

# UNIVERSITY OF PIRAEUS

Department of International & European Studies

## *Special Issues in Energy Finance and Risk Management (DES216)*

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### FINAL EXAMINATION — EXAM CASE

June 2026. Duration: 2 hours. Answer ALL questions.

## PART A — Corporate Finance, Investment Appraisal & Strategy

### The Case: VOLT ENERGY plc

VOLT ENERGY plc (“VOLT”) is a vertically integrated, multinational power and gas group headquartered in Rotterdam. It is listed on Euronext Amsterdam (AEX) with a secondary listing on the London Stock Exchange. The group operates four strategic segments: (a) Generation & Wholesale Trading; (b) Retail Supply, serving 6 million customers; (c) Renewables & Storage; and (d) Hydrogen & New Energies.

At year-end 2025, installed capacity totaled 13,000 MW: 8,000 MW of renewables (wind and solar), 4,000 MW of high-efficiency combined-cycle gas turbines (CCGT), and 1,000 MW-equivalent of battery storage (BESS). Management has announced a €3,000 million capital-investment program for 2026–2029. The group is rated BBB (S&P); its principal debt covenant requires Net Debt / EBITDA to remain below 3.5x to preserve its investment-grade rating.

#### Consolidated Income Statement, FY 2025 (€ million)

Item	FY 2025
Revenue	12,000
Cost of sales	(8,400)
<b>Gross profit</b>	<b>3,600</b>
Operating expenses (OPEX)	(1,200)
<b>EBITDA</b>	<b>2,400</b>
Depreciation & amortization (D&A)	(600)
<b>EBIT</b>	<b>1,800</b>
Net finance costs	(600)
Profit before tax (EBT)	1,200
Income tax (25%)	(300)
<b>Net profit</b>	<b>900</b>

#### Consolidated Balance Sheet, 31/12/2025 (€ million)

Assets	Amount	Equity & Liabilities	Amount
Property, plant & equipment (net)	12,000	Share capital	2,000
Intangibles & goodwill	1,500	Reserves & retained earnings	4,000

Inventories	600	<b>Total equity</b>	<b>6,000</b>
Trade & other receivables	1,800	Long-term borrowings	6,000
Cash & cash equivalents	1,200	Other long-term liabilities	1,500
		Short-term borrowings	1,500
		Trade & other payables	2,100
<b>Total assets</b>	<b>17,100</b>	<b>Total equity &amp; liabilities</b>	<b>17,100</b>

### Supplementary Information

- Net debt = 6,000 (LT) + 1,500 (ST) – 1,200 (cash) = €6,300 million.
- Weighted average cost of capital (WACC): 10.0%.
- Capex program 2026–2029: €3,000 million (60% renewables, 20% BESS, 15% grids/networks, 5% hydrogen). Phasing: 2026 = 1,000; 2027 = 1,000; 2028 = 600; 2029 = 400.
- Incremental EBITDA from the program (€ million): 2027 = 150 · 2028 = 350 · 2029 = 550 · 2030 and each year thereafter = 700 (over 2031-2040).
- Credit rating BBB (S&P); investment-grade covenant: Net Debt / EBITDA < 3.5x.

### Questions — Part A

#### Question 1 — Financial Ratio Analysis

For FY 2025, calculate and briefly interpret the following ratios: (i) EBITDA margin; (ii) Return on Equity (ROE); (iii) Net Debt / EBITDA; (iv) Interest Coverage Ratio; (v) Current Ratio; (vi) Gross Debt / Equity (gearing). Comment on what these indicate about VOLT's profitability, leverage and liquidity, and whether the investment-grade covenant is respected.

#### Question 2 — Strategic (SWOT) Analysis

Construct a SWOT analysis for VOLT, with at least three well-justified items per quadrant, grounded in the case facts (portfolio mix, customer base, capital structure, rating, and the energy-transition context).

