

Financial Analysis of Storage and Renewable Energy



SIDC CPE Approved (10 CPE Points)

HRD Corp Claimable (SBL Khas: Scheme)

13 – 14 November 2025

Sheraton Imperial Kuala Lumpur Hotel, Malaysia.

COURSE OBJECTIVE

The course will address a variety of contract and loan structuring issues associated with wind and solar energy projects as well as battery storage. The course is designed to investigate how various project finance techniques and contract structures can be used to achieve a competitive power prices while maintaining a satisfactory equity return. The course will begin by discussing distinctive project finance features of facilities that depend on wind, hydro or solar resources. Subsequent sessions will address the theory underlying liquidated damages for delay, and performance as well as design of other incentives that is inherent in different contract structures. Nuanced project finance issues associated with structuring debt for renewable projects will be discussed including under what conditions the DSCR drives debt capacity and when the debt to capital ratio is instrumental.

The course will be taught with a combination of theoretical discussions, term sheet review and focused financial models.

WHO SHOULD ATTEND

The course will be of value to professionals in the following areas:

- Bankers/Investment Bankers • Project Finance Modellers
- Financial Advisors • Sponsors • Business Developers
- Government/PPP Agencies • Public Sector Managers
- Export-Credit Agencies • Multilateral Agencies
- Financial Analysts • Analysts/Brokers • Finance Directors
- Credit Committee members • Project Managers
- Project Consultants • Investment/Portfolio Managers

KEY BENEFITS

- Contrast risk and financial structuring for different types of renewable projects including biomass, on-shore wind, off-shore wind, solar PV, solar thermal and geothermal.
- Create flexible and transparent financial models of renewable energy from A-Z that incorporate resource risk, financing structure, tax treatments, alternative pricing policies and other factors.
- Learn practical tools to analyse renewable energy including efficient tools to work with wind, hydro and solar data; creating flexible scenario and sensitivity analysis to evaluate resource risk, construction risk, O&M risk and debt structuring; developing techniques to resolve circular references related to funding debt and sculpting debt without copy and paste macros.
- Measure and evaluate changes in the risk of projects over different stages of the project and how equity returns and value change if purchases and sales occur at different phases of a project's life.
- Understand the implications of project finance features in the context of renewable energy (sculpting, debt funding, debt size, DSCR, DSRA, debt tenor, re-financing) on costs and equity returns from renewable energy.
- Develop efficient ways to quickly compute the levelised electricity cost of different technologies using carrying charge factors and alternative financial models.
- Work through resource assessments and compute probability of achieving different levels of production (P90, P75 etc.) using hands-on exercises for different types of projects in order to effectively review consulting studies.
- Evaluate recent cost trends in capital cost, operating cost and efficiency of renewable resource through studying financial condition of wind and solar suppliers over the past few years.
- Measure the effect of probabilistic risk assessment on the debt capacity of alternative renewable projects and the effects of the DSCR constraint versus the debt to capital constraint.

Edward Bodmer

Expert Trainer



Consultant, Professional Trainer, Author

Ed has created innovative forward pricing, productivity measurement and investment valuation software for consulting clients throughout the United States. He has taught energy economics and finance throughout the world, and formulated significant government policy and corporate strategy in the U.S. His consulting clients include investment banks, commercial banks, research institutions and government agencies on a wide variety of complex valuation and advisory matters. He has constructed a unique framework for electricity price forecasting and valuation using production cost modelling techniques combined with option price theory and Monte Carlo simulation. He is also an adjunct professor at leading University where he teaches courses in microeconomics. Along with his practical experience that covers a multitude of major advisory projects, he has taught specialised courses in financial modelling, electricity pricing, option valuation, mergers and acquisitions and contracting to investment banks, commercial banks, industrial corporations and electric utility companies. He was formerly Vice President at the First National Bank of Chicago where he directed analysis of energy loans and also created financial modelling techniques used in advisory projects. He has used the models in providing expert testimony on subjects ranging from capital structure to investments in multi-billion dollar nuclear plants to complex valuation of new investments. He received an MBA degree specialising in econometrics (with honours) from the University of Chicago and a BS degree in finance from the University of Illinois (with highest university honours). He has written many articles and is in the process of completing a textbook on valuation of electricity assets.

Program Timings

The program will commence at 9.00am each day and continue until 5.00pm.

