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Rooftop Solar and Battery System Design for Buildings Training Course

28 February – 4 March 2027
Abu Dhabi

Rooftop Solar and Battery System Design for Buildings Training Course

Ref: 3212_122175 **Date:** 28 February – 4 March 2027 **Location:** Abu Dhabi **Fees:** 6500 GBP

Rooftop Solar and Battery System Design for Buildings is a 1-week training course for electrical and design engineers working on solar and battery projects, in which each participant prepares a solar and battery sizing report for a commercial or industrial site. Building owners now add rooftop arrays and batteries to cut peak demand charges and keep critical loads running through outages. Jupiter Prime Training runs this Rooftop Solar and Battery System Design course.

Why Rooftop Solar and Battery System Design Matters Now

Three forces shape building-scale solar and storage design today. Module and battery costs have fallen, so factories, warehouses and hospitals ask for combined systems. Network operators set tighter connection conditions on export limits, anti-islanding and power quality. Insurers look closely at roof fire risk and battery room safety. A design that matches array, inverter and battery to the real load profile pays back steadily; one sized from a rule of thumb clips energy, cycles batteries too hard and fails connection review.

Who Gains Most from Rooftop Solar and Battery System Design

- Engineers who prepare array layouts, string schedules and single line diagrams
- Designers who select inverters, batteries and protection for building projects
- Staff who prepare connection applications and respond to network operator comments
- Facility engineers who assess load profiles and specify backup for critical circuits
- Consultants who review contractor designs before procurement and installation

A design office that sends its solar, electrical and facility engineers together gains most.

Rooftop Solar and Battery System Design Capabilities

These outcomes take a building from interval meter readings to a sized and protected solar and storage design.

- Assess roof area, shading, orientation and structural limits for an array — layout approval
- Calculate string length and inverter loading from module temperature coefficients — equipment selection
- Weigh lithium iron phosphate, nickel manganese cobalt and lead acid batteries for each duty — battery specification
- Design a hybrid solar and storage arrangement for peak shaving, self-consumption and backup — owner investment case
- Specify direct current and alternating current protection, earthing and isolation — safety and insurer review
- Build an energy yield and battery cycling estimate — network operator approval

Key Rooftop Solar and Battery System Design Terms

- String Sizing — choosing how many modules connect in series so voltage stays within inverter limits.
- Inverter Loading Ratio — the ratio of array direct current capacity to inverter alternating current rating.
- Depth of Discharge — the share of a battery's capacity used in a cycle.
- Peak Shaving — using stored energy to limit the building's maximum demand drawn from the network.
- Export Limit — the maximum power a building may send to the network under its connection agreement.
- Specific Yield — annual energy produced per unit of installed array capacity.

Rooftop Solar and Battery System Design Day by Day

Day 1: Building Loads and Site Assessment

- Interval Meter Data and Load Profiles — Matching System Size to Demand
- Tariff Structure and Demand Charges — Where Solar and Storage Save Money
- Roof Survey, Shading and Orientation — Usable Array Area
- Structural Loading and Mounting Options — Roof Suitability and Fixing Method
- Critical Loads and Backup Requirements — Scope of Battery Duty

Day 2: Modules, Strings and Inverters

- Module Technologies and Datasheet Parameters — Selecting Panels for Heat and Dust
- String Voltage and Current Calculation — Series and Parallel Arrangements
- String, Central and Hybrid Inverter Types — Fit for Building Scale
- Maximum Power Point Tracking Inputs and Loading Ratio — Clipping Versus Cost
- Cable Sizing and Voltage Drop on Direct Current Runs — Losses and Heating

Day 3: Battery Chemistry and Storage Sizing

- Lithium Iron Phosphate, Nickel Manganese Cobalt and Lead Acid — Chemistry Choice by Duty
- Usable Capacity, Depth of Discharge and Cycle Life — Battery Sizing Inputs
- Battery Management and Thermal Control — Safe Operation in Hot Rooms
- Alternating and Direct Current Coupled Arrangements — Retrofit Versus New Build
- Peak Shaving and Self-Consumption Dispatch Rules — Battery Operating Strategy

Day 4: Protection, Connection and Energy Yield

- Direct Current Isolation, Fusing and Arc Fault Protection — Fire Risk on Roofs
- Earthing, Surge Protection and Lightning Exposure — Equipment Safety
- Anti-Islanding, Export Limiting and Power Quality — Network Connection Conditions
- Single Line Diagram and Connection Application — Network Operator Review
- Energy Yield Simulation and Loss Assumptions — Bankable Production Estimates

Day 5: Practising the Solar and Battery Sizing Report

- Array and String Design for a Sample Warehouse Roof — Applying Module and Inverter Methods
- Battery Sizing for a Hospital Backup and Peak Duty — Applying Storage Methods
- Protection and Connection Review of the Combined Design — Applying Protection Checks
- Payback and Battery Replacement Scenarios — Owner Investment Decision
- Solar and Battery Sizing Report — Completed Commercial or Industrial Site Design

Applying Rooftop Solar and Battery System Design After the Course

- Check the string schedule and inverter loading of one current rooftop project against the methods taught.
- Analyse a building's interval meter data to test whether a battery would cut its peak demand.

Rooftop Solar and Battery System Design Questions FAQ

What is Rooftop Solar and Battery System Design and why does it matter now?

Rooftop Solar and Battery System Design is the engineering of arrays, inverters and batteries for a building's own loads. It matters now because more commercial and industrial owners want combined systems.

Which roles gain most from Rooftop Solar and Battery System Design?

Electrical and design engineers working on solar and battery projects gain most. You gain most when solar, electrical and facility colleagues attend together.

How does Rooftop Solar and Battery System Design differ from a utility-scale solar farm course?

It works at building scale. A solar farm course covers large ground-mounted plants feeding the transmission network; this course designs roof arrays and batteries around one site's load profile, tariff, roof and connection limits.

What do you bring back from Rooftop Solar and Battery System Design?

You bring back a sized solar and battery design for a commercial or industrial site.

Rooftop Solar and Battery System Design: The Way Forward

The solar and battery sizing report sets out array size, inverter choice, battery capacity and protection for one building. Its first use is the owner's investment decision, and it is shared with design reviewers and the network operator. After the first year of metered output, compare actual yield and battery cycling with the estimate.