renac
renewables academy

RENAC Training Centre

The Key to Successful Learning









Energy Through Education!

Our mission is to provide knowledge for the development of renewable energy and energy efficiency. Our belief is that knowledge is one of the key factors needed for the future growth of green energies that provide clean, yet secure power.

renac
renewables academy

"This lab is going to help students open up even more opportunities as it expands the fields we can work in as professionals after graduation."

Helen Lankester, EARTH alumni from Costa Rica

RENAC Training Centres – The key to successful learning

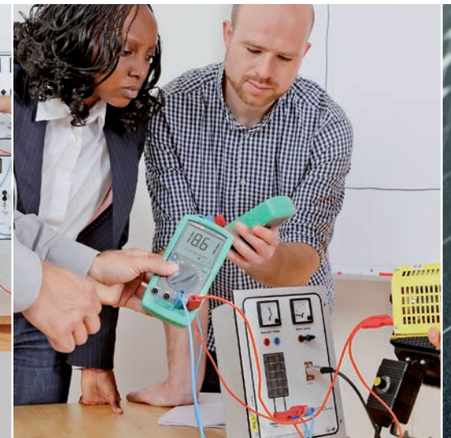
Being trained on practical equipment during solar classes, bio energy courses, wind energy courses or energy efficiency training plays a crucial role in efficient teaching. The Renewables Academy offers turn-key training centres with corresponding instructions and exercises for advanced trainings in the field of renewable energy and energy efficiency. This is a highly customised yet neutral service.

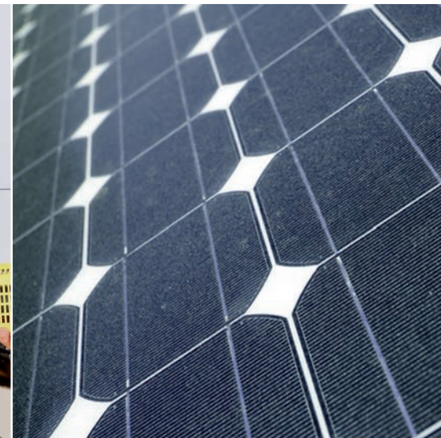
Design and implementation of turn-key training centres

RENAC designs and implements customised training centres in a holistic concept:

- State-of-the-art training equipment
- Customisation to clients and regional requirements
- Turn-key implementation, including transport and installation
- Full range of exercise plans and lab instructions

RENAC's service is independent from manufacturers or producers, guaranteeing unbiased and cost-efficient equipment selection. Courses can be run right after commissioning the centre.





Practical training - essential for efficient learning

A RENAC Training Centre adds a unique feature to education in the thriving field of renewable energy. Practical training is essential to extend and apply expertise gained during lectures or studies.

renac
renewables academy

> "We have an international student body that could take this information learned at the lab back to their communities and improve the livelihoods of those around them."
>
> Professor León, former Director of EARTH's Research Unit

Our services include:

Concept and design

- Customised to our client's training needs and regional requirements

Hardware set-up

- Purchase and assembly of state-of-the-art training equipment

Transportation and logistics

- Including shipment

Turn-key implementation

- Installation at client's location

Train-the-Trainer courses

- On the use of equipment

Complementary manuals

- User handbooks, lab instructions, exercise handbooks, equipment labels

Regular equipment update

- According to newest technological standards

RENAC Photovoltaics Training Centre

With our training centres you can understand the behaviour of various solar module technologies and the use of professional test instruments.

renac
renewables academy

> “The training was very interesting because I have personally advanced my knowledge to another level. It would be good if our government can equip us with all the training facilities.”
>
> Participant from South Africa

