Grid Flexibility for Solar and Wind Training Course: Reserves, Curtailment, Storage, Dispatch Cost

16 – 20 May 2027
Manama

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Ref: 907_41326 **Date:** 16 – 20 May 2027 **Location:** Manama **Fees:** 4300 GBP

Programme Summary

Grid flexibility for solar and wind is the subject of this one-week training course for system planners, grid operators, developers and market advisers, taught at managerial level and ending in a flexibility plan for one grid area. Variable output moves reserves, curtailment and dispatch cost, yet flexibility is often chosen one asset at a time. The programme moves from net load to reserves, storage and dispatch cost, using prepared hourly data from a solar-heavy and a wind-heavy system. Mars Training Centre UK delivers this programme on grid flexibility for solar and wind to mixed-organisation cohorts.

The Business Case

Leaders who can size reserves from forecast error, compare curtailment with storage and test who bears each cost make better connection, investment and operating decisions when solar and wind supply a large share of demand. The programme works on the measures below.

- Curtailed Energy: Falls when oversupply hours meet storage, demand response or export.
- Reserve Cost: Reduces when reserves follow measured forecast error, not fixed margins.
- Dispatch Cost: Improves when sources are ranked by marginal cost against the need served.

Principles and Evidence Base

- IEEE 2800: The standard for interconnection and interoperability of inverter-based resources such as solar, wind and storage, applied in Sessions 1 and 3 to review the support a plant gives the grid.
- Merit order dispatch: The economic basis for ranking sources by marginal cost, applied in Session 4 to compare flexibility choices.
- Probabilistic forecasting: The statistical basis for describing forecast error as a range, applied in Session 2 to size reserves.

Intended Participants

- System planners who decide how much flexibility a grid area needs.
- Grid operators who balance variable output hour by hour.
- Project developers who answer for plant behaviour at connection.
- Market and policy advisers who design the products that reward flexibility.

Typical settings include transmission operation, utility planning and independent power production.

Learning Outcomes

1. Participants will be able to evaluate the flexibility a grid area needs from net load and forecast error.
2. Participants will be able to calculate reserve volumes from a forecast error profile.
3. Participants will be able to compare curtailment with storage, demand response and interconnection by cost.
4. Participants will be able to prioritise flexibility sources against the needs they serve.
5. Participants will be able to diagnose plant behaviours under IEEE 2800 that limit grid support.
6. Participants will be able to justify a grid flexibility plan to a system planning board.

Programme Structure

Day 1: Grid Flexibility Foundations for Solar and Wind

How does variable output change what a grid must be able to do?

- Net Load Curve Reading
- Variability and Forecast Error Profile
- Flexibility Needs Inventory
- Inverter-Based Resource Behaviour Under IEEE 2800
- Hourly Ramp Duration Chart

Day 2: Reserves, Curtailment and Forecast Error

How much reserve does forecast error require, and when is curtailment the cheaper answer?

- Reserve Sizing From Forecast Error
- Curtailment Log Analysis
- Congestion and Oversupply Hours Map
- Frequency Response Contribution Table
- Reserve Versus Curtailment Cost Comparison

Day 3: Storage, Demand Response and Interconnection Options

Which flexibility source meets each need at the lowest system cost?

- Storage Duration and Role Matrix
- Demand Response Eligibility Sheet
- Interconnector and Neighbouring Area Support
- Flexible Thermal Plant Limits Review
- Flexibility Source Ranking Scorecard

Day 4: Dispatch Cost, Market Signals and Investment Cases

What does each flexibility choice cost in dispatch, and who bears it?

- Merit Order Dispatch Model
- Marginal Cost and Price Spread Analysis
- Ancillary Service Product Design
- Investment Case for Flexibility Assets
- Risk Allocation Between Developer and Operator

Day 5: Grid Flexibility Plan for One Grid Area

Do the findings join into a plan that a system planning board can approve?

- Applying the Session 1 Needs Inventory
- Testing the Session 2 Reserve Sizing
- Checking the Session 3 Source Ranking
- Reviewing the Session 4 Cost Comparison
- Completing the Grid Flexibility Plan

Methodology

The programme is a data workshop built on prepared hourly profiles, curtailment logs and dispatch cost tables from a solar-heavy and a wind-heavy system. Participants read net load, size reserves, rank sources and cost each choice, then defend the plan to peers acting as a system planning board.

- Suggested activity: Sizing reserves from a week of forecast error data.
- Suggested activity: Ranking storage, demand response and export for oversupply hours.
- Suggested activity: Comparing the dispatch cost of two flexibility plans.

Capstone Output

Each participant completes a grid flexibility plan for one grid area. It holds the needs inventory, a reserve sizing, a curtailment analysis, a ranked list of sources and a dispatch cost comparison. At work it goes to the system planning board for approval and guides later connection and procurement decisions.

Frequently Asked Questions

Is grid flexibility for solar and wind training suitable for managers who are not power system engineers?

Yes. Grid flexibility for solar and wind is taught through prepared data and templates. You need responsibility for planning, operation or market decisions, but no network modelling skill.

Which standard does grid flexibility for solar and wind rest on in this training?

Grid flexibility for solar and wind here rests on IEEE 2800 for inverter-based plant behaviour, with merit order dispatch and probabilistic forecasting for cost and reserves.

How is the plan from grid flexibility for solar and wind training used at work?

You take the grid flexibility plan to your system planning board, use its reserve sizing to set operating margins, and keep its ranked sources for procurement.

How does grid flexibility for solar and wind differ from a programme on energy storage deployment?

Grid flexibility for solar and wind compares every balancing source, while a programme on energy storage deployment concentrates on siting, sizing and delivering storage assets.