



Transition Capacity of an Emerging-Market National Oil Company: A Framework-Based Assessment of Indonesia

Nugroho Setyo Utomo^{1*}, Hermanto Siregar², Koes Pranowo¹, Nimmi Zulbainarni¹

¹ School of Business, IPB University, Bogor 16151, Indonesia

² Department of Economics, Faculty of Economics and Management, IPB University, Bogor 16680, Indonesia

Corresponding Author Email: nugrohosetyo_utomo@apps.ipb.ac.id

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ABSTRACT

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Emerging-market national oil companies must deliver energy security at administered prices, remit dividends to a fiscally constrained owner, and finance a low-carbon transition from one cash flow. How much green investment can such a firm absorb before its financial durability is compromised? A two-dimensional financial resilience framework is applied to Indonesia's state-owned integrated energy company using audited consolidated accounts for 2020 to 2025. The reference distributions and the distress estimates on which the framework rests are obtained here, from a panel of 55 of the world's largest listed oil and gas companies over 2010 to 2024, so that every parameter used can be traced to data and method reported in this paper. In that panel, state ownership is associated with 72% lower odds of crossing the net-leverage distress threshold (odds ratio 0.279, 95% confidence interval 0.106 to 0.737) while leaving the level dimension unchanged. For the case firm, net debt to earnings before interest, taxes, depreciation and amortisation (EBITDA) of 0.73 times sits far inside the four-times threshold and the liquidity buffer of 15.9% of assets is roughly five times the panel median, yet the resilience ratio of 0.50 falls below the panel median of 0.61. Absorption analysis, computed after income tax, locates the 2025 planning boundary at 1.63% of assets per year. After the dividend actually remitted to the state, headroom is negative. An earnings contraction of 25%, recorded in the firm's own accounts between 2023 and 2024, removes the boundary entirely. Five governance recommendations for the state as shareholder follow.

1. INTRODUCTION

The transition dilemma facing emerging-market national oil companies is sharper than the one facing the international majors. National oil companies are typically expected to secure domestic fuel supply, frequently at administered prices, to remit dividends to a fiscally constrained owner, and, increasingly, to invest in low-carbon capacity, all from the same cash flow. Where investor-owned majors negotiate this trade-off with capital markets, national oil companies negotiate it with a single shareholder who is simultaneously the regulator, the price-setter, and the fiscal beneficiary. The consequence is that transition mandates arrive as instructions rather than as market signals, and the question of whether they are financially absorbable is rarely asked before they are issued.

This is not a marginal concern. National oil companies control the majority of the world's proved reserves and an increasing share of refining capacity [1, 2], and their transition trajectories will therefore determine a large part of the industry's aggregate emissions path. In emerging economies, they are also among the few actors with balance sheets large enough to finance sustainable energy capacity at scale, which makes the financing of green investment by these firms a

development-planning question as much as a corporate-finance one, a linkage that both the political economy of energy transition and the green financing literature have begun to map systematically [3, 4]. Yet the empirical literature on transition finance has developed almost entirely on listed international majors, for whom continuous disclosure makes panel estimation feasible [5-7]. The firms that matter most for the outcome are the ones about which least is known.

This paper applies a two-dimensional financial resilience framework to a single emerging-market national oil company and asks what the evidence implies for a state shareholder setting transition mandates. The framework's reference distributions and its distress estimates are obtained in this paper, from a panel of 55 of the world's largest listed oil and gas companies over 2010 to 2024, and are reported in Section 3.4, so that every parameter used in the assessment can be traced to data and method presented here. The contribution is one of translation, measurement, and governance design. Three moves are made. First, the Indonesian national oil company is positioned within the distribution of its global peers on the framework's own metrics, which reveals a firm strong on some dimensions and unremarkable on others in a pattern that aggregate commentary tends to obscure. Second, its absorption boundary is computed, defined as the annual

transition burden that can be funded from operating cash flow after income tax without drawing on reserves, and the contraction of that boundary under an earnings shock is traced. Third, these findings are translated into five governance recommendations addressed to the state as shareholder rather than to management.

Two features of the design deserve emphasis at the outset. The assessment draws on six consecutive years of audited accounts, from 2020 to 2025, so that the cyclical position of the assessment year is observable rather than assumed. And the absorption calculation is performed after income tax and again after dividends, so that the distinction between

obligations the firm cannot avoid and distributions the shareholder chooses is preserved rather than obscured. That distinction turns out to carry most of the paper's governance content.

The paper proceeds as follows. Section 2 sets out the two-dimensional framework and the concept of absorption capacity. Section 3 describes the case-based design, the data, the metrics, and the reference panel. Section 4 reports the assessment. Section 5 develops governance implications. Section 6 states limitations and a research agenda, and Section 7 concludes.

