THE BROADCAST WILL BEGIN AT 2:00PM (EST)

- Submit your questions in advance using the GoToWebinar control panel
- View previous webcast recordings online at www.cdfa.net
Welcome & Overview

Using your telephone will give you better audio quality.

Submit your questions to the panelists here.

Join the Conversation

Technical Questions?
Contact CDFA at 614-705-1308
CDFA connects the public and private development finance sectors.
CDFA’s 5 Focus Areas:

- Education
- Advocacy
- Research
- Resources
- Networking
Training Courses:

- Fundamentals of Economic Development Finance Course
- Bond Finance (Intro and Advanced)
- Tax Increment Financing (Intro and Advanced)
- Intro Tax Credit Finance Course
- Intro Revolving Loan Fund Course
- Intro Energy Finance Course
- Intro Public-Private Partnership (P3) Finance Course
- Intro EB-5 Finance Course
- Intro Food Systems Finance Course
- Seed & Venture Capital Course
- Intro Brownfield Finance Course
CDFA Online Resource Database – 5,000 categorized resources

Federal Financing Clearinghouse – 150+ federal program overviews

Resource Centers – Bond, TIF, RLF

Development Finance Review Weekly – newsletter to 20K+ subscribers

5 Targeted Newsletters – Tax Increment Finance Update, Bond Finance Update, Clean Energy + Bond Finance Initiative, Legislative Front Update, State Small Business Credit Initiative Update

Targeted State Finance Newsletters

Daily Headlines
CDFA's State Financing Program Directory is the only online resource cataloging the development finance programs offered by state governments. The SFPD includes overviews of over 350 state financing programs available to both public and private sector users. To conduct a search of the State Financing Program Directory, click on a highlighted state below.
CDFA Brownfields Technical Assistance Program

• Online Resources:
  ➢ Monthly Brownfields Financing Update
  ➢ Brownfields Financing Toolkit
  ➢ Online Resource Database

Technical Assistance:
  ➢ Brownfields Project Marketplace
  ➢ Project Response Team Visits

CDFA Brownfields Technical Assistance Program — www.cdfa.net
CDFA Brownfields Project Marketplace  
**February 2-4, 2016**

CDFA Brownfields Financing Webinar Series:  
Managing Brownfield Revolving Loan Funds  
**April 21, 2016**

**Contact:**  
Emily Moser, Program Manager  
614-705-1305  
emoser@cdfa.net
Adam Klinger

Team Lead
U.S. EPA RE-Powering America’s Land
RE-Powering America’s Land: Siting Renewable Energy on Potentially Contaminated Land, Landfills and Mine Sites

CDFA: Financing Green Energy on Brownfields
January 14, 2016
Encourages renewable energy development on current and formerly contaminated lands, landfills and mine sites when such development is aligned with the community's vision for the site.
Why Renewable Energy on Potentially Contaminated Lands

- Build sustainable land development strategy
- Leverage existing infrastructure
- Protect open space
- Provide low-cost, clean power to communities
- Gain community support
- Reduce project cycle times with streamlined zoning and permitting
- Improve project economics through reduced land costs & tax incentives
Encouraging Renewable Energy on Contaminated Lands

- Identifying and screening contaminated properties
- Disseminating success stories and best practices
- Clarifying liability
- Articulating the associated environmental, economic and community benefits
- Disseminating financing strategies and information on incentives
- Highlighting favorable policies
- Developing partnerships and pursuing outreach
Presentation Overview

• RE-Powering Tools and Resources
  – Identifying and Screening Sites
    • RE-Powering’s Mapper
    • Electronic Decision Tree
  – Other Tools
    • Handbook and Best Practices
    • Liability Guidance and Comfort Letters

• Success Stories
  – Tracking Matrix
  – Case Studies

• Financing
Identifying and Screening

Google Earth Mapper

Electronic Decision Tree
RE-Powering Mapper
Google Earth Overlay

Mapped inventory of 80,000+ EPA and select state tracked sites (over 43 million acres of land)

Incorporates data from:
- EPA Cleanup and Landfill Programs
- National Renewable Energy Lab
  - Wind, Solar, and Biomass Resources
- Southern Methodist University and USGS
  - Geothermal
- Department of Homeland Security
  - U.S. Highways
  - Railroads
  - Transmission Lines
  - Substations
- 11 State Agencies: CA, HI, IL, MA, NJ, NY, OR, PA, TX, VA, and WV
# Sites Screened by Program and State

<table>
<thead>
<tr>
<th>Program</th>
<th># of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abandoned Mine Land</td>
<td>466</td>
</tr>
<tr>
<td>Brownfield Program Sites</td>
<td>26,030</td>
</tr>
<tr>
<td>Superfund</td>
<td>2,009</td>
</tr>
<tr>
<td>Landfills - Landfill Methane Outreach Program</td>
<td>2,062</td>
</tr>
<tr>
<td>RCRA Corrective Action Sites</td>
<td>3,759</td>
</tr>
<tr>
<td><strong>Sites Associated with Federal Programs</strong></td>
<td><strong>34,326</strong></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>State Identified Sites</th>
<th># of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>California (7,622), Hawaii (1,180), Illinois (5,541), Massachusetts (1,495), New Jersey (10,362), New York (2,180), Oregon (4,743), Pennsylvania (5,543), Texas (1,150), Virginia (5,422), West Virginia (2,103)</td>
<td>47,341</td>
</tr>
<tr>
<td><strong>Federal and State Sites Screened</strong></td>
<td><strong>81,667</strong></td>
</tr>
</tbody>
</table>
## RE-Powering Mapping Tool
### Solar Screening Process

