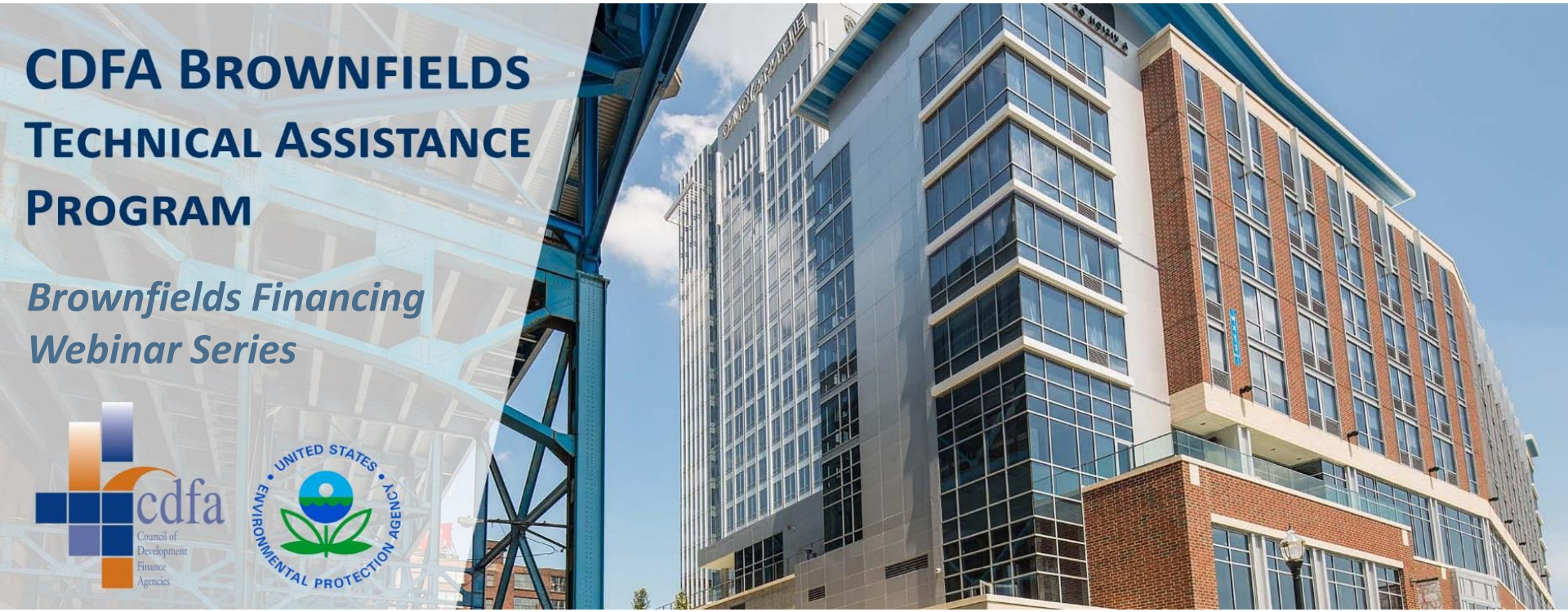
January 14, 2016

CDFA Brownfields Technical Assistance Program

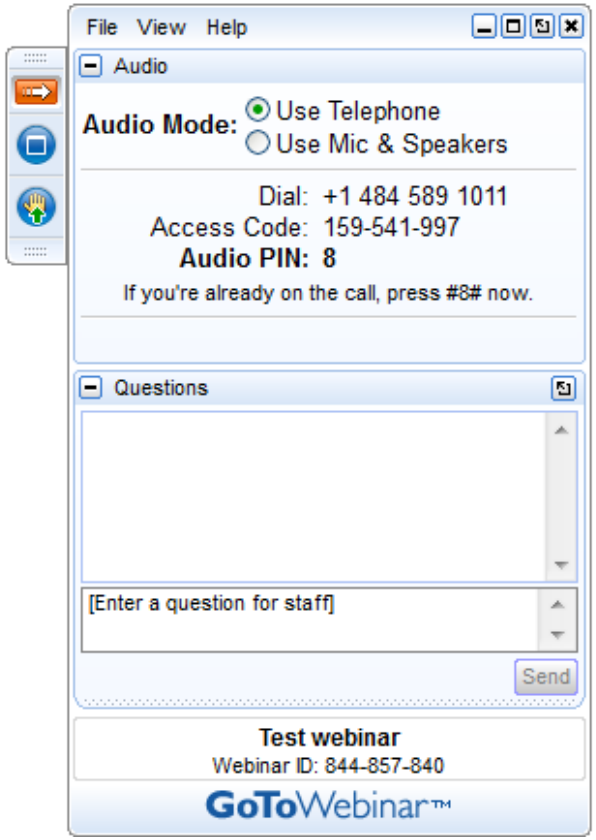
Brownfields Financing Webinar Series



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*

CDFA Training Institute

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

The CDFA Online Resource Database (ORD) is the nation's only electronic resource collection dedicated exclusively to development finance.

- 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

State Roundtables

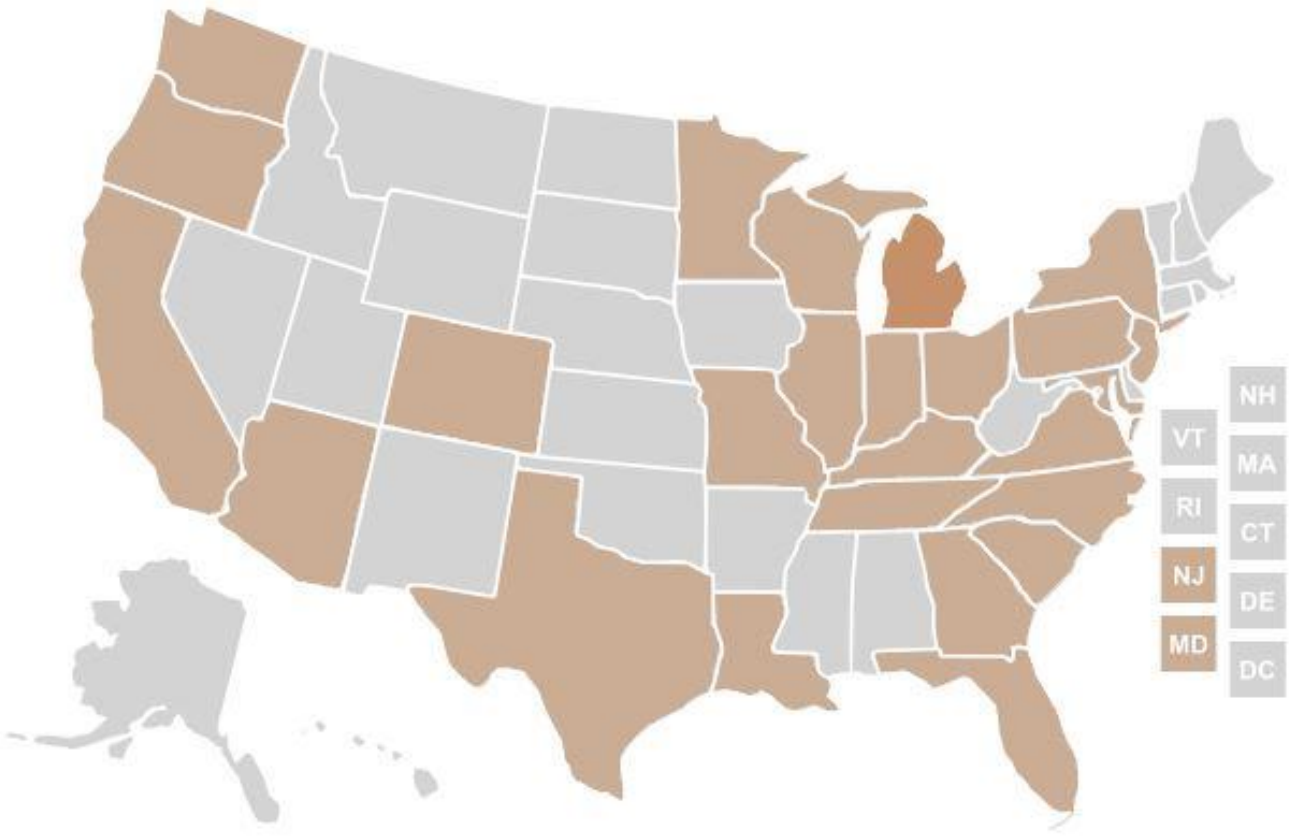
Arizona	Georgia	Oregon
California	Illinois	Pennsylvania
Colorado	Kentucky	S. Carolina
Florida	Michigan	Texas
	Missouri	Washington
	NY/NJ	Wisconsin
	Ohio	

CDFA State Financing Program Directory

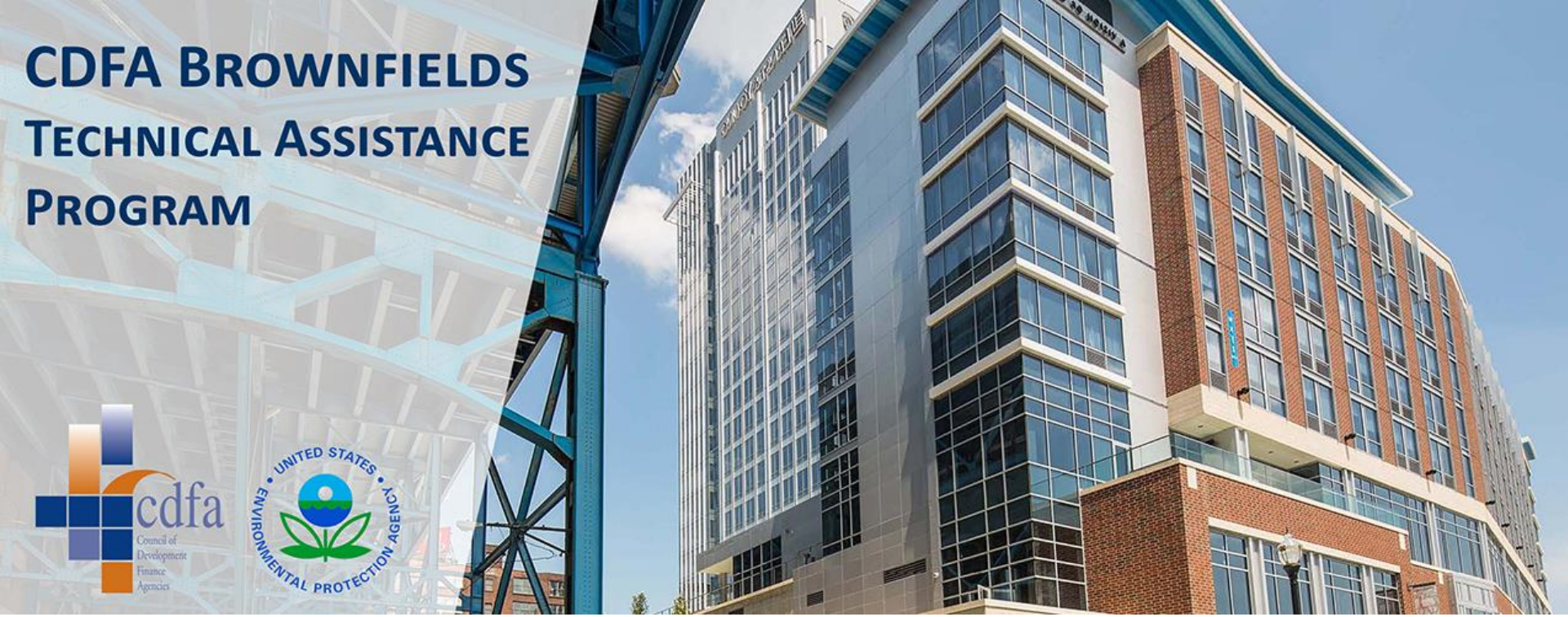
An online searchable clearinghouse of state economic development finance programs.

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.

Search by state: *Simple Search* Advanced Search



CDFA Brownfields Technical Assistance Program



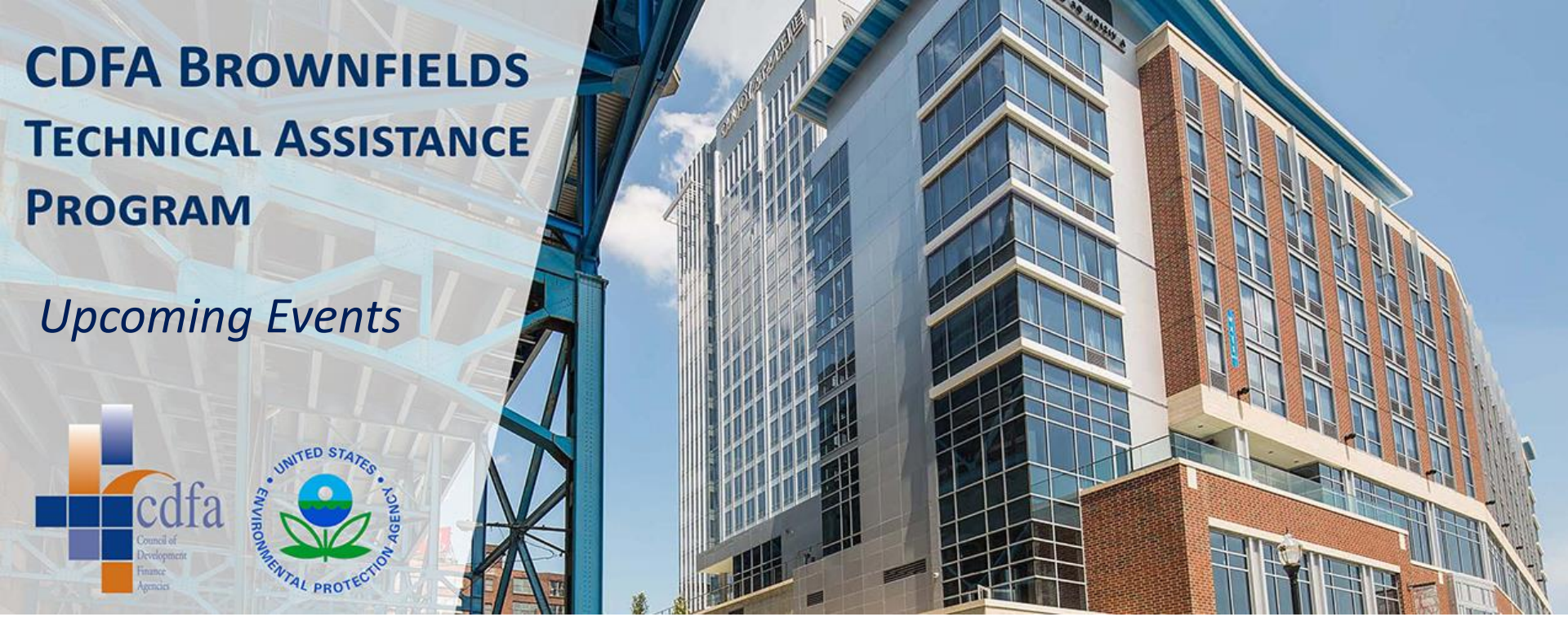
- Online Resources:
  - Monthly Brownfields Financing Update
  - Brownfields Financing Toolkit
  - Online Resource Database

Technical Assistance:

- Brownfields Project Marketplace
- Project Response Team Visits

CDFA Brownfields Technical Assistance Program

Upcoming Events



CDFA Brownfields Project Marketplace
February 2-4, 2016

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

Contact:
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Adam Klinger

Team Lead

U.S. EPA RE-Powering America's Land

RE-Powering America's Land:

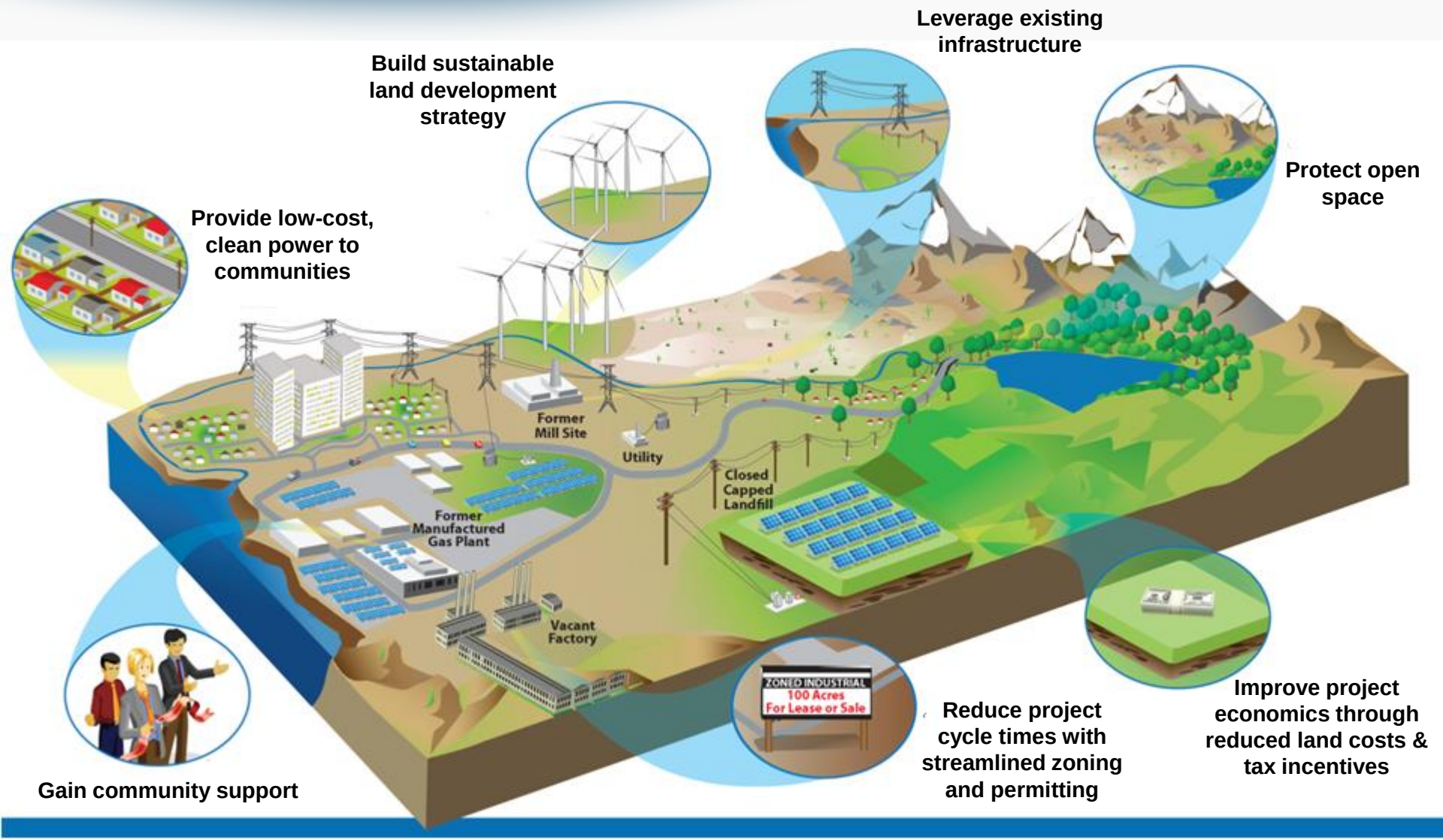
Siting Renewable Energy on Potentially Contaminated Land, Landfills and Mine Sites

CDFA: Financing Green Energy on Brownfields
January 14, 2016

RE-Powering America's Land

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



Encouraging Renewable Energy on Contaminated Lands

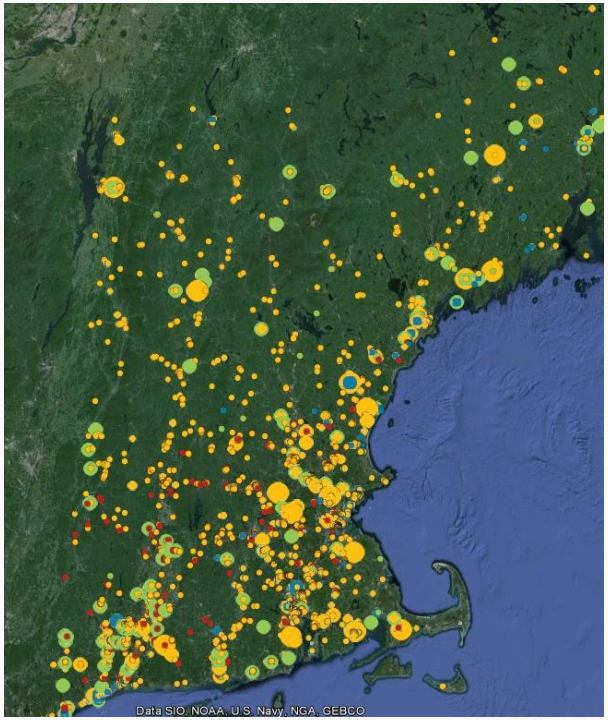
- Identifying and screening contaminated properties
- Disseminating success stories and best practices
- Clarifying liability
- Articulating the associated environmental, economic and community benefits
- Disseminating financing strategies and information on incentives
- Highlighting favorable policies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

Presentation Overview

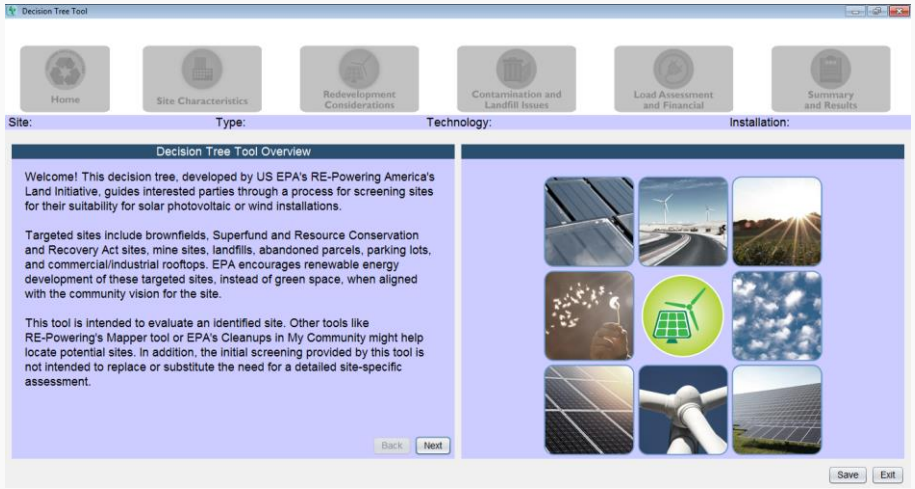
- RE-Powering Tools and Resources
  - Identifying and Screening Sites
    - RE-Powering's Mapper
    - Electronic Decision Tree
  - Other Tools
    - Handbook and Best Practices
    - Liability Guidance and Comfort Letters
- Success Stories
  - Tracking Matrix
  - Case Studies
- Financing

Identifying and Screening

Google Earth Mapper

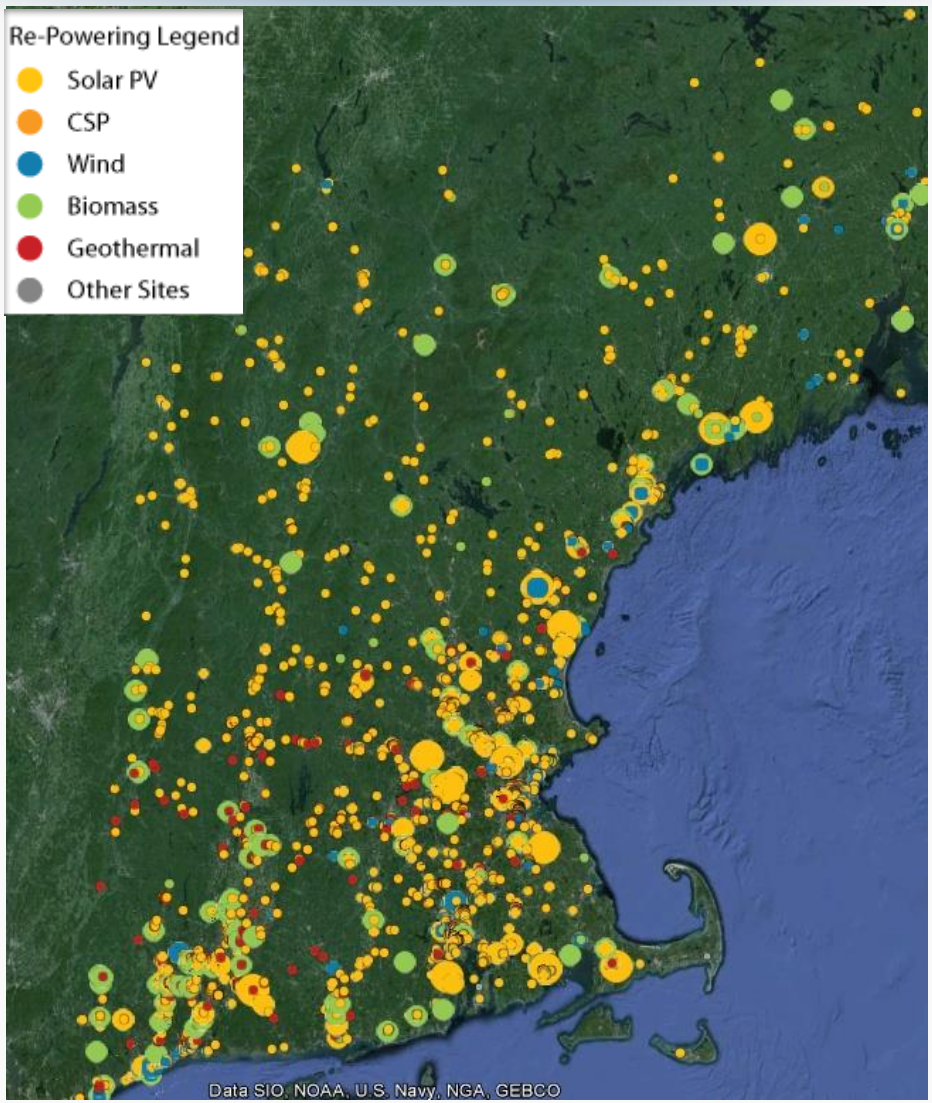


Electronic Decision Tree



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

Program	# of Sites
Abandoned Mine Land	466
Brownfield Program Sites	26,030
Superfund	2,009
Landfills - Landfill Methane Outreach Program	2,062
RCRA Corrective Action Sites	3,759
Sites Associated with Federal Programs	**34,326**

State Identified Sites	# of Sites
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)	47,341
Federal and State Sites Screened	**81,667**

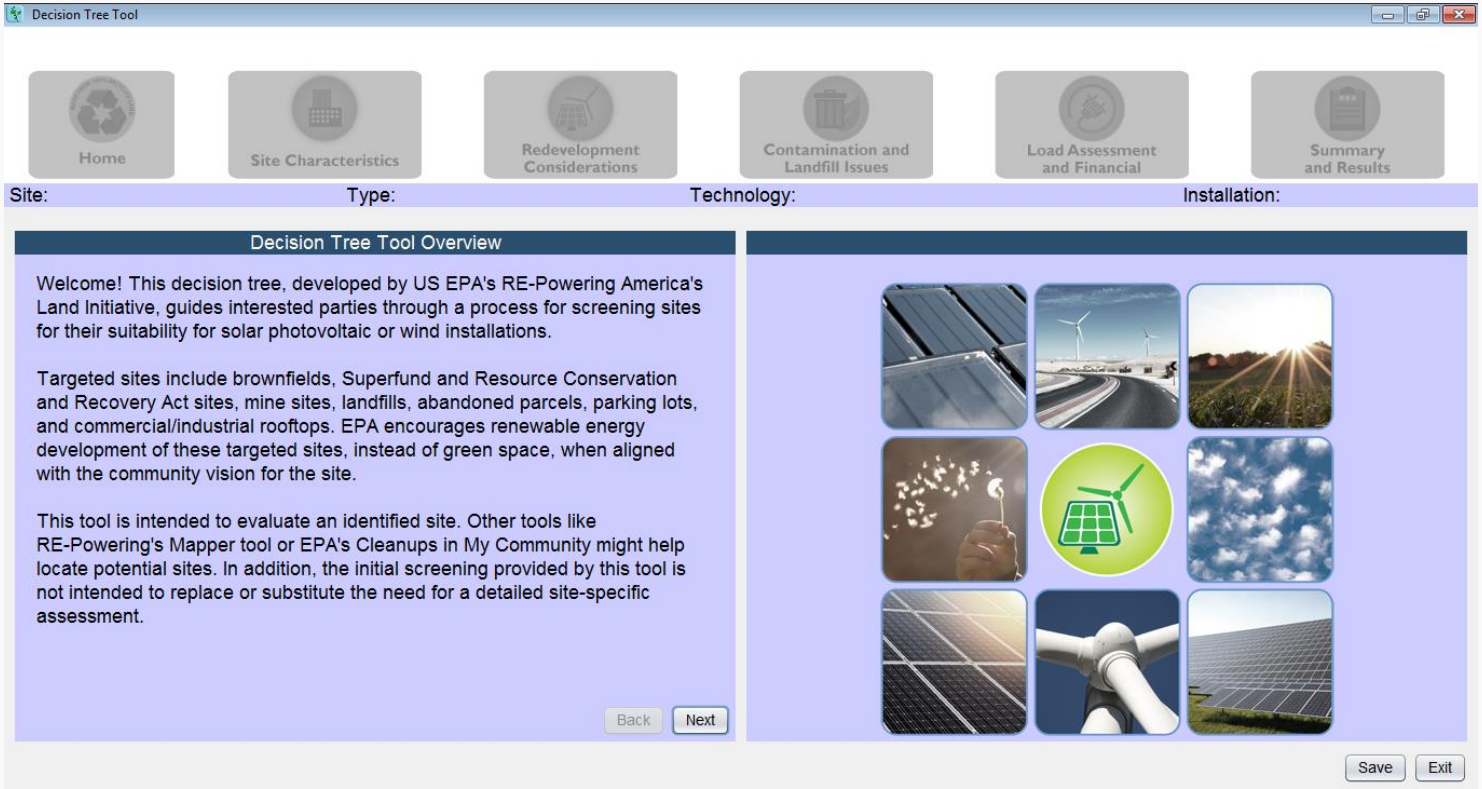
RE-Powering Mapping Tool

Solar Screening Process

	Utility CSP	Utility Solar PV	PV Policy Driven	Large-Scale Solar PV	Off-Grid Solar
Solar Resource ($kWh/m^2/day$)	≥ 5.0	≥ 5.0	≥ 3.5	≥ 3.5	≥ 2.5
Acreage:	≥ 250* [≥ 40]**	≥ 40	≥ 40	≥ 2	--
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