Organised By

Traxius Global Sdn Bhd
(1125473-D)



DAY ONE | 13 Nov 2025 | Thursday

PART 1

REVIEW OF WIND, SOLAR AND BATTERY COST TRENDS THROUGH LCOE ANALYSIS

- Capital intensity of Solar, Wind and Hydro compared to other technologies and the importance of cost of capital for capital intensive projects.
- Understanding of levelised cost of energy mathematics and why discount rates and energy levels must be considered in the calculation and why real LCOE is a more appropriate measure than nominal LCOE.
- Benchmarking fixed and variable O&M costs for solar, wind and hydro projects compared to conventional power plants with fuel expense.
- The theory of carrying costs applied to convert one-time costs to time-period costs and relation to LCOE and the importance of adjusting carrying charges for inflation and taxes.
- Review of solar cost trends through analysis of capital costs, feed-in tariffs and Finance theory in the context of project finance relative to corporate finance and the notion of mitigating risks through paying premium prices for construction and operation contracts.
- Illustration of project finance features in relation to the LCOE of wind, solar and hydro projects compared to conventional projects and how project finance features can affect the cost of wind, solar and hydro facilities.

PART 2

ANALYSIS OF BATTERY COSTS AND CONFIGURATIONS THROUGH ISLAND AND MERCHANT PRICE ANALYSIS

- Cost analysis of solar versus diesel in an island scenario and using variable cost of diesel relative to total cost of solar.
- Compute the optimal sizing of solar capacity in the island scenario with different load profiles and daily solar patterns.
- Measurement of the value of solar and wind energy in different merchant markets around the world.
- Review and analyse the trade-offs between storage time per cycle, capital costs, operating life, future capital expenditures, efficiency and operating costs. Work though which configuration of batteries makes most sense in alternative situations.
- Assess the economics of different battery configurations in merchant electricity markets.
- Evaluate the economics of batteries together with different daily load and solar patterns and compute the optimal amount of solar capacity as well as battery capacity.

PART 3

STRUCTURING PROJECT CONTRACTS FOR SOLAR AND WIND

- Fundamental difference between classic PPA contracts with availability payments for dispatch able plants and single price structures for resource based projects where output is not directly controlled.
- Risk allocation matrices and use of the DSCR, LLCR and PLCR to determine acceptable resource risks [using the formula: break-even cash flow reduction = (DSCR-1)/DSCR or Required DSCR = $1 / (1 - \text{Cash Flow Reduction})$].

- Problem of liquidated damage incentives for delay when the single price in a renewable energy EPC contract and PPA contract when the marginal cost of energy is below the single price in the PPA.
- Problem of setting incentives for performance ratio in Solar project when PPA price is above short-run marginal cost for periods when capacity is constrained.

PART 4

DEBT SIZING AND DEVELOPMENT COST ANALYSIS FOR RENEWABLE ENERGY

- The difference in sizing debt because of the debt-to-capital ratio relative to the DSCR involves the notion of whether forward looking cash flow can be relied upon or alternatively whether the amount of "skin in the game" measured by accounting costs is more reliable.
- How development fees, owner costs, development costs, contingencies and other items that can increase the cost of a project affect returns primarily when the debt to capital constraint applies and have less or no importance when the DSCR drives debt capacity.
- Theory of development fees and how development fees can be computed as a function of development costs, probability of success and IRR required after the development period.
- How differences in one-year and ten-year P50, P90 and P99 can affect the debt capacity when the DSCR constraint applies using wind farm example.
- Items such as project IRR, debt tenure, tax rate and interest rates that influence whether the debt to capital constraint or the debt to capital constraint applies.

TEACHING STYLE COVERING THEORY AND PRACTICE

- We have developed a unique teaching style whereby theory is covered well as practice. Teaching Approaches Include:
 - Having participants perform all the practical exercises rather than the instructor
 - Minimizing the use of power point slides and maximizing theoretical discussion behind each concept
 - Reserving time for group case studies to reinforce theory and practice
 - Providing resources for future learning and knowledge retention
 - Highly interactive and hands-on teaching style
 - Selection of case studies demonstrating potential errors in analysis and theory

DAY TWO | 14 Nov 2025 | Friday

PART 5

UNDERSTANDING RESOURCE ANALYSIS FOR WIND, HYDRO AND SOLAR PROJECTS

- Analysis of resource data that varies over time for irradiation, wind speeds and hydro volumes and computation of P99, P95, P90 etc. for different resources.
- Understanding the difference in variation due directly to resource variation as compared to other sources related to performance ratio, wake effect, turbulence, correlations and other factors that do not exhibit mean reversion.
- Using case study to evaluate P50, P90 and P99 on one-year basis and long-term basis for series of wind farms and working through implied standard deviations of permanent effects compared to wind variation effects.
- How differences in one-year and ten-year P50, P90 and P99 can affect the debt capacity when the DSCR constraint applies using wind farm example.