#### Question 3 — Investment-Program Appraisal

(a) Compute the Net Present Value (NPV) of the €3,000 million program over a 15-year explicit horizon (2026–2040) at a 10% WACC, treating incremental EBITDA as a proxy for cash inflow, with the steady-state €700 million incremental EBITDA held flat from 2030 through 2040 (no perpetuity / terminal value). (b) Estimate the simple (undiscounted) payback period. (c) Assess the financing viability of the program given the current capital structure and the 3.5x covenant.

#### Question 4 — Strategic Recommendations 2026–2030

Formulate five to six strategic recommendations for VOLT over 2026–2030, covering: generation portfolio, customer/retail, ESG and decarbonisation, financial structure/funding, and international expansion. Each recommendation should be specific and tied to the case.

## SOLUTIONS

The following are indicative model answers. Reasonable alternative assumptions, clearly stated, should be credited.

### PART A

#### Solution 1 — Financial Ratio Analysis

Ratio	Formula	Result
EBITDA margin	$\text{EBITDA} / \text{Revenue} = 2,400 / 12,000$	<b>20.0%</b>
ROE	$\text{Net profit} / \text{Equity} = 900 / 6,000$	<b>15.0%</b>
Net Debt / EBITDA	$\text{Net debt} / \text{EBITDA} = 6,300 / 2,400$	<b>2.63x</b>
Interest coverage	$\text{EBIT} / \text{Net finance costs} = 1,800 / 600$	<b>3.0x</b>
Current ratio	$(\text{Inventories} + \text{Trade \& other receivables} + \text{Cash \& cash equivalents}) / (\text{Short-term borrowings} + \text{Trade \& other payables})$ $= (600 + 1,800 + 1,200) / (1,500 + 2,100)$	<b>1.00x</b>
Gross Debt / Equity	$(\text{Long-term borrowings} + \text{Short-term borrowings}) / \text{Total equity} = (6,000 + 1,500) / 6,000$	<b>1.25x</b>

#### Interpretation:

- **Profitability — upper moderate.** The 20% EBITDA margin means every €1 of revenue generates €0.20 of operating (pre-D&A) earnings, and the 15% ROE means shareholders earn €0.15 for each €1 of equity invested. Both fall in the healthy band for an integrated utility and exceed the 10% cost of capital, so VOLT is creating value for shareholders — consistent with its diversified, partly renewable earnings base.
- **Leverage — moderate, with headroom.** Net Debt/EBITDA of 2.63x means it would take about 2.6 years of current EBITDA to repay net debt. This sits clearly below the 3.5x covenant, so the BBB investment-grade rating is preserved, with roughly €2.1bn of additional debt capacity before the covenant binds. Gearing of 1.25x (debt is 1.25 times equity) is typical for a capital-intensive utility.
- **Coverage — adequate but not generous.** Interest cover of 3.0x means operating profit (EBIT) is three times the annual interest bill, so EBIT could fall by about two-thirds before profit no longer covers interest. This is a moderate safety buffer — acceptable for investment grade, but it leaves limited room if earnings weaken or interest rates rise.
- **Liquidity — tight.** A current ratio of exactly 1.00x means current assets only just cover current liabilities, with no margin. VOLT relies on its €1,200m cash balance and undrawn credit facilities to meet day-to-day obligations, so working-capital and refinancing risk should be monitored. Note that utilities often operate near 1.0x because their cash flows are stable and largely contracted.

#### Solution 2 — SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Diversified, vertically integrated value chain (generation → retail) smoothing margins.</li> </ul>	<ul style="list-style-type: none"> <li>• Tight liquidity (current ratio 1.0x) and modest interest cover (3.0x).</li> <li>• Continued exposure to gas/CO<sub>2</sub> price volatility via the 4,000 MW CCGT fleet.</li> </ul>

