

**Major Programs:**

<u>Funding Source</u>	<u>Program</u>	<u>CDFA No.</u>
U.S. Department of Energy	State Energy Program (Recovery Act)	81.041
	Energy Efficiency and Conservation Block Grant (Recovery Act)	81.128

**Dollar Threshold Used to Distinguish Type A and Type B Programs: \$300,000**

**Qualification of Auditee as a Low-Risk Auditee: No**

**CLEAN ENERGY FINANCE AND  
INVESTMENT AUTHORITY**

**SCHEDULE OF FINDINGS AND QUESTIONED COSTS**

**FOR THE YEAR ENDED JUNE 30, 2012**

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**SECTION II — SUMMARY OF FINDINGS RELATED TO FINANCIAL STATEMENTS REQUIRED  
UNDER GENERAL ACCEPTED GOVERNMENT AUDITING STANDARDS**

- We issued reports, dated \_\_\_\_\_, 2012 on internal control over financial reporting and on compliance and other matters based on an audit of financial statements performed in accordance with *Government Auditing Standards*.
- Our report on compliance and other matters indicated no reportable instances of noncompliance.
- Our report on internal control over financial reporting indicated no material weaknesses.

**SECTION III — FEDERAL AWARD FINDINGS AND QUESTIONED COSTS**

There were no findings relating to Federal award programs.

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**Clean Energy Finance and Investment Authority**  
**FY 2013 Operating and Program Budget**  
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**(September 2012 revision)**

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<b>3</b>	Statement of Income and General Operations and Program Expenses
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**Clean Energy Finance and Investment Authority**  
**Program Investments**  
**FY2013**  
**(000's)**

Grid tied loan program	\$ 8,000.0
Op Demo loan program	\$ 2,000.0
Alpha loan program	\$ 450.0
	<u>\$ 10,450.0</u>
GreenerU loan program	\$ 1,000.0
WINN LISC program	\$ 125.0
CPACE loan program	\$ 1,000.0
Residential solar lease PV program	\$ 395.5
Commercial solar lease (MUSH) program	\$ 105.0
Residential solar lease SHW program	\$ 29.0
Residential solar loan program	\$ 550.6
EE loan program	\$ 232.6
Clean Energy Business Solutions	\$ 2,500.0
Microgrid Program (1)	\$ -
	<u>\$ 5,937.7</u>
<b>Total Investments</b>	<u><u>\$ 16,387.7</u></u>

**Program Investments**  
**Provisions for Loan Losses**

	<u>Loss Ratio</u>	
Grid tied loan program	10%	\$ 800.0
Op Demo loan program	50%	\$ 1,000.0
Alpha loan program	50%	\$ 225.0
		<u>\$ 2,025.0</u>
GreenerU loan program	10%	\$ 100.0
WINN LISC program	10%	\$ 12.5
CPACE loan program	10%	\$ 100.0
Residential solar lease PV program (2)	5%	\$ 19.8
Commercial solar lease (MUSH) program	10%	\$ 2.9
Residential solar lease SHW program (2)	5%	\$ 1.4
Residential solar loan program (2)	5%	\$ 27.5
EE loan program (2)	5%	\$ 11.6
Clean Energy Business Solutions	10%	\$ 250.0
		<u>\$ 525.8</u>
<b>Total Provision for Loan Losses</b>		<u><u>\$ 2,550.8</u></u>

**(1) Support for a Microgrid transaction may occur by June 2013, but expect funding in FYE June 2014**

**(2) Supported by ARRA-SEP loan Loss Reserve**

Clean Energy Finance and Investment Authority  
Incentives, Grants and Rebates  
FY 2013  
(in thousands)

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**LLR and IRB programs:**

**NOTE:** Loan Loss Reserves (LLR) are "credit enhancement" mechanisms provided to incentivize lenders into a loan fund. Until a "loss" which utilizes the reserve occurs, the reserve is on CEFIA's books either (a) in restricted cash held by CEFIA or (b) paid to others in which case it is still "restricted cash" but held by others. Setting up the reserve is a cash movement, balance sheet phenomenon. There is NO P&L effect to establish a Loan Loss Reserve - only "actual losses" hit the P&L. If a loss occurs, the restricted cash is reduced, and the P&L is charged a "loss" in equal amount.

An interest rate buydown (IRB) is a "yield enhancement" sum in cash paid to the lender in order for the loan rate to the end use borrower to be reduced. When the IRB is paid, cash is reduced and the P&L is charged in equal amount reflecting an "incentive expense".

**LLR and IRB program line items:**

Loan Loss Reserve -Lease Programs (using ARRA funds)	\$	424.5	
Loan Loss Reserve -Lease Programs (using CEFIA funds)	\$	105.0	
Loan Loss Reserve -Res. Solar Loans (using ARRA funds)	\$	206.5	
Loan Loss Reserve -Res. EE Loans (using ARRA funds)	\$	87.2	
Loan Loss Reserve -HDF/CHIF (using ARRA funds)	\$	500.0	
Loan Loss Reserve -CPACE Loans (using CEFIA funds)	\$	1,000.0	\$ 2,323.2
			<b>NOT P&amp;L</b>

Interest rate Buydown-HDF/CHIF (using ARRA funds)	\$	250.0	\$ 250.0
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**Federal grants:**

DOE Neighbor to Neighbor Energy Challenge	\$	1,350.0	
DOE Sunrise New England	\$	357.0	\$ 1,707.0

**Financial Incentives- Grants and Rebates:**

Education & Training	\$	400.0	
Clean Energy Communities	\$	650.0	
Community Innovation grants	\$	200.0	
Project Opportunity Fund	\$	500.0	
Strategic Investment Fund	\$	100.0	
Residential Solar PV rebates	\$	9,333.0	
Anaerobic Digestor Pilot	\$	2,000.0	
CHP Pilot	\$	2,000.0	
Condo Renewable Energy grants	\$	50.0	
Clean Energy Business Solutions	\$	2,500.0	
Sunrise New England inkind contribution	\$	48.0	\$ 17,781.0
			<b>\$ 19,738.0</b>
			<b>ON P&amp;L</b>

<b>TOTAL Incentives</b>	<b>\$</b>	<b>22,061.18</b>	
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## FY 13 Operations and Program Budget

## Statement of Income and General Operations and Program Expenses

(in thousands)

	General Operations	Total Programs	Total Operations & Program Budget	% of Total Expenditures	
<b>Income</b>					
Utility customer assessments	\$ 27,850.0	\$ -	\$ 27,850.0		
RGGI auction proceeds	\$ 2,000.0	\$ -	\$ 2,000.0		
Interest on bank deposits	\$ 120.0	\$ -	\$ 120.0		
Renewable Energy Credits, net of fees	\$ 50.0	\$ -	\$ 50.0		
Interest Income - Solar Lease Notes, net of fees	\$ 150.0	\$ -	\$ 150.0		
Grant income (LBE/N2N/SunRise)		\$ 1,906.5	\$ 1,906.5		
Grant income (ARRA SEP)		\$ 250.0	\$ 250.0		
Other income	\$ 75.0	\$ -	\$ 75.0		
<b>Total revenues:</b>	<b>\$ 30,245.0</b>	<b>\$ 2,156.5</b>	<b>\$ 32,401.5</b>		
<b>Expenses</b>					
<u>Compensation</u>					
-Salaries & Wages - CEFIA Employees	\$ 1,251.8	\$ 1,579.5	\$ 2,831.3	8.8%	
-Salaries & Wages - CI Shared Services	\$ 361.4	\$ 15.4	\$ 376.8	1.2%	\$ 3,208.1
-Employee Benefits - CEFIA Employees	\$ 776.1	\$ 979.3	\$ 1,755.4	5.5%	
-Employee Benefits - CI Shared Services	\$ 224.3	\$ 9.3	\$ 233.6	0.7%	\$ 1,989.0
<u>Consulting and professional fees</u>					
- Legal	\$ 35.0	\$ 270.0	\$ 305.0	1.0%	
- Accounting & Audit	\$ 25.0	\$ -	\$ 25.0	0.1%	
- Consulting fees	\$ 85.0	\$ 1,025.0	\$ 1,110.0	3.5%	
- Project Inspection Fees		\$ 318.3	\$ 318.3	1.0%	
<u>Marketing/External relations</u>	\$ 311.1	\$ 1,057.5	\$ 1,368.6	4.3%	
<u>EM&amp;V</u>		\$ 305.0	\$ 305.0	1.0%	
<u>Rent and location related expenses</u>					
-Rent/Utilities/Maintenance	\$ 277.9	\$ -	\$ 277.9	0.9%	
-Telephone/Communications	\$ 54.3	\$ -	\$ 54.3	0.2%	
-Equipment & storage space rental	\$ 16.7	\$ -	\$ 16.7	0.1%	
-Depreciation FF&E	\$ 92.9	\$ -	\$ 92.9	0.3%	
<u>Office, computer &amp; other expenses</u>					
-Office expense	\$ 62.1	\$ -	\$ 62.1	0.2%	
-Computer operations	\$ 61.0	\$ 155.0	\$ 216.0	0.7%	
-Subscriptions	\$ 18.0	\$ -	\$ 18.0	0.1%	
-Training and education	\$ 44.8	\$ 60.0	\$ 104.8	0.3%	
-Temporary employees	\$ 25.0	\$ -	\$ 25.0	0.1%	
-Travel, meeting & related expenses	\$ 63.2	\$ 100.0	\$ 163.2	0.5%	
-Insurance	\$ 58.1	\$ -	\$ 58.1	0.2%	30.4%
<u>Third party grant expenses</u>		\$ 1,707.0	\$ 1,707.0	5.3%	5.3%
<u>Financial Incentives- Grants and Rebates</u>		\$ 17,781.0	\$ 17,781.0	55.6%	55.6%
<u>Interest rate Buydown-HDF/CHIE</u>		\$ 250.0	\$ 250.0	0.8%	
<u>Provision for Loan Loss - Grid Tied Loan Program</u>		\$ 800.0	\$ 800.0	2.5%	
<u>Provision for Loan Loss - Op Demo Loans</u>		\$ 1,000.0	\$ 1,000.0	3.1%	1.0%
<u>Provision for Loan Loss - Alpha Loans</u>		\$ 225.0	\$ 225.0	0.7%	
<u>Provision for Loan Loss - GreenerU</u>		\$ 100.0	\$ 100.0	0.3%	
<u>Provision for Loan Loss - WINN LISC</u>		\$ 12.5	\$ 12.5	0.0%	
<u>Provision for Loan Loss - CPACE Loans</u>		\$ 100.0	\$ 100.0	0.3%	
<u>Provision for Loan Loss - Lease Programs</u>		\$ 24.1	\$ 24.1	0.1%	
<u>Provision for Loan Loss - Res. Solar Loans</u>		\$ 27.5	\$ 27.5	0.1%	
<u>Provision for Loan Loss - Res. EE Loans</u>		\$ 11.6	\$ 11.6	0.0%	
<u>Provision for Loan Loss - Clean Energy Bus Solutions Loans</u>		\$ 250.0	\$ 250.0	0.8%	
<b>Total Expenses:</b>	<b>\$ 3,843.8</b>	<b>\$ 28,162.9</b>	<b>\$ 32,006.7</b>	<b>100.0%</b>	<b>92.2%</b>
<b>FY 2013 expenses over income:</b>			<b>\$ 394.8</b>		

**Clean Energy Finance and Investment Authority**  
**Statement of Revenues, Expenses**  
**and Changes in Net Assets**  
**Projected for the Year Ending June 30, 2013**  
**(000's)**

	<b>Total Net Assets</b>	<b>6/30/2012</b>	<b>\$ 81,280.3</b>	
<b>FY 2013 expenses over income:</b>			<b>394.8</b>	
	Utility customer assessments	27,850.0		
	RGGI auction proceeds	2,000.0		
	Grant income	2,156.5		
	Other income	395.0		
		<u>32,401.5</u>		
	Compensation	(5,197.1)		
	Consulting and professional fees	(1,758.3)		
	Marketing/External relations	(1,368.6)		
	EM&V	(305.0)		
	Rent and location related expenses	(441.8)		
	Office, computer & other expenses	(647.2)		
		<u>(9,717.9)</u>		
	Provision for Loan Loss - New Programs	(525.8)		
	Interest Rate Buydowns - New Programs	(250.0)		
	Residential Solar PV rebates	(9,333.0)		
	Anaerobic Digester Pilot	(2,000.0)		
	CHP Pilot	(2,000.0)		
	Condo Renewable Energy grants	(50.0)		
	Maintained Programs	(1,450.0)		
		<u>(15,608.8)</u>		
	<b>NOTE: Subtotal, Recurring Programs</b>	<b>7,074.8</b>		
	Clean Energy Business Solutions	(2,500.0)		
	Transition & Other	(448.0)		
	Federal Grants	(1,707.0)		
	Loan Loss Reserve - Grid Tied, Op Demo & Alpha Loans	(2,025.0)		
		<u>(6,680.0)</u>		
	<b>NOTE: Subtotal, Non-Recurring/Special Programs</b>	<b>(6,680.0)</b>		
	<b>Expenditures grants and rebates approved prior to FY13</b>		<b>\$ (17,912.1)</b>	
	PROGRAM GOAL 1 PROJECT 150 & PRE DEVELOPMENT PROGRAM <b>NOTE 1</b>	\$ -		(7,937.1)
	CI&I ON SITE GENERATION PROGRAM - Strategic Investments	(35.0)		
	CI&I ON SITE GENERATION PROGRAM - COMM. SOLAR	(2,229.3)		
	Residential Solar PV -Pre Sec 106, PA 11-80	(87.1)		
	RESIDENTIAL SOLAR PV INVESTMENT PROGRAM (Section 106,PA 11-80)	(2,944.9)		
	CI&I On Site Generation - Solar NFP/Govt	(2,719.5)		
	CI&I On Site Generation -Fuel Cell	(6,320.4)		
	GEO THERMAL,SOLAR THERMAL AND HOT WATER PROJECTS	(1,095.7)		
	CI&I ON SITE GENERATION PROGRAM - FEASIBILITY STUDIES	(211.3)		
	Operational Demonstration Program	(862.5)		
	TECHNOLOGY AND DEVELOPMENT STUDIES	(85.4)		
	Education & Outreach Programs	(1,219.3)		
	Other	(101.6)		
		<u>(13.6)</u>		
	<b>Other</b>		<b>\$ (13.6)</b>	
	<b>Total Net Assets</b>	<b>6/30/2013</b>	<b>\$ 63,749.4</b>	

