Federal Incentives to Promote Renewable Energy Systems at Brownfield & Cleanup Sites

Renewable Energy & Efficiency for Tribal Community Development
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CENTER FOR PROGRAM ANALYSIS

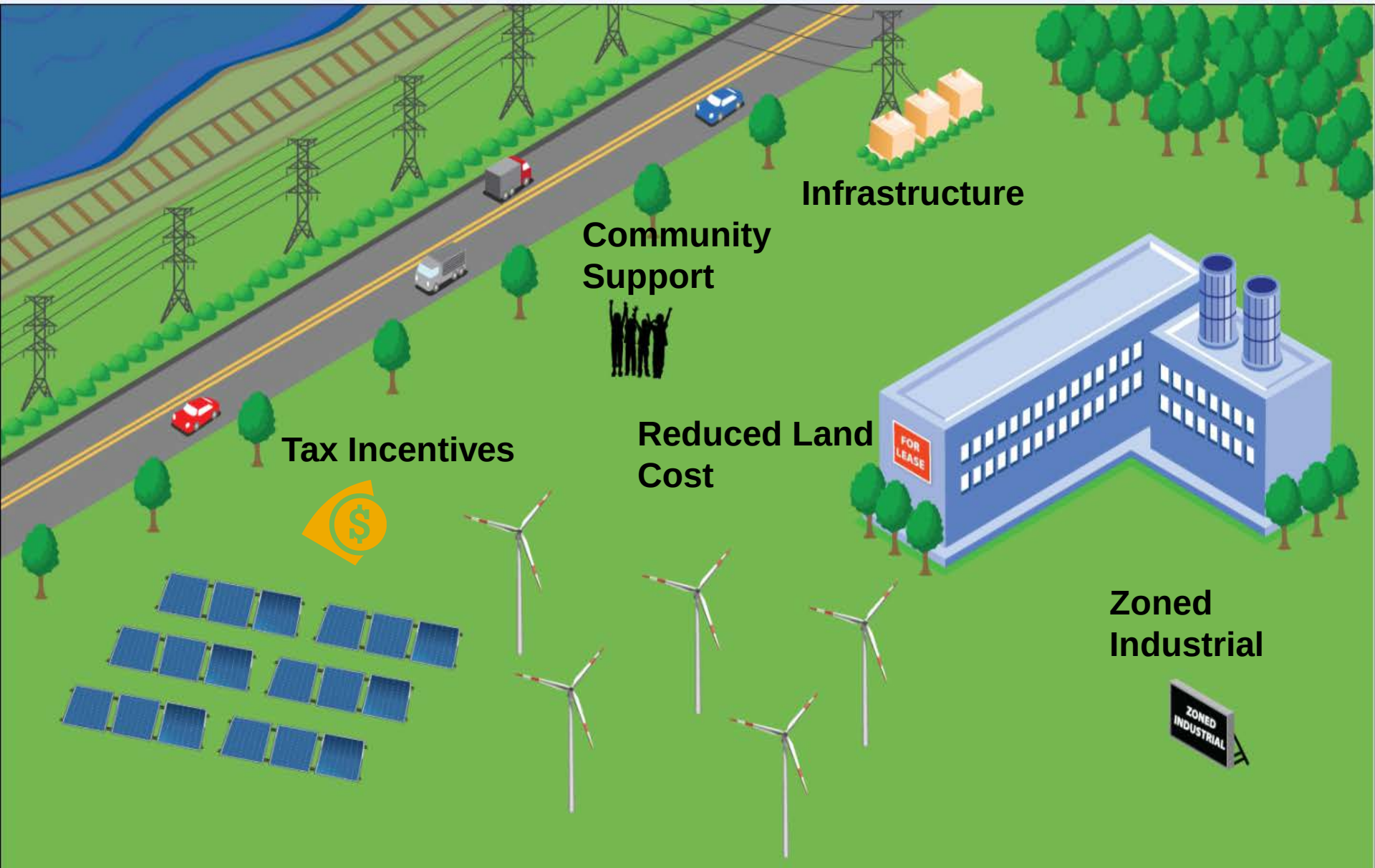
Presentation Topics

- Overview: RE-Powering America's Land Initiative
- Potential Advantages for Siting RE Facilities on Contaminated Land
- RE-Powering Tools and Incentives
- Liability Protections
- What's Next?

What is RE-Powering America's Land Initiative?

