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

Wind Technologies

What is the *RE-Powering America's Land* initiative?

Demand for renewable energy is increasing in the United States. However, renewable energy facilities often require large amounts of land and could contribute to energy sprawl if developed on greenfield sites. Through its *RE-Powering America's Land: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites* initiative, the U.S. Environmental Protection Agency (EPA) identified more than 11,000 EPA tracked sites and nearly 15 million acres that have potential for developing solar, wind, biomass and geothermal facilities. Using potentially contaminated land and mine sites to develop renewable energy facilities can preserve greenfields; provide developers with access to existing infrastructure; create jobs; and enable potentially contaminated property to return to a productive and sustainable use.

What is wind energy?

Wind energy is captured by wind turbines with propeller-like blades mounted on a tower. The force of the wind causes the rotor to spin and the turning shaft spins a turbine to generate electricity. Wind technology is scalable; based on site conditions, different turbine designs can be used to meet different electricity needs. The following types of wind production were evaluated by EPA:

The Steel Winds project in Lackawanna, NY

- ***Utility scale*** – Uses large turbines at the megawatt (MW) or multi-MW scale on sites with the greatest resource and acreage availability. Electricity generated is typically exported to the grid.
- ***Community*** – Represents sites with less acreage than utility scale wind sites, potentially using smaller or fewer turbines. Electricity generated is distributed to the local area through the distribution system, often serving adjacent properties.
- ***Non-grid connected*** – Uses smaller and fewer turbines on a much smaller scale, typically to power the energy needs of a single property.

A wind turbine generates electricity for a home in CA

How much wind potential exists on contaminated sites?

Utility scale – *37 sites*

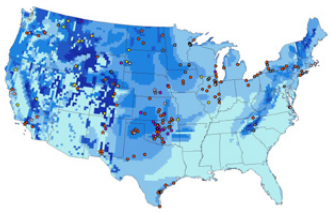
Wind class, measured at 50 meters above ground ≥ 4
Distance to transmission lines ≤ 10 miles
Acreage ≥ 2,000 acres
Distance to graded roads ≤ 25 miles

Community – *169 sites*

Wind class, measured at 50 meters above ground ≥ 3
Distance to transmission lines N/A
Acreage 100 - 1,999 acres
Distance to graded roads ≤ 25 miles

Non-grid connected – *1,304 sites*

Wind class, measured at 50 meters above ground ≥ 3



EPA tracked sites with utility and community scale wind potential

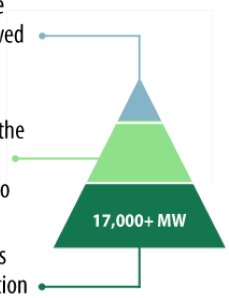
Estimating total technical potential

Wind technical potential for EPA tracked sites: more than 17,000 MW

Market potential – The portion of the economic potential that could be achieved given current costs, policies and technical constraints.

Economic potential – The portion of the technical potential that is economically viable, but requires additional policies to break down market barriers.

Technical potential – Potential that is technically possible, without consideration of cost or practical feasibility.



For more information on wind technologies, visit: www.nrel.gov/learning/re_wind.html

What are some examples of wind facilities being successfully sited on contaminated land?

The *RE-Powering America's Land* Web site highlights wind facilities developed on contaminated land. One example is Steel Winds, the former Bethlehem Steel Mill in Lackawanna, New York. This 30-acre Superfund and brownfield site was contaminated with steel slag and industrial waste. Eight wind turbines were developed on the site. The project will generate over 50 million kilowatt-hours of electricity annually, enough electricity to power 9,000 homes. Steel Winds has received statewide recognition and serves as a model project for other 'Rust Belt' communities. Future plans for the property include the construction of 10 additional turbines, bringing the site's total capacity to 45 MW. Wind power also is used to power remediation projects at contaminated sites. The Apache Power Superfund site in Rio Cochise County, Arizona, uses wind energy to power ground water remediation; this helps reduce remediation costs.

For more information, visit www.epa.gov/renewableenergyland or contact cleanenergy@epa.gov

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