**NOTE 1 - approx \$7,937.1 allocated to this program but NOT expected to require disbursement during FYE 6.30.2013**



## Statement of Cash Flows

Projected for the Year Ending June 30, 2013

(000's)

	Projected 6/30/2013
<b>Cash flows from operating activities</b>	
<b>CASH IN:</b>	
Proceeds from utility customer assessments	\$ 27,850.0
Proceeds from RGGI auctions	\$ 2,000.0
Proceeds from grants	\$ 2,156.5
Proceeds from RECs/other income	\$ 125.0
Proceeds from Interest on deposits, investments, solar lease notes	\$ 270.0
<b>CASH OUT:</b>	
Expenditures General and Program Administration	\$ (9,625.0)
Expenditures third party grants (LBE, N2N, Sunrise)	\$ (1,707.0)
Expenditures grants and rebates approved prior to FY13	\$ (17,912.1)
Expenditures grants and rebates -other programs	\$ (14,651.5)
Expenditures residential solar lease PV program- rebates	\$ (2,197.1)
Expenditures residential solar loan program-rebates	\$ (932.4)
Expenditures-Credit Enhancement IRB	\$ (250.0)
<b>Net cash used by operating activities</b>	<b>\$ (14,873.6)</b>
<b>Cash flows from investing activities</b>	
<b>LOAN RECOVERY</b>	
Return of principal on solar lease V1 promissory notes	\$ 670.0
Proceeds from residential solar loan program	\$ 5.5
Proceeds from WINN LISC program	\$ 1.2
Proceeds from GreenerU program	\$ 24.0
Proceeds from EEloan program	\$ 2.3
	<u>\$ 703.0</u>
<b>LOAN DISBURSEMENTS</b>	
Residential solar lease PV program	\$ (395.5)
Residential solar lease SHW program	\$ (29.0)
Commercial solar lease (MUSH) program	\$ (105.0)
Residential solar loan program	\$ (550.6)
WINN LISC program	\$ (125.0)
GreenerU program	\$ (1,000.0)
EE loan program	\$ (232.6)
CPACE program	\$ (1,000.0)
Grid tied program	\$ (8,000.0)
Op Demo program	\$ (2,000.0)
Alpha program	\$ (450.0)
Clean Energy Business Solutions	\$ (2,500.0)
	<u>\$ (16,387.7)</u>
<b>Net cash used by investing activities</b>	<b>\$ (15,684.7)</b>
<b>Cash flows from capital activities</b>	
Purchase of furniture, equipment & software	\$ (182.0)
<b>Net cash used in operating, investing and capital activities FYE 6/30/2013</b>	<b>\$ (30,740.3)</b>
<b>Cash and cash equiv., 7/1/2012</b>	<b>\$ 73,213.6</b>
<b>Cash and cash equiv., 6/30/2013</b>	<b>\$ 42,473.3</b>

**Cash and cash equiv. composition 7/1/2012**

Restricted - ARRA SEP Funds	\$	8,363.7
Restricted - Other LLRs	\$	-
Commitments for grants and rebates carried forward	\$	25,849.2
Other Restricted	\$	177.0
Unrestricted	\$	38,823.7
<b>6.30.2012</b>	<b>\$</b>	<b>73,213.6</b>

**Cash and cash equiv. composition 6/30/2013**

Restricted - ARRA SEP Funds	\$	8,113.7
Restricted - Other LLRs	\$	1,105.0
Commitments for grants and rebates carried forward		7,937.1
Other Restricted		177.0
Unrestricted	\$	25,140.5
<b>6.30.2013</b>	<b>\$</b>	<b>42,473.3</b>

**Analysis of Restricted SEP Funds 6/30/2012**

<b>Restricted - ARRA SEP Funds balance 7/1/2012</b>	\$	8,363.7
IRB - HDF/CHIF (no further claim by CEFIA)	\$	(250.0)
<b>Restricted - ARRA SEP Funds balance 6/30/2013</b>	\$	8,113.70

LLR paid to (held by) others - HDF/CHIF	\$	(500.0)
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***Non Cash Movement Transactions:***

Loan Loss Reserve -Lease Programs	\$	(424.5)
Loan Loss Reserve -Res. Solar Loans	\$	(206.5)
Loan Loss Reserve -Res. EE Loans	\$	(87.2)
<b>Restricted ARRA SEP Funds available for future programs 6/30/2013</b>	<b>\$</b>	<b>6,895.5</b>

Clean Energy Finance and Investment Authority  
Statement of Net Assets  
Projected for the Year Ending June 30, 2013  
(000's)

	Actual 6/30/2012	Projected 6/30/2013
<b>Assets</b>		
<b>Current assets</b>		
Cash and cash equivalents (Unrestricted)	\$ 38,823.7	\$ 25,140.5
Cash and cash equivalents (Unrestricted - held for Contingent Obligations - Prior Fiscal Years)	25,849.2	7,937.1
Cash and cash equivalents (Total Unrestricted)	64,672.9	33,077.62
Utility receivables	\$ 2,580.0	\$ 2,200.0
RGGI auction receivable	\$ 725.3	\$ 750.0
Promissory notes - solar lease program V1, current portion	\$ 670.6	\$ 670.6
Other current assets	\$ 350.3	\$ 250.0
<b>Total current assets</b>	<b>\$ 68,999.1</b>	<b>\$ 36,948.2</b>
<b>Noncurrent assets</b>		
<b>Investments</b>		
Promissory notes - solar lease program V1	\$ 11,365.8	\$ 10,695.8
Loan loss reserve - solar lease program V1	\$ (300.9)	\$ (267.4)
Promissory notes - solar lease program V2	\$ -	\$ 529.5
Loan loss reserve - solar lease program V2	\$ -	\$ (24.1)
Promissory notes - solar loan program	\$ -	\$ 545.2
Loan loss reserve - solar loan program	\$ -	\$ (27.5)
Promissory notes - WINN LISC program	\$ -	\$ 123.8
Loan loss reserve - WINN LISC program	\$ -	\$ (12.5)
Promissory notes - GreenerU program	\$ -	\$ 976.0
Loan loss reserve - GreenerU program	\$ -	\$ (100.0)
Promissory notes - EE Loan program	\$ -	\$ 230.3
Loan loss reserve - EE loan program	\$ -	\$ (11.6)
Promissory notes - CPACE program	\$ -	\$ 1,000.0
Loan loss reserve - CPACE loan program	\$ -	\$ (100.0)
Promissory notes - Alpha program	\$ -	\$ 450.0
Loan loss reserve - Alpha program	\$ -	\$ (225.0)
Promissory notes - Grid tied program	\$ -	\$ 8,000.0
Loan loss reserve - Grid tied program	\$ -	\$ (800.0)
Promissory notes - Op Demo program	\$ -	\$ 2,000.0
Loan loss reserve - Op Demo program	\$ -	\$ (1,000.0)
Promissory notes - Clean Energy Bus Solutions program	\$ -	\$ 2,500.0
Loan loss reserve - Clean Energy Bus Solutions program	\$ -	\$ (250.0)
Equity/Debt investments (pre FY13)	\$ 2,155.5	\$ 2,155.5
Investments-REC's	\$ 1,429.9	\$ 1,450.0
<b>Capital assets</b>		
Furniture, Equipment & L/H Improvements	\$ 91.3	\$ 181.4
<b>Restricted cash and cash equivalents</b>		
Other restricted cash	177.0	177.0
Cash and cash equivalents (Restricted-Credit Enhancement [LLR] CEFA Funds)		1,105.0
Cash and cash equivalents (Restricted-ARRA-Allocated-Held by CEFA)		718.2
Cash and cash equivalents (Restricted-ARRA-Allocated-Held by Others)		500.0
Cash and cash equivalents (Restricted-ARRA-Unallocated)	\$ 8,363.7	\$ 6,895.5
TOTAL Restricted Cash & Cash Equivalents	8,540.7	9,395.7
<b>Total non current assets</b>	<b>\$ 23,282.3</b>	<b>\$ 37,414.9</b>
<b>Total assets</b>	<b>\$ 92,281.4</b>	<b>\$ 74,363.1</b>

Clean Energy Finance and Investment Authority  
Statement of Net Assets  
Projected for the Year Ending June 30, 2013  
(000's)

	Actual 6/30/2012	Projected 6/30/2013
<b>Liabilities and Net Assets</b>		
Accounts, grants payable and accrued expenses	\$ 2,637.4	\$ 2,500.0
Deferred revenue-ARRA	\$ 8,363.7	\$ 8,113.7
<b>Total liabilities</b>	<b>\$ 11,001.1</b>	<b>\$ 10,613.7</b>
<b>Net Assets:</b>		
Investment in capital assets	\$ 91.3	\$ 181.4
Restricted net assets	\$ 8,540.6	\$ 9,393.6
Unrestricted net assets	\$ 72,648.4	\$ 54,174.4
<b>Total Net Assets</b>	<b>\$ 81,280.3</b>	<b>\$ 63,749.4</b>
<b>Total Liabilities and Net Assets</b>	<b>\$ 92,281.4</b>	<b>\$ 74,363.1</b>

**Clean Energy Finance and Investment Authority  
 FY 13 Operations and Program Budget  
 Utility Customer assessment Projections  
 (in thousands)**

					<b>(Under) Over</b>			<b>(Under) Over</b>
	<u>FY 12 Budget</u>		<u>FY12 Actual</u>		<u>FY 12</u>		<u>FY13 Budget</u>	<u>FY12 Budget</u>
July	\$ 2,429	\$	2,588	A	\$ 160	\$	2,700	\$ 112
August	\$ 2,592	\$	2,800	A	\$ 208	\$	2,825	\$ 25
September	\$ 2,468	\$	2,347	A	\$ (121)	\$	2,500	\$ 153
October	\$ 2,145	\$	2,086	A	\$ (59)	\$	2,200	\$ 114
November	\$ 2,035	\$	1,988	A	\$ (46)	\$	2,100	\$ 112
December	\$ 2,335	\$	2,194	A	\$ (141)	\$	2,375	\$ 181
January	\$ 2,721	\$	2,405	A	\$ (316)	\$	2,400	\$ (5)
February	\$ 2,360	\$	2,270	A	\$ (90)	\$	2,300	\$ 30
March	\$ 2,188	\$	2,189	A	\$ 1	\$	2,200	\$ 11
April	\$ 2,225	\$	2,208	A	\$ (17)	\$	2,250	\$ 42
May	\$ 1,971	\$	1,780	A	\$ (191)	\$	1,800	\$ 20
June	\$ 2,047	\$	2,047	B	\$ -	\$	2,200	\$ 153
Total assessments:	<u>\$ 27,515</u>	<u>\$</u>	<u>26,902</u>		<u>\$ (613)</u>	<u>\$</u>	<u>27,850</u>	<u>\$ 948</u>
					<u>-2.2%</u>			<u>3.4%</u>

**Clean Energy Finance and Investment Authority  
FY 2013 Operations and Program Budget  
Staffing Plan**

<u>Position</u>	<u>% CEFIA</u>	<u>FY12 Staffing Plan</u>	<u>FY 13 Staffing Plan</u>
<b><u>CEFIA Employees</u></b>			
1 President, CEFIA	100%	X	X
2 Chief of Staff	100%	X	X
3 Executive Vice President and Chief Investment Officer	100%	X	X
4 General Counsel	100%	X	X
5 Director of Residential Programs	100%		X
6 Director, Government and External Relations	100%	X	X
7 Director of Renewable Energy Deployment	100%	X	X
8 Director of Energy Efficiency Deployment	100%	X	X
9 Director, Energy Market Initiatives	100%	X	X
10 Director, PACE (new hire FY13)	100%		X
11 Associate Director, Finance (new hire FY13)	100%		X
12 Associate Director of Technology Innovation	100%	X	X
13 Senior Manager of Clean Energy Deployment	100%	X	X
14 Senior Manager of Marketing and Outreach	100%	X	X
15 Senior Manager of Marketing and Outreach	100%	X	X
16 Manager of Evaluation Measurement and Verification	100%	X	X
17 Senior Manager, Clean Energy Finance	100%		X
18 Manager, Clean Energy Finance	100%		X
19 Manager, Clean Energy Finance	100%		X
20 Associate of Clean Energy Deployment	100%	X	X
21 Associate, New Technologies	100%	X	X
22 Associate of Marketing and Outreach	100%	X	X
23 Associate, PACE (new hire FY13)	100%		X
24 Project Assistant	100%	X	X
25 Project Assistant	100%	X	X
26 Project Assistant	100%	X	X
27 Paralegal	100%	X	X
28 Executive Assistant	100%	X	X
29 Administrative Assistant	100%	X	X
30 Program Manager - Lead by Example (Tremaine Foundation)	100%	X	X
31 Director, New Technologies. (vacant not filling in FY 13)	100%	X	
32 Manager of Clean Energy Deployment	100%	X	
33 Manager of Clean Energy Deployment	100%	X	
34 Associate of Technology Innovation (vacant not filling in FY13)	100%	X	
35 Associate of Clean Energy Deployment (vacant not filling in FY13)	100%	X	
36 Associate of Clean Energy Deployment (vacant not filling in FY13)	100%	X	
<b><u>CI Shared Employees</u></b>			
1 VP Finance and Administration	50%	X	X
2 Manager, Human Resources - PT	50%	X	X
3 Director IT and Facilities	50%	X	X
4 Senior IT Systems Administrator (new hire FY13)	50%		X
5 IT and Software Training	50%	X	X
6 Controller	50%	X	X
7 Senior Accountant	50%	X	X
8 Accounting Assistant	100%	X	X
9 Payroll and AP	50%	X	X
10 Receptionist	50%	X	X

# State Clean Energy Finance Banks: New Investment Facilities for Clean Energy Deployment

Ken Berlin, Reed Hundt, Mark Muro, and Devashree Saha<sup>1</sup>

## Summary

Propelled by private entrepreneurship, technology gains, and public support, clean energy and energy efficiency solutions began to proliferate in recent years. However, federal policy gridlock and state budget challenges are now jeopardizing the availability of government finance, exacerbating the serious finance challenges that impede the large-scale deployment of low-carbon energy solutions.

