What the carbon bill does to the collateral behind a shipping loan

A bank finances eighteen vessels. Each one now pays for its emissions into and out of Europe, and the bill rises with the allowance price. The question for credit is not the bill itself but where it lands: in the borrower's cash flow, in the vessel's value, and therefore in the recovery on the loan. One book, three carbon prices, and the loan-to-value and LGD that follow.

1 · THE BOOK

Eighteen financed vessels, 2.1 million dwt: two Capesizes, two Newcastlemaxes, two Kamsarmaxes, two Ultramaxes, a VLCC, a Suezmax, an Aframax, two MRs, three LNG carriers, a feeder container ship and one vessel running on renewable fuel. Collateral value entered at **€1.0 billion**, loans outstanding **€550 million** — a 55% loan-to-value — and a base loss-given-default of 30%. These three are the bank's own inputs; the tool does not value ships.

Annual carbon cost of the book, EU ETS at €85 per allowance (FuelEU netted to zero by the pool's surplus)	**€24.0M a year**
Vessels whose carbon cost already exceeds €5 per dwt a year — the tool's materiality line	**13 of 18**
Where it concentrates	**three LNG carriers · 52% of the cost**
First vessel to cross the materiality line, and the allowance price at which it does	**LNGC-01 · at €6**

2 · FROM CARBON COST TO COLLATERAL, LOAN-TO-VALUE AND LGD

The lens applies one disclosed rule: the carbon cost the owner cannot pass on reduces the vessel's earnings, so its value falls by the present value of that cost over the loan horizon — ten years, discounted at 8%. The loan does not move, so the loan-to-value rises; recovery falls, so LGD rises by the same share of value lost.

ALLOWANCE PRICE	CARBON COST / YR	PV 10 Y @ 8%	HAIRCUT	COLLATERAL	LTV	LGD
EUA €85 · today	€24.0M	€161M	16.1%	€839M	65.6%	30% → 46%
EUA €120	€33.9M	€227M	22.7%	€773M	71.2%	30% → 53%
EUA €200 · stressed	€56.5M	€379M	37.9%	€621M	88.6%	30% → 68%

At today's price the loan already stands at a 65.6% loan-to-value on the carbon-adjusted collateral, against 55% at origination; at €200 the cover is close to gone. These are indicative inputs to the bank's own collateral review and IRB parameters — not a valuation and not a probability of default.

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3 · HOW €24.0M A YEAR BECOMES A 16% HAIRCUT — STEP BY STEP

Every step is one multiplication a credit analyst can repeat on a calculator. The inputs in the right-hand column are the bank's; the lens supplies only the order of the steps.

ANNUAL COST	CASH-FLOW HIT	CAPITALISED	HAIRCUT	LTV	LGD INPUT
€24.0M / yr	**€24.0M / yr**	**€161M**	**16.1%**	**55% → 65.6%**	**30% → 46%**
EUA €85 · FuelEU 2026	pass-through 0%	PV 10 y @ 8% · ×6.710	÷ €1,000M collateral	€550M ÷ €839M	+ haircut, in points

STEP	RULE	INPUT	RESULT AT €85
Annual carbon cost	EU ETS allowances on the book's EU-scope CO_2e at the day's price; FuelEU after pooling	EUA €85 · FuelEU 2026	€24.0M / yr
Cash-flow impact on the owner	Share the owner cannot pass to charterers	Pass-through 0% (conservative)	€24.0M / yr
Capitalised liability	Present value of that cash flow over the loan horizon: annuity factor = (1 − 1.08^{-10}) / 0.08 = 6.710	10 years · 8%	€161M
Collateral haircut	Capitalised liability ÷ collateral value	Collateral €1,000M	16.1%
Loan-to-value	Loans ÷ (collateral − capitalised liability)	Loans €550M	€550M / €839M = 65.6%
LGD input	Lens convention: base LGD + haircut in points (recovery falls by the value lost, measured against the collateral)	Base LGD 30%	30% + 16.1 = 46%

Two readings of the last step. The lens adds the haircut to the base LGD, which is the conservative reading and the one in the tables above. A model that scales the expected recovery with the collateral value instead gives 30% → 1 − 0.70 × 0.839 = 41%. Which applies depends on how the bank's own LGD model links recovery to security value; the tool shows the inputs so the bank can take either. Neither reading is a PD, and neither replaces a valuation.

