CONCEPT

Renewable Energy Finance and Project Economics: LCOE, Storage and Debt Sizing

30 August – 3 September 2027
Amsterdam - Zuidas business district hotel



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Introduction:

Renewable energy finance decisions often go wrong when a solar, wind or battery project is priced on a headline tariff while degradation, curtailment, merchant price exposure and P90 yield are left out of the cash flows, so the debt is oversized and the equity case weakens after commissioning. This Core Concept course trains developers, utility planners, lenders and investment staff to link energy project economics, levelised cost metrics and debt sizing in one model. Participants build a Solar-Plus-Storage Financial Model and Bankability Memo for a case hybrid plant.

Course Objectives:

- Estimate capex, opex, capacity factor and degradation for solar, wind and battery assets and convert P50 and P90 yield inputs into lifetime generation profiles
- Calculate LCOE and LCOS for competing technologies and explain how discount rate, cycling and augmentation change the result
- Evaluate revenue stacks built from contracted offtake, merchant sales, capacity payments and tariffs and quantify their revenue risk
- Build a renewable cash-flow model that derives CFADS, sizes debt to a target DSCR, sculpts repayments and funds reserve accounts
- Assess bankability through lender due diligence findings, a risk allocation matrix and sensitivity and scenario tests
- Recommend a financing mix from project loans, green bonds, blended and development finance and defend an investment decision in a bankability memo

Target Audience:

- Project development managers responsible for bringing solar, wind and storage projects to financial close
- Utility planning managers responsible for comparing generation and storage options on cost and value
- Lending and credit managers responsible for appraising and monitoring renewable energy loans
- Investment and portfolio managers responsible for equity returns on clean energy assets
- Energy advisory managers responsible for reviewing financial models and yield assumptions for clients

Course Outline:

Day 1: Energy Project Economics for Solar, Wind and Battery Assets

- Capex Breakdown for Utility-Scale PV, Onshore Wind and Battery Storage: Modules, Turbines, Cells and Balance of Plant
- Fixed and Variable Opex: Land Lease, Insurance, Inverter Replacement and Battery Augmentation Schedules
- Capacity Factor, Availability and Annual Module Degradation Effects on Lifetime Generation
- Energy Yield Assessment Inputs: P50, P90 and P99 Exceedance Values and Resource Uncertainty
- Discount Rate Build-Up: WACC, Cost of Equity and Hurdle Rates for Renewable Assets

Day 2: Levelised Cost Metrics, Revenue Models and Market Exposure

- LCOE Formula: Discounted Capex, Opex and Generation over the Asset Life
- Levelised Cost of Storage LCOS: Round-Trip Efficiency, Cycling, Depth of Discharge and Augmentation
- Revenue Stack Options: Contracted Offtake, Merchant Sales, Capacity Payments and Feed-in Tariffs
- Battery Revenue Streams: Energy Arbitrage, Ancillary Services and Firming of Solar Output
- Price Curve Scenarios, Capture Price Cannibalisation and Curtailment Exposure

Day 3: Renewable Cash-Flow Model Build and Debt Sizing

- Model Layout: Assumptions Sheet, Timing Flags, Generation and Revenue Blocks
- CFADS Derivation for a Solar Plant with Degradation and Inverter Replacement Costs
- Debt Sizing by Target DSCR on P50 and P90 Cases with a Gearing Cap
- Sculpted Repayment versus Annuity Repayment for Projects with Merchant Tails
- Debt Service Reserve and Battery Augmentation Reserve Account Funding

Day 4: Bankability, Risk Allocation, Sensitivities and Financing Sources

- Lender Due Diligence on Renewables: Independent Engineer Yield Review, Technology and Warranty Checks
- Risk Allocation Matrix for Resource, Technology, Grid, Offtaker and Curtailment Risks
- Tornado Charts, Breakeven Tariff and Scenario Analysis on Yield, Capex and Merchant Price
- Financing Sources: Non-Recourse Loans, Green Bonds under the Green Bond Principles, Blended and Development Finance
- Carbon Credit Revenues and Their Treatment as Upside in Lender Cases

Day 5: Case Work: Solar-Plus-Storage Financial Model and Bankability Memo

- Case Data Pack Review: Site Irradiance, Battery Sizing, Capex Quotes and Offtake Terms
- Technology Comparison Screen: Standalone PV, Wind and PV-Plus-Storage LCOE and Equity IRR
- Hybrid Plant Model Build with Shared Grid Connection and Battery Dispatch Rules
- Downside Case Testing: P90 Yield, Capex Overrun, Battery Degradation and Low Merchant Price
- Bankability Memo Drafting and Investment Committee Defence

Skills You Will Gain:

- Renewable Capex and Opex Estimation
- Yield Uncertainty Interpretation
- Levelised Cost Analysis
- Revenue Stack Evaluation
- CFADS and DSCR Debt Sizing
- Reserve Account Structuring
- Renewable Risk Allocation
- Clean Energy Financing Mix Selection

Why Attend This Course:

- Leave with a Solar-Plus-Storage Financial Model and Bankability Memo that can be adapted to a live solar, wind or storage pipeline
- Challenge developer tariffs, yield reports and battery revenue assumptions before they reach a credit or investment committee
- Show how much debt a renewable project can carry under P90 yield and merchant price downside, with figures that reconcile
- Compare renewable financing practice with peers from developers, utilities, banks, funds and development finance institutions

Conclusion:

Renewable energy finance works when technology costs, yield uncertainty, revenue risk and debt terms are tested in the same model rather than in separate reports. The week moves from capex, opex, capacity factor and degradation, through LCOE, LCOS and revenue stacks, to CFADS, DSCR debt sizing, sculpting and reserve accounts, then due diligence, risk allocation, sensitivities and financing sources. The final day applies every method to a hybrid case and produces a Solar-Plus-Storage Financial Model and Bankability Memo.