Fortunately a number of states are now exploring a variety of ways to leverage scarce public resources with sophisticated banking and finance mechanisms. Epitomized by Connecticut's Clean Energy Finance and Investment Authority (CEFIA), the proposed new finance entities entail the creation by states of dedicated clean energy banks that leverage public money with private-sector funds and expertise.

While these banks can take different forms based on each state's unique circumstances, they essentially combine scarce public resources with private sector funds and then leverage those funds to invest in attractive clean energy and energy efficiency projects. A timely benefit of the low-cost financing that these banks will make available is that it will reduce clean energy projects' dependence on expiring federal grants, tax credits, and subsidies and lower the cost of these projects enough to make them cost-competitive with conventional technologies.

Along these lines, state leaders can choose among at least three bank models. They may:

- Establish, as in Connecticut, a quasi-public corporation into which are combined existing state clean energy and energy efficiency funds so as to permit private investment in the bank and enable the new entity to make loans and leverage its capital with private capital
- Repurpose portions of one or more existing financing authorities from a grant to a lending model and then through a partnership agreement combine the financing authority's funds with private funds
- Adjust an existing or new infrastructure bank so as to attach a clean energy finance bank to fund energy projects to a bank lending to traditional infrastructure projects

## I. Introduction

Propelled by private entrepreneurship, technology gains, and critical public support, clean energy and energy efficiency solutions began to proliferate in recent years.<sup>2</sup>

In a word, clean energy solutions are diffusing steadily through U.S. states and regions and so are helping to create new jobs and innovative new industries even as they reduce carbon pollution and provide energy choices for households and businesses.

“The creation of state clean energy banks represents another arena for state leadership on alternative energy finance.”

And yet, for all of the recent success, continued progress toward a clean energy future will require the provision of unprecedented amounts of dependable, accessible, and fully-scaled capital—financing the source of which is not yet apparent.

Plentiful financing—consistently available in varied amounts with varying tolerances of risk—will be essential if the nation is going to defray the upfront costs of further developing a low-carbon economy. However, while such support has been generally available in the form of myriad federal and state subsidies and grants, a problem now intrudes given the uncertainty that surrounds the future of government finance programs.

With numerous federal programs and policies set to expire and states still struggling with serious budget challenges, direct government grants and tax credits are not going to be as available as they have been to drive the shift to a low-carbon future. Instead, both public and private investment is going to have to be leveraged more smartly.

And so America and its states and regions are going to have to find new ways to provide the financial support needed to shift the nation's economy toward a low-carbon future.

Which is why it is so timely that numerous states are exploring a variety of ways to leverage scarce public resources with sophisticated banking and finance mechanisms even as one state continues to implement an especially bold and intriguing new model.

That model—which draws inspiration from the Overseas Private Investment Corporation (OPIC) and several international experiments (see sidebar on OPIC and the Appendix)—entails the creation by states of clean energy finance banks that can combine scarce public resources with private-sector funds and then leverage the funds to invest in the build-out of clean energy projects and metropolitan energy industries.

Such projects face major financing challenges, as is well known. Even though the cost of renewable energy projects has been dropping rapidly in recent years, the delivered cost of energy from renewable energy projects is still generally more expensive than the delivered cost of energy from conventional fossil fuel projects.<sup>3</sup> This is partly because conventional energy sources enjoy the advantages of built delivery systems, favorable tax policies, low marginal costs at existing generation plants, and vastly larger scale as well as fundamentally lower costs of energy relative to many, but not all, renewable projects.

As a result, it is still very difficult to finance either small- or large-scale deployment of these technologies, even ones with little technology risk, without some form of governmental or other financial support that make the projects cost competitive. This difficulty in financing the deployment of low-risk but more expensive renewable energy technologies is one of several finance gaps that these technologies must overcome for them to be deployed to scale.<sup>4</sup>

To date, the support needed for clean energy projects has been provided by the federal and to a lesser extent state governments in the form of tax incentives, direct grants, and other subsidies. However, with the rapid decline in federal and state spending that could materialize in the next few years, the nation is going to have to find new ways to provide financial support for energy industry development.<sup>5</sup>

Beyond the rapid cutbacks in federal and state spending, there are other compelling reasons for state involvement in clean energy projects including the unique role states play in electricity markets and regulation, their proximity to regional industry clusters and deep engagement in technology-based economic development, and ease of establishing public-private partnerships at the local level. Most important, as “laboratories of democracy” states have always exhibited the creativity and willingness to experiment on several fronts including in clean energy.

Most notably, states are going to need once again to lead the nation—as they have over and over in the past—in developing new and innovative ways to finance clean energy programs just as in the recent past they developed and implemented such powerful concepts as feed-in tariffs, power purchase agreements, renewable energy certificates, and clean energy funds, among others, to drive clean energy development at scale.<sup>6</sup> However, given their own budget restrictions, states will find it difficult to take up new clean energy finance programs with new funding programs or the usual array of subsidies and incentives. And yet, by embracing the “clean energy finance banks” concept states may be able to move forward by tailoring a flexible concept to their own specific strengths. Specifically, recent developments show that states may be able to establish clean energy finance banks that draw

on existing state funds that support clean energy and energy efficiency projects; combine them with private investment in providing debt capital to such projects; and so leverage state funds to maximize investment.

What is more, it appears possible that the availability of low-cost financial support enabled by judicious use of commonly used credit structures from a possible generation of clean energy finance banks could reduce or in some cases replace clean energy projects' reliance on expiring tax credits, grants, and subsidies.

So what are some practical models for such an institution? One model is clearly Connecticut's Clean Energy Finance and Investment Authority (CEFIA)—the nation's first state-based clean energy finance bank, established last year.<sup>7</sup> Created as a key component of a broader energy law that received almost complete bipartisan support, CEFIA is a quasi-public clean energy finance authority that combines several existing state clean energy and energy efficiency funds, enables the new entity to make loans, and to leverage its capital with private capital, permitting private investment in and alongside the bank with the investors receiving a reasonable rate of return on their investments.<sup>8</sup> As such, CEFIA holds out a flexible and attainable model for states to employ in constructing clean energy finance banks.

And yet, CEFIA is just one of several possible models for such clean energy finance banks. A second model builds on existing state financing authorities. It repurposes portions of one or more of existing financing authorities from a grant to a lending model and then, through a partnership agreement, combines the financing authority's funds with private funds. And a third model is similar to the second except that it combines a clean energy investment bank to fund energy projects with a bank lending to traditional infrastructure projects like roads, pipelines, and transmission lines. Under all these models, there is ample new market and profit opportunity for regional and commercial banks as well as community banks.

In each case, clean energy and energy efficiency investment funds would be raised from a combination of existing state funds, federal grants, repurposed regulatory charges (often called "system benefit charges"), foundation grants, private investment, and bonds issued by the clean energy finance bank, the financing authority or the infrastructure and energy bank. The banks would not seek new appropriations, but all three possible models would make existing funds go much further by converting existing programs from a one-time grant model to a lending model that establishes a revolving fund, and then combines the public funds with private funds, and leverages the combined funds in safe, but new and creative ways. In most cases, state clean energy finance banks would provide a low-cost tranche of financing that when combined with commercial bank financing would make a given project commercially viable and enable the bank to make use of the commercial bank's due diligence. If a national clean energy finance bank were established, as has been proposed, one of its key tasks could be to provide additional funding to state clean energy finance banks.<sup>9</sup> Details of how each of these structures would work are provided in Section III.

Connecticut's new clean energy finance bank, while welcome in itself, also points to a larger opportunity. By demonstrating one practical low-cost model as a significant response to one region's clean energy finance needs, CEFIA shows the potential for other states to again step to the forefront of problem-solving on some of the nation's thorniest clean energy financing challenges. CEFIA, in that sense, points to one set of possible outlines of the next needed generation of clean energy finance solutions. After all, a key feature of CEFIA and other possible financing authorities is that, over time, the taxpayer and ratepayer money put into projects will be paid back. This assurance will be critical to maintaining political and citizen support for clean energy undertakings in the future.



## II. The Challenge

The challenge is complex. Transitioning to a cleaner economy is going to entail the deployment of hundreds of thousands of small- and large-scale clean energy projects in the coming decades.

To achieve that goal, though, several trillions of dollars will need to be invested to propel the transition to a clean energy future. One estimate, for instance, concludes that to reduce U.S. fossil fuel-based electric generation by a desirable 88 percent, among other things, by 2030 would require a net investment of \$3.8 trillion in undiscounted 2008 dollars.<sup>10</sup> Other estimates are lower but there's little doubt that the necessary capital expenditures are large and must occur over an extended period of years.

However, multiple pricing, finance, technology, and budgetary issues complicate national as well as state clean energy markets.

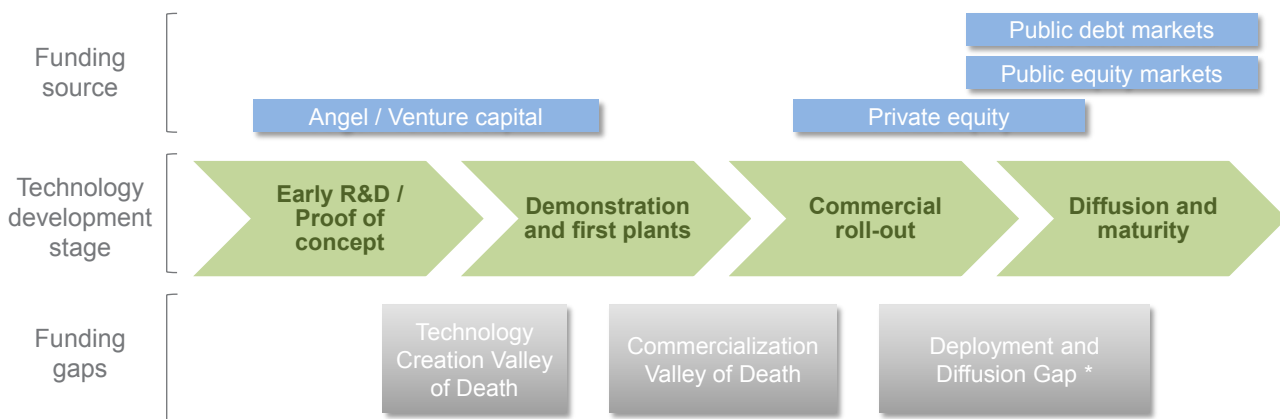
The clean energy industry faces unique challenges in that it is highly asset-based and capital-intensive. What is more, most clean energy technologies face long technology and cost curves that more often than not deter private capital from investing either in a collection of small scale or in a handful of large scale clean energy projects.<sup>11</sup>

As a result, despite the recent success of these new technologies in reducing their production and operating costs, in most cases the delivered cost of energy from clean energy projects remains higher than the delivered cost of energy from existing power generation facilities.<sup>12</sup>

In light of these broad technology and pricing challenges, clean energy projects face both high capital needs and a scarcity of reasonably priced capital at every phase of the development pipeline from the research and development phase to widespread market adoption.

Along these lines, discussions of clean energy scale-up have focused heavily to date on two well-known finance problems, or “Valleys of Death”—the first being the “technology creation” Valley of Death and the second the “commercialization” Valley of Death—that impede the scale-up of clean energy solutions.<sup>13</sup> The “technology creation” Valley of Death occurs at the early end of the development pipeline as a technology moves from the laboratory to the market and needs to establish its basic market viability. The later-stage “commercialization” Valley of Death, for its part, occurs when companies seek capital to fund first-of-a-kind commercial-scale projects or manufacturing plants.

Figure 1. Clean Energy Technology Development Stages and Financing Gaps



Source: Adapted from Bloomberg New Energy Finance

\* Likely focus of state clean energy finance banks

And yet there is another, pervasive challenge to the widespread diffusion of low-carbon clean technology solutions. This additional market problem complicates the large-scale deployment of even relatively mature technologies, which tend to falter in the marketplace given that neither their full social benefits nor their dirtier competitors' full social costs are priced in, which leaves new clean energy technologies relatively more expensive.<sup>14</sup> Given this problem, most low- or no-carbon solutions still need financial help to compete effectively with entrenched older technologies even as they continue to progress down the price curve.

It is this third financing gap that may be the broadest, and most fundamental, hurdle to the widespread deployment and diffusion of clean energy technologies in U.S. states (even though it may be the one most susceptible to state-level finance interventions).

The upshot for states is that in the absence of specific public interventions to provide low-cost financing to enable the widespread deployment of relatively mature clean energy technologies, hundreds of worthwhile renewable energy and energy efficiency projects will simply not be undertaken. States, to that extent, face substantial technology, price, and finance challenges if they wish to help scale up attractive clean energy projects.

