



Dept. of Mechanical Engineering | CPD Course

# Power System Flexible Operation

Presented online and at UCT, 03-07 March 2025



# Introduction



Power systems require a degree of flexibility to continuously balance supply and demand. During the past half century, large power systems consisted mainly of dispatchable, fossil fuelled power plants. This allows system operators to maintain a stable system while meeting the varying demand profile.

Adoption of intermittent renewable energy sources increases uncertainty as the system flexibility would also need to account for fluctuation in supply.

In the ongoing energy transition, flexible operation of generation assets in a dynamic power system present significant challenges. Traditional base load power

plants are shifted towards mid-merit operating modes and funding is required for flexible generation sources.

The objective of this course is to provide participants with an understanding of the considerations for optimising power systems. The content provides an understanding of the interaction between different energy generation sources, how these systems are set up and the market structure to sustainably support flexibly in the power system.

## Course Content

Participants are given an overview of system flexibility resources covering the type of power generation plants available and their contribution to the power system. The content covers traditional generation technologies and introduces participants to novel flexibility resources such as demand side management and virtual power plants. Given an understanding of the context, participants will then build models to study flexibility and use these models to estimate the cost implications of flexible systems. Using these models, the course will cover the requirements for markets to support flexibility; the role of the distribution system operator to encourage customer flexibility; and sector coupling to from a flexibility perspective.

Modules in this course will:

- Outline the technical and operational challenges with flexible operation of power generation assets.
- Identify the factors plant engineers need to consider for flexibility.
- Quantify the impact of flexible operations on emissions.
- Identify methods for production planning for flexible operations.
- Consider resource specific details for a range of generation and storage options.

## Course Presenters



**Dr Graeme Chown** is a power systems control and operations specialist with over 30 years' experience in the electricity industry. He has extensive experience in power system operations, generation scheduling and dispatch, interconnected operations, electricity markets, electricity regulation, ancillary services, energy storage, transmission pricing, power system studies and power system modelling, and power station control.



**Mr. Priyesh Gosai**, a mechanical engineer with 15 years of energy industry experience, began his career as a turbine plant engineer at Eskom, South Africa's state-owned power utility. He later joined the University of Cape Town as a research manager, fostering academia-industry collaboration to address skills gaps in the power sector. Mr. Gosai has designed and delivered specialised courses on power plant operations and flexible power systems, integrating PyPSA to connect theory with practical applications. His expertise also includes optimising hydropower plant operation in Southeast Asia using PyPSA.

## Course Overview

<b>Name</b>	Power System Flexible Operation
<b>Duration</b>	5 days, 03 – 07 March 2025, 08h30 – 16h30
<b>Venue</b>	Hybrid course, presented online and at the University of Cape Town
<b>Course Fee</b>	In person fee: R 15 500 Online fee: R 13 950
<b>Participants</b>	Suitable for a broad audience, including managers, engineers, students, and academics interested in the technology aspects related to the energy sector.
<b>Format</b>	The course will be delivered as a face-to-face course in a venue at the University of Cape Town, as well as online. Further information will be sent closer to the time.

# Registration

## Registration and Cancellation

- [Register online](#)
- Registration covers attendance of all sessions of the workshop, and course material.
- Registrations close one week before the start of the course. Confirmation of acceptance will be sent on receipt of a registration form.
- Cancellations must be received one week before the start of a course, or the full course fee will be charged.
- For more information on application and registration procedures, please visit our [website](#).

## Certificates and CPD Points

A digital certificate of attendance will be awarded to CPD participants. Participants need to attend 80% of the lectures to qualify for an attendance certificate. For further information on digital certificates please visit [Digital Certificates at UCT](#)

This course is registered with the Engineering Council of South Africa (ECSA) for the award of 5 CPD points. The ECSA course validation code is: UCTPPEPSFO25

## Contact details

For more information or details on CPD courses, visit our website or contact us.

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