
Electricity Distribution Network Planning Training Course: Capacity, Connections and Investment

5 – 9 April 2027
Geneva





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Programme Summary

Electricity distribution network planning is the subject of this one-week training course for planning heads, network directors and regulatory staff, ending in a distribution network planning pack for one network area. Networks now receive requests to connect solar, storage and EV charging faster than reinforcement can be built, so each request needs a consistent test. The programme moves from capacity headroom to demand pressure, connection decisions, option comparison and investment cases. Mars Training Centre UK delivers this programme on electricity distribution network planning to mixed-organisation cohorts.

The Business Case

Distribution networks were designed for one-way power flow and steady demand. New generation and charging load alter loading patterns on feeders and substations, and spending decisions made without a shared method are hard to defend to boards, customers and regulators. Teams that use one capacity test, one set of scenarios and one option comparison can explain why a connection is accepted, deferred or reinforced.

- Connection Delays: Fall as headroom is calculated once and reused for every request on the same feeder.
- Investment Regret: Falls as reinforcement is compared with flexible alternatives under several scenarios.
- Review Queries: Fall as the planning file records criteria, assumptions and the reasons for each choice.

Principles and Evidence Base

- Integrated Distribution System Planning: Frames the joint treatment of electrification and distributed energy resources used throughout the programme.
- Hosting Capacity Analysis: Supplies the method for testing how much generation and load a feeder accepts, applied in Session 2.
- Scenario Planning: Provides the contrasting demand and generation futures used to test each option in Session 3.
- Time Value of Money: Supports the discounted comparison of network and non-network options in Session 4.



Intended Participants

- Planning heads who set network criteria and approve the development plan.
- Network directors who decide where limited capital goes.
- Regulatory staff who review connection practice and investment proposals.
- Connection and asset managers who answer requests for new generation and load.

Typical functions include distribution utilities, national grid companies, energy ministries and independent regulators.

Learning Outcomes

1. Participants will be able to evaluate the capacity headroom of a feeder or substation against a stated planning criterion.
2. Participants will be able to construct demand and generation scenarios that reflect solar, storage and EV charging growth.
3. Participants will be able to diagnose the constraints that limit new connections on a network area.
4. Participants will be able to prioritise reinforcement, flexibility and operational options by cost and risk.
5. Participants will be able to justify an investment case to a board or regulatory reviewer.
6. Participants will be able to prepare a network development plan section that records assumptions and decisions.

Programme Structure

Day 1: Electricity Distribution Network Planning Foundations

Which facts about a network area must be fixed before any option is compared?

- Network Area Profile
- Planning Criteria Register
- Capacity Headroom Calculation
- Asset Condition Summary
- Scenario Definition Sheet

Day 2: Diagnosing Capacity and Demand Pressure

Where does loading, voltage or fault level restrict new connections?

- Hosting Capacity Analysis
- Feeder Loading Profile
- Voltage Rise Check
- Connection Queue Map
- Constraint Ranking Table



Day 3: Solar, Storage and EV Charging Connections

How do new generation, storage and charging loads change what a network can accept?

- Solar Export Scenario
- Storage Dispatch Assumption Table
- EV Charging Cluster Estimate
- Connection Offer Decision Tree
- Flexible Connection Terms Outline

Day 4: Comparing Options and Building the Investment Case

Which option meets the need at the lowest justified cost and risk?

- Reinforcement Option Sketch
- Flexibility Service Alternative
- Discounted Cost Comparison
- Risk and Regret Matrix
- Board Investment Paper Outline

Day 5: Distribution Network Planning Pack for One Network Area

Do criteria, scenarios, options and costs agree for one network area?

- Applying the Session 1 Planning Criteria Register
- Testing the Session 2 Constraint Ranking Table
- Reviewing the Session 3 Connection Offer Decision Tree
- Checking the Session 4 Discounted Cost Comparison
- Completing the Distribution Network Planning Pack

Methodology

The programme uses a structured exercise method built on a shared case of a mixed urban and rural network area with a growing connection queue, an ageing substation and rising charging demand. Participants build each artefact on the case, then on a network area from their own organisation, receiving written facilitator feedback in every session.

- Suggested activity: Calculating headroom on three feeders and ranking the constraints.
- Suggested activity: Comparing reinforcement with a flexibility service under two scenarios.
- Suggested activity: Presenting an investment paper to a mock board committee.



Capstone Output

Each participant completes a distribution network planning pack for one network area. It holds a planning criteria register, a headroom and constraint table, a scenario sheet, a connection decision tree and a discounted option comparison. The pack is used at work to open the next planning review, brief the board on investment priorities and answer connection enquiries consistently.

Frequently Asked Questions

Is electricity distribution network planning training suitable for leaders without an engineering background?

Yes. Electricity distribution network planning is taught through cases and templates, assuming responsibility for network decisions but no earlier work with load flow software.

Which models does electricity distribution network planning training rest on?

Electricity distribution network planning training rests on integrated distribution system planning, hosting capacity analysis, scenario planning and discounted cost comparison.

How is the pack from electricity distribution network planning training used at work?

You use the distribution network planning pack to open the next planning review, brief the board on priorities and give consistent answers on connection requests.

How does electricity distribution network planning differ from load forecasting training?

Electricity distribution network planning turns forecasts into connection and investment decisions, while load forecasting training concentrates on building and testing the demand forecast itself.