But states face other challenges. Beyond these technical and finance issues, states that want to accelerate the development of clean energy industries must also grapple with serious budget and policy challenges. Most notably:

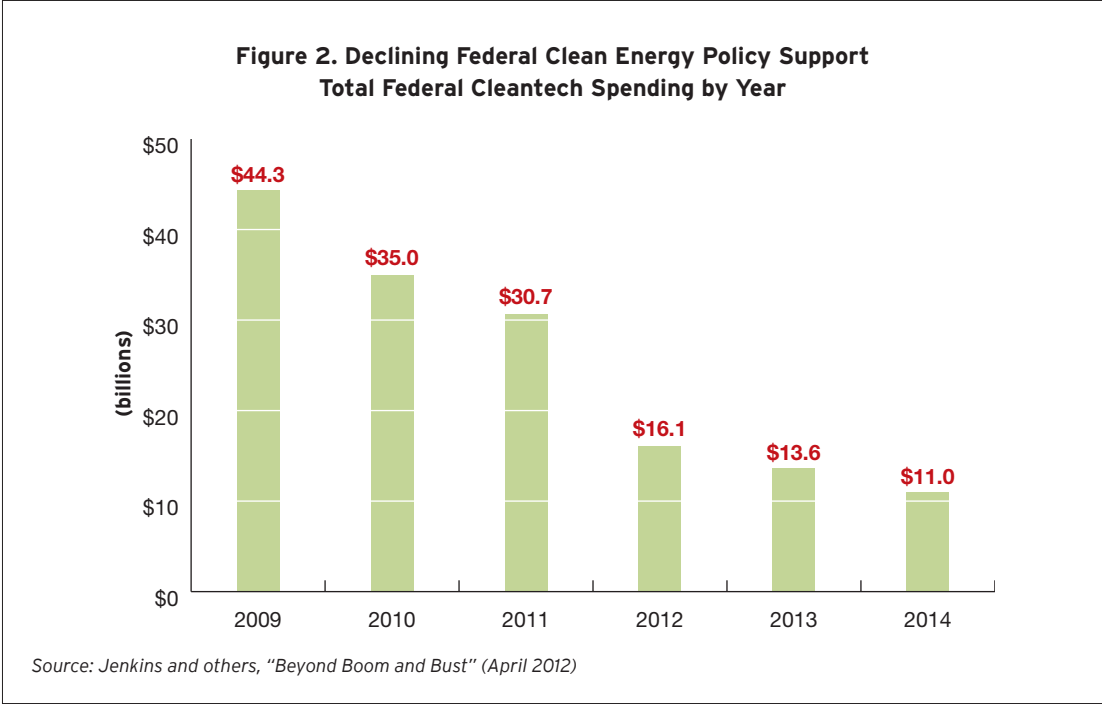
**Federal financial support for clean energy projects will likely decline.** The first and most basic challenge for states is that despite having made significant progress on cost and performance, many clean energy industries remain highly dependent on subsidies, grants, and tax credits—supports that are now set to decline. Most notably, budget limitations, “green backlash,” and the end of many programs funded by the American Recovery and Reinvestment Act of 2009 (ARRA)—which has been the largest federal investment in clean energy in American history—are going to hit the sector hard in the next few years in what some observers are predicting will be a crisis for clean energy finance.<sup>15</sup>

A closer look at the numbers delineates the challenge. Between 2009 and 2014, the federal government will have spent more than \$150 billion in clean energy projects through direct lending, tax expenditures, and loan guarantees, according to an analysis developed by Brookings and the Breakthrough and World Resources institutes.<sup>16</sup> Of this support, roughly one-third (\$51 billion) will have flowed from programs created or expanded by ARRA, including the Department of Energy loan guarantee programs, Section 1603 subsidy, and various federal production and investment tax credits like the Production Tax Credit for wind.

However, many ARRA-funded and other programs have either already expired or are nearing their end and appear unlikely to be replaced (Figure 2). To be specific, 63 of 92 federal clean energy finance policies in place in 2009 will have expired by the end of 2014. In dollar terms, that means that annual federal financial support for clean energy sectors is poised to decline by 75 percent from its 2009 high of \$44.3 billion to \$11 billion in 2014. In short, the federal government—the largest single source of financial support for U.S. clean energy innovation and project development—will be pulling way back in the next few years.

**State budget constraints are also severe.** At the same time, state and local governments are also facing budget problems that will likely preclude efforts to offset the federal pull-back with bold new grant and subsidy programs. For one thing, state discretionary spending remains and is projected to remain depressed given the continued revenue impacts caused by the after-effects of the Great Depression.<sup>17</sup> For another, states are also finding it difficult to issue new general obligation bonds. Bond issuance by states and others including cities, schools, hospitals, and other municipal entities fell to a 10-year low in 2011 after reaching a record high in 2010. Even though debt sales by states are up by 74 percent as of May 2012 compared to the same period in 2011, Moody's notes that heightened fiscal management concerns will result in less new state borrowing, and that much of the increased issuance reflects refunding issues to take advantage of lower long-term interest rates rather than new money issues for new projects. For instance, states like California, Florida, and New Jersey have all reduced borrowing and are funding some capital projects on a pay-as-you-go basis even while contending with their constitutional budget restrictions.<sup>18</sup>

In addition, federal fiscal austerity is likely to impose further challenges. With the direct federal aid to the states under ARRA now waning states will face increased fiscal stress that will vary depending



on their ability to raise revenue and make cuts in other programs.

The implication is that state governments that want to encourage continued clean energy investment in their states are now going to have to do it largely without major new grants, bonds, or subsidy programs.

**Dedicated state investment in clean energy development and deployment—for instance through state clean energy funds—remains modest and is unlikely to increase.** As to states’ existing programs in the clean energy arena, they are not by themselves equal to the task of adequately catalyzing clean energy development in the next decade. To the matter of their size, the states’ varied programs—despite their many successes—have been able to provide only a small fraction of the trillions of dollars needed to bring clean energy projects to scale. What is more, the ability of the states to expand their existing approaches remains limited given the realities of ever-tighter state budgets.

As to the many state programs’ form and focus, the fact remains that few of the programs are optimally designed to catapult states into a new period of clean energy economic development. A case in point is the dedicated clean energy funds (CEFs) that have been established in over 20 states. In some states, these valuable funds generate a few million dollars each year, as noted an earlier paper in the present Brookings-Rockefeller State and Metropolitan Innovation series; in other states, several hundred million dollars are invested annually.<sup>19</sup> In terms of their focus, however, the CEFs have tended to focus mostly on individual project financing and deployment through the use of one-off rebates, grants and performance-based incentives that have directly subsidized the installation of clean energy technologies.<sup>20</sup> Only rarely have the funds explored more sophisticated and leveraged finance models oriented toward the wider-scale deployment of clean energy solutions.

In that sense both the scale and mission of the funds remains sub-optimal from the perspective of accelerating the scale up growth of a strong state cleantech industry.

\* \* \*

The challenge is clear: To accelerate the diffusion of clean energy and energy efficiency solutions states need to develop new mechanisms for intervening in flawed regional energy markets to ensure the availability of adequate deployment finance. Most notably, they will clearly need to supplement or leverage their existing array of grants, tax credits, and bond revenue to create a new generation of modern clean energy finance facilities.

### III. A New State Approach

Given these challenges, states that want to realize the benefits of clean energy deployment should consider a new approach to funding clean energy programs. Specifically, they should investigate the possibility of developing state clean energy finance banks that use limited public dollars and leverage private capital to provide a combination of low-interest rate funding that makes clean energy projects competitive and low-cost 100-percent up-front loans for energy efficiency projects.

Such an approach would address the deployment and diffusion challenges faced by clean energy technologies while recognizing that federal and state appropriations, tax credits, and other incentives and subsidies will be sharply diminished in the years ahead because of the budget crisis at all levels of government. Likewise, the development of such finance entities would address the need for states to develop a new paradigm for financing strong clean energy and energy efficiency projects as part of a push to develop strong regional industries.

So-called “clean energy finance banks” or “green banks” are ideally suited to solve the present problems because they offer a practical way for states to make available leveraged, low-cost financing for project developers in their states. First, they can be developed out of existing state programs while bringing into the enterprise the equivalent of substantial new resources given their ability to leverage funds. Likewise, because the banks would provide debt financing, they would be repaid on their loans, putting them in the position to borrow funds and to establish revolving loan funds that would provide funds that could be reinvested without new sources of financing. Furthermore, clean energy finance banks, if established as independent institutions, would be able to issue revenue bonds without the full faith and credit of the state and without the restrictions facing states, which have limited borrowing capacity. Finally, clean energy finance banks could efficiently seek large investors with patient, long-term capital who are seeking a long-term, conservative rate of return, such as pension fund investors.

Clean energy finance banks, in this regard, hold great promise for financing both energy efficiency projects and the deployment of clean energy projects with low technology risks, including projects using existing wind and solar technologies. Such clean energy projects, because of their low technology risk and low financing risk (particularly when they have entered into long-term power purchase agreements for the purchase of their output) should be able to attract bond purchasers interested in long-term, safe returns and thus willing to accept rates of return at a conservative level. By providing standby purchase agreements or total return swaps, the clean energy finance bank could even increase the potential pool of tax equity investors by lowering the risk profile of such investments.

At the same time, state clean energy finance banks could also be expanded to cover innovative, riskier new technologies and manufacturing facilities, although each of these propositions presents its own risk factors and would require a different funding “window” within the bank.

Along these lines, state-organized clean energy finance banks offer a practical way for states to make available low-cost financing for project developers in their regions and keep the clean energy economy growing. Currently, a significant amount of relatively low-cost credit is available for at least large energy project developers. Studies that the Coalition for Green Capital (CGC) has conducted, however, show that lowering the cost of clean energy loans by 225 basis points and providing long-term loans to all developers would lower the cost for a clean energy project by 15 to 20 percent (See Figure 3).<sup>21</sup> CGC thinks that state clean energy finance banks could provide loans at this rate differential. A clean energy finance bank would establish loan loss reserves through credit subsidy fees or using bank capital that is replenished by credit subsidy fees.<sup>22</sup>

This would be an important gain. A 15 to 20 percent reduction in the cost of a wind or solar project would make many projects cost-competitive with conventional generation. For other projects, clean energy finance banks’ offer of a low-interest rate tranche, rather than the full cost of the project, might be enough for the project to proceed. In yet other cases, the banks’ financing would not replace all of the tax credits and incentives that are likely to be withdrawn for budget reasons but it would substantially reduce the need for such supports.

The need for financing of energy efficiency projects is different. When faced with a choice of spending scarce dollars on energy efficiency rather than other uses, most homeowners and small businessmen, and even many large businesses, choose projects other than energy efficiency. As a result, to

**Figure 3. Comparison of Cost of Delivered Electricity through Financing by Commercial Banks vs. Clean Energy Finance Banks (CEFB)**

Assumptions		Commercial Market Financing	CEFB Financing
Capex - East	[\$/kW]	\$1,963	\$1,963
Capex - Plains	[\$/kW]	\$1,813	\$1,813
Capex - West	[\$/kW]	\$1,739	\$1,739
Tenor	years	10	20
Wind Case / Coverage	DSCR	P50 wind @ 1.4x free cashflow	P50 wind @ 1.3x free cashflow
Interest Rate (1)	[%]	6.75%; LIBOR + 300bps	4.5%; Treasury + 65 bps
Amortization Schedule		Equal over 10 years	Equal over 20 years
Balance at Maturity		Balance fully repaid	Balance fully repaid
Project leverage		20%	34%
IRR to Equity (leveraged)		11.0%	11.3%
Revenue Requirement = 2012 Price @ 2% annual escalation			
East - @ 35% NCF	[\$/MWh]	\$70/MWh	\$57/MWh
Plains - @ 44% NCF	[\$/MWh]	\$50/MWh	\$40/MWh
West - @ 38% NCF	[\$/MWh]	\$55/MWh	\$45/MWh

Model assumes that:

- All after-tax free cashflows from the project are financeable, net of cover ratios
- CAPEX costs do not include significant transmission system upgrades
- CAPEX is based on reported project cost data for the ARRA grant program through November 2009, with a 10 percent discount to account for reductions in equipment costs since 2009 in projects being built in 2011 and 2012
- Projects are identical but commercial banks will finance a more conservative wind case (requiring 1.4x cover ratio)
- Identical quantities of electricity are sold

Note: LIBOR is based on the LIBOR swap curve for the last five years; Treasury rates are based on rates for the same period

*Low-cost financing reduces the delivered electricity prices of these actual wind projects by 15 to 20 percent, making it cost-competitive with new-build conventional coal and gas-fired power plants (see highlighted sections above, where the cost of delivered electricity is reduced by \$10/MWh with the low EIT financing offered in the right column compared to available bank financing in the left column).*

Source: Coalition for Green Capital; prepared by an energy investment firm using public data sources

ensure adequate demand for energy efficiency projects, most energy programs subsidize the cost of energy efficiency projects, and many experts believe that 100 percent subsidies or financing of the up-front costs of energy efficiency projects is needed,<sup>23</sup> with repayment limited to an estimate of the expected amount of the energy savings.<sup>24</sup> The latter limitation becomes difficult if the cost of the project is too high since the cost of repayment at high interest rates would eventually exceed the estimated value of the energy savings. Currently there are low-cost financing programs but often the interest rates are held down by interest rate buy-downs. These types of programs will be very hard to bring to scale in an austere budget environment and in many places it is difficult to obtain 100-percent up-front financing. A clean energy finance bank should be able to provide financing at low enough rates after a loan loss reserve is established to avoid the need for interest rate buy-downs and help bring energy efficiency projects to scale.

In any event, the low-cost lending through state clean energy finance banks should be able to substantially reduce the cost of clean energy projects and so make many of them cost-competitive with traditional power generation while reducing their reliance on subsidies.

## Choosing a Model

And yet, states need not hew to a single model of clean energy finance.

Each state has a different initial set of programs and institutions that provide support for clean energy and energy efficiency projects. In some states, existing sources of funds are structured in a way that enables them to be easily moved into a new quasi-public entity that could become a clean energy finance bank. In others, existing state institutions are better placed for financing or political reasons to be turned into a clean energy finance bank. In every state, if the state chooses to establish financing programs, there is a need to establish an entity that can be staffed by persons with the appropriate lending and finance expertise.

