LBOs in Capex-Intensive Businesses: When Maintenance Investment Defeats the Multiple

An Asset-Level Framework for Sustainable Debt Capacity and Equity Returns

Authored by Chennakeshav Adya, Independent Researcher

September 2026

Abstract

Capital-intensive businesses can appear attractive in leveraged acquisitions because depreciation is excluded from EBITDA while replacement and maintenance expenditure is reported below it. The resulting multiple can overstate distributable cash flow when plant, fleet, networks, facilities or specialised equipment require continuing investment. Historical expenditure can also be an unreliable guide when maintenance was deferred, assets are approaching overhaul, utilisation is rising, regulation is tightening or the seller has classified necessary spend as growth. This paper develops an asset-level framework for testing whether maintenance investment defeats the headline LBO multiple. It reconciles the fixed-asset register, condition data, useful lives, capacity, reliability, regulatory obligations, insurance requirements and management plan. Expenditure is separated into routine maintenance, major inspection, replacement, compliance, resilience, integration, debottlenecking and discretionary growth. The framework translates each category into monthly cash, working-capital, downtime, tax, covenant and refinancing effects. Base, catch-up, failure and transition cases establish sustainable free cash flow, debt paydown and equity returns. Five figures and five tables present the asset-age profile, maintenance evidence matrix, EBITDA-to-cash bridge, debt-capacity sensitivity and board certificate. Eight frequently asked questions and twenty-six primary or authoritative sources support application. Numerical values are illustrative analytical scenarios. Transaction-specific conclusions require verified asset, engineering, financial and operational data, executed finance documents and authorised technical, legal, tax, accounting, regulatory, valuation and investment advice.

JEL Classification: G21, G32, G34, G31, M41

Keywords: leveraged buy-out, maintenance capital expenditure, free cash flow, debt capacity, asset intensity, replacement cycle, working capital, covenant headroom, valuation, refinancing

1. Define the sustainable-return question

The transaction team should state the purchase price, leverage, investment horizon, operational plan, minimum asset standard and target equity return. The required output is a signed cash-return mandate. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [1][2].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that the team can price the business on EBITDA before defining the investment required to sustain it. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

2. Reconstruct the asset perimeter

The transaction team should reconcile owned, leased, concession, outsourced and customer-funded assets to legal entities and operating sites. The required output is an asset-perimeter certificate. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][4].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that material operating assets and obligations can sit outside the headline fixed-asset register. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

3. Reconcile the fixed-asset register

The transaction team should link asset class, location, acquisition date, cost, accumulated depreciation, useful life, condition and responsible owner. The required output is a verified fixed-asset ledger. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][5].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that financial records can lack the engineering detail needed to forecast cash replacement. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

4. Map asset age and condition

The transaction team should combine age, utilisation, inspection, failure, service history and remaining-life evidence. The required output is an asset-health heat map. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][6].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that straight-line accounting lives can diverge materially from physical consumption and operational risk. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

