green banking
an initiative by RENAC

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Federal Ministry
for the Environment, Climate Action,
Nature Conservation and Nuclear Safety

based on a decision of
the German Bundestag

IKI INTERNATIONAL CLIMATE INITIATIVE

renac
renewables academy

GREEN ENERGY FINANCE SPECIALIST - SMALL-SCALE PROJECTS

BLENDED - LEARNING PROGRAMME

The Alliance For green Commercial Banks

An Initiative of IFC International Finance Corporation WORLD BANK GROUP

GBAC Green Banking Academy

AN INNOVATION OF IFC International Finance Corporation WORLD BANK GROUP

PFAN
Accelerating Investment for Climate and Clean Energy

Green Banking – Capacity Building on Green Energy and Climate Finance

The Green Energy Finance Specialist – Small-scale Projects Programme is a training as a part of the **Green Banking – Capacity Building on Green Energy and Climate Finance project.** This project is supported by the International Climate Initiative (IKI) of the Federal Government of Germany. Within the Federal Government, the IKI is anchored in the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN). Selected individual projects are also the responsibility of the Federal Foreign Office (AA).

The programme is implemented in close cooperation with the International Finance Corporation (IFC) through its regional initiatives: the Alliance for Green Commercial Banks (IFC–AGCB) in Indonesia and Vietnam, and the Green Banking Academy (IFC-GBAC) in Kenya, South Africa, Colombia, and Brazil.

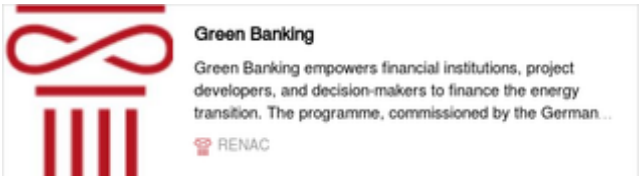
Green Banking aims to strengthen the capacities of financial institutions and professionals in partner countries to finance renewable energy, energy efficiency, green hydrogen, and energy storage projects. In addition, the programme supports the development of sustainable capacity-building approaches for banks, investors, and project developers across the entire banking value chain.

Since its launch, the project has been successfully implemented in Southeast Asia, Africa, and Latin America. It is currently in its third implementation phase (2024–2027), building on the experience and results of previous phases in the partner countries.

Programme Objectives

The Green Banking – Capacity Building on Green Energy and Climate Finance project pursues the following key objectives:

- Build technical and economic expertise on renewable energy, energy efficiency, green hydrogen, and energy storage projects, including their financial and economic assessment, to mobilise increased investment from development banks, commercial banks, private equity, venture capital, infrastructure funds, and institutional investors.
- Strengthen access to climate finance by facilitating knowledge exchange and networking around German and international climate finance instruments, such as the Green Climate Fund, and by supporting the integration of international funding sources with local financing opportunities.
- Promote sustainable capacity building through holistic training formats tailored to the needs of financial institutions, project developers, and policymakers.



Contact

Volker Jaensch
Head of Division
Green Energy and Climate Finance
Tel: +49 (0)30 58 70870 20
jaensch(at)renac.de

imprint

Renewables Academy(RENAC) AG
Schönhauser Allee 10-11
10119 Berlin, Germany Email:
info(at)renac.de
Phone: +49 (0)30 58 70870 00
Fax: +49 (0)30 58 70870 88

GREEN ENERGY FINANCE SPECIALIST
SMALL-SCALE PROJECTS

INTRODUCTION

The Green Energy Finance Specialist – Small-scale Projects Programme equips professionals in the finance and energy sectors with the knowledge and tools to effectively engage in financing small-scale renewable energy (RE) and energy efficiency (EE) projects.

The programme provides a solid foundation in small-scale technologies, the fundamentals of green energy finance, policy frameworks, business models, and financing approaches tailored to small-scale applications. Participants will also gain in-depth skills in financial assessments and project evaluation as well as calculating energy savings for EE investments.

A key focus is placed on the specific risks, opportunities, and financing structures associated with distributed generation, SME-led initiatives, and community-level energy efficiency projects. The programme prepares participants to actively contribute to and expand the growing market for small-scale green energy solutions, while also exploring climate finance opportunities.

The programme concludes with a three-day in-person seminar held in each partner country (Brazil, Colombia, Indonesia, Kenya, South Africa, and Vietnam) where participants will apply their learning through financial assessments and sensitivity analyses of a practical case study.

THIS PROGRAM IS SUITABLE FOR THOSE WHO ARE:

- Professionals based in one of the six partner countries of the Green Banking Project (Indonesia, Vietnam, Kenya, South Africa, Brazil, Colombia).
- Mid- to senior-level finance professionals leading teams that finance green energy projects who seek to strengthen their expertise in small-scale project financing.
- Finance professionals with prior experience in green energy project financing who want to deepen their expertise in small-scale projects, such as project finance specialists, credit analysts, and investment managers.
- Finance professionals seeking to transition into green energy finance, including those without prior sector experience.
- Policymakers or members of a regulatory body involved in shaping policy or financial incentives.