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

Potential Advantages for Siting RE Facilities on Contaminated Land



RE-Powering Tools

- RE-Powering Website
  - www.epa.gov/renewableenergyland/
- Google Earth Mapping Tool
- Technical Assistance
- Resources for Financial Incentives
- Success Stories and Case Studies
- Handbook on Siting Renewable Energy Projects
- Decision Trees to Screen Sites for Solar and Wind
- Quarterly Webinar Series

Google Earth Mapping Tool

- **Mapped EPA inventory of EPA tracked sites (over 15 million acres)**
- **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

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
Arizona
Baja California
199 mi
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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/m^2), at 50 Meters: 0-200
Wind Resource Potential: Poor
Utility Solar Power Resource (kWh/m^2/day): 7.03
Utility Solar Potential: Excellent
Non-Grid Connected Photovoltaic Solar Resource (kWh/m^2/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/NREL Feasibility Studies
- The feasibility study analysis has included:
  - Determining the best RE technology for the site,
  - The optimal location,
  - Potential energy generating capacity,
  - Return on investment, and
  - The economic feasibility.
- 2009: 13 projects initiated including
  - Mille Lacs
  - Keweenaw Bay Indian Community

Technical Assistance

- March 2011: Request for applications
- November 4, 2011: Announced 26 new projects
- Unknown Future Announcements at this point
- Direct Technical Assistance for Energy Projects – NREL
  - http://www.nrel.gov/applying_technologies/state_local_activities/technical_assistance.html

Resources for Financial Incentives

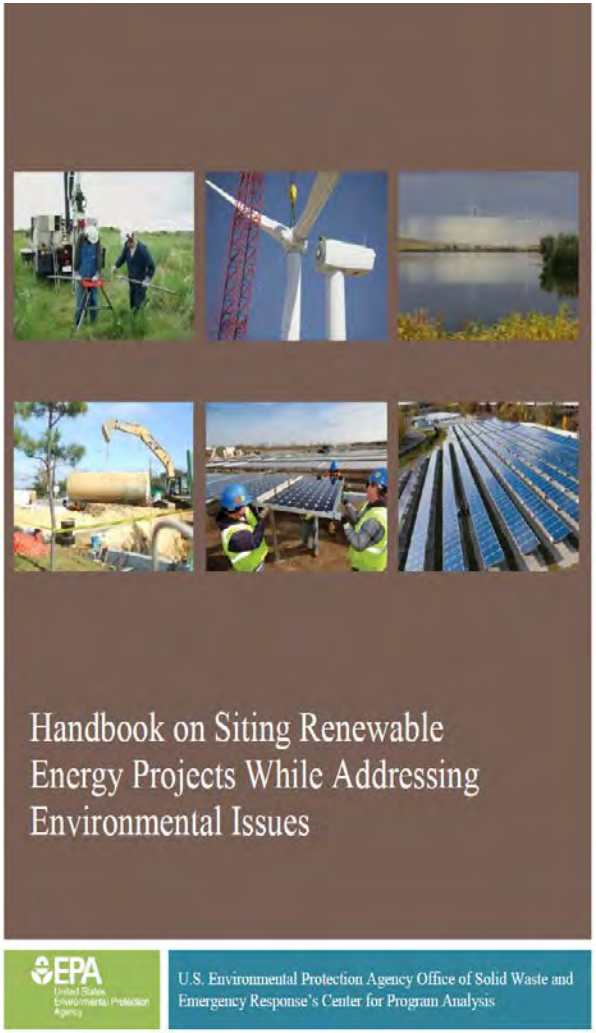
- EPA's RE-Powering Website
  - http://epa.gov/renewableenergyland/incentives.htm

- Database of State Incentives for Renewables & Efficiency (DSIRE) Website
  - http://www.dsireusa.org/

Handbook on Siting RE Projects

- Objectives
  - Emphasize that RE projects may occur during several phases of cleanup
  - Provide key considerations for integrating RE into cleanup processes

- The following tools are included:
  - Checklists
  - Maps
  - Solar and wind decision trees



Solar and Wind Decision Trees

Goal:

To guide stakeholders through the process of screening sites for solar or wind potential

Key Stakeholders:

- State & Local Governments
- Renewable Energy Developers
- Cleanup Project Managers

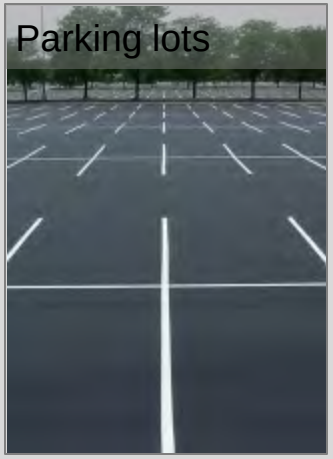
Targeted Sites: Contaminated or Underutilized Sites

Brownfields, Superfund or RCRA sites

Landfills

Underutilized rooftops

Parking lots



Abandoned parcels

Decision Tree Process Overview

I. Pre-Screening

- Solar or Wind Resource
- Available Area
- Distance to Existing Infrastructure
- Site Topology
- Redevelopment Priorities & Land Use Exclusions