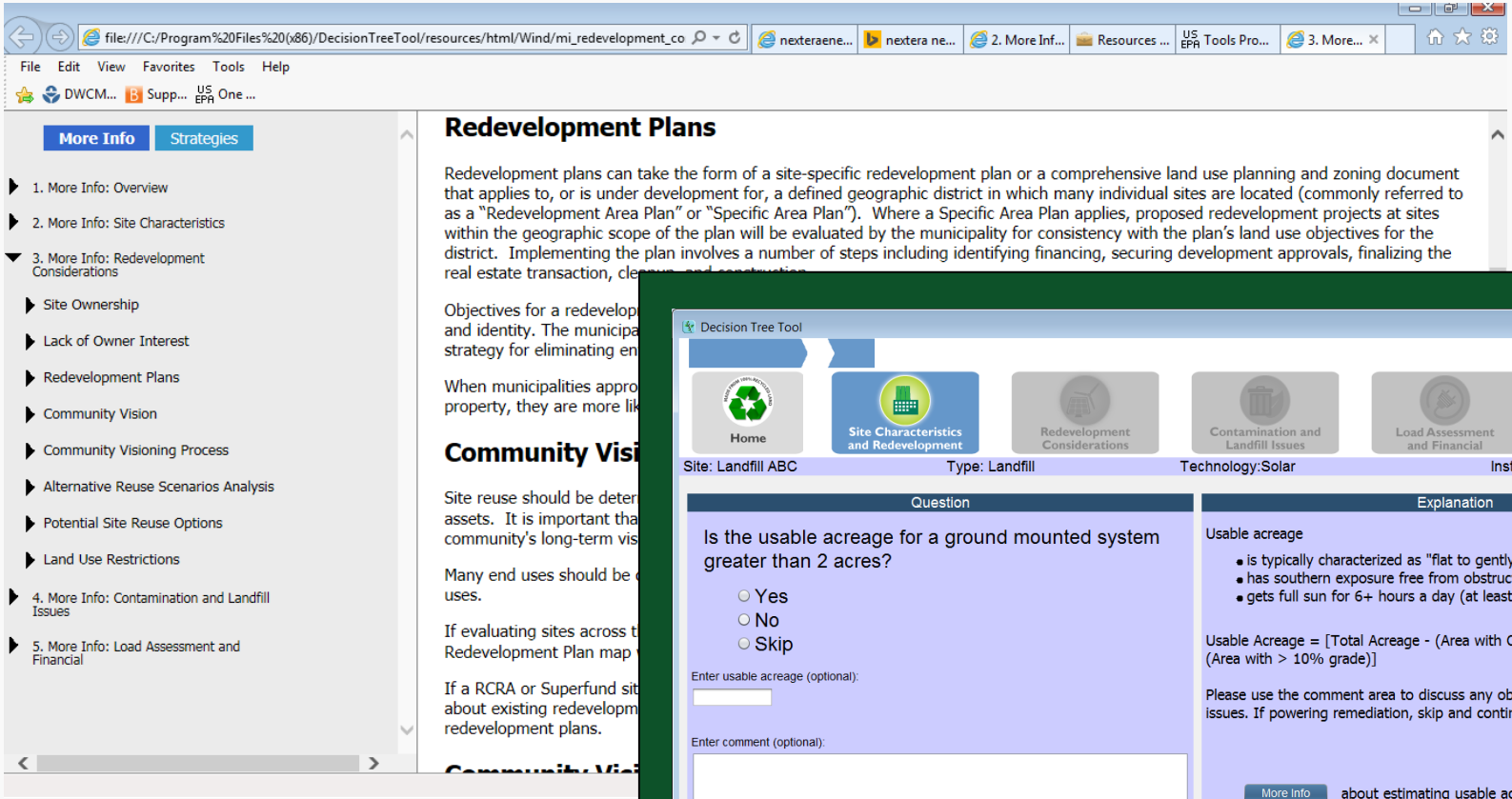
Screening Potential Sites: Electronic Decision Tree tool



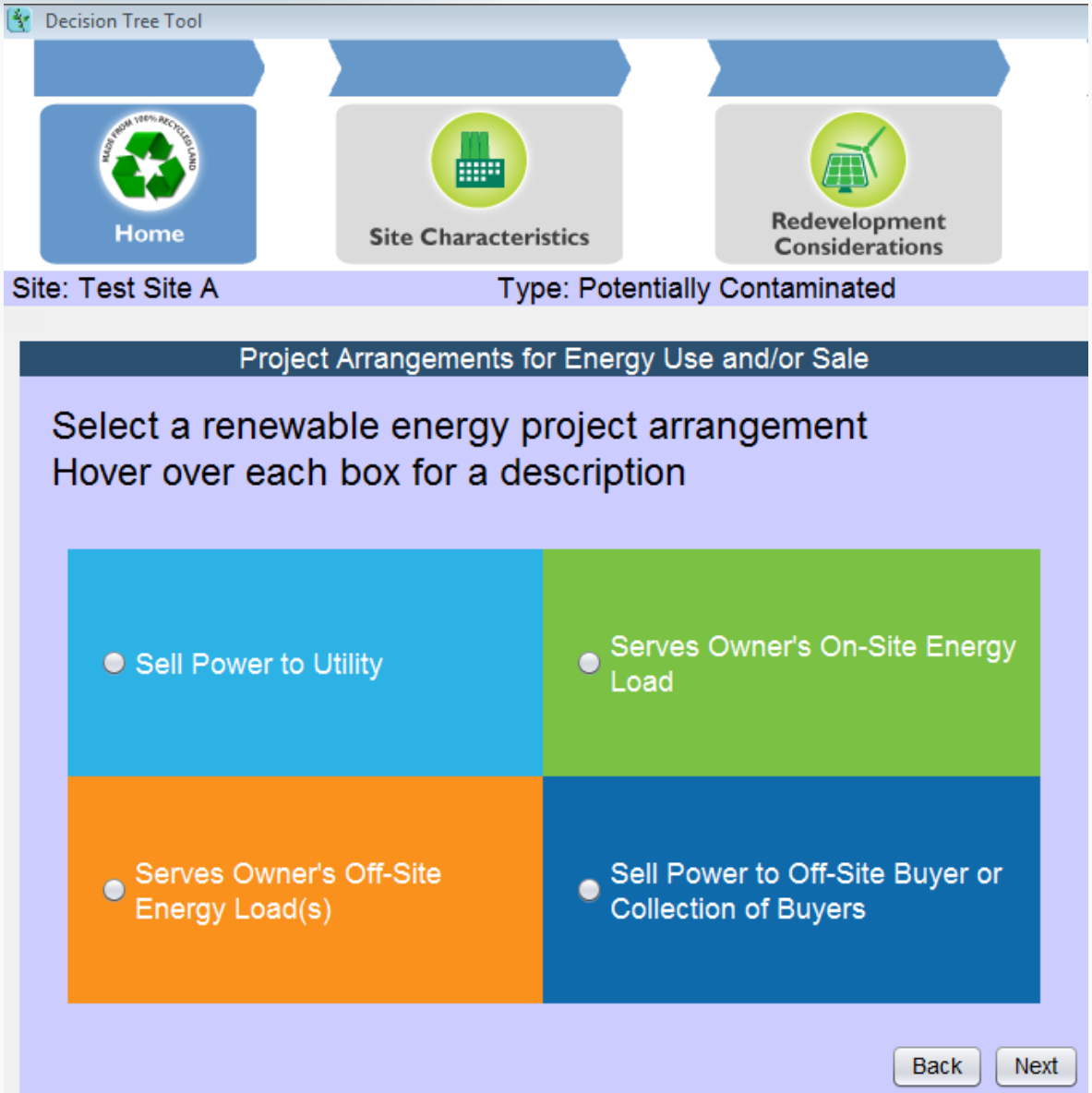
Decision Tree Summary

- **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

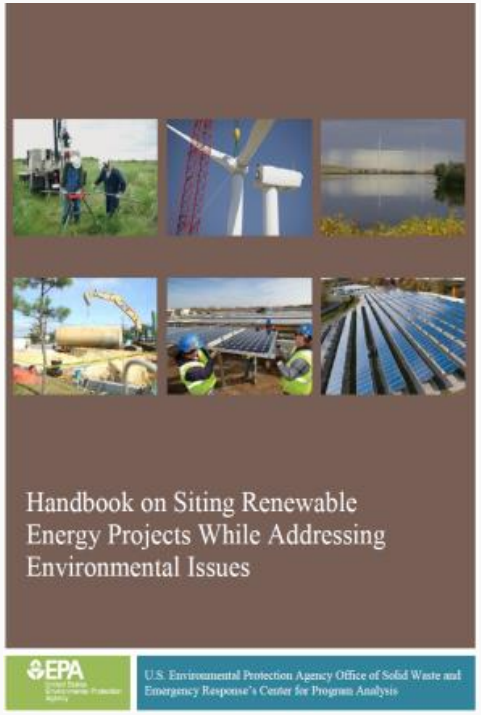


Electronic Decision Tree: Project Arrangements

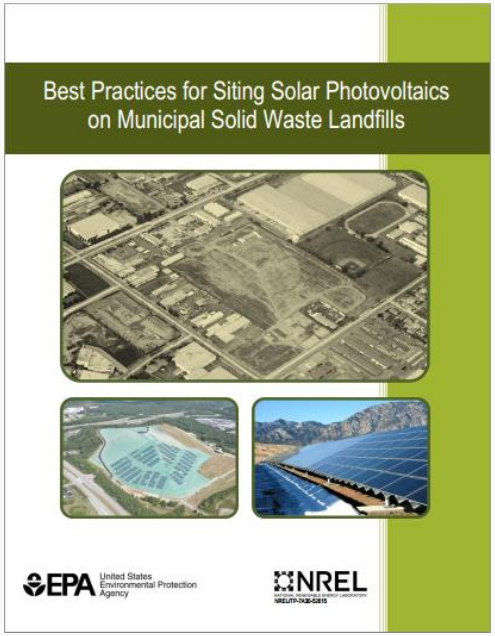


RE-Powering Resources

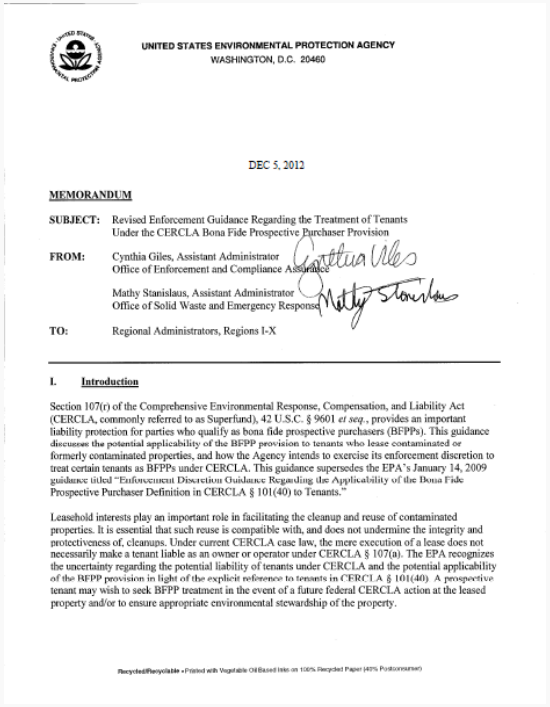
Handbook



Best Practices



Liability Guidance and Comfort Letters



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 5, 2012

MEMORANDUM

SUBJECT: Revised Enforcement Guidance Regarding the Treatment of Tenants Under the CERCLA Bona Fide Prospective Purchaser Provision

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

Mathy Stanislaus, Assistant Administrator
Office of Solid Waste and Emergency Response

TO: Regional Administrators, Regions I-X

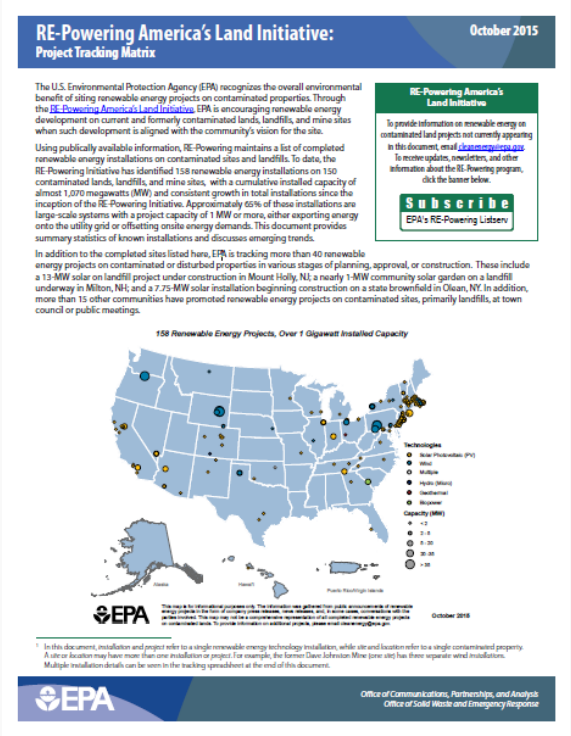
I. Introduction

Section 107(r) 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 qualify as bona fide prospective purchasers (BFPPs). This guidance discusses the potential applicability of the BFPP provision to tenants who lease contaminated or formerly contaminated properties, and how the Agency intends to exercise its enforcement discretion to treat certain tenants as BFPPs under CERCLA. This guidance supersedes the EPA's January 14, 2009 guidance titled "Enforcement Discretion Guidance Regarding the Applicability of the Bona Fide Prospective Purchaser Definition in CERCLA § 101(40) to Tenants."

Leasehold interests play an important role in facilitating the cleanup and reuse of contaminated properties. It is essential that such reuse is compatible with, and does not undermine the integrity and protectiveness of, cleanups. Under current CERCLA case law, the mere execution of a lease does not necessarily make a tenant liable as an owner or operator under CERCLA § 107(a). The EPA recognizes the uncertainty regarding the potential liability of tenants under CERCLA and the potential applicability of the BFPP provision in light of the explicit reference to tenants in CERCLA § 101(40). A prospective tenant may wish to seek BFPP treatment in the event of a future federal CERCLA action at the leased property and/or to ensure appropriate environmental stewardship of the property.

Tracking Matrix and Success Stories

Tracking Matrix



RE-Powering America's Land Initiative:
Project Tracking Matrix

October 2015

The U.S. Environmental Protection Agency (EPA) recognizes the overall environmental benefit of siting renewable energy projects on contaminated properties. Through the RE-Powering America's Land Initiative, EPA is encouraging 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.

Using publically available information, RE-Powering maintains a list of completed renewable energy installations on contaminated sites and landfills. To date, the RE-Powering Initiative has identified 158 renewable energy installations on 150 contaminated lands, landfills, and mine sites, with a cumulative installed capacity of almost 1,070 megawatts (MW) and consistent growth in total installations since the inception of the RE-Powering Initiative. Approximately 65% of these installations are large-scale systems with a project capacity of 1 MW or more, either exporting energy onto the utility grid or offsetting onsite energy demands. This document provides summary statistics of known installations and discusses emerging trends.

RE-Powering America's Land Initiative

To provide information on renewable energy on contaminated land projects not currently appearing in this document, email cleanenergy@epa.gov. To receive updates, newsletters, and other information about the RE-Powering program, click the banner below.

