JUPITER PRIME
Consulting • Training • Advisory
جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Advanced Renewable Resource Assessment and Energy Yield Training Course

20 September – 1 October 2027
Singapore

jupiterprime.uk
info@jupiterprime.uk
Registered in the United Kingdom and Saudi Arabia

Advanced Renewable Resource Assessment and Energy Yield Training Course

Ref: 2587_98419 **Date:** 20 September – 1 October 2027 **Location:** Singapore **Fees:** 12000 GBP

Renewable Resource Assessment and Energy Yield is a 2-week training course for renewable project engineers and energy planners who must show how much electricity a solar, wind or hybrid site will deliver, and it ends with a Hybrid Plant Concept and Yield Case. Lenders, offtakers and boards now commit capital on the strength of these estimates, so every loss assumption and uncertainty band is questioned. The course is delivered by Jupiter Prime Training.

Why Renewable Resource Assessment and Energy Yield Matters Now

Three forces shape renewable resource assessment and energy yield today. Lenders size debt on exceedance estimates, so a loose uncertainty budget raises financing costs. Offtakers want shaped delivery, pushing developers towards hybrid solar, wind and storage plants. Congested networks turn curtailment into a direct yield loss. A team that estimates well wins competitive tenders without overpromising; one that estimates badly faces underperforming assets, covenant pressure and disputes with buyers. The course rests on measure-correlate-predict methods, long-term reanalysis datasets and probabilistic exceedance analysis.

Who Gains Most from Renewable Resource Assessment and Energy Yield

- Engineers responsible for measurement campaigns and site wind or irradiance data quality
- Specialists who build energy yield models and loss budgets for bids and investment decisions
- Planners who size hybrid plants and decide the mix of solar, wind and storage capacity
- Technical advisers who review third-party yield reports for lenders or owners
- Performance engineers who compare operational output with pre-construction estimates

Development teams gain most when the measurement, modelling and plant design specialists of one project attend together.

Renewable Resource Assessment and Energy Yield Capabilities

Participants move from raw mast, lidar and pyranometer records to a defensible long-term output figure and the plant it supports.

- Assess measurement campaign quality and data recovery before modelling — the investment committee
- Calculate long-term corrected wind and solar resource using reference datasets — the bid pricing decision
- Build an energy loss budget covering wake, soiling, availability and curtailment — the technical adviser review
- Test exceedance values and combine independent uncertainty sources — lenders sizing project debt
- Weigh solar, wind and storage ratios against a shaped delivery profile — the offtake negotiation
- Communicate a hybrid concept design and its yield case to non-specialists — the project board

Key Renewable Resource Assessment and Energy Yield Terms

- Measure-Correlate-Predict — a method that relates short on-site measurements to a long reference record to estimate the long-term resource at the site.
- Exceedance Probability Value — an annual output figure the plant is expected to exceed with a stated probability.
- Wake Loss — the reduction in turbine output caused by slower, more turbulent air downstream of other turbines.
- Performance Ratio — the ratio of actual solar plant output to the output expected from the irradiance received, showing combined system losses.
- Clipping Loss — energy lost when solar array output exceeds inverter or export capacity and is cut off at that limit.
- Interannual Variability — the year-to-year swing in wind speed or irradiance that adds uncertainty to any single year's output.

Renewable Resource Assessment and Energy Yield Day by Day

Day 1: Yield Estimates in Investment Decisions

- Lender Debt Sizing on Exceedance Values — Setting Required Confidence Levels
- Tender Bid Pricing Sensitivity — Linking Output Error to Tariff Risk
- Shaped and Firm Offtake Requirements — Driving Hybrid Plant Choices
- Historic Underperformance Case Reviews — Learning From Estimate Shortfalls
- Independent Engineer Review Scope — Preparing Evidence for Due Diligence

Day 2: Wind Measurement Campaigns

- Met Mast Configuration and Sensor Heights — Capturing Shear Reliably
- Remote Sensing With Lidar and Sodar — Extending Measured Heights
- Data Recovery and Icing Flags — Deciding Which Records Remain Usable
- Calibration and Boom Shadow Corrections — Removing Systematic Sensor Bias
- Campaign Duration Planning — Balancing Schedule Pressure Against Uncertainty

Day 3: Solar Irradiance Measurement

- Global, Direct and Diffuse Irradiance Components — Choosing Station Instruments
- Pyranometer Cleaning and Maintenance Logs — Protecting Ground Data Quality
- Satellite-Derived Irradiance Records — Filling Gaps at Remote Sites
- Site Adaptation of Satellite Series — Reducing Bias Against Ground Readings
- Dust, Temperature and Albedo Measurements — Feeding Desert Loss Assumptions

