Clean Energy Training for Educators

VOCTEC Clean Energy Training for Educators is designed to assist and prepare local educators and professionals from government, industry and educational institutions for future practice and delivery of vocational hands-on renewable energy training in their home countries.

The program incorporates comprehensive educational elements on clean energy technologies including how to train local technicians and operators for the sustainable installation, operation and maintenance of renewable energy systems. Classwork includes lectures and demonstrations to instill fundamental principles of design, installation, maintenance, and troubleshooting of renewable energy systems. These sessions are paired with hands-on training on relevant equipment. This technical training is supplemented with modules on teaching techniques and communication, as well as economic and social issues related to the use of clean energy.

VOCTEC Clean Energy Training for Educators programs are customized in accordance with local requirements and conducted in close cooperation with local educational and other institutions. Depending on local capacity, availability and requirements, the length of these in-depth programs typically varies from 2 - 3 weeks.

After completing VOCTEC educator training, students will understand:

- Fundamental electricity principles, including electrical current, voltage, power, resistance
- Common terminology and components used in RE technologies
- Natural resource assessments and their relationship to local natural resources
- Best practices for system design, selection, installation and operation
- How to maintain, troubleshoot and repair renewable energy systems.
- Differences between grid-connected and off-grid RE systems
- Significance of energy efficiency measures
- Social and economic impacts of RE systems on community members
- Teaching tips & communication strategies

What is VOCTEC?

The “Vocational Training and Education for Clean Energy” (VOCTEC) program, under the leadership of Arizona State University (ASU), is a 5 year global program funded by the United States Agency for International Development (USAID). VOCTEC aims to improve the sustainability of renewable energy infrastructure and investments in developing countries by increasing awareness, knowledge and capacity of local stakeholders, primarily in decentralized clean energy technologies.
Example Training Course Topics

**Solar Educators PV Workshop Outline**
- Overview of solar thermal and solar PV technologies
- Basic principles of solar PV systems and components
- Solar radiation map and spectrum
- Weather factors influencing system performance
- Sizing of PV configurations and components
- Installation, maintenance and operation of PV systems
- Importance of international standards and certifications
- Set-up of solar PV training and testing laboratories
- Lab experiments enforcing the theory learned in the classroom

**Wind Educators Workshop Outline**
- Overview of wind energy technologies and their applications
- Basic principles of electricity and how to safely use and measure it
- Basic principles of wind turbine site selection & proper siting
- Wind resource assessment techniques
- Estimating energy production
- Introduction to tower types and construction tools & techniques
- Turbine types and installation procedures
- Balance of System Component design and proper construction
- Maintenance issues, requirements, and procedures

**Micro-Hydro Educators Workshop Outline**
- Definitions of small, micro, pico hydro and overview of system components
- Demand analysis, load profile, power production estimation
- Water resource assessment and site analysis
- Civil Works - role and function of system components
- Overview and comparison of most common types of turbines
- Mechanical transmission options and comparisons
- Types and selection of generator, load controller and other equipment
- Electrical distribution mini-grid
- Installation, operation, and maintenance for all the above