Subscribe
EPA's RE-Powering Listserv

In addition to the completed sites listed here, EPA is tracking more than 40 renewable energy projects on contaminated or disturbed properties in various stages of planning, approval, or construction. These include a 13-MW solar on landfill project under construction in Mount Holly, NJ; a nearly 1-MW community solar garden on a landfill underway in Milton, NH; and a 7.75-MW solar installation beginning construction on a state brownfield in Olean, NY. In addition, more than 15 other communities have promoted renewable energy projects on contaminated sites, primarily landfills, at town council or public meetings.

158 Renewable Energy Projects, Over 1 Gigawatt Installed Capacity

EPA

October 2015

* In this document, installation and project refer to a single renewable energy technology installation, while site and location refer to a single contaminated property. A site or location may have more than one installation or project. For example, the former Dave Johnston Mine (one site) has three separate wind installations. Multiple installation details can be seen in the tracking spreadsheet at the end of this document.

EPA

Office of Communications, Partnerships, and Analysis
Office of Solid Waste and Emergency Response

Success Stories

RE-Powering America's Land:
Siting Renewable Energy on Potentially Contaminated Land and Mine Sites

EPA

An Old New England Town Lights the Way with Solar

April 2014

The U.S. Environmental Protection Agency (EPA) recognizes the overall benefit of siting renewable energy projects on contaminated properties. Through the RE-Powering America's Land Initiative, EPA is encouraging renewable energy development on current and formerly contaminated lands, landfills, and mine sites. This case study highlights a successful renewable energy project on a closed landfill, including information on how key challenges were addressed.

Finding Treasure in a Trash Site

In 2010, representatives in the town of Scituate, MA, sought to find a productive use for its defunct town landfill. After considering recreational uses such as baseball fields, the town decided a solar photovoltaic (PV) installation would be the most viable and cost-effective use of the site, turning a cost center into a source of revenue.

After issuing a request for proposal (RFP) and conducting multiple interviews with respondents, Scituate representatives selected BrightFields Development, LLC (BrightFields), a Wellesley, MA, developer. BrightFields worked with the town, National Grid (utility), and others to tackle challenges and ensure the installation met a multitude of stakeholder objectives, such as cost savings for the town and alignment with the community's environmental interests. The Scituate Landfill is now home to a 3-megawatt (MW) PV installation that, in combination with a nearby wind turbine, provides Scituate with 100% of its municipal power needs from renewable sources.

Property History

Turning a Cost Center into Revenue

Scituate is tucked into the southeastern tip of the greater Boston area, about 23 miles from the city and bordered on the east by the Atlantic Ocean. Incorporated in 1636, the Plymouth County town is now home to 18,000 people and is primarily residential.

Scituate's town-owned landfill operated from 1976 until 1999, accepting a combination of municipal solid waste, construction debris, and residuals from a nearby wastewater treatment facility. In 2000, the municipal landfill was capped and a trash transfer station was constructed on the west portion of the property.

Once the site was capped and confirmed compliant with Massachusetts Department of Environmental Protection (MassDEP) standards, the town began investigating ways to return the land to productive use. The site was deemed inappropriate for

Scituate Landfill solar installation (August 2013). Courtesy of Google Earth

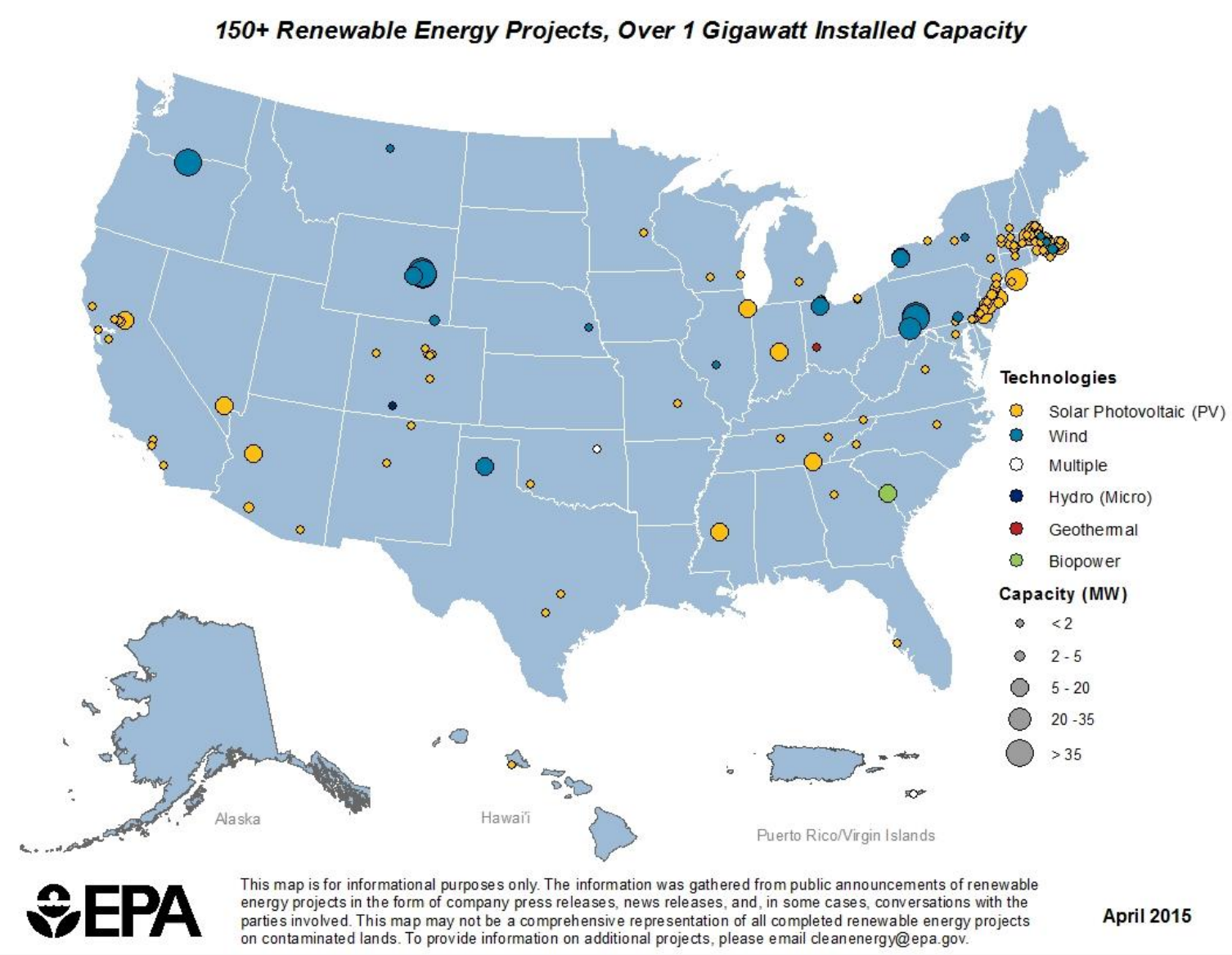
SCITUATE SOLAR LANDFILL AT-A-GLANCE

- Scituate, MA (www.scituatema.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 $220,000 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

"The most important issue was finding a developer with the experience, credibility, permitting expertise, and ability to obtain financing. We didn't select the lowest cost provider, but we did select the one we felt had the best chance of seeing the installation through to completion."

—Al Bangert, Scituate Department of Public Works

Tracking Matrix
--151 Installations Identified To Date



Tracking Matrix - Excerpt

1. Site Description									2. Renewable Energy Information				3. Project Implementation	
Site/Project Name	EPA Region	State	City	Type of Site	Site Owner	Site Ownership Type	Property Acreage	Former Use Description	RE Type	Project Capacity (MW)	Project Acreage	Primare RE Developer Name	Completion Date	Project Type
NC State University - Agricultural Pesticide Landfill	4	NC	Raleigh	Brownfield	NC State University	Private	-	Agricultural Pesticide Landfill	Solar PV	0.08	-	Carolina Solar Energy	2007	Wholesale Electricity
Nellis AFB Solar Facility Site	9	NV	Las Vegas	RCRA	U.S. Air Force	Federal	14,000	Landfill/landfill buffer	Solar PV	14.20	140.0	MMA Renewable Ventures LLC,	2007	Onsite Use - General
New Rifle Mill	8	CO	Rifle	Other	City of Rifle	Municipal	130	Former DOE Uranium Processing Mill	Solar PV	1.70	12.0	SunEdison	2009	Onsite Use - General
Norfolk Landfill Phase I	1	MA	Norfolk	Landfill	Town of Norfolk	Municipal	51	MSW Landfill and Adjacent Land	Solar PV	0.55	1.6	Constellation Solar Massachusetts, LLC	2012	Wholesale Electricity
Norfolk Landfill Phase II	1	MA	Norfolk	Landfill	Town of Norfolk	Municipal	51	MSW Landfill and Adjacent Land	Solar PV	1.05	3.5	Constellation Solar Massachusetts, LLC	2012	Wholesale Electricity
Oliver Street Landfill	1	MA	Easthampton	Landfill	City of Easthampton	Municipal	40	MSW Landfill	Solar PV	2.30	12.0	Borrego Solar	2012	Wholesale Electricity
Pantex Renewable Energy Project (PREP)	6	TX	Amarillo	Superfund	U.S. Department of Energy NNSA and Texas Tech University	Federal	16,000	Nuclear weapon assembly and disassembly	Wind	11.50	1,500.0	Siemens USA	2014	Onsite Use - General
Parklands Solar Farm	2	NJ	Bordentown Township	Landfill	Waste Management	Private	95	MSW Landfill	Solar PV	10.14	40.0	PSE&G	2015	Wholesale Electricity
Paulsboro Terminal Landfill	2	NJ	Paulsboro	Brownfield	BP	Private	17	Former refined petroleum and specialty chemical bulk storage and distribution facility	Solar PV	0.28	5.0	BP	2002	Onsite Use - Green Remediation
Pemaco Superfund Site	9	CA	Maywood	Superfund	City of Maywood	Municipal	1	Custom Chemical Blender	Solar PV	0.01	1.4	Unknown	2007	Onsite Use - Green Remediation

Success Stories
Case Study: Solar on Landfill

SCITUATE SOLAR LANDFILL AT-A-GLANCE

- Scituate, MA (www.scituatema.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

Success Stories
Case Study: Green Remediation

Busy Bee's Laundry

- Case Study (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

MAYWOOD SOLAR FARM

- 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

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 (2)

- Financing and procurement arrangements include
  - Owner / Operator Financing
  - Third Party Developers with Power Purchase Agreements (PPAs)
  - Community Solar
  - Community Choice Aggregation

- Federal Tax Incentives

RE-Powering America's Land Initiative:
Financing Renewable Energy Projects on Contaminated Lands

May 2013

The U.S. Environmental Protection Agency (EPA) recognizes the overall environmental benefit of siting renewable energy projects on contaminated lands. This fact sheet answers questions from site owners, renewable energy developers and communities concerning financing tools and structures, as well as federal financial incentives that may be available for redeveloping potentially contaminated sites, landfills, or mine sites for renewable energy.

Have any renewable energy projects been financed and built on potentially contaminated lands, landfills or mine sites?

Yes. To date, EPA's RE-Powering America's Land Initiative has identified over 70 renewable energy projects installed on contaminated properties or landfills, with a cumulative capacity just over 215 megawatts (MW) – the equivalent of a mid-size, coal-fired power plant. Over half are large-scale systems with a project capacity of 1 MW or greater, with many exporting energy onto the utility grid or offsetting onsite energy demands.

How are renewable energy projects financed?

Various approaches have been employed successfully. Project financing varies by project size, as well as local market conditions and available incentives. For many large-scale projects, options range from owner-operator financing, where the system is purchased directly, to third-party power purchase agreements, where the

Re-Powering America's Land Initiative

Through the RE-Powering America's Land Initiative, the EPA promotes the reuse of potentially contaminated lands, landfills and mine sites for renewable energy through a combination of tailored redevelopment tools for communities and developers, as well as site-specific technical support.

The Initiative aims to revitalize degraded land by promoting renewable energy as a productive end use, when aligned with the community vision for the site.

Advantages of Reuse

Potentially contaminated lands, landfills and mining sites offer developers a unique value proposition for renewable energy deployment by:

- Leveraging existing infrastructure
- Reducing project cycle times through streamlined permitting and zoning

RE-Powering America's Land:
Action Plan

- 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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Liability Questions
Phil Page (page.phillip@epa.gov) (202) 564-4211

Regions

Region 1 – New England
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Thomas Potter

Chief, Clean Energy Development Coordinator

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

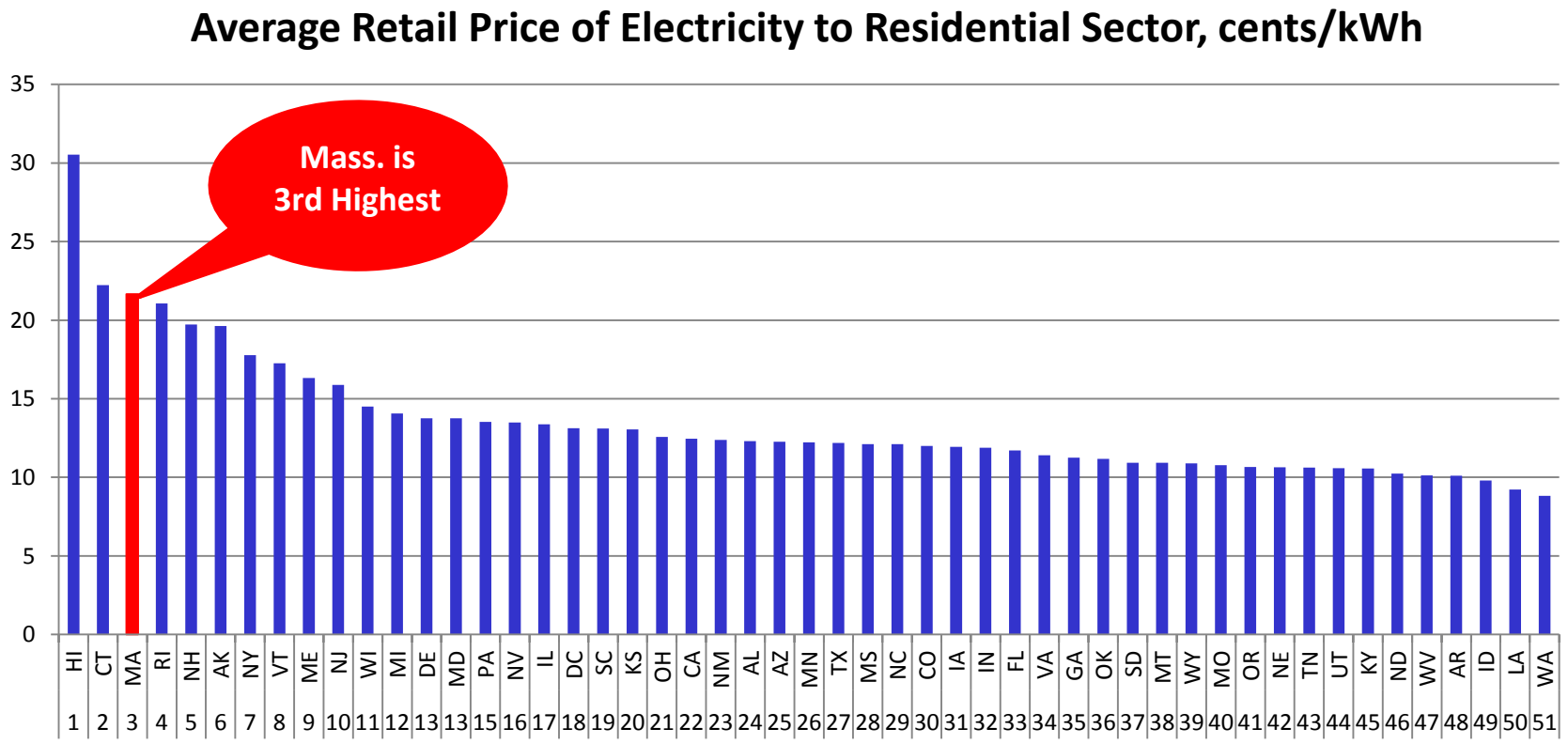
Thomas M. Potter, Clean Energy Development Coordinator

