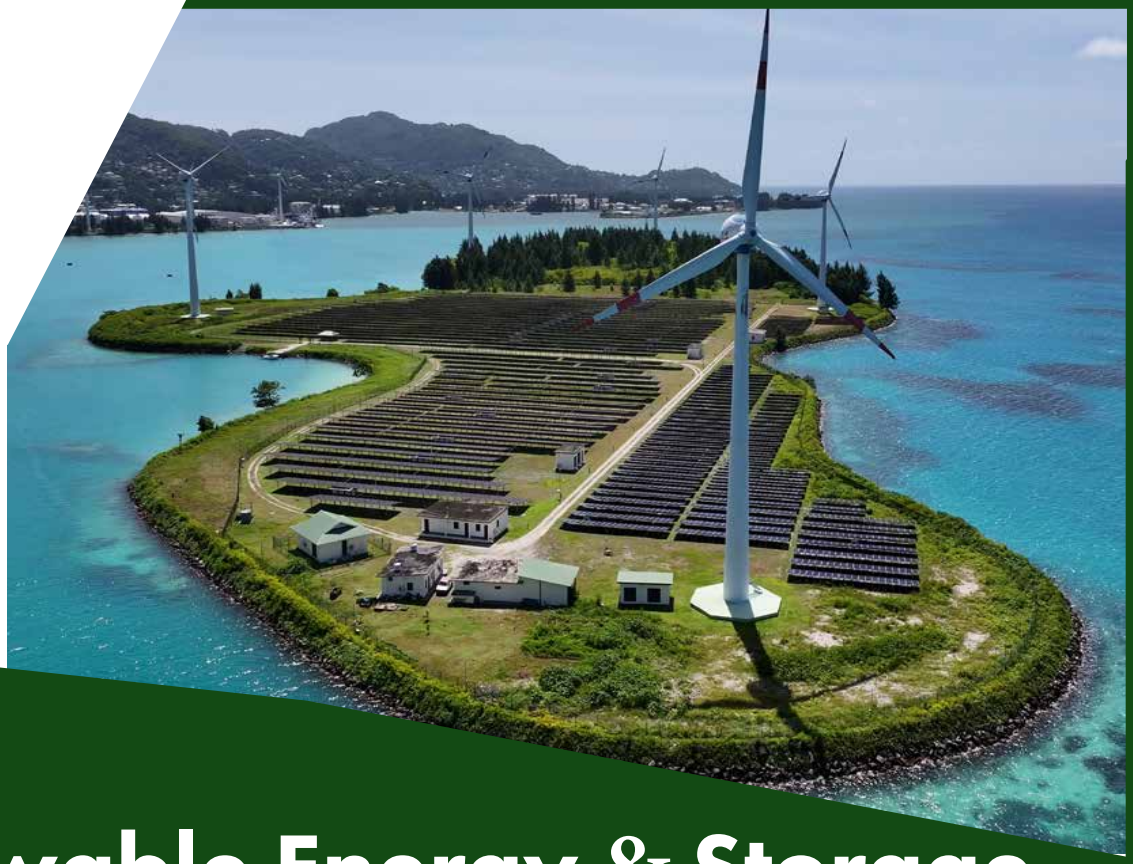
BII WORLD
Engage • Enlighten • Empower

In-Person Course



Renewable Energy & Storage Analysis

[Specific Focus on Islands Systems]

Join our BII World global industry expert & instructor:
Edward Bodmer and transform your learning experience.

3 Day Face to Face Course

12 – 14 November 2025

09:00 - 17:00 Port of Spain, Trinidad & Tobago

www.biiworld.com

COURSE OVERVIEW:

The 3 Day In-Person Course "Renewable Energy and Storage Analysis for Island Systems" is intended for different professionals who are involved in energy analysis.

The training sessions will cover a variety of subjects related to potential strategies and use cases for energy storage. Participants in the course will work with hands on data to simulate the necessity for storage systems and then prepare financial and economic analysis to quantify how renewable energy plus storage affects electricity costs.

The program will emphasize methods to effectively evaluate and present different use cases for batteries on an objective basis and cover recent trends in battery costs.

LEARNING OBJECTIVES:

1. Gain practical ability to evaluate energy strategies both in terms of conceptual and quantitative analysis using operating and financial models.
2. Evaluation in different stages ranging from simple levelized cost models to comprehensive financial models whether batteries plus renewable energy can compete with thermal power.
3. Understanding of battery dispatch and battery characteristics will provide the basis for evaluation of issues associated with PPA agreements.
4. The issues associated with battery operation, battery characteristics, different use cases and PPA terms are put together into a comprehensive financial model.