And so states should design and implement in ways that suit their unique needs and existing programs. At least three leading models for the creation of state clean energy finance banks can be discerned:

**The Connecticut model.** Prior to the establishment of CEFIA, Connecticut had several different clean energy funds—including a system benefit fund and revenues from the Regional Greenhouse Gas initiative (RGGI) allowances—that had been set up by state legislation, but which were disconnected from other governmental entities like the Connecticut Department of Energy and Environmental Protection or the Connecticut Department of Economic and Community Development. At the same time, Connecticut lacked an overall financing authority that could be repurposed to act as a clean energy investment bank. Instead, while several of the existing funds had reliable sources of financing—from state utility charges and in some cases from bond revenue—the funds largely worked through direct grants and loans or interest rate buy-downs. There was general consensus in Connecticut that this system could be improved substantially if an approach could be developed that let these funds be used to make loans instead of grants, better leverage their capital by combining it with private financing, and operate in a business-like way with profit and loss statements and a prudent balance sheet. CEFIA was established to achieve those goals.<sup>25</sup> As of the publication date of this paper, CEFIA was close to finishing a comprehensive review of lending models and consultations with solar photovoltaics stakeholders and was about to start making its first loans.

The Connecticut model reflects the following key design elements:

- ▶ **Establishment of a quasi-public corporation, CEFIA, to act as the clean energy finance bank.**<sup>26</sup> In Connecticut, an existing entity, the Connecticut Clean Energy Fund (CCEF), became the clean energy finance bank, ensuring that the bank could get off the ground on its first day with existing staff. The legislation replaced the board of the CCEF with a new board appointed by the governor and political leaders in the legislature. One of the goals of the reconstitution of the board was to add individuals with clean energy financing expertise. As a quasi-public institution, CEFIA has its own budget outside of the budget of the state
- ▶ **Consolidation of several existing funding sources into one clean energy finance bank.** In Connecticut, the sources included a system benefit charge for clean energy, RGGI allowance revenue, and unused resources from an earlier bond offering for energy efficiency projects. Several of these sources, like the system benefit charge, will provide a yearly infusion of funds without further legislation. The legislation provides that CEFIA may seek to qualify as a community development financial institution.<sup>27</sup> In addition, because one of the goals of proponents of a national clean energy finance bank is to task the national bank with providing funds to state clean energy finance banks, CEFIA is given the authority to accept federal funds
- ▶ **Authorization to issue special obligations in the form of bonds, bond anticipation notes, or other obligations.** Supplemental legislation passed in June 2012 authorizes CEFIA to raise additional capital by issuing up to \$50 million in tax advantaged bonds and anticipation notes. In doing so it must make payments to holders of bonds solely from CEFIA assets and it may not secure bonds by any capital reserve fund contributed to by the state
- ▶ **Authorization to raise or leverage (through credit enhancements) funds from private sources of capital at an average rate of return set by the board of directors.**<sup>28</sup> The idea of the cap on returns is two-fold. First, one of CEFIA's goals is to provide low-cost loans that leverage private capital. The challenge is to balance the return expectations of private investors with a lower rate of return on state provided funds (i.e., enough of a return on state funds to cover costs and risk). Second, the sponsors of the legislation felt that it was important to remove from the quasi-public corporation the incentive to rush after the highest rates of return and thus undertake projects

## Attracting and Deploying Capital to Finance the Clean Energy Goals of the State: Connecticut's Clean Energy Finance and Investment Authority

Established a year ago, Connecticut's Clean Energy Finance and Investment Authority (CEFIA) became the nation's first full-scale clean energy finance authority with the mandate to support the governor's and legislature's energy strategy to deliver cleaner, cheaper, and more reliable sources of energy while creating jobs and supporting economic development. Along those lines CEFIA's main thrust has been to transition Connecticut's clean energy programs away from grants, rebates, and other subsidies as well as early-stage technology investments towards attracting and deploying private capital to finance commercially available clean energy technologies.

One year later, CEFIA is developing innovative programs to leverage private sector investment in the state's residential, commercial and industrial, and institutional clean energy market.

- ▶ **Residential Sector** - Working with the Connecticut Department of Energy and Environmental Protection (DEEP), CEFIA has repurposed \$8.25 million of federal economic stimulus funds to support two residential clean energy financing programs –the Clean Energy Financial Innovation program and the Residential Clean Energy Financing program–that will support the installation of solar photovoltaic systems, solar thermal systems, and energy efficiency measures through innovative lease and loan structures. Both programs will use credit enhancements, including loan loss reserves, interest rate buy-downs, and subordinated debt to attract multiples of private capital
- ▶ **Commercial and Industrial Sector** - Working with DEEP, the Connecticut Bankers Association, the Connecticut Business and Industry Association, the Connecticut Conference of Municipalities, and other key stakeholders, CEFIA advanced commercial property assessed clean energy (C-PACE) policy through Connecticut's General Assembly. The policy is unique in that it was created with the support of the banking community. CEFIA plays a key role in supporting the policy's implementation as its administrator for the first statewide C-PACE program in the country. CEFIA will work with individual municipalities, commercial and industrial companies, the utilities, Connecticut Energy Efficiency Fund, and financial institutions to implement the program throughout the state
- ▶ **Bonding Authority** - Working with Connecticut Treasurer's Office and DEEP, the same legislation that created C-PACE also clarified the bonding authority of CEFIA and provided it with access to the state's Special Capital Reserve Fund (SCRF), further solidifying its ability to leverage low-cost funds to attract private capital. CEFIA can now issue up to \$50 million in bonds backed by a SCRF account–thereby establishing a pathway to low-cost secure bond financing based on the state's credit rating to support clean energy deployment in the commercial, industrial, and institutional sectors

CEFIA, in sum, embodies a significant and creative bid to bring clean energy investments to scale in Connecticut. If it succeeds, the quasi-public finance and investment authority will provide an important model for state level self-help in financing clean energy projects. In the coming year, CEFIA will endeavor to demonstrate how demand for clean energy—both renewable energy and energy efficiency—can be increased at no additional cost to taxpayers and ratepayers and how sophisticated finance tools can attract and deploy capital to help finance the clean energy goals of a progressive state.

Source: [www.ctcleanenergy.com/](http://www.ctcleanenergy.com/)

with a significant risk of nonpayment. The example of Fannie Mae is always in the background as a reason not to establish a quasi-independent entity, and this approach successfully quelled fears that CEFIA would take too great a risk with state funds in order to obtain the highest possible profits for its investors. At any rate, conversations between CGC, CEFIA, and investment bankers suggest that the quasi-public authority will be able to raise funds from private source if it provides a rate of return in the 8 percent range (possibly between 6 to 10 percent) for safe, long-term loans like loans to clean energy projects. (This rate of return is relative to current Treasury rates; as those change, so too the cap should change)

- ▶ **Authorization to finance up to 80 percent of the cost to develop and deploy a clean energy project and up to 100 percent of the cost of financing an energy efficiency project.**<sup>29</sup> The 80 percent limit is designed to ensure that there is sufficient equity capital in each clean energy project. In general the goal will be to provide a tranche of the debt financing wherever possible and not 100 percent of the loan. Because of the conviction of the sponsors that 100 percent up front capital was needed to entice homeowners and small businessmen to conduct energy efficiency

projects, CEFIA is permitted to loan 100 percent of the cost of an energy retrofit project

- ▶ **Authorization to utilize financing tools such as direct lending, co-lending through public-private partnerships, provision of credit enhancements, administration of commercial property assessed clean energy, and securitization to finance the deployment of clean energy.** Such authorities provide CEFIA an ample array of standard finance tools
- ▶ **Strong provisions on transparency, regular reporting to the legislature, and the development of standards to govern eligibility for loans.**<sup>30</sup> CEFIA is required to provide information regarding rates and terms and conditions for public inspection and subject to private audits. It is also required to submit an annual report to the Connecticut Department of Energy and Environmental Protection with copies to the state general assembly. Finally CEFIA is required to conduct formal annual reviews by both a private auditor and the Comptroller

In short, the Connecticut model of a clean energy finance bank consolidates into a focused, quasi-independent new clean energy financial authority an array of preexisting, disconnected state programs aiming to maximize their impact and at the same time permits the CEFIA management team—working in harmony with the state’s energy plan—to transform the state’s functions from grant-making and subsidies to providing low-cost financing that will result in maximum clean energy being deployed per dollar of ratepayer and taxpayer funds at risk.

**The state clean energy financing authority model.** Many states, such as Michigan and California, possess existing environmental and economic development authorities—some of which are housed within treasury departments or within other parts of the state administration—that could become clean energy finance banks or undertake the functions of such a bank.<sup>31</sup> Most of these agencies lack a defining mission aimed at maximizing the per-dollar deployment of energy efficiency and clean energy but their activities could be bent in that direction. A clean energy finance bank established under this model would have the following characteristics:

- ▶ **The clean energy finance bank would in most cases be part of the state government, not a quasi-independent governmental entity.** As such, it would be a not-for-profit entity and probably could not take private investments or even state pension funds seeking a rate of return in the 8 percent range. Since an existing agency would be chosen, it could be up and running on the first day. Some of these authorities are already adept at leveraging their funds; others would require a board and staff reshuffling to make them more finance oriented
- ▶ **Where private funds cannot be brought into the entity, a separate entity could be established to raise private funds and partner with the state financing authority under a formal partnership agreement.** This would differ from a standard public-private model where a private entity funds some of the project and a governmental entity the rest. In that case the private funds are used for a specific project and cannot be directly leveraged to cover multiple projects. Here, private funds would be co-invested with the governmental funds and this could be leveraged along with the government funds. Otherwise, the same conditions applying to private funding under the Connecticut model would obtain
- ▶ **The ability of state authorities to issue bonds is likely to vary widely, with some subject to the limitations on the issuance of new state bonds.** In some cases bonds would implicate the full faith and credit of the state and thus be subject to limitations on the issuance of general obligation bonds
- ▶ **As in the Connecticut model, a state would determine whether it could consolidate other funds into the clean energy finance bank authority.** States’ ability to do so is likely to vary widely
- ▶ **Co-payment considerations, transparency and other reporting obligations and the development of standards are likely to be similar to those in the Connecticut model.** Such transparency is essential to top-quality finance activity

This state-government model would seek to extend and optimize the activities of an existing state finance entity.

**The infrastructure bank model.** In this model, clean energy projects and general infrastructure projects like road projects would be financed by a combined state energy and infrastructure authority or bank that could be created out of an existing infrastructure bank. (See the companion paper Robert Puentes and Jennifer Thompson, “Banking on Infrastructure: Understanding State Revolving Funds



for Transportation.”) The California Infrastructure and Economic Development Bank could be a model for this approach.<sup>32</sup> In most ways an energy and infrastructure authority would be identical to a state authority dedicated to clean energy.

There are, however, structural differences between clean energy and infrastructure projects that need to be kept in mind. In a state clean energy authority, the authority could develop expertise in clean energy projects and its funding would largely go to private parties since that is generally how clean energy projects are developed. In addition, energy projects, particularly energy efficiency and distributed energy projects like rooftop solar projects, are often small and an energy authority is likely to fund a large number of projects. In most cases, the clean energy finance bank can serve a useful purpose in aggregating small-scale loans or pooling demand for commercial loans.

Likewise, while in the energy sector most investment can flow into productive, revenue-producing projects, infrastructure investment often entails the provision of public goods where the benefits are widely distributed and not directly paid for by users. In this fashion, infrastructure projects are usually public, not private, and they can be very large. An infrastructure bank could fund a significant number of small projects (such as road repair), but it could also fund only large projects. In the Kerry-Hutchison infrastructure bill introduced in Congress in 2011, for example, financing was limited to projects in excess of \$100 million (\$25 million for rural projects).<sup>34</sup>

In view of these differences, then, clean energy and infrastructure banking activities are best addressed by establishing two separate divisions, balance sheets, and management teams in the bank—one for energy and one for infrastructure. Persons with different expertise would have to be hired for each area. Guidelines would have to be established to determine how funding is divided between energy and infrastructure projects.

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**The innovation window.** Across all of these models the new state clean energy investment banks probably should start by funding projects that create relatively low risk for investors. The technologies involved raise low technology risk and in the case of power projects will usually have long-term power purchase agreements. Various risk reduction models have been developed for energy efficiency projects that also reduce the risk of those projects. However, some states will want to attack the critical need to provide financing solutions for scaling up newer emerging technologies such as the manufacturing of solar photovoltaics and other solar technologies, advanced battery manufacturing, second-generation biofuel, and enhanced geothermal generation with higher degrees of technological risk. Such a worthy undertaking will require a different model or “window” in the clean energy investment bank.

New technology projects often fail. Nevertheless, such projects attract investors when models are developed that reduce the risk and protect the investors by enabling them to recover losses in one project through loan loss reserves and/or through gains in another project. Such high-risk projects have generally been funded using venture capital models. Similar models can be developed that are based on public funds. The key is to understand the risk; candidly admit that some projects will fail; provide for the certainty of losses through loan loss reserves and or gains in other projects; and agree that the success of the venture will be measured by the success of the overall portfolio of projects, not by the success of each individual one.

And so the question is whether a venture capital-type funding model can be incorporated into a clean energy investment bank. The answer is yes, but with several caveats. First, the lending will have to be accompanied by significant loan loss reserves and probably by the bank taking an ownership (stock) interest in the projects to which it lends money so that it can make a profit on successful projects that enable it to recover the losses on failed projects.

To further protect the safer deployment portion of the bank from failures in the innovation portion, moreover, the innovation window should be established in the form of a separate subsidiary. It is important that profits generated from lower-risk and low-return funds are not used to subsidize a high risk, high return fund. The bankers working in the innovation subsidiary would also need different skills from those in the deployment part of the bank, but it is not unusual for investment funds to include both high- and low-risk investment entities.

## Mobilizing Private Capital to Support Clean Energy in Emerging Markets: The Overseas Private Investment Corporation

The Overseas Private Investment Corporation (OPIC)—an independent U.S. government agency created in 1969 that provides international development finance—offers a useful model for thinking through how a clean energy finance bank can operate. While the OPIC has achieved a successful track record for financing overseas investments in clean energy projects, among other projects, its operations provide valuable tips on financing clean energy projects within the U.S. through the creation of an entity that will lend money to commercially viable projects that have trouble attracting conventional financing.

OPIC helps make U.S. firms make qualified investments overseas through a combination of financial products—direct financing, loan guarantees, political risk insurance, and support for private equity investments. To obtain OPIC financing, projects have to be commercially and financially sound and have a degree of U.S. ownership.