Day 4: Long-Term Resource Correction

- Reanalysis Dataset Selection — Picking a Representative Long Reference
- Measure-Correlate-Predict Regression Choices — Projecting Short Records Forward
- Typical Meteorological Year Construction — Representing Expected Solar Conditions
- Interannual Variability Analysis — Bounding Single-Year Output Swings
- Climate Trend Screening — Judging Whether the Past Represents the Future

Day 5: Wind Flow and Array Modelling

- Linear and Computational Flow Models — Matching Model Complexity to Terrain
- Vertical Extrapolation of Wind Shear — Reaching Hub Height Credibly
- Wake Model Selection and Tuning — Estimating Internal Array Losses
- Turbine Layout Optimisation — Trading Spacing Against Land Constraints
- Power Curve Adjustment for Air Density — Correcting Hot Climate Output

Day 6: Solar Plant Performance Modelling

- Transposition and Shading Models — Converting Irradiance to the Plane of Array
- Bifacial Gain and Tracker Geometry — Weighing Single-Axis Against Fixed Tilt
- Soiling Rate and Cleaning Cycle Assumptions — Setting Maintenance Budgets
- Module Degradation and Temperature Losses — Projecting Lifetime Output
- Inverter Loading Ratio and Clipping — Sizing Direct to Alternating Capacity

Day 7: Loss Budgets and Uncertainty

- Availability and Electrical Loss Categories — Building a Transparent Loss Tree
- Grid Curtailment and Export Limit Losses — Testing Network Constraint Exposure
- Uncertainty Source Inventory — Separating Measurement, Model and Variability Errors
- Combining Independent Uncertainties — Deriving Exceedance Values Correctly
- Back-Casting Against Operating Plants — Validating Model Assumptions

Day 8: Hybrid Plant and Storage Concepts

- Solar and Wind Output Complementarity — Choosing Capacity Ratios
- Battery Power and Energy Rating — Meeting Evening Delivery Windows
- Shared Connection Point Sizing — Accepting Controlled Overbuild Losses
- Storage Round-Trip Efficiency and Cycling — Projecting Usable Energy
- Hourly Dispatch Simulation — Testing Firmness Against Offtake Profiles

Day 9: Design Trade-Offs and Yield Economics

- Levelised Cost Sensitivity to Output Assumptions — Ranking Design Options
- Land Use and Layout Density Choices — Balancing Yield Against Footprint
- Equipment Selection Under Heat and Dust — Protecting Long-Term Performance
- Supplier Performance Warranties — Allocating Output Risk
- Yield Report Structure for Lenders — Presenting Assumptions Transparently

Day 10: Practising the Hybrid Plant Concept and Yield Case

- Case Site Data Screening and Long-Term Correction — Applying Measurement Methods
- Solar and Wind Output Modelling for the Case Site — Applying Plant Models
- Loss Tree and Exceedance Calculation — Applying Uncertainty Methods
- Storage Sizing Against a Delivery Profile — Applying Hybrid Concepts
- Hybrid Plant Concept and Yield Case Presentation — Securing Board Endorsement

Applying Renewable Resource Assessment and Energy Yield After the Course

- Audit the loss tree and uncertainty inventory of a current project yield estimate and brief the project board on gaps against exceedance requirements.
- Lead a back-cast of one operating solar or wind plant against its pre-construction estimate to recalibrate soiling, wake or curtailment assumptions.

Renewable Resource Assessment and Energy Yield Questions FAQ

What is renewable resource assessment and energy yield, and why does it matter now?

It is the discipline of turning site wind and sunlight records into a long-term output estimate with stated uncertainty. It matters now because lenders and tender evaluators rely on these figures, and hybrid plants make them harder to estimate.

Which roles gain most from renewable resource assessment and energy yield training?

Measurement, modelling and plant design specialists gain most. You will gain most if you run site campaigns, build yield models for utility-scale bids or industrial self-generation projects, size hybrid plants, or review third-party estimates.

How does renewable resource assessment and energy yield training differ from a grid integration course?

It looks at what a plant will produce, not how the network absorbs it. A grid integration course studies protection, power quality and connection studies, while this course covers measurement campaigns, long-term correction, loss budgets, exceedance values and hybrid sizing.

What do you bring back from renewable resource assessment and energy yield training?

You bring back a concept design and yield case for a hybrid plant. It contains a corrected long-term resource, solar and wind output models, a loss tree, exceedance values and a storage size tested against a delivery profile.

Renewable Resource Assessment and Energy Yield: The Way Forward

The Hybrid Plant Concept and Yield Case first informs the capacity ratio and storage size a project takes to bid or financing. Modelling specialists use it with commercial colleagues to set tariff and debt assumptions. Revisit it after the first operating year, when real availability, soiling and curtailment show which losses were set too optimistically.