PROGRAMME SUMMARY

LEARNING OBJECTIVES

Upon completing the programme, participants will be able to:

- Identify practical applications and scenarios where green energy solutions are most effective.
- Develop a broad understanding of financing markets specific to renewable energy (RE) and energy efficiency (EE).
- Explore the project cycle and recognize the key stakeholders involved in RE and EE projects.
- Master financing options for small-scale green energy applications.
- Understand due diligence requirements for financing small-scale RE and EE systems.
- Conduct technical and financial assessments for small-scale renewable energy projects.
- Identify and quantify the savings potential of energy efficiency initiatives.
- Navigate regulatory frameworks and financial incentive mechanisms for RE and EE measures.
- Examine region-specific policies and regulations related to green energy markets.
- Explain the core principles of sustainable finance mechanisms.
- Apply insights from real-world case studies across diverse green energy markets.
- Prepare a professional term sheet for a small-scale renewable energy project.
- Utilize project evaluation and financial modelling tools effectively.
- Explore climate finance opportunities and business models for scaling RE and EE applications.

PROGRAM PARTICIPATION

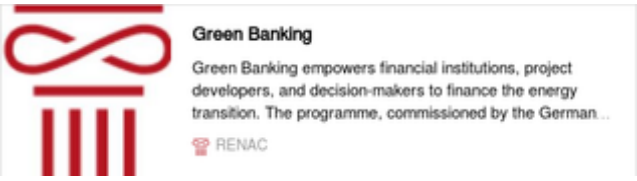
APPLICATION PROCESS

As part of the Green Banking project, RENAC offers 15 scholarships per partner country for participants from Brazil, Colombia, Kenya, Indonesia, South Africa, and Vietnam. Individuals interested in participating in the training must submit a completed application form via the RENAC website, where the application period and training start dates are also published.

The training promotes balanced gender representation among participants and supports equal career development opportunities.

RENAC will inform applicants by email as soon as possible regarding the outcome of their scholarship application. Selected candidates must confirm their acceptance of the scholarship offer by replying to the invitation email sent by RENAC.

Note: Scholarship recipients must log in to the learning platform no later than two weeks after the start of the training. Failure to do so may result in the scholarship being reassigned to a participant on the waiting list.



LANGUAGE

The programme language is English, Spanish and Portuguese. All programme material (including course content, videos, pre-recorded lectures, assignments, and exams) will be available in English, Spanish and Portuguese.

ONLINE TRAINING PROGRAMME FEATURES

The Green Energy Finance Specialist – Small-Scale Projects training combines asynchronous and synchronous learning methods. Participants have access to written materials, assignments, and instructional videos, and are also invited to take part in live virtual sessions.

Learning with RENAC follows a two-step asynchronous approach. First, participants work through the course content independently. This is followed by the application of newly acquired knowledge and skills, allowing learning outcomes to be reinforced and consolidated. These steps are supported through a variety of learning activities.

The online training also includes written assignments, which further strengthen learning outcomes and may contribute to the final exam results.

WORKLOAD FOR PARTICIPANTS

Depending on prior knowledge, participants should expect to spend approximately 280 hours to successfully complete the course. This corresponds to an estimated 8–10 hours per week over the duration of the training. The workload includes reading and understanding the course materials, watching videos, completing self-test questions, participating in virtual classrooms, joining the Q&A forum, and attending a three-day in-country seminar. It also includes submitting short assignments, completing administrative tasks (such as familiarising with the Moodle platform and creating profiles), and preparing for and taking the online exam.

PROGRAMME ELEMENTS

LIVE VIRTUAL SESSIONS

The programme begins with a live online orientation session in which participants meet RENAC staff members, receive an introduction to the Moodle learning platform and its functions, and are familiarised with the forum. The session also covers key programme details, including activities and assignments, the exam, deadlines, and scheduling. Throughout the programme, virtual classroom sessions of approximately 1–1.5 hours are offered. Participation in these sessions is not mandatory. The sessions are conducted via Zoom, recorded, and made available on the Moodle platform for later viewing. In general, there is approximately one virtual classroom per module, and the content of each session is directly related to the respective module content or the corresponding module assignment.

EXAM AND CERTIFICATIONS

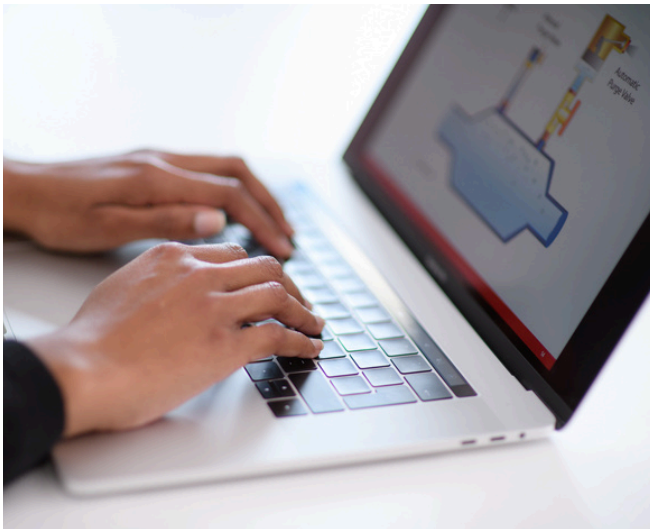
The final programme grade is based on the results of the final exam as well as the grades obtained from programme assignments. The minimum passing grade for assignments is 50%, and the final exam is 70%.