Table 1. Reference panel: random-effects panel logit estimates of distress

Variable	Odds Ratio	Standard Error (Beta)	95% CI (Odds Ratio)
State ownership (TYPE)	0.279***	0.495	0.106 - 0.737
Green investment (GRN)	0.902	0.650	0.252 - 3.225
Leverage (DER)	1.111	0.065	0.978 - 1.262
Tangibility (TAN)	0.032***	1.183	0.003 - 0.325
Liquidity buffer (LIQ)	0.001***	2.456	0.000 - 0.094
Asset turnover (ATO)	0.882	0.114	0.706 - 1.102
Size (SIZE)	0.861	0.173	0.613 - 1.209
World GDP growth (GDP)	0.957	0.072	0.832 - 1.102
Price volatility (VOL)	0.905**	0.050	0.821 - 0.999
Interest rate (IR)	1.027	0.127	0.800 - 1.317
Firm-level standard deviation (σ)	1.281		
Observations / firms	744 / 55		

Notes: Dependent variable is a binary distress indicator, equal to one when net debt exceeds four times EBITDA. Random-effects panel logit, sixteen-point Gauss-Hermite quadrature; 744 firm-years, 55 firms, 2011 to 2024; incidence 13.3%. All covariates lagged one year. Standard errors from the numerical Hessian. Rho is 0.333 and the area under the receiver operating characteristic curve is 0.752. *** $p < 0.01$, ** $p < 0.05$.

2. CONCEPTUAL FRAMEWORK

2.1 Two dimensions of financial resilience

The framework applied here treats financial resilience as having two distinct dimensions rather than one. The level dimension asks how much capacity to service the debt stock a firm sustains on average, measured as operating cash generation relative to total debt, in the tradition of cash-flow-based early-warning measures developed for emerging markets [8]. That tradition has since been extended to non-bank financial intermediaries in the same market setting [9] and to the transmission of distress into equity returns through the pandemic period [10]. The event dimension asks how likely the firm is to cross a threshold of financial pressure, measured as a binary distress state. The distinction is not cosmetic. In the reference panel described in Section 3.4, state ownership leaves the level dimension statistically unchanged while being associated with approximately 72% lower odds of crossing the distress threshold, as reported in Table 1. The wider repositioning of this literature from financial distress toward financial resilience has been reviewed systematically elsewhere [11]. A variable can therefore be irrelevant to the average and decisive at the extreme. The explanation for this pattern is a difference in exposure rather than a difference in management. A sovereign owner that sets domestic prices, adjusts fiscal terms, and absorbs part of the price cycle attenuates the transmission of commodity price movements before those movements reach the income statement [12-19]. Attenuated transmission compresses the lower tail of the outcome distribution without shifting its centre, which is precisely the pattern observed in the panel. The attenuation is partial rather than complete, however, and Section 4.1

documents an earnings contraction of roughly one quarter in the case firm's own accounts within the observation window.

2.2 Structural versus adaptive resilience

These findings support a distinction between two forms of durability. Structural resilience is conferred by institutional position: a sovereign owner able to provide implicit guarantees, preferential financing, and fiscal terms that absorb part of the price cycle before it reaches company earnings [12-19]. It works by attenuating shocks. Adaptive resilience is accumulated through managerial choice, through conservative leverage, liquidity buffers, portfolio flexibility, and investment sequencing [20, 21], and works by absorbing shocks after they arrive. In dynamic-capabilities terms [22, 23], adaptive resilience is a reconfiguration capability, while structural resilience is an endowment that lowers the need for reconfiguration.

For a wholly state-owned firm, the governance implication is uncomfortable. The same insulation that protects the firm financially attenuates the market discipline that would otherwise force transition, a tension already visible in the mixed evidence on the operating efficiency of state-owned producers [24]. Structural resilience buys time; whether that time is used for transformation is a matter of ownership design rather than of market pressure. This is the central reason why the recommendations offered here are addressed to the shareholder rather than to management.

2.3 Measurement in very large firms

Two measurement results condition the assessment that follows. First, conventional distress criteria do not transfer to

firms of this scale. In the reference panel of Section 3.4, among the 799 firm-years for which the full ratio set is available, an interest-coverage criterion identifies only 14 distress events and a non-positive-earnings criterion 13, while a net-leverage criterion identifies 90. The three together identify 103 events, or 12.9% of firm-years, and every event flagged by the coverage criterion is already flagged by one of the other two, so the coverage criterion contributes nothing of its own. The median coverage ratio on an earnings before interest, taxes, depreciation and amortisation (EBITDA) basis is 19.0 times, so a coverage-based trigger is effectively silent through the industry's worst episodes. Net debt above four times EBITDA is therefore the appropriate trigger for this population.

That threshold is not chosen arbitrarily. It is written explicitly into supervisory guidance on leveraged transactions in the euro area [25] and into the interagency guidance issued by the United States banking agencies [26]; it is used in the same range by the Financial Stability Board in its assessment of leveraged lending vulnerabilities [27]; and it corresponds to the point at which published rating methodology moves a financial risk profile from significant to aggressive. The academic basis is equally established. Covenants written on debt to EBITDA are among the most common terms in private credit contracts, and their breach has measurable real effects on corporate investment [28, 29]. The ratio of debt to operating cash flow has been used as a measure of debt overhang with a demonstrated causal effect on investment [30]. Threshold-based classification of distressed firms is standard in the literature on zombie firms [31, 32], which conventionally applies an interest-coverage trigger; the substitution of a leverage-based trigger here is required by the emptiness of the coverage criterion in this population rather than chosen for convenience. Second, the discriminatory power of conventional financial ratios weakens in a population of financially homogeneous giants, so a firm's position relative to peer percentiles is more informative than its absolute ratio values.