MassDEP

Massachusetts Agenda

- Why in Renewable Energy Development on Contaminated Land in Massachusetts?
- Goals and Drivers
- Technical Feasibility/Resources
- Regulatory Feasibility
- Financial Feasibility

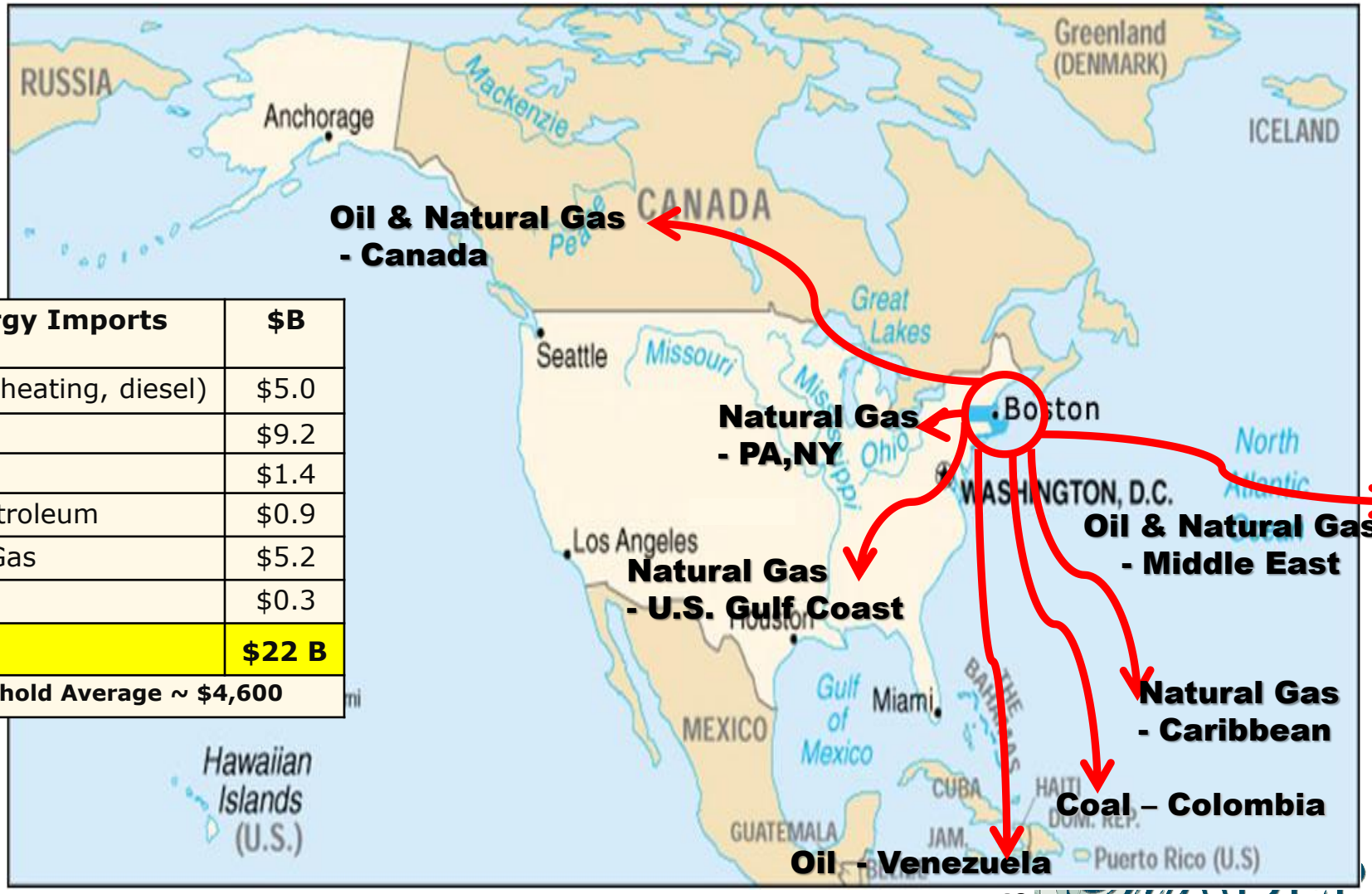
Mass. Has High Electricity Prices!



Source: EIA Form 826

Energy Dollars Flow Out of MA

We spend $22B per year on energy; 80% leaves MA -- $18B

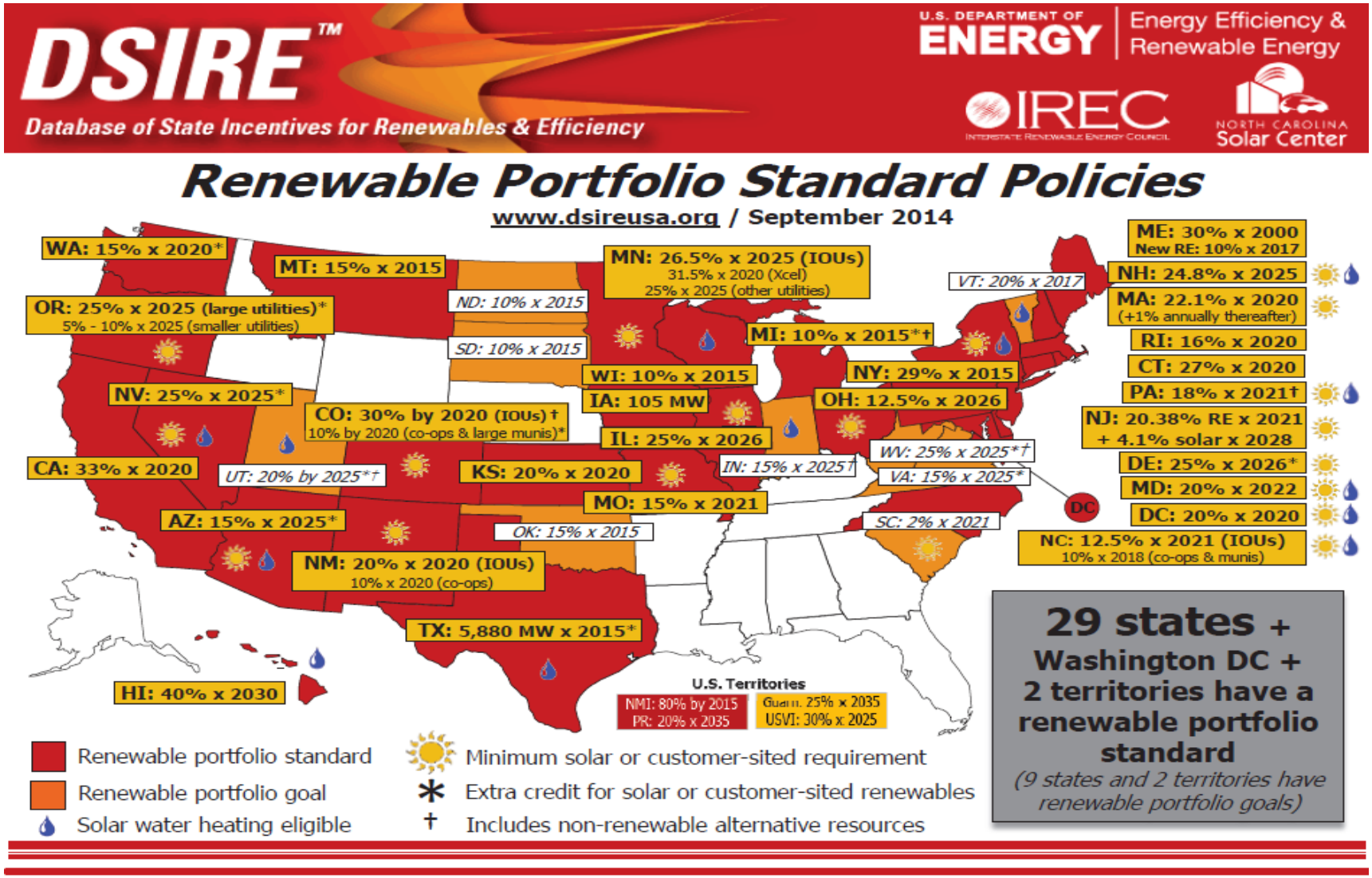


MA Energy Imports 2008	$B
Fuel Oil (heating, diesel)	$5.0
Gasoline	$9.2
Jet Fuel	$1.4
Other Petroleum	$0.9
Natural Gas	$5.2
Coal	$0.3
Total	**$22 B**
Per Household Average ~ $4,600	

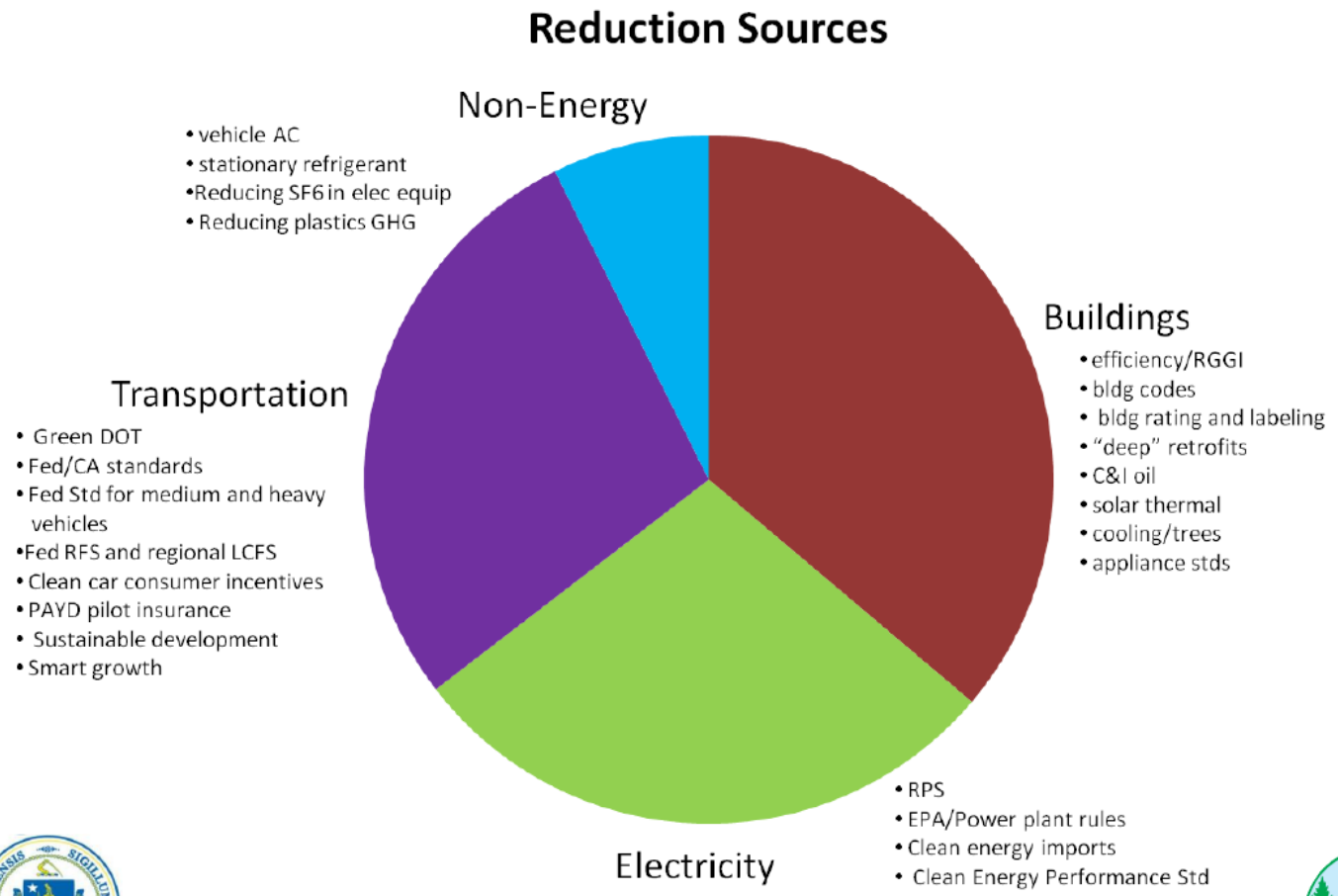
Massachusetts Clean Energy

- 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



EMISSIONS: GHG Emission Reduction Opportunities



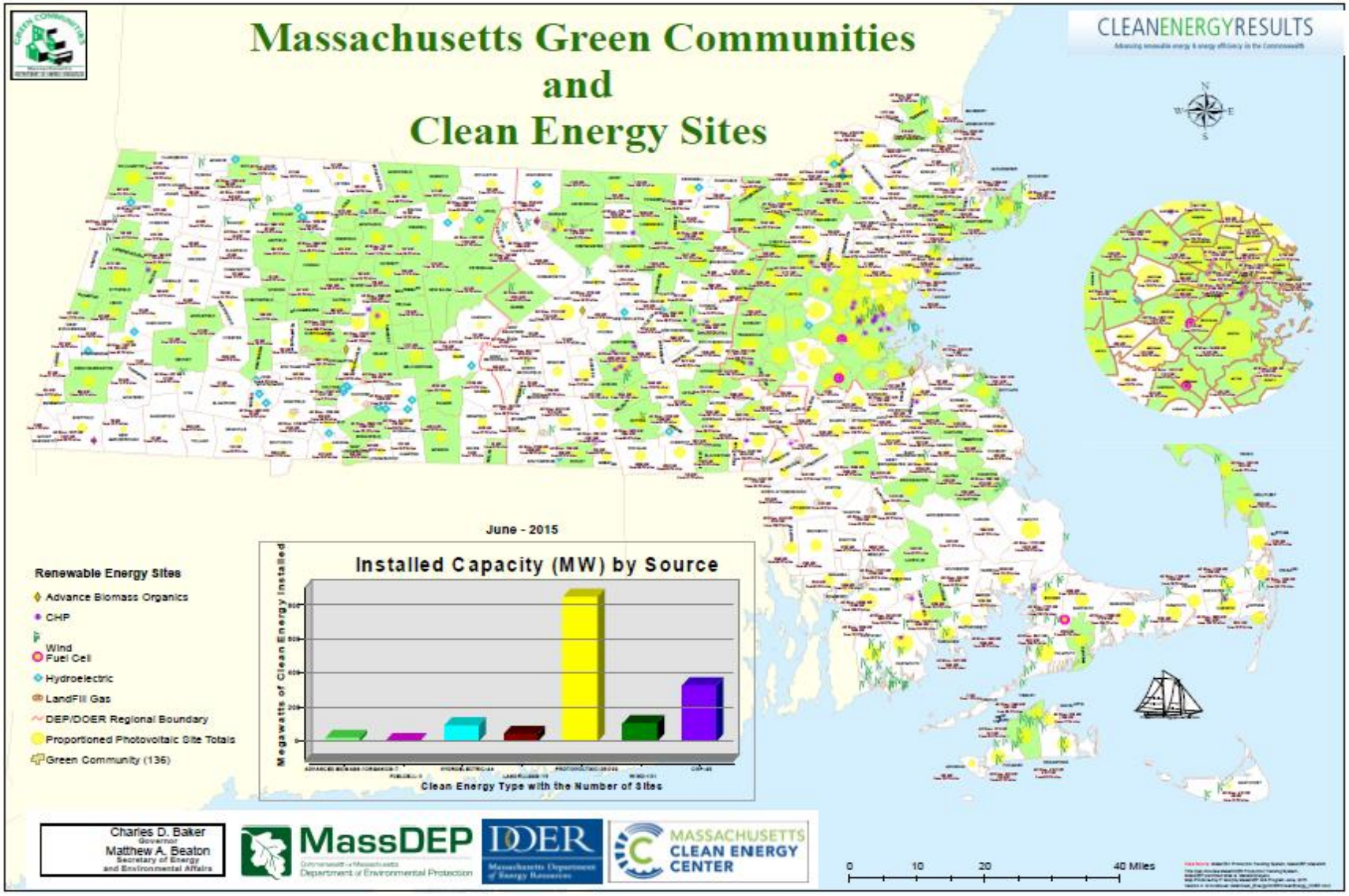
Executive Office of Energy and Environmental Affairs