The final exam consists of 90 multiple-choice questions, and participants are given 120 minutes to complete it. To prepare for the exam, participants are encouraged to complete the self-test questions included in each mandatory course.

Participants who score below 70% may request a certificate of attendance, provided they have attempted all self-test questions in the compulsory courses. Certificates are issued as PDF files and sent via email. Participants who do not pass the exam on their first attempt will have the opportunity to retake it at a later date. Exam and retake dates will be announced during the introductory live session.

ASSIGNMENTS AND EVALUATION

The courses are designed to be followed continuously from the beginning of the semester through to the final exam. Typically, there is one assignment per module, covering a range of formats such as multiple-choice quizzes, forum contributions, written assignments, and calculation exercises. All assignments must be submitted by the specified deadlines, which are communicated during the introductory live session.



SCHEDULE & ORGANISATION

MODULE	Module Title	Duration
Warm up (optional)	Intro to energy Intro to electricity	week 0
Module 1	Introduction to green energy finance	weeks 1-2
Module 2	Renewable energy technologies	weeks 3-5
Module 3	Energy efficiency	weeks 6-8
Module 4	Political and legal market frameworks	weeks 9-11
Module 5	Business models	weeks 12-14
Module 6	Financing small scale RE and EE applications	weeks 15-16
Module 7	Green Energy Finance in practice	weeks 17-18
Module 8	Specific issues in project evaluation	weeks 19-20
Module 9	Climate finance	weeks 21-22
Seminar Week	Seminar Week	3-day seminar

Each module is composed of mandatory, elective, and optional courses. Mandatory courses must be completed, as their content forms the basis of the final examination. Elective courses require participants to choose and complete one course from a designated list within the module, while optional courses are entirely voluntary and serve as supplementary material for those wishing to deepen their understanding.

MODULES OVERVIEW

MODULE 1 - INTRODUCTION TO GREEN ENERGY FINANCE

MANDATORY COURSES	ELECTIVE COURSES	OPTIONAL COURSES
• Intro to RE projects • Intro to Energy Efficiency projects • Market overview of global RE and EE financing • Fact sheet on definition of small-scale applications	• Fact sheet on different energy use cases • Intro to the wind resource • Intro to the solar resource	• Sustainable finance

Live virtual session: Introduction to programme

MODULE 2 - RENEWABLE ENERGY TECHNOLOGIES

MANDATORY COURSES	ELECTIVE COURSES	OPTIONAL COURSES
• Overview of power generation technologies	• Grid-connected PV systems • Solar PV Diesel-hybrid technologies • Solar Thermal Technologies for C & I • Biogas and solid biomass • Mini-grid planning	• Small wind power – • Application, technology and planning • Small hydropower • E-mobility for private transport and charging infrastructure • Heat pumps

Live virtual session: Overview of RE market in the country

MODULES OVERVIEW

MODULE 3 – ENERGY EFFICIENCY

MANDATORY COURSES	OPTIONAL COURSES
• Energy efficiency in industry – application	• Energy efficient buildings - application • Synergies between EE and RE

Live virtual session: Cross sectional technologies (EE)

MODULE 4 – POLITICAL AND LEGAL MARKET FRAMEWORKS

MANDATORY COURSES	ELECTIVE COURSES
• Policies for Renewable Energy in the Electricity Sector Support mechanisms for EE projects	• Fact sheets on polica and regulatory frameworks in Brazil, Colombia, Kenya, South Africa, Indonesia and Vietnam

Live virtual session: Policy framework and support mechanism

MODULE 5 – BUSINESS MODELS

MANDATORY COURSES	OPTIONAL COURSES
• Business models for decentralized RE technologies and profitability • Cost comparison of different Renewable Energy (RE) technologies • Business models for photovoltaic projects	• Crowdfunding fact sheet

Live virtual session: Common business models for small scale green energy and EE applications

MODULES OVERVIEW

MODULE 6 – FINANCING SMALL SCALE RE AND EE APPLICATIONS

MANDATORY COURSES	OPTIONAL COURSES
• Introduction to SME finance • Systematic approach to energy saving • Assessment of small-scale green energy projects • Financing EE projects and ESCOs	• Loan assessment for financing small scale green energy systems

- Live virtual session: EE assignment on calculating energy savings
- Financial calculations and investment cost estimation. Prioritisation of measures.

MODULE 7 – GREEN ENERGY FINANCE IN PRACTICE

MANDATORY COURSES	ELECTIVE COURSES
• Case study: Application of a solar photovoltaic system to a grid-connected hotel in Mexico	• Case study: Solar PV systems and BESS for industrial applications

Live virtual session: Introducing the pro-forma model

MODULES OVERVIEW

MODULE 8 – SPECIFIC ISSUES IN PROJECT EVALUATION

MANDATORY COURSES	ELECTIVE COURSES
• Bankable O&M strategies for RE projects • Risk analysis and mitigation (combine EE and RE in one course)	• Environmental and social standards for RE projects

Live virtual session: Due diligence

MODULE 9 – CLIMATE FINANCE

MANDATORY COURSES	ELECTIVE COURSES	OPTIONAL COURSES
• Climate finance - Accessing and mobilising climate finance • Financial aggregation & project bundling	• Climate Finance I: the global landscape of climate finance • Fact sheet on climate smart agriculture	• Fact sheets on refinancing options in Brazil, Colombia, Kenya, South Africa, Indonesia and Vietnam

Note: The content and structure of the module descriptions below are subject to change as course materials are continuously updated.