<ul style="list-style-type: none"> <li>• Large, low-carbon fleet (8,000 MW renewables + 1,000 MW BESS) aligned with the transition.</li> <li>• Investment-grade BBB rating with covenant headroom; 6m-customer retail base.</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy capex needs strain free cash flow and balance-sheet flexibility.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Growth in renewables, storage and flexibility/ancillary-services revenues.</li> <li>• Hydrogen and new-energy optionality; green-bond/sustainable financing access.</li> <li>• Electrification of demand expanding the retail and PPA market.</li> </ul>	<ul style="list-style-type: none"> <li>• Commodity and carbon price volatility; merchant-power price cannibalization by renewables.</li> <li>• Regulatory/political risk (windfall taxes, market intervention).</li> <li>• Rising interest rates lifting funding costs; execution risk on the €3bn program.</li> </ul>

### Solution 3 — Investment-Program Appraisal

#### (a) NPV (15-year explicit horizon, 2026–2040, WACC = 10%)

**What NPV measures.** NPV is the value created today by the whole program, after paying for it. Every future euro is brought back to 2025 money using the 10% WACC and compared with the cash spent. A positive NPV means the program is worth more than it costs, so it should be accepted.

#### How it is calculated (three steps):

- **Step 1 – Net cash flow each year = incremental EBITDA – capex.** This is the money the program generates minus the money spent on it that year (the “Net CF” column below).
- **Step 2 – Discount each year to today.**  $PV = \text{Net CF} \times \text{discount factor}$ , where the discount factor (DF) =  $1 \div (1.10)^t$  and  $t$  is the number of years after 2025. Money further in the future is worth less today, so later cash flows are multiplied by a smaller DF.
- **Step 3 – NPV = sum of the 15 discounted cash flows.** We model the program over a 15-year horizon (2026–2040), with the steady €700m of extra EBITDA shown explicitly for each year from 2030 onwards, and simply add up the PV column. No perpetuity or terminal value is used: the analysis stops at 2040.

Applying Steps 1–2, the yearly figures and their present values are:

Year (t)	Capex	Incr. EBITDA	Net CF	DF @10%	PV
2026 (1)	(1,000)	0	(1,000)	0.9091	(909.1)
2027 (2)	(1,000)	150	(850)	0.8264	(702.5)
2028 (3)	(600)	350	(250)	0.7513	(187.8)
2029 (4)	(400)	550	150	0.6830	102.5
2030 (5)	0	700	700	0.6209	434.6
2031 (6)	0	700	700	0.5645	395.1
2032 (7)	0	700	700	0.5132	359.2
2033 (8)	0	700	700	0.4665	326.6
2034 (9)	0	700	700	0.4241	296.9
2035 (10)	0	700	700	0.3855	269.9

2036 (11)	0	700	700	0.3505	245.3
2037 (12)	0	700	700	0.3186	223.0
2038 (13)	0	700	700	0.2897	202.8
2039 (14)	0	700	700	0.2633	184.3
2040 (15)	0	700	700	0.2394	167.6

- **Step A — PV of the build & ramp years (2026–2030):** add up the PV column for these years =  $(909.1) + (702.5) + (187.8) + 102.5 + 434.6 = -€1,262.3$  million. They are net-negative because the heavy capex is spent before the extra earnings ramp up.
- **Step B — PV of the steady-state years (2031–2040):** ten years each delivering €700m of extra EBITDA. Adding their PVs =  $395.1 + 359.2 + 326.6 + 296.9 + 269.9 + 245.3 + 223.0 + 202.8 + 184.3 + 167.6 = +€2,670.7$  million. These years are all positive: the build is finished, so the full €700m flows through.

**Step C — NPV = Step A + Step B =  $-1,262.3 + 2,670.7 \approx +€1,408$  million (positive).**

The program is value-accretive over the 15-year horizon: it earns above the 10% WACC, and the steady €700m of incremental EBITDA from 2030 onwards more than offsets the early capex.

#### (b) Simple payback period

Cumulating undiscounted incremental EBITDA against the €3,000m outlay: 150 (2027) → 500 (2028) → 1,050 (2029) → 1,750 (2030) → 2,450 (2031) → 3,150 (2032). The €3,000m threshold is crossed during 2032 ( $\approx (3,000 - 2,450) / 700 \approx 0.79$  into the year).