CLEANENERGYRESULTS

- 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**

CLEANENERGYRESULTS

- 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


Massachusetts Green Communities
and
Clean Energy Sites
CLEANENERGYRESULTS
June - 2015
Renewable Energy Sites
Advance Biomass Organics
CHP
Wind
Fuel Cell
Hydroelectric
LandFill Gas
DEP/DOER Regional Boundary
Proportioned Photovoltaic Site Totals
Green Community (136)
Installed Capacity (MW) by Source
Megawatts of Clean Energy Installed
Clean Energy Type with the Number of Sites
Charles D. Baker
Governor
Matthew A. Beaton
Secretary of Energy and Environmental Affairs
MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection
DOER
Massachusetts Department of Energy Resources
MASSACHUSETTS
CLEAN ENERGY
CENTER
0
10
20
40 Miles

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**

*MassDEP Bureau of Air & Waste (BAW)

Brockton Brightfields, 425 kW solar PV

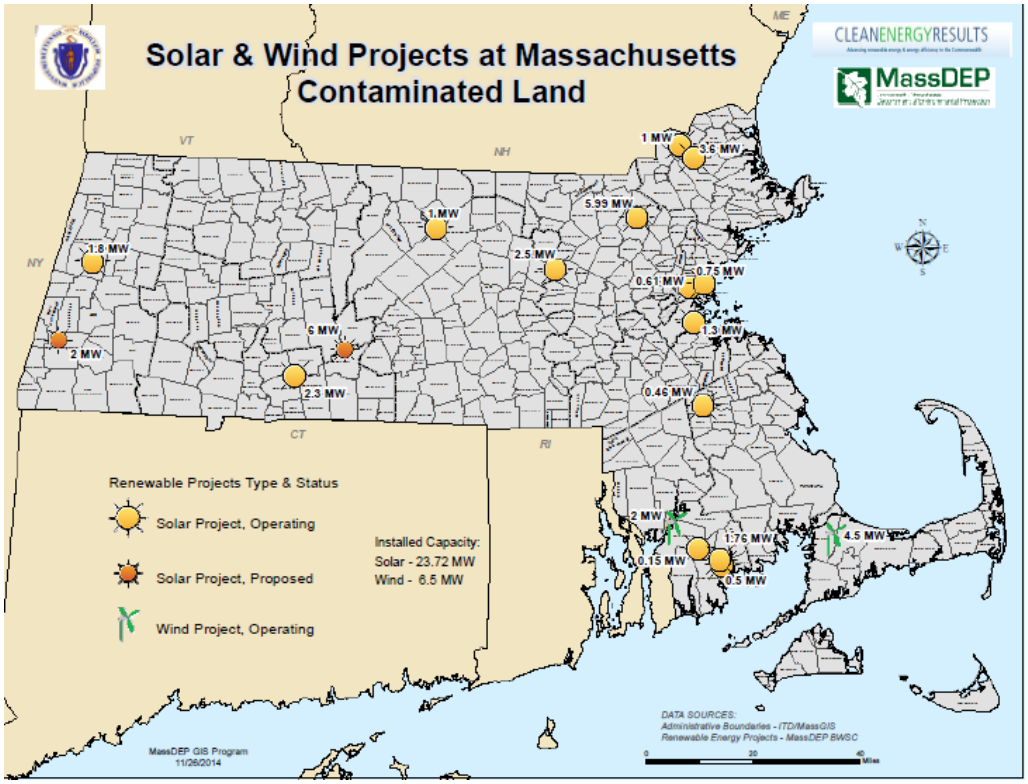
“Operating” Installations

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



http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/contaminated-land-and-brownfields/

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 manufactured gas plant

Everett Solar Project

Fixed tilt system at landfill

Pittsfield MSW

Two of three turbines powering remediation

MMR Wind Turbines

Solar array installed at former foundry

Indian Orchard Solar Facility

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

Massachusetts Focused

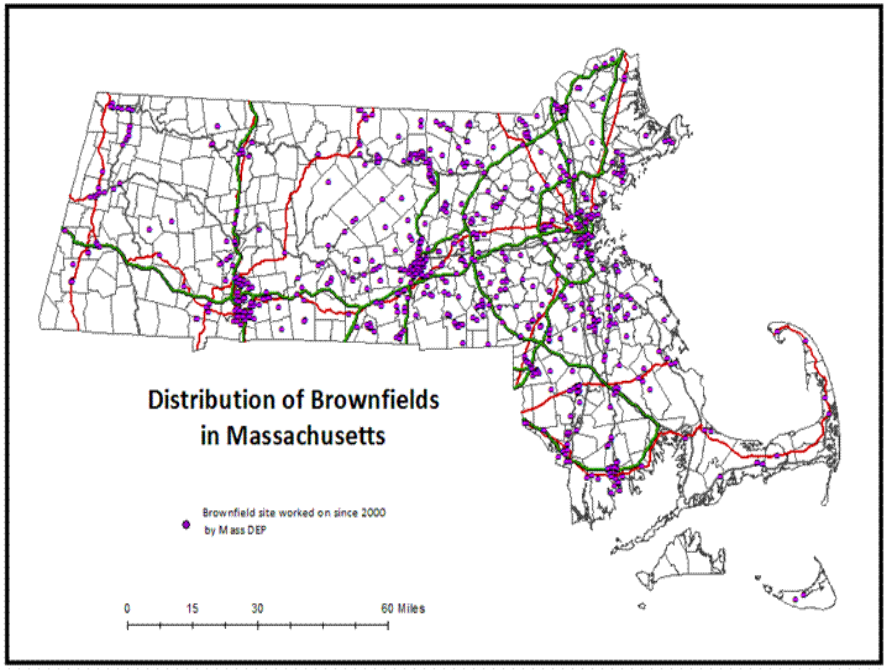
Technical Feasibility/Resources

(abbreviated)

MassDEP

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

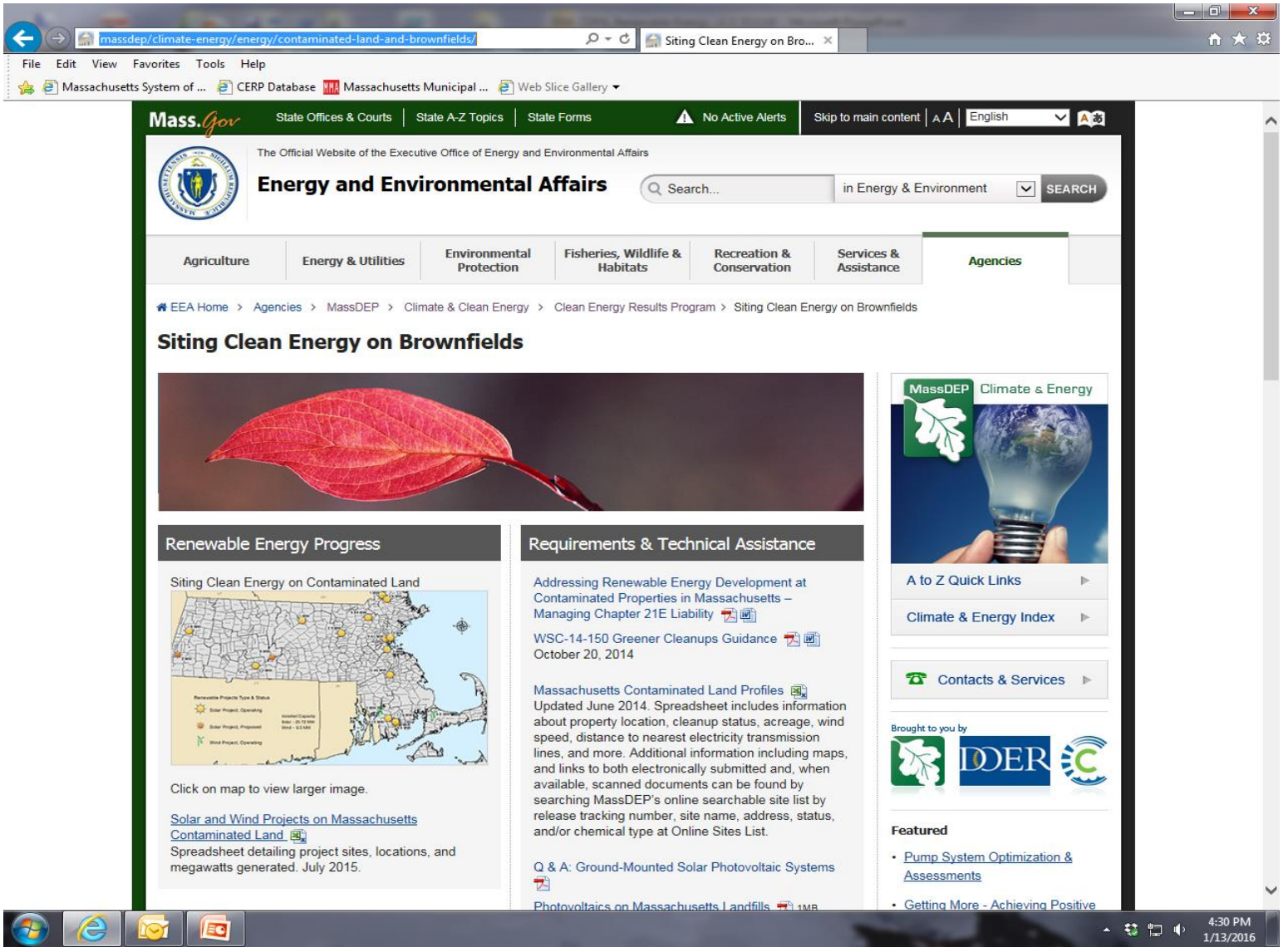


Establish Ownership & Site Control

- **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

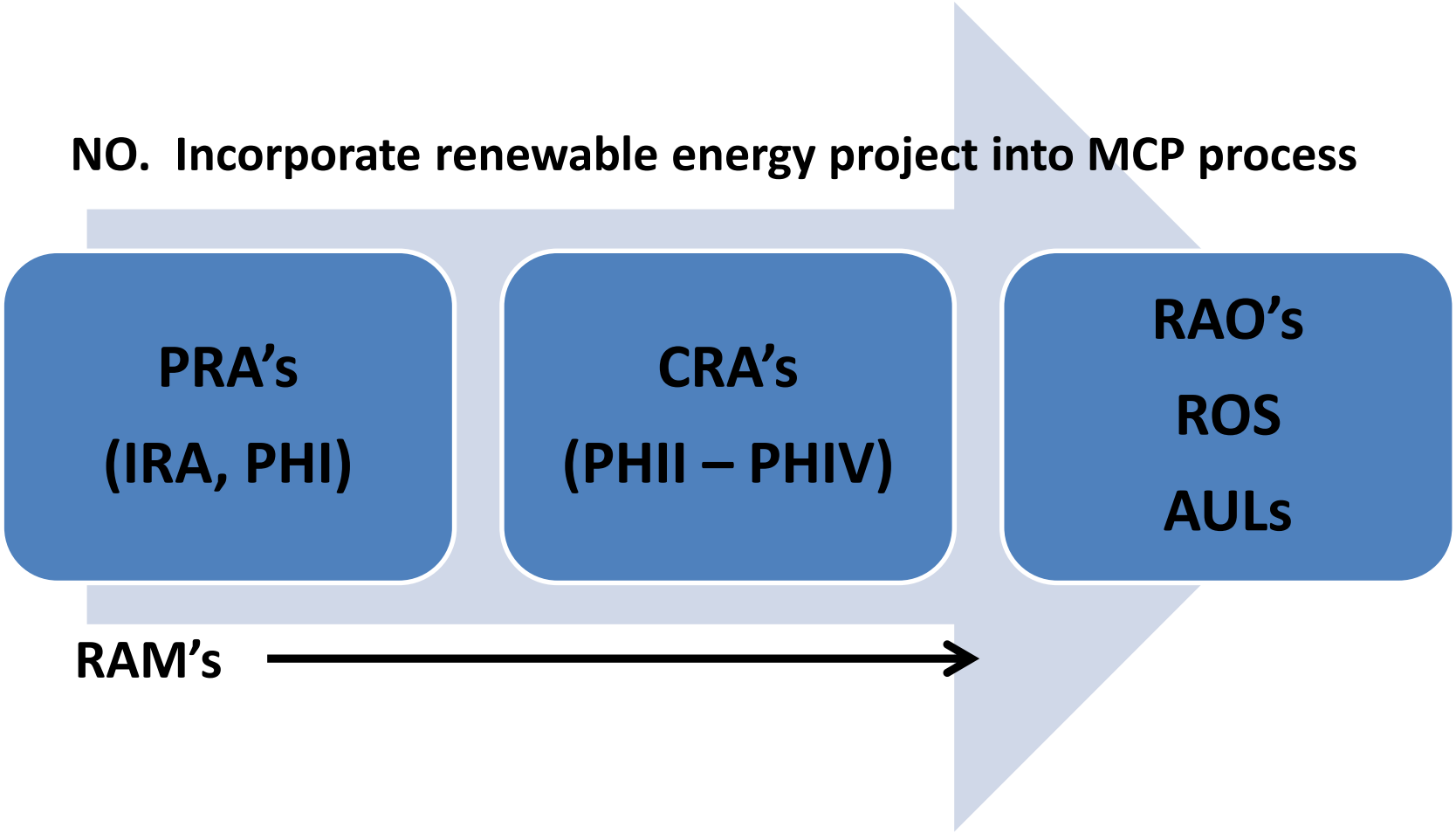
- **2002 Brownfield Amendments to CERCLA** *(new protections)*
- **"Innocent Landowners"** (modified defense)
  - i.e. State/Local Governments
- **"Bona Fide Prospective Purchasers" (BFPPs)**
  - Protects purchaser (or tenant of purchaser)
  - Can purchase with knowledge of contamination
  - Threshold 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