CONTENT DETAILS OF MODULE 1

INTRODUCTION TO GREEN ENERGY FINANCE

MANDATORY COURSE

Introduction to RE projects

After completing this course, participants should be able to:

- illustrate the steps and tasks of a project life-cycle of renewable energy (RE) projects
- compare different public and private perspectives of RE project life cycles
- assess project attractiveness with standard methods.

Content

- General characteristics of RE projects
- The project realisation cycle
- The average lifetime of RE
- projects
- Typical players in RE projects
- End of life considerations

Financial aspects of RE projects

- Investments and investment
- appraisal
- Investment decision
- Assessing an investment´s attractiveness
- Financial management tasks
- Cost structure of RE projects

Non-financial aspects of RE projects

- Introduction
- Public and private investment appraisal
- Public support mechanism
- Externalities of RE projects
- Evaluating external effects

CONTENT DETAILS OF MODULE 1

INTRODUCTION TO GREEN ENERGY FINANCE

MANDATORY COURSE

Introduction to Energy Efficiency Projects

After completing this course, participants should be able to:

- explain what energy efficiency is and why it is important
- understand the benefits of energy efficiency and know how to identify the drivers and barriers to energy efficiency implementation
- analyse the relevance of energy efficiency in different economic sectors
- identify financing options for energy efficiency and the role of financiers

Content

- The importance of energy efficiency
- Energy efficiency to reduce energy demand
- Energy efficiency strategies cost
- Benefits of energy efficiency
- Energy consumption by sectors
- Stakeholders in energyefficiency
- Drivers of implementation of energy efficiency measures
- Barriers in implementation of energy efficiency
- Strategic Principles for Implementing Energy Efficiency Policies
- Definition of Greenhouse Gases (GHG)
- Definition of Baseline and Business as usual
- Definition of energy consumption and energy baseline
- Definition of energy efficiency
- Definition of Energy Intensity on the country level
- Definition of energy conservation
- Differences between EE programmes and EE projects
- Concept and types of energy efficiency projects
- Energy efficiency projects by investment category
- Sustainable finance taxonomy and energy efficiency
- The economicsbehind energy efficiency projects
- Project cost and revenues
- The role of providers of finance in a green economy
- Climate finance investment evolution
- Internal processesfor providers of finance
- Special features of energy efficiency finance
- Barriers to energy efficiency finance
- Financing options

CONTENT DETAILS OF MODULE 1

INTRODUCTION TO GREEN ENERGY FINANCE

MANDATORY COURSE

Market Overview of Global RE and EE Financing

After completing this course, participants should be able to:

- describe the global investment situation and major trends in renewable energy and energy efficiency finance, as well as the trends of the different technologies and regions
- classify and define renewable energy and energy efficiency finance as well as asset classes
- distinguish different types of investors
- explain current development in several markets worldwide

Content

- Global RE financing market volume
- Global RE financing market by region and technology
- Classification of RE financing
- Major market trends and regional comparison
- Renewable energy country attractiveness index (RECAI)
- Global RE financing market – major asset classes
- Global RE financing market – major investors
- Global RE financing market - league tables
- Regional installed RE capacity
- Energy efficiency – a global market
- Global EE financingmarket by region and technology
- Market trends in energy efficiency investments
- Classification of EE financing
- Global EE financing market - major issuers of green bonds

MANDATORY FACT SHEET

Fact Sheet on definitions of small-scale applications

ELECTIVE FACT SHEET

Fact Sheet on different energy use cases

CONTENT DETAILS OF MODULE 1

INTRODUCTION TO GREEN ENERGY FINANCE

ELECTIVE COURSES

Intro to the Wind Resource

Upon completion of this course, you should be able to:

- understand how the wind is created and explain the main characteristics of wind
- be able to describe the factors affecting wind speed

Content

- What causes wind
- Wind speed units
- Wind power density
- Power coefficient and Betz limit
- Wind direction and wind rose
- Wind speed turbulence
- Diurnal and seasonal wind speed variability
- Climate change impact on wind resource
- Wind speed change above ground
- Roughness length and wind shear exponent
- Wind speed extrapolation to a certain height

Intro to the Solar Resource

Upon completion of this course, you should be able to:

- describe the variability of the solar resource around the world and influencing factors
- explain the difference between irradiation and irradiance as well as components of solar radiation
- define important solar terms and the position of the sun in the sky
- illustrate the benefits of energy-efficient buildings, and
- discover the importance of orientation and tilt of a solar array for optimising energy yield

Content

- What is solar energy?
- How important is solar energy?
- What is solar energy used for?
- Difference between solar irradiation and solar irradiance
- Physical nature of solar radiation: waves or particles
- Solar radiation spectrum
- Direct and diffuse components of solar radiation
- Effect of angle on solar radiation levels
- Other important solar radiation parameters
- Measurement equipment
- Earth's position relative to the sun
- Definition of the sun's position
- Effect of sun position on solar irradiance

CONTENT DETAILS OF MODULE 1

INTRODUCTION TO GREEN ENERGY FINANCE

OPTIONAL COURSE

Sustainable Finance

Upon completion of this course, you should be able to:

- summarise the concept of sustainable finance
- contextualise the market and policy framework of sustainable finance
- identify drivers and obstacles to sustainable finance
- link climate-related risks to financial stability
- describe climate policy and assess its effect on sustainable finance
- explain the financial impact of climate-related issues at the organisation level
- name ongoing regulatory initiatives to change the legal framework for sustainable finance
- reflect critically on the remaining challenges ahead and formulate actions to address them

Content

- Definition
- Climate-related financial risks
- Market failure
- Drivers of sustainable finance
- Obstacles to sustainable finance
- International climate policy
- Market-driven policy instruments
- Impact of and obstacles to carbon taxes and emissions trading systems
- Regulation
- Support policies for low-carbon technologies
- Climate-related financial disclosures by organizations
- Ongoing policy and regulatory initiatives
- Remaining challenges

CONTENT DETAILS OF MODULE 2

RENEWABLE ENERGY TECHNOLOGIES

MANDATORY COURSE

Overview of power generation technologies

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

- describe how different thermal power generation technologies work in principle
- describe how different renewable energy generation technologies work in principle
- compare power generation technologies based on different cost aspects
- explain global trends of power generation technologies in terms of investments

Content

- Overview of conventional thermal power generation technology
- Coal power plants (lignite and hard coal)
- Open cycle gas turbines
- Combined Cycle Gas Turbines
- Nuclear power plants
- Different renewable electricity generation technologies
- Hydropower and pumped storage
- Wind energy
- Solar photovoltaic (PV)
- Concentrated solar power (CSP)
- Bioenergy (solid biomass and biogas)
- Geothermal power
- Ocean energy
- Cost categories
- Metrics for cost comparison
- Levelized Cost of Electricity (LCOE)
- Sensitivities of LCOE
- Application and limitations of LCOE
- Avoided costs or marginal costs
- External cost
- Grid parity
- Fuel parity

CONTENT DETAILS OF MODULE 2

RENEWABLE ENERGY TECHNOLOGIES

TECHNOLOGY COURSES

The following technology courses are divided into elective and optional. Participants are encouraged to choose at least one elective course to review. Optional technology courses are there for further reading and investigation.

Elective Courses

- Grid-connected PV systems
- Solar PV Diesel-hybrid technologies
- Solar Thermal Technologies for C & I
- Biogas and solid biomass
- Mini-grid planning

Optional Courses

- Small wind power – Application, technology and planning
- Small hydropower
- E-mobility for private transport and charging infrastructure
- Heat pumps

CONTENT DETAILS OF MODULE 3

ENERGY EFFICIENCY

MANDATORY COURSE

Energy efficiency in industry - application

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

- demonstrate the basic functions of cross-sectoral technologies in industry
- determine areas of application for cross-sectoral technologies in industry
- prepare technical measures to enhance energy efficiency with regard to the respective cross-sectoral technology
- classify the saving potential of the technical measures to enhance energy efficiency

Content

- Introduction to the course
- Energy Efficiency in Industry
- Drivers and Barriers for Energy Efficiency in Industry
- How to Measure Energy Efficiency Performance in the Company / Industry
- Corporate Social Responsibility and Sustainability
- Energy Efficiency Potential for Industry
- Electric Drives: Areas of Application in Industrial Sectors
- Heating
- Cooling
- Heating and Cooling from Renewables
- Pump Systems: Industrial Application
- Compressed Air Systems
- Ventilation Systems
- Lighting in Industry
- Role of Innovation, Renewables, and Digital Solutions
- Trends in Industry

CONTENT DETAILS OF MODULE 3

ENERGY EFFICIENCY

OPTIONAL COURSE

Energy efficient buildings - application

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

- explain the relevance of buildings in the context of climate mitigation,
- identify barriers and drivers for energy efficiency in buildings,
- state the energy efficiency principles in buildings,
- compare different building energy efficiency standards,
- explain how climate factors affect structural measures and buildings' energy consumption,
- describe the benefits of energy efficiency in buildings, and
- compare the economics of green buildings with that of conventional types of buildings.

Content

- Status Quo of the Building Sector
- Barriers and Drivers in Energy Efficiency in Buildings
- Energy Efficiency Policies and Building Standards
- Benefits of "Green" Buildings
- Energy Efficiency in Buildings: Principles
- Thermal Comfort, Climate Data, and Heating and Cooling Degree Days
- Reducing Energy Demand
- Reducing Energy Consumption
- Reducing Fossil Fuel Consumption
- Digitisation

CONTENT DETAILS OF MODULE 3

ENERGY EFFICIENCY

OPTIONAL COURSE

Synergies between energy efficiency and renewable energy – methodology and applications

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

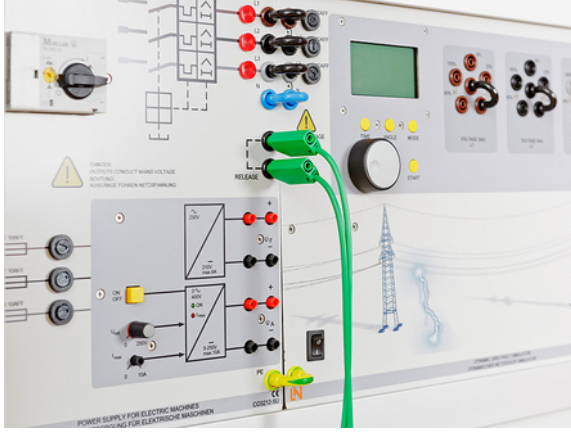
- recognise the relationship between energy efficiency (EE) and renewable energy (RE),
- name technologies that promote synergy between EE and RE,
- describe the methodology to identify valuable measures for creating synergy,
- name indicators to trace the linkage between EE and RE,
- explain the meaning of different graphs showing concepts related to EE and RE.

