



GECI

Green Energy Center of Iran  
مرکز انرژی سبز ایران



# Enabling Climate Change Mitigation through Capacity Building – Green Energy Center of Iran (GECI)

**GECI's certified blended learning packages  
(trainings in Berlin, in Iran and via the internet)**

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## 1. General procedures and requirements

### Introduction

The “Enabling Climate Change through Capacity Building – Green Energy Center Iran (GECI)” project aims to contribute to the development of renewable energy and energy efficiency in Iran and therefore to the reduction of greenhouse gas emissions. This project is financed by Germany’s International Climate Initiative (IKI). The German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) supports this initiative based on a resolution adopted by the German Bundestag. The project started 2017 and will end 2020.

This document provides an overview of trainings held in 2018/2019. The application links and deadlines will be added to the document over time. Please check information on our website regularly or contact us at [geci@renac.de](mailto:geci@renac.de) for further information on the trainings detailed below.

### Target Groups

For professionals from the energy sector working in ministries, public institutions grid operators, power generation companies, project developers, enterprises, the finance sector and NGOs, this capacity building programme will offer full and partial scholarships for short term trainings in Iran, in Berlin and via the internet. The specific target group for each training is specified in the sections below.

### Teaching Methods

Motivation plays the most important role for successful learning. In order to offer an enjoyable and sustainable training, RENAC will use a range of teaching methods. The lecturers will choose the methods according to the learning target of each teaching unit. Teaching methods include:

- Online Trainings via RENAC’s e-learning platform
  - Independent study phases of varying length (texts, videos, tests for self-evaluation and further reading material).
  - Lecturers will offer individual support via an online-forum for questions and answers.
  - Lecturers will teach in virtual classroom sessions.
  - In order to receive a certificate, participants are required to successfully pass one exam at the end of an online training.
  - To refresh basic knowledge of essential concepts required for passing online exams, RENAC offers all participants introductory courses on (a) energy (b) the solar resource (c) electricity and (d) electric grids. Studying the material provided in these courses is voluntary and there will be no exam on course content.

- Classroom-trainings:
  - Lectures will include PowerPoint presentations, flip charts and white boards.
  - Lectures will combine theoretical information and exercises that enable the participants to apply learned concepts to practical situations.
  - Group work and discussions during lessons involving all participants and providing them with an opportunity to interact in groups by applying the learned content of the course.

### Language, Hand-outs and Online Training



- Course material will be provided in English.
- Lecturers will present in English.
- An English-Farsi glossary is provided on the online course platform.
- Classroom seminar participants will receive colour printed hard copies (no files).
- All self-study online training material will be accessible at any time during the study phase.
- Additionally, online training participants can download course texts (PDF files) and videos for offline use.
- Virtual classroom sessions and online exams take place at fixed dates that are communicated at the beginning of the study phase.

### Training Locations

- The online trainings will be held via RENAC's e-learning platform (<https://renewables-online.de/>).
- The location for the classroom seminars in Germany will be RENAC's offices at Schönhauser Allee 10-11, 10119 Berlin, Germany. The office is in the centre of Berlin in 5 minutes walking distance from the subway station U2-Senefelderplatz.
- Classroom trainings in Iran will be held in Tehran and, in one case, in Shiraz (tbc; see below). The exact location of each training will be communicated to participants in due time.

## Eligibility Criteria and Application Deadlines

- GECI-trainings target Iranian citizens fulfilling the specific target group criteria for each training specified in the description of each seminar (see sections below).
- Candidates have to fill out an online application form and submit it before the application deadline. Applications which are submitted after this date cannot be considered (for further details on the application procedure see below). The application tool is available at RENAC's website (<https://www.renac.de/projects/current-projects/geci-green-energy-center-of-iran/>)
- Candidates for trainings taking place in Berlin have to upload a scanned copy of their passport.

In order to facilitate the visa application procedure, all applicants for trainings in Berlin are required **to book an interview date at the German embassy via their [website](#)**. Applicants who are not accepted to participate in the training are required to cancel the appointment after receiving a notice from RENAC. Candidates have the sole responsibility for the visa application procedure.

Candidates have to accept the terms of reference for participation.

- Candidates should have proficient English language skills.
- Participants of Berlin seminars have to book and pay travel arrangements (e.g. transport, hotel) themselves. Some of these costs can be refunded by RENAC (for details see below).
- Participants of the classroom training have to attend the preparatory online trainings and to pass the exam(s) successfully.
- Participants of the classroom training should be willing to find solutions through group work, present results and discuss solutions.
- Participants of the online training should have access to a stable internet connection.

## Duration and Number of Participants

The duration of classroom and online trainings varies according to training subjects, level of complexity, and learning objectives. The duration of each training is specified in the respective training descriptions below.

- Classroom trainings are designed for 12 or 15 participants.
- Each online training is designed for up to 75 participants.