Since its inception, OPIC has supported over 4,000 projects providing \$200 billion of investment in 150 countries and, in the process, generated \$74 billion in U.S. exports and supported more than 275,000 jobs. Each dollar of OPIC support has catalyzed, on average, more than \$2.50 in additional investment.

OPIC has recently begun to place more emphasis on clean energy investments reflecting the vast scale of opportunity in this sector as more developing countries invite investment in clean energy and more investors respond positively. In 2011, clean energy investment made up almost 40 percent of OPIC portfolio.

Structured like a private corporation, OPIC budget is fully self-sustaining from its own revenues (e.g. charging interest and premium from its products) and the agency operates at no net cost to U.S. taxpayers. In fact it has recorded a positive net income for every year of operation. The discipline of being self-sustaining has served OPIC well, both because it requires the agency to be very well run and also because it insulates it from the appropriations and political process.

More importantly, the emphasis on being self-sustaining has influenced the types of projects that OPIC finances—commercially viable projects that have a high likelihood of pay-back but are not able to access market financing for one reason or another. As such OPIC holds valuable lessons for the creation of state clean energy finance banks that can mobilize and facilitate private sector capital deployment in clean energy on a large-scale basis.

Source: [www.opic.gov/](http://www.opic.gov/)

### Choosing the Loans and Credit Enhancements

In designing their banks states can choose among a variety of financing strategies. Particular situations will require particular approaches. For instance, direct lending may be necessary where no commercial lenders will step in. In other cases, securitization is likely to be a desired goal after an adequate portfolio is created. In any event, states will need to examine all possible financing choices in designing their clean energy finance banks. At least five finance approaches will be of particular use:

**Direct lending.** Clean energy finance banks could lend directly to renewable energy projects and residential and commercial retrofit programs, including specialized commercial projects such as those in the MUSH (municipal, university, school, hospital) markets. For each of the above, this lending could be done either directly using existing funding sources or through auction financing.

Similarly, for each of the above, loans could be made either directly or to other institutions, including energy distribution companies doing the retrofits or project developers responsible for renewable energy installations. Repayment of these loans could be made directly or through an “on-bill” repayment mechanism. On-bill refinancing would reduce risk effectively if the repayment liability ran with the rental property, not the renter at the time of the lease, or the owned property, not the owner. Use of on-bill financing would generally need legislative and regulatory approval and may extend the time-frame before these projects can be implemented.

Financing could also be secured with a Property-Assessed Clean Energy (PACE) program for commercial projects (currently there is little prospect for residential PACE programs), with loans repaid through the property taxes under the program. Many variations of commercial PACE programs have been proposed, with the most effective ones giving the retrofit loans backed by PACE priority over other noteholders. Seeking legislative approval for commercial PACE programs that give PACE loans priority over existing loans, however, could run into substantial resistance from other noteholders.

Nevertheless, effective PACE programs can be an important tool in the arsenal of financing means to a clean energy future.

**Participation in a direct lending deal with one or more outside lenders.** Perhaps the most straightforward way to leverage a clean energy finance bank capital from public and private funding sources would be to partner with one or more outside private lenders in providing direct financing to end-users. This sort of financing would have many of the characteristics of the direct lending opportunities described above, but instead of the clean energy finance bank being responsible for the full amount being financed, the financing would be allocated between the clean energy finance bank and the outside private lenders.

In addition to the results that direct lending can provide, loan participation offers at least three additional significant advantages. First, the involvement of outside lenders provides leveraging opportunities that simply do not exist when the clean energy finance bank is responsible for providing the full loan amount. Even in instances where outside lenders limit their investment to 50 percent of the total, with the clean energy finance bank providing the other 50 percent, the funding available for the state bank's direct lending programs is doubled. Second, participation by outside lenders allows the clean energy finance bank to "piggy back" on the diligence performed by these lenders. Because these lenders are making a significant investment of their own, the clean energy finance bank—even while conducting its own due diligence—can rely to some extent on the private lender's expertise, ensuring that loans are carefully vetted in accordance with traditional banking standards. Finally, the clean energy finance bank could also use the outside lender as the loan administrator, saving the bank from having to perform loan processing functions for which its lending partner may be substantially better placed to perform.

Each of the direct lending programs described above in the direct lending section could also be undertaken in partnership with one or more outside lenders.

**Credit enhancements to reduce the cost of capital.** Clean energy finance banks could provide a range of credit enhancements, including loan loss reserve funds and loan guarantees. These credit enhancements could be used to lower the cost of capital for projects fully financed using outside capital; direct lending projects in which the clean energy finance bank is participating with outside lenders; and pooling and securitization arrangements (described below) in which the credit enhancements reduce the risk profile of the investment products being offered in the markets for rated debt. In the case of credit enhancement, it is important to find mechanisms by which, in future years, to refund to the state financing authority the cash paid out for credit enhancement so as to maintain the commitment to taxpayers and ratepayers to hold them at least harmless over time.

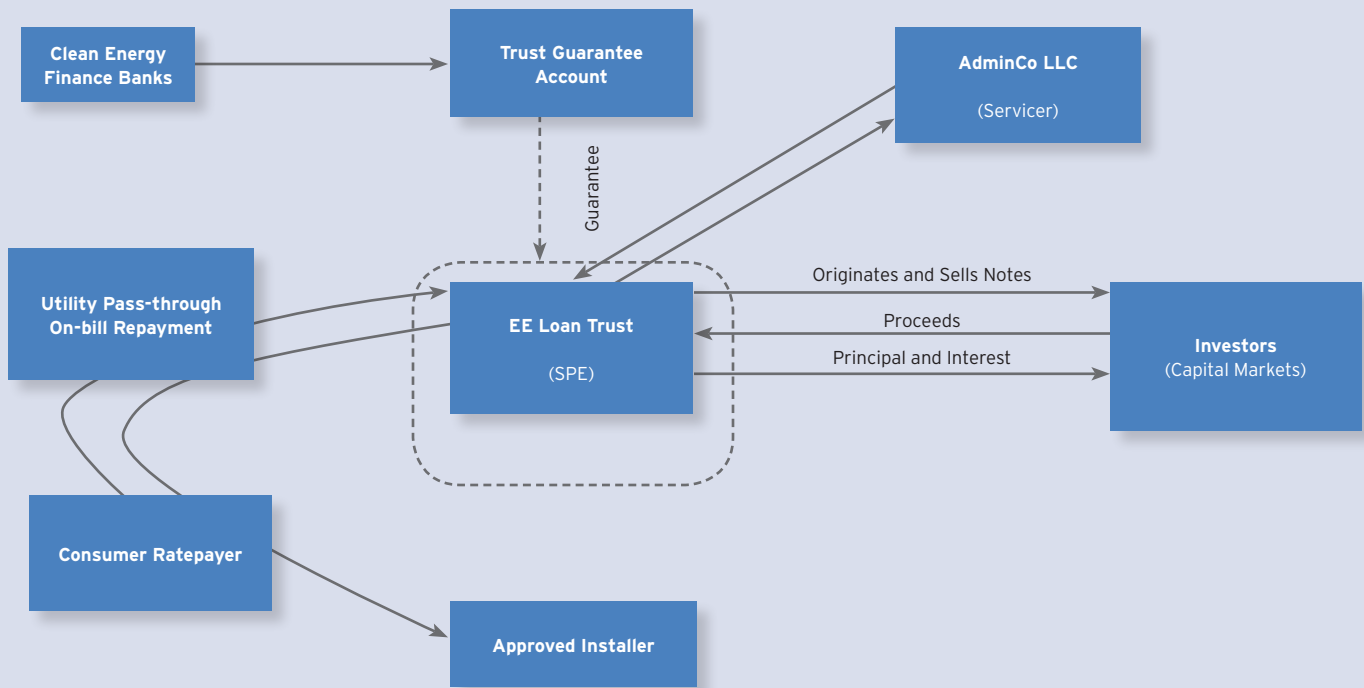
**Pooling and securitization of project loans.** In addition to direct and indirect lending, clean energy finance banks could create funding structures to pool and securitize project loans, allowing for the involvement of substantial amounts of outside investment capital. Any such securitization, including any issuance of bonds to underwrite the pooled costs of clean energy projects, would require the formation of a bankruptcy-remote special purpose entity ("SPE") in the form of a trust. A clean energy finance bank's role in such financing, therefore, would be the development of the funding structure and the creation of the trust mechanism and any other entities necessary for the funding structure's operation. An example of such a structure focusing on financing energy efficiency projects is set forth below.

While more complicated than direct lending, this type of financing structure is not new. In Connecticut, for example, a similar structure to that proposed below (including loan loss reserve support) is currently being used for an energy efficiency financing program administered by the Connecticut Energy Efficiency Fund (CEEF) (which is not under CEFIA), though there are some factors which limit the impact of the CEEF program, including its scale, its income eligibility restrictions and its reliance on debt capital provided by utilities (and repaid at the utilities cost of capital).

The primary advantages of this type of financing structure are its ability to raise potentially significant amounts of capital in the markets for rated debt and the fact that an existing financial institution would be responsible for actual program administration, minimizing a clean energy investment bank's responsibility to actually run the day-to-day mechanics of the program.

**The Energy Efficiency Lending Trust.** The potential promise of pursuing a financing path is most easily illustrated with energy efficiency financing examples. Energy efficiency is widely recognized as the lowest-cost option for providing energy services over the long term when compared with other

**Figure 4. Energy Efficiency Lending Trust Model**



resources, yet deploying energy efficiency measures at scale has so far proven to be an insurmountable challenge because of, among other things, large up-front costs and limited capital resources available to the consumer or the public financing entity. As described above, many of the key barriers to large-scale deployment of energy efficiency could be overcome by a clean energy finance bank if it took advantage of its flexibility to develop public-private partnership financing vehicles that induce significant participation by private capital investors in providing 100 percent up-front project loans. Such vehicles should enable clean energy finance banks to supplant existing financing programs that have little or no private capital participation on the debt side, such as direct loans and grants/rebates and interest rate buy-downs. Such public-private partnership vehicles also should enable clean energy finance banks to succeed in their mission without having to develop significant staffing and a large internal infrastructure to engage banking-type functions.

At least initially, clean energy finance banks would likely need to partner with other financial institutions in order to scale up quickly and best use their resources by tapping the capital and expertise of others in the private sector. A clean energy finance bank developing a comprehensive plan and lending standards should collaborate on such planning and standard-setting with partners with solid financing histories and experience and apply commercially reasonable practices.

One potential model (See Figure 4) would have a clean energy finance bank use some of its limited capital resources to provide the credit enhancement, such as a loan loss reserve, necessary to support the securitization of large numbers efficiency loans pooled together through a special purpose trust (e.g., a master trust cycling through individual loans) that issues bonds sold to private investors. This investment vehicle should be particularly attractive to private investors, would lessen any risk borne by the clean energy finance bank (giving it greater leverage), and should result in a lower cost to borrowers, if the loans underlying the trust can be repaid through utility bills, as the unmitigated risk of default might be determined by a rating agency to be at or below the default rate for utility bills payments. At the same time, the trust and its loans would be serviced by a private financial institution avoiding the need for the clean energy finance bank to develop internal infrastructure and expertise

to perform loan servicing, traditional back office banking-type functions, or loan trust administration services (e.g., communications with trust investment participants).

In all these models it is important to focus on payback. Grant programs by another name, with financial institutions as the beneficiaries, may be expected to receive tepid or declining support from voters.

### **Moving into Implementation**

In terms of moving into clean energy finance bank design, states need to carefully assess their current portfolio of existing clean energy programs; assess the constraints offered by relevant government and private-sector conditions; and seek indigenous (rather than “off-the-rack”) solutions. To establish clean energy finance banks, then, states should:

- ▶ Review all of their current programs that support clean energy and energy efficiency projects as well as their general economic development and infrastructure programs and determine whether these programs are providing subsidies, grants, interest rate buy-downs or loans and other instruments that have to be repaid; whether these funds are being leveraged and combined to the maximum degree with private funding; whether some or all of those programs could be combined into a clean energy finance bank; and whether such a bank should have separate authority to issue bonds with or without the full faith and credit of the state
- ▶ Review any statutory or constitutional impediments to the state providing loans, working with equity capital or leveraging funds
- ▶ Meet with state businesses and financial institutions to determine whether it appears feasible to raise private capital and to place it in the bank with a capped, reasonable rate of return
- ▶ Determine the best structure for a clean energy finance bank in the state, including analysis of job impact within the state, possible coupling with federal financing programs, and impact of renewable energy standards and other related tax and regulatory programs
- ▶ Maximize private investment in the clean energy market. There are at least five ways for state clean energy finance banks to provide new profitable opportunities for private banks, lenders, and investors to participate in the market: (1) Banks and other investors can provide capital to state clean energy finance banks, such as by buying preferred stock carrying a fixed interest rate; (2) Banks can loan money, alongside the state clean energy finance bank, at reasonably higher commercial rates; (3) Banks can perform outsourced state clean energy finance bank services for a fee; (4) Banks can loan for equipment, buy and sell state clean energy finance bank loans, and securitize them; and finally (5) Investors can make equity investments into projects supported by state clean energy finance bank loans
- ▶ Establish metrics for achieving goals. It is particularly important to establish metrics that create accountability to legislatures and also can be used in constructive continued dialogue with state regulators

Ultimately for states to design these new finance entities and run them successfully, they will need to engage key stakeholders (e.g., capital providers, contractors, customers, utilities) early on in the planning process and clearly define the mission and goals of the new entity. Stakeholders will each have their own views on where the initial effort should be focused and sometimes competing views will have to be reconciled.

Most important of all, the new banks will need to be staffed by specialists who have backgrounds in finance and who can understand complex deal structures, new product development, and can successfully retool the organization.<sup>33</sup> Only with such personnel running the new organizations will the entities possess the expertise and sophistication needed to move their states beyond conventional clean energy project support and into true clean energy finance.