4 · WHAT MOVES THE RESULT — AT €85

ASSUMPTION	PV OF COST	HAIRCUT	LTV	LGD
Full pass-through to the owner (the lens's rule)	€161M	16.1%	65.6%	30% → 46%
Half the cost recovered from charterers	€80M	8.1%	59.8%	30% → 38%
Five-year horizon instead of ten (annuity factor 3.99 vs 6.71)	€96M	9.6%	60.8%	30% → 40%

Pass-through is the assumption that matters most. On a time charter the charterer pays for the fuel and, under the usual clauses, the allowances; on the spot market the owner carries the cost until the freight adjusts. The lens takes the owner's full exposure as the conservative case; the bank chooses the share it believes in, per borrower.

5 · WHERE THE RISK SITS — FIVE VESSELS CARRY TWO THIRDS OF THE BILL

VESSEL	CARBON COST / YR	CII	CROSSES €5/DWT AT	DRIVERS
LNGC-01 · TFDE LNG carrier, 85k dwt	€6.4M	E	€6	high EU share · methane slip +31.7%
LNGC-02 · TFDE LNG carrier, 84k dwt	€3.8M	E	€9	methane slip · CII E
LNGC-03 · TFDE LNG carrier, 94k dwt	€2.3M	E	€18	methane slip · CII E
MV FEEDER-01 Feeder container, 35k dwt	€2.2M	E	€7	intra-EU trading · FuelEU deficit
MV NMX-02 Newcastlemax, 208k dwt	€1.2M	E	€74	CII E · FuelEU deficit

Transition risk score per vessel: carbon-cost intensity per dwt 30%, CII rating 25%, fuel pathway 20%, methane uplift 15%, EU regulatory concentration 10% — simple enough to defend in a credit paper, and recomputed as the inputs change. Methane slip on the three TFDE LNG carriers is counted on the CO_2-equivalent basis the EU ETS applies from 2026.

6 · WHAT THE CREDIT PAPER CAN SAY TOMORROW MORNING

- **Covenant monitoring.** Six vessels sit in the high-transition bucket — a third of the book. Trigger: move them to quarterly climate reporting into the loan file.
- **Collateral review.** Thirteen vessels are above the €5/dwt materiality line today, fifteen at €200. Trigger: carry the carbon-adjusted value into the next collateral review, with the pass-through share agreed per borrower.
- **Allowance exposure.** The EU ETS is the whole of the €24.0M; a move from €85 to €200 adds €32.5M a year unhedged across the book. Trigger: assess forward allowance cover against the borrowers' surrender profile.
- **Methane.** Three LNG carriers carry a 31.7% methane uplift and head the watchlist. Trigger: verify engine technology per unit and re-run the book at GWP_{20} before the accounting debate reaches policy.

7 · WHAT IS CERTAIN, AND WHAT IS NOT

- **Known:** the rule, the regulation behind each figure (EU ETS on the MRV basis, FuelEU Maritime at the 2026 target), and the allowance price on the day.
- **The bank's own inputs:** collateral value, loans outstanding, base LGD, discount rate and horizon. Change them and every line above moves with them; the tool keeps the arithmetic, not the judgement.
- **Estimated:** each vessel's consumption and trading pattern — class archetypes here, the borrower's own data in a pilot. A vessel that burns 10% more carries a 10% larger bill.
- **Not modelled:** freight-market response, second-hand values, charter pass-through beyond the share the bank sets, and anything about probability of default. Poseidon alignment is reported separately in the same tool; it answers a different question.

MCCS-BV runs this on the bank's own book: the portfolio loaded from a vessel list, the credit dashboard, the LGD lens and the Poseidon view from one set of figures, on the bank's own machine. No loan data leaves the building.

Basis. MCCS-BV v1.39, demonstration portfolio of 18 vessels (archetypes; no real ships or borrowers), run 8 Nov 2026. EU ETS at 100% surrender for 2026 emissions, CO_2e basis; EUA €85 today, €120 and €200 as scenarios — not forecasts. FuelEU Maritime at the 2026 target, netted across the pool: the renewable-fuel vessel's surplus covers the others' deficits, so the FuelEU line is zero for this book. Collateral €1.0bn, loans €550M, base LGD 30%, discount 8%, horizon 10 years are illustrative inputs. Materiality line €5 per dwt a year. Indicative inputs to the institution's own rating, collateral and RWA processes; not a valuation, not a PD, not investment or credit advice.

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