Welcome to the CLU-IN Internet Seminar

Renewable Energy on Contaminated Land: Tools for Local Governments

Sponsored by: U.S. EPA, Office of Solid Waste and Emergency Response, Center for Program Analysis

Delivered: May 22, 2012, 2:00 PM - 3:30 PM, EDT (18:00-19:30 GMT)

Instructors:

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Moderator:

Lura Matthews, U.S. EPA, RE-Powering America's Land Initiative (matthews.lura@epa.gov)

Visit the Clean Up Information Network online at www.cluin.org

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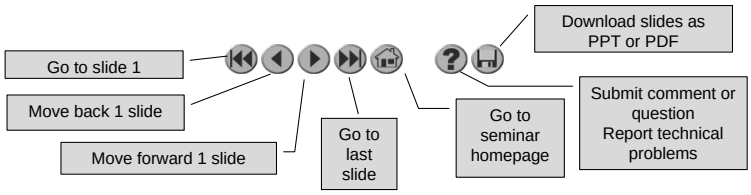
Housekeeping

- Please mute your phone lines, Do NOT put this call on hold
- Q&A
- Turn off any pop-up blockers
- Move through slides using # links on left or buttons



- This event is being recorded
- Archives accessed for free **http://cluin.org/live/archive/**

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Although I'm sure that some of you have these rules memorized from previous CLU-IN events, let's run through them quickly for our new participants.

Please mute your phone lines during the seminar to minimize disruption and background noise. If you do not have a mute button, press *6 to mute #6 to unmute your lines at anytime. Also, please do NOT put this call on hold as this may bring delightful, but unwanted background music over the lines and interupt the seminar.

You should note that throughout the seminar, we will ask for your feedback. You do not need to wait for Q&A breaks to ask questions or provide comments. To submit comments/questions and report technical problems, please use the ? Icon at the top of your screen. You can move forward/backward in the slides by using the single arrow buttons (left moves back 1 slide, right moves advances 1 slide). The double arrowed buttons will take you to 1st and last slides respectively. You may also advance to any slide using the numbered links that appear on the left side of your screen. The button with a house icon will take you back to main seminar page which displays our agenda, speaker information, links to the slides and additional resources. Lastly, the button with a computer disc can be used to download and save today's presentation materials.

With that, please move to slide 3.

RE-Powering America's Land Initiative:
Tools for Local Governments

May 22, 2012

Shea Jones
OSWER Center for Program Analysis
U.S. Environmental Protection Agency

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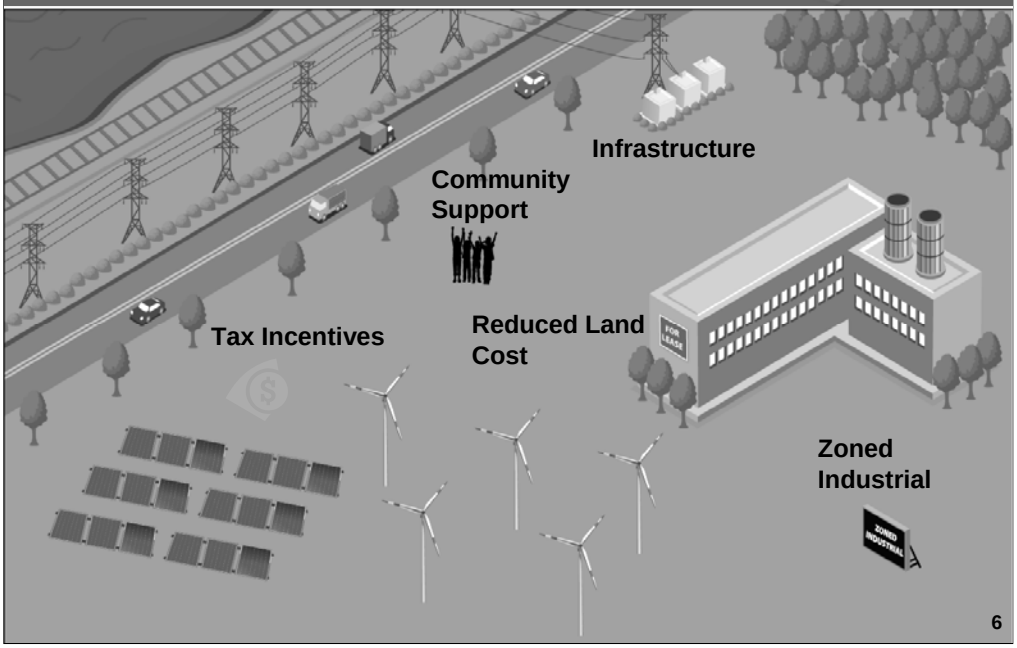
Presentation Topics

- What is RE-Powering America's Land Initiative?
- Why Focus on Renewable Energy Production on Contaminated Sites?
- RE-Powering Tools
- What's Next?

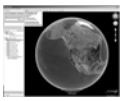
What is RE-Powering America's Land Initiative?

Launched in 2008 to encourage renewable energy (RE) development on potentially contaminated land, mine sites, and landfills when aligned with the community's vision for the site.

Why Focus on Renewable Energy on Contaminated Sites?



RE-Powering Tools



- **Google Earth Mapping**
  - Joint EPA-NREL venture produced interactive maps
- **Technical Assistance – EPA and NREL**
- **Success Stories and Case Studies**
- **Handbook on Siting Renewable Energy Projects**
- **Decision Trees to Screen Sites for Solar and Wind**
- **Quarterly webinar series**
  - First webinar held on 2/7/12 – Decision Tree Training (over 250 attendees)

Google Earth Mapping Tool

- **Mapped EPA inventory of EPA tracked sites (over 15 million acres)**
  - Abandoned Mine Lands
  - Brownfields – Sites that received a Brownfields grant
  - RCRA
  - Superfund
  - Landfills
- **National Renewable Energy Laboratory (NREL) Data**
  - Wind, Solar, Biomass, and Geothermal Resources
- **Infrastructure Data**
  - U.S. Highways
  - U.S. National Transportation Atlas Railroads
  - Transmission Lines

