

Commonwealth Infrastructure Partners

Training programmes for solar engineers

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Introduction

Specialist solar engineer training

Commonwealth Infrastructure Partners (CIP) offers specialist training programmes for engineers to develop international best practice standards in solar engineering, for all stages of project design, implementation and operation.

The training programmes include practical knowledge relevant to on- and off-grid systems, large and micro systems, and ground-based and rooftop technologies.

Commonwealth Infrastructure Partners (CIP) capacity building and training programmes are designed to equip professionals with the best practical knowledge and strategic tools in their sector, and to develop the ability to understand and anticipate new developments in their field.

Outcomes and benefits

All CIP capacity building programmes focus on outcomes and benefits for both the client organisation and individual participants. This is accomplished by:

- i. A dialogue in advance of the programme with senior managers in the client organisation to determine:
 - a. Priorities for organisational development in the organisation
 - b. Specific challenges and training requirements for the participants in the programme
- ii. Interactive structure for the programme, focusing on practical learning outcomes
- iii. Ongoing dialogue and feedback with senior managers and participants
- iv. Modification and refinement of the programme as necessary to optimise results

Outcomes and benefits in solar engineer training programmes

Solar technology is evolving rapidly. CIP training programmes in this sector focus on:

- i. The latest advances in areas including:
 - a. solar panel technology
 - b. module design
 - c. optimised system design for on- and off-grid systems
- ii. Providing participants with the necessary resources and tools to keep abreast of developments in technology and best practice; and to anticipate change in the sector

Individual benefits

Participants will develop their practical engineering skills in all aspects of solar projects, including:

- design
- choice of optimum systems & technology
- integration of electrical and other engineering capabilities
- construction
- commissioning
- operations
- maintenance
- grid integration

They will be equipped to understand new developments in the sector, now and in the future, and integrate these advances into their projects. They will also enhance their management capabilities for solar projects, including stakeholder management and managing the team of technicians and semi-skilled workers that construct and maintain a solar plant.

Organisational benefits

CIP solar engineering programmes are designed to produce organisational benefits, including:

- enhanced organisational efficiency
- clearer definition of individual roles and responsibilities in the organisation
- better vertical integration in the organisation, including an enhanced ability of engineers to mentor and train the work force
- better horizontal integration – including better communication and mutual understanding between management and technical experts

The improvements in vertical and horizontal integration lead to improved organisational efficiency, as a result of which projects become more efficient and financially profitable.

Capacity building programmes with sector specialists

CIP engages sector specialists to design and deliver customised programmes for each sector. Wherever practical, CIP's partners are not only familiar with international best practice but also have high-level experience relevant to the country where a project will be implemented.

CIP's core team and partners have experience across a broad range of infrastructure sectors, and are therefore able to integrate the needs and challenges of a particular sector with the overall development requirements of the country.

Integrating management and technical capability

CIP capacity building programmes focus on integrating management and technical capabilities. Lack of such integration can often be identified as the cause of inadequate project planning or of projects failing to achieve their target. Our specialists have experience in project management in addition to their sector expertise.

Engineer training in solar technology

In the rapidly-developing sector of solar technology, it is vital that engineers are trained in the most recent knowledge and methods and are also equipped with the resources to keep up to date. They must also be capable of delivering the necessary skills training to the technician work force under their supervision.

Customised programmes for companies and government departments

CIP offers customised solar engineer training programmes to suit the needs and challenges of companies and government departments. The content and level of these programmes has been defined following discussions with the Ministry of New and Renewable Energy (MNRE); State Government officials; and companies & engineers in the sector.

The content, duration and level of the training programme can be adjusted according to the requirements of the organisation and the level of competence and expertise of the engineers.

Postgraduate level training programme

In response to the recognised needs, CIP has developed a part-time, work-based postgraduate level solar engineer training programme.

Programme content

1. Principles and fundamentals of solar energy
2. Basics of electrical engineering
3. Grid connected systems
4. Case studies of grid-connected solar photovoltaic systems
5. Design of off-grid systems
6. Case studies of off-grid solar photovoltaic systems
7. Erection, installation and testing of solar photovoltaic power plants
8. Commissioning of solar photovoltaic power plants
9. Operation and maintenance of a solar photovoltaic plant
10. Engineering practices
11. Types of measuring instruments
12. Examples of solar installations and storage methods
13. Fixed, seasonal and tracking systems
14. Rules, regulations, government policies and funding
15. Manufacturers, vendors, EPC contractors
16. Solar PV plant performance Capacity Utilisation Factor (CUF) vs Performance Ratio (PR)

Programme structure

The programme follows a work-based structure:

- Classroom activity is based at a site; participants put knowledge into practice immediately
- Classroom sessions are interspersed with work experience; applying the knowledge in real projects

Programme timetable

The programme timetable can be adjusted to fit the needs of the client organisation and work schedule of participants.

Sample timetable

Six months duration

1. Two weeks classroom tuition, at a site
2. Eleven weeks work experience
3. Two weeks classroom experience, including reporting and feedback on work experience
4. Eleven weeks work experience
5. Final evaluation

If it is not feasible for engineers to take two continuous weeks for the classroom tuition sessions, these can be divided into shorter segments.

Shorter customised programmes

CIP can provide shorter customised programmes, for example to update knowledge and expertise for engineers with some experience in solar projects and / or to provide expertise in a specialist topic, e.g. rooftop solar or micro grids.

Integration with international best practice

As with all other infrastructure sectors, local expertise and implementation methods for solar projects have to match international best practice. Nearly all major projects involve international collaboration, whether with commercial partners, sources of funding or international consultancy partners.

CIP uses its international experience in assisting local partners to incorporate best practice in their project design and implementation.

Professional Engineering programmes

All engineering sectors face challenges arising from a lack of engineering competence at the required professional level. CIP Director Jonathan Ling has pioneered Masters' and Bachelors' Degree Programmes in Professional Engineering, working with the UK Engineering Council and UK universities. CIP offers programmes in Professional Engineering customised for the solar engineering sector.

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