



International Centre
for Hydropower



Norad

30 years

MODELING INTEGRATED POWER MARKETS

Building practical skills for Africa's evolving power markets

JOHANNESBURG, SOUTH AFRICA 20–24 April 2026

Application deadline – 06 March 2026

Course fee €1300,- (incl. accommodation & meals*)



Women are
encouraged
to apply.



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GAINING THROUGH TRAINING

MODELING INTEGRATED POWER MARKETS



RATIONALE

Across Africa, power pools and national utilities are moving toward more coordinated and market-based operation. Day-ahead trading, regional exchanges, renewable variability, and transmission congestion are becoming everyday operational realities.

In this context, professionals need practical tools to:

- understand how technical constraints influence prices and trade,
- evaluate investment or policy options, and
- communicate decisions using quantitative evidence.

Many organisations rely on external consultants for such analysis. Building in-house modelling literacy allows utilities and regulators to engage more effectively, test assumptions independently, and make more informed decisions.

This course responds to that need by combining market fundamentals with hands-on modelling skills that participants can immediately apply at work.

COURSE DESCRIPTION

African power systems are increasingly operating in a market-oriented environment, with growing cross-border trade, renewable integration, and tighter system constraints. Utilities, regulators, and system operators are therefore expected to support decisions using transparent, data-driven analysis rather than intuition alone.

This five-day, practical hands-on course links power market fundamentals with practical system modelling. Throughout the week, participants will build and run their own PyPSA models to analyse real systems, test scenarios, and evaluate least-cost dispatch outcomes.

The program provides a solid working foundation in power market modelling and equips participants with tools and approaches they can further develop and apply within their organisations.



—Hands-on PyPSA modelling using realistic regional scenarios.

COURSE OBJECTIVES

By following the course, participants will be able to:

- Establish a clear understanding of how power markets operate, including key actors, constraints, and pricing mechanisms.
- Examine real-world market operations through practical case studies from the region.
- Structure an energy system into components suitable for numerical modelling.
- Develop and run a basic PyPSA model of a power system.
- Analyse and interpret model outputs to understand congestion, dispatch, and least-cost outcomes.
- Use modelling results to support operational, planning, or policy discussions in their organisations.

MAIN TOPICS

- Power market fundamentals, operational realities and pricing mechanisms
- Practical energy system modelling using PyPSA
- Structuring data and building simple network models

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- Transmission constraints, congestion analysis and system flexibility
- Renewable energy integration and variability considerations
- Regional power system integration and cross-border trade
- Scenario analysis and least-cost dispatch evaluation
- Interpreting modelling results for operational and planning discussions
- Using modelling insights to inform investment and policy dialogue

The course emphasizes practical understanding over theoretical depth, focusing on how modelling can support real-world decisions.

Participants will receive preparatory materials and basic PyPSA instructions before the in-person program to maximize hands-on learning during the course.

—Building practical modelling skills for better power system planning and operation.

TARGET GROUP

This course is designed for professionals who support operational, planning, regulatory, or market decisions within power systems and who need practical modelling skills to inform their work.

- Power market professionals
- Utility planners and system operators
- Market analysts and power pool staff



- Engineers and technical specialists involved in system planning or dispatch
- Regulatory and policy staff involved in market or tariff development
- Energy ministry or utility staff responsible for data analysis and decision support
- Consultants or advisors supporting power sector planning and market design
- Academics and researchers focused on applied energy system analysis

Participants should have prior experience in either power markets OR power system operations and be comfortable working with data and basic computer tools.

ADMISSION REQUIREMENTS

- Minimum of 5 years of relevant working experience in power markets, power system operations, planning, or regulation.
- Educational background or demonstrated experience in energy systems or power markets
- Proficiency in English.



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- Basic computer skills and familiarity with spreadsheets.
- A commitment to implementing learned skills and knowledge in their respective workplaces.
- Applicants MUST diligently complete the application form before submission.

Please ensure your completed application is received no later than the given deadline – **6th March**

ICH reserves the right to accept or reject any applicant based on their qualifications and experience.

GENERAL

All lecturers and resource persons are experienced practitioners and specialists within their fields, bringing extensive international and regional experience in both power markets and energy system modeling.

The course provides a valuable forum for peer exchange, enabling participants to discuss current challenges with professionals from utilities, regulators, and power pools across the continent and abroad. Participants are encouraged to bring examples or case material from their own organisations to enrich discussions and exercises. The application form is available at www.ich.no

Admission decisions will be communicated shortly after the application deadline.

Practical information regarding travel, the detailed programme, and logistics will be shared with confirmed participants in advance. Arrival is expected the day before the course begins, with departure no earlier than the day after the course concludes.

COURSE FEE

The course fee covers lectures, materials, accommodation, meals*, and the course programme. International travel is not included.

A reduced fee is available for ICH members.

The course is self-funded. A limited number of supported places may be offered for participants from Energy for Development priority partner countries.

Participants seeking a guaranteed place are encouraged to secure institutional funding.

—Supporting Africa's growing power markets by building in-house modelling skills for utilities and regulators.

CONTACT;

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