



**International Institute
for Sustainable Finance**

EXECUTIVE EDUCATION • COURSE 05 OF 06

Renewable Energy and Green Infrastructure

Course Syllabus

Self-paced online course

About 20 hours • 8 modules • 40 lessons

2026 Edition

Version 1.0 • October 2026

sustainablefinance.in

COURSE 05

Course Overview

The technology, economics, contracts, and finance of clean energy and sustainable infrastructure.

Meeting climate goals requires a rapid build-out of renewable power and of infrastructure that is low in carbon and resilient to a changing climate. This course explains how such projects work technically, how they earn revenue, how they are financed, and how their environmental and social risks are managed.

Participants calculate the levelised cost of energy, size project debt, and read a power purchase agreement. They work with IRENA and IEA data, the Equator Principles, the IFC Performance Standards, the ICMA Green Bond Principles, and green building and infrastructure standards.

At a glance

Level	Introductory to intermediate
Format	Self-paced and online. Recorded lessons on the IISF learning platform.
Study time	About 20 hours
Structure	8 modules and 40 lessons
Enrolment	Open throughout the year, with no fixed start date
Access	12 months from enrolment
Assessment	A quiz in every module, then a final quiz
Award	IISF Certificate of Completion for the course
Fee	USD 200. All six courses taken together: USD 1,000.
Prerequisites	None. The financial methods are taught within the course. Course 1 is recommended first.

Who the course is for

- 1 Bankers, investors, and analysts entering energy and infrastructure finance.
- 2 Developers, engineers, and corporate energy buyers who need financial fluency.
- 3 Policy and development professionals working on the energy transition.

COURSE 05

Outcomes and Structure

What you will be able to do

On completing the course, a participant should be able to:

CO1	Explain how solar, wind, hydropower, and storage technologies generate and deliver electricity.
CO2	Calculate the levelised cost of energy and analyse its sensitivity to the cost of capital.
CO3	Compare auctions, feed-in tariffs, and power purchase agreements.
CO4	Calculate debt capacity from cash flow available for debt service.
CO5	Evaluate a project against the IFC Performance Standards and the Equator Principles.
CO6	Structure the financing of a renewable energy or green infrastructure project.

Course structure

Module	Title	Lessons	Study time
Module 1	The Energy Transition	5	2 h 15 min
Module 2	Renewable Technologies	5	2 h 15 min
Module 3	The Economics of Renewable Projects	5	2 h 15 min
Module 4	Markets, Policy, and Procurement	5	2 h 15 min
Module 5	Project Finance for Renewables	5	2 h 15 min
Module 6	Green Infrastructure Beyond Power	5	2 h 15 min
Module 7	Financing Instruments and Capital Sources	5	2 h 15 min
Module 8	Environmental, Social, and Delivery Risk	5	2 h 15 min
Assessment	Revision and final quiz		2 h
Total		40	20 h

MODULE 1 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

The Energy Transition

The energy system, why and how fast it is changing, and what that means in different countries.

No.	Lesson	What it covers
1.1	Energy basics	Primary and final energy, capacity and generation, the capacity factor, and units.
1.2	The case for transition	Emissions, energy security, and cost; the COP28 goal to triple renewable capacity by 2030.
1.3	Status and trends	What IRENA and IEA data show on deployment, cost, and where investment flows.
1.4	Country pathways	India's 500 gigawatt target, China, the European Union, ASEAN, and Africa.
1.5	Access and fairness	Sustainable Development Goal 7, clean cooking, and Just Energy Transition Partnerships.

Ref.	On completing this module, you should be able to:
LO 1.1	Distinguish between capacity and generation and calculate a capacity factor.
LO 1.2	Describe the commitments of the COP28 UAE Consensus on energy.
LO 1.3	Compare the energy transition pathways of India, China, and the European Union.

Standards and frameworks	IEA World Energy Outlook and Net Zero Roadmap; IRENA renewable capacity statistics; COP28 UAE Consensus (2023); Tracking SDG 7 report; Just Energy Transition Partnerships.
Core reading	Marked extract from IEA, World Energy Outlook (latest edition), Executive Summary.
Key terms	primary energy; final energy; capacity; generation; capacity factor; dispatchable; energy access; just transition.
Case study	India's solar decade. From the National Solar Mission of 2010 to one of the world's largest solar fleets.
Practice exercise	Read a national energy balance and calculate the share of renewables in generation.

MODULE 2 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

Renewable Technologies

How the main technologies work, what determines their output, and where each fits.

No.	Lesson	What it covers
2.1	Solar photovoltaics	Modules, inverters, trackers, degradation, and energy yield at P50 and P90.
2.2	Wind	Onshore and offshore turbines, the wind resource, wake losses, and capacity factors.
2.3	Hydro, geothermal, bioenergy	Their roles in the system and the sustainability questions each raises.
2.4	Storage and flexibility	Lithium-ion batteries, pumped hydro, storage duration, and round-the-clock supply.
2.5	Emerging options	Green hydrogen and ammonia, offshore wind in new markets, and technology readiness.

