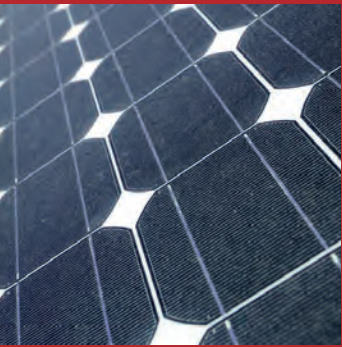




# ENERGY THROUGH EDUCATION!



## RENAC MISSION

### Know-how transfer for Renewable Energy and Energy Efficiency – International and national

The Renewables Academy AG (RENAC), based in Berlin, Germany, is one of the leading international providers of education and training in the fields of renewable energy and energy efficiency. Since our founding in January 2008 over 1,500 participants from 96 countries worldwide have benefited from our expertise in the technology, financing, management and market development of renewable energy and energy efficiency. A key feature of RENAC is its Training Center with its fixed as well as mobile training facilities for photovoltaic, solar thermal, wind and energy efficiency technologies, so that not only theoretical but also practical training can be carried out flexibly in Germany and abroad.



## Providing knowledge for the development of Renewable Energy and Energy Efficiency

### Our Goal

Our belief is that knowledge is one of the key factors for the future growth of renewable energies and clean, secure energy supplies. The rapid growth of green technology markets has led to increased demand for expertise and qualifications throughout the industry, financial institutions and policy-setting bodies. Through training and professional services, RENAC aims to propagate the necessary know-how for the growth of renewable energy and energy efficiency markets.

### Get professional for tomorrow's markets

RENAC supports people, companies, institutions and organizations in developing renewable energy and energy efficiency markets at different levels - technical, political, legal, financial. Therefore, side-by-side with our educational courses, we also offer professional services, tailored to customers' needs, both in Europe and worldwide:

- Consultancy for grid integration of renewable energy
- Programmes for international delegations
- Conferences and workshops on capacity building
- Assessment of training needs
- Study courses

Experience the hospitality of RENAC's staff in the heart of Berlin or let us come to your location:

### In-house seminars

Well-trained staff are crucial to business success. However internal training comes at a cost – both in terms of time and budget. Our standard in-house courses cover the full spectrum of renewable energy topics; alternatively we provide customised training as an optimal solution to your needs – either at your premises or in RENAC's Training Center.

"The more I look at my notes from the class, the more helpful I find them. RENAC is really providing one of the strongest courses imaginable."

Piper Foster, Ecologic Institute, Germany

# RENAC COURSES

## We offer courses in the following technologies:

- Photovoltaics (grid-connected and off-grid)
- Solar thermal (small and large scale)
- Wind energy (small and large scale)
- Concentrating Solar Power (CSP)
- Bioenergy (biogas, biogene fuels, biomass)
- Energy efficiency in buildings
- Energy efficiency in industry and commerce



“Fantastic course. Great instructions and course participants. Good platform for exchange.”  
Minhaj Ameen, Auro Renewable Energy, India

## Our courses cover the whole value chain of renewable technologies

### For managers, economists, project developers, sales and marketing, finance providers ...

Learn about the renewable energy business:

- How the technologies operate
- Opening up RE markets
- Successful project financing and economic feasibility assessments
- Project management and working methods for technical projects
- Optimisation of technical business processes

### At the cutting edge of practice: Get empowered

We want to equip our course participants for the challenges of real projects through an intense and absorbing training experience. Therefore all our courses are designed so that the material can be readily put into practice. Our lecturers use examples based on real-world experience, we organise visits to operational sites, and we compliment this with real, hands-on experience in our Training Center.

### For engineers, technicians, builders ...

Learn how to design, install and maintain renewable energy systems:

- Understand the physics and technical fundamentals of electricity or heat generation from sun and wind
- Characteristics of components
- Planning, construction, operation and maintenance of systems
- Quality assurance

### For the public sector, government, advisors, consultants ...

Learn about all aspects of market development:

- Setting up policies to enhance market growth
- Legislation and regulation
- Financing and other incentives



# RENAC TRAINING CENTER

## Practical Training and Experience

To provide our course participants with a thorough understanding of green energy technologies, we place a high emphasis on hands-on instruction – which takes place in the RENAC Training Center. An experience of the technologies in use is essential – theory and books are not enough.

## Get first-hand experience of the latest developments in RE technology

Experimenter kits help to demonstrate the principles of renewable energy technologies.

Training rigs enable realistic simulation of solar systems.

A computer lab allows system simulation using state-of-the-art design and planning software.

A demonstration area, with sample components and information panels, showcases a broad range of technological applications.



## Practical training and experience – the key to successful learning

### One Training Center – Four technology-specific labs

To maximize learning outcomes, the RENAC Training Center in Berlin is equipped with: PV systems, solar hot water systems, wind power systems, energy efficiency technologies.