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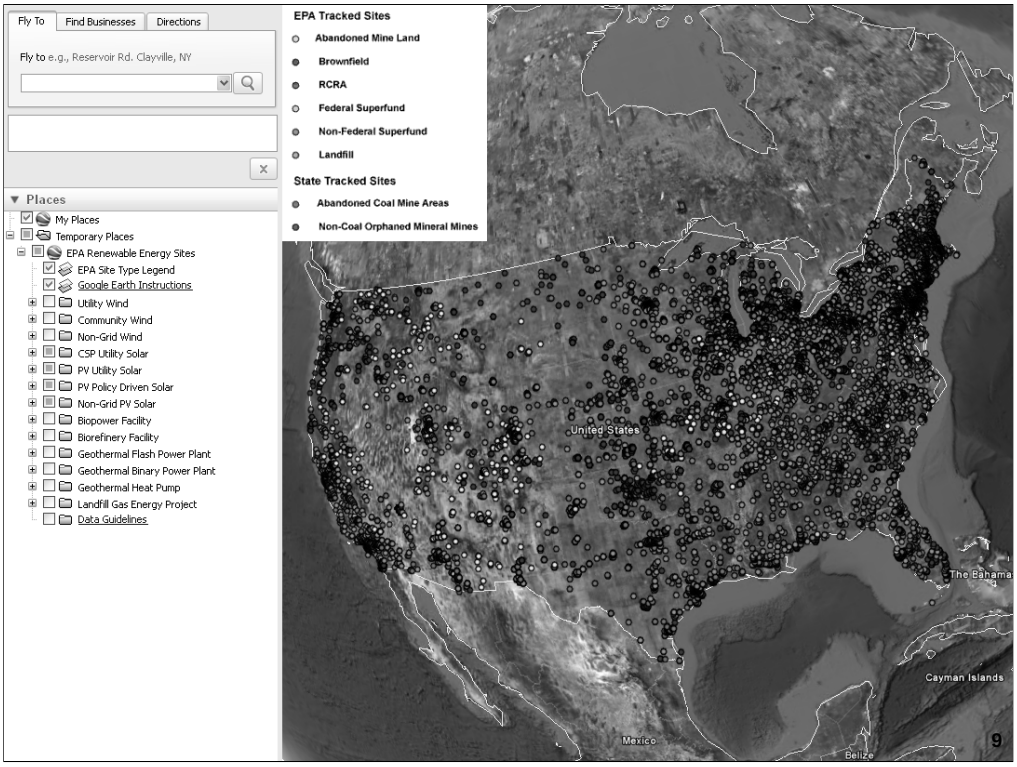
Fly To
Find Businesses
Directions
Fly to e.g., Reservoir Rd. Clayville, NY
Places
My Places
Temporary Places
EPA Renewable Energy Sites
EPA Site Type Legend
Google Earth Instructions
Utility Wind
Community Wind
Non-Grid Wind
CSP Utility Solar
PV Utility Solar
PV Policy Driven Solar
Non-Grid PV Solar
Biopower Facility
Biorefinery Facility
Geothermal Flash Power Plant
Geothermal Binary Power Plant
Geothermal Heat Pump
Landfill Gas Energy Project
Data Guidelines
EPA Tracked Sites
Abandoned Mine Land
Brownfield
RCRA
Federal Superfund
Non-Federal Superfund
Landfill
State Tracked Sites
Abandoned Coal Mine Areas
Non-Coal Orphaned Mineral Mines
United States
The Bahama
Cayman Islands
Mexico
Belize
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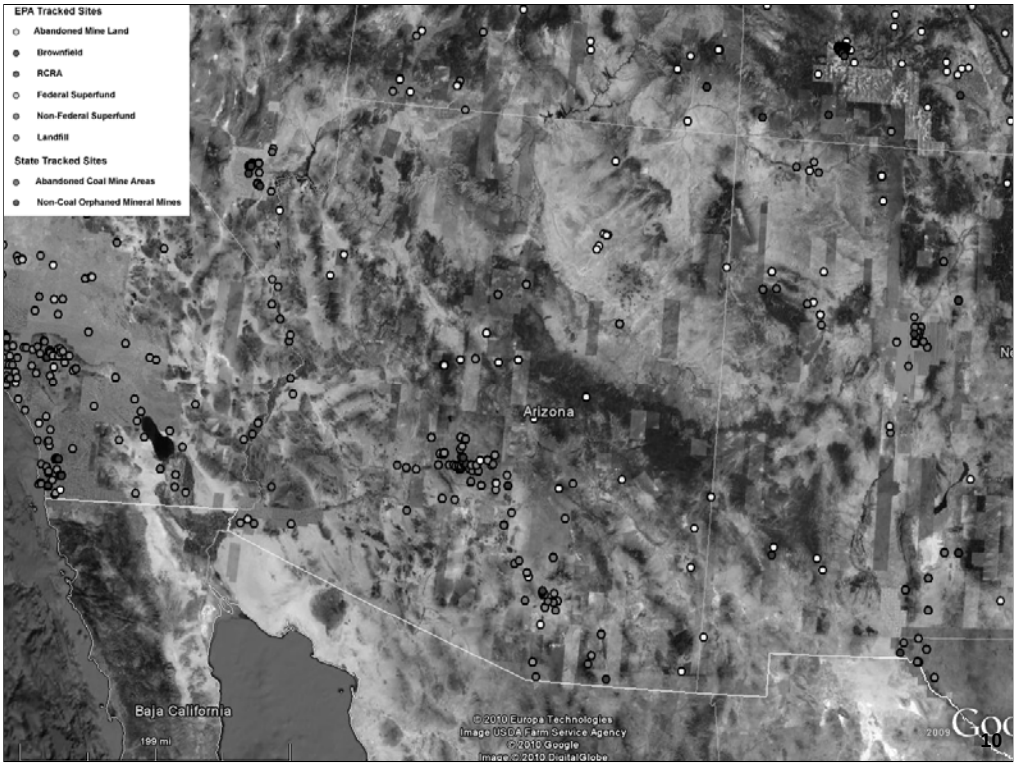
EPA Tracked Sites
Abandoned Mine Land
Brownfield
RCRA
Federal Superfund
Non-Federal Superfund
Landfill
State Tracked Sites
Abandoned Coal Mine Areas
Non-Coal Orphaned Mineral Mines
Arizona
Baja California
199 mi
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Image USDA Farm Service Agency
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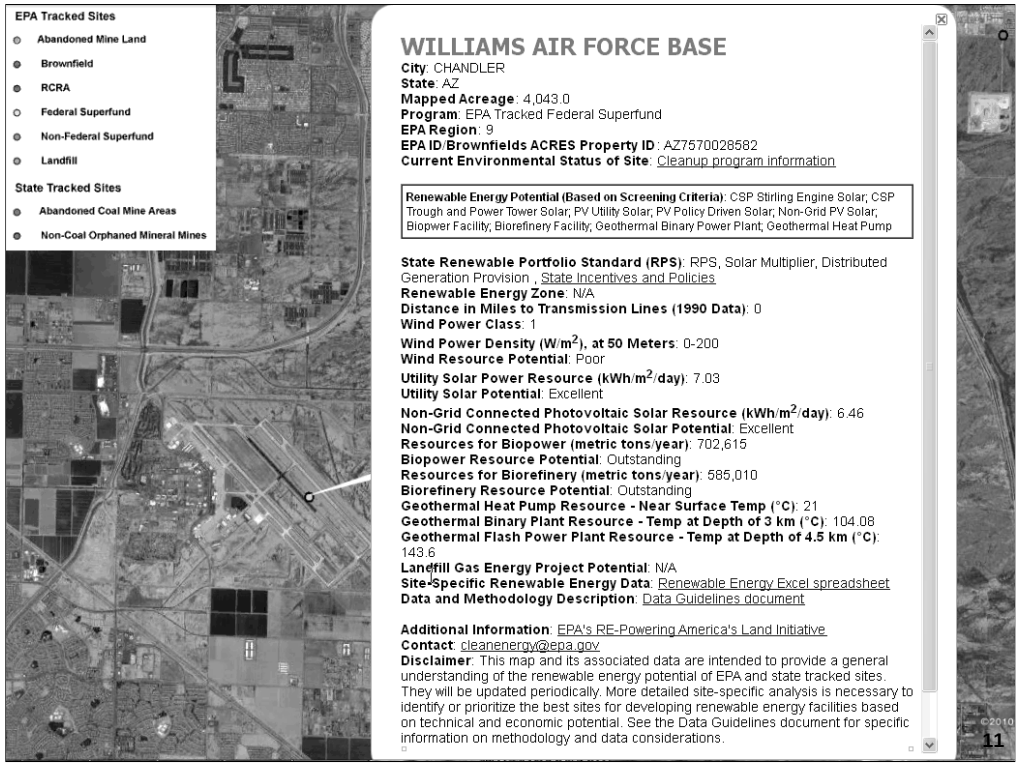
EPA Tracked Sites
Abandoned Mine Land
Brownfield
RCRA
Federal Superfund
Non-Federal Superfund
Landfill
State Tracked Sites
Abandoned Coal Mine Areas
Non-Coal Orphaned Mineral Mines
WILLIAMS AIR FORCE BASE
City: CHANDLER
State: AZ
Mapped Acreage: 4,043.0
Program: EPA Tracked Federal Superfund
EPA Region: 9
EPA ID/Brownfields ACRES Property ID: AZ7570028582
Current Environmental Status of Site: Cleanup program information
Renewable Energy Potential (Based on Screening Criteria): CSP Stirling Engine Solar; CSP Trough and Power Tower Solar; PV Utility Solar; PV Policy Driven Solar; Non-Grid PV Solar; Biopwer Facility; Biorefinery Facility; Geothermal Binary Power Plant; Geothermal Heat Pump
State Renewable Portfolio Standard (RPS): RPS, Solar Multiplier, Distributed Generation Provision , State Incentives and Policies
Renewable Energy Zone: N/A
Distance in Miles to Transmission Lines (1990 Data): 0
Wind Power Class: 1
Wind Power Density (W/m2), at 50 Meters: 0-200
Wind Resource Potential: Poor
Utility Solar Power Resource (kWh/m2/day): 7.03
Utility Solar Potential: Excellent
Non-Grid Connected Photovoltaic Solar Resource (kWh/m2/day): 6.46
Non-Grid Connected Photovoltaic Solar Potential: Excellent
Resources for Biopower (metric tons/year): 702,615
Biopower Resource Potential: Outstanding
Resources for Biorefinery (metric tons/year): 585,010
Biorefinery Resource Potential: Outstanding
Geothermal Heat Pump Resource - Near Surface Temp (°C): 21
Geothermal Binary Plant Resource - Temp at Depth of 3 km (°C): 104.08
Geothermal Flash Power Plant Resource - Temp at Depth of 4.5 km (°C): 143.6
Landfill Gas Energy Project Potential: N/A
Site-Specific Renewable Energy Data: Renewable Energy Excel spreadsheet
Data and Methodology Description: Data Guidelines document
Additional Information: EPA's RE-Powering America's Land Initiative
Contact: cleanenergy@epa.gov
Disclaimer: This map and its associated data are intended to provide a general understanding of the renewable energy potential of EPA and state tracked sites. They will be updated periodically. More detailed site-specific analysis is necessary to identify or prioritize the best sites for developing renewable energy facilities based on technical and economic potential. See the Data Guidelines document for specific information on methodology and data considerations.
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Technical Assistance