5. Separate depreciation from cash need

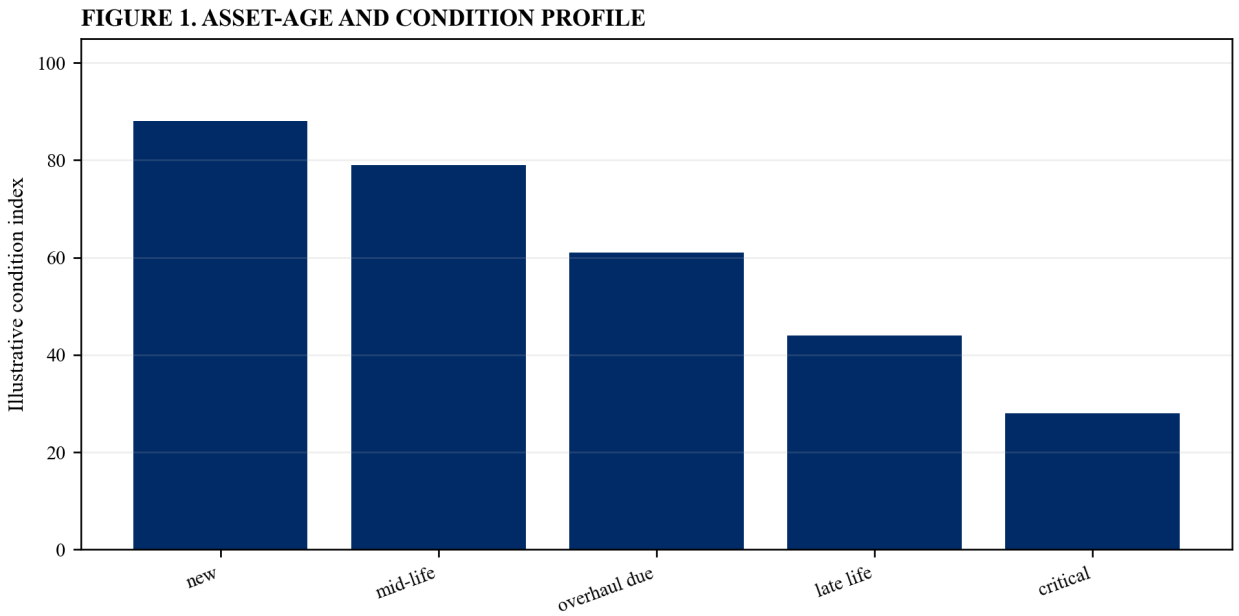
The transaction team should compare accounting depreciation with maintenance, overhaul and replacement expenditure by asset cohort. The required output is a depreciation-to-cash bridge. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][7].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that EBITDA can rise while the underlying asset base consumes more cash. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Figure 1. Asset-age and condition profile



Illustrative analytical scenario; verified asset and transaction evidence should replace index values.

6. Define maintenance capital expenditure

The transaction team should identify expenditure required to preserve current capacity, reliability, safety, quality and licence to operate. The required output is a binding maintenance definition. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [2][8].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that seller and buyer can classify the same necessary spend differently and produce incompatible cash-flow cases. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

7. Separate growth capital expenditure

The transaction team should require capacity, revenue, margin, timing and incremental working-capital evidence for expansion spend. The required output is a growth-investment register. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [8][9].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that necessary replacement can be labelled growth and excluded from sustainable free cash flow. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

8. Identify catch-up maintenance

The transaction team should compare work orders, inspection findings, shutdown history, maintenance backlog and pre-sale spending patterns. The required output is a deferred-maintenance schedule. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][10].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that temporarily low historical spend can create a large post-completion cash obligation. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Table 1. Maintenance evidence matrix

Investment class	Minimum evidence	Core test
routine maintenance	work orders and invoices	sustains current output
major overhaul	life-cycle schedule	cash peak funded
replacement	condition and lead time	remaining life verified
growth	capacity and revenue case	incremental return evidenced

Illustrative control framework; verified asset evidence and executed documents govern.

9. Test major overhaul cycles

The transaction team should map turbines, engines, vessels, vehicles, production lines, data-centre systems and other periodic overhaul requirements. The required output is a life-cycle overhaul calendar. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][11].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that average annual capital expenditure can conceal concentrated cash peaks that breach liquidity or covenants. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

10. Model replacement cohorts

The transaction team should group assets by remaining useful life, criticality, lead time, replacement cost and downtime. The required output is a replacement-wave forecast. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][12].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that many assets can reach end of life within the same hold period. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

11. Price inflation and supply constraints

The transaction team should apply equipment, construction, labour, freight, currency and lead-time scenarios to the investment plan. The required output is a replacement-cost escalation model. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [1][13].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that book value and historical invoices can materially understate current cash replacement cost. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

12. Test utilisation effects

The transaction team should connect throughput, operating hours, load, mileage, environmental conditions and maintenance intervals. The required output is a utilisation-to-investment curve. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][14].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that the acquisition plan can increase output and accelerate wear without increasing maintenance cash. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

