

Photovoltaic Solar Energy Development on Landfills

February 2012

Fact Sheet

The Issue

California aims to produce 20,000 new megawatts of renewable electricity by 2020 under its new energy plan, with 33 percent of the state's electricity derived from renewable sources. This effort will help California's retail sellers of electricity meet their requirement to serve 33 percent of their load with renewable energy by 2020. Utility-scale solar development is crucial to this energy plan. While playing an important role in achieving California's energy goals, such development often has large land and water requirements, including negative impacts on vulnerable species in fragile desert ecosystems. There is a need for new solar technologies with lower land and water impacts, as well as innovative approaches that result in a lower facility footprint. Such solar technologies would help meet the renewable energy goals of California's new energy plan.

Project Description

The goal of the project is to determine whether placement of a self-ballasting photovoltaic solar racking system will affect a closed landfill's dirt cap. The effects on landfill settlement and power generation performance will be measured with a closely monitored pilot experiment wherein single racks with photovoltaic modules will be placed on a landfill cap. This innovative approach could produce power on previously disturbed landfill sites, instead of using large areas of remote and



Photovoltaic solar panels with a self-ballasting system.
Source: www.pvnavigatorllc.com

environmentally sensitive desert lands, as is the case for some large-scale solar developments. There are an estimated 35,000 acres of suitable, closed landfill sites throughout the state, with the potential to generate up to 7,000 megawatts of solar energy while avoiding sensitive biological resources. The data and resulting guidance manual will aid the development of more landfill-located photovoltaic solar projects and will be made publicly available. This information may be useful for permitting future photovoltaic systems on landfills.

The goals of this project are to:

- Place the racking systems on top of a closed, capped landfill.
- Monitor the effects on the cap using a highly instrumented system.
- Develop a plan detailing the sampling

activities, the sampling frequency, and the data to be recorded.

- Collect data including wind speed, temperature, dust, rain, landfill settlement, solar intensity, electrical generation, vegetative growth, seismic activity, and landfill cap cracking or erosion.

PIER Program Objectives and Anticipated Benefits for California

This research will guide both developers and regulators in future permitting of landfill photovoltaic projects. Landfill-based utility scale photovoltaic energy facilities would provide many benefits. The placement of photovoltaic panels on landfills is desirable because landfills are previously disturbed areas, lacking the resource impacts of natural lands developed for solar energy at high environmental costs. Innovative technologies and approaches will increase use of disturbed or developed land for utility-scale solar, thereby increasing opportunities for the avoidance of sensitive and undisturbed habitats. This will reduce demands on land and fresh water, reduce consumption of other finite resources, and reduce negative impacts on sensitive species and ecosystems. These advanced technologies will also increase usage of renewable energy resources, and improve transmission and distribution of electricity generated from such sources. By avoiding environmental impacts to sensitive natural areas, this project will benefit California residents by providing clean energy and associated jobs in a timely and environmentally responsible manner. This research will help procure a stable, secure, and reliable form of electricity while helping to protect beautiful, natural areas for recreation and enjoyment.

Project Specifics

Contract Number: 500-10-061

Contractor: Project Navigator, LTD

Contract Amount: \$120,000

Contract Term: June 2011 to June 2013

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