## IV. Conclusion

In sum, governors, legislators, NGOs, and regional private-sector leaders need not abandon all optimism as they survey the coming energy policy pull-back in Washington. Instead, state leaders should consider working to develop state-side clean energy finance banks as a source of low-cost, stable finance for the deployment of clean energy projects in their regions.

In this respect, the new banks represent a sound new strategy for continuing to widen the decarbonization of regional economies and the scale-up of fledgling clean energy and energy efficiency industries.

Clean energy finance banks will apply proven financial techniques to a recognized market problem at a time of federal retrenchment.

Clean energy finance banks can be financed from existing state funds and in the current fiscally strapped climate furnish an attractive tool for leveraging scarce public dollars with private capital. And for that matter clean energy finance banks—with their proximity to regional industries and deal flow—can bring important resources to bear in states wishing to foster local clean energy, energy efficiency, and energy technology clusters.

What is more, state clean energy finance banks hold out the promise of serving as effective vehicles for leveraging and tuning to local needs such federal funding or finance programs as may emerge in the future. In this respect, the new entities could well contribute to the construction of an enduring platform on which to ground the delivery of tangible benefits to society with a guaranteed payback to taxpayers and ratepayers.

In short, entrepreneurial states should innovate again. By employing their characteristic creativity and sophistication, enterprising states should begin now to stand up the next generation of needed clean energy finance solutions.

## Appendix. International and National Examples of Clean Energy Financing Entities

	Source of funding	Initial capitalization	Project approval process	Eligible projects, technologies	Target rate of return	Types of credit support	Oversight	Reporting	Audits	Application review time period
<b>NATIONAL</b>										
Clean Energy Finance Corporation (Australia) (as proposed)	Budget appropriation	\$10 billion over five years starting 2013-2014	Review by investment committee prior to final Board consideration; risk committee provides ongoing monitoring and of projects and portfolio diversification	Renewable energy, low-emissions and energy efficiency technology, as well as manufacturing companies that produce the required inputs	Government bond rate	Broad - direct investments (debt or equity) and indirect investments (pooled fund)	Government will set the direction and broad mandate of the CEFC but does not direct the CEFC in relation to specific investments; Board will be appointed by the Government and be responsible for making management, operational and investment decisions	CEFC will publish guidelines and annual reports that will include audited financial statements	CEFC's annual reports will include audited financial statements.	None specified
Kreditanstalt für Wiederaufbau ("KfW") (Germany) (Energy-Efficient Construction and Energy-Efficient Rehabilitation Programs)	Federal and regional government appropriations	DM 1 million (in 1948); annual appropriations of \$1.4 billion per year between 2008-2011	Borrower's bank submits application to KfW; KfW confirms application meets specified criteria; borrower's bank becomes legally responsible for the loan, drafts loan contract with borrower, and then calls down funds from KfW; a secondary lien is placed on the borrower's property	Loan application must have confirmation of CO2 reductions and employ energy efficiency measures to meet certain energy efficiency standards set by legislation	Below market rate (e.g., as low as 1.00% fixed for ten years for certain improvements as of September 2011 and as low as 1.3% (20-year fixed) in 2008 when market rate was 4%)	Loans and subsidies (financing authority generally limited to each program's specific rules)	Owned by federal (80%) and regional (20%) governments; all members of the Board of Supervisory Directors (BSD) are appointed by the federal government; the BSD appoints the Board of Managing Directors, which is in charge of the operations; the Federal Ministry of Finance supervises KfW and is empowered to adopt measures to ensure conformity with the law, KfW's by-laws and other regulations	KfW must prepare financial statements and a management report annually	The financial statements and management report must be audited.	None specified
Green Investment Bank (United Kingdom) (as proposed)	Asset sales	£3 billion over the period to 2015	Decisions made by investment committee except Board approval for cases above a defined threshold	Not yet specified; first priority sectors will be offshore wind power generation, commercial and industrial waste processing and recycling, energy from waste generation, non-domestic energy efficiency	None specified	Broad - examples include first loss debt in the construction phase, equity co-investment, pari passu senior debt, upfront refinancing commitment, and subordinated debt during the operational phase; all through direct or indirect investment	Governance model with five components: (i) The Department for Business, Innovation and Skills is the sole shareholder; (ii) the GIB Policy Group; (iii) the Board; (iv) Board Committees; and (v) Executive Management	GIB will publish an annual report and shareholder reports as agreed upon	None specified	None specified
Clean Energy Deployment Administration (United States) (as proposed in HR 2454)	Green Bonds issued by U.S. Treasury	\$7.5 billion	Criteria established by the Energy Technology Advisory Council; decisions made by the Board	Project must be a "clean energy technology"	According to commercial rates; minimum amount for breakthrough technologies	Broad - direct loans, letters of credit, and loan guarantees and indirect support (e.g., portfolios and tax equity markets)	CEDA Administrator appointed by the President; Nine-member Board of Directors; Energy Technology Advisory Council	CEDA must file annual and quarterly reports; funding recipients must report on a quarterly basis	Subject to audit by Comptroller General; CEDA must also have an annual independent audit conducted	180 days

DOE Loan Guarantee Program (United States) (Section 1703)	U.S. Treasury appropriations	None specified	Pre-applications in response to a solicitation are accepted and reviewed, followed by a full application and another review period	Project must be located in the U.S. and employ a new or significantly improved technology that is not a commercial technology and that avoids, reduces or sequesters air pollutants or anthropogenic emissions	Determined as reasonable by DOE	Loan guarantees	None specified	Recipient must provide annual financial and other reports on the status and condition of the project	Recipient must maintain records to facilitate an effective audit; Secretary of Energy and Comptroller General may audit	None specified
Export-Import Bank	Ex-Im Bank is self-funded and is able to cover all operation costs and potential losses by charging fees and interest on loan-related transactions	Initial not specified. The current capital stock is \$1 billion subscribed by the US government	Applicants must submit a Letter of Interest or Preliminary Commitment/Final Commitment Application	All projects must uphold environmental standards, support US jobs, and recipients must demonstrate that competition is supported by foreign export credit agencies or that private sector financing is unavailable at terms sufficiently favorable to win the export sale	The fees and premiums are must cover the risks associated by the liability that the Bank incurs for guarantees, insurance, co-insurance, and reinsurance against political and credit risks of loss	Ex-Im Bank provides working capital guarantees (pre-export financing); export credit insurance; and loan guarantees and direct loans (buyer financing). No transaction is too large or too small	The Board of Directors consists of the President of the Ex-Im Bank who serves as Chairman, the First Vice-President who serves as Vice Chairman, and three additional persons appointed by the President of the United States	Ex-Im Bank must submit to Congress annually a complete and detailed report of its operations	The Ex-Im Bank Office of Inspector General appointed by the President conducts internal audits and investigations	Varies depending on financial product and amount
Overseas Private Investment Corporation	OPIC is self-sustaining and is able to cover all operation costs and potential losses by its offsetting collections, which are derived from the premiums, interest, and fees from its financial services	None specified	Following preliminary review and approval, the sponsors usually provide additional economic, financial and technical information	The four main criteria are that projects must have positive environmental and social impact, support worker and human rights, advance US economic interests, and develop the host country. Also, to obtain financing the venture must be financially sound and have some portion of U.S. ownership	Upfront fees range from 1-2 percent, commitment fees, maintenance fees and cancellation fees may be charged, and reimbursement is required for related out-of-pocket expenses. Interest rates and loan guarantee fees are based on cost of capital plus a risk premium of between 2-6 percent, depending on commercial and political risks	OPIC provides financing either through direct loans or through loan guarantees, which are typically used for larger projects. OPIC can offer loans as small as \$350,000 and can lend up to \$250 million per project. All loans or guarantees over \$50 million must be approved by the OPIC Board of Directors	Congress does not approve individual OPIC projects, but has authorization, appropriations, and oversight responsibilities related to the agency and its activities. Congress authorizes OPIC's ability to conduct its credit and insurance programs for a period of time chosen by Congress	OPIC's Office of Accountability assesses and reviews complaints about OPIC-supported project	The Office of Inspector General of the United States Agency for International Development provides internal audit and investigative services to OPIC	Varied depending on financial product and amount. Typically between 2-6 months
<b>SUB-NATIONAL</b>										
Clean Energy Finance and Investment Authority (Connecticut)	Repurposed funds from existing clean energy programs (e.g., surcharge); certain federal funds; gifts; earnings from CEFIA's activities; contracts with private entities subject to rate of return limitations	\$48 million	Process varies by RFP, but there are three general processes: (i) competitive selection award; (ii) programmatic selection award; and (iii) strategic selection award	Programs must (i) finance clean energy investment in small projects and larger commercial projects; (ii) support financing and other expenditures that promote investment in clean energy; and (iii) stimulate demand for clean energy within the state	TBD by Board	Broad - none specified and only limited restrictions on funding (e.g., funding for clean energy projects cannot exceed 80% of the cost of the project)	Governed by Board of Directors appointed by government officials (e.g., the Governor)	CEFIA must publish an annual report, as do funding recipients	CEFIA must conduct formal annual reviews by both a private auditor and the Comptroller	None specified



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## Endnotes

1. Ken Berlin is a senior vice president for policy and planning and general counsel at the Coalition for Green Capital. Reed Hundt is the CEO of the Coalition for Green Capital. Mark Muro is a senior fellow and the director of policy for the Metropolitan Policy Program at Brookings. Devashree Saha is a senior policy analyst and associate fellow at the Brookings Metropolitan Policy Program.

Through the Coalition for Green Capital, Berlin and Hundt worked with Daniel Esty, commissioner of the Connecticut Department of Energy and Environmental Protection, and Gov. Daniel Malloy soon after his November 2010 election to craft a comprehensive reform of the state's energy and environmental laws. Berlin spent most of the first half of 2011 working with Esty and the legislature on the reform, which passed with broad bipartisan support. Hundt later became a board member of Connecticut's Clean Energy Finance and Investment Authority (CEFIA).

2. The diffusion of clean energy and energy efficiency solutions can be measured in many ways but progress may be best seen in the growing share of the nation's electricity now generated from renewable sources, the declining cost of clean energy, and in the expansion of energy efficiency activities. To the first measure, the share of electricity generation from renewables has increased from 9.25 percent in 2008 to 12.67 percent in 2011. Even discounting hydroelectric sourcing, the share of electricity generation from renewables is up in many states with wind being the largest driver of this increase across all states. For more information see Energy Information Administration, "Electric Power Monthly" (July 2012). Turning to price declines, the unsubsidized levelized cost of electricity from utility scale-solar photovoltaic (PV) installations fell between \$111 and \$181 per MWh in late 2011 (a broad range based on regional solar resources). It is expected that unsubsidized utility scale solar PV costs will further decline into the \$90-\$150 per MWh range by 2014 and the \$40-\$66 per MWh range by 2020. The unsubsidized cost of new wind power projects ranges between \$60-\$90 per

MWh and with the federal production tax credit the levelized cost drops down to an estimated range of \$33-\$65 per MWh, depending on the quality of wind resource. See Jesse Jenkins and others, "Beyond Boom and Bust: Putting Clean Tech on a Path to Subsidy Independence" (Washington and Oakland: Brookings Institution, Breakthrough Institute, and World Resources Institute, 2012). As to energy efficiency advances further gains have been made as ratepayer-funded energy efficiency programs climbed to \$6.8 billion last year—a 25 percent increase over 2010 levels. See Adam Cooper and Lisa Wood, "Summary of Ratepayer-Funded Electric Efficiency Impacts, Budgets, and Expenditures," (Washington: Institute for Electric Efficiency, January 2012). Electric utilities are the largest provider of energy efficiency programs with utility budgets comprising 84 percent of the total ratepayer-funded energy efficiency budget nationwide.

3. The "levelized" costs of new renewable electricity technologies remain substantially higher than conventional coal and natural gas-fired fossil power plants. The Department of Energy's Energy Information Administration has estimated the cost of electricity by source for plants entering service in 2016. EIA estimates suggest that while the costs of conventional coal-fired plants going online in 2016 would come in at about \$95 per megawatt hour (MWh), those for onshore wind generation clock in at \$97, for geothermal at \$101, and for advanced nuclear at \$113. Solar PV generation will run to \$211, off shore wind \$243, and solar thermal to \$312. No federal and state tax credits or incentives are incorporated in the analysis. See Energy Information Administration, "2016 Levelized Cost of New Generation Resources in the Annual Energy Outlook 2011" (December 16, 2010).

More recent analysis has also noted that renewable energy technologies such as wind and solar are not able to compete with conventional power generation technologies without subsidies. Declining federal incentives and low natural gas prices are further exacerbating the difference. For instance, the current unsubsidized cost for wind generated electricity is \$60-\$90 per MWh, depending on available wind resource at different locations. In comparison, the prices for natural gas-fired generation fall in the \$52-\$72 range. See Alex Trembath and Jesse Jenkins, "Gas Boom Poses Challenges for Renewables and Nuclear" (Oakland: Breakthrough Institute, April 2012).

It should also be noted that the perceived "cost disadvantage" of new clean energy technologies exists in part because it is hard to put a value on some of the benefits of the clean technologies. For instance, underinvestment

in distributed generation such as roof-top solar exists in part because the benefits of grid security and load reduction are not internalized in market prices. Also skewing pricing against the adoption of clean energy technologies are the externalities associated with greenhouse gas emissions which are but some of the costs not included in the price of incumbent energy technologies and products. For more detailed analysis of the social cost of carbon see Frank Ackerman and Elizabeth Stanton, "Climate Risks and Carbon Prices: Revising the Social Cost of Carbon," *Economics* No. 2012-10 (April 4, 2012).

