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COURSE BROCHURE

Advanced Energy Planning and Sustainable Development Training Course

23 August – 3 September 2027
Madrid

Advanced Energy Planning and Sustainable Development Training Course

Ref: 269_8693 **Date:** 23 August – 3 September 2027 **Location:** Madrid **Fees:** 11100 GBP

Energy Planning and Sustainable Development is a 2-week training course for energy planners, policy advisers and sustainability managers who shape long-term supply, demand and emissions choices for utilities, ministries, cities and large industrial groups, and who leave with a Long-Term Energy Scenario Plan comparing at least three futures. Decarbonisation targets, rising demand and energy access gaps now force planners to justify every investment pathway. Jupiter Prime Training delivers this course on energy planning and sustainable development.

Why Energy Planning and Sustainable Development Matters Now

Three forces shape energy planning and sustainable development today. Electricity demand is climbing with population growth, cooling needs, desalination and electrification of transport and industry, so planners must forecast further ahead with more uncertainty. Emission reduction commitments and investor expectations require credible pathways rather than broad ambitions. Falling costs of solar, wind and storage reshape what least-cost really means, while gas and existing plants still anchor reliability. An organisation that plans with transparent scenarios commits capital at the right pace and avoids stranded assets; one that plans by extrapolation either overbuilds or leaves demand unserved. The course rests on established energy balance, least-cost optimisation and scenario planning methods.

Who Gains Most from Energy Planning and Sustainable Development

- Energy planners who prepare demand forecasts and capacity expansion studies for utilities and system operators
- Policy advisers who draft energy strategies, targets and investment frameworks
- Sustainability managers who set emission pathways for industrial groups and cities
- Economists who appraise energy projects and subsidy reforms
- Development specialists who plan electrification and clean cooking access

A national or corporate energy planning unit gains most when its forecasters, economists and sustainability advisers attend together and test one shared scenario set.

Energy Planning and Sustainable Development Capabilities

Participants link demand, supply, cost and emissions in one consistent planning frame that decision makers can interrogate.

- Build an energy balance and demand forecast by sector and end use — planning baseline for ministries and utilities
- Apply least-cost capacity expansion logic with reliability constraints — investment sequencing decisions
- Design energy mix scenarios with clear storylines and assumptions — strategy committees
- Calculate emissions pathways and abatement costs — sustainability targets and investor reporting
- Assess energy access gaps and electrification options — social development programmes
- Communicate scenario trade-offs in cost, security and emissions — ministers, boards and the public

Key Energy Planning and Sustainable Development Terms

- Energy balance — a table tracing all energy supply, transformation and final consumption across fuels and sectors for one period.
- Capacity expansion model — an optimisation tool choosing which plants to build and when to meet demand at least total cost.
- Reserve margin — the share by which available capacity exceeds expected peak demand, a planning measure of security.
- Marginal abatement cost curve — a chart ranking emission reduction options by cost per tonne and volume available.
- Scenario storyline — a coherent narrative of future drivers such as growth, technology and policy that sets model inputs.
- Energy intensity — energy consumed per unit of economic output, used to track efficiency gains over time.

Energy Planning and Sustainable Development Day by Day

Day 1: Energy and Sustainable Development Context

- Energy and Economic Growth Linkages — Intensity and Decoupling Trends
- Sustainable Development Dimensions — Security, Affordability and Environment
- Global Energy Transition Drivers — Technology Costs and Climate Commitments
- Planning Institutions and Mandates — Ministries, Utilities and System Operators
- Planning Horizons — Short, Medium and Long-Term Questions

Day 2: Energy Data and Balances

- Energy Balance Construction — Supply, Transformation and Final Use
- Data Sources and Quality Checks — Surveys, Utility Records and Estimates
- Sankey Diagrams — Visualising Flows and Losses
- Useful Energy and End-Use Analysis — Services Behind Consumption
- Energy Indicators Dashboard — Intensity, Access and Import Dependence

Day 3: Demand Forecasting

- Econometric Demand Models — Income, Price and Population Drivers
- End-Use Accounting Models — Sector and Technology Detail
- Peak Load and Load Curve Projection — Cooling and Electrification Effects
- Efficiency and Demand-Side Measures — Avoided Consumption Estimates
- Forecast Uncertainty Bands — High, Base and Low Cases

