



**WINROCK**  
INTERNATIONAL



Water, Energy & Infrastructure

Bioenergy

## Facilitating Bioenergy Use

Winrock has played a key technical and knowledge transfer role in sustainable bioenergy development for more than two decades. Our experts in forestry, agriculture, clean energy, enterprise development, and governance create the interdisciplinary teams needed to ensure that bioenergy delivers sustainable outcomes.

## Supporting Innovation

Winrock promotes the application of new ideas for bioenergy technologies and processes that address energy access and sustainability challenges.

We conduct feasibility studies, field-based demonstrations and trials to test and prove the commercial viability and cultural acceptability of bioenergy initiatives. Past activities include the following:

**Pakistan and Uganda:** Biogas production and use, and developing programs to launch domestic biogas projects, straight vegetable oil-run generators.

**Liberia:** Small-scale gasifier technology and training for 180 people on operation and maintenance.

**Brazil:** Ethanol cook-stoves, biomass-fueled advanced gas turbine technology, and high-efficiency charcoal production.

**United States:** Field-testing of higher-yielding varieties of grasses and trees; co-firing biomass fuels with coal in utility-scale power plants; and production of liquid fuels from forest residues.

**Nepal:** Jatropha collection and processing to run irrigation pumps.

**Thailand, India, Jamaica, the Philippines:** Baling cane field residues to increase available fuel for co-generation plants at sugar factories.

**India:** Piloting a commercial demonstration unit to produce ethanol from ligno-cellulosic biomass, straight vegetable oil-run generators.

In Asia, Europe and South America, Winrock has worked with local industries to develop more efficient equipment with better environmental performance.

In Africa, we managed grants for nine bioenergy pilot projects, five of which secured additional funding for scale up. We also developed and promoted innovative satellite and GIS based analyses to support improvements in biomass resource assessment mapping.

## Scaling Up Use of Modern Bioenergy Services

Winrock launched the Environmental Enterprises Assistance Fund (EEAF) to invest in promising environmental innovations. EEAF provided debt and equity financing to catalyze investments in bioenergy projects.

**Indonesia:** Winrock works with palm oil mills, providing technical assistance to replicate and scale palm oil mill effluent-to-energy projects for the mill and local community, while reducing costs and greenhouse gas emissions. More than 20 mills have received technical assistance and four mills have reached financial closure. By the end of

the project there will be over \$90 million in investments in palm oil mill effluents-to-energy power plants and offset over 880,000 tons of CO<sub>2</sub> annually.

**Russia:** The technical and financial assistance provided by Winrock to partner-companies supported the launch of 76.5 MW new bioenergy capacity, replacing



more than 300,000 tons of fossil fuel a year and, producing an annual added value of USD \$20M.

**Nigeria:** We are facilitating access to finance in the renewable energy sector. This includes bioenergy projects using agricultural wastes and residues. We are partnering with project developers and banks to significantly increase installed capacity.

### Supporting Sustainability Research and Standards

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Winrock plays an important role in the development of international sustainability research and standards development. Since 2008, with support from the Packard Foundation, Winrock has partnered with scientific leaders and policy makers to develop technical and scientific information that inform policy and standards development. Our technical resources have been used by policy-makers and international voluntary standard setting groups in developing sustainability indicators and measurement approaches that are now being piloted or implemented internationally.

### Identifying Policy and Market Options

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Winrock has a long history in market development for bioenergy. In Jamaica, we collaborated with the government to strengthen bioenergy and biofuel policy and market development. Through the U.S.-Brazil Biofuels

Winrock supported private-sector investment in sugarcane, rice, and wood residue energy systems, resulting in the development of over 300 MW of grid-connected generation and improved policies and laws favorable to private power and/or biomass energy in Costa Rica, Guatemala, El Salvador and India.

Partnership, we identified opportunities for biofuel projects in El Salvador, Dominican Republic, and Haiti aimed at reducing the cost of imports of fossil fuel, securing investment, creating jobs and improving social conditions. In support of the APEC Biofuels Task Force, Winrock identified policy options for the environmentally sustainable development of biofuels in APEC member economies.

### Facilitating Knowledge Transfer

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Winrock facilitates the use of satellite-based technology to monitor and support bioenergy policies and programs. We have engaged more than 70 specialists from 10 countries through webinars, workshops and pilot activities. We have disseminated new ideas and best practices on bioenergy sustainability subjects to international organizations involved in setting bioenergy policies and standards. In addition, Winrock promotes international knowledge sharing and exchange at the bioenergy and water nexus with the IEA Bioenergy and the Global Bioenergy Partnership.

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.