## Seminar Fees and Travelling Costs to Berlin

Participation in online and classroom trainings will be covered by a scholarship. This includes course material (colour printed hard copies), lunch, coffee/tea breaks, access to texts and videos, questions for independent study, virtual classrooms, a forum for questions / answers, an online test, certificates, as well as site visits and health insurance for the duration of the trainings held in Berlin.

**Travelling costs for trainings held in Berlin:** Selected participants will receive a partial scholarship for flights and accommodation for trainings taking place in Berlin. The scholarship covers up to 50 % of flight tickets and hotel costs upon receiving the candidates' payment documents in Germany during the seminar. After seminar participants payed their bills and present originals of the invoices to RENAC, RENAC will reimburse participants in cash. The maximum reimbursement for a flight to/from Berlin is 250 € and the reimbursement for hotel costs in Berlin is up to seven nights and up to 41,25 €/night. The participants shall bear the rest of the cost themselves. Examples for reimbursement calculations:

- RENAC will reimburse 20 €/night if the hotel costs 40 €/night, 41.25 €/night if the hotel costs 82.50 €/night and 41.25 € if the hotel costs is e.g. 100 €/night.
- For a flight (round trip) from Tehran to Berlin of 400 €, RENAC will reimburse 200 €, for a flight of 500 €, RENAC will reimburse 250 € and if the flight cost is about 1300 €, RENAC will reimburse 250 € as well.

## Application Procedure

Interested individuals are requested to apply through RENAC's website (<https://www.renac.de/projects/current-projects/geci-green-energy-center-of-iran/>) by the deadline specified for each training. Links and deadlines are specified in the sections below. RENAC will choose the participants according to information provided by the applicants. Applicants must demonstrate that they fulfil the eligibility above mentioned criteria.

If RENAC accepts the application, RENAC will inform candidates via e-mail in due time before the beginning of the seminar. Within one week after the acceptance confirmation, the candidate must confirm his/her participation by sending an email to RENAC. If the candidate does not confirm his/her participation in time, RENAC has the right to transfer the scholarship to another candidate on the waiting list. If a candidate is accepted for the GECI-scholarship and confirms his/her participation, he/she is obliged to attend the entire seminar and all lectures conducted.

For trainings taking place in Berlin, RENAC will send an official invitation letter for the visa procedure. In case a visa is not granted, the participant has to inform RENAC immediately. Completing the visa application procedure is the participants' responsibility. RENAC will send the names of all accepted candidates to the German embassy in Tehran for confirmation.

Confirmed participants should be prepared to attend the entire seminar, participate in group work, present results and discuss solutions. Participation in the training is free of charge as long as registered participants attend the entire seminar. In case a participant does not attend parts of the seminar in Berlin, he/she has to pay 500 Euro per full seminar day and 250 Euro for a half seminar day which he/she does not attend. In case of sudden illness during the seminar, he/she will inform

RENAC immediately and send a medical certificate with a letter stating the reasons for declining his/her participation and the seminar participant does not have to pay the seminar fees.

## 2. GECI-Renewable Energy Education Innovator Training

In this package, the main focus is in the German energy transition strategy (Energiewende). This is a blended learning package: A combination of an online training (a) with a face-to-face-training in Berlin (b).

For those that pass the entire blended learning package (a)+(b), the title of the awarded certificate is: **“GECI-Renewable Energy Education Innovator”**

For those that do not participate in the face-to-face-training in Berlin, but successfully pass the online training, the title of the awarded certificate is: **“GECI-Renewable Energy and Energy Efficiency Innovator - Online”**

\* This training will be offered three times during the course of the GECI project. Please refer to the following table for details:

Date of online training	Code	Date for face-to-face training	Deadline for application	Application
12 March – 30 June 2018	GECI-B1	9 – 13 July 2018	14 February 2018	Apply online (Closed)
13 August – November 15 2018	GECI-B2	24 – 28 September 2018	15 May 2018	Apply online (Closed)
1 March – 31 May 2019	GECI-B3	17 – 21 June 2019	15. January 2019	Apply online (Closed)

### Target Group

This training targets experienced trainers and educators for photovoltaic and wind power working in the Iranian public and private sector. All participants are required to successfully complete the preparatory online seminars. The following eligibility criteria apply for all applicants:

- Long term training experience in the field of renewable energy in Iran
- Proof of more than 3 years of vocational training and/or higher education lecturer experience for wind and/or photovoltaic

## Content

This blended learning package consists of a preparatory online training and a face-to-face training including field trips in and around Berlin. The following topics will be covered:

- a) Online training, to be completed within three months:
  - o Fundamentals of renewable energy (PV application, wind power, biogas)
  - o Fundamentals of energy efficiency (Intro to energy efficiency projects, technological aspects of energy efficiency)
  - o Grid integration of variable renewable energy (Wind and PV grid integration)

All three online modules combined will require approximately 130 hours of independent study.