- EPA partnered with NREL to evaluate the feasibility of siting RE at contaminated sites
- 2009: 13 projects initiated
  - EPA Regional Offices suggested projects
  - Feasibility Study reports have been posted on our website
- March 2011: Request for applications
  - States, tribes, regional governments, and communities were eligible to apply
- November 4, 2011: Announced 26 new projects
  - 11 Brownfields, 5 Resource Conservation and Recovery Act (RCRA), and 10 Superfund sites

Technical Assistance

- The feasibility study analysis includes:
  - Determining the best RE technology for the site,
  - The optimal location for placement of the RE technology,
  - Potential energy generating capacity,
  - The return on the investment, and
  - The economic feasibility of the RE project

- Helpful tool to use when seeking developers for a particular site
- In addition, EPA and NREL provide technical assistance to communities and local governments

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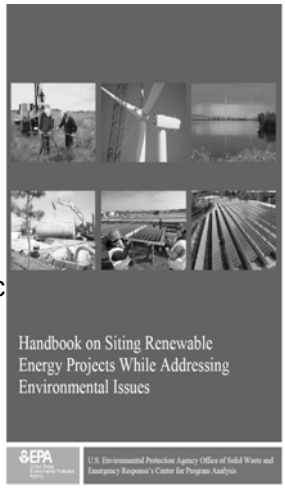
Handbook on Siting RE Projects

- Objectives
  - Increase the awareness of opportunities for siting RE projects during all phases of cleanup
  - Provide key considerations for integrating RE into the Superfund, RCRA, and Brownfields cleanup processes.
- The following tools are included:
  - Checklists with step‐by‐step milestones for eac stage in cleanup processes that can help coordinate and integrate RE development
  - Maps of potentially contaminated sites with RE potential
  - Solar and wind decision trees



Solar and Wind Decision Trees

Goal Enable state and local governments to evaluate potentially contaminated or underutilized sites for renewable energy potential

Approach Collaborate between EPA and NREL to create new tools to guide stakeholders through the process of screening sites for their suitability for future redevelopment with solar photovoltaic (PV) or wind energy

Needs and Objectives

- Fills a knowledge gap
- Encourages a leadership role for local governments
- Provides a straightforward, step-by-step screening process short of a detailed site-specific assessment
  - Aim is to identify good candidate sites for renewable energy based on technical and economic feasibility criteria

Stakeholders & Targeted Sites

Key Stakeholders

State & Local Governments

To help states and municipalities screen and prioritize existing sites for their suitability for solar PV installation

Renewable Energy Developers

To introduce considerations unique to redevelopment of potentially contaminated sites and provide common framework for interactions with state and local governments during project development phase

Clean-up Project Managers

To aid clean-up PMs to screen their potentially contaminated sites for PV development potential

Targeted Sites: Potentially Contaminated or Underutilized Sites

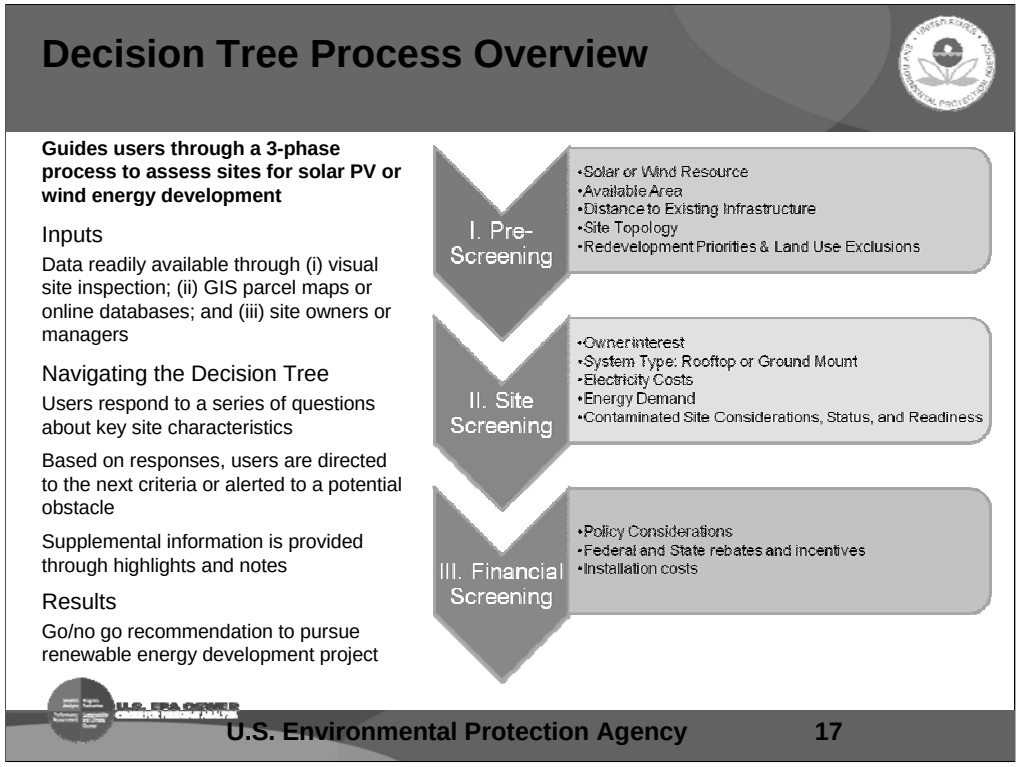
Brownfields, Superfund or RCRA sites

Landfills

Underutilized rooftops

Parking lots

Abandoned parcels



High-Level Phases

Pre-Screening

Addresses data readily available through GIS parcel maps and online databases, as well as information that can be easily obtained through visual inspection

Site Screening

Addresses data that generally requires collecting information from property owners or site managers. May also require site-level investigation, potentially using specialized tools or equipment.

Financial Screening

Addresses economic, policy, and incentive factors that further influence payback.

Next Steps for RE-Powering

- Expand the toolbox of resources for use by EPA staff, other federal agencies, states, local governments, and stakeholders
  - Solar on landfills guidance
  - Case studies tied to barriers
- Clarify Liability Protections
- Add state-tracked sites to Google Earth

Contact Information

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Center for Program Analysis
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www.epa.gov/renewableenergyland

SunShot and Local Solar

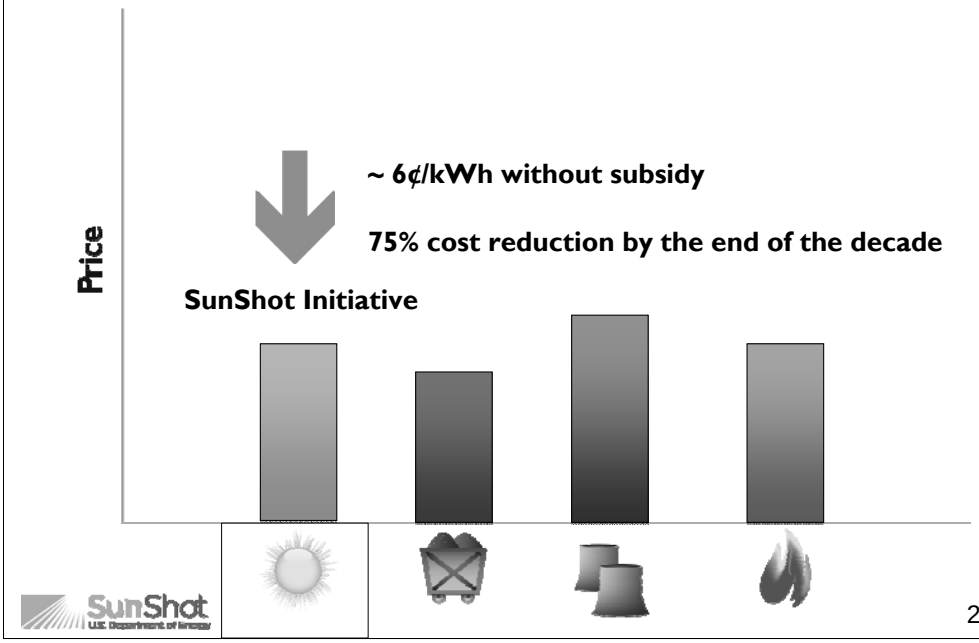
Renewable Energy on Contaminated Land: Tools for Local Governments

SunShot
U.S. Department of Energy

Presentation Agenda

- The SunShot Initiative
- SunShot & Local Solar
- Why Solar on Contaminated Sites?
- Solar Powering Your Community Guide
- Where to Find Out More

What is SunShot?



