RE-Powering America's Land

Evaluating the Feasibility of Siting Renewable Energy Production on Potentially Contaminated Land

Tucson, Arizona

RE-Powering: EPA/NREL Feasibility Studies

The U.S. Environmental Protection Agency's (EPA) *RE-Powering America's Land* Initiative encourages renewable energy development on current and formerly contaminated land, landfills and mine sites when it is aligned with the community's vision for the site. EPA and the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) are collaborating on a project to evaluate the feasibility of siting renewable energy production on potentially contaminated sites. This effort pairs EPA's expertise on contaminated sites with NREL's expertise in renewable energy. The feasibility studies provide site owners and communities with a technical and economic assessment of installing renewable energy on a given site.

Site Description

The Vincent Mullins Landfill is a retired 61-acre site with a 36-acre waste footprint and an engineered and constructed soil cap. From 1967 to 1987, the City of Tucson operated the landfill, accepting only municipal solid waste. The landfill is 40 feet deep and stores about 2.2 million cubic yards of waste. The site was officially closed in 2007, and a gas extraction system was installed to control and maintain landfill gas within the site and to remove residual contaminants from the waste and the soil. The landfill is in its fourth year of a 30-year post-closure monitoring cycle.

Community Goals

The city is committed to developing solar resources on city land and buildings and considers the landfill as having renewable energy potential. The landfill uses about 13,200 kilowatt hours per year of electric power and is surrounded by other city-owned facilities that consume significant amount of electricity. A solar energy project at the site could supply enough energy to power the landfill flare and meet the needs of several surrounding public facilities. The city plans to use the expertise gained from the feasibility study to evaluate the physical and economic feasibility of renewable energy projects on ten other inactive landfills.

Feasibility Study: Solar

EPA and NREL conducted a study on the potential for solar power generation on the Vincent Mullins Landfill site. The feasibility study evaluated the technical and economic opportunities and challenges at the site. The completed study:

- Provides a preliminary analysis of the viability of the site;
- Assesses solar resource availability;
- Identifies possible system size, design and location; and
- Reviews the economics of the proposed system.

Utility-scale photovoltaic (PV) systems are both technically and economically feasible for the Vincent Mullins Landfill site. Two development scenarios were evaluated in this study for implementing large-scale PV systems on five of Tucson's landfills: one in which the city owns and operates the system and another where a private entity is allowed to develop the site and sell the electricity generated using a Power Purchase Agreement (PPA). The private ownership of a PV system is currently the most economically viable option.

Installing a PV system on one or more of these sites has the potential to add a significant amount of distributed generation to the area, contribute to Arizona's renewable energy standard and tariff (REST), offset energy costs, and create additional revenue for the City of Tucson. Based on available area, the five landfills have the potential to host solar arrays with up to a 25.6-MW capacity cumulatively, with individual systems ranging from 1.6 to 9.1 MW. Tucson's closed landfills represent an under-utilized resource for renewable energy generation, and the results of this study indicate that the energy produced from a privately owned utility-scale PV system will be cost-competitive with traditional grid-purchased electricity.

Vincent Mullins Landfill
Tucson, Arizona

Site Facts:

Site type: Landfill
Renewable technology: Solar

Contacts:

EPA Region 9
Andria Benner
benner.andria@epa.gov
(415) 972-3189

EPA Headquarters
Adam Klinger
klinger.adam@epa.gov
(202) 566-0546
www.epa.gov/renewableenergyland

National Renewable Energy Lab
Gail Mosey
gail.mosey@nrel.gov
(303) 384-7356
www.nrel.gov

The information presented in this fact sheet is from the site's initial proposal, site visit(s), discussions with community stakeholders, and other information collected in preparation of the feasibility study. This fact sheet is for informational purposes only and may not reflect the site's current regulatory or remediation status.

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

EPA

Study Published in January 2013