2.4 Absorption capacity and the non-linear boundary

The absorption of an additional transition cash burden is not linear in the size of that burden. The mechanism is a threshold effect. While free cash flow remains positive, a burden is met from operations and leaves the balance sheet unchanged. Once free cash flow turns negative, cash reserves deplete and the shortfall becomes new borrowing, which raises net leverage toward the distress threshold. The point at which that transition occurs is therefore the quantity of interest for a shareholder setting a mandate.

The construct applied here is defined at three levels, and the distinction between them is substantive rather than presentational. Gross headroom is EBITDA less financing costs less baseline capital expenditure. Post-tax headroom deducts income tax expense, which is not discretionary. Post-distribution headroom further deducts the dividends actually remitted to the shareholder, which are discretionary. The absorption boundary is the annual transition burden, expressed as a proportion of total assets, at which post-tax headroom reaches zero; that boundary is reported throughout as the planning quantity. Below it a transition programme is self-funding from operations; above it the programme necessarily draws on reserves or on new debt. The three-level definition matters because the gap between the post-tax and post-distribution lines is not an accounting detail but the

shareholder's own decision variable, and Section 5 returns to it. The construct is deliberately mechanical rather than behavioural, and it is conservative in the sense that firms in practice respond by re-phasing capital expenditure and adjusting distributions.

3. DESIGN AND DATA

3.1 Case-based application

A single-case application design is adopted. The case is Indonesia's state-owned integrated energy company, selected on three criteria. It is wholly state-owned, so the structural-resilience mechanism operates in its purest form. It is an integrated producer operating under administered domestic fuel prices, which introduces an exposure that the reference panel captures only partially. And it publishes audited consolidated accounts, which makes the framework metrics computable despite the absence of a stock exchange listing.

The case is not included in the reference panel precisely because it is not an exchange-listed entity with the continuous disclosure that panel construction requires. That absence is itself informative in two ways. It illustrates the disclosure gap that prevents systematic financial assessment of a substantial share of the global industry, and it means that the application here proceeds by structural analogy rather than by inclusion in the estimation.

3.2 Data

Firm data are taken from the audited consolidated financial statements published in the company's Annual Reports for 2020 through 2025. Revenue, operating income, EBITDA, total assets, total liabilities and total equity are taken from the multi-year performance summaries. Profit before income tax, income tax expense, finance costs, dividends paid, and cash and cash equivalents are taken from the consolidated statement of profit or loss and the consolidated statement of cash flows. Interest-bearing debt is taken from the capital management note. Capital expenditure is measured as the sum of three investing cash flow lines, namely purchases of oil and gas and geothermal properties, purchases of fixed assets, and purchases of exploration and evaluation assets, because that measure is the only one available on a consistent basis for all six years.

Two features of the published data are recorded here rather than left implicit. EBITDA as reported by the company is stated to be measured on the basis used for the collective key performance indicators of the Board of Directors rather than on a standard audited definition, and it is reproduced here as published without restatement. And the company's management discussion reports capital goods investment for 2025 of US\$6,612 million on an accrual basis, against the US\$5,994 million of investing cash outflow used here; the consequence of that difference for the absorption boundary is quantified in Section 4.4. All figures are expressed in United States dollars as published.

3.3 Metrics

Framework metrics are computed as follows. The resilience ratio is EBITDA divided by total interest-bearing debt, and is the level-dimension measure. Net debt to EBITDA is the

event-dimension trigger, evaluated against the four-times threshold, where net debt is interest-bearing debt less cash and equivalents. The liquidity buffer is cash and equivalents divided by total assets. Asset turnover is revenue divided by total assets. Two coverage measures are reported separately and are not interchangeable: the interest coverage ratio, defined as operating income divided by finance costs, and an EBITDA-based coverage ratio, defined as EBITDA divided by finance costs. The distinction is retained throughout, and only the EBITDA-based measure is used for comparison with the panel, because operating income is not available on a consistent basis for the panel firms. Each metric is compared with the corresponding percentile of the reference distribution. The absorption boundary is then computed as defined in Section 2.4, at base earnings and under earnings reductions of 10%, 25% and 40%.

3.4 Reference panel: Data, method and estimates

The reference distributions used in Section 4.2 and the distress estimates cited in Section 2.1 are obtained from a panel constructed for this purpose, and are reported here so that no parameter used in the assessment rests on a source external to this paper. The panel covers 55 of the world's largest listed oil and gas companies over the period 2010 to 2024, comprising 825 firm-years, of which 799 carry the complete ratio set used throughout and form the analysis base; 22 of the firms are majority state-owned and 33 are investor-owned, giving 310 state-owned and 489 investor-owned firm-years. Firms were identified from the petroleum refining category of the Fortune Global 500 across the observation window, and accounting data were drawn from published consolidated statements. Individual ratios are available for between 757 and 799 firm-years depending on the metric, and reported percentiles are computed on the available observations.