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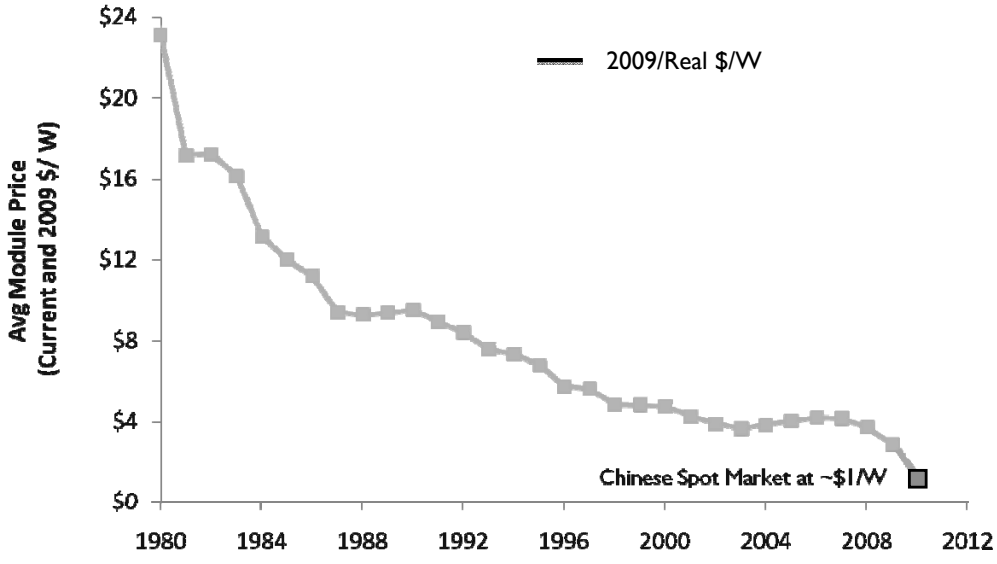
Panel Prices Plummeted



SunShot U.S. Department of Energy

Source: Mints, P. (2011). *Photovoltaic Manufacturer Shipments, Capacity, & Competitive Analysis 20010/2011*. Report # NPS-Supply6. Palo Alto, CA: Navigant Consulting Photovoltaic Service Program.

However…

"Even if you paid nothing for the hardware, you'd still pay thousands of dollars to install a residential solar power system."

- Secretary Chu

SunShot U.S. Department of Energy

What is SunShot targeting?

= Up to **40%** of the cost of a solar installation

SunShot U.S. Department of Energy

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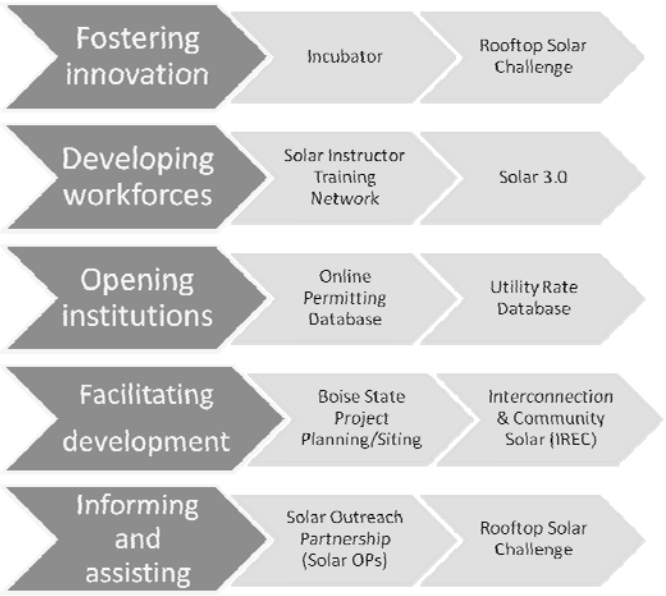
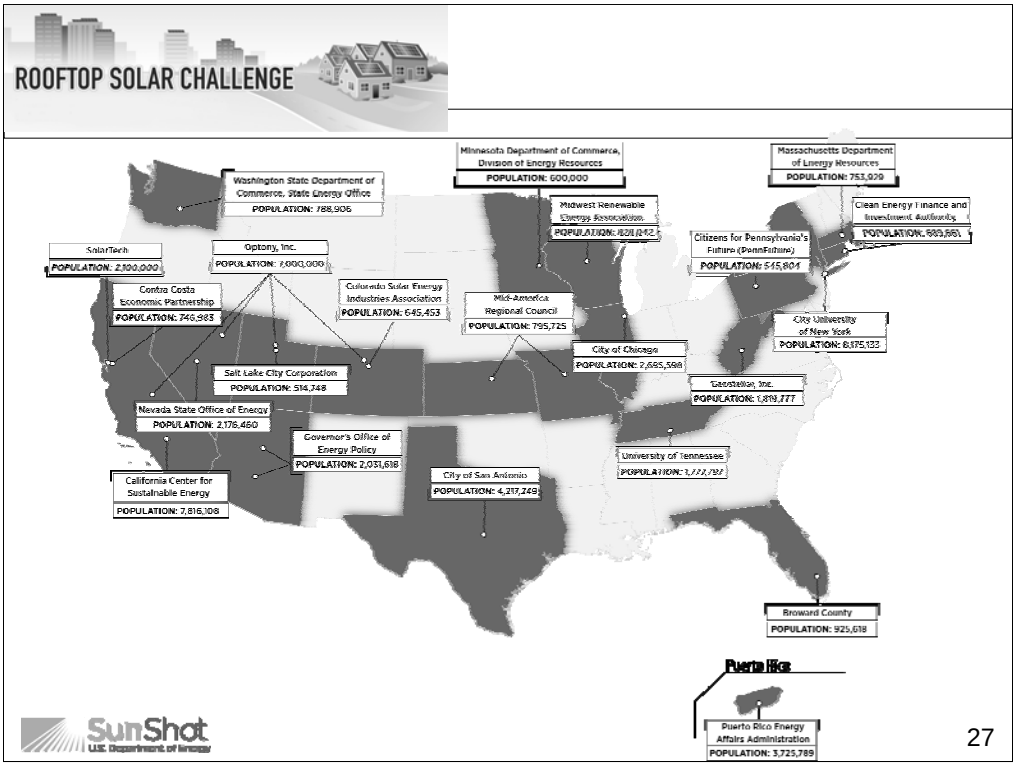
SunShot targets "soft costs" by:



SunShot U.S. Department of Energy


ROOFTOP SOLAR CHALLENGE
Minnesota Department of Commerce, Division of Energy Resources
POPULATION: 600,000
Massachusetts Department of Energy Resources
POPULATION: 753,029
Washington State Department of Commerce, State Energy Office
POPULATION: 788,906
Midwest Renewable Energy Association
POPULATION: 831,242
Clean Energy Finance and Investment Authority
POPULATION: 683,581
SolarTech
POPULATION: 2,100,000
Optony, Inc.
POPULATION: 2,900,000
Citizens for Pennsylvania's Future (PennFuture)
POPULATION: 545,801
Contra Costa Economic Partnership
POPULATION: 748,983
Colorado Solar Energy Industries Association
POPULATION: 645,453
Mid-America Regional Council
POPULATION: 795,725
City University of New York
POPULATION: 8,175,133
City of Chicago
POPULATION: 2,685,598
Salt Lake City Corporation
POPULATION: 514,748
Geostellar, Inc.
POPULATION: 1,819,777
Nevada State Office of Energy
POPULATION: 2,176,460
Governor's Office of Energy Policy
POPULATION: 2,031,618
University of Tennessee
POPULATION: 1,777,797
California Center for Sustainable Energy
POPULATION: 7,816,108
City of San Antonio
POPULATION: 4,217,249
Broward County
POPULATION: 925,618
Puerto Rico
Puerto Rico Energy Affairs Administration
POPULATION: 3,725,789
SunShot
U.S. Department of Energy
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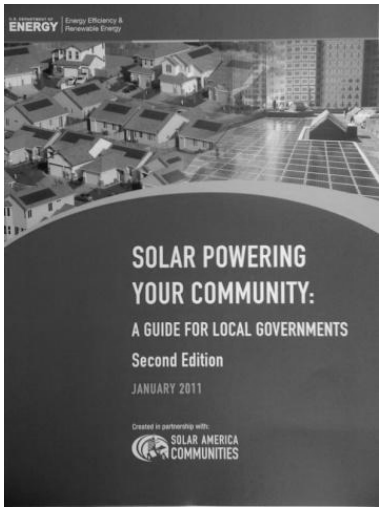
Solar Outreach Partnership (SolarOPs)

SolarOPs helps local governments take a comprehensive approach to solar energy deployment by:
•Conducting outreach and sharing best practices for increasing solar energy use with thousands of local governments across the nation
•Working in partnership with industry experts and national membership associations to enable local governments across the United States to expand their local solar markets
•Providing information in relevant areas, such as solar policies and regulations, financial incentives, workforce training, and utility and community engagement.

