Small Hydro Power
CLEAN RENEWABLE WATER POWER

economical inflation free environmentally benign

www.unido.org/ruralenergy

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
www.unido.org
UNIDO’s Rural Energy Initiative through Renewable Energy Helps Achieve Millenium Development Goals

- **Halving Extreme Poverty**  
  (access to energy services frees time for productive activities otherwise used for fuel gathering, food grinding/preparation)

- **Halving the number of people who suffer from hunger**  
  (Energy for pumping water for drinking/irrigation - processing/grinding food grains)

- **Enabling Universal Primary Education**  
  (Energy powers ICTs for distance learning - lighting homes for study during evening hours)

- **Promoting gender equality and empower women, also in education**  
  (Energy provides increased opportunities for productive activities)

- **Reducing Child Mortality**

- **Ensuring environmental sustainability**  
  (Renewable energy can reduce greenhouse gas emissions and deforestation)

UNIDO Institutions that help Promote Small Hydro Power Projects and provide Training and Capacity Building in Developing Countries

**The International Centre for Small Hydro Power (ICSHP)**  
Hangzhou, China.

Objectives and Activities:
- Promote sustainable development of water resources worldwide
- Clean, environmentally sound rural electrification
- Provide successful models for speedy development of SHP
- Training and Capacity building in SHP
- Technology Transfer in SHP

For more information contact: [www.inshp.org](http://www.inshp.org)

**UNIDO Regional Centre for Small Hydro Power, Kerala, India.**

Objectives and Activities:
- Providing training and capacity building in the area of Small Hydro Power.
- Carrying out feasibility study, analysis, design, development and implementation of SHP systems in the region.
- Establishing an information network on renewable energy and small hydro power.
- Act as a sub centre for the International Centre for Small Hydro Power, Hangzhou, China.

For more information contact: [www.unidorc.org](http://www.unidorc.org)

**UNIDO Regional Centre for Small Hydro Power, Abuja, Nigeria.**

Objectives and Activities:
- Promote Small Hydro Power in ECOWAS Region
- Training and Capacity building in SHP

For more information contact: office.nigeria@unido.org

For information on upcoming Training Seminars/Workshops or National Focal Points, please contact: [www.unido.org/ruralenergy](http://www.unido.org/ruralenergy)
SHP for Rural Development

COMMUNITY DEVELOPMENT CENTRE (MODEL) POWERED BY SMALL HYDRO POWER

- **Agro-Processing**
  - Food grain grinders, Oil expellers
  - Grain dehusking, Cold Storage etc.

- **ICT-Connectivity**
  - Networked PCs, Internet Connectivity
  - Distance Education, E-Governance, Market Information, Information Dissemination etc.

- **Health Centre Facilities**
  - Refrigeration for vaccines & Medicines
  - Health Service/Care Equipments, Tele-Medicine etc.

MICROGRID POWERED BY SMALL HYDRO POWER

- **Lighting**
  - Household lighting, Cooking, Heating, Refrigeration etc.

- **Industries**
  - MicroLight/Cottage Industries

- **Food Preservation**
  - Food Preservation, Cold Storage etc.

Energy for Productive Use in Off-Grid Areas
Technology Partnerships Through South South Cooperation
Ongoing UNIDO Projects in Renewable Energy

India: Mankulam, Kerala
SHP (110 kW) / Solar Hybrid (1 kW) to power Common Facilities with ICT/VSAT Internet connectivity, Mobile Phone Recharging, Grain Grinding, Cold Storage, Satellite TV, Telephone Exchange and micro-grid for rural lighting.

Maldives: Baa. Atoll
Solar (4 kW) / Wind (6 kW) hybrid to power Community Development Centre with ICT/Internet Connectivity, streaming classroom programmes to remote islands through internet technology, e-health, e-governance. Solar Thermal Energy for water desalination and hydroponics.