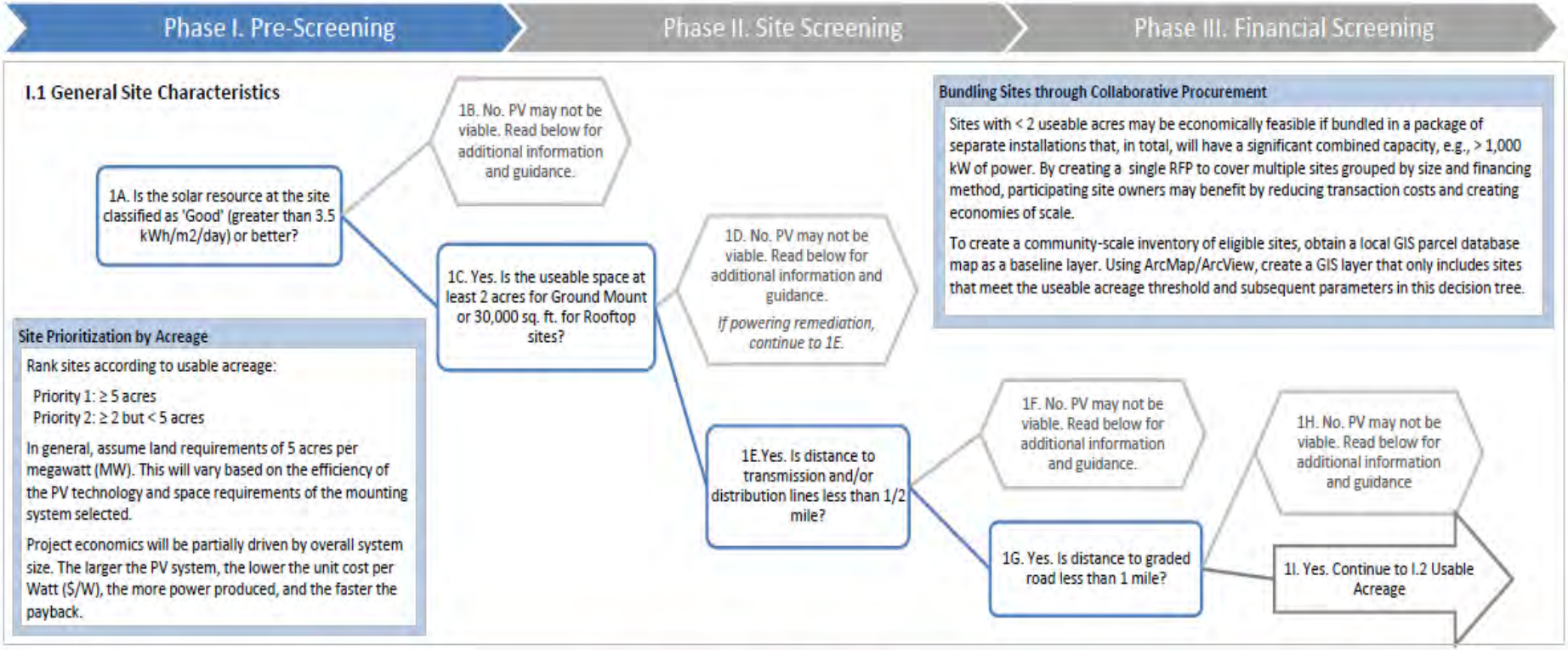
II. Site Screening

- Owner interest
- System Type: Rooftop or Ground Mount
- Electricity Costs
- Energy Demand
- Contaminated Site Considerations, Status, and Readiness

III. Financial Screening

- Policy Considerations
- Federal and State rebates and incentives
- Installation costs

Solar Decision Tree – Sample Page



Phase I.1: Pre-Screening - General Site Characteristics	
Question	Explanatory Text and Additional Resources
1A	The solar resource potential is measured in kilowatt-hours per square meter per day (kWh/m2/day). The majority of the US meets the 3.5 kWh/m2/day threshold. NREL's Renewable Energy Resource maps (www.nrel.gov/gis/solar.html) provide information at the regional level. For a specific site, use the EPA Renewable Energy "Google Earth" Interactive Mapping Tool (www.epa.gov/renewableenergyland/mapping_tool.htm). Solar resource potential is not likely to vary significantly among sites in the same geographic vicinity and elevation.
1B	If the solar resource for this particular site is classified as less than "Good" (having less than 3.5 kWh/m2/day), a solar PV system may not be ideal for redevelopment at this site, unless the state also has strong incentives. We recommend exploring other renewable energy redevelopment options or infill redevelopment options. Note: Infill indicates redevelopment within an urban setting.

EPA Liability Protections

Support for RE on Contaminated Lands

- EPA will work with individuals to address potential liability issues

State vs. Federal Programs

- State programs address the majority of cleanups
- Few sites require federal involvement

Existing Liability Protections

- CERCLA includes a number of liability protections

Leases & Responsibility

- Not all leases trigger CERCLA liability for lessees.

Due Diligence

- Consult with legal counsel and the appropriate state, tribal or local environmental protection agency

For a more comprehensive overview of liability considerations, please review EPA Report No. EPA-330-F-11-001, "Siting Renewable Energy on Contaminated Properties: Addressing Liability Concerns."

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 document
  - Training courses
- Add state-tracked sites to Google Earth

Contact Information

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