ICMA Leaders at the Core of Better Communities
APA American Planning Association Making Great Communities Happen
NARC Building Regional Communities National Association of Regional Councils
ICLEI Local Governments for Sustainability USA
IREC Interstate Renewable Energy Council
MEISTER CONSULTANTS GROUP
NORTH CAROLINA Solar Center
THE SOLAR FOUNDATION Research and Education to Advance Solar Energy
SEPA solar electric power association
SunShot U.S. Department of Energy

Local Government Resources

- Key Lessons for Contaminated Lands:
  - Ch. 1: Organizing and Strategizing a Local Solar Effort
  - Ch. 2: Making Solar Affordable for Residents and Business
  - Ch. 3: Updating and Enforcing Local Rules and Regulations
  - Ch. 4: Improving Utility Policies and Practices
  - Ch. 5: Creating Jobs and Supporting Economic Development
  - Ch. 6: Educating and Empowering Potential Customers
  - Ch. 7: Leading by Example with Installations on Government Property

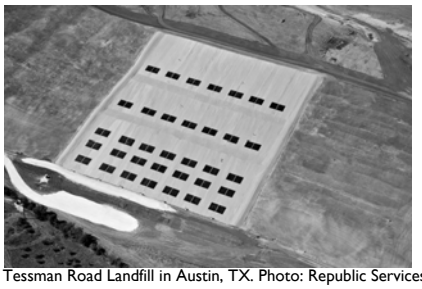


SunShot U.S. Department of Energy

Why Solar for Contaminated Sites?

Because many contaminated sites offer:

1. Existing infrastructure
2. Potentially lower transaction costs
3. Improved public support and faster permitting
4. Appropriate zoning for large installations



Tessman Road Landfill in Austin, TX. Photo: Republic Services, Inc.

SunShot U.S. Department of Energy

Why Solar for Contaminated Sites?

Installing solar energy on contaminated sites may:

1. Increase a property's economic value
2. Further environmental sustainability by maximizing land use
3. Provide clean energy for use on-site
4. Create local jobs
5. Provide a "cap"
6. Provide source of lease revenue

Brockton Brightfields, 435k System on Remediated Landfill in MA. Photo: AECOM.

SunShot U.S. Department of Energy

Ch. 1: Organizing a Local Effort

- Create a Solar Advisory Committee or Task Force
- Hire or Designate a Local Solar Coordinator
- Survey Residents and Businesses to Identify Barriers
- Conduct an Installation Baseline Survey
- Establish Solar Installation Targets
- Include Solar in Broader City, County, or Regional Planning Efforts

Billboard in Salt Lake City

SunShot U.S. Department of Energy

Ch. 5: Creating Jobs and Development

- Recruit the Solar Industry
- Develop Local Workforce Training and Education Programs

10MW Exelon City Solar on a remediated brownfield site. Credit: Exelon

SunShot U.S. Department of Energy

Ch. 7: Leading by Example

- Identify Optimal Installation Locations
- Standardize Solicitations for Solar Installations
- Select the Appropriate Financing Mechanism
- Commission the Solar Energy System and Ensure Quality Operations
- Host Wholesale Power Generators on Local Government Land or Facilities

Rendering of Fresh Kills Landfill (Staten Island, NY) with solar array

Where to Find Out More

- Download the **Solar Powering Your Community** guide and other resources here
- Collection of resources on solar technologies and best practices to implement solar, both at the local level and with large-scale deployment.
- Includes articles, case studies, fact sheets, how-to guides, model rules and ordinances, presentations, sample government documents, technical reports, tools, and webinars.

www4.eere.energy.gov/solar/sunshot/resource_center/

Follow SolarOPs on Twitter @SolarOutreach

Joshua Huneycutt

joshua.huneycutt@ee.doe.gov

202.287.1781

5.22.2012

Cultivating Green Energy on Brownfields

May 22, 2012
Renewable Energy on Contaminated Land: Tools for Local Governments

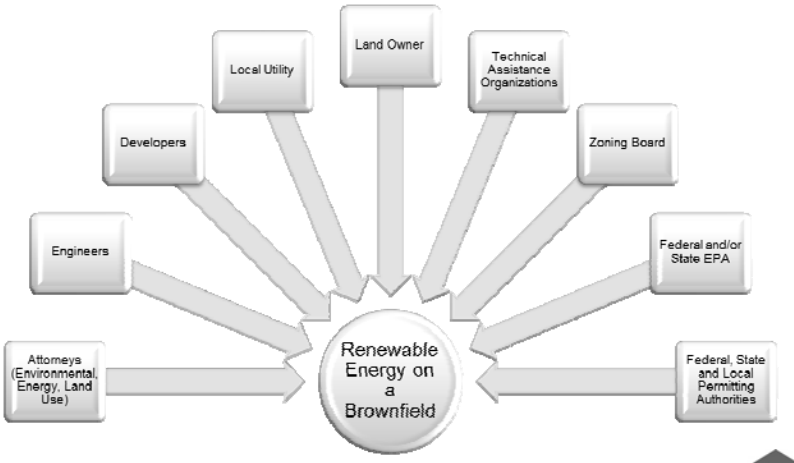
Anjali Patel

Associate

Spiegel & McDiarmid, LLP

NALGEP

Some of the Parties Involved



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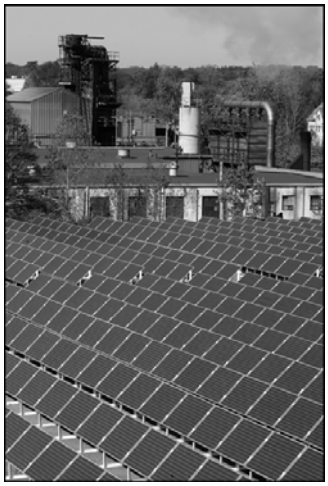
Cultivating Green Energy



- Where to site and what renewable energy can be sited?
- How are renewable energy systems financed?
- What are some ways local governments can get involved or encourage this type of development?
- Case Studies and Links to Additional Resources

NALGEP

Benefits of Siting Renewable Energy on a Brownfield

- Productive reuse of land
- Lease income/property tax payments
- Jobs
- Compatible with other beneficial redevelopment
- Preservation of greenfields and other environmental benefits
- Source of “green” energy for your community and/or local utilities

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Uses for the Energy: Remediation

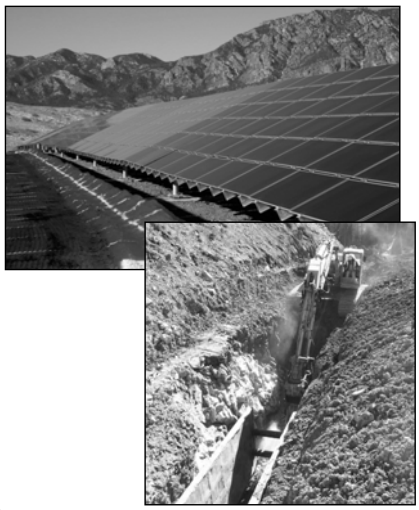
Photo © U.S. EPA Office of Superfund Remediation and Technology Innovation

Photo © U.S. EPA Office of Superfund Remediation and Technology Innovation

- Pemaco Superfund Site
  - **Maywood, California**
  - **3.4 kw PV system**

NALGEP

Uses for the Energy: On-Site Power Consumption and Net Metering



- Fort Carson Solar Array
  - **Fort Carson, Colorado**
  - **2 MW PV system**
- Summitville Mine Hydroelectric Project
  - **Rio Grande County, Colorado**
  - **35 kW**

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Uses for the Energy: 3rd Party Sale or Utility Owned

- Steel Winds
  - **Lackawanna, New York**
  - **20 MW**
- Silver Lake Solar
  - **Pittsfield, Massachusetts**
  - **1.8 MW**

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Examples of Where to Site and What to Site

- Where:
  - **Commercial or industrial properties**
  - **Closed landfills**
  - **Mines**
  - **Agricultural facilities**
  - **Former gas stations**
- Renewable Energy Technologies
  - **Solar (Photovoltaic, CSP, Water Heater)**
  - **Wind Turbines**
  - **Biomass (Landfill Gas, Biopower)**
  - **Small hydro**
  - **Geothermal**

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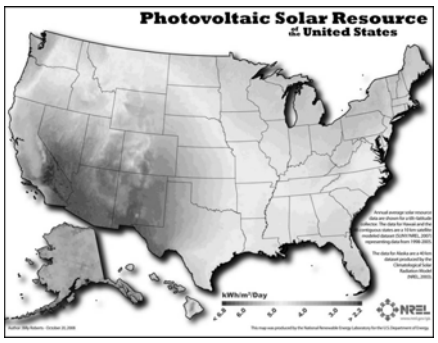
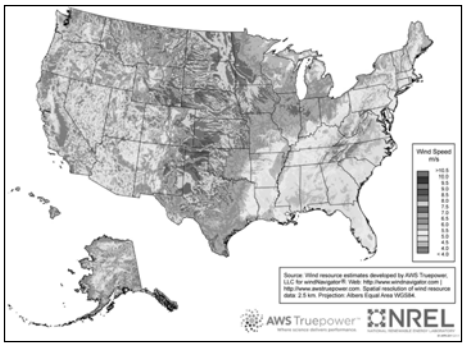
High Level Site Assessments





- Resource Potential Maps
- Economic and Performance Assessment Models (PVWatts, SAM, JEDI)

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Site Specific Considerations

- Power potential
- Engineering constraints
- Clean-up status and potential liability
- Transmission and interconnection infrastructure
- Transportation infrastructure

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Economic Feasibility

- **Energy Sales**
  - Power (Power Purchase Agreement, Net Metering etc.)
  - Renewable Energy Credits (RECs)
- **Government Incentives**
  - Brownfield redevelopment incentives
    - Assessment Pilot/Grant
    - Clean-up Grants
    - Revolving Loan Fund Pilots/Grants
  - Renewable energy incentives
    - Tax Incentives (PTC, ITC, 1603 Cash Grants)
    - Renewable Energy Production Incentive
    - Bonds
    - Grants

NALGEP

State and Local Utility Policies and Incentives

- Renewable Portfolio Standard
- Net Metering
- Interconnection Standards
- Loans/Grants, Tax Incentive or Rebate Programs

- DSIRE website: www.dsireusa.org
- RE-Powering America: www.epa.gov/renewableenergyland

NALGEP

How can Local Governments participate?