- b) Face-to-face training in Berlin:
  - o Germany's climate protection and energy transition strategy
  - o Education opportunities and job programs in the German solar and wind sector
  - o Practical exercises for education purposes: solar and wind power laboratory/grid integration of variable renewable energy
  - o Field trips: Research institutes in the solar and/or wind sector, large grid-connected photovoltaic and/or wind farms, remote monitoring and control centres for wind and/or Photovoltaic

## Online Application Tool and Deadline

- Candidates have to fill out an **online application form** and submit it before each application deadline.
- Candidates have to upload their CV and a scanned copy of their passport.
- In order to facilitate the visa application procedure, all applicants are required to book an interview date at the German embassy via their **website**. Applicants who are not accepted to participate in the training are required to cancel the appointment after receiving a notice from RENAC.
- Candidates have to accept the **terms of reference** for participation.

## Duration and Number of Participants

The classroom training will be held during five days and is designed for up to 12 participants.

The online training shall be successfully completed within three to four months.

Please note: Applicants who were not accepted to participate in the program may still participate in the online training. Upon successful completion, they will receive the certificate "Green Energy Center Iran (GECI) - Renewable Energy Innovator – Online".



### 3. GECI – Photovoltaic Business Development Specialist Training

In this package the focus is on the Photovoltaic - from project planning to bankable business plans. This is a blended learning package: A combination of an online training (a) with face-to-face training; in Tehran and the other in Shiraz (twice in each city)

For those that pass the entire blended learning package (a)+(b), the title of the awarded certificate is: **“GECI- Photovoltaic Business Development Specialist”**

For those that do not participate in the face-to-face training in Tehran or Shiraz, but successfully pass the online training, the title of the awarded certificate is: **“GECI- Photovoltaic Business Developer - Online”**

In order to be closer to interested candidates outside of Tehran, these trainings will also be held in Shiraz. They will be identical in content and teaching methods.

#### Content

This blended learning package consists of preparatory online trainings and a face-to-face training. The following topics will be covered:

- a) Online training with exam:
  - PV application & technology
  - Methodology of project valuation
  - PV business models and business plans
  - Grid integration of variable renewable energy
- b) Face-to-face training in Tehran or Shiraz.
  - PV application advanced
  - PV business development

#### a) Online training with exam

	Online course	Topics	Study time	Duration
PV application & technology	PV application	PV system categories PV module characteristics Inverters Energy yield and Performance Ratio	Approx. 20 hours	August – September 2018
	PV technology	Physics of a PV cell Different PV module Technologies PV Array Configurations Shading aspects	Approx. 20 hours	August – September 2018

<b>Methodology of project valuation</b>	<b>Methodology of project valuation</b>	Equity and debt capital Financing options, risks and uncertainties Time value of money Weighted average cost of capital (WACC) Financial performance indicators Net Present Value (NPV) Simple payback (SPB) and discounted payback (DPB) Benefit-to-cost Ratio (B / C) Levelized cost of Energy (LCOE) Debt Service Cover Ratio (DSCR)	Approx. 40 hours	September – October 2018
<b>PV business</b>	<b>PV business models and business plans</b>	PV Business Model Scenarios Key Aspects of a bankable Business Plan PV Business Plan Scenarios	Approx. 40 hours	November – December 2018

**b) Face-to-face training:**

Face-to-face training	Topics	Study time	Duration Tehran	Duration Shiraz
<b>I. PV application advanced</b>	Solar resource assessment Overview PV system components PV system design PV system output simulation Project development EPC milestones Operation and maintenance	Five days, 09 AM – 5 PM	06 – 10 October 2018	13 – 17 October 2018
<b>II. PV business development</b>	Different scenarios of suitable business models in Iran Key contracts and principle of subcontracting Development of a business plan for two different scenarios	Four days, 09 AM – 5 PM	20 – 23 January 2019	26 – 29 January 2019

## I. Face-to-face-training “PV Application Advanced” in Tehran (06 – 10 October 2018) and Shiraz (13 – 17 October 2018)

The five-day seminar “PV Application Advanced” offers applied knowledge on technical, legal and financial aspects of grid connected utility scale PV Projects. The first two days of this seminar will focus on the fundamentals of PV System Engineering where the participants acquire theoretical and practical knowledge on PV System components, sizing and output modelling. The next 3 days cover a thorough insight into the PV Project Development as well as the following project stages and milestones, giving practical examples and application related exercises. After that, the participants will be able to identify key aspects of the project development chain, explain important milestones of the PV project life-cycle, and analyse operational PV system data.

This seminar provides the fundamentals for the face to face training on PV Business models and business plans which follows in January 2019.

The trainings are designed for up to 15 participants.