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TARGET AUDIENCE:

Job Titles:

- Power System Managers
- Transmission and Distribution Operation Staff
- Planning & Engineering Managers in Electric Utility Generation
- Electrical Engineers/Technicians
- System & Generation Operations
- New Generation & Business Development
- Grid Modernization
- Anybody With an Interest in Renewable Energy Generation and Storage

Industries:

- Distribution and Transmission Companies
- Commissioning & EMC Companies
- Generation & Battery Owners
- Grid Infrastructure Companies
- Renewable Energy Developers
- Local Utilities Companies
- Government Agencies

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Instructor:

Edward Bodmer

… your EXPERT TRAINER for this Course.

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) across geographies (Africa, Americas, 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, Society General, General Electric, HSBC, GDF Suez, Citibank, CIMB, Lindlakers, HSBC, Saudi Aramco and many other energy and industrial clients.

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 has written a textbook titled published by Wiley Finance. The book introduces unique modeling techniques that address many complex issues that are not typically used by even the most experienced financial analysts.

- Development of a biomass plant, analysis, and advisory work for purchase ofelectricity generation, distribution, and transmission assets by the City ofChicago\
- 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.
- Constructed many advisory analyses for project finance and M&A transactions.

Formerly Vice President at the First National Bank of Chicago where he directed analysis of energy loans and created financial modeling techniques used in advisory projects. He received an MBA specializing in econometrics (with honors) from the University of Chicago and a BSc in Finance from the University of Illinois (with highest university honors).

PRESENTATIONS:

Day 1:

09:00 - Pre-Course Intro

Session 1: Overview of Storage in the context of island systems with increasing renewable resources.

- Course and overview of subjects covered ranging from simulation of storage use (charging and discharging); to evaluation of battery characteristics; to costs to levelized cost of energy; to evaluation of different integrated battery strategies to evaluation of issues related toincorporating batteries in PPA agreements; and to creating of integrated financial models with different strategies.
- Discussion of renewable energy, inertia in thermal plants and varying weather patterns with analysis of hourly solar and wind data.
- Specific problems with island systems and requirements for ancillary services.
- Alternative ways to effectively measure the cost of different strategies and answer the crucial question of whether solar and/or wind plus storage compete on an economic basis with conventional thermal systems.
- Overview of public data sources that can be used to evaluate the operation of solar hourly operation, solar costs, wind patterns, battery costs.

Session 2: Solar and Wind Generation and Operation and Costs.

- Understanding solar efficiency, standard testing condition, temperature coefficientsand evaluation of yield.
- Working with solar and wind data to understand how much load can be covered without storage.
- Hands on exercise to present and work with hourly data and comparison with PVSYST.
- Understanding the problems that arise from the duck curve and integration of demand data with renewable energy data.
- Problem of lack of correlation between solar and wind on an hourly basis
- Background on the dramatic cost trends of solar power and benchmark solar datafor analysis.

PRESENTATIONS:

Session 3: Overview of Battery Terms and Basic Use Cases.

- Overview of Battery Terms - Battery Storage Duration and Cycles.
- Use of Batteries for different Ancillary Services (spinning reserve, fast start,frequency management, voltage regulation)
- Use of Batteries for Bulk Power Storage (shifting power from daytime tonight time).
- Conceptual questions of whether batteries can be used at same times for multiple services – if a battery has been discharged for meeting short-term ancillary service requirements, can it also be used for moving power to evening and night time hours.
- Detailed discussion of potential for using batteries for multiple uses – can you reserve battery capacity for frequency regulation and at the same time usethe battery for moving power off-peak to on-peak periods
- Discussion of Alternative Use Cases from Consumer Perspective: (e.g.frequency management in the context of individual customers; load shifting and management of peak and off-peak rates; use of solar in micro grids; use of batteries to manage solar power from customer perspective; use ofbatteries from utility dispatch perspective).

Post-Session Q &A

17:00: End of Day 1

Day 2:

09:00 - Day 1 Recap

Session 4: Battery Characteristics and Economic Analysis.