Distress is coded as a binary state. A firm-year is classified as distressed when net debt exceeds four times EBITDA. A firm-year with non-positive EBITDA and positive net debt is classified as distressed, and a firm-year with non-positive net debt is classified as healthy. On this definition, the incidence over 2010 to 2024 is 103 events among 799 firm-years, or 12.9%, concentrated in the two price collapses of 2014 to 2016 and of 2020. The rule selects exactly the same firm-years as a three-part composite of non-positive EBITDA, interest coverage below one, and net leverage above four times, which is why a single leverage-based trigger is used throughout. Incidence differs sharply by ownership: 27 of 310 state-owned firm-years, or 8.7%, against 76 of 489 investor-owned firm-years, or 15.5%.

The event dimension is estimated as a random-effects panel logit with a firm-specific intercept, fitted by maximum likelihood using sixteen-point Gauss-Hermite quadrature, with standard errors obtained from the numerical Hessian. All covariates are lagged one year, so that the specification is an early-warning rather than a contemporaneous one. The estimation sample is 744 firm-years covering 55 firms over 2011 to 2024, with an incidence of 13.3%. Table 1 reports the estimates as odds ratios.

State ownership is associated with an odds ratio of 0.279, equivalent to approximately 72% lower odds of crossing the distress threshold, significant at the 1% level. The estimate is robust in direction and in significance to a pooled logit with standard errors clustered by firm, which returns an odds ratio

of 0.390. Asset tangibility and the liquidity buffer are the strongest firm-level protective factors, while leverage carries the expected positive sign without attaining conventional significance. The share of unexplained variance attributable to the firm-specific intercept is 0.33, and the area under the receiver operating characteristic curve is 0.752.

Two features of these estimates matter for the assessment that follows. The variables that discriminate at the extremes are not the variables that dominate the average, which is the empirical content of the two-dimensional framework. And the protective role of the liquidity buffer, which is the single most distinctive feature of the case firm's balance sheet, is established on panel evidence rather than asserted.

4. ASSESSMENT

4.1 Financial position

Table 2 summarises the financial position and the derived framework metrics for the six years from 2020 to 2025. In 2025, the firm generated EBITDA of US\$11.4 billion on revenue of US\$70.9 billion, against total assets of US\$91.6 billion and interest-bearing debt of US\$23.0 billion. Cash and equivalents stood at US\$14.6 billion, so net debt was US\$8.4 billion. Capital expenditure was US\$6.0 billion on the investing cash flow measure, and financing costs were US\$1.2 billion at a reported cost of debt of 4.56%. Income tax expense was US\$2.7 billion, and dividends of US\$2.5 billion were remitted to the shareholder.

The six-year series answers a question that a single year cannot. On every framework metric, the position in 2025 lies within the range observed since 2020 and close to the centre of that range: a resilience ratio of 0.50 against a range of 0.39 to 0.60, net leverage of 0.73 times against a range of 0.33 to 1.26, and a liquidity buffer of 15.9% against a range of 14.0% to 21.7%. The assessment year is therefore neither a cyclical peak nor a trough, and the metrics reported below are not an artefact of cyclical position.

Two features of the series deserve separate emphasis because they carry directly into the absorption analysis. Earnings are volatile: EBITDA fell by 24.8% between 2023 and 2024, and the 2020 trough was 47.0% below the 2023 peak. And the effective tax rate ranges from 35.3% to 63.6% with a mean above 40%, which reflects the fiscal terms applying to upstream operations in this jurisdiction and which is the reason the distinction between pre-tax and post-tax headroom is material rather than technical.

4.2 Position relative to global peers

Table 3 places the 2025 metrics against the reference distribution described in Section 3.4. The picture is more differentiated than aggregate commentary usually allows, and the two dimensions of the framework point in different directions.

Three readings follow. On the event dimension, the firm is comfortably positioned: net leverage of 0.73 times is roughly half the panel median and less than a fifth of the distress threshold, and the liquidity buffer is an outlier at roughly five times the panel median. On the level dimension, the picture is unremarkable: the resilience ratio of 0.50 falls below both the full-sample median and the median for state-owned firms, indicating that the firm generates less annual operating cash

flow per unit of debt than the typical large producer. Leverage and asset turnover sit almost exactly at panel norms.

Table 2. Financial position and derived framework metrics, 2020-2025

Item	2020	2021	2022	2023	2024	2025
Revenue	41,469	57,509	84,888	75,788	75,327	70,894
EBITDA	7,608	9,256	13,593	14,356	10,793	11,431
Operating income	4,101	4,962	9,520	8,399	6,392	6,386
Profit before income tax	2,258	3,995	6,999	7,376	5,410	6,414
Income tax expense	1,435	1,756	2,939	2,606	1,963	2,732
Profit for the year	823	2,239	4,060	4,770	3,447	3,682
Financing costs	988	996	1,236	1,446	1,387	1,214
Capital expenditure	3,834	4,723	4,519	6,159	6,612	5,994
Dividends paid	574	282	197	908	598	2,530
Total assets	69,144	78,051	87,811	91,124	89,850	91,630
Total equity	31,254	33,328	37,215	41,429	44,081	44,613
Interest-bearing debt	19,484	22,287	26,124	24,105	23,010	22,981
Cash and equivalents	9,937	10,934	19,057	19,386	15,287	14,614
Net debt	9,547	11,353	7,067	4,719	7,723	8,367
Resilience ratio	0.39	0.42	0.52	0.60	0.47	0.50
Net debt / EBITDA	1.26	1.23	0.52	0.33	0.72	0.73
ICR (EBIT / finance costs)	4.15	4.98	7.70	5.81	4.61	5.26
Coverage (EBITDA / finance costs)	7.70	9.29	11.00	9.93	7.78	9.42
Liquidity buffer	14.4%	14.0%	21.7%	21.3%	17.0%	15.9%
Debt to equity	0.62	0.67	0.70	0.58	0.52	0.52
Asset turnover	0.60	0.74	0.97	0.83	0.84	0.77
Capital expenditure intensity	5.5%	6.1%	5.1%	6.8%	7.4%	6.5%
Effective tax rate	63.6%	44.0%	42.0%	35.3%	36.3%	42.6%
Dividend payout ratio	69.7%	12.6%	4.9%	19.0%	17.3%	68.7%

