



CENTRE FOR RENEWABLE &  
SUSTAINABLE ENERGY STUDIES

# Long-Term Power Systems Planning

**DATE** 25 – 29 July 2022

**VENUE** Engineering Faculty, Stellenbosch University

**ACCREDITATION** Certificate of attendance (4 CPD points) [REGISTER HERE](#)  
Certificate of competence (4 CPD points) [REGISTER HERE](#)  
15 academic credits at NQF 8 or 9 level [READ MORE](#)

**DEADLINE** Certificate course registration closes 14 calendar days before the course starts. The number of attendees is limited. Bookings will be taken on a first come, first served basis. For academic module registration deadlines, please contact the relevant academic programme coordinator.



## PRESENTER

**Michael Barry** has wide experience in the energy planning field. He specialises in the modelling of power systems with more than 35 years' experience in integrated resource planning, production planning, unit commitment, scheduling and dispatch. Michael is a registered Professional Engineer with a degree in Electrical Engineering. He is presently self-employed after working for Eskom South Africa for 33 years.



## PRESENTER

**Dr Jarrad Wright** is a qualified electrical engineer with Ph.D. from WITS and 12 years of industry experience. He is also a registered Pr.Eng. with ECSA and a member of SAIEE, CIGRE and IEEE. He has extensive energy sector experience in 11 African countries and has been a researcher at the CSIR, in a number of private sector consulting roles and a Commissioner on the South African NPC.

## OTHER PRESENTERS

**Keith Bowen** Power Systems Economist (Eskom)  
**Dr Bernard Bekker** Course Coordinator (Stellenbosch University)





## Synopsis

The principles and techniques informing optimised long-term generation capacity planning, and transmission expansion planning.

### Generation capacity planning

- Long-term demand forecasting (top down)
- Basic principles of optimization and the objective function (cost contributions, variable and fixed cost, NPV..)
- Constraints (capacity, energy, stability, flexibility, liability, emission, water, etc.)
- Contribution of VRE to firm capacity
- The impact of uncertainties on power system planning
- Aspects of geographical siting of VRE plants
- International best practice
- Sector coupling and the electrification of end-uses

### Transmission network expansion planning

- Time horizon and objectives of transmission network expansion planning
- System security criteria (N-1)
- Definition of planning scenarios (deterministic/worst case, market-simulation based etc.), objectives and constraints (incl system security)
- Heuristic versus automated processes
- Active and reactive power planning
- Load forecasting for transmission expansion planning
- Load flow analysis for system expansion planning
- Transmission line & substation planning
- Transmission grid codes
- HVDC/MVDC
- Towards integrated planning

## Qualification and accreditation

The module is accredited for a variety of outcomes, depending on what the attendee registers for. Module contact time (40 hours) are shared by all attendees, but additional assessments, assignments, and projects will be specific to the outcome that the attendee registered for.

- The module is accredited for ECSA Continuous Professional Development (CPD) credits, and attendees can obtain a certificate of attendance (if all lectures have been attended) or competence (if all lectures have been attended and various assessments have been successfully passed).
- The module is also accredited for 15 academic credits at both NQF8 level (Post-graduate diploma) and NQF9 level (Masters), as part of various [academic programmes](#). This requires a total time investment of 150 hours.

## Delivery Model

- The module will be delivered over five days. Pre- and post-module assignments and projects are applicable depending on the outcome the attendee registered for.
- A blended classroom/online model will be followed, with students being offered the options to attend in person (covid dependent), online only, or a mixture of these.

## Who should attend

Engineers, technologists and technicians active in the energy sector. Government and local authority officials. Architects, planners and developers. Investors. Academic students.

## Travel and Accommodation

All travel and accommodation arrangements are the attendee's own responsibility.

## Prerequisites

**Certificate of attendance:** none

**Certificate of competence / Post-graduate diploma at NQF8:** NQF7 engineering qualification

**Masters at NQF9:** NQF8 engineering qualification

**IT infrastructure:** For online attendees, adequate internet connectivity to connect reliably via Teams for the duration of the module. For Certificate of competence, Diploma and Masters attendees, a computer capable of running Windows 10 with user rights to install new software.

## Module Fees

- The standard fee for the five-day module is:
- **R12 000 for a certificate of attendance**, and
- **R14 000 for a certificate of competence**. Please refer to the University's latest study cost information for academic fees.
- Attendees from Eskom, municipalities, government, academia and industry that are actively involved in some aspect of the South African power system may apply for a **50% CPD fee reduction**.
- Cancellations made up to 21 days before the module starts will be subject to a 15% handling fee. No refunds will be made after this date; however, substitutions will be accepted.
- Payment is mandatory for attendance.
- In the case of unforeseen circumstances, Stellenbosch University reserves the right to cancel the module or change the presenter/s, in which case all fees will be reimbursed in full on request.

## Contact

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