- Battery Capital Cost
  - Costs of batteries in China, India and other regions of the world
  - Cost as a Function of both Storage Capacity and Charging/ Discharging
  - Trend in Capital Costs and Learning
- Contracts for battery capacity with guaranteed life and capacity
- Cost of warranties
- Required augmentation to meet capacity requirements
- Costs of batteries in Caribbean versus other areas of the world

PRESENTATIONS:

- Operating and Maintenance Cost of Batteries
  - Cost of cooling
  - Other costs
  - Inclusion of augmentation in operating costs
  - Sources of information from published sources and financial models
- Battery Life and Degradation
  - Battery Degradation and Effect of Use Case
  - Effects of Degradation on Replacement Cost
  - Changes in Degradation over time
  - Degradation and Definition of End of Life
- Round Trip Efficiency and State of Charge
  - Estimates of Round-Trip Efficiency
  - State of Charge
  - Minimum State of Charge
  - Maximum State of Charge

Session 5: Introduction to Levelized Cost of Renewable Energy.

- Calculation methods for LCOE – four methods and problems of comparing the cost of solar/ wind to dispatchable technologies without accounting foroperational flexibility.
- Use of PMT function to evaluate LCOE with different costs, capacity factors, lifetime and cost of capital.
- Comparison of solar and wind LCOE with the variable cost of running thermal plants.
- Reconciliation of LCOE with financial model for simple cases.
- Discussion of reasonable target project IRR.
- Differences electricity production and risks for different renewable technologies: On-Shore Wind (Wind Resource), Off-Shore Wind, Solar, Hydro, Wave (Refurbishment Timing), Geothermal (Development Probability).

Session 6: Nuances of Levelized Cost Calculation and Inclusion of Battery Storage Costs.

- Inclusion of batteries in LCOE with different assumptions for battery cost, battery life, battery degradation, battery round trip efficiency and battery dispatch.
- Case Exercise with solar use case and battery implemented for ancillary services.
- LCOE calculation with batteries for moving bulk power.
- Inclusion of inflation and degradation in LCOE Analysis.
- Risk Evaluation Using Break-Even and Sensitivity Analysis.

PRESENTATIONS:

Session 7: Use Cases for Batteries with Simulation.

- General discussion of use cases (ancillary services, load shifting, peakingreplacement, meeting of evening demand, transmission and distributionsupport).
- Dispatch of batteries in alternative contexts.
- Evaluation of battery costs in peaker replacement scenario.
- Issues in cases where surplus solar or wind is installed to provide discharge energy – is there a reduced need for batteries for ancillary services.
- Measuring the cost of thermal plants that are not needed with surplus solarpower – minimum run requirements and start-up times.
- Predictability of renewable resources and battery requirements.

Post-Session Q &A

17:00: End of Day 2

Day 3:

09:00 - Day 2 Recap

Session 8: Use Cases for Batteries with Hourly Simulation.

- Simulation of electricity demand and solar power with large percentage of solar and wind using hourly demand profiles, hourly solar.
- Simulation of battery operation using simple case with surplus renewable energy for storage and deficit renewable energy for discharge with battery storage constraints.
- Simple case with inclusion of round-trip efficiency and state of charge constraints and implications on the required battery and charging capacity.
- Inclusion of detailed battery simulation in hourly analysis with and without wind resources.
- Presentation of hourly renewable, demand and battery discharge using flexible graphs with hands-on exercise.
- Circle back and include implications of detailed battery simulation in the levelized cost of electricity analysis.
- Sensitivity analysis that include costs of operating thermal plants in different ways.

PRESENTATIONS:

Session 9: Implementing Storage with PPA Agreements.

- Theory of PPA agreements in the context of historic PPA agreements – capacity, availability, efficiency, risk allocation, capacity charges, coverage of variable charges
- Development of PPA's to designed to provide ancillary services market in PPAs (grid services provided load shifting, frequency and voltage management, spinning reserve management, inertia support, black start).
- Research on alternative pricing, availability targets, and liquidated damage practices in different countries (dispatch of batteries in PPA agreements, battery requirements in renewable PPAs; structure of tolling contracts; financing of batteries by electricity distribution companies).
- Problems of control of cycles in battery PPA agreements – as the supplier does not have control over cycles, should the supplier take risks of degradation and battery life.
- Issue of whether battery PPA agreements should require fixed amounts of capacity over time and thereby require augmentation

Session 10: Review of PPA Agreements for Energy Storage.

- Availability of Public PPA agreements
- Case Study on Review of Actual PPA Agreements – Entergy Case
- Data measurement of capacity and availability in PPA
  - Availability KPI's in PPA agreements and liquidated damages for missing availability targets
  - Efficiency KPI's in PPA agreements and liquidated damages for missing targets
  - Degradation and Augmentation KPI's and requirements in PPA's and how to structure capacity requirements in PPA's
- PPA price mechanisms Alterative pricing for batteries – Capacity payment;Pay-as-produced, Limits on Cycles, Correspondence with supply contracts
- Batteries in the context of Physical and Virtual PPAs for renewable energy such as corporate PPAs for datacenters and other non-utility consumers.

