

# SOLAR ENERGY PROJECT & FINANCIAL FEASIBILITY FRAMEWORK

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10 – 14 NOVEMBER 2014, SINGAPORE

## TOPICS COVERED

Overview of Solar Markets and Technologies

Types of Solar Power Developments

Solar Project Development Phases

Major Solar Analysis elements

Financial and Sensitivity Analysis

Organizational Analysis for structuring Solar Projects

Financing Strategies for small solar projects

Success factors to financing Solar Projects



Expert Course Faculty Leader  
**Frederic Pouyot**



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## About This Training Course

This 5 day interactive training course will provide a thorough understanding of solar PV systems in operation around the world including the technologies in use, the motivating factors driving their development and how they can be evaluated, financed and built. This course will provide a sound grounding in solar PV project development that will help tackle similar projects your organization may be currently considering or that you may have to deal with in the future.

Additionally, you will gain a wide-ranging appreciation of the various elements that make up effective solar PV project development from identification of their viability potential to the range of solar PV technologies available or soon to be on the market, how to ensure buy-in from stakeholders, supporting the projects through to construction and operating and maintenance.

## Learning Outcomes

This course has been designed to give engineers and other professionals a sound grounding and understanding of solar PV project development:

- Understand the market for solar PV, current solar PV project types and best suited corresponding technologies
- Gain knowledge of the holistic process to evaluate the viability of current and emerging solar PV projects in the context of Asia and the developing world
- Find out how to evaluate the initial and operating costs using models and industry data on solar PV projects
- Assess the potential technical, financial, regulatory, construction and operational risks of PV projects
- Learn how PV projects can be financed and what can increase the business case for it
- Learning from case history examples and extrapolating them to the needs of your own country/organization

## Who Should Attend

This course has been designed for the following delegates:

Engineers, managers and other professionals working in organisations interested in evaluating PV projects

## Unique Features with **powerEDGE** Training

- Pre-Course Questionnaire to help us focus on your learning objectives
- Detailed Course & Reference Manual for Continuous Learning and Sharing
- Practical Exercises & Case Studies to better understand the principles
- Limited class size to ensure One-to-One Interactivity
- Assessment at the end of the course to help you develop a Personal Action Plan

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## 5 Day Course Outline

### Day 1

#### Introduction to the course

- **Overview of the global Solar Markets**
  - Growth area in Solar Development
  - Introduction to solar Project Feasibility Analysis
  - Background on Solar project development
- **Types of Solar Power Developments**
  - Solar PV technologies
  - Concentrating PV
  - Solar Thermal Power
  - Aggregated Distributed PV developments
  - Hybrid Power Developments

### Day 2

#### • Overview of Solar Project Development Phases

- Solar Project Civil Work
- Electrical and mechanical equipment
- Cost Analysis: statistical data
- Pre versus full feasibility cost
- Initial costs
- Due diligence
- Development
- Engineering
- Operating costs
- Labor
- Equipment
- End of project costs/credits

### Day 3

#### • Major Solar Analysis elements

- Technical Solar Analysis:
- Technological Solar Analysis: aspects
- Regulatory, Environmental and Political considerations
- Environmental Solar Analysis:
- Major Solar Computer Models: RETScreen, PVSys, System Advisor, and other popular Solar Models
- Understanding the RETScreen GHG worksheet and how to model with Carbon credits

### Day 4

#### • Financial and Sensitivity Analysis Overview

- Financial Analysis with RETScreen
- Method 1 versus Method 2
- Financial input parameters
- Understanding the output parameters and cash flow graph
- Various method to perform a Financial Sensitivity
- Evaluating Risks
- General approach
- Quantitative solar Project Risk Analysis

#### • Organizational Analysis for structuring Solar Projects

- Role of key stakeholders
- Sponsor, Developer, Lender, Investor, Power purchaser, Contractor

#### • Financing Strategies for small solar projects

- (In-house funds, Bank loans/balance sheet financing, Co-development with strong partner, Limited recourse financing, Leasing, Build Own Operate
- Power Purchase Agreement
- Suppliers' credit
- Factors that affect Solar project financing strategy
- Current status of solar financing
- Financing conditions

