PETROLEUM ECONOMICS

A classroom guide to project value, fiscal terms and uncertainty

LEARN → MODEL → TEST → EXPLAIN

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CLASSROOM LESSON · 45–60 MINUTES

Petroleum economics: the decision lens

A petroleum project converts uncertain subsurface volumes into timed cash flows.

Economics asks whether value, risk and public outcomes justify the capital and time.

Today: build the logic, read the metrics, then challenge the assumptions.

TEACHING CUE · Keep the decision question visible.

Pause for a learner response or short discussion.

LEARNING TARGETS

By the end, you can…

Sketch project cash flows across exploration, development, production and closure.

Explain NPV, IRR, payback and break-even in plain language.

Show how fiscal terms and uncertainty change value.

Give a short recommendation with evidence and caveats.

TEACHING CUE · A good answer names both value and uncertainty.

Pause for a learner response or short discussion.

ONE PROJECT · THREE QUESTIONS

Start with the decision

Should we explore, appraise, develop, continue, or stop?

Which option creates more value for the same owner and price basis?

Who receives the value—and when?

TEACHING CUE · Model only what the decision needs.

Pause for a learner response or short discussion.

THE TIMELINE MATTERS

Cash flows follow the project life

Explore & appraise: seismic, wells, studies, and uncertain outcomes.

Develop: facilities, subsea systems, wells, export routes and schedule.

Produce: sales less operating costs, taxes and sustaining investment.

Close: abandonment, restoration and post-closure obligations.

TEACHING CUE · Put each cost and benefit in the period it occurs.

Pause for a learner response or short discussion.

A SIMPLE REVENUE BRIDGE

From production to cash flow

Sales revenue = saleable volume × realised price.

Then account for transport, quality differentials, operating cost and capital.

Apply royalty, tax, production-sharing and financing rules in their correct order.

Check units, currency, dates, price basis and ownership share.

TEACHING CUE · Gross revenue is not project value.

Pause for a learner response or short discussion.

CLASS TOGETHER · ILLUSTRATIVE ONLY

Worked example: value over time

Year 0 investment: −$100 million.

Year 1 cash flow: +$60 million; Year 2: +$60 million.

At a 10% annual discount rate: NPV = −100 + 60/1.10 + 60/1.10².

NPV ≈ +$4.1 million: positive at this rate, before uncertainty and omitted costs.

TEACHING CUE · Change one assumption at a time, then stress combinations.

Pause for a learner response or short discussion.

DON’T MIX THE SIGNALS

Four measures, four questions

NPV: how much value is created at the chosen discount rate?

IRR: what discount rate makes NPV equal zero?

Payback: how long until cumulative cash flow turns positive?

Break-even: what price, cost, volume or schedule makes the decision threshold bind?

TEACHING CUE · NPV is usually the clearest value measure; use the rest as context.

Pause for a learner response or short discussion.

TRACE THE CONTRACTUAL WATERFALL

Fiscal terms shape distribution

Possible components: bonuses, royalties, cost recovery, profit share, income tax and state participation.

Progressive terms may change with production, prices, profitability or time.

Compare government take over the full project life—not only a headline rate.

Separate contractor economics from public-revenue timing and national benefits.

TEACHING CUE · Use the applicable contract and law; never assume a generic fiscal rate.

Pause for a learner response or short discussion.

MODEL HYGIENE

Make the spreadsheet auditable

Separate inputs, calculations and outputs; label every assumption and unit.

Use dated cash flows and one consistent real or nominal basis.

Reconcile formula chains, tax logic, ownership shares and sign conventions.

Keep a source, date, owner and change log for material inputs.

TEACHING CUE · If another analyst cannot trace it, it is not decision-ready.

Pause for a learner response or short discussion.

LOW · BASE · HIGH

Uncertainty: scenarios before precision

Vary price, production, recovery, capital, operating cost, schedule, FX and fiscal terms.

Test combinations that can occur together; avoid impossible independent extremes.

Use sensitivity charts to find the few assumptions that move the decision most.

Label forecasts by source, publication date and scenario.

TEACHING CUE · A forecast is an input to a scenario—not a fact.

Pause for a learner response or short discussion.

CURRENT REFERENCE POINTS · NOT PROJECT ASSUMPTIONS

Market context · 20 November 2026

EIA's 10 Nov 2026 outlook: Brent near $100/b for the rest of 2026; forecast average $77/b in Q4 2027.

That path depends on stated assumptions; it is not a realised price or a Namibia project forecast.

IMF Oct 2026 WEO: global growth projected at 3.1% in 2026 and 3.4% in 2027.

Translate macro context into project-specific price, cost, demand and schedule cases.

TEACHING CUE · Refresh market inputs before each real investment decision.

Pause for a learner response or short discussion.

VALUE IS MORE THAN GROSS SPEND

Namibia: measure national value carefully

Track local jobs, skills transfer, supplier capability and domestic procurement.

Include infrastructure, public revenue timing, environmental obligations and transition costs.

Avoid counting gross spending as net benefit; identify who pays and who benefits.

Use measurable outcomes and a transparent counterfactual.

TEACHING CUE · Local content targets need capability, timing and cost evidence.

Pause for a learner response or short discussion.

10 MINUTES · USE YOUR PRACTICE WORKBOOK

Team exercise · make the call

Choose a case from the Petroleum Economics Workshop or UEM Case 1/2 workbook.

Check the assumptions, formula flow, tax logic and unit consistency.

Report NPV or the workbook's main decision metric under low/base/high cases.

Recommend proceed, defer or stop—with two key risks and one data request.

TEACHING CUE · Explain the decision in 60 seconds.

Pause for a learner response or short discussion.

THREE QUESTIONS TO TAKE AWAY

Exit check & references

What decision is the model supporting—and from whose perspective?

Which two assumptions change the result most?

What is excluded, uncertain or legally unverified?

Sources: EIA STEO, 10 Nov 2026 · IMF WEO, Oct 2026 · supplied Petroleum Economics teaching materials and workbooks.

TEACHING CUE · Educational material; verify law, terms and data before use.

Pause for a learner response or short discussion.