### Target Group

The five-day seminar targets professionals from the public and private sector, as well as graduates interested in starting their professional career within the Solar PV Business. Generally, the training is directed to

- Consultants
- Public and private companies
- Start ups

### Requirements for Participants

- Participants need to bring their own computer with MS Excel software
- Basic knowledge of photovoltaic technology is required.
- Participants should be willing to find solutions through group work, present results and discuss solutions

## Training Schedule

Legend	theory	in-class workshop	exercise
<b>Day 1</b>			
9:00-10:30	10:45 - 12:15	13:30 - 15:00	15:15 - 16:45
<b>Session 1</b> <ul style="list-style-type: none"> <li>• Welcome &amp; Introduction</li> <li>• Application Segments               <ul style="list-style-type: none"> <li>○ Rooftop vs Gound-Mounted PV</li> </ul> </li> <li>• Introduction large scale PV Projects               <ul style="list-style-type: none"> <li>○ PV Project Structure &amp; Life-Cycle</li> </ul> </li> </ul>	<b>Session 2</b> <ul style="list-style-type: none"> <li>• Solar Ressource               <ul style="list-style-type: none"> <li>○ Irradiation</li> <li>○ Tilt &amp; Orientation</li> <li>○ Measurement</li> <li>○ Data Sources</li> <li>○ Data Retrieval</li> </ul> </li> </ul>	<b>Session 3</b> <ul style="list-style-type: none"> <li>• System Output Modeling               <ul style="list-style-type: none"> <li>○ Yield Assessment</li> <li>○ Spatial Planning</li> </ul> </li> </ul>	<b>Session 4</b> <ul style="list-style-type: none"> <li>• PV Modules               <ul style="list-style-type: none"> <li>○ Key Characteristics</li> <li>○ Interconnection</li> <li>○ Quality Standards</li> </ul> </li> <li>• PV Module Technologies               <ul style="list-style-type: none"> <li>○ Impact Amient Conditions</li> </ul> </li> </ul>
9:00-10:30	10:45 - 12:15	13:30 - 15:00	15:15 - 16:45
<b>Session 1</b> <ul style="list-style-type: none"> <li>• PV System Components               <ul style="list-style-type: none"> <li>○ Overview DC Side</li> <li>○ Inverter Types</li> <li>○ Overview AC Side</li> </ul> </li> </ul>	<b>Session 2</b> <ul style="list-style-type: none"> <li>• PV System Sizing DC Side               <ul style="list-style-type: none"> <li>○ PV Modules</li> <li>○ Inverters</li> <li>○ Nominal Power Ratio</li> </ul> </li> </ul>	<b>Session 3</b> <ul style="list-style-type: none"> <li>• PV System Output Simulation PV Syst I               <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Preliminary Design of a Case Study Project in Iran</li> </ul> </li> </ul>	<b>Session 4</b> <ul style="list-style-type: none"> <li>• PV System Output Simulation PV Syst II a)               <ul style="list-style-type: none"> <li>○ Full System Design and Assessment of a Case Study Project in Iran</li> </ul> </li> </ul>
<b>Day 3</b>			
9:00-10:30	10:45 - 12:15	13:30 - 15:00	15:15 - 16:45
<b>Session 1</b> <ul style="list-style-type: none"> <li>• PV System Output Simulation PV Syst II b)               <ul style="list-style-type: none"> <li>○ Full System Design and Assessment of a Case Study Project in Iran</li> </ul> </li> </ul>	<b>Session 2</b> <ul style="list-style-type: none"> <li>• Project Development I               <ul style="list-style-type: none"> <li>○ Development Chain (technical, legal and financial aspects)</li> </ul> </li> </ul>	<b>Session 3</b> <ul style="list-style-type: none"> <li>• Project Development II (legal aspects)               <ul style="list-style-type: none"> <li>○ Key Contracts and Permits</li> <li>○ Risks and Mitigation</li> <li>○ Local Barriers</li> </ul> </li> </ul>	<b>Session 4</b> <ul style="list-style-type: none"> <li>• Project Development III (financial aspects)               <ul style="list-style-type: none"> <li>○ Financial Performance Indicators</li> <li>○ PV Project Valuation</li> </ul> </li> </ul>
<b>Day 4</b>			
9:00-10:30	10:45 - 12:15	13:30 - 15:00	15:15 - 16:45
<b>Session 1</b> <ul style="list-style-type: none"> <li>• Engineering, Procurement and Construction (EPC)               <ul style="list-style-type: none"> <li>○ Overview Scope of Work</li> <li>○ Commissioning</li> <li>○ Quality of Documentation</li> </ul> </li> </ul>	<b>Session 2</b> <ul style="list-style-type: none"> <li>• EPC Guarantee I               <ul style="list-style-type: none"> <li>○ Acceptance Tests (PAC, IAC, FAC)</li> <li>○ Functional Tests</li> </ul> </li> </ul>	<b>Session 3</b> <ul style="list-style-type: none"> <li>• EPC Guarantee II               <ul style="list-style-type: none"> <li>○ Acceptance Tests (PAC, IAC, FAC)</li> <li>○ Performance Tests</li> </ul> </li> </ul>	<b>Session 4</b> <ul style="list-style-type: none"> <li>• Operation and Maintenance (O&amp;M) I               <ul style="list-style-type: none"> <li>○ Maintenance Types</li> </ul> </li> </ul>
<b>Day 5</b>			
9:00-10:30	10:45 - 12:15	13:30 - 15:00	15:15 - 16:45
<b>Session 1</b> <ul style="list-style-type: none"> <li>• Operation and Maintenance (O&amp;M) II               <ul style="list-style-type: none"> <li>○ Full Scope of O&amp;M Services</li> </ul> </li> </ul>	<b>Session 2</b> <ul style="list-style-type: none"> <li>• Monitoring &amp; Performance Control I               <ul style="list-style-type: none"> <li>○ Curve Evaluation and Failure Detection</li> </ul> </li> </ul>	<b>Session 3</b> <ul style="list-style-type: none"> <li>• Monitoring &amp; Performance Control II               <ul style="list-style-type: none"> <li>○ Performance Parameters</li> <li>○ Performance Test Methods</li> </ul> </li> </ul>	<b>Session 4</b> <ul style="list-style-type: none"> <li>• Seminar Closing               <ul style="list-style-type: none"> <li>○ Final Quiz</li> <li>○ Q&amp;A</li> <li>○ Evaluation</li> </ul> </li> </ul>
Legend	theory	in-class workshop	exercise

