renac
renewables academy

Certified Renewable Energy Project Developer

Photovoltaics | Biogas | Solar Thermal | Wind | PV-Diesel Hybrid Systems

Online programme overview

COURSE OVERVIEW & ENROLLMENT INFORMATION

INTRODUCTION

This online programme covers the most important economic aspects of renewable energy project planning and describes how the most common public policy support mechanisms work. The programme also looks into how banks view the risks related to renewable energy projects, and examines the parameters they use to assess any new project's bankability in order to decide whether they will get on board and finance it. To this end, the programme includes a checklist for project developers to ensure that potential partner banks receive all the data they require in the way they require it. The Certified Renewable Energy Project Developer programme offers participants different renewable energy technology specialisations, in photovoltaics (PV), solar thermal, PV diesel hybrid systems, wind power and biogas.

SCHEDULE & ORGANISATION

STARTING DATES	Spring I Fall semester each year Start date: 1 April / 1 October
ESTIMATED WORKLOAD	• 130 hours in total • 5 - 10 hours study time per week • 5 Live webinars • 3 Assignments
FEES	€ 1100 Payment method: VISA, MasterCard, American Express, PayPal, Invoice
DISCOUNTS	Early Bird 10%, Alumni 10%, Group 5% (min. 2 courses)
REGISTRATION	You can register online: Shop - RENAC

DEADLINES

Early bird deadline: 20 August / 20 February
Registration deadline: 30 September / 31 March

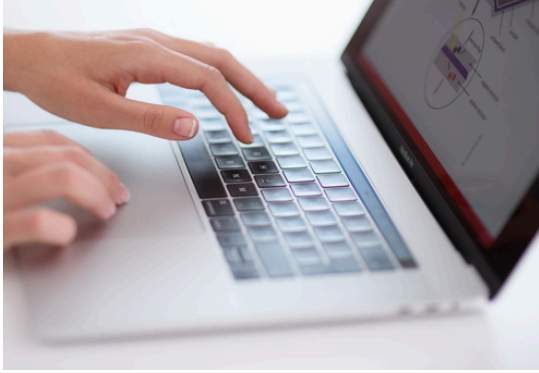
THIS PROGRAM IS SUITABLE FOR THOSE WHO:

- Are charged with planning or developing a renewable energy project
- Need to deal with various stakeholders in a project appraisal process
- Will supervise the implementation of a renewable energy system

LEARNING OBJECTIVES

- Calculate the relevant economic parameters of a renewable energy project
- Decide which support mechanisms are best suited to a given RE project
- Prepare the data required for a bankability assessment
- Define the necessary steps from planning to O&M for a renewable energy system using one or more of the specific technologies offered as specialisations

LEARNING OBJECTIVES & CONTENT OF THE COURSES



OPTIONAL INTRODUCTORY COURSES

Participants will have access to short introductory courses on energy and electricity topics to learn or revise the basics. These courses are not mandatory, and will not be covered in the exam.

Content

- Introduction to energy
- Introduction to electricity
- Introduction to the solar resource
- Introduction to electric grids
- Introduction to RE projects

MANDATORY COURSES

Renewable Energy Feasibility Assessment and Investment Valuation

After completion of this course, participants will be able to:

- Explain basic financial principles, including the time value of money and how to determine the cost of capital
- Understand capital budgeting tools used to assess renewable energy investment attractiveness
- Calculate important economic parameters to assess the viability of a renewable energy project
- Explain the concepts of risk and uncertainty as well as risk assessment instruments

Content

- Basic financial principles and concepts
- Financial performance indicators
- RE project risks and uncertainties

Renewable Energy Project Finance

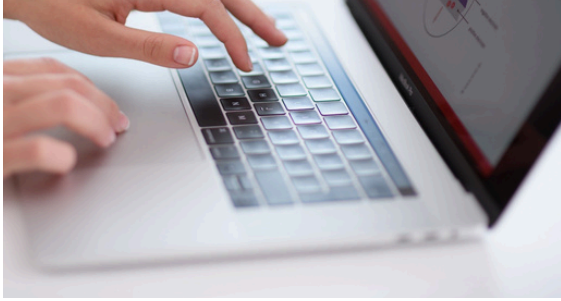
After completion of this course, participants will be able to:

- Explain the different financing options for renewable energy projects in principle and the Project finance option in more detail;
- Perform a risk assessment for renewable energy projects;
- Understand a bank‘s perspective of the risks related to PV, wind, and biogas plants; and
- Collect the data required for a bankability assessment of a renewable energy project.