Notes: Compiled from the company's Annual Reports for 2020 to 2025. Amounts in US\$ million. Derived metrics computed by the authors from the reported figures. EBITDA is as published by the company. Capital expenditure is the sum of investing cash outflows for oil and gas and geothermal properties, fixed assets, and exploration and evaluation assets. ICR is operating income divided by finance costs; the EBITDA-based coverage ratio is reported separately because only the latter is comparable with the reference panel. EBITDA = earnings before interest, taxes, depreciation and amortisation, ICR = interest coverage ratio, EBIT = earnings before interest and taxes.

Table 3. Framework metrics relative to the global reference distribution

Metric	Case, 2025	Global Reference	Position
Resilience ratio	0.50	Median 0.61; state-owned median 0.65; 25th percentile 0.35	Below both medians; above the caution threshold
Net debt / EBITDA	0.73×	Median 1.37×; distress threshold 4×	Materially stronger than the median
Coverage (EBITDA / finance costs)	9.42×	Median 19.0×	Below median but far from binding
Liquidity buffer	15.9%	Median 3.1%	Approximately five times the median
Debt to equity	0.52	Median 0.49	At the median
Asset turnover	0.77	Median 0.78	At the median

Notes: Reference distribution from the panel of 55 listed oil and gas companies over 2010 to 2024 described in Section 3.4. Case metrics from Table 2. The coverage ratio is reported on an EBITDA basis for both the case and the panel, because operating income is not available on a consistent basis for the panel firms; the case firm's interest coverage ratio on the operating-income definition is 5.26 times and has no panel counterpart.

Table 4. Free cash flow headroom ladder, 2020-2025

Item	2020	2021	2022	2023	2024	2025
EBITDA	7,608	9,256	13,593	14,356	10,793	11,431
less financing costs	988	996	1,236	1,446	1,387	1,214
less capital expenditure	3,834	4,723	4,519	6,159	6,612	5,994
Gross headroom	2,786	3,537	7,838	6,751	2,794	4,223
less income tax expense	1,435	1,756	2,939	2,606	1,963	2,732
Post-tax headroom	1,351	1,781	4,899	4,145	831	1,491
less dividends paid	574	282	197	908	598	2,530
Post-distribution headroom	777	1,499	4,702	3,237	233	-1,039
Gross boundary (% of assets)	4.03%	4.53%	8.93%	7.41%	3.11%	4.61%
Post-tax boundary (% of assets)	1.95%	2.28%	5.58%	4.55%	0.92%	1.63%
Post-distribution (% of assets)	1.12%	1.92%	5.35%	3.55%	0.26%	-1.13%

Notes: Amounts in US\$ million. Gross headroom is EBITDA less financing costs less capital expenditure. Post-tax headroom deducts income tax expense. Post-distribution headroom further deducts dividends paid as reported in the consolidated statement of cash flows. Boundaries are expressed as a percentage of total assets in the same year.

This combination is what the framework predicts for a structurally resilient firm. Ordinary operating performance coexists with a strong position against extreme outcomes,

because the protection operates on exposure rather than on operations. The very large liquidity buffer merits separate emphasis. It is the single most distinctive feature of the firm's

balance sheet, and the panel estimates in Table 1 identify liquidity as the strongest firm-level protector in the tail of the distribution even though it does not discriminate in the middle. The firm therefore holds, in unusual measure, precisely the asset that matters most where structural protection would be tested.

4.3 Transition commitment profile

The firm's stated transition position is a Net Zero Emission aspiration for Scopes 1 and 2 by 2060 or earlier, operationalised through a roadmap of eight acceleration initiatives spanning geothermal generation, solar, biofuels and low-carbon fuel processing, battery and electric-vehicle ecosystem development, and carbon capture, utilisation and storage. Installed renewable and new-energy capacity reached approximately 3,226 megawatts in 2025, up from approximately 2,502 megawatts a year earlier, an increase of roughly 29%.

That aspiration is not adopted in isolation. It sits inside Indonesia's national net zero emission commitment, the country's position on which has been assessed directly [33], and the factors that determine the attainable national emission level have been identified empirically for the same economy [34]. A corporate commitment of the kind examined here is therefore best read as the firm-level expression of a national target rather than as an independent strategic choice, which is a further reason why the shareholder's mandate, and not management's ambition, is the operative variable in what follows.