Simple payback  $\approx$  6 years of incremental earnings (i.e. around 2032), or roughly 7 years from the first spend in 2026 — typical of energy-infrastructure assets.

#### (c) Financing viability

- At the 3.5x covenant and base EBITDA of €2,400m, maximum tolerable net debt  $\approx$  €8,400m. Current net debt is €6,300m — leaving only  $\approx$  €2,100m of debt headroom against €3,000m of capex.
- Therefore the program cannot be fully debt-financed without breaching the covenant.
- The shortfall is about €900m (€3,000m capex – €2,100m debt headroom). This portion must be funded from internally generated cash flow, equity (a capital increase / rights issue) or asset rotation rather than new debt. The larger the debt-funded share, the sooner the 3.5x covenant binds and a capital increase becomes unavoidable.
- As incremental EBITDA ramps (reaching +€700m steady-state), the denominator grows and the ratio self-corrects — but the 2026–2028 build phase is the period of greatest covenant and liquidity pressure and must be carefully sequenced.

### Solution 4 — Strategic Recommendations 2026–2030

1. Portfolio: Accelerate renewables and BESS build-out per the 60/20 capex split; gradually convert or retire the oldest CCGT capacity while retaining CCGTs as flexible back-up monetized through capacity and ancillary-services markets.
2. Customer/Retail: Defend and grow the 6m-customer base with value-added products (dynamic tariffs, EV charging, home solar/storage, demand response), improving retention and margin stability that offsets wholesale volatility.
3. ESG & decarbonization: Set and disclose science-based targets; use sustainability-linked financing; develop hydrogen optionality selectively (pilot before scaling) to manage technology and demand risk.

4. Financial structure: Protect the BBB rating — fund growth with a balanced mix (operating cash flow, green bonds, project finance, asset rotation); keep Net Debt/EBITDA on a path below 3.5x and lengthen debt maturities to reduce refinancing risk.
5. Risk management: Systematically hedge the clean spark spread and retail supply book; set VaR and credit limits; manage liquidity for margin calls.
6. International expansion: Grow selectively in markets with stable, supportive regulatory regimes and contracted (PPA/CfD) revenues, prioritizing risk-adjusted returns over volume.

## Annex I

This Annex is a study aid. It explains

- the benchmark ranges used to judge each financial ratio,
- a step-by-step method for building a SWOT analysis, and
- how to judge whether an investment or a company is financially viable.

Indicative ranges and methods are drawn from standard corporate-finance practice and textbooks.

### 1. Benchmark ranges for the financial ratios

Ratios are only meaningful against a benchmark. Compare each indicator with (i) the bands below, (ii) sector peers, and (iii) the company's own history and any covenant or rating threshold. The bands are indicative and vary by industry and across the economic cycle.

Indicator	Formula	Indicative ranges (what they signal)	VOLT (verdict)	FY2025
<b>Profitability — EBITDA margin</b>	$\text{EBITDA} \div \text{Revenue}$	Weak: < 10% Moderate: 10–20% Strong: > 20% (Sector-dependent: regulated networks/utilities often run 25–40%.)	20.0% — upper-moderate	
<b>Profitability — ROE</b>	$\text{Net profit} \div \text{Equity}$	Weak: < 8% Adequate: 8–15% Strong: 15–20%	15.0% — upper end of adequate; above the 10% WACC (it should be above cost of equity, as not provided, WACC is used)	
<b>Leverage — Net Debt/EBITDA</b>	$\text{Net debt} \div \text{EBITDA}$	Conservative: < 2x Moderate: 2–3x (typical investment-grade utility) Elevated: 3–4x Aggressive / sub-investment-grade: > 4–5x For portfolios that include regulated assets, up to about 3.5x is acceptable — here it preserves the BBB investment-grade rating.	2.63x — moderate; inside the 3.5x covenant	
<b>Leverage — Gearing (D/E)</b>	$\text{Total debt} \div \text{Equity}$	Low: < 1x Typical capital-intensive utility: 1–1.5x High: > 2x	1.25x — typical for the sector	
<b>Coverage — Interest cover</b>	$\text{EBIT} \div \text{Net finance costs}$	Distress risk: < 1.5x Adequate: 1.5–3x Comfortable: 3–5x Strong: > 5x (EBITDA-based coverage runs higher; investment grade usually > 3x on EBIT.)	3.0x — adequate, modest buffer	
<b>Liquidity — Current ratio</b>	$\text{Current assets} \div \text{Current liabilities}$	< 1.0: potential strain 1.0–1.5: adequate but tight 1.5–2.0: healthy Quick ratio > 1.0 is desirable.	1.00x — tight	