<table>
<thead>
<tr>
<th>Solar Resource (kWh/m²/day)</th>
<th>Utility CSP</th>
<th>Utility Solar PV</th>
<th>PV Policy Driven</th>
<th>Large-Scale Solar PV</th>
<th>Off-Grid Solar</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 5.0</td>
<td>≥ 5.0</td>
<td>≥ 3.5</td>
<td>≥ 3.5</td>
<td>≥ 2.5</td>
<td></td>
</tr>
</tbody>
</table>

| Acreage:                    | ≥ 250*      | ≥ 40             | ≥ 40             | ≥ 2                  |                |
|                             | [≥ 40]**    |                  |                  |                      |                |

| Distance to Transmission (miles) | ≤ 10       | ≤ 10             | ≤ 10             | ≤ 1                  |                |
| Distance to Graded Roads (miles) | ≤ 10       | ≤ 10             | ≤ 10             | ≤ 1                  |                |

| Policies                    | --         | --               | Renewable Portfolio Standards | -- | -- |

*CSP: Trough & Power Tower
**CSP: Stirling Engine
Screening Potential Sites: Electronic Decision Tree tool

Welcome! This decision tree, developed by US EPA's RE-Powering America's Land Initiative, guides interested parties through a process for screening sites for their suitability for solar photovoltaic or wind installations.

Targeted sites include brownfields, Superfund and Resource Conservation and Recovery Act sites, mine sites, landfills, abandoned parcels, parking lots, and commercial/industrial rooftops. EPA encourages renewable energy development of these targeted sites, instead of green space, when aligned with the community vision for the site.

This tool is intended to evaluate an identified site. Other tools like RE-Powering's Mapper tool or EPA's Cleanups in My Community might help locate potential sites. In addition, the initial screening provided by this tool is not intended to replace or substitute the need for a detailed site-specific assessment.
Explores solar (ground mount and/or rooftop) or wind (ground mount)

Can be used for small to large sites to assess potential for distributed, large-scale or utility-scale systems

Walks users through a series of Yes / No / Skip Questions

Supplements questions with additional information, tips and links to relevant resources

Generates reports of the screening results and user comments that can be printed or imported into other documents

- Summary Site Screening Report
- Data Entry Report
- Site Comparison Report
RE-Powering’s Electronic Decision Tree

Redevelopment Plans

Redevelopment plans can take the form of a site-specific redevelopment plan or a comprehensive land use planning and zoning document that applies to, or is under development for, a defined geographic district in which many individual sites are located (commonly referred to as a "Redevelopment Area Plan" or "Specific Area Plan"). Where a Specific Area Plan applies, proposed redevelopment projects at sites within the geographic scope of the plan will be evaluated by the municipality for consistency with the plan’s land use objectives for the district. Implementing the plan involves a number of steps including identifying financing, securing development approvals, finalizing the real estate transaction, clearing, and construction.

Objectives for a redevelopment plan include:

1. Objectives for eliminating environmental hazards
2. Objectives for securing the property
3. Objectives for increasing the property’s long-term value

When municipalities approach the use of contaminated property, they are more likely to utilize redevelopment plans.

Community Visit

Site reuse should be determined as an asset. It is important that the plan is developed with the community’s long-term vision in mind.

Many end uses should be considered for the site.

If evaluating sites across a region, the Regional Redevelopment Plan map will be used.

If a RCRA or Superfund site is present, the site-specific redevelopment plans should be considered.

Community Visioning Process

Alternative Reuse Scenarios Analysis
Potential Site Reuse Options
Land Use Restrictions

4. More Info: Contamination and Landfill Issues
5. More Info: Land Assessment and Financial

Is the usable acreage for a ground mounted system greater than 2 acres?

- Yes
- No
- Skip

Enter usable acreage (optional):

Enter comment (optional):

Please use the comment area to discuss any obstacle, shading or grade issues. If powering remediation, skip and continue.
Electronic Decision Tree: Project Arrangements

Select a renewable energy project arrangement
Hover over each box for a description

- Sell Power to Utility
- Serves Owner's On-Site Energy Load
- Serves Owner's Off-Site Energy Load(s)
- Sell Power to Off-Site Buyer or Collection of Buyers
Best Practices

Handbook on Siting Renewable Energy Projects While Addressing Environmental Issues

Liability Guidance and Comfort Letters

MEMORANDUM

SUBJECT: Revised Environmental Guidance Regarding the Treatment of Tenants Under the CERCLA Brownfield Prospective Purchase Provisions

FROM: Cynthia Uhls, Assistant Administrator
Office of Enforcement and Compliance Assurance

TO: Regional Administrators, Regions I-VIII

1. Introduction

Section 107 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly referred to as Superfund), 42 U.S.C. § 9601 et seq., provides an important liability protection for parties who acquire property subject to a “closed, abandoned, or operable hazardous waste disposal site,” also referred to as a “former solid waste disposal site,” as defined in Section 1004(i)(6) of CERCLA. The CERCLA 107(a) liability protection is available when a party acquires a property that is subject to CERCLA, but is not necessarily subject to CERCLA liability under CERCLA § 107(a).

2. Background

The Environmental Protection Agency (EPA) has published guidance documents, including the CERCLA Brownfield Prospective Purchase Provisions (BPPP) that describe the procedures for acquiring a property subject to CERCLA, and the criteria for determining if a property is subject to CERCLA. This memorandum provides additional guidance on the treatment of tenants under the CERCLA BPPP.

3. Treatment of Tenants Under the CERCLA BPPP

The CERCLA BPPP provides that the acquisition of a property subject to CERCLA requires the acquisition of any lease or tenancy that exists at the time of acquisition. This memorandum clarifies that tenants under the CERCLA BPPP are treated in the same manner as owners of the property.

4. Conclusion

The EPA recognizes that the potential liabilities under CERCLA may affect the ability of a prospective purchaser to acquire a property. The EPA encourages the sale of the property under CERCLA BPPP is a potential solution to these issues, but the EPA will not waive the potential liabilities under CERCLA.