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

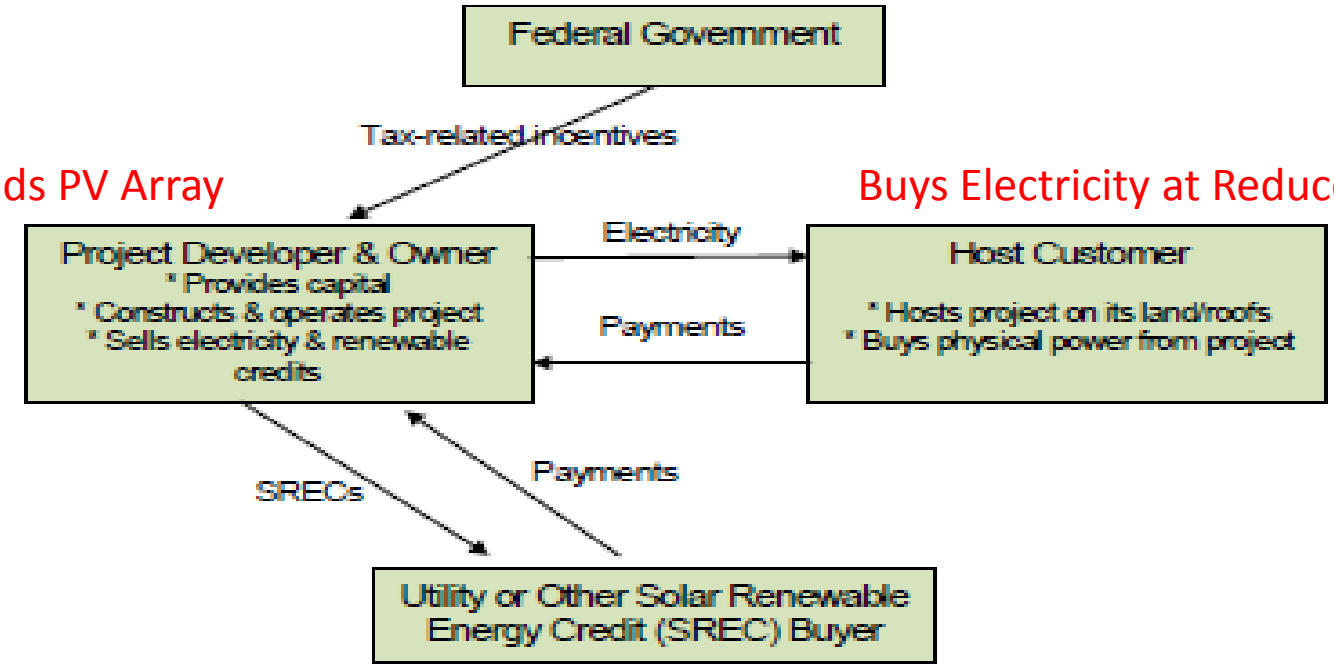
    Qualifications (for above three)
    - Borrower did not own/operate at time of release and/or cause or contribute to contamination
    - Must be located in Economically Distressed Area (EDA)
    - MCP related cleanups only (need RTN)
- **Environmental Insurance (MassBusiness)**
  - 50% State Subsidy 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)



SREC Payments, Net Metering Credits (retail 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)**
  - I SREC = 1 MWh
  - Retail electrical providers required to buy (RPS)

DRIVER: Solar Incentives in Massachusetts

Incentives
Federal Tax Incentives (30%)
Federal Accelerated Depreciation (5 years)
MA Net Metering (credits)
MA RPS Solar Carve-out Renewable Energy Certificates (SREC) Sales

www.house-power.com/blog/wp-content/uploads/2009/12/iStock_000009001180XSmall.jpg

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:

Market Sector	Generation Unit Type	SREC Factor
A	1. Generation Units with a capacity of <=25 kW DC 2. Solar Canopy Generation Units 3. Emergency Power Generation Units 4. Community Shared Solar Generation Units 5. Low or Moderate Income Housing Generation Units	1.0
B	1. Building Mounted Generation Units 2. Ground mounted Generation Units with a capacity > 25 kW DC with 67% or more of the electric output on an annual basis used by an on-site load	0.9
C	1. Generation Units sited on Eligible Landfills 2. Generation Units sited on Brownfield's 3. Ground mounted Generation Units with a capacity of <= 650 kW with less than 67% of the electrical output on an annual basis used by an on-site load.	0.8
Managed Growth	Unit does not meet the criteria of Market Sector A, B, or C [NOTE: FY14 Capacity Block = 26 MW, FY15 = 80 MW to FY17 = 0]	0.7

SREC II Eligibility = 10 years/40 quarters

Year	$/MWh		
	Auction Price Bid	Auction Price After 5% Fee	ACP Rate
2014	300	285	375
2015	300	285	375
2016	300	285	350
2017	285	271	350
2018	271	257	350
2019	257	244	333
2020	244	232	316
2021	232	221	300
2022	221	210	285
2023	210	199	271
2024	199	189	257
2025	Values announced by DOER each year to maintain 10-year forward schedule.		
2026			
2027			
2028			
2029			
2030			

Market Sector C Generating Units:
At 80%

285 * 0.80 = $228

225 CMR 14.00 (effective 04/25/14)
Renewable Energy Portfolio Standard – CLASS I

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)

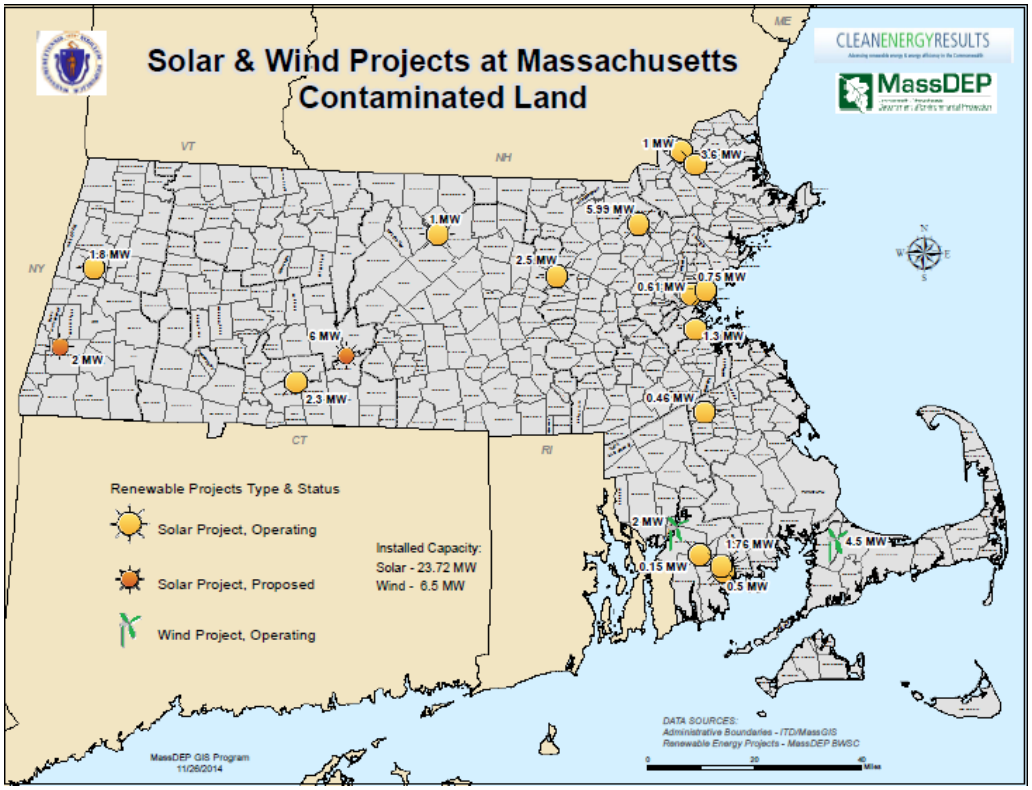
"Brownfield Pre-Determination Request Form"

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)

http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/doer/

Massachusetts Clean Energy Center (CEC)

http://www.masscec.com/

Mark Lewis

Brownfields Coordinator

Connecticut Department of Energy & Environmental Protection

CONNECTICUT'S SITING CLEAN ENERGY ON BROWNFIELDS WEB PAGE

January 14, 2016

CDFA Financing Green Energy on Brownfields Webinar

Connecticut Department of Energy and Environmental Protection

Siting Clean Energy on Connecticut Brownfields

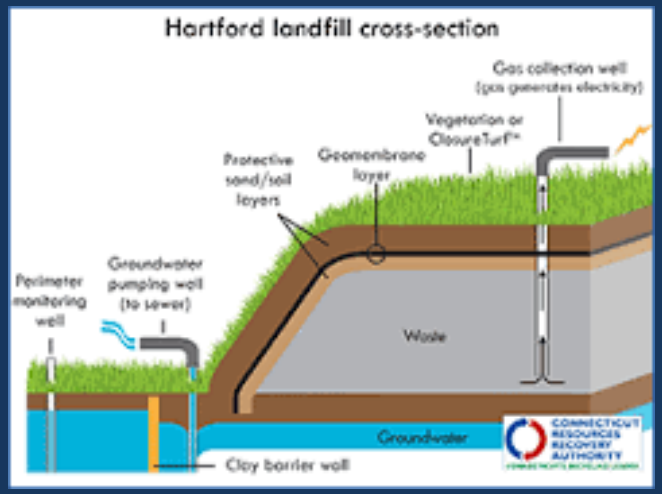
Brownfields Can be an Ideal Location for Alternative Energy Sources

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

Planned “eco park” at Seaside Park Landfill
Bridgeport, Connecticut

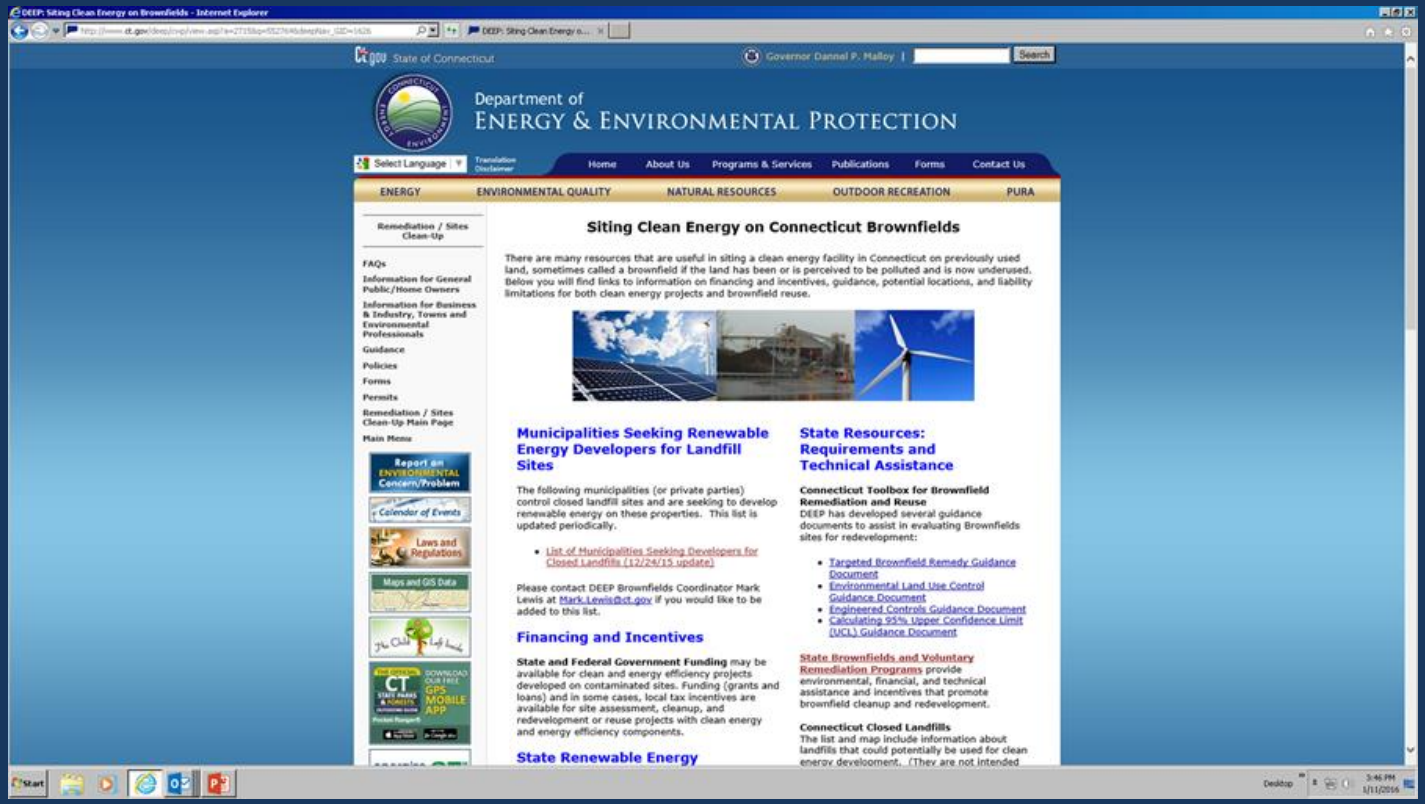
Combines Several DEEP Goals

- 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:
http://www.ct.gov/deep/cwp/view.asp?a=2715&q=552764&deepNav_GID=1626



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

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USDA Rural Development, Rural Utilities Service

