



**WINROCK**  
INTERNATIONAL



Powerhouse of the 35 Kw microhydro power system in Sitio Lubo, in the Philippines. It provides electricity to 125 households, a national high school, a religious center and a community hall.

## Water, Energy & Infrastructure

## Hydropower

### Hydropower to Increase Productivity & Economic Security

For more than 20 years, Winrock has provided technical support to and mobilized investments in mini-grids powered by micro- and small hydropower Independent Power Producers (IPPs) for emerging economies in Asia, Africa, and Eastern Europe.

#### Winrock's Services

**Resource Assessments, Feasibility Studies, Project Design:** Conduct desk studies, resource assessments, and field surveys to prepare pre-feasibility and feasibility studies of micro- to small hydropower projects (<10 MW); prepare detailed engineering design and bid documents for construction.

**Capacity Building:** Improve the capacity of companies, communities, IPPs, and banks through technical training in equipment manufacturing, hydropower design, finance, installation, operation and maintenance, and monitoring of hydropower plants.

**Finance Facilitation:** Foster dialogue and build developer-financial institution partnerships; assist developers in preparing bankable documents and educate banks about risk mitigation; provide and strengthen access to carbon finance.

**Social Mobilization:** Design and implement social mobilization strategies to actively involve communities in hydropower development.

**Impacts Assessment:** Monitor and evaluate hydropower programs' performance and their impacts on health, the environment and local economy; and conduct Environmental Impact Assessments (EIA).

**Productive-use Promotion:** Design tariffs to promote productive uses, increase awareness among enterprises, and facilitate technology transfer; in-

crease jobs and income by making use of generated electricity.

**Policy Advice:** Advise policy makers on legislative and regulatory issues involving the hydro sector; and conduct comprehensive reviews of hydro programs.

### Examples of Winrock's Hydropower Projects

**Nepal:** Winrock and its partners catalyzed investments of over \$100 million in private equity and debt into small hydropower IPP projects in the 1 MW to 10 MW range. Winrock enabled project developers to carry out bankable feasibility studies, negotiate power purchase agreements with the utility and overcome legal and managerial hurdles. Banks were trained to mitigate risks on energy project loans. Winrock mobilized private equity investment to establish a fully commercial Clean Energy Development Bank that specializes in lending to hydropower and other renewable energy projects. In addition, Winrock proposed revisions on behalf of the Nepal government to the country's subsidy policy for over 700 mini-grids using micro-hydropower.

**The Philippines:** Under the Alliance for Mindanao Off-Grid Renewable Energy (AMORE) program, Winrock constructed and commissioned two micro-hydropower projects, 35 kW and 40 kW, to electrify 250 households and demonstrate sustainable mini-grids for remote communities in South Cotabato. Households in these communities were actively involved in project implementation through Barangay Renewable Energy and Community Development Associations (BREC-DAs). Winrock helped form the BRECDAs, to enable communities to properly operate and maintain micro-hydropower systems. BRECDAs were trained in organizational development and management, financial management, technical operation and maintenance, and environmental management.





**Afghanistan:** Winrock completed the feasibility study and engineering design of a 1,000 kW to supply the town of Bamiyan. In Badakhshan, Winrock galvanized teams of experts to carry out surveys and design for a new 700 kW mini-hydropower plant in Kishem district and the refurbishment of existing micro hydropower plants in Faizabad and Baharak districts. Winrock provided micro-hydropower technical training to enhance the skills of 40 Afghan engineers working under the National Solidarity Program to design and implement around 500 micro-hydropower projects each year. Participants were trained in resource assessment, community mobilization, surveying and engineering design.

**Pakistan:** Winrock prepared documentation for Aga Khan Rural Support Program (AKRSP) to register a small-scale renewable energy project under the Clean Development Mechanism by aggregating 103 mini-

hydropower projects to supply remote communities in Northern Pakistan. Winrock helped AKRSP negotiate an emissions reduction purchase agreement with the World Bank's Community Development Carbon Fund. Winrock increased the project's energy utilization factor by improving the reliability and quality of supplied electricity, and using electronic load controllers at power plants.

**Republic of Georgia:** Winrock added more than 11 MW to the country's electricity generation capacity and mobilized investors to rehabilitate 10 small hydropower projects. Project financing for the rehabilitation came from major Georgian banks, eight of which went on to establish separate energy financing units. Winrock developed an online database, [www.minenergy.gov.ge](http://www.minenergy.gov.ge), for potential investors. The database includes hydrological and other site parameters for 91 hydropower sites, ranging from 5 MW to 100 MW. Winrock helped electrify seven off-grid communities using micro-hydropower projects, and completed 35 village assessments and eight feasibility studies in the process.

**South Sudan:** Winrock carried out pre-feasibility and inception studies for hydropower projects, sizes 200 kW and 1,500 kW respectively, to expand electrification and reduce operating costs of the diesel-based mini-grids that supply the towns of Maridi and Yei.

**Liberia:** Winrock conducted a feasibility study, completed an EIA and engineering design, and prepared bidding documents for the 1,000 kW Mein River project in Liberia to provide electricity for more than 2,000 families in Bong County.



Winrock International is a nonprofit organization that works with people in the United States and around the world to empower the disadvantaged, increase economic opportunity, and sustain natural resources.