Sri Lanka: Northern, Eastern and Tsunami Affected Areas
SHP (25kW) / Solar / Wind hybrid systems to power ICT for internet connectivity and other income generating activities in rural, post conflict and Tsunami affected areas in Sri Lanka.

Tanzania: Rukwa Region, Sumbawanga
SHP (75 kW) / Solar hybrid system powered ICT with Internet connectivity, Satellite TV, Community Development Centre with micro grid for rural lighting.

Uganda: Bundibugyo, Ndugutu River
SHP (250 kW) powered Community Development Centre with ICT / network & internet connectivity, satellite TV, e-health, e-governance, and micro grid for income generating activities.

Nigeria: Enugu
SHP - (30 kW) powered Community Development Centre for internet connectivity and income generating activities.

Bauchi
SHP (75 kW) for productive applications including ICT and internet connectivity.

Several Ongoing Microhydro Demonstration Projects in East & Sub-Saharan African Countries
Idduki district in Kerala, India, prides in having the country’s tallest arch dam in its largest Hydro Electric Power Project. However, till recently, Mankulam village in the district had no road, electricity and phones. Since this district is also home to a wildlife sanctuary, environmental concerns determined the development ethos of the village and its population of 15,000 had to make do without modern amenities and Information Technology.

With UNIDO assistance, the long cherished dream of the people to electrify the village became a reality on 28 October 2004. In keeping with its mission to catalyse all-round development and progress in rural areas, UNIDO assisted the Mankulam village community in implementing a Micro Hydro Power Project through the UNIDO Regional Centre for Small Hydro Power in Trivandrum, Kerala. To ensure that power generation also results in employment, income generation and offers entertainment and leisure, UNIDO established a Community Development Centre (CDC) with networked computers, TV, flour mill, and a wet grinding station. The Computer Centre has already trained several youth. The village has also established Internet connectivity through VSAT to enable people to stay informed as well as communicate to the outside world using email in the absence of telephones.

Inspired by the immense success of Micro Hydro Projects in China, the power project at Mankulam is the first UNIDO project to be completed under the direction of the Village Panchayat (a local self governing body; a community based organisation). The entire system ranging from generation, transmission and distribution of power is owned, operated and managed by the Panchayat which ensures long term sustainability of the project. Thus, there is little doubt that the 110kW station is truly a people’s project. UNIDO uses this model of micro hydro systems powered community development centres for replication in other developing countries as it ensures that the power will result not only in rural electrification but also long term economic benefits and overall community development. In Mankulam, within the last few months, availability of power has catalysed the creation of small enterprises and has enabled people to productively use the rich, unpolluted local agricultural products like cocoa, milk and other forest produce and access markets directly.

UNIDO will also install a Biomass Gasifier in the village that will utilise local agricultural waste for production of additional electricity and develop the abundant water resources through an additional 1 MW small hydro capacity and connect all these resources into a rural grid.

Renewable Energy for Rural ICT & Telecom

Bridging the digital divide in rural areas to improve:

- Information Dissemination
- Economic and SME Opportunities
- Good Governance - increase transparency
- Education - distance learning
- Health - especially for women & children
- Environment
- Tourism - create and enhance income
- Rural Connectivity for better communications
- Agricultural Productivity
- Early Warning System for natural disasters
Renewable Energy for Sustainable Development

UNIDO offers tailor made solutions through its Technical Assistance Programme to meet rural energy demands in developing countries through South–South Cooperation and technology transfer.

Facilitate improvements in productivity of rural enterprises and quality of life for rural communities and individuals.

Productive Use of Energy in Agriculture:
Provide rural farmers clean, and reliable energy in an affordable and sustainable way and enhance productivity.

Productive Use of Energy in Rural SME Development:
Facilitate improvements in productivity of rural enterprises and business development services

Productive Use of Energy to Empower Rural Communities:
Improve standards of health, quality of life and standard of living among rural communities.

Comprehensive services for Renewable Energy Projects
Planning & Feasibility,
Project Engineering & Project Management.
Renewable Energy for Rural Industrialization

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