Technologies and skills transfered

Photovoltaics (PV) fundamentals, off-grid and on-grid

- Conduct current and voltage measurements and performance characteristics
- Explain fundamental relationships in solar cells
- Distinguish and explain different characteristics of poly- and mono-crystalline and amorphous solar cells
- Define the functions of all components of a solar home system
- Assess sites in relation to their suitability for solar installations
- Perform the dimensioning of PV systems by using simulation software
- Set up a simple demo-solar home system (SHS) (modules, charge controller, battery and DC load)
- Perform measurements at an existing SHS and to detect faults
- Calculate the economic viability of a site by using measured radiation data
- Detect possible errors and how to correct them
- Explain the functionality of a grid-connected PV system and introduce incentive schemes
- Perform rough plant sizing exercises using simulation software
- Explain the differences between island and grid-connected inverters
- Calculate feasibility of the site using measured radiation data
- Detect possible errors and how to correct them

RENAC Training Centre

A fully equipped training centre consists of computer laboratories with design and planning software, experimental kits, demonstration components and systems with real-life equipment for practicals, grid simulation devices and measurement instruments.

renac
renewables academy

"It was a great experience to be part of that training, and take home a lot of knowledge, tips, and tools about PV-hybrid systems. Thank you again for your knowledge sharing spirit and hospitality."

Rami Nassar, energy and sustain-ability Consultant, participant 2014

Solar thermal

- Explain the functionality of a solar thermal installation for hot water
- Define the function of each component: collector, storage tank, heat exchanger, pump
- Calculate sizes for hot water consumption in residential and office buildings
- Measure and plan solar thermal systems - using pre-installed and portable instruments
- Assess the economics of solar thermal plants based on measured data
- Detect faults in a system for water heating and correct errors

Hydro power

- Understand the functionality of a run-of-river hydropower installation
- Understand the purpose and functionality of the electro-mechanical components
- Understand the concept of head and head loss, and the difference between static and dynamic pressure
- Calculate from theory the optimum turbine and generator operating conditions and observe how these can be adjusted in practice to reach the optimum
- Measure water flow rate and pressure and calculate power input
- Measure the generated current and voltage and calculate power output
- Calculate system efficiency
- Record how current, voltage and turbine rotational speed vary as electrical load is varied and plot a power curve

RENAC Wind and Bioenergy Training Centre

We offer simulated systems for practicals and demonstration components. For wind energy, the Training Centre is well equipped with eight milliwatt-windtrainers. This equipment, through the practical understanding it brings, enhances the theoretical content of our courses.

renac
renewables academy

> "*One of the things that struck me the most about the renewable energy lab is how accessible the equipment is and how easy to understand the principals are.*"
>
> Professor León, former Director of EARTH's Research Unit

Wind energy

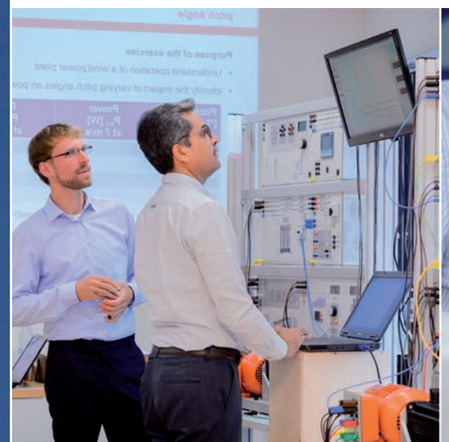
- Measure power curves of laboratory wind turbines, conduct current and voltage measurements
- Explain fundamental relationships and characteristics of wind turbines
- Define the function of anemometers and wind vanes
- Perform cost calculations based on measured data
- Compare the energy output of various wind power curves