13. Quantify reliability economics

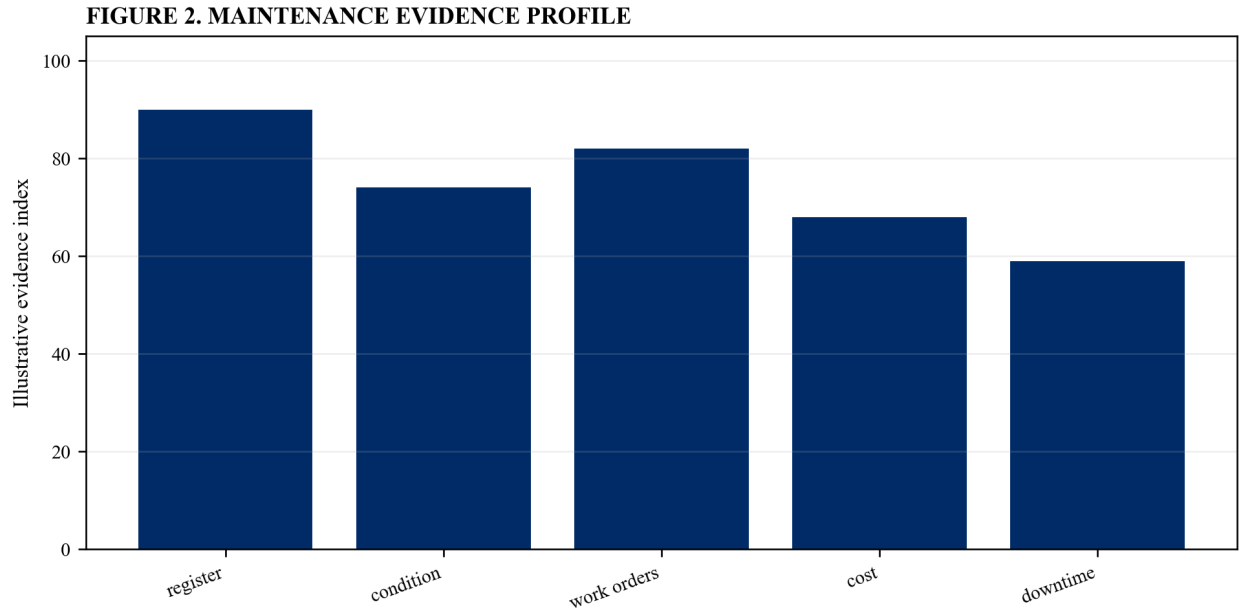
The transaction team should link failure probability, lost output, service penalties, repair cost, safety exposure and customer churn. The required output is a reliability value-at-risk model. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][15].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that cutting maintenance can improve near-term EBITDA while destroying availability and enterprise value. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Figure 2. Maintenance evidence profile



Illustrative analytical scenario; verified asset and transaction evidence should replace index values.

14. Capture compliance investment

The transaction team should map environmental, safety, cyber, building, grid, transport and sector-specific requirements to dated projects. The required output is a compliance capital register. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [16][17].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that mandatory spend can be absent from management forecasts until regulators or insurers intervene. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

15. Capture resilience investment

The transaction team should identify redundancy, climate adaptation, backup power, water, spares, security and business-continuity requirements. The required output is a resilience investment plan. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [17][18].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that a lowest-cost maintenance case can leave the asset base unable to absorb foreseeable disruption. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

16. Test lease and outsourcing economics

The transaction team should compare owned replacement cash with lease payments, maintenance obligations, residual risk and supplier concentration. The required output is an owned-versus-contracted bridge. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [4][19].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that outsourcing can move capital expenditure into fixed operating cash without reducing economic asset dependence. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Table 2. Asset-level cash bridge

Cash item	Forecast basis	Control
maintenance	asset workplan	engineering approval
compliance	dated obligation	legal owner
downtime	lost-output model	operations review
working capital	spares and activity	treasury funding

Illustrative control framework; verified asset evidence and executed documents govern.

17. Reconcile capitalised labour and software

The transaction team should separate payroll, implementation, cloud, licences and internally generated asset costs by accounting and cash treatment. The required output is a capitalisation-policy bridge. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [20][21].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that capitalised expenditure can support EBITDA while increasing cash consumption and future amortisation. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

18. Model shutdown and downtime

The transaction team should schedule outages, lost production, restart cost, inventory buffers and customer commitments. The required output is an outage cash-flow schedule. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [11][15].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that the cost of maintaining an asset includes operational cash effects beyond the contractor invoice. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

19. Link spares and inventory

The transaction team should connect critical spares, obsolescence, service levels, procurement lead times and inventory funding. The required output is a spares working-capital model. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [9][22].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that maintenance resilience can require cash tied up in components that EBITDA does not reveal. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