This memorandum provides additional guidance on the treatment of tenants under the CERCLA BPPP. The EPA encourages prospective purchasers to consider the potential liabilities under CERCLA before acquiring a property.
Tracking Matrix

151 Installations Identified To Date

150+ Renewable Energy Projects, Over 1 Gigawatt Installed Capacity

This map is for informational purposes only. The information was gathered from public announcements of renewable energy projects in the form of company press releases, news releases, and, in some cases, conversations with the parties involved. This map may not be a comprehensive representation of all completed renewable energy projects on contaminated lands. To provide information on additional projects, please email cleanenergy@epa.gov.

April 2015
<table>
<thead>
<tr>
<th>Site/Project Name</th>
<th>EPA Region</th>
<th>State</th>
<th>City</th>
<th>Type of Site</th>
<th>Site Owner</th>
<th>Property Acreage</th>
<th>Former Use Description</th>
<th>RE Type</th>
<th>Project Capacity (MW)</th>
<th>Project Acreage</th>
<th>Primarie RE Developer Name</th>
<th>Completion Data</th>
<th>Project Type</th>
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<tbody>
<tr>
<td>NC State University - Agricultural Pesticide Landfill</td>
<td>4</td>
<td>NC</td>
<td>Raleigh</td>
<td>Brownfield</td>
<td>NC State University</td>
<td>Private</td>
<td>Agricultural Pesticide Landfill</td>
<td>Solar PV</td>
<td>0.08</td>
<td>-</td>
<td>Carolina Solar Energy</td>
<td>2007</td>
<td>Wholesale Electricity</td>
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<tr>
<td>New Rifle Mill</td>
<td>8</td>
<td>CO</td>
<td>Rifle</td>
<td>Other</td>
<td>City of Rifle</td>
<td>Municipal</td>
<td>Former DOE Uranium Processing Mill</td>
<td>Solar PV</td>
<td>1.70</td>
<td>12.6</td>
<td>SunEdison</td>
<td>2009</td>
<td>Onsite Use - General</td>
</tr>
<tr>
<td>Norfolk Landfill Phase I</td>
<td>1</td>
<td>MA</td>
<td>Norfolk</td>
<td>Landfill</td>
<td>Town of Norfolk</td>
<td>Municipal</td>
<td>MSW Landfill and Adjacent Land</td>
<td>Solar PV</td>
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<td>1.6</td>
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<td>Wholesale Electricity</td>
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<td>MA</td>
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<td>Town of Norfolk</td>
<td>Municipal</td>
<td>MSW Landfill and Adjacent Land</td>
<td>Solar PV</td>
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<td>3.5</td>
<td>Constellation Solar Massachusetts, LLC</td>
<td>2012</td>
<td>Wholesale Electricity</td>
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<tr>
<td>Oliver Street Landfill</td>
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<td>MA</td>
<td>Easthampton</td>
<td>Landfill</td>
<td>City of Easthampton</td>
<td>Municipal</td>
<td>MSW Landfill</td>
<td>Solar PV</td>
<td>2.30</td>
<td>12.0</td>
<td>Borrego Solar</td>
<td>2012</td>
<td>Wholesale Electricity</td>
</tr>
<tr>
<td>Pantex Renewable Energy Project (PREP)</td>
<td>6</td>
<td>TX</td>
<td>Amarillo</td>
<td>Superfund</td>
<td>U.S. Department of Energy NNSA and Texas Tech University</td>
<td>Federal</td>
<td>Nuclear weapon assembly and disassembly</td>
<td>Wind</td>
<td>11.50</td>
<td>1,500.0</td>
<td>Siemens USA</td>
<td>2014</td>
<td>Onsite Use - General</td>
</tr>
<tr>
<td>Parklands Solar Farm</td>
<td>2</td>
<td>NJ</td>
<td>Bordentown Township</td>
<td>Landfill</td>
<td>Waste Management</td>
<td>Private</td>
<td>MSW Landfill</td>
<td>Solar PV</td>
<td>10.14</td>
<td>40.0</td>
<td>PSE&amp;G</td>
<td>2015</td>
<td>Wholesale Electricity</td>
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<td>Paulsboro Terminal Landfill</td>
<td>2</td>
<td>NJ</td>
<td>Paulsboro</td>
<td>Brownfield</td>
<td>BP</td>
<td>Private</td>
<td>Former refined petroleum and specialty chemical bulk storage and distribution facility</td>
<td>Solar PV</td>
<td>0.28</td>
<td>5.0</td>
<td>BP</td>
<td>2002</td>
<td>Onsite Use - Green Remediation</td>
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<td>Pomaco Superfund Site</td>
<td>9</td>
<td>CA</td>
<td>Maywood</td>
<td>Superfund</td>
<td>City of Maywood</td>
<td>Municipal</td>
<td>Custom Chemical Blander</td>
<td>Solar PV</td>
<td>0.01</td>
<td>1.4</td>
<td>Unknown</td>
<td>2007</td>
<td>Onsite Use - Green Remediation</td>
</tr>
</tbody>
</table>
Success Stories
Case Study: Solar on Landfill

SCITUATE SOLAR LANDFILL AT-A-GLANCE

- Scituate, MA (www.scituate.ma.gov)
- Former 29-acre municipal landfill
- Capped and covered with soil layer
- 3 MW solar PV installation on 12.5 acres (panels cover 6.1 acres)
- 10,560 polysilicon panels
- Expected $200,000 annual savings for town from net metering; T&D plus energy value
- Project will produce 3.825 million kilowatt-hours per year
- Land lease to developer: $1/year
- PPA price: 8.4 cents/kWh plus escalators; developer retained the SRECs
- All project labor was local
Case Study: Green Remediation