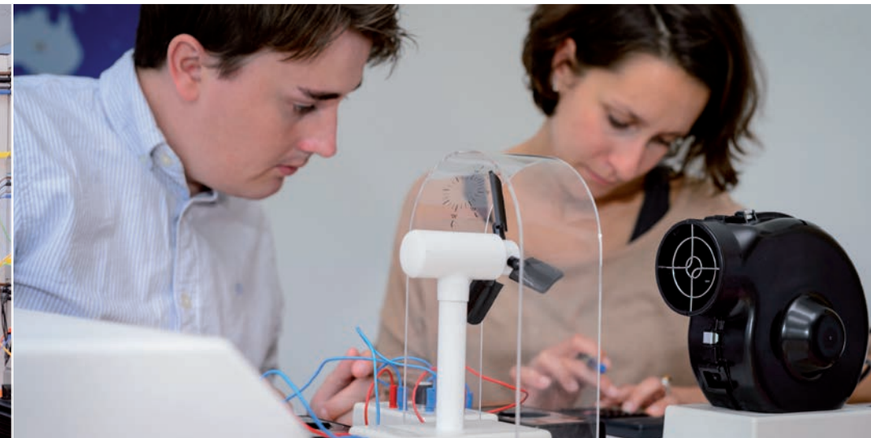
Biogas

- Determine the specific biogas energy potential of different organic substrates in relation to the dry matter content
- Determine biogas quality resulting from the fermentation of various substrates
- Make a rough design of a biogas plant on the basis of the determined biogas yield and quality of various substrates
- Evaluate the specific operation and maintenance (O & M) requirements resulting from the investigated substrates
- Calculate the profitability of a biogas plant for the fermentation of the substrates investigated

Grid integration and simulation

- Role of power electronics in a DFIG wind turbine
- Frequency and voltage control strategies with wind turbines
- Voltage control measures with capacitors and coils, reactive power management
- Voltage control with distributed generation





RENAC Energy Efficiency Training Centre

Being trained on practical equipment is essential for a sustainable learning effect. RENAC supports to plan, design and implement a Training Centre; this can either focus just on energy efficiency or also include renewable energy technologies in general.

renac
renewables academy

"Hands on practicals helped me to build my confidence when dealing with renewable energy technologies. I will deepen my knowledge by studying theoretical aspects."

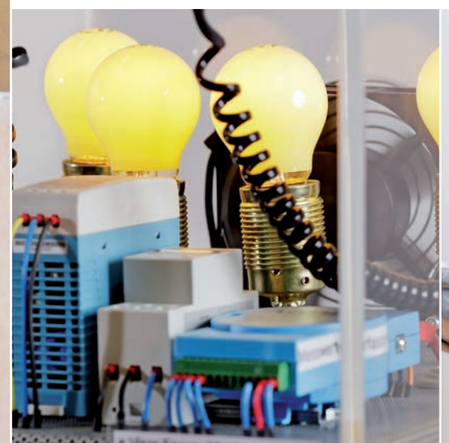
Participant from South Africa

Energy Efficiency in the built environment

- Gain an understanding of the structure of the building envelope in a lightweight construction (pitched roof, floor, walls, windows)
- Gain an understanding of the structure of the building envelope in a massive construction (pitched roof, floor, walls, windows)
- Identify thermal bridges in an existing construction
- Be able to integrate renewable energy systems into buildings

Energy Efficiency in industry and commerce

- Calculate the technical and economic savings which result from energy efficiency measures
- Assess the energy losses caused by leakages in a compressed air system
- Evaluate the energy savings through an improved insulation of a piping network
- Estimate the energy savings which can be achieved in a lighting system by a daylight dependent dimmer
- Classify the energy efficiency of different control strategies of pumps



Additional services

For international courses RENAC has a mobile Training Centre, which can be transported to any location worlwide. Using the mobile Training Centre, RENAC can undertake training for photovoltaic, solar thermal and wind energy technologies.

renac
renewables academy

Additional services offered by RENAC

- Capacity Needs Assessment
- Assessment of course materials, course structures, training equipment
- Integration of renewable energy education into existing curricula
- Train-the-Trainer courses
- Training materials update
- Training centre update
- Preparation and conduction of exams (RENAC certificate)

About RENAC

The Renewables Academy AG (RENAC), based in Berlin, Germany, is one of the leading international providers for training and capacity building on renewable energy and energy efficiency. More than 20,000 participants from 163 countries worldwide have benefited from our expertise in the technology, financing, management and market development of renewable energy and energy efficiency.

Contact:
Renewables Academy AG (RENAC)
Schönhauser Allee 10 –11
10119 Berlin, Germany
Phone: +49 (0)30 58 70870 00
Email: info@renac.de
www.renac.de

Pictures:
RENAC
Heidi Scherm Fotografie Berlin (page 5, 7, 9, 11, 15)