#### • Success factors to financing Solar Projects

- Strategies to improve the ability to finance solar projects
- Solar versus other power projects (Fossil fuel, Renewable energy)

### Day 5

- RETScreen Solar Project Model in practice: 3 case studies (Case studies for various type of projects)

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## Expert Course Trainer

**Frederic Pouyot**



Frederic has been involved in the renewable energy and Solar Industries for over three decades. He was president of the non-profit association Solar Service International in the 1980s, became president of The Green Power Network in 2001, and then since 2002 has been the CEO of GPEKS Constructions in 2002 (GPEKS is an acronym for Green Power Environment Knowledge Systems). He has initiated and managed dozens of renewable energy feasibility studies since the creation of GPEKS, and has been very active on projects in developing countries. Frederic has delivered Solar courses every year for over 10 years training hundreds of professionals from all over the world, and has written curriculum for a number of professional organizations including Leonardo Energy Academy in 2013.

Frederic is the original author of a series of solar courses that have been delivered in partnership with various associations such as IEEE, Association of Energy Engineers and with colleges, at industry conferences and for government sponsored workshops. He has also worked extensively with renewable industry Association in France and Canada on various outreach and technical education projects. He was commissioned by Canadian Association to co-develop a national certification curriculum for solar professionals, and developed the first set of exams for that certification. Frederic has provided consulting and training services to over 11,000 government staff and professionals, mostly in small workshops of a week or less.

Frederic has a multi-disciplinary university background in Business (MBA level - University of Limoges, France), Technology (Energy & Solar Technologies - University of Perpignan, France), International Trade (University of Nice - Institute for Export) and Public Policies (Certificate of the European Institute for High International Studies based in Brussels, Belgium), Information Technology (Microsoft Certified Solution Developer and trainer), Project Management (Learning Tree International - Certified Project Management Professional and Certified IT Management Professional; on the last stretch of the Masters in Project Management at University of Quebec). He is also a Comptia certified Technical Trainer, ColdFusion certified technical trainer, Productivity Point International Certified Trainer, a top leading expert RETScreen International Certified Trainer Clean Energy Institute Professional Certification in Project Analysis for 10 technological areas (Solar, Wind, Hydro, Geothermal, Bio-energy, CHP).