## Lecturers

### Bernd Wollwerth-Carl, RENAC



Bernd Wollwerth-Carl has been working in different fields of renewable energies for almost 20 years and has been with Renewables Academy (RENAC) AG since March 2017. At RENAC, he leads the Solar Energy department and in this role he gives lectures, runs seminars and workshops, and coordinates all solar energy projects. Bernd has a diploma in Environmental Engineering. After finishing his studies, he started working in different fields of bioenergy (process engineering of biodiesel plants, operation of biogas plants, R&D for biogas liquefaction, etc.). In 2003 he joined the German Energy Agency (dena) where he was responsible for the bioenergy sector within the “Export Initiative Renewable Energies”. Here he implemented several large projects including the first PV roof top project of dena’s “solar roof program” in Athens. Later he worked for an energy supply company where he designed, developed and implemented bioenergy heat supply projects all over Germany. Thereafter he worked for three years as manager of the bioenergy department and later as International Sector Manager “Energy Companies” for the consulting company Ecofys GmbH where he implemented several large bioenergy studies. In 2009 he founded the company KWA Eviva GmbH and worked there as CEO as well as project developer for large-scale PV power plants in Germany, in Turkey and further countries abroad. At KWA Eviva GmbH he realized several large-scale ground-mounted PV plants.

### Isabelle Gezer, RENAC

Isabelle Gezer joined the Renewables Academy (RENAC) in October 2017. She holds a diploma in Environmental Engineering (Technical University of Berlin) and Masters in Solar PV Engineering (University of Jaen, Spain). During her Master Thesis she investigated the energy performance of different photovoltaic modules under different climatic conditions. Isabelle worked for three years for one of Europe’s biggest Solar Asset Management providers. As a technical asset manager for a large Solar PV Portfolio in UK, her daily routine included overseeing the technical performance of the assets, reviewing acceptance test calculations and liaising with EPC Contractors, O&M Providers, grid operators as well as other third parties. At RENAC she works as Project Manager within the Solar Energy Department, develops training material and is also involved as lecturer in face-to-face seminars, workshops and online classrooms.



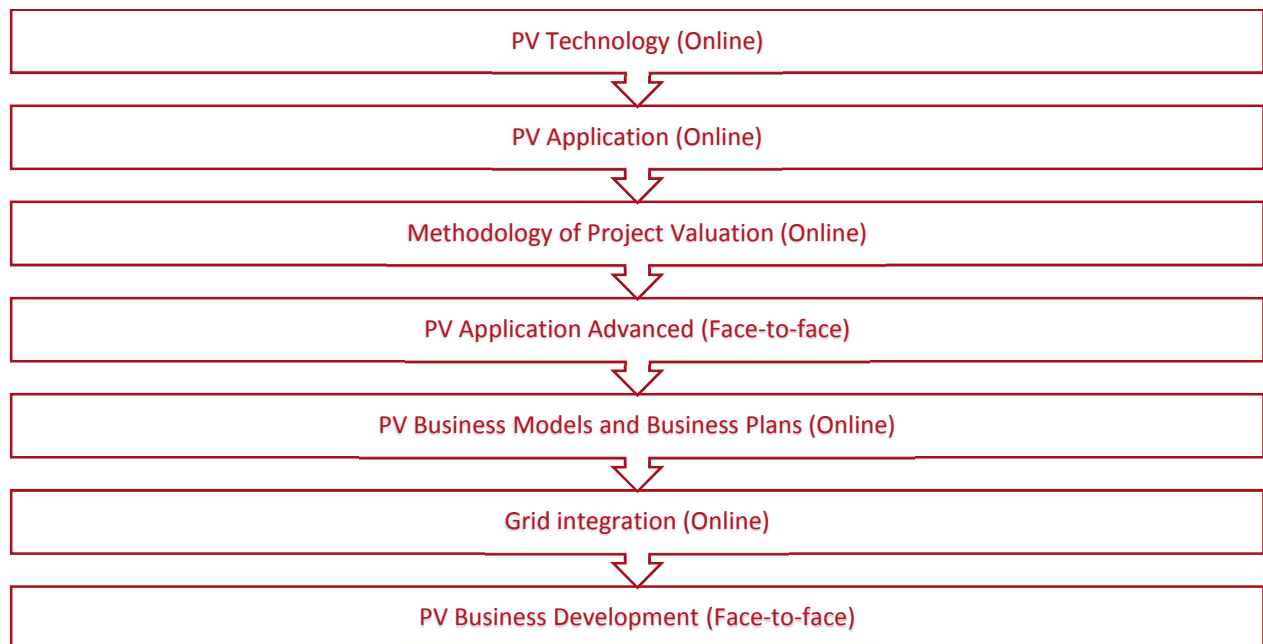
## II. Face-to-face-training “PV Business Development” in Tehran (20 – 23 January 2019) and Shiraz (26 – 29 January 2019)