Content

- Framing the Link between EE and RE
- Synergies from Implementing EE and RE Measures at the Same Time
- A Methodology to Measure Synergies between EE and RE
- Examples of Synergy between EE and RE
- Indicators to Track Synergy between EE and RE
- Interpretation of Various Graphs
- Decomposition Analysis for EE

CONTENT DETAILS OF MODULE 4

POLITICAL AND LEGAL MARKET FRAMEWORKS



MANDATORY COURSE

Policies for Renewable Energies in the Electricity Sector

After completing this course, participants should 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 Renewable Energy Integration
- Grids
- Planning and Permitting for Renewable Energy Projects
- Industrial Policies and Socio-Economic Benefits (Just Transition)

CONTENT DETAILS OF MODULE 4

POLITICAL AND LEGAL MARKET FRAMEWORKS

MANDATORY COURSE

Support Mechanisms for Energy Efficiency Projects

After completing this course, participants should be able to:

- name different barriers to energy efficiency deployment
- identify the roles and competencies of political stakeholders in energy efficiency
- discuss the benefits and drawbacks of the most common support mechanisms
- explain the bundling of different support mechanisms to achieve governmental goals

Content

- Why we need energy efficiency policies
- Benefits of support mechanisms
- Types of energy efficiency policy measures
- Combining and assessment of different measures
- Case study – examples of existing support mechanisms

ELECTIVE COURSE

Fact Sheet on policy and regulatory frameworks

CONTENT DETAILS OF MODULE 5

BUSINESS MODELS

MANDATORY COURSES

Business models for decentralized RE technologies and profitability

After completing this course, participants should be able to:

- understand how business models are structured in the various DRE market segments to mitigate risks and to make investments in DRE systems profitable and bankable;
- explain to what extent investments in DRE systems are viable and how risk can be mitigated and managed

Content

- Key Features of a Business Model in the DRE Sector
- Types of Business Models in the DRE Sector
- Most Common Business Models in the Various DRE Markets
- Application of Business Models
- Commercial Viability of DRE Investments

Cost comparison of different RE technologies

Upon completion of this course, you should be able to:

- recall life-cycle costing (LCC) and levelised cost of energy (LCOE), including their main metrics and calculation methods identify the levelised cost of energy (LCOE) of various renewable energy (RE) technologies
- perform a simplified cash flow (CF) analysis of energy projects in order to compare project options

Content

- Introduction – Cost Comparison of Different Renewable Energy (RE) Technologies
- Fundamentals
- LCC Analysis and Comparing Different RE Technologies

CONTENT DETAILS OF MODULE 5

BUSINESS MODELS

MANDATORY COURSE

Business models for photovoltaic projects

After completing this course, participants should be able to:

- give an overview of the installed capacity of PV systems globally,
- understand the PV potential in emerging markets.

Content

- Overview of Business Model Design
- Introduction to Business Models
- Introduction to the Business Model Navigator (BMN)
- Suitable Business Models for a Project Developer
- Suitable Business Models for an Investor
- Suitable Business Models for an EPC Contractor
- Suitable Business Models for an O&M Contractor's Activities
- Suitable Business Models for an Independent Engineer
- Suitable Business Models for a Specialist for Inspection and Acceptance Tests
- Suitable Business Models for a Mechanical Installer of PV Plants
- Suitable Business Models for an SME for Service and Repair

OPTIONAL COURSE

Fact Sheet on crowdfunding

CONTENT DETAILS OF MODULE 6

FINANCING SMALL SCALE RE AND EE APPLICATIONS

MANDATORY COURSE

Introduction to SME Finance

After completing this course, participants should be able to:

- explain why small and medium-sized enterprises (SMEs) are relevant for economic growth and financial institutions
- explain what defines an SME and differentiates SMEs from other types of businesses and why they differ in different economies
- name challenges in SME lending
- describe the core aspects of green energy SME loan analysis

Content

- Role of SMEs in Economic Development
- SME Definitions
- SME Characteristics in Emerging Markets
- SME Financial Products for Borrowers
- SME Financial Products for Green Energy Applications
- Real-World Examples of Green SME Finance
- Challenges in SME Lending in Emerging Markets
- Overview of the SME Lending Process

CONTENT DETAILS OF MODULE 6

FINANCING SMALL SCALE RE AND EE APPLICATIONS

MANDATORY COURSE

Systematic Approach to Energy Saving

After completing this course, participants should be able to:

- list key standards that set the framework for energy management systems and energy audits
- explain the plan-do-check-act cycle and its role in continual energy efficiency improvements
- describe the importance and benefits of an energy management system
- elaborate on the purpose and types of energy audits
- describe the different energy audit process stages