#### Photovoltaics (grid-connected and off-grid)

In our PV Lab participants obtain hands-on practice in all stages of PV system building – from planning, installation, maintenance, quality management, through to monitoring and remote control. Industry standard components are available for inspection and measurement exercises. Training equipment covers both grid-connected and off-grid configurations.

#### Solar Thermal

The Solar Thermal Lab houses several rigs for demonstrating the operation of solar thermal systems to provide hot water and space heating. Participants can actively familiarize themselves with the systems by fitting components, mounting collectors, fault-finding and going through the commissioning process.

#### Wind Power

In our Wind Lab you will get a fundamental understanding of wind energy physics. We will teach you how to measure and assess the wind resource. You can undertake a broad range of experiments with micro wind turbines: seeing the effect of changing wind speed, measuring power curves, varying the number of rotor blades, changing the rotor pitch, examining the aerodynamic lift and resistance, measuring tip speed, and looking at other, typical technical parameters, loading and micro grid variants.

#### Energy Efficiency

We make energy efficiency visible! We use a suit of model building components to demonstrate the various approaches to best practice in building design and construction. Further on, we have experimental rigs for industrial applications to allow you to perform a variety of exercises, so that you can become familiar with the latest energy saving methods and technologies in the commercial sector.

# RENAC TRAINING CENTER

## Software and analyzing instruments

- Laptops with industry-norm software for the simulation of renewable energy projects, e.g. PV\*Sol, T\*Sol, PVSyst, AWS openWind, Wind PRO, HOMER etc.
- Instruments for assessing the suitability of sites, including solar irradiation meters and wind measurement devices

## Technologies

- A large assortment of thin film and wafer based PV modules
- Inverters from a range of manufacturers
- The specially designed IKS Photovoltaics Trainer for Professionals to simulate the electro-technical behaviour of PV systems
- A variety of solar thermal collector types from a variety of manufacturers
- Controllers, monitoring systems, mounting devices
- Mock roof and support frames with all necessary mounting parts for the installation of roof-mounted solar systems
- Windtrainers, small wind turbines, micro grids, anemometers
- Model house for demonstrating energy saving techniques
- Models for simulating energy-optimized industrial assembly



## RENAC Mobile Training Center

For courses at, or near our clients' premises – whether in Cape Town, San Diego, Delhi or Munich – we have a mobile Training Center, which we can transport to your location. Using our RENAC Mobile Training Center, we can undertake training for photovoltaic, solar thermal and wind energy technologies.

## Make sure your business stays at the forefront through training with our extensive range of training equipment

### Intensified training through practical exercises

Hands-on exercises are essential to allow course participants to gain the right expertise for successfully installing reliable and long-lasting systems.

A selection of exercises available in the RENAC Training Center:

- Electrical connection and setting-up of photovoltaic systems (on- and off-grid)
- Installation of solar thermal collectors and PV modules
- Operation and maintenance of solar thermal and photovoltaic systems
- Measuring the electrical characteristics of PV modules under varying environmental parameters
- Measuring wind speed, power output and power curves of wind turbines
- Rotor blade maintenance
- Fault finding and repair

### We use case studies and real-life scenarios, working in small groups e.g.:

- Calculation of shadow-casting and noise-propagation of wind farms
- Energy yield calculations
- Financial aspects: Cash flow analysis, risk assessment, due diligence, business model development
- Assessment of sites



## SELECTION OF OUR REFERENCES

Supported by:



based on a decision of the Parliament of the Federal Republic of Germany



- TREE – Transfer Renewable Energy & Efficiency
- ReGrid – Grid Integration of Renewables
- GPE-Solar Master Degree Program on Solar Technology with the Technical University Berlin



- Export Initiative - AHK Business Trip Program
- Business Delegations
- Trade Fair Program



- In-house Training for GIZ
- GIZ Chile – Wind Power Forecast
- GIZ Egypt and GIZ Syria – Solar Thermal Training
- GIZ Wind Seminar in Vietnam



- Public Authority for Electricity and Water (PAEW) in Oman – Solar Training



- Abu Dhabi Distribution Company, VAE – Photovoltaic Training



- Training Programmes for the Kuwait Institute of Scientific Research (KISR)



- IRENA – Workshop for Capacity Building



- RCREEE Training for Delegates from nine MENA Countries



- Nigeria Eauxwell – Photovoltaic Offgrid Training



- Photovoltaic Workshop in Saudi Arabia



- Capacity Building on Grid-Integration of Renewable Electricity, Egypt



- Solar Thermal Market Research



- Seminar providing In-depth Knowledge on the Design of Utility Scale Solar Power Plants (PV and CSP)



- Training on Bioenergy and Photovoltaic, Ghana



- Customers Training for Aleo Solar on Photovoltaic



- EurObserv'ER

### CONTACT

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