Co-Benefits Assessments: Methods and Tools to Assess Social and Economic Opportunities of Renewable Energy

Study time:	Approx. 20 hours
Duration:	Approx. 2-3 weeks
Relation to other courses:	Co-benefits Overview: Renewable energy in climate change mitigation Co-benefits Policies: Climate policies to mobilize a renewable energy future Overview of renewable energy technologies Co-benefits Power System Planning (under construction) PV Business Models (extension- under construction)
Languages	English
Content:	Introduction: Quantification of co-benefits: Assessment methods Scoping of effects: direct, indirect and induced effects Scoping: gross and net effects Methodologies for assessing/evaluating co-benefits Introduction to modelling tools Key socio-economic co-benefits: jobs and employment, climate and environment, Health Energy Access Energy Security, local economic development Key socio-economic co-benefits in South Africa, India, Vietnam and Turkey
Objective:	After completion of this course, participants will be able to: • Develop causal chains for an assessment • Interpret, communicate and commission methods for quantitative assessment of co-benefits • Interpret findings of co-benefit analyses considering possible unwanted impacts and identifying the net-effects • Identify indicators and data sources for quantification of key co-benefits (Jobs/employment, air pollution, health, energy access, local economic development, energy security) • Commission and interpret co-benefit analyses and effectively communicate its results • Prepare schematic cost-benefit analyses • Interpret the findings of co-benefit analyses for re-formulating RE policies

Integrated Power System Planning
(previously named Sustainable Power System Planning with Co-benefits)

Study time:	Approx. 10-20 hours
Duration:	Approx. 2-3 weeks
Languages	English
Relation to other courses:	Prerequisites: Fundamental know how about co-benefits definitions, electricity and grids, wind power and photovoltaic is recommended
Content:	Introduction and typical questions of power system planning

	Traditional electric power systems planning with power production in central generating stations and power delivery to the points of end use via transmission and distribution systems Long-term electric power system expansion planning considering residual load approach and co-benefits of wind power and solar-PV. Software tool overview used for power system planning taking into account co-benefits of renewable power generation (Purpose, features and covered co-benefits / environmental effects) Power system planning case studies considering co-benefits of wind and solar-PV
Objective:	After completing the course, participants will be able to: • explain the differences between the traditional and modern power system planning approaches, based on different load curve methods and incorporation of co-benefits • compare tools used for power system planning and how co-benefits can be used during the planning process • explain how selected co-benefits of renewable energy, e.g. information on "global warming and human health effects of ambient air quality", affect the outcome of power system planning

Intro course: Renewable Energy Grid Integration

Study time:	Approx. 40 hours
Duration:	Approx. 3-6 weeks
Languages	English and Spanish
Relation to other courses:	**Online:** Either solid knowledge of electricity and grids, or Introduction to electricity Introduction to Electric Grids If no previous knowledge of RE, also PV – technology PV – Application Wind power *This course is a short version of the eight advanced online courses on grid integration (that are used for "CRGM")* **Recommended further courses** **Online** Highly resolved scenarios for grid integration of wind and solar power Short term prediction of wind and solar power generation Generator concept for renewables Balancing power for grid integration of renewables Grid codes for renewables Generation expansion planning for a high share of wind and solar power Grid integration studies and system integration studies Energy Storage
Content:	Time Series of Variable Renewable Energies

	System Operation: Scheduling and Forecasting Balancing Power Calculation Methodology Management of Grid Congestion Capacity Planning Grid Code Development Grid and System Integration Studies
Objective:	After completing this course, participants will be able to: • Explain the use and development of time series for variable renewable energy • Present the basics about power system operation, scheduling and forecasting • Describe the purpose and types of balancing power and management of grid congestion • Discuss capacity planning methodologies, grid codes and the development of grid studies