Busy Bee’s Laundry

- Case Study ([https://clu-in.org/greenremediation/profiles/busybeeslaundry](https://clu-in.org/greenremediation/profiles/busybeeslaundry))
- Groundwater contaminated from dry cleaning operations;
- Pump and treat remedy selected to address volatile organic compounds (VOCs) detected in an adjacent municipal park reservoir and off-site wells;
- Solar PV system selected to power P&T system and to minimize negative effects of cleanup activities on adjacent park and reservoir;
- 560W passive tracking PV system sized on anticipated energy demand of pumping system;
- Reliance on intermittent pumping to match various amounts of electricity supplied by solar PV system;
- Community involved through outreach and educational opportunities; Local university faculty and graduate students completed installation with assistance from property owner’s cleanup contractor.
Success Stories
Case Study: Wind on Brownfield

Steel Winds

- Case Study (http://www.epa.gov/sites/production/files/2015-04/documents/success_steelwinds_ny.pdf)
- Old Bethlehem Steel plant that sat idle for 20 years;
- 30 of 1,600 acre property used for wind farm (phases I and II);
- 14 wind turbines with a capacity of 35 MW;
- Private development pursued in coordination with surrounding communities;
- Existing transmission infrastructure saved substantial development costs;
- Renewable Energy Credits (RECs) sold to local utility to support RPS obligation;
- $100K in annual payments plus ~$190K in annual tax revenues to local communities;
Success Stories
Case Study: Solar on Superfund Site

- Case Study (http://www.epa.gov/superfund/programs/recycle/pdf/reilly-chem-2014.pdf)
- Old industrial property (distilled coal tar and treated wood) – 120 acres
- Treatment, containment and cover of contaminated areas; on-going groundwater management and monitoring
- Innovative soil management plan to minimize disturbance of impaired soil
- EPA “comfort letter” to clarify liability issues
- 10.8 MW solar PV installation on 43 acres; Over 36,000 panels
- Project developer sub-leases site property and sells power to local utility under 15 year PPA
- Qualified for utility sponsored renewable energy program (voluntary “feed in tariff” type program)
- Utility retains ownership of project renewable energy credits

MAYWOOD SOLAR FARM
Financing

• Tools for remediation and redevelopment that could also be used for renewable energy (Federal, State, Local)
  – EPA and State Brownfield Programs
  – Tax Abatement Programs
  – Tax Increment Financing
  – HUD Community Development Block Grants
  – Community Reinvestment Act

• Renewable energy financing tools
  – USDA Rural Energy for America Program
  – State Green Banks
  – Green Bonds
• Financing and procurement arrangements include
  – Owner / Operator Financing
  – Third Party Developers with Power Purchase Agreements (PPAs)
  – Community Solar
  – Community Choice Aggregation

• Federal Tax Incentives
• Technical and Programmatic Assistance Opportunities
  – Enhance and disseminate tools
  – Expedite projects

• Opportunities to Promote Policies / Encourage Best Practices
  – Highlight and analyze policies and programs
  – Evaluate success and disseminate lessons learned

• Opportunities to Partner and Leverage Resources
  – Coordinate and Collaborate
  – Integrate consideration of RE on CLs
  – Highlight eligibility of related funding sources
RE-Powering America’s Land
www2.epa.gov/re-powering/

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Massachusetts Department of Environmental Protection Bureau
Facilitating the Development of Clean Energy on Contaminated Land in Massachusetts

Council of Development Finance Agencies (CDFA)

Brownfield's Financing Webinar Series: Financing Green Energy on Brownfield's

14 January 2015

Thomas M. Potter, Clean Energy Development Coordinator
Massachusetts Agenda

• Why in Renewable Energy Development on Contaminated Land in Massachusetts?
• Goals and Drivers
• Technical Feasibility/Resources
• Regulatory Feasibility
• Financial Feasibility
Mass. Has High Electricity Prices!

Average Retail Price of Electricity to Residential Sector, cents/kWh

Mass. is 3rd Highest

Source: EIA Form 826

01/14/2016
Energy Dollars Flow Out of MA
We spend $22B per year on energy; 80% leaves MA -- $18B

<table>
<thead>
<tr>
<th>MA Energy Imports 2008</th>
<th>$B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Oil (heating, diesel)</td>
<td>5.0</td>
</tr>
<tr>
<td>Gasoline</td>
<td>9.2</td>
</tr>
<tr>
<td>Jet Fuel</td>
<td>1.4</td>
</tr>
<tr>
<td>Other Petroleum</td>
<td>0.9</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>5.2</td>
</tr>
<tr>
<td>Coal</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$22 B</strong></td>
</tr>
</tbody>
</table>

Per Household Average ~ $4,600
Massachusetts Clean Energy

• 2007 established Executive Office of Energy & Environmental Affairs

• 2008 Green Communities Act (GCA)
  – Supports Development of Clean Energy Resources
  – Expands Efforts to Promote Energy Efficiency
  – Increased the Renewable Energy Portfolio Standard (RPS) to 1% per year.
  – Goal of 15% “New Sources” by 2020 (currently 9%)

• 2008 Global Warming Solutions Act
  – Comprehensive Program -> Climate Change
  – Goal 25 % Below 1990 GHG levels by 2020
ENERGY: RPS Programs Nationally

**Renewable Portfolio Standard Policies**

**www.dsireusa.org** / September 2014

- **WA**: 15% x 2020
- **MT**: 15% x 2015
- **MN**: 26.5% x 2025 (IOUs)
  - 31.5% x 2020 (xcel)
  - 25% x 2025 (other utilities)
- **OR**: 25% x 2025 (large utilities)
  - 5% - 10% x 2025 (smaller utilities)
- **CA**: 33% x 2020
- **NV**: 25% x 2025
- **AZ**: 15% x 2025
- **NM**: 20% x 2020 (IOUs)
  - 10% x 2020 (co-ops)
- **TX**: 5.880 MW x 2015
- **HI**: 40% x 2030
- **NC**: 12.5% x 2021 (IOUs)
  - 10% x 2018 (co-ops & munis)
- **VT**: 20% x 2017
- **ME**: 30% x 2000
  - New RE: 10% x 2017
- **NH**: 24.8% x 2025
- **MA**: 22.1% x 2020
  - (+1% annually thereafter)
- **RI**: 16% x 2020
- **CT**: 27% x 2020
- **PA**: 18% x 2021
- **NJ**: 20.36% RE x 2021
  - + 4.1% solar x 2028
- **DE**: 25% x 2026
- **MD**: 20% x 2022
- **DC**: 20% x 2020