- Educate themselves
- Spearhead a Project/Participate in a Development Partnership
- Work with federal agencies (EPA- RE-Powering America, NREL- Technical Assistance Program) and state partners (e.g. state brownfield offices)
- Lease land and/or purchase power
- Offer local financial incentives
- Lower zoning hurdles and offer permitting assistance
- Conduct an all-appropriates inquiry for liability protection
- Community outreach

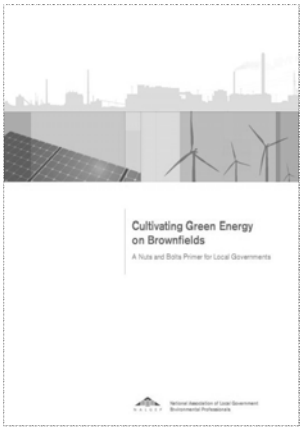
NALGEP

About NALGEP

- Members: Local government personnel responsible for ensuring environmental compliance and developing and implementing environmental policies and programs.
- Services:
  - **Information sharing network**
  - **Technical expertise and advice on environmental policy matters**
  - **Funding identification for environmental and energy project available to local governments and partners**
  - **Represents local environmental officials in federal policy-making and procedures**
- Project areas include Brownfield Communities Network, Smart Growth Partnerships, Clean Air Communities

NALGEP

Contact Information



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NALGEP

CLEAN COALITION

Making Clean Local Energy Accessible Now

Local CLEAN Program Guide

How-To Guide for Local Governments & Utilities

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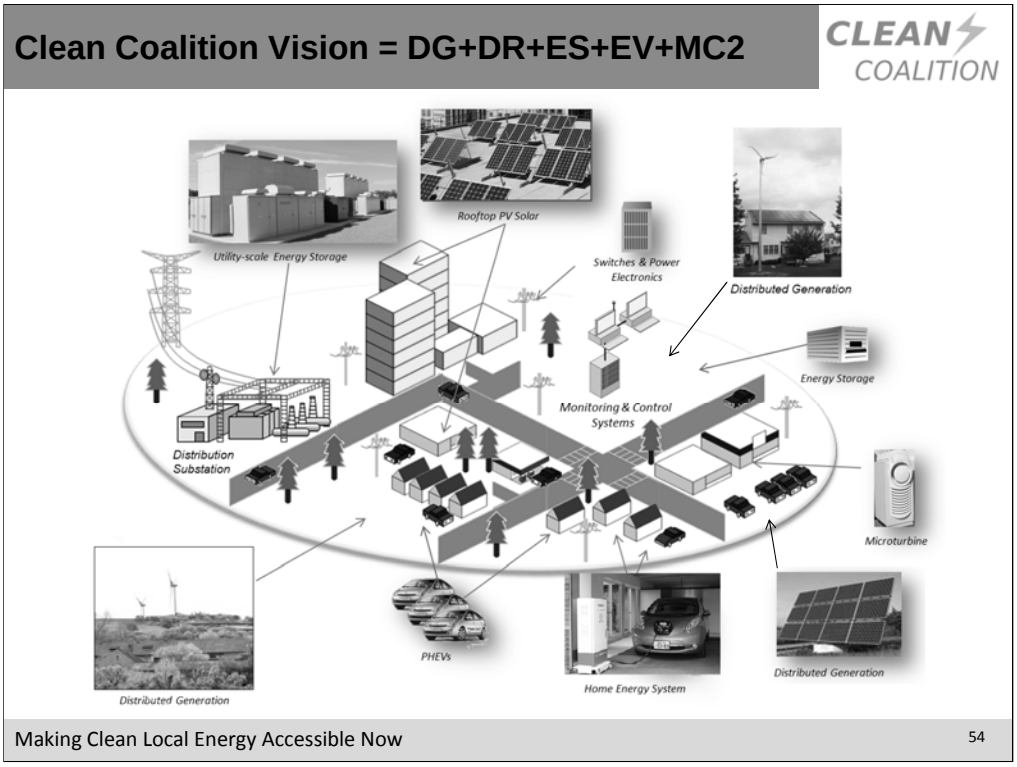
(cl_04a, 12 Jan 2012)



(cl_04a, 12 Jan 2012)
To lay the groundwork, this slide represents the ultimate Clean Coalition vision. This is what a smart energy future looks like.
The key components will be:
Distributed Generation + Demand Response + Energy Storage + Electrical Vehicle + overall Monitoring Communications and Controls or MC2 for short.

The Clean Coalition envisions a future where these components are no longer treated as independent silos. These components will work seamlessly together, using information technology to locally control, create and balance supply and demand of electricity.

What this slide also shows is the huge market opportunity for the transition. There is a $6 trillion dollar energy market AND it will transition to a smart energy future – and there are three key drivers behind that:
Economic sensibility
Energy security
Environmental sustainability

Regardless of your political affiliation, one of these drivers or a combination there of, will take us to this future.

The only question is how painful will this transition be, how fast will it happen, and who's going to win all the economic benefits.

U.S. Policy Gap for Commercial-Scale Renewables

CLEAN COALITION

National policies focus on removing barriers for large-scale renewable power facilities and infrastructure.

State and local net-metering policies promote small-scale renewables:

- Net-metering is designed to reduce a utility customer's electric bills
- Net metering is not designed for owners of commercial and multi-tenant properties (where tenants pay the utility bills)
- Annual on-site energy use generally caps net-metering project size
- Investors and lenders find a utility customer's energy savings from net-metering far less attractive than a revenue stream from a stable utility

(ssw_02, 19 April 2012)

CLEAN Programs Defined

CLEAN COALITION

- **CLEAN = Clean Local Energy Accessible Now**
- **CLEAN Features**:
  - Procurement: Standard and guaranteed contract between the utility and a renewable energy facility owner
  - Interconnection: Predictable and streamlined distribution grid access
  - Financing: Predefined and financeable fixed rates for long durations
- **CLEAN Benefits**:
  - Removes the top three barriers to renewable energy
  - The vast majority of renewable energy deployed in the world has been driven by CLEAN Programs
  - Allows any party to become a clean energy entrepreneur
  - Attracts private capital, including vital new sources of equity
  - Drives local employment and generates tax revenue at no cost to government

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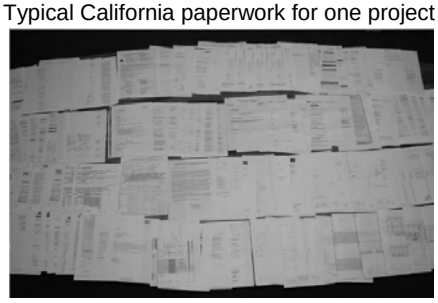
(cl_4, 13 April 2012)

CLEAN Programs are Simple and Transparent

CLEAN COALITION

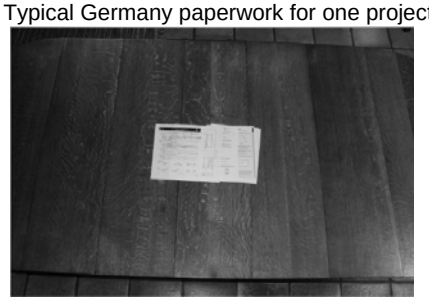
CLEAN Contracts reduce transaction costs

Typical California paperwork for one project



Could be a 1kW-sized project, but maximum 1MW (via CSI program). Even more paperwork for California projects larger than 1MW (via RPS program).

Typical Germany paperwork for one project



Could be a 1kW or 20MW-sized project, or bigger.

Source: Gary Gerber, President of CalSEIA and Sun Light & Power, Jun09

ssw_02, 15 May 2012

CLEAN Streamlines Procurement for Utilities

"Several aspects of the CLEAN Program have **proven to simplify and streamline the process**.

First, there is a **standard set of "bright line" rules** for a project to qualify, demanding no staff analysis or interpretations.