How to read a number against the bands: state what the ratio measures, place the value in a band, compare with the relevant threshold (covenant/rating/cost of capital), and give a one-word verdict (weak / adequate

/ strong). Where several years of data are available, also note the direction of travel: whether a ratio is improving or deteriorating over time matters as much as its level.

**Note on gearing (Debt/Equity).** Gearing shows how much of the firm’s capital comes from debt versus equity: 1.25x means VOLT carries €1.25 of debt for every €1 of shareholders’ equity. It is a balance-sheet (stock) measure of leverage, whereas Net Debt/EBITDA is an earnings (flow) measure.

Both are shown because they answer different questions — gearing describes the capital structure and the size of the equity cushion that protects lenders, while Net Debt/EBITDA shows how many years of earnings would be needed to repay the debt and is the metric the rating covenant is written against.

Higher gearing raises financial risk and the cost of equity because it magnifies returns in good years and losses in bad years; for capital-intensive utilities with stable, partly contracted cash flows, gearing of about 1–1.5x is normal and consistent with an investment-grade rating.

## 2. How to make a SWOT analysis

**SWOT** summarizes the position of a firm on two axes. **Internal** factors, which management controls, are **Strengths** and **Weaknesses**. **External** factors, from the environment, are **Opportunities** and **Threats**. A good SWOT is evidence-based and specific to the case — not a generic list.

**Method (follow the steps):**

- **Step 1 — Define the objective and scope.** Be clear about the firm, business unit and time horizon you are assessing.
- **Step 2 — Audit the inside (S & W).** Review resources and capabilities: portfolio/asset mix, market position and customer base, cost position, technology, management, and the financials/ratios. A resource is a strength when it is valuable and hard to imitate (resource-based view).
- **Step 3 — Scan the outside (O & T).** Use a structured lens such as PESTEL (political, economic, social, technological, environmental, legal) to surface market, regulatory, commodity-price and competitive factors.
- **Step 4 — Select material, evidence-backed items.** Keep at least three well-justified points per quadrant; each must be tied to a specific case fact (e.g. a ratio, capacity, rating or covenant).
- **Step 5 — Prioritize.** Rank items by impact and likelihood; a SWOT that does not distinguish the critical few from the trivial many is of little use.
- **Step 6 (optional) — Convert SWOT into strategy with a TOWS matrix.** Pair internal and external factors to generate concrete actions:

TOWS matrix	Opportunities (O)	Threats (T)
<b>Strengths (S)</b>	SO — use strengths to seize opportunities (attack/grow).	ST — use strengths to defend against threats.
<b>Weaknesses (W)</b>	WO — fix weaknesses to capture opportunities (improve/invest).	WT — minimize weaknesses and avoid threats (defend/exit).

**Common pitfalls to avoid:** vague one-word entries, long unranked lists, mixing internal with external factors, and stopping at the four boxes without translating them into actions. The value of SWOT is the strategy it generates, not the table itself.

## 3. How to judge financial viability

**Financial viability** asks two linked questions: does the investment **create value**, and can the firm actually **fund it and stay solvent** while doing so? Assess it through three lenses.

