

## Renewable Energy Assessment for Reclamation

*Determining ways to use renewable energy on Reclamation lands*

### Bottom Line

These tools provide a way for Reclamation managers to determine the potential for renewable energy at their facilities and lands.

### Better, Faster, Cheaper

In some locations, wind and solar energy can cost-effectively augment Reclamation's hydroelectric power as sustainable non-polluting sources of energy.

### Principal Investigator

Mitch Haws  
mhaws@usbr.gov  
623-773-6274

### R&D Office Contact

Miguel Rocha  
Science and Technology Program  
Coordinator  
mrocha@usbr.gov  
303-445-2841

### Collaborators

- Phoenix Area Office, Reclamation
- National Renewable Energy Laboratory (NREL)
- Central Arizona Water Conservation District
- Bureau of Land Management

### Problem

As environmental concerns over carbon-based power generation increase, Reclamation is exploring the possibilities of adding solar and wind energy to its renewable hydroelectric generation portfolio. Solar and wind could be used to generate power for the overall electric grid (utility scale) or just to meet the power needs of an individual building or plant (facility scale).

To analyze the potential for energy use in our system, we need consistent, accurate, and reliable methods. Determining the potential, suitability, and costs for renewable energy depends on many factors such as slope, insolation (the amount of sunlight), wind resource potential, proximity to power transmission, access to roads, adjacent public or state lands, and regional market potential. Undertaking these investigations will help Reclamation make informed decisions about wind and solar energy.

### Solution

In 2011, Reclamation's Phoenix Area Office initiated a study to assess the economic feasibility and technical suitability of renewable energy use at its facilities. To assist in this effort, the Research and Development Office established an Inter-Agency Agreement with the National Renewable Energy Laboratory (NREL) to assess and analyze renewable energy generation opportunities within Reclamation. The Reclamation-NREL Team:

- Used geographic information system (GIS) technology to identify and rank the potential for solar and wind energy development on Reclamation lands
- Conducted detailed technical and economic assessments of these potentially suitable lands
- Identified Reclamation facilities with the best potential to deploy facility-scale solar and/or wind energy resources
- Conducted a technical and economic study of deploying wind or solar energy at three Reclamation sites north of Reclamation's Hayden-Rhodes Aqueduct right-of-way
- Examined the possibility of installing solar energy at the Phoenix Area Office building

### Conclusions and Recommendations

The team has developed a methodology to examine the opportunities for developing renewable energy on Reclamation properties. This method uses GIS overlays to examine slope and insolation as well as other suitability factors, and then uses financial analyses to determine feasibility.

— continued



— continued

NREL has released a final report detailing the potential for renewable energy in the Phoenix Area Office service area. Recommendations include:

- Revisit cost analyses if solar prices continue to drop and the cost of power from the Navajo Generating Station increases
- Pre-qualify the development potential of the most promising sites, especially in areas that are near transmission lines that have capacity, and areas with the potential for very low environmental and cultural impact
- Once Reclamation determines that a site has strong potential for development, they consider issuing a competitive lease solicitation that can be used to evaluate industry interest in moving forward with a project at that site

NREL recommends that Reclamation further study the Hassayampa and other regional sites as the most suitable locations for possible replacement project power. NREL further recommends that the Phoenix Area Office consider installation of additional photovoltaic panels because of the high cost of energy, dropping cost of photovoltaics, excellent solar resource, and excellent incentives.

*Project team identifying renewable energy opportunities at Hassayampa, Arizona.*



***“Reclamation has several cost-effective opportunities to integrate renewable energy sources into its facilities as well as along existing right-of-ways for water supply projects such as the Central Arizona Project. Integration of renewable energy technologies with critical water supply infrastructure will allow Reclamation to be at the forefront of meeting national and regional sustainability and critical infrastructure goals.”***

Mitch Haws,  
Program Development Division,  
Phoenix Area Office, Reclamation

#### **More Information**

Haase, S., K. Burman, D. Dahle,  
D. Heimiller, and O. Van Geet.  
2012, Assessment for the Bureau of  
Reclamation.  
[www.nrel.gov/docs/y12osti/53697.pdf](http://www.nrel.gov/docs/y12osti/53697.pdf)