Second, there is a clear method for assigning capacity to qualifying projects… There is **no staff time wasted with evaluating RFPs**…

Third, each project… signs a **short, standard offer contract** and interconnection agreement.

There is **no valuable staff time wasted in negotiations and legal disputes**."

- John Crider, GRU Strategic Planning

(cl_2, 13 April 2012)

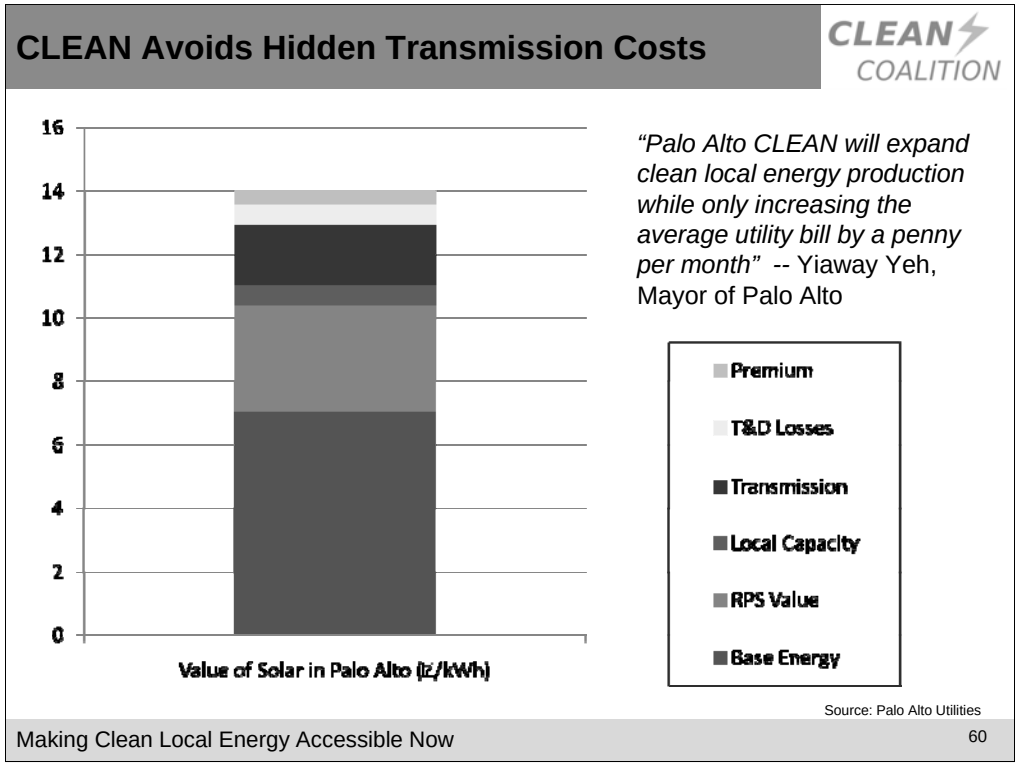
CLEAN Maximizes Local Economic Benefits

CLEAN COALITION

- Local Job Creation
  - CLEAN projects are local and “shovel-ready”
  - Renewable energy creates far more jobs than fossil fuels or nuclear power (UC Berkeley)
- Local Capital Investment
  - CLEAN Programs level the playing field, giving local residents and businesses the opportunity to reinvest capital in the community
  - Local ownership of renewable energy increases the economic benefits to the community by 200% to 300% (US GAO)

- Local Tax Revenues
  - Local job creation and capital investment in the community creates new sources of state and local tax revenues
  - Does not rely on government subsidies

(sw 2, 19 Jan 2012)



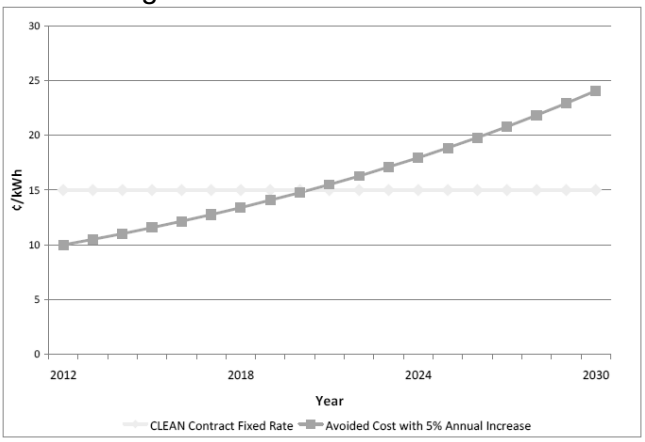
(ssw_6, 10 April 2012)

7.04 cents - Base Energy
3.35 cents - RPS Value
0.60 cents - Local Capacity
1.94 cents - Transmission
0.62 cents - T&D Losses
0.45 cents - Premium

CLEAN Programs Stabilize Electricity Rates

- May result in a small rate increase during initial years
  (e.g. Gainesville, Florida, achieved a 2,000% increase in deployed solar capacity with a rate increase of less than 1% during first 2.5 years of program)
- Protects communities from rising fossil fuel costs over time

For this solar rooftop project in Colorado, avoided costs will rise above the CLEAN contract price within a few years



Source: Clean Coalition, 2012

CLEAN Delivers Renewable Energy Goals

CLEAN COALITION

CLEAN Programs (also known as feed-in tariffs) are the most effective policy solution for spurring renewable energy installations around the world:

45% of wind energy and
75% of solar PV capacity
installed in the world
before 2008
National Renewable Energy Laboratory

86% of solar capacity
deployed in the world
in 2009
Meister Consultants Group

Source: Renewables 2011 Global Status Report, Renewable Energy Policy Network for the 21st Century

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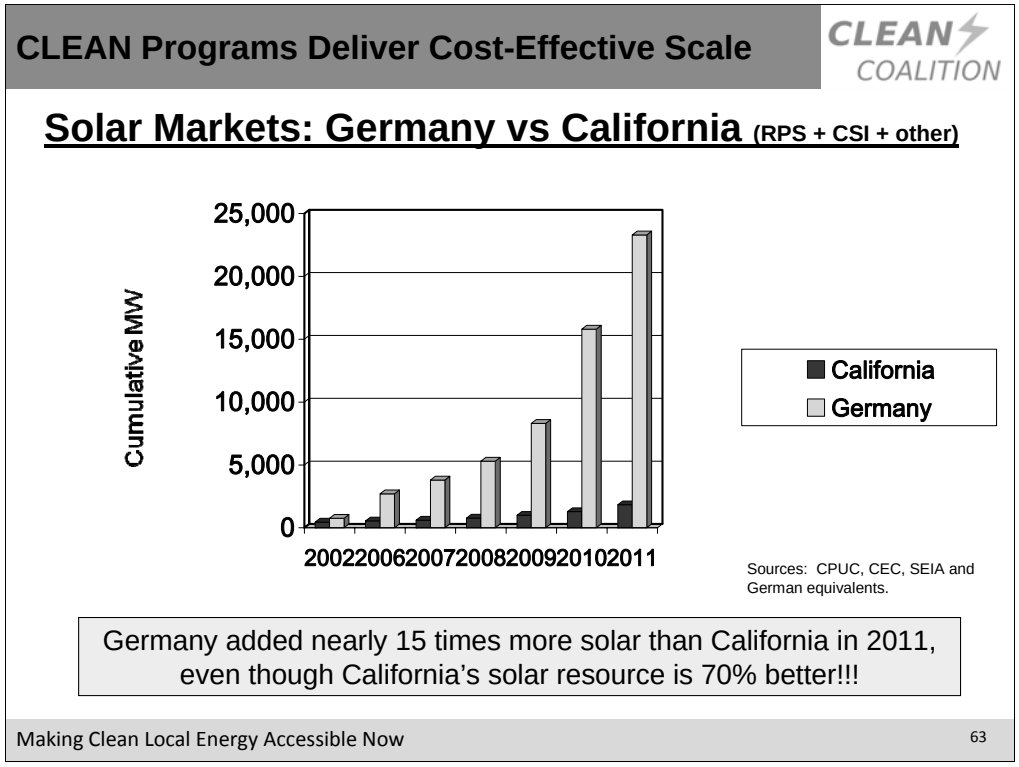
(ssw_1, 17 April 2012)