Content

- Available financing options
- SPV-contract negotiation
- Business planning
- Bankability assessment
- Financial engineering
- Example assessments

LEARNING OBJECTIVES & CONTENT OF THE COURSES



Policies for Renewable Energies in the Electricity Sector

After completion of this course, participants will be able to:

- Understand the overall framework conditions required to reach high shares of renewables in the electricity sector
- Recognise the key procurement mechanisms and support policies for renewables, including auctions, feed-in tariffs, and self-consumption policies
- Identify key flexibility options for power systems with high shares of solar PV and wind energy, including grids, dispatchable power plants, batteries, demand side flexibility, and electricity market design
- Understand key permitting and planning elements for renewables, as well as industrial policies to harness socio-economic benefits.

Content

- Drivers for renewable energy deployment and targets
- Procurement Mechanisms: Auctions and feed-in tariffs
- Incentives for Distributed Generation: Self-consumption, prosumers and rooftop solar PV
- Power System Flexibility for RE integration
- Grids
- Planning and permitting for RE projects
- Industrial policies and socio-economic benefits (Just transition)

ELECTIVE SPECIALISATION COURSES OPTIONAL AND MANDATORY

Participants must take at least one of the following electives. Electives contain one mandatory technology-specific planning course and one optional course that covers the technology's applications. The content of the mandatory course is part of the final exam.

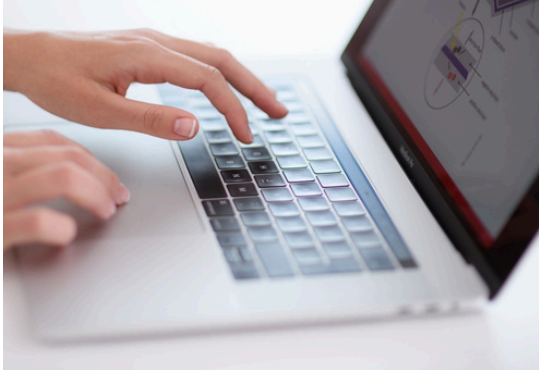
Elective optional

- PHOTOVOLTAICS: PV – application
- BIOGAS: Biogas – application
- SOLAR THERMAL: Solar thermal – application
- WIND POWER: Wind power – application
- PV-DIESEL HYBRID SYSTEMS: PV – diesel hybrid systems

Elective Mandatory

- PHOTOVOLTAICS: Planning of large-scale PV grid-connected system
- BIOGAS: Planning of medium-sized biogas plants
- SOLAR THERMAL: Planning of large-scale solar thermal systems
- WIND POWER: Wind power planning and measurement
- PV-DIESEL HYBRID SYSTEMS: Planning of PV-diesel hybrid systems

LEARNING OBJECTIVES & CONTENT OF THE COURSES



CONTENT DETAILS OF ELECTIVE SPECIALISATION COURSES

PV - Application (optional)

After completion of this course, participants will be able to:

- Describe a range of grid-connected and off-grid PV applications and how they are useful;
- Visualise how onsite PV electricity generation can meet daily electricity demand;
- Describe solar irradiation around the globe; calculate the required spacing between PV module rows to avoid self-shading;
- Calculate the basic energy yield from a PV system using peak sun hours and performance ratios;
- Explain which factors influence the capital and operational expenditures of PV systems, and give examples of system costs in different countries around the world; and
- Perform basic calculations of payback time and unit cost of electricity for gridconnected and off-grid PV systems.