The four-day seminar “PV Business Development” focusses on sustainable PV business models in Iran and the elaboration of an appropriate business plan. This course provides integrated knowledge about important aspects in the PV Business and the offers the participants the opportunity to learn how to set up their own business plan in the local PV Sector.

### Requirements for Participants

- Participants are required to have passed the exam of the preparatory online courses
- Participants need to bring their own computer with MS Excel software
- Basic knowledge of photovoltaic technology is required.
- Participants should be willing to find solutions through group work, present results and discuss solutions
- Good English proficiency is required.

**Further details will be announced closer to the application date**



**Blended learning program: PV business development specialist**

## 4. GECI – Photovoltaic Vocational Training Specialist

This package is a Train-the-Trainer PV training with a focus on open-space industry-scale and industry rooftop applications. This is a blended learning package: A combination of an online training (a) with face-to-face training in Tehran and Berlin.

For those that pass the entire blended learning package (a)+(b), the title of the awarded certificate is: **“GECI- Photovoltaic Vocational Training Specialist”**

For those that do not participate in the face-to-face trainings in Tehran and Berlin, the title of the awarded certificate is: **“GECI- Photovoltaic Business Developer - Online”**

### Content

This blended learning package consists of preparatory online training and a face-to-face training. The following topics will be covered:

- a) Online training with final exam:
  - PV application & technology
  - Methodology of project valuation
  - PV business models and business plans
  - Grid integration of variable renewable energy
- b) Face-to-face training in Tehran 24 – 28 August 2019
- c) Face-to-face training in Berlin 16 – 20 Sept 2019



a) Online training:

	Online course	Topics	Study time	Duration
PV Application & Technology	PV application	PV system categories PV module characteristics Inverters Energy yield and Performance Ratio	Approx. 20 hours	March – July 2019
	PV technology	Physics of a PV cell Different PV module Technologies PV array configurations Shading aspects	Approx. 20 hours	
Grid integration of variable renewable energy	Wind and PV grid integration	Time series for variable renewable energy Power system operation, scheduling and forecasting Balancing power and management of grid congestion Capacity planning methodologies, grid codes and the development of grid studies	Approx. 40 hours	
PV Business models and business plans	PV business models and business plans	PV business model scenarios Key aspects of a bankable business plan PV business plan scenarios	Approx. 40 hours	



### b) Face-to-face training Tehran:

Face-to-face training	Topics	Study time	Duration
<b>Face-to-face training Tehran</b>	<p>See page 10 (5 and 4 days face-to-face trainings of PV Business Development Specialist) but in compressed form focus on “how to train” including didactical and methodological tasks participants will give sample lectures themselves</p> <p>Tasks:</p> <ul style="list-style-type: none"> <li>Solar resource assessment</li> <li>Overview PV system components</li> <li>PV system design</li> <li>PV system output simulation</li> <li>Project development</li> <li>EPC milestones</li> <li>Operation and maintenance</li> <li>Different scenarios of suitable business models in Iran</li> <li>Key Contracts and principle of subcontracting</li> <li>Development of a business plan for two different scenarios</li> </ul>	Five days, 09 AM – 5 PM	24 – 28 August 2019

### c) Face-to-face training Berlin:

Face-to-face training	Topics	Study time	Duration
<b>Face-to-face training Berlin</b>	Field trips: PV plants, companies, institutes with focus on job creation	Five days, 09 AM – 5 PM	16 – 20 September 2019

The ten-day seminar “PV Vocational Training Specialist” will offer its participants an in-depth view into the technological and economical requirements for proper PV grid connected plants, how to assess and manage project related risks and how to plan operation and maintenance as well as the management of PV plants. Furthermore, the participants will learn to draft a bankable business plan and they will be enabled to train themselves local technicians, project planers, start-ups and companies to develop grid connected open field industry scale and industry rooftop PV projects and how to start business in the PV sector.

The above-mentioned objectives will be attained through a blend of up-to-date online trainings via RENAC’s online academy, face-to-face lectures in Teheran and Berlin, laboratory exercises, site visits, and discussions with stakeholders as well as group exercises. The face-to-face lectures shall enable participants to gain knowledge with high practical relevance which they can use for further trainings.