The direction of travel is consistent with the wider national research agenda on sustainable energy deployment, where feasibility assessments of solar, wind, and hybrid systems for Indonesian infrastructure have moved from concept to costed engineering-economic analysis [35], and with the broader evidence on the determinants of environmental, social and governance performance in Indonesian and regional firms [36, 37]. Two features of the firm's own position are notable. The commitment is material rather than token by the standards of the global industry, where clean-energy spending has remained a small share of the sector's capital expenditure [38] and cumulative firm-level ratios have been reported in the low single digits [39]. At the same time, the annual report does not disclose transition capital expenditure as a separate, audited line item within capital goods investment, so the share of capital actually allocated to low-carbon assets cannot be verified from published accounts. This is the disclosure gap in concrete form: the commitment is visible, its financing is not.

4.4 Absorption capacity

Applying the definition in Section 2.4 to the 2025 accounts, gross headroom is US\$11.4 billion of EBITDA less US\$1.2 billion of financing costs less US\$6.0 billion of capital expenditure, or US\$4.2 billion, equivalent to 4.61% of total assets. Income tax expense of US\$2.7 billion reduces this to US\$1.5 billion, so the absorption boundary on the post-tax definition adopted here is 1.63% of assets per year. Dividends of US\$2.5 billion remitted to the shareholder reduce headroom further, to negative US\$1.0 billion, or negative 1.13% of assets. Table 4 reports the full ladder for all six years.

Three observations follow from Table 4. The post-tax boundary has ranged from 0.92% to 5.58% of assets per year since 2020, and its 2025 value of 1.63% lies in the lower half

of that range. The post-distribution line was positive in every year from 2020 to 2024 and negative in 2025, which means that in the assessment year the firm did not generate sufficient cash from operations to meet capital expenditure, financing costs, income tax and the dividend simultaneously; the difference was met from the cash balance and from new borrowing. And the gap between the two lines is not stable. Dividends remitted have ranged from 4.9% to 68.7% of profit for the year over the six years, a variation of more than thirteen-fold, so the quantity available for transition investment is determined more by the annual distribution decision than by operating performance.

Two sensitivities are reported rather than left for the reader to discover. On the accrual basis used in the company's own management discussion, which records capital goods investment of US\$6,612 million for 2025, the corresponding boundaries are 3.93% gross and 0.95% post-tax; the choice of capital expenditure measure therefore places the post-tax boundary in a range of roughly 0.95% to 1.63% of assets per year. Separately, finance income of US\$1.0 billion in 2025 nearly offsets the US\$1.2 billion of finance costs deducted here, so measuring the deduction net of finance income would raise each level of the ladder by approximately US\$1.0 billion and would bring post-distribution headroom close to balance. The gross measure is retained because it is consistent with the denominator of the coverage ratios and because it is the conservative choice. Under every variant, the post-tax boundary remains far below the gross figure of 3.93% that a pre-tax calculation would report.

4.5 The fragility of absorption capacity

The boundary is contingent on earnings, and the contingency is severe. Table 5 reports post-tax headroom across a grid of earnings shocks and transition burdens, with income tax scaled at the 2025 effective rate. The grid is calibrated on the firm's own history rather than on an assumed elasticity. The 25% column corresponds to the contraction of 24.8% actually recorded between 2023 and 2024, and the 40% column remains inside the peak-to-trough movement of 47.0% observed between 2023 and 2020.

The result is stark. A 10% earnings reduction lowers the boundary from 1.63% to 0.91% of assets. A 25% reduction, a shock the firm experienced in the year before the assessment year, removes the boundary altogether: post-tax headroom becomes negative, at negative 0.16% of assets, so any transition burden at all must be funded from reserves or from new debt. At a 40% reduction, post-tax headroom is negative US\$1.1 billion before any transition spending whatsoever. Figure 1 shows the base and shocked schedules together.

The disproportion between the shock and the response is the central quantitative finding of this assessment. Capital expenditure, financing costs and, under this fiscal regime, a substantial part of the tax charge are inflexible in the short run, while earnings are not, so absorption capacity is a highly geared quantity. The cash reserve of US\$14.6 billion is what separates a strained programme from a curtailed one: at a burden of 2% of assets under a 25% earnings reduction, the reserve would sustain the shortfall for approximately seven years.

Two implications follow directly. Transition mandates should be expressed as multi-year commitments with explicit contingency provisions rather than as fixed annual percentages, since the affordable percentage is itself a function

of the price cycle and, as Section 4.4 shows, of the distribution decision. And the liquidity buffer identified in Section 4.2

should be understood as transition capacity held in reserve rather than as idle cash available for distribution.

