Renewable Energy at Remediation Sites:

Legal, Technical, and Financing Considerations

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AWMA Midwest Section
Technical Conference
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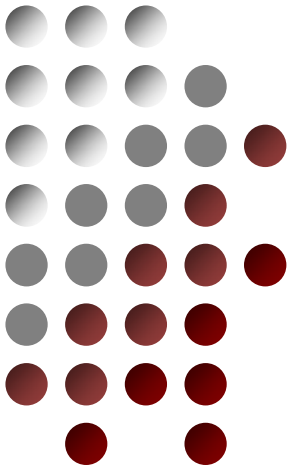

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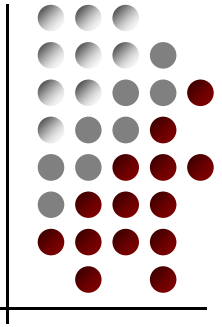
Renewable Energy

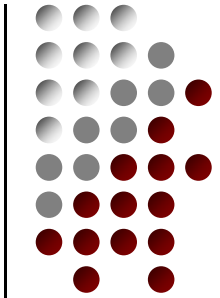
- EPA's RE-Powering America initiative
- epa.gov/renewable energyland/

Characteristics



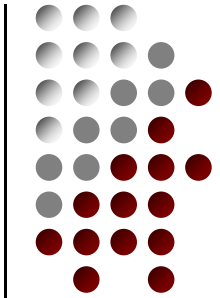
- Technical complexity
- Significant remediation costs, potential savings
- Alternatives
  - Technical
  - Redevelopment
- Available property
- Potential for connectivity
- Funding requirements

Structural considerations



- Project, property ownership
- Finding the right renewable energy developer/partner
- Sell or use the energy produced?
  - Effect on financing
  - Power purchase agreement
  - Local utility programs
  - State public utility regulations

Structural considerations

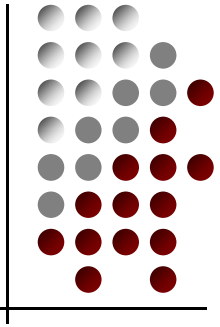


- Liability concerns
- Activity on a remediation site
- Operation and maintenance requirements
- Institutional controls and long-term stewardship
- Opportunities for a more efficient remedy, cost savings
- Retrofit vs. new installation

Interests of various parties

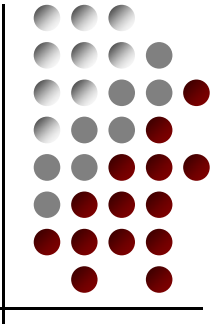
- Energy company/power purchaser
- Landowner
- Responsible parties
- Developer
- Community
- Regulatory agencies

Liability Issues



- Superfund Liability?
  - Owner
  - Operator
  - Arranger
  - Lessee
- Defenses and liability management
  - Bona Fide Prospective Purchaser
  - All Appropriate Inquiry
  - Contractual provisions
  - Property ownership/transactional structuring
  - EPA guidance

Liability Issues, cont'd



- Remediation responsible parties
  - Cleanup progress

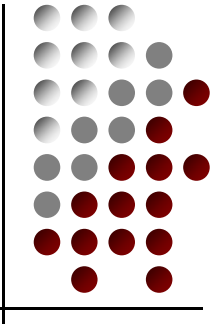
Project Contracts

- Financing
- Utility
- Design & Construction
- Development Agreement
- Liability Protection, Allocation Terms
- Extent of ownership provisions

Project Contracts - Financing

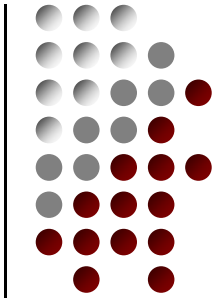
- Developer / 3rd Party
- Equipment Lease
- Self Financed
- Incentives

Project Contracts - Utility



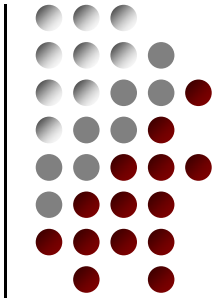
- Interconnection Agreement plus
- Power Purchase Agreements (PPA)
- Hybrid Agreement
- Net Metering Agreement