Day 4: Supply Options and Technology Data

- Generation Technology Characteristics — Cost, Efficiency and Lifetime Inputs
- Renewable Resource Potential — Solar, Wind and Hydro Assessment
- Fuel Supply and Price Projections — Gas, Oil and Imports
- Storage and Flexibility Resources — Batteries, Pumped Hydro and Demand Response
- Grid Expansion Requirements — Transmission Costs of New Supply

Day 5: Least-Cost Capacity Expansion

- Optimisation Model Structure — Objective, Constraints and Decision Variables
- Reliability Constraints — Reserve Margin and Loss of Load Targets
- Discount Rate and Planning Period Choices — Effect on Technology Selection
- Representative Days and Time Slices — Capturing Renewable Variability
- Reading Model Outputs — Build Schedule, Dispatch and System Cost

Day 6: Energy Mix Scenarios

- Scenario Planning Method — Drivers, Uncertainties and Storylines
- Reference, Accelerated Transition and Constrained Scenarios — Contrasting Futures
- Policy Levers in Models — Targets, Carbon Prices and Subsidies
- Sensitivity Testing — Fuel Price, Demand and Technology Cost Swings
- Robust Decision Identification — No-Regret Investments Across Scenarios

Day 7: Emissions Pathways and Climate Targets

- Emission Factor Accounting — Fuel Combustion and Process Emissions
- Pathway Design to Long-Term Targets — Milestones and Carbon Budgets
- Marginal Abatement Cost Curves — Ranking Reduction Options
- Carbon Capture, Hydrogen and Electrification Roles — Hard-to-Abate Sectors
- Co-Benefits Assessment — Air Quality, Water and Health Gains

Day 8: Energy Access and Social Dimensions

- Access Gap Mapping — Unserved Households and Weak Supply Areas
- Grid Extension Versus Mini-Grids and Solar Home Systems — Least-Cost Electrification
- Clean Cooking Options — Fuel Switching and Health Outcomes
- Affordability and Tariff Design — Lifeline Tariffs and Subsidy Targeting
- Just Transition Planning — Workforce and Community Impacts

Day 9: Investment, Finance and Policy Integration

- Investment Needs Estimation — Capital Requirements by Scenario
- Financing Instruments — Public, Private and Blended Sources
- Policy and Regulatory Alignment — Targets, Market Rules and Tariffs
- Plan Monitoring Indicators — Tracking Progress Against Milestones
- Stakeholder Consultation Process — Building Acceptance for the Plan

Day 10: Practising the Long-Term Energy Scenario Plan

- Applying Demand Forecast Methods — Selected Case Demand Projection
- Applying Least-Cost Expansion Logic — Supply Build Plan for the Case
- Applying Emissions and Access Analysis — Pathway and Equity Results
- Applying Scenario Comparison — Cost, Security and Emissions Trade-Offs
- Long-Term Energy Scenario Plan — Three-Scenario Plan for Peer Review

Applying Energy Planning and Sustainable Development After the Course

- Rebuild the latest demand forecast in your organisation with high, base and low cases and share the drivers behind each band.
- Draft three scenario storylines for your system and map which investments appear in all three as no-regret choices.

Energy Planning and Sustainable Development Questions FAQ

What is energy planning and sustainable development, and why does it matter now?

Energy planning and sustainable development is the structured choice of future energy supply, demand and emissions pathways that balance cost, security and environment. It matters now because rising demand and climate commitments require credible long-term investment plans.

Which roles gain most from energy planning and sustainable development training?

Energy planners, policy advisers, sustainability managers, energy economists and electrification specialists gain most. You benefit if you prepare forecasts, draft strategies, set emission targets or plan access for underserved communities.

How does energy planning and sustainable development differ from a renewable energy project course?

A renewable energy project course focuses on designing or financing individual plants. This course works at system level, combining demand forecasting, capacity expansion, scenarios, emissions pathways and access planning to decide which mix of projects a country, city or group should pursue.

What do you bring back from energy planning and sustainable development training?

You bring back a three-scenario energy plan for a real or realistic system, with demand projections, supply build plans, emissions results and trade-off comparisons. It gives your unit a tested structure for the next strategy update.

Energy Planning and Sustainable Development: The Way Forward

The Long-Term Energy Scenario Plan first informs which investments proceed now as no-regret choices and which wait for clearer signals. Planners and policy advisers use it to brief ministers, boards and financiers. After its first use, revisit technology cost and demand assumptions, since storage prices, cooling loads and electrification trends move faster than most planning cycles.