Ref.	On completing this module, you should be able to:
LO 2.1	Explain how solar and wind plants convert a resource into electricity.
LO 2.2	Estimate the annual generation of a plant from its capacity and capacity factor.
LO 2.3	Compare storage technologies by duration, cost, and use.

Standards and frameworks	IEC 61215 and IEC 61730 for photovoltaic modules; IEC 61400 for wind turbines; P50 and P90 energy yield assessment; Hydropower Sustainability Standard (2021); IEA Global Hydrogen Review.
Core reading	Marked extract from IRENA, Renewable Power Generation Costs (latest edition).
Key terms	module; inverter; tracker; degradation; P50 and P90; wake loss; storage duration; round-the-clock supply; electrolyser.
Case study	Bhadla Solar Park. A solar park of more than two gigawatts in the Rajasthan desert: land, evacuation, and dust.
Practice exercise	Estimate annual output and revenue for a 100 megawatt solar plant at a stated capacity factor.

MODULE 3 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

The Economics of Renewable Projects

Costs, revenues, returns, and why the cost of capital decides whether a project is built.

No.	Lesson	What it covers
3.1	Cost structure	Capital cost, operating cost, and financing cost across a project's life.
3.2	Levelised cost of energy	The formula, its inputs, and what it leaves out.
3.3	Revenue	Tariffs, contracted and merchant sales, curtailment, and degradation.
3.4	Returns	Net present value, project and equity internal rates of return, and payback.
3.5	Cost of capital	The weighted average cost of capital, and why it is higher in emerging markets.

Ref.	On completing this module, you should be able to:
LO 3.1	Calculate the levelised cost of energy of a project.
LO 3.2	Calculate the net present value and internal rate of return of a project.
LO 3.3	Analyse the effect of the cost of capital on the levelised cost of energy.

Standards and frameworks	IRENA Renewable Power Generation Costs; IEA Cost of Capital Observatory; levelised cost of energy; discounted cash flow analysis.
Core reading	Marked extract from IEA, Reducing the Cost of Capital (2024).
Key terms	capital expenditure; operating expenditure; levelised cost of energy; net present value; internal rate of return; weighted average cost of capital; country risk premium.
Case study	One plant, two countries. Why an identical solar plant costs more per unit in a high-risk market than in a low-risk one.
Practice exercise	Calculate the levelised cost of a solar project at two costs of capital and explain the gap.

MODULE 4 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

Markets, Policy, and Procurement

How renewable power is bought and sold, and the rules that govern claims about it.

No.	Lesson	What it covers
4.1	Support schemes	Feed-in tariffs, reverse auctions, contracts for difference, purchase obligations, and net metering.
4.2	Power purchase agreements	Utility and corporate agreements, physical and virtual; tenor, take-or-pay, and termination.
4.3	Certificates and claims	Renewable energy certificates, the Scope 2 Guidance, RE100 criteria, and hourly matching.
4.4	India and ASEAN	Central and state auctions, open access, distribution company risk, and the Philippine auction programme.
4.5	Grid integration	Transmission, curtailment, ancillary services, and connection queues.

Ref.	On completing this module, you should be able to:
LO 4.1	Compare feed-in tariffs, auctions, and contracts for difference.
LO 4.2	Distinguish between physical and virtual power purchase agreements.
LO 4.3	Apply the GHG Protocol Scope 2 Guidance to a renewable electricity claim.

Standards and frameworks	GHG Protocol Scope 2 Guidance (2015); RE100 Technical Criteria; I-REC Standard; India's Green Energy Open Access Rules (2022); Philippine Green Energy Auction Program; contracts for difference.
Core reading	Marked extract from GHG Protocol, Scope 2 Guidance (2015).
Key terms	feed-in tariff; reverse auction; contract for difference; take-or-pay; virtual agreement; renewable energy certificate; market-based method; curtailment.
Case study	Rewa Ultra Mega Solar. A 750 megawatt park in Madhya Pradesh whose payment security design produced a record-low tariff in 2017.
Practice exercise	Compare a physical and a virtual agreement for a corporate buyer and recommend one.

MODULE 5 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

Project Finance for Renewables

The structure, risk allocation, debt sizing, and credit support of a project financing.

No.	Lesson	What it covers
5.1	The structure	The project company, sponsors, lenders, and the construction, operation, and offtake contracts.
5.2	Allocating risk	Construction, resource, offtaker, regulatory, currency, and political risk, and who bears each.
5.3	Sizing debt	Cash flow available for debt service, coverage ratios, sculpting, tenor, and reserve accounts.
5.4	The financial model	The cash flow waterfall, covenants, and base and downside cases.
5.5	Credit support	Guarantees, political risk insurance, payment security, and currency hedging.