**Lens A — Value creation (is it worth doing?).**

- **NPV > 0** is the primary decision rule: discount future free cash flows at the WACC; accept if positive. A positive NPV means the project earns more than the cost of the capital it uses.
- **Supporting metrics:** IRR > WACC, profitability index > 1, and discounted payback. Use NPV when signals conflict, because it measures value in money terms.

#### **Lens B — Funding capacity & solvency (can it be financed?).**

- **Debt headroom** = (covenant multiple × EBITDA) – current net debt. Check the financing plan does not breach debt covenants or the target credit rating.
- **Capital structure:** decide the debt/equity mix. The trade-off view balances the tax shield of debt against distress costs; the pecking-order view predicts firms prefer internal funds, then debt, then equity last. A capital increase (equity issue) is the option of last resort when debt capacity is exhausted.

**How a capital increase / rights issue works.** A capital increase raises new equity by issuing additional shares. For a listed company the usual route is a rights issue: with shareholder approval, the company offers existing shareholders the right to buy new shares in proportion to their current holding (for example, one new share for every four held) at a subscription price set at a discount to the prevailing market price to encourage take-up. Each shareholder can then either exercise the rights and pay for the new shares or sell the rights to other investors in the market; any rights not taken up are usually placed with other buyers, often through an underwriter who guarantees the proceeds for a fee. Once the new shares are issued and paid for, the company receives the cash, its share capital and equity rise, and leverage ratios such as Net Debt/EBITDA and gearing fall — which is precisely why a firm that has used up its debt headroom turns to an equity issue to fund further investment while protecting its credit rating.

#### **Lens C — Liquidity, timing & resilience (does it survive shocks?).**

- **Cash-flow timing & payback:** ensure the firm can meet outflows during the build phase before returns arrive; long paybacks are normal for energy infrastructure but raise liquidity risk.
- **Sensitivity & scenario analysis:** stress the key drivers (prices, volumes, WACC, capex) and identify break-even points. Surveys show practitioners rely heavily on NPV, IRR and sensitivity analysis.

**Decision rule (checklist):** a project is financially viable when NPV > 0 (value), the financing plan keeps the firm within its covenants and rating (solvency), liquidity is sufficient through the build phase, and the conclusion is robust to reasonable downside scenarios. Failing any one of these is a warning sign even if the others pass.

#### **Applied to VOLT (worked illustration):**

- **Value:** NPV ≈ +€1.41bn (> 0) and the return exceeds the 10% WACC — the program creates value. ✓
- **Solvency:** debt headroom ≈ €2.1bn against €3.0bn capex, so ≈ €0.9bn must come from cash flow, equity or asset rotation; the 3.5x covenant holds if the build is sequenced. ✓ (with care)
- **Liquidity:** payback of ≈ 6–7 years and a current ratio of 1.0x make 2026–2028 the pressure period; monitor closely. ⚠ (be cautious)
- **Conclusion:** the program is viable and value-accretive, but only if funding is structured to protect the BBB rating and manage build-phase liquidity.

## **4. Recommended reading**

For a fuller, freely available treatment of the material in this Annex — reading the financial statements, ratio analysis, and the time value of money that underpins NPV — see the open-access resources below.

- **Bigel, K. S. (2022), Introduction to Financial Analysis (Open Touro, CC BY) — recommended.** A complete, university-level open textbook: how to read the financial statements, the full set of ratios (liquidity, solvency, profitability, return, turnover and market), forecasting, and the time value of

money — present and future values, annuities and perpetuities — that underpins NPV. Free PDF: [Introduction to Financial Analysis — free PDF \(Open Touro\)](#)

- **Corporate Finance Institute — Financial Ratios eBook.** A short quick-reference cheat sheet of the main ratios with formulas. Free PDF: [corporatefinanceinstitute.com/assets/CFI-Financial-Ratios-Cheat-Sheet-eBook.pdf](https://corporatefinanceinstitute.com/assets/CFI-Financial-Ratios-Cheat-Sheet-eBook.pdf) *Both resources are freely distributed by their publishers under open licenses; links were live at the time of writing.*