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## Courses Available

[4 Pillars of Transformer Condition](#)  
[Advanced Project Finance for Power](#)  
[Advanced Technical Report Writing & Presentation Skills](#)  
[Advanced Turnaround Shutdown & Outage Management](#)  
[Ancillary Services in Competitive Electricity](#)  
[Asset Management for the Power Industry](#)  
[Best Practice Renewable Energy Capital & Project Management](#)  
[Biomass Power Generation](#)  
[CFB Combustion for Boiler Operations](#)  
[Clean Development Mechanism and Carbon Markets](#)  
[Coal Contracts](#)  
[Combined Cycle Power Plants Operation](#)  
[Combined Heat & Power \(CHP\) and Co-Generation Plant Operations](#)  
[Competency Management System for the Power Industry](#)  
[Design & Operations of Circulating Fluidized Bed Boiler](#)  
[Developing & Structuring Public-Private Partnership \(PPP\) for Infrastructure](#)  
[Effective Tender Process Management for Power & Utilities](#)  
[Electrical Hazop \(eHazop\) Studies for the Power Industry](#)  
[Electricity Demand-Side Management](#)  
[Electricity Industry Design](#)  
[Electricity Network Planning](#)  
[Electricity Retail Contracts](#)  
[Electricity Theft](#)  
[Electricity Trading Essentials](#)  
[Energy Efficiency](#)  
[EPC Contract Management for Power & Utilities](#)  
[Essentials of Coal Markets and Trading](#)  
[Essentials of Power Trading](#)  
[Excitation Systems](#)  
[Feed-In Tariffs for PV Systems](#)  
[Finance for Non-Finance Professionals in Power & Utilities](#)  
[Financial Modelling for Project Finance in Power & Utilities](#)  
[Fitness-For-Service AP1 579 & High Energy Piping Life Management](#)  
[Fundamentals of Geothermal Energy](#)  
[Fundamentals of Power Generation](#)  
[Gas & LNG Contract Negotiation](#)  
[Gas Turbine Generator Selection, Operation & Maintenance](#)  
[Gas Turbine Hot Gas Paths, Rotors & Failure Analysis](#)  
[Gas Turbine Major Inspection & Overhaul](#)  
[GE Gas Turbine Operations Simulation Based](#)  
[HRSG Design, Operations & Understanding, Controlling of HRSG Damage Mechanisms](#)  
[HV Substation Design & Construction](#)  
[IEC for Utilities](#)  
[Integration of Distributed Generation](#)  
[Introduction to Carbon Capture & Storage](#)  
[Introduction to Clean Coal Technology](#)  
[Introduction to Power Systems](#)  
[Keeping Electrical Switchgear Safe](#)  
[Leadership & Team Dynamics for Power & Utilities](#)  
[LNG Fundamentals](#)  
[LNG Markets & SPOT Trading](#)  
[Maintenance Planning & Scheduling](#)  
[Making IPP & Renewable Energy Projects Contract Frameworks Bankable](#)  
[Managing Complex Projects for Power and Utilities Professionals](#)  
[Medium Voltage & High Voltage Switchgear Metallurgy for Engineers](#)  
[Mechanical Engineering for Non-Mechanical Engineers](#)  
[Mini Hydro Project Analysis](#)  
[MKV Speedtronic Control System](#)  
[MK VI Speedtronic Control System](#)  
[Nuclear Energy Project Planning & Economics](#)  
[Nuclear Power](#)  
[Offshore Platforms Electrical Systems Design & Illustrations](#)  
[Operations of Coal Fired Power Plants](#)  
[Power Generation Commissioning, Operations & Maintenance](#)  
[Power Generation Operation, Protection & Excitation Control](#)  
[Power Plant Chemistry for Chemist & Chemical Engineers](#)  
[Power Purchase Agreements](#)  
[Process Control Methods](#)  
[Programmatic CDM](#)  
[Relay Protection in Power Systems](#)  
[Reliability Centered Maintenance Masterclass](#)  
[Reliability Engineering](#)  
[Renewable Energy Development & Investment](#)  
[Renewable Energy Integration](#)  
[Risk Based Inspection](#)  
[Risk Management in Power Markets](#)  
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[SCADA & Power Systems](#)  
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[Solar Energy & Photovoltaic Power](#)  
[Spare Parts Optimisation](#)  
[Supercritical and Ultra-Supercritical Coal-Fired Power Plant](#)  
[Technical Report Writing & Presentation Skills for Power & Utilities Professionals](#)  
[Ultra Low NOx Gas Turbine Combustion](#)  
[Uninterruptible Power Supply](#)  
[Vibration Analysis & Condition Monitoring](#)  
[Waste to Energy Plant Operations](#)  
[Water Treatment and Corrosion Control for Steam Generation and Power Production](#)  
[Writing Effective Standard Operating Procedures \(SOP\) for Power & Utilities Professionals & Engineers](#)

## Frequently Asked Questions (FAQs)

**1. Does PowerEdge have other programmes than those listed?**

We have more than 200 programmes that we are capable of running. All we need is for you to contact us and request for the preferred programme and we will be able to develop it.

**2. Where is PowerEdge based?**

PowerEDGE is headquartered in Singapore but we run our training programmes in different venues around Asia.

**3. What does PowerEdge do?**

We are a Power & Utilities Training Specialist.

**4. Can this course be done in our city?**

It absolutely can. Get in touch with us to request for a training programme to be carried out in your city.

**5. Can you reduce the price of our preferred course?**

While our price has been reduced before it is even launched, we are always happy to help you with further discounts.

**6. Can you change the dates of the course?**

If you have a special requested date, let us know and we will arrange another session for you.

**7. Who are the companies that will be participating?**

This varies from a diversity of Power Operators, Regulators, Financiers, to Vendors in the Power & Utilities industry.

**8. Where is the venue for the course?**

We usually engage a 4 to 5 star hotel meeting room to ensure the comfort of our participants.

**9. How many delegates should we expect for each course?**

This varies from 15 to 20 participants. Class sizes are kept small to allow trainers to focus better on each participant.

**10. What are the different payment modes?**

We accept Visa/MasterCard, cheques, bank transfers and cash on site.