Table 5. Post-tax headroom across earnings shocks and transition burdens

Earnings Shock	EBITDA	Income Tax	Post-tax Headroom	Absorption Boundary	Headroom at Burden of 1% / 2% / 3% / 5% of Assets
None (2025 actual)	11,431	2,732	1,491	1.63% of assets	+575 / -341 / -1,258 / -3,090
EBITDA reduced by 10%	10,288	2,245	835	0.91% of assets	-81 / -998 / -1,914 / -3,746
EBITDA reduced by 25%	8,573	1,515	-149	None; already negative	-1,066 / -1,982 / -2,898 / -4,731
EBITDA reduced by 40%	6,859	784	-1,134	None; already negative	-2,050 / -2,966 / -3,883 / -5,715

Notes: Amounts in US\$ million. Income tax scaled at the 2025 effective rate of 42.6% applied to profit before tax reduced by the earnings shock, floored at zero. The boundary is the burden at which post-tax headroom reaches zero. Depletion horizons in the text assume the 2025 cash balance of US\$14.6 billion absorbs the shortfall with capital expenditure and financing costs held constant.

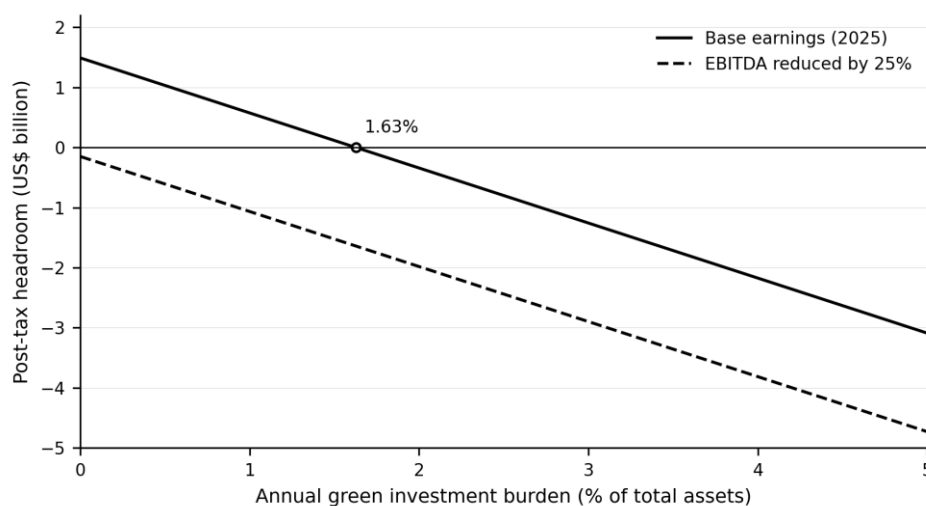


Figure 1. Post-tax free cash flow headroom against the annual green investment burden, at base 2025 earnings and under a 25% earnings reduction

5. GOVERNANCE IMPLICATIONS FOR THE STATE AS SHAREHOLDER

Because structural resilience cannot be chosen by management, and because the insulation it provides also weakens the market discipline that would otherwise force transition, the operative recommendations are addressed to the sovereign shareholder. Five are derived.

5.1 Set the green investment mandate against post-tax absorption capacity, not peer announcements

The assessment locates a planning boundary rather than a target. At 2025 earnings and after income tax, a transition programme of up to approximately 1.6% of assets per year, or roughly US\$1.5 billion, is self-funding from operations before any distribution is made. A programme approaching or exceeding that boundary should be accompanied by an explicit funding plan, whether an equity injection, concessional finance, or partner capital, rather than assumed to be met from operating cash flow. The distinction between this figure and the 4.61% that a pre-tax calculation would report is not a technicality: in this fiscal regime the state takes more than 40% of profit before tax, so a mandate set against pre-tax headroom is set against money that has already been claimed. Benchmarking the mandate against the announcements of

international majors is doubly misleading, because those firms face both a different transmission mechanism and a different shareholder.

5.2 Treat the distribution decision as the primary transition lever

The gap between the post-tax and post-distribution lines in Table 4 is the shareholder's own decision variable, and over the six years examined it has been the largest single determinant of what the firm could fund. Dividends remitted have ranged from 4.9% of profit for the year in 2022 to 68.7% in 2025, and the company's own disclosure records a payout of 85% of net income in respect of the 2024 financial year. In 2025, the amount remitted, US\$2.5 billion, exceeded the entire post-tax headroom of US\$1.5 billion, which is why post-distribution headroom was negative in that year. No operational improvement available to management over a comparable horizon would release a comparable sum. The implication is not that distributions should cease, since the shareholder's fiscal need is real and is part of the same public budget that a transition would serve, but that the distribution decision and the transition mandate should be taken together rather than in separate processes. A mandate issued without reference to the distribution decided in the same year is a mandate whose funding has already been allocated elsewhere.

5.3 Pair mandates with published and audited sustainable energy performance indicators

Insulation reduces the market pressure that disciplines investor-owned firms, so transition commitments at state-linked companies are structurally vulnerable to displacement by dividend and production targets. Explicit, published indicators, namely low-carbon capital expenditure as a share of total capital expenditure, capacity delivered against plan, and emissions intensity, convert a structural advantage into transition capability. The absence of a disclosed transition capital expenditure line in the current accounts is the first gap to close, the more so because commitment without verifiable disclosure is precisely the condition under which greenwashing concerns arise and under which environmental disclosure loses value to outside assessors [40, 41], and the more so because independent assessments of national oil company transition plans now exist precisely to serve banks, investors and regulators [42]. Publishing audited, disaggregated low-carbon capital expenditure would allow the firm to be assessed within the same framework as its listed peers, would permit the state shareholder to verify mandate compliance, and would remove the measurement obstacle that currently limits what can be established about the relationship between transition investment and financial resilience anywhere in the industry.