PART 6

STRUCTURING OF WIND, SOLAR AND HYDRO REPAYMENTS

- Importance of the debt tenure relative to other debt parameters and problems when the debt tenure does not equal the life of the project.
- Use of geometry to maximize debt is explained in the context of patterns of cash flow available for debt service.
- Theory of sculpting and constant risk over the life of a project.
- Detailed sculpting formulas including effects of letter of credit fees, changes in the DSRA, LLCR on debt to capital and interest income.

PART 7

CREDIT SPREADS AND EQUITY RETURNS FOR SUSTAINABLE ENERGY IN DIFFERENT COUNTRIES

- Theory of credit spreads, debt IRR and all-in interest cost and relation to both probability of default and loss given default.
- Computation of the implied default probability with different credit spreads, debt tenors and loss given default parameters.
- Reasons for step-up credit spreads with no prepayment penalties and constant credit spreads with prepayment penalties.
- Comparison of country risk estimates with required credit spreads.
- Evaluation of different currencies and interest rates and hedging variable rates relative to fixed rates.
- Alternative ways of measuring the required return on equity using Yieldco market statistics, stock prices and probability of defaults on contracts.
- Alternative structures that incorporate some interest rate risk with caps and floors and the types of transactions that have some natural hedging against varying interest rates will also be addressed.

PART 8

CREDIT ENHANCEMENTS FOR DIFFERENT TYPES OF RENEWABLE PROJECTS

- Review of various added provisions that are included in loan agreements to provide additional protection to lenders that cannot make a bad project into a good project.
- Demonstration that covenants and cash sweeps can only either limit dividends or reduce the amount of effective net debt associated with a project.
- Measurement of the negative effects on the equity IRR of a project and methods to consider the risk benefits to the bank versus the costs to sponsors.
- Mechanics of cash sweep with different triggers and theory of what kinds of transactions would be relevant for cash sweep (e.g. hydro but not solar because of volatility).
- In describing credit enhancements, the difference between analysis with the DSCR, LLCR and PLCR are discussed.
- Economics of Maintenance Reserve Accounts for inverters and other equipment. Cost of maintaining maintenance reserve account for items such as inverter replacement relative to including costs in maintenance contracts. Effects of major maintenance on tax expense and DSCR.

UNIQUE RESOURCES FOR FURTHER LEARNING AND RETAINING KNOWLEDGE

- An essential part of the course is the provision of vast materials that can be used to re-enforce the concepts discussed in the workshop and to allow participants to engage in further study. Materials include:
 - Many featured models in electric power that fully resolve circular references, rigorous structuring, customised scenario analysis and other features
 - Hundreds of Focused exercises highlighting a variety of advanced financial issues
 - Frameworks for unique presentation of data and risk analysis including Monte Carlo Simulation;
 - Methods for extracting crucial data for financial and energy analysis with transparent macros that automatically update information
 - Unique tools to convert PDF files, format spreadsheets and enhance efficiency
 - Collection of comprehensive case studies, financial articles, contracts and models



Mr. Edward Bodmer provides financial and economic consulting services to a variety of clients, he teaches professional development courses in an assortment of modelling topics (project finance, M&A, and energy). He is passionate about teaching in Africa, South America, Asia and Europe. Many of the unique analytical concepts and modelling techniques he has developed have arisen from discussion with participants in his courses. Professor Bodmer has taught customized courses for MIT's Sloan Business School, Bank Paribas, Shell Oil, Societe General, General Electric, HSBC, GDF Suez, Citibank, CIMB, Lind Lagers, HSBC, Saudi Aramco and many other energy and industrial clients. Bodmer's consulting activities include developing complex project finance, corporate and simulation models, providing expert testimony on financial and economic issues before energy regulatory agencies, and advisory services to support merger and acquisition projects.