4. As with clean energy projects, energy efficiency programs face significant financing challenges. The cost of energy efficiency retrofits for all commercial and residential buildings is likely to approach \$1.5 trillion dollars. Only a relatively small percentage of these funds are likely to be provided by homeowners and businesses. The government funding on which these programs rely is threatened as well.
5. The decline in federal support for the U.S. cleantech sector has been extensively discussed in Jesse Jenkins and others, "Beyond Boom and Bust: Putting Clean Tech on a Path to Subsidy Independence." Among the major findings of that report are that federal cleantech funding is poised to decline by 75 percent from a high of \$44.3 billion in 2009 to \$11 billion by 2014.
6. The sophistication and effectiveness of states' creativity in catalyzing clean energy and energy efficiency has been impressive. Initiatives in California, Massachusetts, and elsewhere make the point. With a mandate to obtain 33 percent of its power from renewables by 2020, California is using a wide range of coordinated procurement, feed-in tariff, and power purchase agreements (PPAs) to accelerate clean energy development. In this vein, the state increased its total installed kilowatts of renewable energy from 42,933 kilowatts installed in the first five months of 2011 to 77,473 in the same period in 2012. While kilowatts installed with cash went down from 23,360 to 21,223, kilowatts installed using PPAs and third-party financing tripled from 19,572 to 56,250. California utilities such as PG&E and San Diego Gas & Electric have entered into several PPAs to meet the state renewable portfolio standard and renewable energy represented 20.6 percent of the electricity mix from the state's three biggest utilities at the end of 2011, up from 17 percent in 2010. For more information see Silvio Marcacci, "California Renewable Energy Forecast Just Keeps Getting Better," *Clean Technica* (July 29, 2012), and Herman Trabish, "How Solar's ITC Tax Credit is a Money-Maker," *Greentech Media* (July 30, 2012). In Massachusetts, the Massachusetts

Clean Energy Center (MassCEC) has employed rebates through its Commonwealth Solar rebate program to create a booming solar market. Thanks in part to the rebate program, the number of installed megawatts of solar power in Massachusetts has increased more than 20-fold from 3.5 MW in 2007 to 118 MW installed or in process as of early 2012. An aggressive Solar Renewable Energy Certificate (SREC) program has also helped accelerate the state's solar growth. Looking more widely, more than 20 states have created clean energy funds (CEFs) to accelerate the development of clean energy projects. The state CEFs generate about \$500 million per year in dedicated support from utility surcharges, making them significant public investors in thousands of clean energy projects. For more information see Lew Milford and others, "Leveraging State Clean Energy Funds for Economic Development" (Washington: Brookings Institution, January 2012). See also Devashree Saha, Sue Gander, and Greg Dierkers, "State Clean Energy Financing Guidebook," (Washington: National Governors Association, January 2011) on the variety of clean energy financing options states are using to maximize their resources including revolving loan funds to recycle funds within the state's economy, utility on-bill financing programs that marry repayment with the source of savings, linked deposit programs that help leverage private capital, among others.

7. Section 99 of Public Act No. 11-80, An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future. For more information, see: [www.ct.gov/2011/act/pa/pdf/2011PA-00080-R00SB-01243-PA.pdf](http://www.ct.gov/2011/act/pa/pdf/2011PA-00080-R00SB-01243-PA.pdf).
8. Senate Bill No. 1243. The legislation creating CEFIA had overwhelming bipartisan support, passing the Connecticut Senate 36-0 and the House by 139-8.
9. Debates persist about the exact design of such a new national entity. However, several models appear promising, including the proposed Clean Energy Deployment Administration (CEDA) and the so-called Energy Independence Trust (EIT) concept developed by the Coalition for Green Capital. For background on CEDA, see Jesse Jenkins and Sara Mansur, "A Clean Energy Deployment Administration: Unlocking Advanced Energy Innovation and Commercialization" (Oakland: Breakthrough Institute, November 2011). For discussion of Energy Independence Trust model, see Bracken Hendricks and others, "Cutting the Cost of Clean Energy 1.0." (Washington: Center for American Progress, Coalition for Green Capital, November 2010).
10. Google's clean energy team released its analysis in October 2008 suggesting a potential path to weaning the U.S. off of coal and oil for electricity generation by 2030. Switching to aggressive reliance on renewable energy—where wind power would grow to 29 percent of U.S. electricity production, geothermal to 15 percent, and solar to 12 percent—and natural gas, assuming electricity consumption remains flat, can cut fossil fuel use by 88 percent from 2003 projections. In addition, Google's analysis estimated the following reductions in energy and emissions level compared to 2003 projections: vehicle oil consumption by 44 percent; dependence on imported oil by 37 percent; electricity sector CO2 emissions by 95 percent; personal vehicle sector CO2 emissions by 44 percent; and U.S. CO2 emissions overall by 49 percent. Although the cost of Google's Clean Energy 2030 proposal is about \$3.86 trillion in undiscounted 2008 dollars, the savings are even greater at \$4.68 trillion, returning a net savings of \$820 billion over the 22-year life of the plan. For more details see Google, "Clean Energy 2030" (October 2008).
11. Jesse Jenkins, Devon Swezey, and Alex Trembath, "Solyndra's Failure Is No Reason to Abandon Federal Energy Innovation Policy," *Forbes* (September 2, 2011).
12. See Energy Information Administration, "Levelized Cost of New Generation Resources in the Annual Energy Outlook 2011" and Trembath and Jenkins, "Gas Boom Poses Challenges for Renewables and Nuclear."
13. For useful descriptions of the two "Valleys of Death" that complicate the scale up of new and emerging technologies see: Bloomberg New Energy Finance (BNEF), "Crossing the Valley of Death" (New York, 2010); Eliot Jamison, "From Innovation to Infrastructure: Financing First Commercial Clean Energy Projects" (San Francisco: CalCEF, 2010); Jesse Jenkins and Sara Mansur, "Bridging the Clean Energy Valleys of Death" (Oakland: Breakthrough Institute, November 2011); Mark Muro, Jonathan Rothwell, and Devashree Saha, "Sizing the Clean Economy: A National and Regional Green Jobs Assessment" (Washington: Brookings Institution, July 2011). In general most accounts notice an early-stage "technology creation" Valley of Death—arising from dearth of financing available to take a bench-scale model and create a commercial-scale demonstration—and also a later-stage "commercialization" (or deployment) Valley of Death that involves the difficulty of obtaining financing to scale-up manufacturing and put more projects on the ground.

14. For rich discussions of the social cost of carbon (i.e., the economic cost imposed on society by the emission of an additional ton of carbon dioxide emission or its equivalent), see Frank Ackerman and Elizabeth Stanton, "Climate Risks and Carbon Prices: Revising the Social Cost of Carbon;" Robert Kopp and Bryan Mignone, "The U.S. Government's Social Cost of Carbon Estimates after Their First Two Years: Pathways for Improvement," *Economics* No. 2012-15 (May 4, 2012); and William Nordhaus, "Estimates of the Social Cost of Carbon: Background and Results from the RICE-2011 Model," NBER Working Paper Series 17540 (October 2011). Estimates of the social cost of carbon are highly uncertain. Estimates by a federal government working group have placed this cost at \$21 in 2010 or the equivalent of \$0.21 for every gallon of gasoline. Those estimates have been questioned by analysts who say they omit many of the biggest risks associated with climate change. In response, estimates put forth by Ackerman and Stanton place the social cost of carbon as high as \$900 in 2010 and \$1,500 by 2050.
15. Victor and Yanosek in an article published in July/August 2011 predicted a crisis for the clean energy industry. They argued that the 25 percent annual growth in clean energy in Western countries has been achieved with the help of public subsidies, which are now unsustainable. As predicted in their article, the popularity of these subsidies has already declined in the U.S. and Europe where a host of countries including Italy, Spain, Germany, and the U.K. have cut back on subsidies, See David Victor and Kasia Yanosek, "The Crisis in Clean Energy" *Foreign Affairs*, July/August 2011. In more recent work, Yanosek has argued that U.S. tax credits, as they have been applied, have contributed to an inefficient boom and bust approach to clean energy. Smarter government policies are needed to help renewable technologies overcome the commercialization gap. See Kasia Yanosek, "Policies for Financing the Energy Transition" *Daedalus, The Alternative Energy Future* Vol. 1, Spring 2012.
16. Jesse Jenkins and others, "Beyond Boom & Bust: Putting Clean Tech on a Path to Subsidy Independence" (Oakland: Breakthrough Institute, April 2012).
17. See Elizabeth McNichol, Phil Oliff, and Nicholas Johnson, "States Continue to Feel Recession's Impact" (Washington: Center on Budget and Policy Priorities, February 2012).
18. *Chicago Tribune*, "US State Debt to be Subdued Again in 2012 - Moody's." May 22, 2012.
19. Lew Milford and others, "Leveraging State Clean Energy Funds for Economic Development."
20. For additional discussion of state CEF activity see Milford and others, "Leveraging State Clean Energy Funds for Economic Development." State CEFs' emphasis on a project finance model—which directly promotes clean energy project installation by providing rebates (e.g., Hawaii's Energy Efficiency Program offering solar water heater rebates to residential utility customers), grants (e.g., Delaware's Green Energy Fund providing cash grants for renewable energy installation), and performance-based incentives (e.g., California Solar Initiative offering PBI for solar PV systems between 50kW and 1 MW in size)—is by itself not enough to build a statewide clean energy industry. To do that state CEFs will need to pay attention to other critical aspects of building a robust clean energy industry, including cleantech innovation support through research and development funding, financial support for early-stage cleantech companies and emerging technologies, and various other industry development efforts.
21. Coalition for Green Capital, "Energy Economy Strategy: The Way Forward" January 2012 PowerPoint Presentation available at [www.coalitionforgreencapital.com/downloads.html](http://www.coalitionforgreencapital.com/downloads.html).
22. The latter might be necessary if federal funding were involved and the federal government did not allow project developers to finance credit subsidy fees. The federal government took this position for some ARRA funding. In that case the loan loss reserve would be established first out of existing bank capital and the credit subsidy fees would be used to replenish that capital.
23. For example, the PACE program spreads the cost of energy improvements through an assessment on a homeowner's property taxes. The program currently works in 27 states and has been considered on the federal level. "PACE Now," available at [www.pacenow.org/blog/](http://www.pacenow.org/blog/) (July 2011). Other innovative and successful programs for financing energy efficiency include on-bill financing and managed energy-services agreements. With on-bill financing, the borrower repays the utility directly on the energy bill, which is still lower than it would be without the improvement. Another alternative is managed energy-services agreements where a company pays for the retrofit and recoups the benefits from the energy savings. Liam Plevin, "Buy Now, Pay Later," *The Wall Street Journal*, February 28, 2011.
24. Energy Service Companies (ESCOs) offer up front funding and some sort of performance guarantees to large industrial and government users, but these programs have been mostly limited to government buildings and single owner industrial buildings owned by large, credit worthy

- businesses. See J. Freeling. "Energy Efficiency Finance 101: Understanding the Marketplace." American Council for an Energy Efficient Economy 2011.
25. In March 2012, the Hawaii State House passed legislation to establish the Clean Economy Bank of the state of Hawaii. The Clean Economy Bank resembles the Connecticut model in most respects, but, if enacted would also allow other states and U.S. territories to "opt-in" to the bank by helping to capitalize one or more of its funds. An opt-in model may hold particular appeal to smaller states that can realize economies of scale by partnering with other states. The Hawaii State Legislature is expected to reconsider the clean economy bank in 2013.
  26. Conn. Gen. Stat. §16-245n(d)(1).
  27. Conn. Gen. Stat. §16-245n(d)(2)(A).
  28. *Ibid.*
  29. Conn. Gen. Stat. §16-245n(d)(2)(D).
  30. Conn. Gen. Stat. §16-245n(d)(2)(B.) and Conn. Gen. Stat. §16-245n(d)(2) (F).
  31. Examples include the California Pollution Control Financing Authority, the California Alternative Energy & Advanced Transportation Financing Authority (CAEATFA), the Michigan Economic Development Corporation, and the Illinois Finance Authority.
  32. The California Infrastructure and Economic Development Bank (I-Bank) finances public infrastructure and private development projects. The I-Bank has the power to issue revenue bonds, and provide credit enhancements for a wide variety of infrastructure and economic development projects. For more information, see [www.ibank.ca.gov/](http://www.ibank.ca.gov/). According to the FHA, 32 states and Puerto Rico have state-run infrastructure banks, which have distributed over \$6.5 billion to 712 projects as of December 2010. Most cover transportation projects but some include energy and water also.
  33. Building and Upgrading Infrastructure for Long-Term Development Act (BUILD Act) was introduced in March 2011 to create an American Infrastructure Financing Authority at an initial cost of about \$10 billion. Its objective was to provide loans and loans guarantees to large infrastructure projects. Chances of the bill being passed in this Congress are very slim.
  34. In a 2010 article on the Clean Energy Deployment Administration, Clements and Sims argued that such entities should make it a priority to get experienced bankers and other seasoned financial experts. Such staff should come from the investment banking, private equity, and insurance industries, be qualified to assess the specific barriers to commercialization and deployment faced by different technologies, and be able to design products targeted at removing those barriers. See Allison Clements and Douglass Sims, "A Clean Energy Deployment Administration: The Right Policy for Emerging Renewable Technologies," *Energy Law Journal* Vol. 3, 2010.

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BROOKINGS





# CLEAN ENERGY

## FINANCE AND INVESTMENT AUTHORITY

### **BOARD OF DIRECTORS** **REGULAR MEETING SCHEDULE FOR 2013**

The following is a list of dates and times for **regular quarterly meetings** of the Clean Energy Finance and Investment Authority's Board of Directors through 2013.

- March 15, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- June 21, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- September 20, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- December 20, 2013 – Regular Meeting from 9:00 to 11:00 a.m.

**If necessary**, the following is a list of dates and times for regular meetings of the Clean Energy Finance and Investment Authority's Board of Directors through 2013.

- January 18, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- February 15, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- April 19, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- May 17, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- July 19, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- August 16, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- October 18, 2013 – Regular Meeting from 9:00 to 11:00 a.m.
- November 15, 2013 – Regular Meeting from 9:00 to 11:00 a.m.

Regular meetings of the Audit, Compliance & Governance, Budget & Operations, Technology Innovation, and Deployment Committees will be separately scheduled.

All regular meetings will take place at:

Clean Energy Finance and Investment Authority  
865 Brook Street  
Rocky Hill, CT 06067