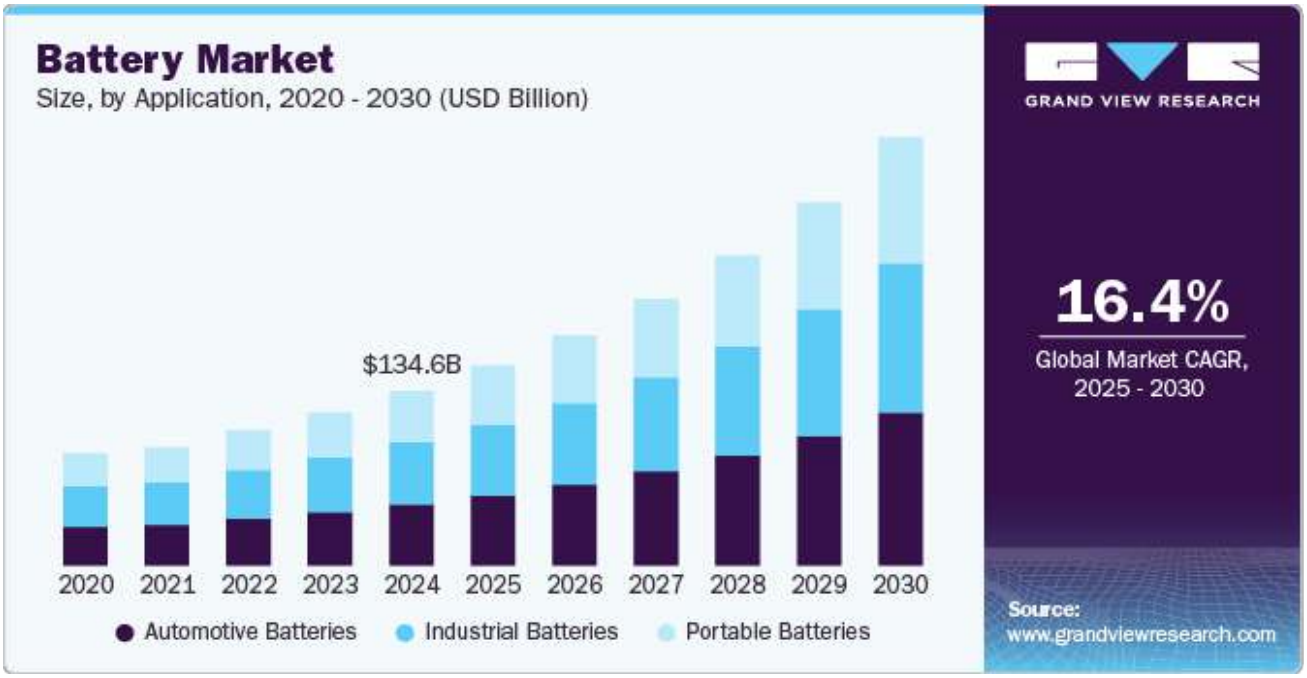
PRESENTATIONS:

Session 11: Evaluation of Financing and Integrated Financial Models of Battery Systems.

- Theory Risk Evaluation Using Scenario Analysis with Focus on the Manner in which Bankers Apply Downside Analysis
- Inclusion of replacement cost of batteries with solar and battery differing lifespans
- Financing and Concern About Technology Risk
- Demonstration of Banking Analysis with Independent Engineer
- Measurement of Risk Using Structured Master Scenario Page in Excel
- Model with Options for Adding Sensitivity Analysis to Defined ScenariosW

Post-Session Q &A (Day 1 – 3)

17:00 – End of Day 3 & Course.



Renewable Energy & Storage Analysis

12 - 14 November 2025

BII World Limited
9616 45th Avenue
Northwest, Edmonton, AB
T6E 5Y9, **Canada**

Please complete this form and send it back to
zack.miller@biiworld.com
mithun.siddartha@biiworld.com

Event Code: AM HS 01

Delegate Details

1. Name: Mr/Mrs/ Ms .....
   .....
   Job Title: .....
   Email: .....
2. Name: Mr/Mrs/ Ms .....
   .....
   Job Title: .....
   Email: .....
3. Name: Mr/Mrs/ Ms .....
   .....
   Job Title: .....
   Email: .....