20. Model supplier finance

The transaction team should identify extended payment terms, reverse factoring, deposits, retention and equipment financing. The required output is a supplier-finance reconciliation. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [7][23].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that reported operating cash flow can benefit from funding arrangements that unwind after completion. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

21. Build the EBITDA-to-cash bridge

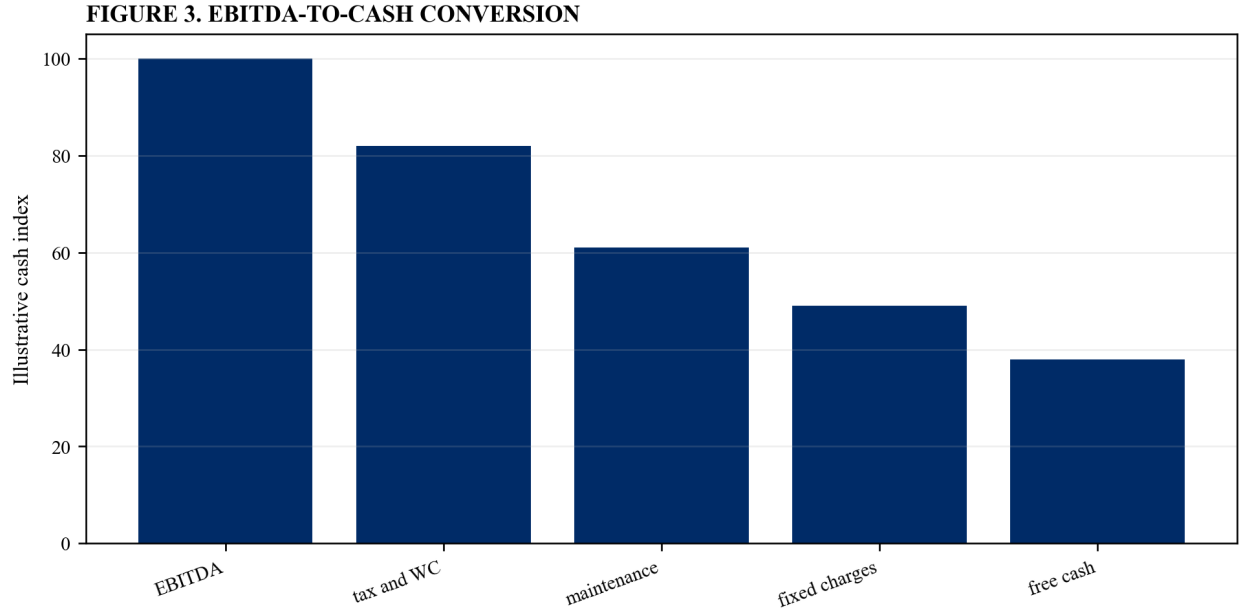
The transaction team should deduct cash tax, working capital, maintenance, compliance, replacement, leases and other fixed charges from operating earnings. The required output is a sustainable free-cash-flow bridge. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [7][8].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that headline EBITDA can support a valuation multiple that the business cannot convert into distributable cash. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Figure 3. EBITDA-to-cash conversion



Illustrative analytical scenario; verified asset and transaction evidence should replace index values.

22. Normalise historical expenditure

The transaction team should adjust for shutdown timing, asset sales, acquisitions, capitalised items, grants, insurance proceeds and temporary deferral. The required output is a normalised investment history. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][7].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that a simple multi-year average can mix unlike periods and conceal the forward requirement. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

23. Build the engineering base case

The transaction team should use verified condition, work orders, operating plan, regulatory commitments and current replacement prices. The required output is an asset-led base forecast. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][6].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that management's financial plan can omit engineering work that has no approved purchase order. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

24. Build the catch-up case

The transaction team should accelerate deferred work, include outage effects and restore the asset base to the agreed operating standard. The required output is a post-completion recovery case. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][10].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that catch-up expenditure can coincide with transaction debt service and integration cash. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Table 3. Scenario architecture

Case	Primary pressure	Decision use
base	verified life-cycle plan	sustainable leverage
catch-up	deferred work	completion funding
failure	critical outage	contingency liquidity
transition	technology and regulation	exit resilience

Illustrative control framework; verified asset evidence and executed documents govern.