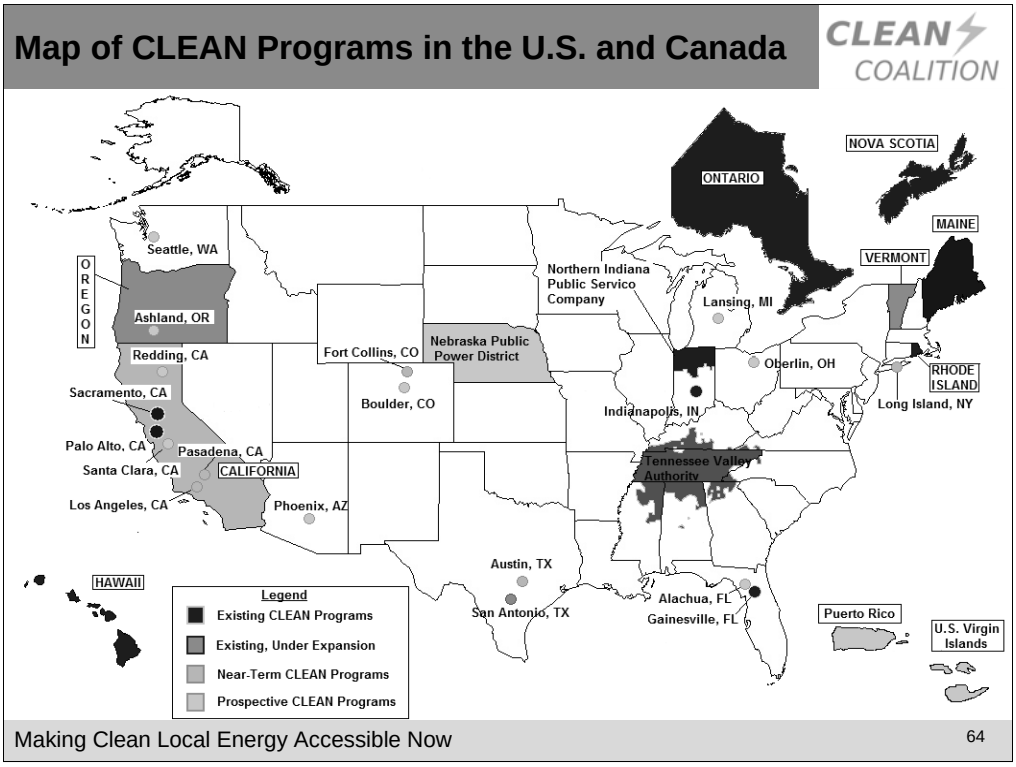


(jf_05, 7 Mar 2011)

Beyond the obvious details on this slide, see the notes below.

CLEAN = Clean Local Energy Acceccible Now and CLEAN Programs are the new name for feed-in tariffs in the United States.

Rooftop solar in Germany today is priced at the California-equivalent of 12 cents/kWh, which would be the most cost-effective solar that has ever been deployed in California -- even more cost-effective than ground-based solar projects deployed in California to date. Ground-based solar projects typically generate about 25% more kWh/W than rooftop projects, because they use tracking, which allows the panels to follow the sun throughout the day. The net result is that ground-based projects are generally about 20% more cost-effective than rooftop projects. The difference between the 25% and the 20% is that the O&M costs for ground-based projects are a bit higher due to their moving parts.

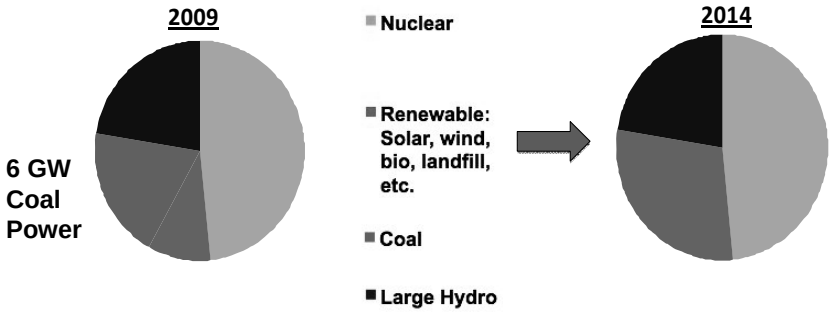


(jf, 16 May 2012)

CLEAN Delivers Ontario's Goals

CLEAN COALITION

- On track to replace 100% of coal power by 2014
- Created tens of thousands of jobs, and on track to create 50,000 jobs
- Attracted over $20 billion in private-sector investment to Ontario
- More than 30 companies are currently operating or plan to build, solar and wind manufacturing facilities in Ontario



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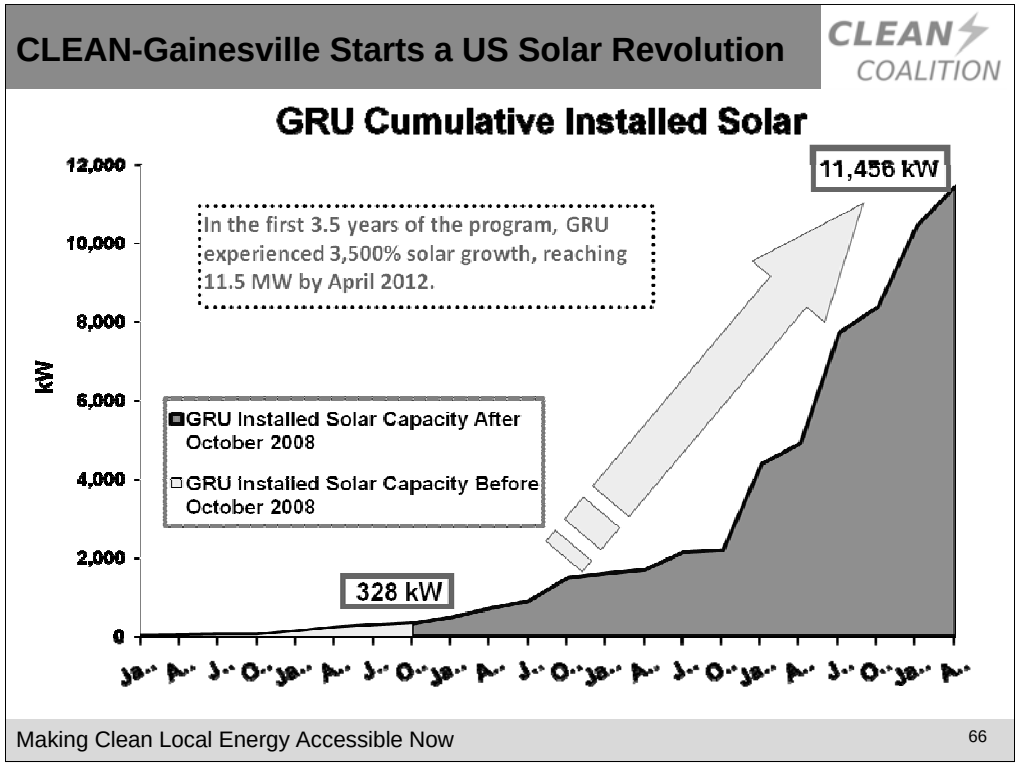
(ssw_1, 12 April 2012)

-The Canadian Province of Ontario had 31 GW of peak electric capacity in 2009.

-The source of the economic data is the Ontario Economic Ministry's Feed-in Tariff Two Year Review Report (March 2012)



(SW_13, 9 April 2012)

Prior to the launch of the CLEAN-Gainesville program in October 2008, GRU had 328 kW of installed solar capacity. In the first 3.5 years of the program, GRU experienced 3,500% solar growth reaching 11.5 MW by April 2012 and growing fast. More than 90% of GRU's solar capacity has been driven by the CLEAN program. The rest is due to its net metering program.

LIPA CLEAN Solar Program (Long Island, NY)

CLEAN COALITION

LIPA plans to approve a CLEAN Solar Program in June 2012:

- Fixed Rate Contracts: 22 cents/kWh solar electricity for 20 years
- Program Size: Purchase 50 MW over 2 years

LIPA
Long Island Power Authority

(ssw_1, 17 April 2012)

CLEAN LA Solar Program (Los Angeles, CA)

CLEAN COALITION

In April 2012, the City Council and the Mayor authorized the Los Angeles Department of Water and Power to purchase up to 150 MW of solar power generated by local property owners.

Timeline:
-May 2012 – Launch 10 MW pilot program to determine prices for energy
-Fall 2012 – Expand program to 75 MW
-2013 – May expand program to 150 MW

Los Angeles Business Council found that a 150 MW program would:
•Create 4,500 jobs
•Generate $500 million in economic activity
•Offset 2.25 million tons of carbon dioxide emissions

(ssw_1, 17 April 2012)

Download the Local CLEAN Program Guide

Free download: http://www.Clean-Coalition.org/local-action

Contact us: LocalGuide@Clean-Coalition.org

Modules of the Guide:

1. Overview & Key Considerations
2. Establishing CLEAN Contract Prices
3. Evaluating Avoided Costs
4. Determining Program Size & Cost Impact
5. Estimating CLEAN Economic Benefits
6. Designing CLEAN Policies & Procedures
7. Gaining Support for a CLEAN Program

(ssw_5, 16 April 2012)

Resources & Feedback

- To view a complete list of resources for this seminar, please visit the **Additional Resources**
- Please complete the **Feedback Form** to help ensure events like this are offered in the future

Need confirmation of your participation today?

Fill out the feedback form and check box for confirmation email.

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