**29 states + Washington DC + 2 territories have a renewable portfolio standard**
(9 states and 2 territories have renewable portfolio goals)

- **Minimum solar or customer-sited requirement**
- **Extra credit for solar or customer-sited renewables**
- **Solar water heating eligible**
- **Includes non-renewable alternative resources**
EMISSIONS: GHG Emission Reduction Opportunities

Reduction Sources

Non-Energy
- vehicle AC
- stationary refrigerant
- Reducing SF6 in elec equip
- Reducing plastics GHG

Transportation
- Green DOT
- Fed/CA standards
- Fed Std for medium and heavy vehicles
- Fed RFS and regional LCFS
- Clean car consumer incentives
- PAYD pilot insurance
- Sustainable development
- Smart growth

Buildings
- efficiency/RGGI
- bldg codes
- bldg rating and labeling
- "deep" retrofits
- C&I oil
- solar thermal
- cooling/trees
- appliance stds

Electricity
- RPS
- EPA/Power plant rules
- Clean energy imports
- Clean Energy Performance Std

Executive Office of Energy and Environmental Affairs

01/14/2016
Launched 2011

Promotes Clean and Efficient Sources of Energy at MassDEP Regulated Sites (where we have authority or control)

Maximizes MassDEP’s Unique Expertise to Overcome Permitting & Siting Obstacles

Create economic growth and employment opportunities
RPS/APS Projects, including:

- Solar Photovoltaic
  - Goal of 1,600 MW
  - Currently 985 MWs (11/15)

- Wind
  - Goal of 2,000 MW
  - Currently 107 MWs (11/15)

- Anaerobic Digestion
- Renewable Thermal
- Small-scale Hydroelectric

Energy Efficiency
Energy Conservation
GOAL: Contaminated Land Development

• 50 MW Clean Energy by 2020
• Primarily Solar Photovoltaic's (PV)
  – Some wind
• Locations:
  – 21e Sites
  – Underused Brownfields
  – Superfund Sites
  – Closed Landfills*
• Size: 0.5 to 2.0 MWs

*Brockton Brightfields, 425 kW solar PV

*MassDEP Bureau of Air & Waste (BAW)
“Operating” Installations

Solar PV
- 13 Sites
- 23.72 MW Solar PV (utility scale)
- 1 Site, 0.15 MW (GR)

Wind
- 2 Sites
- 6.5 MW
- Green Remediation

Massachusetts Contaminated Land Installations To Date

Solar array installed at former gas works

Brockton Brightfields

Solar array installed at former manufactured gas plant

Haverhill Solar Project

Solar array installed at former foundry

Indian Orchard Solar Facility

Fixed tilt system at landfill

Pittsfield MSW

Two of three turbines powering remediation

MMR Wind Turbines

Source: Provided through the U.S. EPA’s RE-Powering America’s Land Initiative, 2012
Massachusetts Focused

Technical Feasibility/Resources
(abbreviated)
2014 Contaminated Land Profile List (Federal & State Sites)

- 44,000 Site Universe
- “Brownfield” Sub-set
- “usable acreage”
  - 4-5 acres = 0.5 MW’s PV
- May 2014 – 1059 Sites
  - 40% are 4 Acres or greater
- “Community Solar”
  - 80% Rooftops not good for residential solar
  - 2 + Acres
  - ~150 additional sites
Establish Ownership & Site Control

• Who has control of property?
• Is the owner interested?
  – Selling Property
  – Leasing Property
  – Investing In Redevelopment for Renewable Energy
• Ownership information
  – MA Registry of Deeds
    www.masslandrecords.com
http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/
Regulatory Feasibility

What are the regulatory requirements?
Regulatory Considerations

EPA - SUPERFUND SITES

A. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA - “Superfund Law” – does not include oil)
   – National Contingency Plan (NCP)

B. Direct Oversight
   – Decision making by EPA
   – Oversight role by MassDEP

C. Cleanup Plan = “Record of Decision”
   – tailor cleanup to site-specific goals
   – May include multiple settling parties = “Consent Decree”
   – May include “Fund Lead”

MassDEP - STATE SITES

A. M.G.L. Ch 21E (“OHM Materials Release Prevention Act”)
   – Massachusetts Contingency Plan (MCP)

B. Privatized Program
   – Decision making by LSP’s
   – Audit role by MassDEP

C. Flexibility in Cleanup
   – Tailor Cleanup to Reuse (current/future)
   – Multiple standardized cleanup options
Liability Considerations/Protections

[for parties who own or acquire contaminated property but did not cause or contribute to the contamination]

EPA - CERCLA Liability Status

• 2002 Brownfield Amendments to CERCLA (new protections)
• “Innocent Landowners” (modified defense)
  – i.e. State/Local Governments
• “Bona Fide Prospective Purchasers” (BFPPs)
  – Protects purchaser (or tenant of purchaser)
  – Can purchase with knowledge of contamination
  – Threshold Criteria
    ◦ Acquire ownership after 1/11/02
    ◦ Disposal occurred before purchase
    ◦ Conduct “all appropriate inquiries” (AAI)
    ◦ Not a liable party and no affiliation with a liable party
  – Continuing Obligations
    ◦ Provide cooperation, assistance, access
    ◦ Comply with land use restrictions; not impede institutional controls
• “Comfort Letters” for RE Projects

MassDEP - 21E Liability Status

• 1998 Brownfield Amendments to 21E
• Eligible Owners
  – Must Meet liability Endpoints (i.e. RAO, ROS)
• Eligible Tenants
  – Must meet statutory requirements
  – “Lessee” considered an eligible tenant under 21E
  – MassDEP Fact Sheet
• Other “Safe Harbors”
  – Redevelopment Authorities
  – Secured Lenders
• Covenant Not To Sue Program
  – Attorney General Administers
  – For non-applicable statutory protections
• “Comfort Letters” for RE Projects
MCP Permits?