25. Build the failure case

The transaction team should model critical asset loss, repair, replacement, lost output, insurance timing and customer consequences. The required output is a severe-but-plausible failure case. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [15][18].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that low-frequency asset events can consume the entire equity buffer. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

26. Build the transition case

The transaction team should model technology substitution, decarbonisation, electrification, automation and stranded-asset risk. The required output is an asset-transition case. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [17][24].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that the existing base can require investment while becoming economically obsolete before the debt matures. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

27. Calculate sustainable leverage

The transaction team should size debt from free cash flow after verified maintenance and fixed charges under all cases. The required output is an asset-adjusted debt-capacity model. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [1][2].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that leverage based on accounting EBITDA can exceed the asset base's repayment capacity. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

28. Test covenant definitions

The transaction team should map capital expenditure, leases, exceptional repairs, insurance proceeds and EBITDA adjustments to executed documents. The required output is a covenant eligibility schedule. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [2][5].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that a maintenance shock can weaken cash while remaining partly invisible in the covenant ratio. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

29. Forecast minimum liquidity

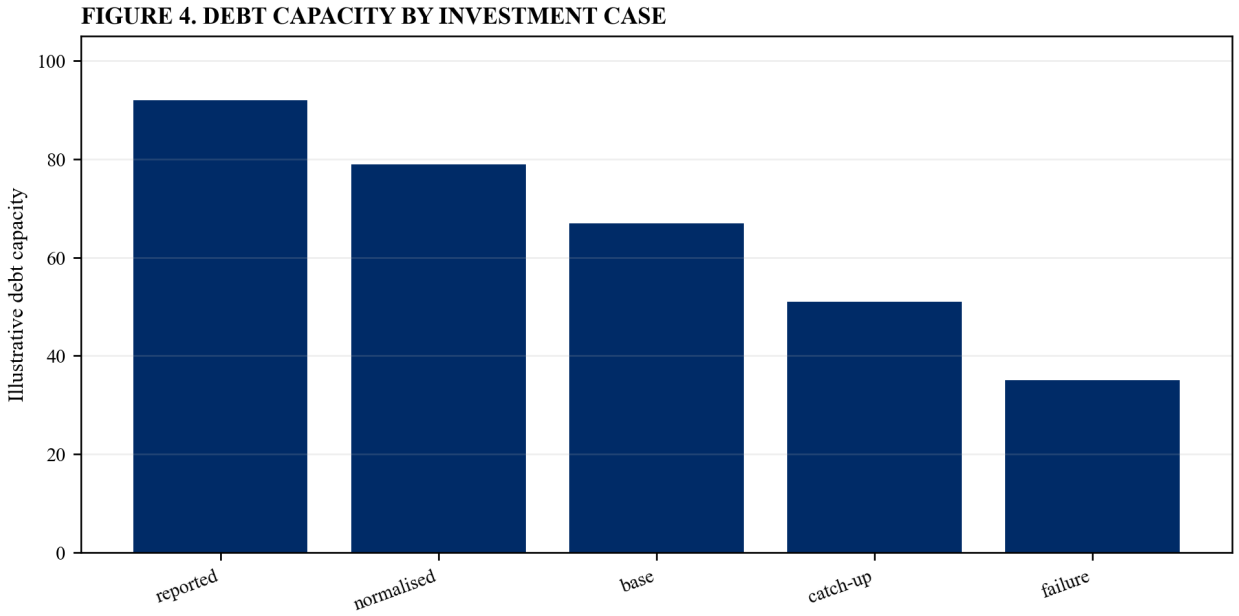
The transaction team should combine investment milestones, working capital, debt service, facility availability and contingency cash by month. The required output is a liquidity runway. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [1][7].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that annual investment budgets can miss concentrated funding gaps. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Figure 4. Debt capacity by investment case



Illustrative analytical scenario; verified asset and transaction evidence should replace index values.