**11. Is accommodation included when I sign up for a course?**

Accommodation is not included in the course fee but we are always happy to advise on available accommodations.

**12. Can I get a cheaper accommodation through PowerEdge?**

We will be pleased to help you negotiate a better rate with hotels.

**13. Is lunch provided during the course?**

We provide lunch and 2 tea breaks every day during our training programmes.

**14. Are the training materials included once I have signed up for a course?**

Yes, training and course materials are included in the course fee.

**15. Will there be a certificate for the course?**

Yes, there will be a certificate of participation upon completion of a course.

**16. Who are PowerEdge trainers?**

They are expert consultants and practitioners with many years of experience in the subject matter that they deliver on.

**17. Are PowerEdge trainers competent?**

We have received numerous favourable feedbacks on our trainers from past participants.

**18. Can PowerEdge assist with Visa travel applications?**

We can assist in advising you on the relevant procedure(s) and embassies/consulates that provide Visa for travel purposes.

**19. Can we purchase training materials without attending a course?**

Unfortunately this option is not available as training materials are specially developed for courses.

**20. Can course content be tweaked to cater to our needs?**

Of course! Just let us know your request and we will get the trainer to assist in carrying it out.

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	NORMAL PRICE	Early Bird Ends 30 Sep 2014	GROUP OF 3 or More
5 Day Programme	SGD 3,899 Per Participant	SGD3,699 Per Participant	SGD 3,329 Per Participant

## ATTENDEE DETAILS

Name ..... Job title .....

Tel ..... Department ..... Email .....

Name ..... Job title .....

Tel ..... Department ..... Email .....

Name ..... Job title .....

Tel ..... Department ..... Email .....

Name ..... Job title .....

Tel ..... Department ..... Email .....

Name ..... Job title .....

Tel ..... Department ..... Email .....

## COMPANY DETAILS

Organisation name ..... Industry.....

Address .....

Postcode..... Country.....

Tel ..... Fax.....

## PAYMENT METHODS

By Cheque/ Bank Draft: Make Payable to PowerEdge Pte Ltd.

By Telegraphic Transfer: Please quote AE1 with the remittance advise

Account Name: PowerEdge Pte. Ltd.

Bank Code: 7339 Branch code: 686 Account Number: 686-253386-001 Swift Code: OCBCSGSG

Bank Address: 65 Chulia Street OCBC Centre, Singapore 049513

All bank charges and payment in Singapore dollars (SGD) to be borne by payer. Please ensure that PowerEdge Pte Ltd receive the full invoiced amount.

## PAYMENT POLICY

Payment is due in full at the time of registration. Full payment is mandatory for event attendance. I agree to PowerEdge Pte Ltd. payment terms

## CANCELLATIONS & SUBSTITUTIONS

You may substitute delegates at any time. POWEREDGE PTE LTD does not provide refunds for cancellations. For cancellations received in writing more than seven (7) days prior to the training course you will receive a 100% credit to be used at another POWEREDGE PTE LTD training course for up to one year from the date of issuance. For cancellations received seven (7) days or less prior to an event (including day 7), no credits will be issued. In the event that POWEREDGE PTE LTD cancels an event, delegate payments at the date of cancellation will be credited to a future POWEREDGE PTE LTD event. This credit will be available for up to one year from the date of issuance. In the event that POWEREDGE PTE LTD postpones an event, delegate payments at the postponement date will be credited towards the rescheduled date. If the delegate is unable to attend the rescheduled event, the delegate will receive a 100% credit

## 4 ways to Register

-  [Online Web Registration](#)
-  [info@poweredgeasia.com](mailto:info@poweredgeasia.com)
-  (65) 6741 9927
-  (65) 67478737

## You may also be interested in

- [Introduction to Power Systems](#)
- [Introduction to Clean Coal](#)
- [Power Generation Operation Protection & Excitation Control](#)
- [Fundamentals of Power Generation](#)



## On Site Training

Can't make it for the Course? We'll make the course come to you!!

Simply let us know your preferred time and dates and we will meet you at your schedule and venue.

With a host of highly trained experts, we will be happy to customize your programme with your needs 100% fulfilled.

Contact us today at

-  [info@poweredgeasia.com](mailto:info@poweredgeasia.com)
-  (65) 6741 9927

