Developing Comprehensive Financial Models to Forecast ROI for Renewable-Energy Projects (2025)

1 | Why partnerships still make (or break) a model

Region	2024-25 landmark deal	What it tells modellers
UK	Cleve Hill Solar + 150 MW BESS — £218.5 m term-loan jointly underwritten by NatWest & Lloyds, supported by a 15-year offtake for 65% of solar generation with Tesco and the UK's largest solar allocation under CfD Round 4. Quinbrook Infrastructure Partners	Stacking *contracted & indexed* revenues (CfD + merchant PPA + capacity) dramatically improves debt-service cover.
Abu Dhabi	Al Ajban 1.5 GW Solar PV — bid won by Masdar, EDF Renewables & KOWEPO with a long-term energy-only PPA signed at WFES 2024. Masdar	Foreign equity plus local utility PPA lowers WACC; single-buyer risk supersedes merchant volatility.
Australia	FRV nine-asset portfolio (≈1 GW PV + 102.5 MW/205 MWh storage) — AU$ 90m senior debt from CEFC alongside 10 global commercial banks. CEFC	Portfolio refinancing frees sponsor equity and diversifies cash-flow, a template for multi-asset models.

Example sources:

- Quinbrook Infrastructure Partners
- Masdar
- CEFC

Take-away: building ROI forecasts now starts with mapping **revenue stacks and banking consortia** before you touch the spreadsheet.

2 | The five biggest ROI-model mistakes (seen in 2024-25)

1. **Over-optimistic revenue curves** ("hockey sticks") with no bottom-up sales/PPA logic.

2. **Under-modelled O&M escalation**, ignoring inverter replacements and high-voltage compliance costs.

3. **Confusing profitability with liquidity** (P&L shows profit while monthly cash turns negative).

4. **Ignoring equity dilution and capital stack effects** from layered funding rounds (e.g., convertibles, mezzanine, or green bonds).

5. **Single-scenario bliss** — no base/downside cases or toggles for price & irradiance shocks. Fin-Wiser

3 | Stress-testing: putting sensitivity analysis to work

Modern guidance emphasises three nested approaches; one-way, multi-way and **probabilistic (Monte-Carlo)** sensitivity, to reveal which levers (irradiance, PPA price, CAPEX, debt-margin) truly swing IRR/NPV.

Key best-practice points:

- Pinpoint the critical few variables before running hundreds of simulations.
- Use tornado charts for board-level conversations; keep the heavy Monte-Carlo in the background.
- Pair sensitivity outputs with **hedging or commercial mitigations** (e.g., interest-rate swaps, EPC price caps).
- Energy arbitrage calculations require assumptions for future market price, quantity and competitive dynamics. In turn, prices should reflect supply and demand assumptions.

4 | Building the model: variables you cannot skip

Pillar	Essential inputs & tips
Cost stack	CAPEX (modules, inverters, HV works), EPC contingencies, land leases, network access, financing & development fees. Fin-Wiser
Production	Site-specific GHI, degradation curve (-0.4% p.a. typical), availability losses, curtailment assumptions.
Revenue	PPA tariff or index (CfD strike, merchant curve), RECs/REGOs, capacity payments, ancillary-service upside.
Capital	Debt tenor & sculpting, hedge premiums, equity IRR hurdle; for Australia add **LGC** price paths.
Policy/tax	CfD indexation (UK), Dh tariff escalator (UAE), instant-asset-write-off & carbon credit price (AU).

5 | Accounting for policy change & price volatility

UK:

DESNZ's 2025 CfD-AR7 shift from a fixed budget to a **"capacity ambition"** means bid sizing must remain a live scenario until auction close. Renewable Exchange

- **Wholesale price risk:** 2024 saw record hours of negative power prices across Europe; statistical price models missed them, while **fundamental dispatch models** (e.g., PLEXOS) captured – €100/MWh events. Energy Exemplar
- **Tariff benchmarks:** The UK solar PPA market has been steadily declining—Q3 2024 figures show average fixed-price solar PPAs at ~£76/MWh—suggesting downside cases could use £70/MWh or lower as a base. Solar Power Portal

6 | Q&A

Q1 – What's the single worst assumption you can make?

"A flat 95 % availability for 25 years. Real-world data shows outages and curtailment knock this to ~91 % by year 10." fin-wiser.com

Q2 – How exactly does sensitivity analysis save deals?

It highlights *which* covenant bites first; at Cleve Hill, a 10 % CAPEX overrun hurt the DSCR more than a 5 % PPA haircut — so lenders insisted on an EPC fixed-price, not a higher tariff. Energy arbitrage calculations should reflect future competitive landscapes. Cost

forecasts should reflect observed cost curves, especially if capex is multiple years ahead. quinbrook.com

Q3 – Which variables must every solar/renewable model include?

LCOE inputs (CAPEX, OPEX, yield), financing metrics (WACC, DSCR), tax shields, degradation, curtailment, merchant tail, exit multiple. Optionality to add batteries if not already included. fin-wiser.com

Q4 – How do you price in future policy shifts?

Run a **policy-off / policy-on** pair of cases (e.g., CfD lapses, UAE green-certificate boost). Then layer price-path volatility using a fundamental model to test break-even IRR under each regime. Try to insure against policy shifts - look at the USA for recent examples of policy changes that negatively impact returns. energyexemplar.com

Key take-aways for practitioners

- **Partnership structure drives the spreadsheet**: secure multi-bank or utility partnerships first; numbers follow.
- **Mistakes are predictable**: over-stated revenues, under-counted costs, single-scenario optimism.
- **Sensitivity is non-negotiable**: Monte-Carlo or multi-way analysis exposes weak covenants before lenders do.
- **Volatility & policy iterate**: embed toggles for CfD/PPA shifts and feed them a volatile price curve, not a flat escalator.
- **Audit-ready models win capital**: clear sheet architecture and cited sources build investor trust.

About the Authors

PJ McCloskey

Director

pj@mcceconomics.co.uk

+(971) 58 588 7584

Rodrigo Remor

Consultant

rodrigo@mcceconomics.co.uk

+(39) 342 832 3977

Offices & Locations	Kemp House, 160 City Road London, EC1V 2NX, United Kingdom Al Sarab Tower, Abu Dhabi Global Market, UAE Office 901-2, Apricot Tower, Silicon Oasis, Dubai
Incorporation	UAE & UK
Registration details	UAE licence number 47005411
Web address	**www.mcceconomics.co.uk**
General email	**tenders@mcceconomics.co.uk**