30. Test debt-service coverage

The transaction team should calculate cash interest, amortisation and fixed charges after sustainable maintenance under every case. The required output is a debt-service coverage certificate. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [2][7].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that a business can report positive EBITDA and still lack cash for scheduled debt service. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

31. Recalculate the entry multiple

The transaction team should compare enterprise value with accounting EBITDA, sustainable EBITDA-equivalent cash flow and asset-adjusted free cash flow. The required output is a multiple reconciliation. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [8][25].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that the apparent acquisition discount can disappear after necessary investment is recognised. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

32. Recalculate equity returns

The transaction team should integrate maintenance cash, downtime, financing, tax, debt paydown, exit capital need and exit multiple. The required output is an asset-adjusted equity case. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [1][25].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that sponsor returns can rely on deferring expenditure to the next owner. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Table 4. Multiple reconciliation

Measure	Required adjustment	Use
accounting EBITDA	reported bridge	headline comparison
maintenance-adjusted cash	verified sustaining spend	debt capacity
free cash flow	tax and working capital	equity paydown
exit cash flow	backlog and transition	terminal value

Illustrative control framework; verified asset evidence and executed documents govern.

33. Test exit readiness

The transaction team should forecast asset condition, backlog, compliance, inspection evidence and buyer diligence at the planned sale date. The required output is an exit asset-integrity plan. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][26].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that underinvestment during the hold can reappear as price reduction, indemnity or failed refinancing. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

34. Negotiate purchase protection

The transaction team should translate identified backlog into price, completion accounts, escrow, warranty, indemnity, covenant and committed funding terms. The required output is an asset-risk negotiation map. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [8][26].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that technical diligence findings can remain descriptive and fail to change transaction economics. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

35. Design capital-expenditure controls

The transaction team should set approval thresholds, asset evidence, benefit classification, procurement controls and post-investment review. The required output is an investment governance protocol. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][22].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that uncontrolled growth projects can crowd out mandatory maintenance. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

36. Monitor asset indicators

The transaction team should track availability, failures, backlog, overdue inspection, utilisation, unit cost and forecast-to-actual investment. The required output is a monthly asset dashboard. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][15].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that financial variance can emerge after physical deterioration has become expensive to reverse. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

37. Back-test maintenance assumptions

The transaction team should compare forecast work, cost, timing, downtime and reliability with realised outcomes. The required output is an asset-plan variance report. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [3][10].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that optimistic useful lives and low cost estimates can persist through successive refinancings. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

38. Prepare the lender evidence pack

The transaction team should present the asset register, engineering forecast, investment bridge, downside cases, liquidity and covenant effects. The required output is a lender-ready asset memorandum. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [2][5].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that insufficient evidence can reduce lender confidence and debt capacity late in the process. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

39. Govern changes and exceptions

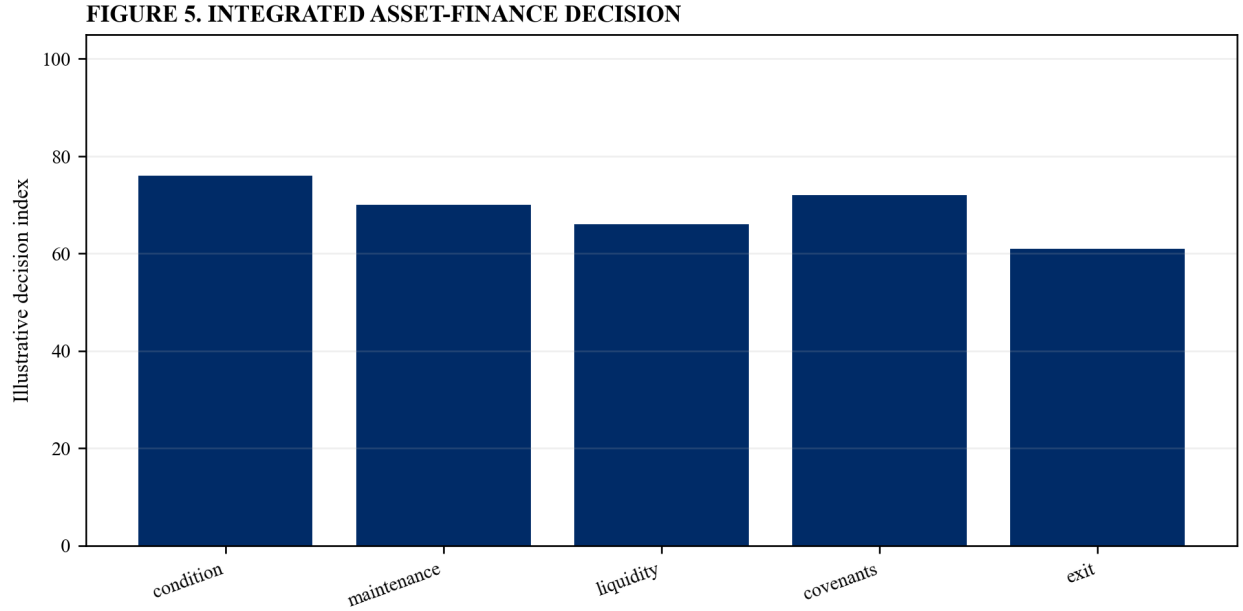
The transaction team should maintain source links, model versions, engineering approval, finance review, authority limits and escalation deadlines. The required output is an integrated asset-finance control. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [6][22].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that manual reclassification can manufacture free cash flow without improving asset condition. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Figure 5. Integrated asset-finance decision