5.4 Adopt a leverage-based supervisory indicator

The coverage ratios reported in Table 2 illustrate the measurement point made in Section 2.3. On the interest coverage definition used here, operating income divided by finance costs, coverage has ranged from 4.15 to 7.70 times over the six years and stood at 5.26 times in 2025; on an EBITDA basis, the corresponding figures are 7.70 to 11.00 times and 9.42 times. Under either definition, a coverage-based trigger would signal nothing under any plausible scenario. A net-debt-to-EBITDA trigger evaluated against the four-times convention provides the shareholder with an indicator that will actually move before difficulty arrives, consistent with the design logic of climate-related stress testing in the financial-supervision literature [43, 44]. On current figures, the firm stands at 0.73 times, with headroom to the threshold of approximately US\$37 billion of additional net debt, which is precisely the kind of quantified statement a shareholder needs when weighing a mandate.

5.5 Treat liquidity as transition capacity, and sequence accordingly

The panel estimates in Table 1 identify the liquidity buffer as the strongest firm-level protective factor in the tail of the outcome distribution, even though it does not discriminate at the mean. A transition programme financed by drawing down cash therefore exchanges a small average gain for a disproportionate increase in tail exposure. Given that the firm's liquidity buffer is roughly five times the panel median, it has unusual room to sequence a programme through a downturn, but only if the buffer is recognised as a transition asset rather than treated as surplus available for distribution. The decline in the buffer from 21.7% of assets in 2022 to 15.9% in 2025, over a period in which the payout ratio rose sharply, indicates that this recognition is not currently in place.

6. LIMITATIONS AND RESEARCH AGENDA

Four limitations qualify this assessment. The reference panel covers listed firms, so its application to a wholly state-owned company is an assumption rather than a result, although the direction of any bias favours the conclusions reached here, since the excluded firms are plausibly those with the strongest sovereign linkage. EBITDA is reported by the case firm on a basis defined by its own performance framework rather than by a standard audited definition, and no restatement was attempted. The absorption calculation is mechanical: it holds capital expenditure, financing costs and managerial behaviour constant, whereas firms in practice re-phase investment and adjust distributions, so the boundary should be read as a planning quantity rather than as a forecast. And the distress classification depends on a single threshold; the four-times convention is supported by the supervisory guidance and the covenant literature cited in Section 2.3, but the sensitivity of the panel estimates to alternative thresholds is not reported here.

Three extensions follow. The most valuable is to assemble a disclosure-based panel of unlisted national oil companies, which is feasible for the substantial number that publish audited statements, and to estimate the two-dimensional framework directly on that population, which would allow the insulation mechanism to be tested where it is presumed strongest rather than inferred from listed proxies. A second extension is to decompose the insulation mechanism into its fiscal, contractual and hedging components, which would identify which features of state ownership perform the protective function and therefore which are replicable by contract rather than requiring ownership. A third is to apply the absorption framework comparatively across emerging-market national oil companies, which would establish whether the boundary computed here is typical or particular, and whether the dominance of the distribution decision documented in Section 5.2 generalises. Each extension gains urgency from the wider transition-risk agenda, in which the pace of demand decline remains genuinely uncertain [45], the strategic options open to incumbents are contested [46], and the resulting exposures propagate to lenders, investors and sovereign balance sheets [47, 48].

7. CONCLUSIONS

Applying a two-dimensional financial resilience framework to Indonesia's national oil company yields a picture that neither aggregate reassurance nor aggregate alarm would capture. On the event dimension, the firm is strongly positioned, with net leverage at less than a fifth of the distress threshold and a liquidity buffer roughly five times the global median, consistent with panel estimates that associate state ownership with 72% lower odds of distress. On the level dimension, it is unremarkable, generating less operating cash flow per unit of debt than the typical large producer. Six years of accounts confirm that the assessment year is cyclically ordinary rather than exceptional.

The absorption analysis is where the assessment departs most sharply from what headline figures suggest. Gross of tax and distributions, headroom in 2025 amounted to 4.61% of assets, or US\$4.2 billion. After income tax the boundary is 1.63%. After the dividend actually remitted to the state it is negative. An earnings contraction of one quarter, which the

firm experienced between 2023 and 2024, removes the post-tax boundary entirely. The answer to the question posed in the title is therefore not a single percentage but a conditional one: what this firm can absorb depends less on what it earns than on what its owner takes.

The governance conclusion follows from the mechanism rather than from the numbers alone. Structural resilience buys time and simultaneously weakens the market pressure to use it. Converting that time into transition capability is the shareholder's task, and it requires mandates calibrated to post-tax absorption capacity, a distribution decision taken jointly with the mandate rather than in a separate process, performance indicators that make compliance verifiable, a supervisory trigger that will actually fire, and recognition of liquidity as transition capacity rather than as surplus.

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NOMENCLATURE

EBIT	earnings before interest and taxes, reported as operating income
EBITDA	earnings before interest, taxes, depreciation and amortisation
ICR	interest coverage ratio, operating income divided by finance costs