Ref.	On completing this module, you should be able to:
LO 5.1	Describe the contractual structure of a renewable project financing.
LO 5.2	Calculate the debt capacity of a project from its cash flow and a target coverage ratio.
LO 5.3	Evaluate the allocation of risk among the parties to a project.

Standards and frameworks	Equator Principles (EP4, 2020); IFC Performance Standards (2012); debt service coverage and loan life coverage ratios; MIGA guarantees; partial risk guarantees; TCX currency hedging.
Core reading	Marked extract from IFC, Utility-Scale Solar Photovoltaic Power Plants: A Project Developer's Guide (2015).
Key terms	special purpose vehicle; limited recourse; cash flow available for debt service; debt service coverage ratio; sculpting; reserve account; waterfall; covenant.
Case study	Lake Turkana Wind Power. Kenya's 310 megawatt wind farm, a delayed transmission line, and who paid for the delay.
Practice exercise	Size the debt for a wind project at a coverage ratio of 1.30 and test a downside case.

MODULE 6 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

Green Infrastructure Beyond Power

Sustainable transport, buildings, water, and nature-based infrastructure, and the standards that define quality.

No.	Lesson	What it covers
6.1	Scope	Transport, water and sanitation, waste, buildings, and digital infrastructure.
6.2	Green buildings	LEED, EDGE, BREEAM, GRIHA, and IGBC ratings; energy codes; embodied carbon.
6.3	Nature-based solutions	The IUCN Global Standard, mangroves and wetlands as infrastructure, and urban cooling.
6.4	Resilience	Physical climate risk assessment, ISO 14090, and the Coalition for Disaster Resilient Infrastructure.
6.5	Quality standards	The G20 Principles for Quality Infrastructure Investment, the FAST-Infra Label, and GRESB.

Ref.	On completing this module, you should be able to:
LO 6.1	Compare the principal green building rating systems.
LO 6.2	Apply the IUCN Global Standard to a nature-based solution.
LO 6.3	Assess the physical climate risk of an infrastructure asset.

Standards and frameworks	LEED; EDGE (IFC); BREEAM; GRIHA; IGBC; IUCN Global Standard for Nature-based Solutions (2020); ISO 14090:2019; G20 Principles for Quality Infrastructure Investment (2019); FAST-Infra Label; GRESB Infrastructure Assessment.
Core reading	Marked extract from IUCN, Global Standard for Nature-based Solutions (2020).
Key terms	embodied carbon; operational carbon; green rating; nature-based solution; blue-green infrastructure; hazard; exposure; vulnerability; resilience dividend.
Case study	Delhi Metro. Financing, ridership, and avoided emissions in one of Asia's largest urban rail systems.
Practice exercise	Screen a proposed water project against the four dimensions of the FAST-Infra Label.

MODULE 7 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

Financing Instruments and Capital Sources

Where the money comes from: bonds, institutional investors, development finance, and blended structures.

No.	Lesson	What it covers
7.1	Green bonds and loans	The ICMA principles, the Climate Bonds Standard, the EU Green Bond Standard, and sovereign green bonds.
7.2	Institutional capital	Infrastructure funds, India's infrastructure investment trusts, and refinancing after construction.
7.3	Development finance	Multilateral banks, development finance institutions, the Green Climate Fund, and concessional terms.
7.4	Blended finance	First-loss capital, guarantees, and viability gap funding.
7.5	Coal transition finance	Just Energy Transition Partnerships, early retirement mechanisms, and transition credits.

Ref.	On completing this module, you should be able to:
LO 7.1	Explain the four core components of the ICMA Green Bond Principles.
LO 7.2	Compare commercial, concessional, and blended sources of capital.
LO 7.3	Structure a blended capital stack for a portfolio of small renewable projects.

Standards and frameworks	ICMA Green Bond Principles; Climate Bonds Standard; EU Green Bond Standard (EU 2023/2631); LMA Green Loan Principles; Green Climate Fund; GFANZ guidance on managed phase-out (2022); EU, ASEAN, and Indian taxonomies.
Core reading	Marked extract from ICMA, Green Bond Principles.
Key terms	use of proceeds; external review; infrastructure investment trust; refinancing; concessional finance; first-loss capital; viability gap funding; transition credit.
Case study	ACEN and the SLTEC coal plant. A 2022 energy transition mechanism transaction to retire a 246 megawatt Philippine coal plant early.
Practice exercise	Build a three-tier capital stack for a mini-grid portfolio and state who takes first loss.

MODULE 8 OF 8 • 2 HOURS 15 MINUTES • 5 LESSONS

Environmental, Social, and Delivery Risk

The safeguards lenders apply, the risks in supply and construction, and the investment decision.