The classroom trainings are designed for up to 12 participants.

## Target Group

The training in Teheran and Berlin targets experienced trainers and educators for photovoltaic working in the Iranian public and private sector.

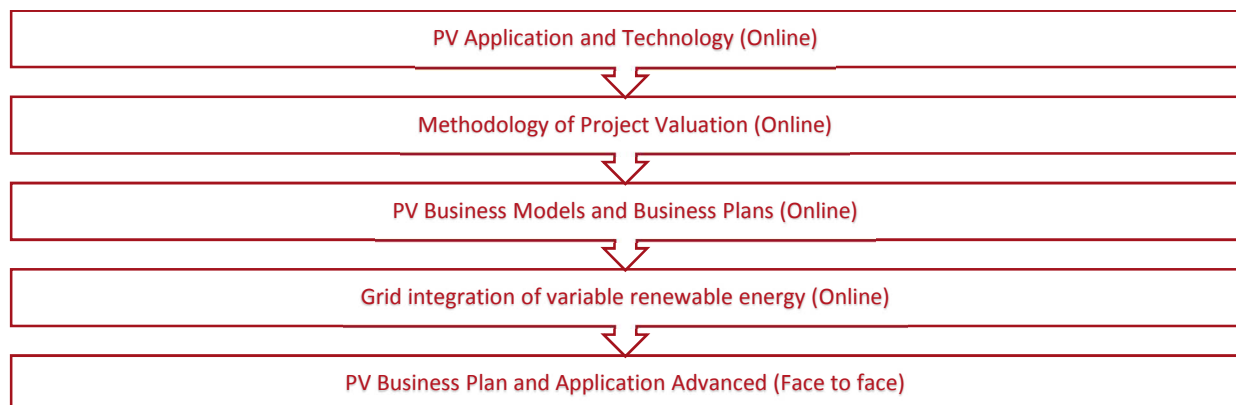
## Requirements for Participants

The following eligibility criteria apply for all applicants:

- Long term training experience in the field of renewable energy in Iran
- Proof of more than 3 years of vocational training and/or higher education lecturer experience for photovoltaic
- Excellent English language skills
- Participants are required to have passed the exam of the preparatory online courses
- Participants need to bring their own computer with MS Excel software

Participants should be willing to find solutions through group work, present results and discuss solutions

**Further details will be announced closer to the application date**



**Blended learning program: PV Vocational Training Specialist**

## 5. GECI – Certified Green Energy Professional

As part of the GECI-programme, RENAC will conduct a comprehensive course, which is completely online. For those that pass the advanced courses of the online package, the title of the awarded certificate is: **“GECI-Certified Green Energy Professional - Online”**. We recommend that seminar participants also work through the fundamental courses, as many facts are a prerequisite for the advanced courses. Seminar participants who have already attended these courses in previous semesters can start the training later.

### Content

This training package consists of online courses with a final exam. The exam will cover courses marked with \*\*\*.

- Renewable energy fundamentals technology:
  - PV, application and technology
  - Wind power, application and technology
- Energy Efficiency
  - Energy efficiency fundamentals
  - Synergies of energy efficiency and renewable energy policy \*\*\* (new course)
  - Heat pumps for heating and cooling – technology and applications \*\*\* (new course)
  - Protection systems in low and medium voltage networks with rooftop and ground-mounted photovoltaics \*\*\* (new course)
- Grid integration
  - Grid integration of variable renewable energy fundamentals
  - Battery energy storage systems for grid ancillary services\*\*\* (new course)
  - Spinning Reserve in Power Supply Systems with wind power and photovoltaic\*\*\*(new course)
  - Battery storage overview \*\*\* (new course)
- Business
  - PV business models and business plans
  - Methodology of project valuation

### Timetable

The following figure shows the timetable for the entire training. Fundamental courses will be available from October onwards. RENAC will broadcast the advanced courses from January to March 2020. The final exam and a re-exam on the advanced courses will be at the beginning of April 2020.