Power Purchase Agreement



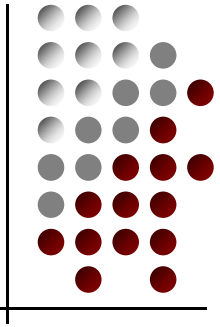
- Power pricing; escalators
- Obligation to produce, deliver power
- Obligation to purchase power
- Conditions, contingencies
- Completion dates; performance guaranties, penalties
- Assignment of risk
- Allocation of other benefits
- Others

Project Contracts – Design & Construction



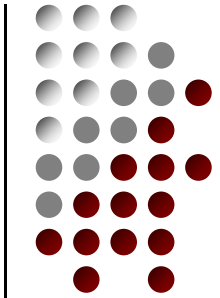
- One Contract – Turnkey, Design – Build, EPC (Engineer, Procure, Construct)
- Two Contracts – Turbine + BOP (Balance of Plant)
- Multiple Contracts – Engineering Design, Construction, Installation, Equipment
- Plus any service & maintenance contracts
- Legal, performance issues

Project Permits - Environmental



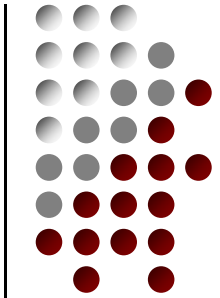
- Threatened & Endangered Species
- Section 404 / Wetlands
- Cultural Resources & State Historic Preservation Office (SHPO)
- NPDES & SWPPP
- NEPA Compliance & Environmental Assessments
- Remediation Program Approvals

Project Permits - Federal



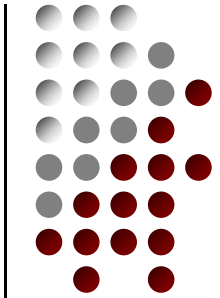
- Federal Aviation Administration (FAA)
- Department of Defense (DoD)
- Federal Energy Regulatory Commission / Regional Transmission Organization
  - 5 MW threshold

Project Permits – Regional & Local



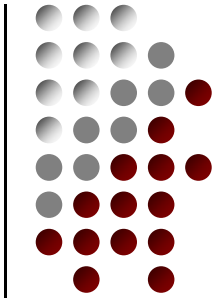
- Building Permit – Special or Conditional Use Permits
- Zoning or Ordinance changes
- DOT, utility moving, access permits
- Sign permits, event permits
- Community involvement

Funding



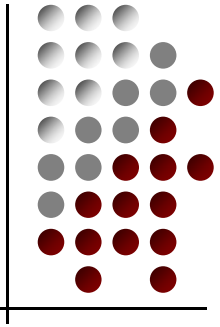
- Federal programs
- State programs
- Participant (PRP) contributions
- Local, Community contributions
- Carbon credits
- Renewable Energy Credits
- Energy sales, reduced energy costs
- Utility rebates and incentives

Local Funding Opportunities



- Local economic development incentives: TIF, Low-interest loans, Property tax abatement
- Local sustainability initiatives: Purchase power?
- Services
  - In-kind
  - O & M
  - Example: California Gulch Superfund Site

State incentives, issues



- Renewable Portfolio Standards
- State utility laws and regulations
- State energy offices
- State financial incentives
  - California, coastal states
  - As states add incentives, to whom will the incentives belong?
  - www.dsireusa.org

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U.S. Department of Energy Energy Efficiency and Renewable Energy