NO. Incorporate renewable energy project into MCP process

- PRA’s (IRA, PHI)
- CRA’s (PHII – PHIV)
- RAO’s, ROS, AULs

RAM’s
Compatibility of Renewable Energy to Cleanup

RAO/ROS/AUL=**YES**
- Assessed, Remedy Complete, Complete with AUL
- Assessed, Remedy Ongoing
  - (RE will not compromise remedy under construction or operational)

CRA=**MAYBE**
- Assessed with Remedy Implementation Plan (RIP)
  - (RE design and development can be incorporated into remedy design and implementation)

PRA=**NO**
- Assessment/No Remedy (consider future PV!)
- No Assessment (consider future PV!)
Examples of Compatible Remedial Solutions

• In Situ Bioremediation
• Long-Term Pump & Treat
• Monitored natural Attenuation
• Permeable Reactive barriers
• Soil Vapor Extraction
• Activity & Use Limitation

Baird & McGuire, Holbrook, 2006
Other Permit Considerations

• **Zoning**
  – Is the project zoned for PV? May require a “Special Permit”

• **Interconnection**
  – Review by distribution utility required.
  – Cost of interconnecting falls on project.

• **MEPA**
  – ten or more acres of any other wetland area (including land altered to install roads and utilities)

• **Wetlands**

• **Building Permit**

• **Federal Aviation Administration**
  – Wind projects
Financial Feasibility

How do I fund the Cleanup?
Federal (EPA) Brownfield Program

• **Assessment Grants**
  - $200,000 Per Property
  - $1M Coalition Assessment Grant
  - Non-profits and municipals

• **Cleanup Grants**
  - $200,000 Per Property
  - $1M Cleanup Revolving Loan Fund
  - Non-profits and municipals

• **Federal Targeted Brownfield Assessment**
  - EPA Region 1 Uses contractors
  - <$75,000 Grant of Service

• **State Targeted Brownfield Assessment**
  (Not Available)
Massachusetts Brownfield Programs

- **Assessment Loans (MassDevelopment)**
  - Up to $100,000

- **Cleanup Loans (MassDevelopment)**
  - Up to $500,000

- **Brownfield Tax Credits (completion of cleanup)**
  - Expires August 5th, 2013 (work must be done prior to)
    - In 2013, the deadline for eligible cleanup costs was extended to January 1, 2019.
  - 50% of Cleanup Costs
  - 25% for Cleanups Using AUL
    Qualifications (for above three)
    - Borrower did not own/operate at time of release and/or cause or contribute to contamination
    - Must be located in Economically Distressed Area (EDA)
    - MCP related cleanups only (need RTN)

- **Environmental Insurance (MassBusiness)**
  - 50% State Subsidy for Insurance Premium
    - Capped at $50,000 for Private Sector
    - Capped at $150,000 for Municipal/Non-Profit
Financial Feasibility (cont.)

How do I fund the Solar Photovoltaic (PV) Renewable Energy System?
Third-Party Power Purchase Agreement (PPA)

Tax Credits (ITC, MACRS)

Federal Government

Builds PV Array

Project Developer & Owner
* Provides capital
* Constructs & operates project
* Sells electricity & renewable credits

Electricity

Payments

Host Customer
* Hosts project on its land/roofs
* Buys physical power from project

Payments

SREC Payments, Net Metering Credits (retail rate)

Utility or Other Solar Renewable Energy Credit (SREC) Buyer

Buys Electricity at Reduced Rate
Array Cost

• Total Cost could includes:
  – Soft Costs (e.g. permits)
  – Design/construction
  – Panels
  – Inverters

• Price reflected as size per watt DC of electricity times cost per watt.

• 1 MW (1,000,000Wdc) @ $4.18/watt = $4,180,000
Federal PV Incentive Programs (commercial scale)

- **FEDERAL Investment Tax Credit (ITC)**
  - Up to 30% of eligible system costs
  - Hard cost of equipment
  - Taken and applied against federal tax obligation of a “for-profit entity”
  - **Expires 12/31/16** Extended to 2020.

- **FEDERAL Modified Accelerated Cost-recovery System (MACRS)**
  - Recover costs through depreciation reductions
  - 5-year accelerated depreciation
  - Expires by 12/31/16!!!
Massachusetts PV Incentive Programs (commercial scale)

- **Net Metering Credits**
  - Customers located in investor-owned utilities (National Grid, NSTAR, Western Massachusetts Electric Company, and Unitil) have the option of selling net excess electricity generation from a qualifying solar project via net metering.