Content

- Introduction to energy management systems, including benefits, barriers, and key ISO 50001 definitions
- Application of the Plan–Do–Check–Act (PDCA) cycle for continual improvement
- Planning and setting energy targets
- Implementation and operation of energy-saving improvements
- Performance evaluation and continual improvement of energy management systems
- Objectives, scope, and types of energy audits
- Roles and qualifications of entities conducting energy audits

Content

- Energy audit process, including planning, preparation, and on-site data collection
- Measurement, metering systems, and analysis of energy data
- Identification, financial evaluation, and prioritisation of energy efficiency measures
- Energy audit reporting and presentation of results
- Concept and purpose of learning energy efficiency networks
- Overview of best available techniques for improving energy efficiency

CONTENT DETAILS OF MODULE 6

FINANCING SMALL SCALE RE AND EE APPLICATIONS

MANDATORY COURSE

Assessment of Green Energy Projects

After completing this course, participants should be able to:

- summarise the green finance approach to energy project development and assessment
- demonstrate an understanding of the key operational and financial output parameters of renewable energy (RE) projects used in project assessment
- locate key output parameters (operational and financial) of energy projects and connect them with the larger green finance context
- analyse case studies on PV grid-connected, PV-diesel hybrid, biogas, and solid biomass technologies
- compare application results from these technology case studies and recommend specific technologies accordingly for commercial and industrial use.

Content

- Overview of the green finance approach
- Step-by-step guide for defining RE projects
- Key operational parameters that define RE projects
- Key financial parameters that define RE projects
- Analytical approaches
- Analytical approach 1 – Ceteris Paribus Analysis (One-Variable Sensitivity)
- Analytical approach 2 – Multi-Variable Sensitivity Analysis
- Analytical approach 3 – Scenario analysis
- Analytical approach 4 – Monte Carlo Simulation (with energy example)
- Modelling tools: purpose, main inputs, and main outputs
- PV tools (grid-connected, off-grid, or hybrid)
- Biogas tool
- Biomass gasification to electricity tool
- Micro-hydro tool
- Decision tree for RE project assessment and recommendations for further steps

CONTENT DETAILS OF MODULE 6

FINANCING SMALL SCALE RE AND EE APPLICATIONS

MANDATORY COURSE

Financing EE Projects and ESCOS

After completing this course, participants should be able to:

- distinguish energy efficiency projects from conventional investments
- explain the different financing options for energy efficiency projects
- analyse new innovative business models in the energy sector, such as utilising energy efficiency experts, energy performance contracts, energy service companies, and collaborative de-risking mechanisms
- identify important stakeholders in energy efficiency finance besides financial institutions
- develop an energy efficiency finance portfolio/combine it with existing customer offers
- organise an energy efficiency project assessment from the perspective of a bank

Content

- Introduction – Financing of Energy Efficiency Projects and ESCOs
- Types of Energy Efficiency Finance
- Energy Efficiency Financing Mechanisms and Framework Conditions
- Technology De-Risking in Energy Efficiency Projects – Collaboration with EE Experts
- Project Lifecycle and Project Development: The Technical Side
- Project Development – Financial Model
- Underwriting Process I – Contractual Structure, Monitoring and Verification, and Creditworthiness
- Underwriting Process II – Risk Assessment, ESIAs, Investment Decision, and Implementation
- Global Energy Efficiency Financing Support

CONTENT DETAILS OF MODULE 6

FINANCING SMALL SCALE RE AND EE APPLICATIONS

OPTIONAL COURSE

Loan Assessment For Financing Small Scale Green Energy Systems

Upon completion of this course, you should be able to:

- explain the main aspects of a loan assessment for financing a green energy system
- propose factors and financial ratios required to make a positive decision to disburse a green energy small and medium enterprise (SME) loan

Content

- SME Loan Assessment
- SME Loan qualitative assessment
- SME Loan quantitative assessment
- Renewable energy (RE) applications in SMEs from different sectors
- Loan purpose
- Project plan
- Impact of the investment project on the SME
- Project rentability
- Assessment of loan securities - Collateral
- Assessment of loan securities - Credit guarantee

CONTENT DETAILS OF MODULE 7

GREEN ENERGY FINANCE IN PRACTICE

MANDATORY COURSE

Case study: Application of a solar photovoltaic system to a grid-connected hotel

Upon completion of this course, you should be able to:

- understand the impact of the specific legal framework on Solar PV applications in Mexico,
- comprehend the compensation methods for the Distributed Generation (DG) projects in Mexico,
- identify and analyse the key parameters needed to perform financial analysis,
- evaluate the financials and risk aspects of two distinct business models,
- determine the primary factor affecting the financial performance of a project,
- gain practical experience by conducting a comprehensive assessment of:
  - User's consumption
  - Solar PV technology
  - Financial performance
  - Risk analysis

Content

- Energy regulation, demand, and cost of electricity
- Mexico's regulatory framework
- User's energy demand and cost of electricity
- Benefits of the PV solar system in the region
- Site assessment: solar PV potential
- Characteristics, sizing, and design of the solar PV system
- Installation, operation, and maintenance
- Risk analysis
  - Turnkey model
  - PPA model
- Financial analysis
  - Input data and key parameters
  - Financial performance
  - Sensitivity analysis
- Non-financial analysis
  - Reduction of CO_2
  - Enhanced brand reputation
  - Avoided energy shortages

CONTENT DETAILS OF MODULE 8

SPECIFIC ISSUES ISSUE IN PROJECT EVALUATION

MANDATORY COURSE

Bankable O&M strategies for RE projects

Upon completion of this course, you should be able to:

- understand and explain the market standards related to long-term bankable operations and maintenance (O&M) strategies for different renewable energy (RE) technologies.
- explain how one can align the interests of a diverse range of stakeholders through well-structured O&M contracts that ensure plants' operational efficiency.
- give reasons financing partners have an interest in energy project performance reporting.