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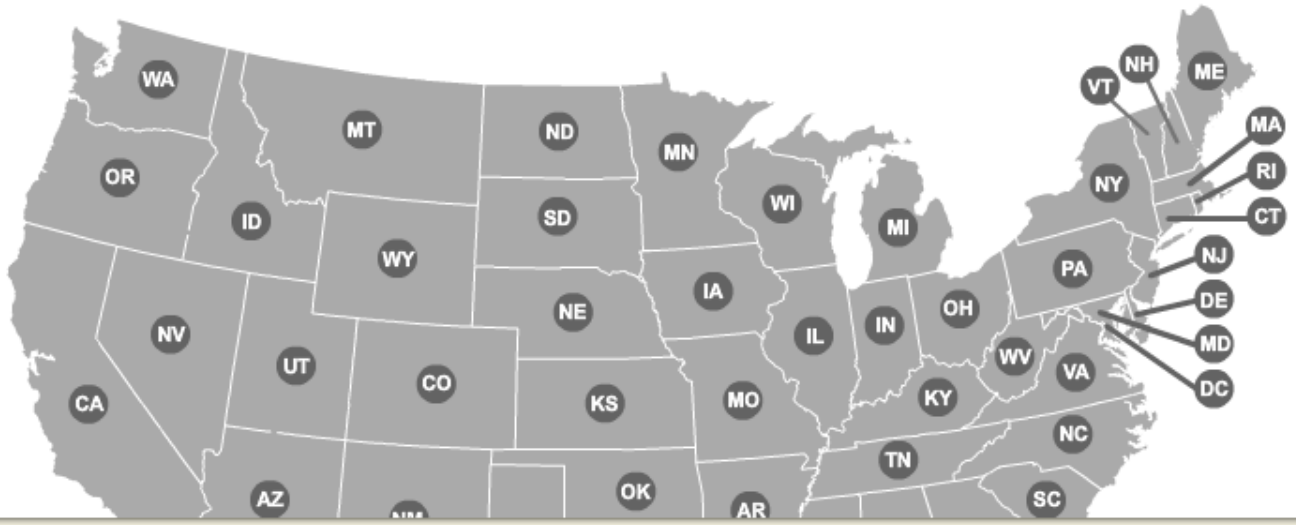
DSIRE is a comprehensive source of information on state, local, utility, and federal incentives and policies that promote renewable energy and energy efficiency. Established in 1995 and funded by the U.S. Department of Energy, DSIRE is an ongoing project of the N.C. Solar Center and the Interstate Renewable Energy Council.

Choose one or both databases:

☑ **Renewable Energy** ☑ **Energy Efficiency**

Federal Incentives



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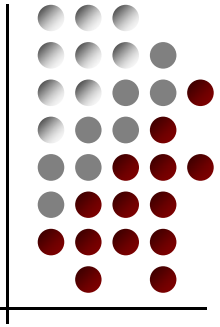
Federal Incentives



- EPA grants and other incentives
- Department of Energy
- Federal Tax Credits
- Federal Stimulus Bill

El Dorado Kansas Wetland & Water Reclamation Facility

- Two bladed wind turbine with flexible design
- Hub height 230’ on monopole tower
- Rotor Diameter = 194’

- Wind speed at hub = 7.24 m/s
- AEP 2,500 MWh/yr
- Turnkey cost $2.2 million

Riley County Public Works

- Solar energy systems
  - 1.125 kW Monocrystalline photovoltaic system
  - 1.152 kW thin film panel photovoltaic system
- Wind turbine systems
  - 2.4 kW Skystream 3.7
  - 20 kW Jacobs 31-20
  - 40 kW Enertech 44/40
  - 100 kW Northwind 100
- Geothermal system

Northern Power 100 - 100kW

- Upwind rotor orientation with direct drive permanent magnet generator
- Hub height 121’ on monopole tower
- Rotor diameter = 69’

- Wind speed at hub height = 6.86 m/s
- Turnkey cost $575,000

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Photovoltaic Systems – 2.3kW

- 1.125 kW crystalline panel system
- 5 x 225 watt Sunpower panels on a SolarMount rail system
- Approx. 5.5’ x 34” x 6” each
- Turnkey cost $10,000/kW for small systems, $7,5000/kW for average systems