Content

- Grid -connected PV applications
- Off -grid PV applications
- Energy flow and metering options
- Solar irradiation and space requirements
- PV system energy yield
- Economics of PV systems

Planning of large-scale PV grid-conntected systems (mandatory)

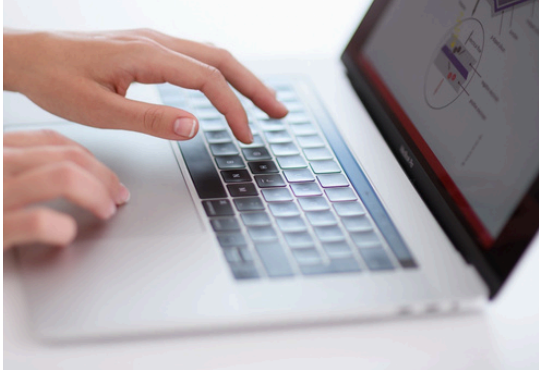
After completion of this course, participants will be able to:

- List and describe the main components making up a PV power plant;
- Describe the contracts, studies and permissions required for PV project development;
- List the main project steps from project planning through to system operation; and
- Describe the key tasks in assessing and supervising the implementation of a large-scale PV power plant.

Content

- Project mission
- Main system components
- Project development
- Project planning
- Construction and installation
- PV plant operation

LEARNING OBJECTIVES & CONTENT OF THE COURSES



CONTENT DETAILS OF ELECTIVE SPECIALISATION COURSES

Biogas - application (optional)

After completion of this course, participants will be able to:

- Describe the range of applications for biogas systems;
- Explain the relevance of biogas in the energy mix;
- Classify the most common types of biogas systems and their components, purpose, and output;
- Explain a biogas plant's role in transforming organic waste into organic fertiliser;
- Describe all the logistics required to provide the needed substrates for a biogas system;
- Analyse the impact of different input parameters on the power output of biogas systems; and
- Evaluate biogas systems based on economic and environmental aspects.

Content

- Biogas applications
- Biogas production
- Biogas plants output
- Biogas system classification
- Economic and environmental aspects

Planning of medium-sized biogas plants (mandatory)

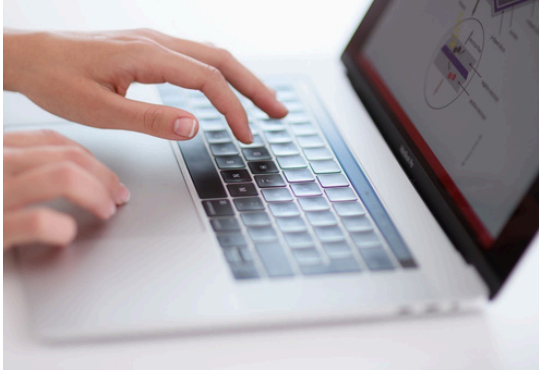
After completion of this course, participants will be able to:

- Describe the anaerobic digestion process and relevant process parameters;
- Discuss special substrates and technologies for biogas production in connection with sustainability issues; and
- Explain all the necessary steps from planning to operation and maintenance as well as the functioning of system components and their respective applications

Content

- The anaerobic digestion process – types of process and process parameters
- Special substrates and sustainability
- Special technologies for biogas production
- Main components
- Biogas applications
- Treatment of digestate
- Example biogas plant
- Operation and maintenance

LEARNING OBJECTIVES & CONTENT OF THE COURSES



CONTENT DETAILS OF ELECTIVE SPECIALISATION COURSES

Solar thermal - application (optional)

After completion of this course, participants will be able to:

- Explain the relevance of solar thermal in the energy mix and its basic economics;
- Cxplain how solar thermal systems and their system components work;
- Differentiate between types of solar thermal systems and solar thermal collectors; and
- Describe the basics of system sizing, installation, commissioning, operation and maintenance.

Content

- Fundamentals of solar thermal energy
- How solar thermal works
- Solar thermal collectors
- System types
- Solar thermal system components
- Practical considerations and economics

Planning of large-scale solar thermal systems (mandatory)

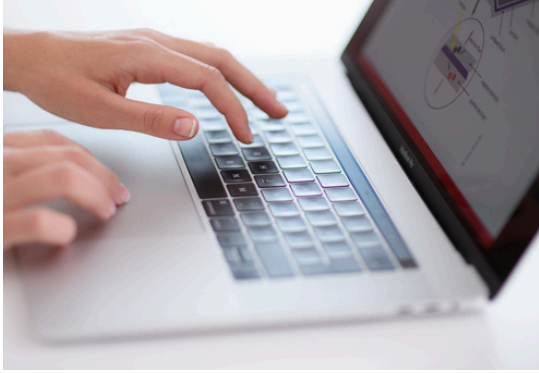
After completion of this course, participants will be able to:

- Explain how large-scale solar thermal systems work and describe different system components and their respective performance standards;
- Distinguish between different large-scale system configurations and describe their areas of application;
- Manage the designing of a large-scale system and the sizing specification of components; and
- describe key tasks in installation, commissioning, fault-finding and maintenance

Content

- Introduction to large-scale solar thermal
- Solar thermal collectors
- Storage cylinders and other system components
- System types
- Sizing
- Design example
- Implementation

LEARNING OBJECTIVES & CONTENT OF THE COURSES



CONTENT DETAILS OF ELECTIVE SPECIALISATION COURSES

Wind power- Application and cost development (optional)

After completion of this course, participants will be able to:

- List the different applications of wind turbines and name the turbine components; and
- Understand the economic and environmental aspects of wind power

Content

- Wind power applications
- Introduction to wind turbine components
- Wind turbine power output
- Wind farms and protection of the environment
- Repowering and decommissioning
- CAPEX, OPEX and LCOE of wind power

Wind power planning and measurement (mandatory)

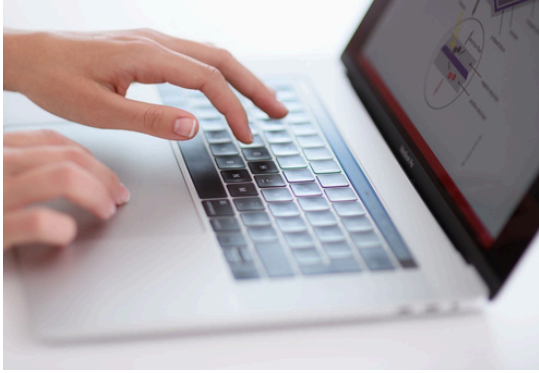
After completion of this course, participants will be able to:

- List the fundamental wind farm planning and construction steps;
- Estimate the duration of each step in a wind farm's planning process;
- Know which software to use for different purposes related to wind power generation; and
- Analyse and understand measured wind data and explain the importance of measuring the wind resource at the project site.

Content

- Wind farm planning and design
- Wind measurement
- Software

LEARNING OBJECTIVES & CONTENT OF THE COURSES



CONTENT DETAILS OF ELECTIVE SPECIALISATION COURSES

PV-Diesel Hybrid systems (optional)

After completion of this course, participants will be able to:

- Estimate the potential of, and identify suitable locations for, PV-diesel hybrid systems;
- Describe the main system components and what they are used for;
- Explain the basic parameters for system sizing and dynamic system behaviour; and
- Evaluate PV-diesel hybrid systems from an economic perspective

Content

- System components
- System sizing
- Dynamic system behaviour
- Economic evaluation
- Case studies

Planning of PV-diesel hybrid systems (mandatory)

After completion of this course, participants will be able to:

- Distinguish between different system designs and understand their most suitable applications;
- Lead a feasibility study to integrate PV into an existing diesel power system;
- Explain the functioning of a PV-diesel hybrid system's components, its operating strategies and its optimising potential; and
- Assess and supervise the planning and implementation of a PV-diesel power plant

Content

- Introduction to PV-diesel hybrid power stations
- Introduction to feasibility case study
- Feasibility study – PV integration and conclusions
- Technical aspects of conversion from diesel-only to PV-diesel hybrid
- Additional options to optimize system
- Financial analysis – key parameters
- Installation, commissioning, operation and maintenance

LEARNING METHODS & ONLINE PLATFORM FEATURES

IMPORTANT FEATURES

- Multilanguage platform
- Discussion Forums
- Integrated Glossary
- Stream/Download videos
- Live webinars (EN, ES)
- Self-quizzes
- Online exams
- Personalised feedback on assignments

TECHNICAL REQUIREMENTS

- An e-mail address, which is regularly checked
- A stable internet connection (at least 2 Mbit/s)
- We use Zoom for webinars
- Headset or speakers are required to participate on webinars

EARN YOUR CERTIFICATE

- Digital Certificate of Completion (final grade 70% or above)
- Digital Certificate of Attandance (final grade below 70%)

Programme certified by ZFU (German Central Office for Distance Learning – official quality standard for distance learning in Germany)

DEMO COURSE

For a first impression of our online platform, have a look at our demo course: Demo Course
For an introduction to the Wind programme: watch here; to the PV programme: watch here

Contact

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