Content

- O&M strategies for photovoltaic power plants
- Contractual arrangements for PV projects
- Regular maintenance and scheduled inspections
- Warranties, guarantees, and incentive mechanisms
- Reporting requirements for PV projects
- O&M strategies for wind farms
- Contracting models and O&M service providers
- Operational guarantees and pricing schemes
- Regular assessments and inspections
- Performance reporting to financing partners
- Specific challenges in offshore wind projects
- Adaptation of maintenance strategies for offshore wind
- O&M strategies for biogas plants
- Selection of maintenance contracts
- Challenges related to operational guarantees
- Required assessments and inspections
- Reporting requirements, reserves, and capacity building

CONTENT DETAILS OF MODULE 8

SPECIFIC ISSUES ISSUE IN PROJECT EVALUATION

ELECTIVE COURSE

Environmental and social standards for RE projects

Upon completion of this course, you should be able to:

- compare different internationally recognized standards for environmental, social, climate change, gender or cultural issues
- explain environmental, social, climate change, gender or cultural standards in renewable energy project financing
- organise procedures and processes in order to comply to these standards from a project perspective
- assess in how far renewable energy and energy efficiency projects comply with these standards from a bank's perspective

Content

- The Equator Principles for the Financial Industry
- Introduction
- EHS Guidelines
- Types of EHS Guidelines
- Harmonization of Environmental and Social Safeguards
- Environmental and Social Impact Assessment (ESIA) Process
- Introduction
- Screening and Scoping – Introduction
- Practical Guidance on Screening
- Practical Guidance on the ESIA
- Content of an ESIA Report
- Introduction
- Executive Summary / Non-Technical Summary
- Methods and Key Issues
- Legal Framework
- Consultation Process
- Social and Environmental Baseline
- Description of the Proposed Development
- Prediction and Evaluation of Significant Social and Environmental Impacts
- Mitigation Measures
- Consideration of Alternatives
- Environmental and Social Management and Monitoring Plans
- Example of Impacts of Projects
- Roles and Responsibilities
- The Environmental and Social Management Plan
- Definition of the ESMP
- Content of the ESMP
- ISO 14001

CONTENT DETAILS OF MODULE 9

CLIMATE FINANCE

MANDATORY COURSE

Climate Finance: Accessing and mobilising climate finance

Upon completion of this course, you should be able to:

- list the various international sources of climate finance and their mechanisms for accessing climate finance
- list domestic climate finance sources and mechanisms
- explain the trends in private financing in climate finance
- assess the suitability of various sources and mechanisms for specific projects
- analyse practical examples of climate finance concepts.

Content

- Principles of Climate Finance
- Definitions and Elements of Climate Finance
- Climate Finance Instruments
- Multilateral Climate Finance Sources and Mechanisms
- Financial Mechanisms of the UNFCCC
- Access Modalities: via Intermediaries
- Access Modalities: Direct Access
- Multilateral Development Banks
- Bilateral Climate Finance Sources and Mechanisms
- Bilateral Finance: Relevance
- Bilateral Finance: Landscape
- Examples of Innovative Climate Financing Mechanisms
- Domestic Climate Finance Sources and Mechanisms
- Domestic (Policy) Instruments for Climate Finance
- The Role of Central Banks in Climate Finance
- National Climate Funds
- Private Financing in Climate Finance
- Relevance of Private Actors in Climate Finance
- Trends in Private Climate Finance
- Example: Export Credits in Climate Finance

CONTENT DETAILS OF MODULE 9

CLIMATE FINANCE

ELECTIVE COURSE

Climate Finance: Navigating the global landscape

Upon completion of this course, you should be able to:

- describe the overall global landscape of climate finance and its political framework
- compare climate finance needs and climate finance flows
- distinguish between various climate finance sources and financial mechanisms
- compare the roles and respective contributions of the main players and institutions involved in the climate finance landscape
- explain the importance of measurement, verification, & reporting and monitoring & evaluation in the climate (finance) landscape

Content

- Definitions of Climate Finance
- Definitions and Key Elements of Climate Finance
- Politics and Governance of Climate Finance
- Climate Finance after Paris
- Climate Finance Commitments Made by Developed Countries
- Global Climate Finance Landscape
- Climate Finance Needs
- Climate Finance Flows
- Climate Finance Sources
- Climate Finance Instruments
- Climate Finance Uses: Mitigation
- Climate Finance Uses: Adaptation
- Frameworks for Climate Action to Mobilise Finance
- Long-Term Low-Emission Development Strategies
- Nationally Determined Contributions
- Climate Change Mitigation Actions
- Project-Based Climate Financing
- Measurement, Reporting, and Verification
- MRV: Concept and Purpose
- Monitoring and Evaluation: Characteristics
- M&E vs. MRV

ELECTIVE FACT SHEET

Fact Sheet on climate smart agriculture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