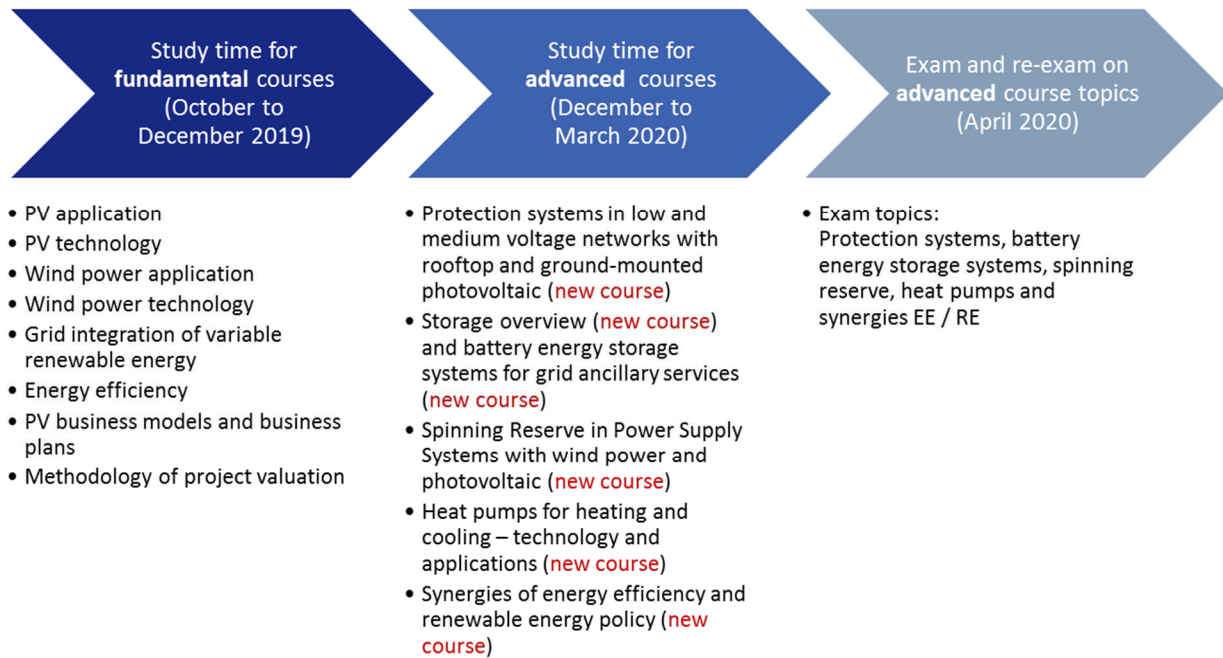


Figure: Timetable and content for “GECI- Green Energy Professional” training

**Detailed course content**

	Online course	Topics (***) courses are relevant for final exam)	Study time
Energy Efficiency	Synergies of energy efficiency and renewable energy policy ***	Deploying both energy efficiency and renewable energy measures at the same time Identifying high impact policy measures	App 20 hours
	Heat pumps for heating and cooling ***	Air source heat pumps (ASHPS), ground source heat pumps (GSHPS) and hydrothermal heat pumps (HHPS))	App 20 hours
Grid integration	Protection systems ***	Protection systems in low and medium voltage distribution grids New requirements for protection systems in grids with rooftop and ground-mounted photovoltaics	App 20 hours
	Battery overview and battery systems for ancillary services ***	Technology overview Sizing of a BESS for ancillary services BESS configuration	App 40 hours
	Spinning Reserve ***	Spinning Reserve in Power Supply Systems with wind power and photovoltaic Dynamic stability analysis of power systems Change in the spinning reserve in the event that the share of wind/PV power	App 20 hours
	Wind and PV grid integration	Time series for variable renewable energy Power system operation, scheduling and forecasting Balancing power and management of grid congestion Capacity planning methodologies, grid codes and the development of grid studies	Approx. 40 hours

Renewable Energy Fundamentals	PV application	PV system categories and module characteristics Inverters Energy yield and Performance Ratio	Approx. 20 hours
	PV technology	Physics of a PV cell, different PV module technologies PV array configurations Shading aspects	Approx. 20 hours
	Wind power	Wind system types and components System sizing and energy yield Planning and implementation steps for a wind power plant	Approx. 20 hours
Energy Efficiency Fundamentals	Introduction to energy efficiency projects	Drivers and barriers to energy efficiency projects The relevance of energy efficiency in different economic sectors Energy efficiency finance options	Approx. 10 hours
	Technological aspects of energy efficiency	Basic functions and areas of application of cross-cutting technologies in the industry Technical measures to enhance energy efficiency Saving potential of the energy efficiency measures	Approx. 20 hours
PV Business Models and Business Plans	Methodology of project valuation	Equity and debt capital Financing options, risks and uncertainties Time value of money The weighted average cost of capital (WACC) Financial performance indicators Net present value (NPV) Simple payback (SPB) and discounted payback (DPB) Benefit-to-cost ratio (B / C) Levelized cost of energy (LCOE) Debt service cover ratio (DSCR)	Approx. 40 hours
	PV business models and business plans	PV business model scenarios Key aspects of a bankable business plan PV business plan scenarios	Approx. 40 hours

### Target Group

- Transmission and distribution grid operators that work towards the integration of electricity from photovoltaic and wind power
- Enterprises, consultants and project developers working in the renewable energy sectors
- Universities supporting start-ups and entrepreneurship in the renewable energy sector (professors and assistant professors)
- Ministries and public institutions involved in establishing political and economic frameworks
- Non-governmental organizations active in the field of renewable energy
- The excellent knowledge of English is essential to participate in online training.

Date of online training	Code	Deadline for application	Application
01 October 2019 – March 2020	GECI-Online	20 September 2019	Apply online

Renewables Academy Online

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GECI

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