USDA United States Department of Agriculture

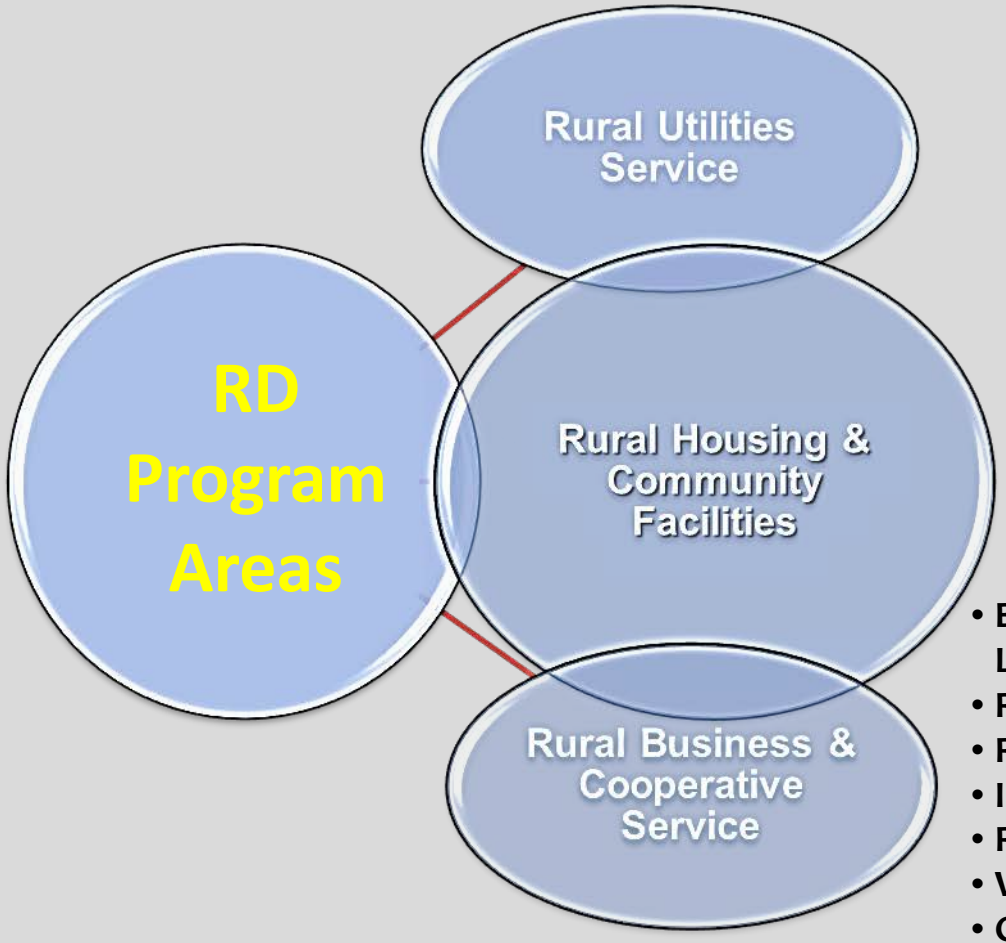
Rural Development

Presented by Gerry Moore and Titilayo Ogunyale

USDA Rural Utilities Service

Renewable Energy and Energy Efficiency

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

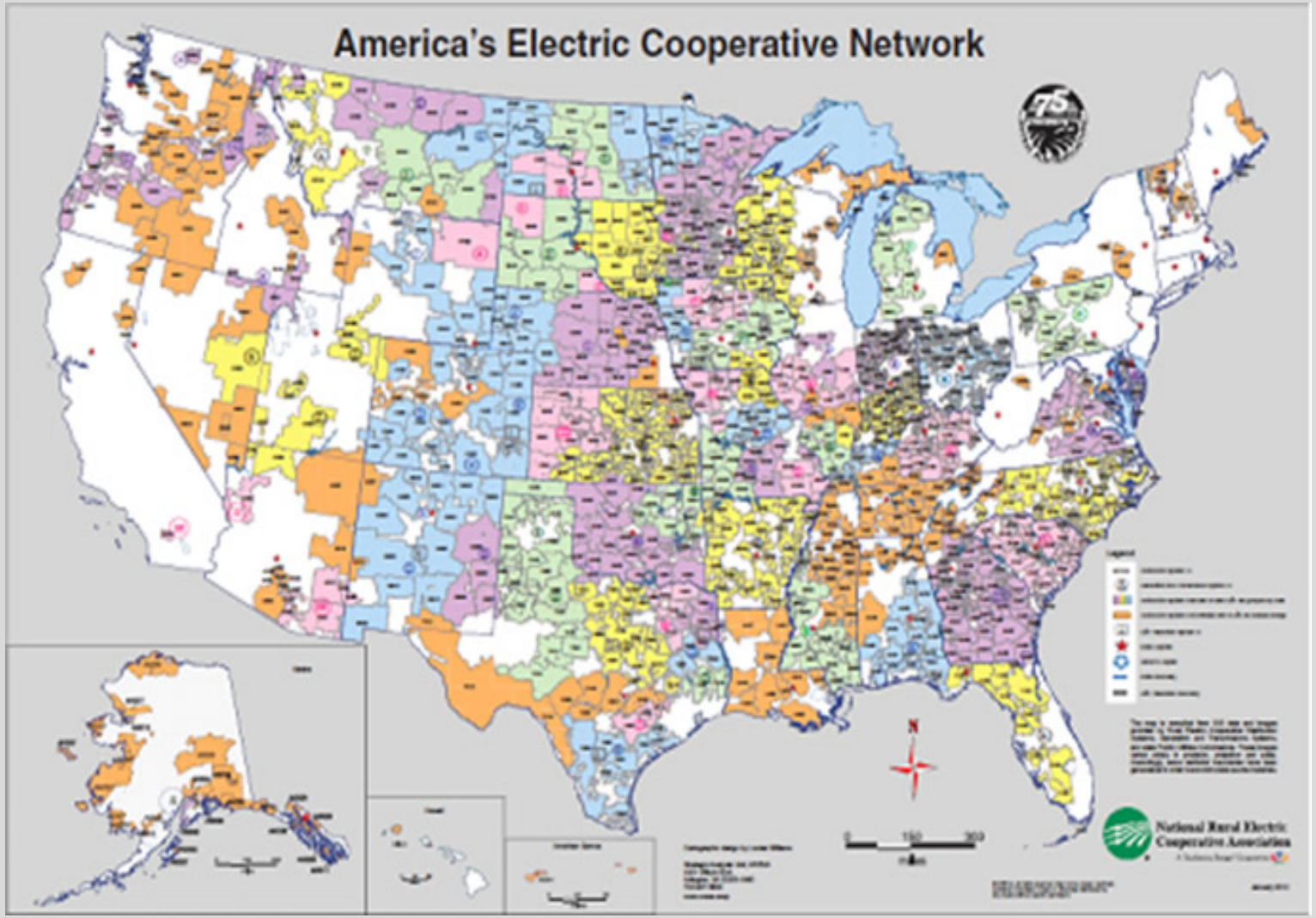
- Business and Industry Guaranteed Loans
- Rural Business Enterprise Grants
- Rural Business Opportunity Grants
- Intermediary Relending Program
- Rural Energy for America Program
- Value Added Producer Grants
- Cooperative Development Assistance

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

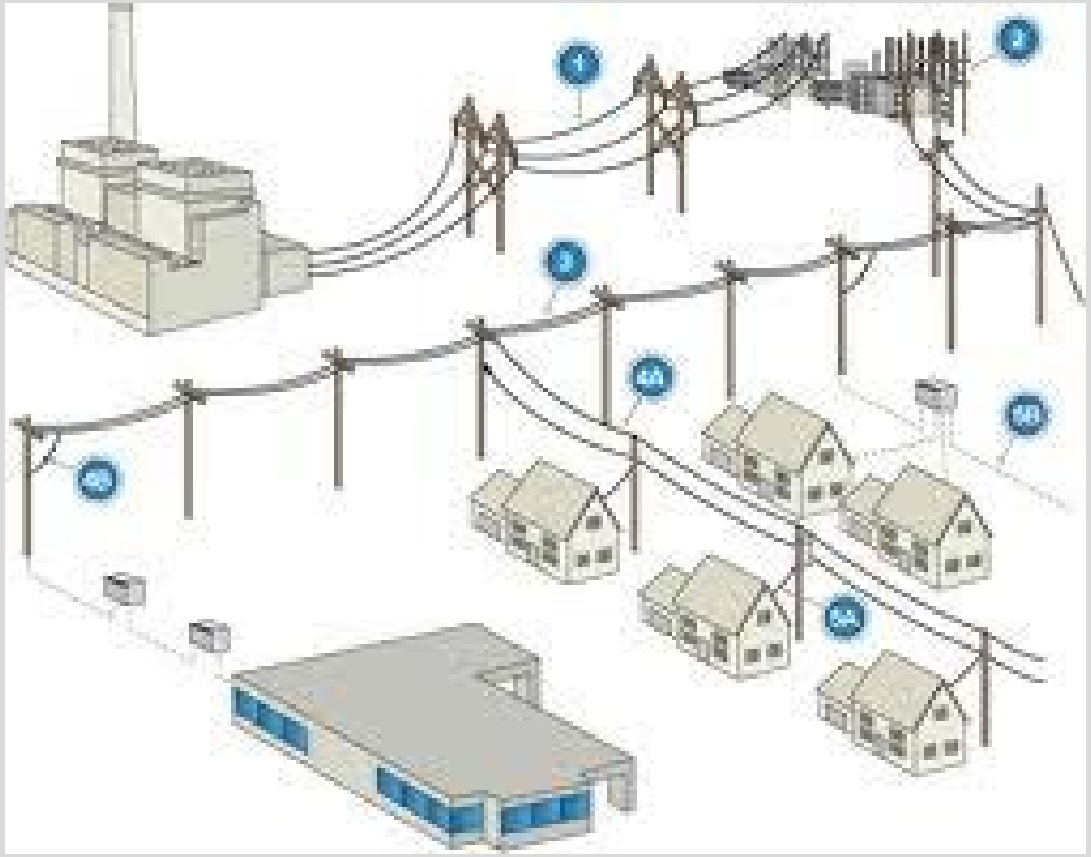
Electric Program



Electric Program

The Rural Utilities Service (RUS) Electric Program provides financial assistance and engineering expertise to:

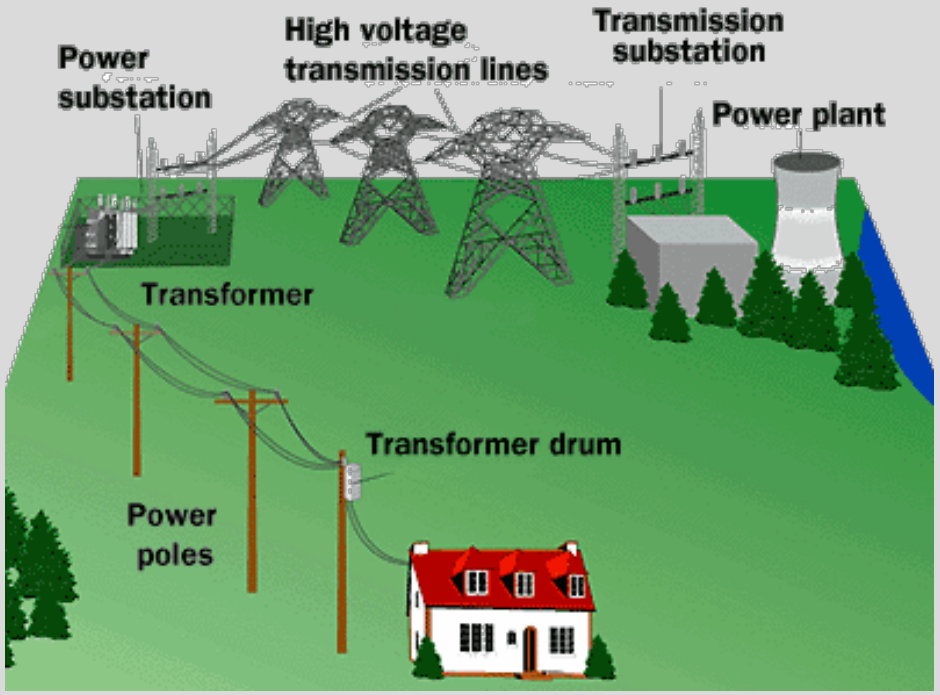
- 500 + Distribution Utilities
- 30 + Generation and Transmission Entities



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.



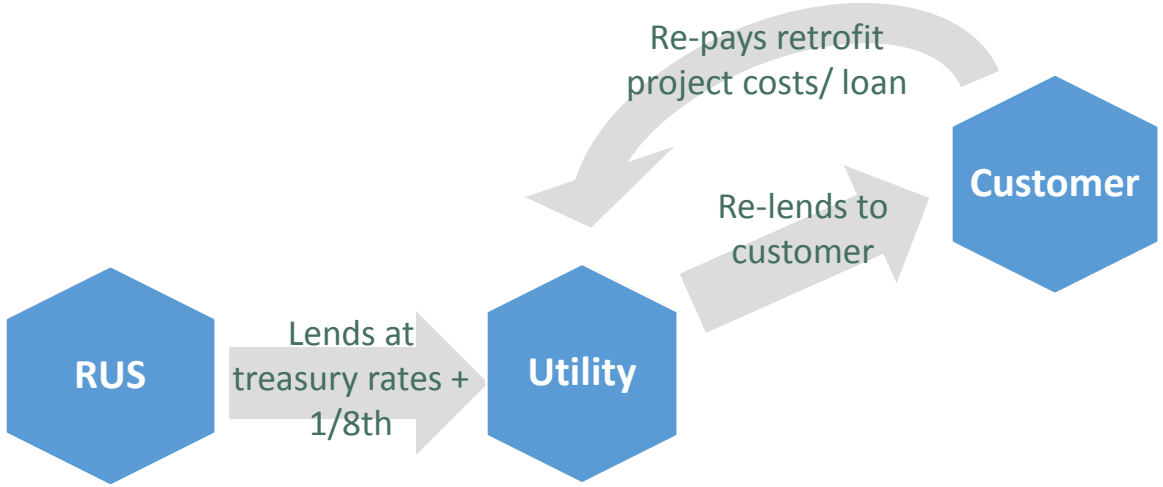
Renewable Energy Loans
Project loans vs. System loans

- 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

United States Department of Agriculture

Rural Development

USDA Rural Development is committed to the future of rural communities.

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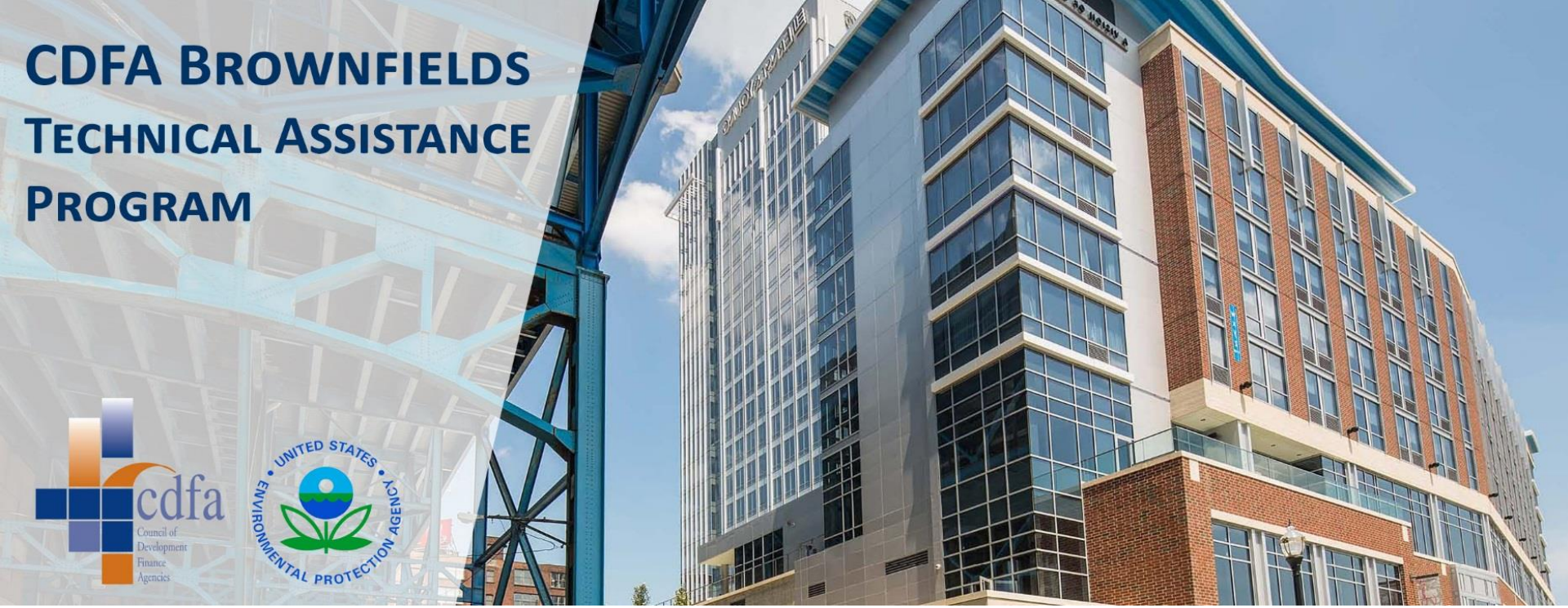
CDFA Brownfields Technical Assistance Program



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