ENERGY ACADEMY

ELECTRICITY SUPPLY SYSTEM INTRODUCTORY COURSE

The ideal way to improve your basic knowledge

This two-day introductory course explains the essentials of electricity generation, electricity supply and markets. Terminology, grid structures and grid components, market players and the coordination of supply and demand will be discussed. The layout, operation, quality and protection of the electricity grid are also addressed. The basic principles will be related to new developments, such as smart grids and renewable generation.

You will also have the opportunity to discuss your questions with internationally-renowned experts, and to exchange experiences and practical examples with fellow participants.

Among other things, answers to the following questions will be provided:

- Who are the stakeholders in the electricity supply system, and what are their roles and responsibilities?
- How does the electricity supply system work, and what are its main components?
- What safety and protection systems are in place in the grid?
- What exactly is the difference between current, voltage, power and energy?
- What are active and reactive power, and why are they important?
- How is network power quality influenced?
- How are supply and demand matched in electricity markets, and what can the role of storage be?
- How is it decided which production units supply electricity?
- What is meant by power flow and network congestion?
- What effects do renewable energy resources have on the grid and the market?
Subjects covered

- Basics:
  - voltage, current, power and energy
  - Ohm’s law
  - conductors and insulators
  - inductors and capacitors
  - transformers
  - batteries
  - inverters
  - active and reactive power

- Grounding and protection:
  - grounding systems
  - overcurrent protection

- Grid structure:
  - function and voltage levels
  - grid components
  - availability/reliability

- Direct current vs. alternating current, three-phase systems

- Load and generation:
  - grid capacity
  - distributed and renewable generation, load and coincidence
  - power flow and voltage control
  - load duration curve

- Electricity markets:
  - stakeholders and their roles
  - balancing supply and demand
  - ancillary services
  - unit commitment and economic dispatch
  - challenges and developments in power markets
  - market coupling and European international developments

For whom?
This course is designed for anyone whose work involves the electricity supply system directly or indirectly, and who wants to increase their understanding of the related issues. Elementary knowledge of electricity and/or physics is recommended, but is not required.

Practical information
The training and all materials will be in English. A USB flash drive will be provided to all participants, containing all the slides presented during the training. This can serve as a useful reference afterwards.

To encourage active participation, the number of participants is limited to 15. The course(s) may be cancelled or rescheduled if there are insufficient participants. The registration fee includes course materials, lunches and refreshments and dinner on the first day. The costs of travel and accommodation are not included. Hotel accommodation can be arranged through us, but payment must be made directly to the hotel.

For the following items, please refer to the registration form:

- Course dates
- Venue details
- Registration fee
- Payment & cancellation conditions
- Hotel accommodation

For more information and to register please visit: www.dnvgl.com/electricity-supply-system-course.

In-company and customised training courses
On request, DNV GL can also develop customised and in-company training courses. The content, location and duration of the course can be adapted to your specific needs.

ABOUT DNV GL

DNV GL is the independent expert in risk management and quality assurance, operating in more than 100 countries. Through its broad experience and deep expertise DNV GL advances safety and sustainable performance, sets industry benchmarks, and inspires and invents solutions.

Driven by its purpose, to safeguard life, property, and the environment, DNV GL helps tackle the challenges and global transformations facing its customers and the world today and is a trusted voice for many of the world’s most successful and forward-thinking companies.

In the power and renewables industry DNV GL delivers advisory, certification and testing services to stakeholders in the energy value chain. Our expertise spans energy markets and regulations, onshore and offshore wind and solar power generation, power transmission and distribution grids, energy storage and sustainable energy use. Our experts support customers around the globe in delivering a safe, reliable, efficient, and sustainable energy supply.

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