

## Entrepreneurial training for installers and maintenance technicians of photovoltaic solar panels



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## Context

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The challenge of access to energy in Africa is a reality known to all, especially in rural areas. However, Africa has great potential for the development of solar energy technologies, especially systems using photovoltaic solar panels.

Solar Power systems are a clean and sustainable way to generate electricity. They could become a powerful tool for rural development by providing a source of income for young people and women.

In Togo in particular, the new electrification strategy adopted by the government foresees the creation of thousands of jobs in the photovoltaic solar sector. Unfortunately, very few adequate trainings exist today for the training of installers.

This document aims to define the "Entrepreneurial Training of Installers and Technicians for The Maintenance of Photovoltaic Solar Systems" carried out by Energy Generation.

# Energy Generation

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Energy Generation is an organization that aims to help the whole generation of young Africans cope with the challenge of access to electricity for all on the continent. Our project aims to promote and support technological innovation and social entrepreneurship at the local level in order to identify, develop and disseminate on a large scale the electrification solutions "made in Africa" of for today and tomorrow. To do this, we organize the Africa Energy Generation Prize every year to identify innovative projects.

## Target Audience

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The training is aimed primarily at people working on an electrification project, building electrical technicians and all people with a passion for photovoltaic solar energy. Although women have the ability to perform very well in this area, we have noticed that only a few of them are interested, mainly for economic reasons. As a result, women are strongly encouraged to enroll in our training. A grant is made available to 40 women by EDF and will be an asset to help us empower women who want to venture into photovoltaic solar installations.

## Objective

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The aim is to develop a training program based on solar system installation and entrepreneurship skills. The learners will acquire the technical skills necessary to install a self-contained, clean and appropriate solar photovoltaic system. In addition, they will have the ability to create, manage and promote an economic activity built around the installation of solar based systems.

## Training program

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The training is a 10-month competency-based program divided into two parts. The first part is the technical journey that deals with the technical aspects of the installation and maintenance of solar system and lasts 10 weeks, while the second part, the entrepreneurial journey, provides the basic skills that candidates need to start their own business and be competitive in the market. This second part lasts 7 months and includes a section on 6-week entrepreneurship courses followed by 6 months of incubation.

### Part 1: Technical Course

The technical course has been developed to meet the technical requirements and safety standards required by photovoltaic solar installations. It is designed to provide the skills required to install and maintain autonomous photovoltaic solar systems through courses, directed work, practical work, workshops and field visits. Thanks to the support of the Schneider Electric Foundation, we have practical work equipment adapted to quality training.



## Module 1: Installation of photovoltaic solar systems

This first module aims to provide the basics of electricity, to describe the main components of a PV system and their operation, as well as their methods of connection, and finally to discuss the rules and safety equipment related to a photovoltaic system. The various themes included in module 1 are listed below:

- Direct current
- PV panels
- Batteries
- Panel-Batteries links
- Charge regulator
- Inverter
- Safety

### INDICATIVE PROGRAMMING OF THE MODULE 1

	General	Direct current	Photovoltaic panels	Batteries	Battery panel link	Charge regulator	Inverter	Installation safety	
Lectures	2h	1h	3h30	3h	2h30	2h30	2h	2h	18,5h
Tutorials	1h	0	3h	1h30	1h30	1h	1h	2h	11h
Practical work	0	0	5h	4h	0	2h	2h	2h	15h
Evaluation	1h	0	2h	2h	1h30	3h	2h	2h	16,5h
<b>TOTAL</b>	<b>61h</b>								

## Module 2: Maintenance of photovoltaic solar systems

This module is designed to provide learners with the skills to put into service, troubleshoot, identify or prevent failures and propose solutions for an autonomous solar system. The themes covered in Module 2 are listed below:

- Maintenance
- Isolated site installations
- Preventive maintenance
- Commissioning
- Curative maintenance

INDICATIVE PROGRAMMING OF THE MODULE 2

	General	Maintenance	Reminder: isolated site installation	Preventive maintenance	Commissioning	Maintenance curative	
Lectures	2h	1h30	2h30	3h30	3h30	3h30	16h30
Tutorials	0	0	8h45	3h	1h30	2h	15h15
Practical work	0	0	6h	1h30	2h	2h	11h30
Evaluation	0	0	2h	2h	1h30	2h	7h30
TOTAL	51h						

## Part 2: Entrepreneurial Course

Our program aims to train people willing to work for market participants or to create their own independent solar system installation and maintenance business. We already have a solid foundation in entrepreneurial training over the past two years through our inventors' program. The entrepreneurship component is designed to help trainees start their own businesses and we accompany through the first 6 months. The entrepreneurial course includes the following themes:

Business creation / Accounting / Management / Marketing / Communication / Business Plan / Research funding / Leadership and personal development

## Monitoring

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The end of the incubation period marks the end of the training program but not the end of the follow-up process. We keep in constant contact with our learners by regularly monitoring their progress in the market. Two years after the end of the training program, we anticipate that each of them will have either set up their own business or will be hired by a local or international company as an installation and maintenance technician or as specialized sales agents.