- **Solar Renewable Energy Certificates (SRECs)**
  - 1 SREC = 1 MWh
  - Retail electrical providers required to buy (RPS)
# DRIVER: Solar Incentives in Massachusetts

<table>
<thead>
<tr>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Tax Incentives (30%)</td>
</tr>
<tr>
<td>Federal Accelerated Depreciation (5 years)</td>
</tr>
<tr>
<td>MA Net Metering (credits)</td>
</tr>
<tr>
<td><strong>MA RPS Solar Carve-out</strong></td>
</tr>
<tr>
<td><strong>Renewable Energy Certificates (SREC)</strong> Sales</td>
</tr>
</tbody>
</table>

RPS Solar Carve-out Renewable Energy Certificates (SREC)

SREC I (2009)
- Program cap of **400 MW**
- Provided economic support of solar PV industry
- Undersupply and Oversupply concerns.
- No restrictions on growth. Land-use issues in some communities – particularly with regard to use of agricultural lands, open space, forestland, and tree cutting

SREC II (2014)
- Program cap of **1600 MW** (1200 additional) minus the capacity reached in SREC I by 6/30/14
- To meet goal, 140 – 200 MW per year
- Continues economic support and momentum for solar PV industry
- Managed Growth
- Incentives decline over 10 years
- Financial incentives differentiated between Market Sectors
- Favorability to Landfill and Brownfield type projects
# Market Sectors

Projects under the RPS Solar Carve-Out II Program are each assigned to a particular Market Sector as follows:

<table>
<thead>
<tr>
<th>Market Sector</th>
<th>Generation Unit Type</th>
<th>SREC Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>1. Building Mounted Generation Units &lt;br&gt;2. Ground mounted Generation Units with a capacity &gt; 25 kW DC with 67% or more of the electric output on an annual basis used by an on-site load</td>
<td>0.9</td>
</tr>
<tr>
<td>C</td>
<td>1. Generation Units sited on Eligible Landfills &lt;br&gt;2. Generation Units sited on Brownfield’s &lt;br&gt;3. Ground mounted Generation Units with a capacity of &lt;= 650 kW with less than 67% of the electrical output on an annual basis used by an on-site load.</td>
<td>0.8</td>
</tr>
<tr>
<td>Managed Growth</td>
<td>Unit does not meet the criteria of Market Sector A, B, or C</td>
<td>0.7</td>
</tr>
</tbody>
</table>

[NOTE: FY14 Capacity Block = 26 MW, FY15 = 80 MW to FY17 = 0]
SREC II Eligibility = 10 years/40 quarters

<table>
<thead>
<tr>
<th>Year</th>
<th>Auction Price Bid</th>
<th>Auction Price After 5% Fee</th>
<th>ACP Rate</th>
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</thead>
<tbody>
<tr>
<td>2014</td>
<td>300</td>
<td>285</td>
<td>375</td>
</tr>
<tr>
<td>2015</td>
<td>300</td>
<td>285</td>
<td>375</td>
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<td>2016</td>
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<td>2017</td>
<td>285</td>
<td>271</td>
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<td>2018</td>
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<tr>
<td>2030</td>
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</tbody>
</table>

Values announced by DOER each year to maintain 10-year forward schedule.

Market Sector C Generating Units:
At 80%

285 * 0.80 = $228
Per 225 CMR 14.02, a Brownfield is defined as follows:

- A disposal site that has received a release tracking number from MassDEP pursuant to 310 CMR 40.0000, the redevelopment or reuse of which is hindered by the presence of oil or hazardous materials, as determined by the Department, in consultation with MassDEP. For the purposes of this definition, the terms “disposal site,” “release tracking number,” “oil,” and “hazardous materials” shall have the meanings giving to such terms in 310 CMR 40.0006. No disposal site that otherwise meets the requirements of this definition shall be excluded from consideration as a Brownfield because its cleanup is also regulated by the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601-9675, the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6921 – 6939g, or any other federal program. 310 CMR 14.02.
DOER Guideline Regarding the Definition of “Brownfield” (September 2014)

• DOER’s “Brownfield” is broadly defined to include universe of 44,000 listed sites and EPA Superfund, RCRA and Federal Facility locations (e.g. RE-Powering)

• Request a Brownfield “Pre-Determination” Letter from DOER prior to submitting your SREC II Statement of Qualification Application (SQA)
“Brownfield Pre-Determination Request Form”

A. Identification

B. RTN

C. Supporting documentation for “Hindered”
   – Estimate of Cleanup Costs (past/present/future)
   – Evidence of Marketability (e.g. resale, financing, environmental restrictions, abandonment)
   – Evidence as to appropriate reuse

D. Signature
Pre-Determinations (2014 – Present)

Solar PV

- 9 Sites
- 35.5 MW Solar PV
- Range from 1.4 to 8 MWs (3x6MWs)
  - Former industrial
  - Former airport
  - Former quarry
Case Study
Iron Horse Park Superfund Site – Shaffer Landfill
Billerica, MA

BACKGROUND

• The Iron Horse Park site, a 553-acre industrial complex, includes manufacturing and railyard maintenance facilities, open storage areas, landfills, and wastewater lagoons.

• A long history of activities at the site, beginning in 1913, has resulted in the contamination of soil, groundwater, and surface water.

• The Shaffer Landfill has two lobes and occupies approximately 60 acres.

• Cleanup methods selected included reconstruction of the landfill cap and collection and off-site treatment and disposal of leachate.
Iron Horse Park Superfund Site – Shaffer Landfill
Billerica, MA

SOLAR DEVELOPMENT

• Significant Photovoltaic Project
  – major contribution to Commonwealth clean energy goals – one of largest
  – offers beneficial reuse of a closed landfill portion of a federal Superfund Site
  – long-term landfill cap limited Site reuse potential

• MassDEP Met Novel Permitting Challenges
  – multiple interested parties: EPA, MassDEP, PRP Group (ongoing operation and maintenance responsibilities), project proponent; Town of Billerica
  – time constrains driven by availability of tax credits
  – ensured safe post-cleanup reuse
  – flexibility in applying State post-closure reuse regulations to federally-closed Site (including innovative mapping of federal cleanup milestones and requirements to State landfill closure requirements)
  – permit requires noninvasive design to avoid adverse impacts on landfill cap during construction and operation (gravel bed for panels weighted by ballasts, reinforced concrete pads for heavy components)
  – FAM ensures funding for decommissioning, removal and Site restoration at end of useful life
THANK YOU!