No.	Lesson	What it covers
8.1	Impact assessment	Environmental and social impact assessment, IFC Performance Standards 1 to 8, and project categorisation.
8.2	Land and communities	Resettlement, Indigenous peoples, consent, and biodiversity, including wind and bird mortality.
8.3	Supply chain risk	Forced labour risk in solar supply, critical minerals, and end-of-life recycling.
8.4	Construction and operation	Contractor risk, delay, performance guarantees, and health and safety.
8.5	The investment memorandum	Structure, key risks, mitigants, and the recommendation.

Ref.	On completing this module, you should be able to:
LO 8.1	Classify a project by environmental and social risk under the Equator Principles.
LO 8.2	Identify the Performance Standards that a given project triggers.
LO 8.3	Formulate an investment recommendation supported by financial and risk analysis.

Standards and frameworks	IFC Performance Standards on Environmental and Social Sustainability (2012); Equator Principles (EP4); World Bank Environmental and Social Framework; Uyghur Forced Labor Prevention Act; Solar Stewardship Initiative.
Core reading	Marked extract from IFC, Performance Standards on Environmental and Social Sustainability (2012).
Key terms	impact assessment; categorisation; involuntary resettlement; critical habitat; cumulative impact; liquidated damages; performance guarantee; investment memorandum.
Case study	The Great Indian Bustard. Power lines, a critically endangered bird, and India's Supreme Court rulings of 2021 and 2024.
Practice exercise	Draft a two-page investment memorandum for a solar or wind project.

COURSE 05

Learning and Assessment

How you will learn

Recorded lessons	Five lessons in each module, available at any time on the IISF learning platform.
Core reading	One marked extract in each module, of about ten pages, taken from the standards and reports named in this syllabus.
Practice exercise	One exercise in each module, with a worksheet and a worked solution. It is not assessed.
Case study	One case in each module, drawn from practice in advanced and emerging markets.

How you will be assessed

Module quizzes	A short quiz at the end of each of the eight modules.
Final quiz	A quiz covering all eight modules, taken once the module quizzes are complete.
Pass requirement	Completion of the eight module quizzes and a pass in the final quiz. The pass mark is stated on the learning platform.

Certificate

Course certificate	The IISF Certificate of Completion for this course is awarded to participants who meet the pass requirement.
Executive Certificate	Participants who earn the certificate in all six courses receive the IISF Executive Certificate in Sustainability and Sustainable Finance.
Verification	Every certificate carries a reference that can be checked online.

COURSE 05

Core References

The course draws on the sources below. Each module names the standards and frameworks it teaches, and the learning platform links to the current edition of each.

Publisher or author	Document
IEA	World Energy Outlook (annual)
IEA	Net Zero Roadmap: A Global Pathway to Keep the 1.5°C Goal in Reach (2023)
IEA	Reducing the Cost of Capital (2024)
IRENA	Renewable Power Generation Costs (annual)
UNFCCC	Outcome of the first global stocktake, Decision 1/CMA.5 (2023)
GHG Protocol	Scope 2 Guidance (2015)
Equator Principles Association	The Equator Principles, EP4 (2020)
IFC	Performance Standards on Environmental and Social Sustainability (2012)
IFC	Utility-Scale Solar Photovoltaic Power Plants: A Project Developer's Guide (2015)
ICMA	Green Bond Principles
Climate Bonds Initiative	Climate Bonds Standard, Version 4
IUCN	Global Standard for Nature-based Solutions (2020)
G20	Principles for Quality Infrastructure Investment (2019)
Yescombe	Principles of Project Finance, second edition (2013)

Currency of the syllabus

Standards and regulations are cited as in force in October 2026. Lessons are revised when a named standard changes, and the revision is recorded on the learning platform.

EXECUTIVE EDUCATION

The Learning Pathway

This course is one of six. Each stands alone and may be taken in any order, although Course 1 is recommended first.

Course	Title	Study time
Course 1	Foundations of Sustainability	20 h
Course 2	Sustainable Business Models	20 h
Course 3	Sustainable Supply Chains	20 h
Course 4	Sustainable Agriculture and Food Systems	20 h
Course 5	Renewable Energy and Green Infrastructure This course	20 h
Course 6	Impact Investing	20 h

Fees and the Executive Certificate

Each course costs USD 200. The six courses taken together cost USD 1,000. Completing all six earns the IISF Executive Certificate in Sustainability and Sustainable Finance.

Short courses and the CSFP

A short course is assessed by online quiz. The Chartered Sustainable Finance Professional (CSFP) is a designation earned by proctored examination. The short courses carry no exemption from the CSFP examinations, and they are useful preparation for Level I.

About IISF

The International Institute for Sustainable Finance (IISF) is a professional body that sets standards of competence and conduct for sustainable finance, transition capital, climate risk, and responsible investment. It awards the CSFP designation.

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