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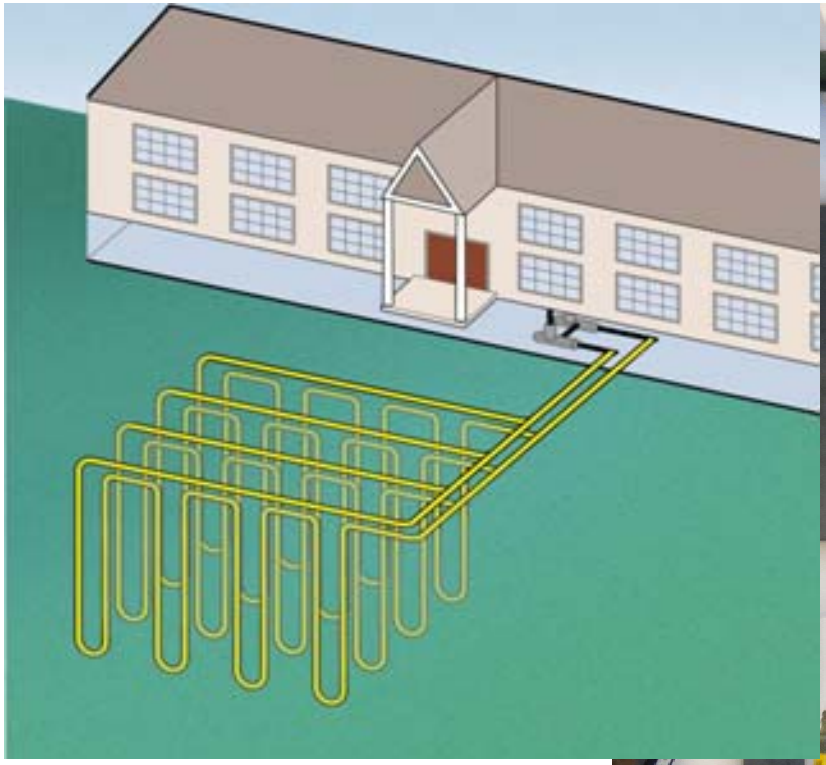
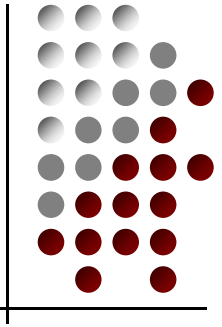


Geothermal System

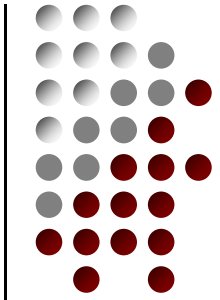
Doepke Holliday Superfund Site

Wind Turbine Examples



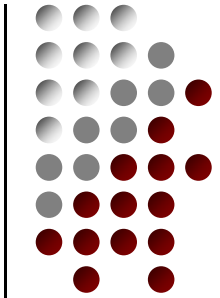
Turbine Size	Annual Production	Turbine Height	Area Required	Project Length	Turn-key Cost
100 kW	260,000 kWh	120' / 155'	1.75 acres	6 months	$580,000
225 kW	535,000 kWh	130' / 180'	2.50 acres	7 months	$810,000
750 kW	1,730,000 kWh	180' / 260'	5.00 acres	8 months	$1,675,000
1000 kW	2,200,000 kWh	230' / 325'	7.50 acres	9 months	$2,250,000

PV System Examples



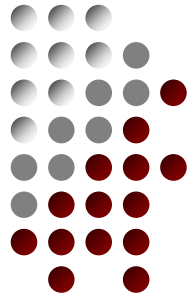
System Type	Panel / Array Size	Annual Energy Production	Area Required	Project Length	Turn-key Cost
Crystalline	220 W / 2.0 kW	2,730 kWh	140 sqft	2 months	$20,000
Crystalline	220 W / 20 kW	27,300 kWh	1,400 sqft	2 months	$150,000
Thin Film	144 W / 2.0 kW	2,730 kWh	326 sqft	2 months	$22,000
Thin Film	144 W / 20 kW	27,300 kWh	3,260 sqft	2 months	$180,000

Opportunities: What do they look like?



- Proximity to renewable resources, or on-site possibilities
- Remedy has energy needs, or buyer will purchase energy produced
- Infrastructure to transmit power into power supply system
- Remedy deserves to be reevaluated
- A Raving Fan

Conclusion; Questions?



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