Thomas M. Potter
Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
Clean Energy Development Coordinator

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Boston, MA 02108
617-292-5628
Thomas.Potter@state.ma.us

Clean Energy Results Program Website:
http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/

Mass Department of Energy Resources (DOER)

Massachusetts Clean Energy Center (CEC)
http://www.masscec.com/
Mark Lewis

Brownfields Coordinator

Connecticut Department of Energy & Environmental Protection
Siting Clean Energy on Connecticut Brownfields

Brownfields Can be an Ideal Location for Alternative Energy Sources

- Solar
- Wind
- Hydroelectric
- Landfill Gas
- Other technologies

Planned “eco park” at Seaside Park Landfill, Bridgeport, Connecticut
Combines Several DEEP Goals

- Brownfield remediation & redevelopment
- Leverage existing infrastructure
- Encouraging clean/ renewable energy
- Environmental justice
- Promoting green jobs
Siting Clean Energy on Brownfields Web Site

On DEEP Web site:

Rolled out February 2015
Web Site Purpose

• Resource for locating energy facilities on brownfields

• Content from across State government and EPA
  - Technical and Policy Information
  - Financing and Incentives

Plainfield Renewable Energy biomass power plant
On former Gallup’s Quarry Superfund Site, Plainfield
Financial Incentives - Energy Specific

• Combined Heat and Power (CHP)
  Through Connecticut Green Bank (Quasi Public Agency)

• Connecticut Property Assessed Clean Energy (C-PACE)
  Through Connecticut Green Bank

• Low and Zero Emissions Renewable Energy Credits (LREC/ZREC)
  Through private utilities

• Class I and Large-Scale Hydropower Procurement
  Joint with State of Mass., private utilities in CT, RI, MA

• Net Metering and Virtual Net Metering
  Through private utilities
Financial Incentives-Brownfields

- Loans & Grants
- Administered by Dept. of Economic & Community Development
- Cover most expenses except acquisition & vertical construction
- CT has invested $139 M in brownfields redevelopment from 2011-2015
- $20 million committed each of next 2 fiscal years
- Every $1 of state investment = $4.99 from non-state partners
  Leverage increasing $8.37:1 for July-December 2015
Financial Incentives-Brownfields

• **Targeted Brownfield Development Loans**
  • Municipalities & private developers
  • Up to $4 M, up to 20 years, low/ deferred interest
  • Rolling applications- 4x/ year

• **Municipal Grant Program**
  • Municipalities & municipal economic development agencies
  • Up to $4M
  • Competitive- usually 3:1 oversubscription
  • Usually 2 rounds/ year

• **Brownfields Area Revitalization Grants**
  • Planning for multiple sites in a city/ town
  • First awards January 2016- ~ $1 million
  • Similar to EPA Community Wide Planning Grants
Landfills for Clean Energy Web Page

- Lists landfills with owners seeking clean energy developers
- Currently lists 14 landfills
- Includes town & location, landfill size, waste type, closure year

Seaside Park Landfill, Bridgeport, 1970s
Source: Connecticut Post, 4/19/2010

Former Hartford Mayor Segarra & Former Bridgeport Mayor at Hartford Landfill, 2014
Source: Sunlightsolar.com
For additional information contact
Mark Lewis
Brownfields Coordinator
Connecticut Department of Energy & Environmental Protection
(860) 424-3768
mark.lewis@ct.gov
Gerry Moore & Titilayo Ogunyale

USDA Rural Development, Rural Utilities Service
Rural Development Program Areas

- Electric Program
- Water & Environmental Programs
- Telecommunications and Broadband Programs
- Homeownership Loans
- Home Repair Loans & Grants
- Mutual Self-Help TA Grants
- Multi-Family Housing Loans
- Housing Preservation Grants
- Community Facilities Loans & Grants
- Business and Industry Guaranteed Loans
- Rural Business Enterprise Grants
- Rural Business Opportunity Grants
- Intermediary Relending Program
- Rural Energy for America Program
- Value Added Producer Grants
- Cooperative Development Assistance
Rural Utilities Service

Electric Program - Water and Environmental Programs - Telecommunications

- Infrastructure for 80% of the nation’s land mass
  - Enhancing the lives of 25% of the population
- Loans to assist the private sector in developing and planning the construction of critical infrastructure in rural areas
  - Modernization of infrastructure for growth
  - Technical assistance and training
- Grants to provide broadband service to economically challenged rural communities
  - Opportunities to obtain educational and medical services from distant locations utilizing communications technologies
The Rural Utilities Service (RUS) Electric Program provides financial assistance and engineering expertise to:

• 500 + Distribution Utilities

• 30 + Generation and Transmission Entities
Electric Program

In turn these providers supply electricity to:

• Approximately 42 million people

• 47 states

• 18 million business, homes, schools, churches, farms, irrigation systems, and other establishments

• 2,500 of the 3,141 counties in the United States.
Renewable Energy Loans
Project loans vs. System loans

- RUS institutional history has consisted of making system loans where the entity that signs the note has the ability to raise rates and exercise some control over their revenue.

- Project obligors entities do not have ratemaking ability – their revenue is limited to what a power sales contract provides.
What is EECLP?

The Energy Efficiency Conservation Loan Program (EECLP) provides utilities low-cost federal financing for energy efficiency and conservation in eligible rural communities.

**EECLP Fast Facts**

**Eligibility**
- Rural Utility Service (RUS) Borrowers
- Other electric utilities serving in rural areas (pop. < 20K)

**Loan Terms**
- Treasury rate + 1/8th percent
- Tied to the useful life of the asset
- Typically 15 years
Rural Energy for America Program - REAP

• Provides financial assistance in the form of grants and guaranteed loans to agricultural producers and rural small businesses

• Purchasing and installing renewable energy systems and making energy efficiency improvements.

• Eligible Projects include, Wind, Solar, Biomass, Geothermal, etc.

• Energy Efficiency Improvements to a facility or building

• Must be commercial technology
Contact Information
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Rural Utilities Service
Titilayo.ogunyale@wdc.usda.gov
Office: 202.720.0736
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