Mr Bodmer has written a textbook titled ***Corporate and Project Finance Modelling, Theory and Practice*** published by Wiley Finance. The book introduces unique modelling techniques that address many complex issues that are not typically used by even the most experienced financial analysts. For example, it describes how to build user-defined functions to solve circular logic without cumbersome copy and paste macros; how to write function that derives the ratio of EV/EBITDA accounting for asset life, historical growth, taxes, return on investment, and cost of capital; and how to efficiently solve many project finance issues related to debt structuring. Bodmer is in the process of writing a second book that describes a series of valuation and analytical mistakes made in finance. This book uses many case studies from Harvard Business School that were thought to represent effective business strategies and later turned into valuation nightmares.

Over the course of his career Professor Bodmer has been involved in formulating significant government policy related to electricity deregulation; he has prepared models and analyses for many clients around the world; he has evaluated energy purchasing decisions for many corporations; and, he has provided advice on corporate strategy. Mr Bodmer's projects include development of a biomass plant, analysis and advisory work for purchase of electricity generation, distribution and transmission assets by the City of Chicago, formulation of rate policy for major metro systems and street lighting networks, advocacy testimony on behalf of low income consumers, risk analysis for toll roads, and evaluation of solar and wind projects. He has constructed many advisory analyses for project finance and merger and acquisition transactions.

Professor Bodmer was formerly Vice President at the First National Bank of Chicago where he directed analysis of energy loans and also created financial modelling techniques used in advisory projects. He received an MBA specializing in econometrics (with honours) from the University of Chicago and a BSc in Finance from the University of Illinois (with highest university honours). Mr Bodmer was born in Manchester, England, he lived in Switzerland as a child, and currently resides in Chicago.

Past Delegate Testimonial

"Mr Edward is very attentive and a good trainer to explain everything so well"

Trainee Business Development, UEM Lestira Berhad

"Greatful for the opportunity to learn from Mr Edward. It was certainly an eye-opening learning session"

Executive, UTSB Management Sdn Bhd

"Good coordination of the training. Well prepared with excellent trainer to deliver the training content materials"

Assistant Manager Group Strategy & Innovation, Sime Darby Plantation

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Sheraton Imperial Kuala
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PLEASE COMPLETE and send:

Marketing

Email: marketing@traxiusglobal.com

INVESTMENT

☐ Early Bird Price RM 7,795 per delegate

☐ Regular Price RM 7,995 per delegate

*Early Bird only VALID for registrations received
before and on **13th Oct 2025**

PAYMENT METHOD

☐ By Cheque crossed & payable to:
Traxius Global Sdn Bhd

☐ By Direct Bank Transfer: CIMB Bank Berhad
Bandar Sunway, Selangor
Acc. No. (8007375369)
SWIFT Code: CIBBMYKL

VENUE INFORMATION

Sheraton Imperial Kuala Lumpur Hotel

Jalan Sultan Ismail, Chow Kit,
50250 Kuala Lumpur, Wilayah Persekutuan
Kuala Lumpur, Malaysia.
Tel: +603-2717 9900

***The workshop fee does not include hotel
accommodation.**

INDEMNITY

TRAXIUS GLOBAL SDN BHD reserves the right to
make any changes or amendments to the programme
for reasons beyond its control.

CANCELLATIONS & SUBSTITUTIONS

Substitutions are welcomed. Please notify us at least
two week before the event (30th Oct 2025).
Cancellations must be in writing either by fax or
email. A 10% service fee will apply.

Regrettably, there will be **no refund and a 100%
liability for the cancellations received after the
aforementioned date.** This will also apply to
delegates who are unable to attend on the day.



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2	Name: _____
	Job Title: _____
	Department: _____
	Email: _____
3	Name: _____
	Job Title: _____
	Department: _____
	Email: _____

COMPANY INFORMATION:

Company Name: _____	
Street Address: _____	

City: _____	Postcode: _____
State: _____	Country: _____
Tel: _____	Fax: _____

CONTACT PERSON:

Name: _____	
Job Title: _____	Email: _____
Department: _____	
Direct Line: _____	Direct Fax: _____

AUTHORISER INFORMATION:

Name: _____	Job Title: _____
Department: _____	Email: _____
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Signature: _____

Date: _____

STAMP REQUIRED