Company/Organisation Detail

Name: .....
Person to Contact:.....
Email: .....
Address: .....
.....
City: .....
Country: .....
Contact No: .....
Type of Business: .....
Website: .....

PAYMENT METHOD:

CREDIT CARD ☐

The secured payment link will be shared/sent

WIRE TRANSFER OR BANK TRANSFER ☐

Authorization and Acceptance of Sales Contract & Terms & Conditions

I hereby declare I am authorised to sign this contract and terms & conditions in the name of the company/organisation:

Name:.....

Date:.....

Signature:.....

Delegate Fee ☐ **USD 2199 per delegate**

20 USD administration charge and any applicable withholding or any other tax or fee will be applied

TERMS & CONDITIONS:

1. Payment terms: BII World LTD requires the full payment of the invoiced amount within 7 working days from the issue date of the invoice. BII World LTD reserves the right to refuse entry to any client who does not pay the invoice in full and on time. The registration fee includes: Training documentation and admission to all training sessions.

2. Cancellation by client: The client has the right to cancel his/her participation in the event. Cancellation must be received by BII World LTD in writing either by mail or fax. If the client cancels the event, he/she will get two options:

- **A. CREDIT NOTE:** Choose 2-year credit note, BII World LTD will send all the schedule training event details throughout the year. Delegate has the right to choose and attend any of the future training programs of BII World (valid 2 years).
- **B- NOMINATION:** In this option delegate can nominate/refer someone from his/her group/company to attend the particular training program on behalf of the actual delegate.

3. Cancellation by BII World LTD : While every reasonable effort is made to adhere to the advertised program, circumstances can arise which may cause changes in the program, including but not limited to changes in the content, date(s), or special features of the planned event. Such circumstances include but are not limited to acts of terrorism, war, extreme weather conditions, compliance with government requests, orders and legal requirements, failure of third-party suppliers to timely deliver, and failure to register the minimum target number of attendees for a given event. BII World LTD reserves the right to change the content, date(s), and/ or special features of an event, to merge the event with another event, or to postpone it or cancel it entirely as appropriate under the circumstances. Client agrees that BII World LTD shall not be liable for any cost, damage or expense which may be incurred by client as a consequence of the event being so changed, merged, postponed or canceled and client agrees to hold BII World LTD harmless and to indemnify BII World LTD in case of liability caused by any such changes, mergers, postponements or cancellations.

4. Cancellation of the event: In case BII World LTD cancels an event, then client can choose any of the below mentioned options:

(a) BII World LTD will refund full payment to the client within 15 business days.
(b) Client can choose the credit option for 2 years, for more details please read term no-2 part (a)

5. Postponement of the event : In case BII World Ltd postpones the event to a new date, then client can choose any of the below mentioned options.

(a) The client can attend the course on the postponed dates.
(b) Client can choose the credit option for 2 years, for more details please read term no-2 part (a)

6. Client's identification information. By signing of this sales contract and these terms and conditions the client gives full right to BII World LTD to share the client's identification information, i.e. client's name, address, email addresses, phone numbers and names of representatives and website with other clients who participated in the same event. The client has the right to opt out of this clause by written notice to BII World LTD.

7. Governing law: This contract shall be governed by and construed in accordance with the laws of the Province of Alberta, Canada. Any disputes arising under or in connection with this registration form shall be sealed before the competent court in Canada.

8. Indemnification: To the fullest extent permitted by the law, you agree to protect, indemnify, defend and hold harmless BII World LTD, its owners, managers, partners, subsidiaries, affiliates, officers, directors, employees and agents, from and against any and all claims, losses or damages to persons or property, governmental charges or fines, penalize, and costs (including reasonable attorney's fees) (collectively "the Claims"), in any way arising out of or relating to the event that is the subject of this contract, and regardless of negligence, included but not limited to, Claims arising out of the negligence, gross negligence or intentional misconduct of BII World LTD employees, agents, contractors, and attendees; provided, however, that nothing in this indemnification shall require you to indemnify BII World LTD Indemnified parties for that portion of any Claim arising out of the sole negligence, gross negligence or intensional misconduct of the BII World LTD parties.

9. Other currencies. In case that client requests payment in other than official currency (USD), BII World LTD reserves the right to apply 5% currency risk surcharge to the actual exchange rate.

10. Other Conditions: Any terms or conditions contained in the client's acceptance which contradict or are different from the terms and conditions of this registration document shall not become part of the contract unless individually negotiated with BII World LTD and expressly accepted by BII World LTD.