Illustrative analytical scenario; verified asset and transaction evidence should replace index values.

40. Issue the asset-integrity certificate

The transaction team should approve sustainable maintenance, liquidity, covenant headroom, debt capacity, equity returns and exit condition. The required output is a retained board certificate. Use dated source data and link each material conclusion to retained asset, engineering, financial and contractual evidence [22][26].

Translate the asset assumption into monthly investment, downtime, working-capital, tax, debt and covenant effects. Identify the accountable owner, measurement method, remaining life, dependency, decision date and evidence threshold. Reconcile the engineering workplan, financial statements, fixed-asset register, operating forecast and financing model.

The principal risk is that the board can approve an attractive multiple without seeing the cash investment that sustains it. Quantify the effect on sustainable free cash flow, revolving-credit availability, leverage, debt-service coverage, minimum liquidity, refinancing and equity value. Show base, catch-up, failure and transition cases with enough buffer for forecast error and execution volatility.

Retain the source, model version, reviewer, technical approval and board response. Compare forecast expenditure, asset condition, availability and cash with realised outcomes; remove unsupported classifications; and assign every exception an owner and deadline.

Table 5. Asset-integrity certificate

Conclusion	Evidence	Approval test
maintenance need	asset-level forecast	complete and funded
liquidity	monthly cash model	above policy floor
debt capacity	downside free cash flow	repayment credible
exit condition	backlog and compliance	value preserved

Illustrative control framework; verified asset evidence and executed documents govern.

References

[1] Bank of England, Financial Stability Report July 2026, https://www.bankofengland.co.uk/financial-stability-report/2026/july-2026

[2] European Central Bank, Guidance on leveraged transactions, https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.leveraged_transactions_guidance_201705.en.pdf

[3] IFRS Foundation, IAS 16 Property Plant and Equipment, https://www.ifrs.org/issued-standards/list-of-standards/ias-16-property-plant-and-equipment/

[4] IFRS Foundation, IFRS 16 Leases, https://www.ifrs.org/issued-standards/list-of-standards/ifrs-16-leases/

[5] European Banking Authority, Guidelines on leveraged transactions, https://www.eba.europa.eu/sites/default/files/documents/10180/1696305/1dba7657-6ccb-462a-b9f8-8df8686b9807/Final%20Guidelines%20on%20Leveraged%20Transactions.pdf

[6] International Organization for Standardization, ISO 55000 Asset management, https://www.iso.org/iso-55001-asset-management.html

[7] IFRS Foundation, IAS 7 Statement of Cash Flows, https://www.ifrs.org/issued-standards/list-of-standards/ias-7-statement-of-cash-flows/

[8] International Valuation Standards Council, International Valuation Standards, https://www.ivsc.org/standards/

[9] IFRS Foundation, IAS 2 Inventories, https://www.ifrs.org/issued-standards/list-of-standards/ias-2-inventories/

[10] IFRS Foundation, IAS 36 Impairment of Assets, https://www.ifrs.org/issued-standards/list-of-standards/ias-36-impairment-of-assets/

[11] IFRS Foundation, IAS 37 Provisions Contingent Liabilities and Contingent Assets, https://www.ifrs.org/issued-standards/list-of-standards/ias-37-provisions-contingent-liabilities-and-contingent-assets/

[12] IFRS Foundation, IFRS 5 Non-current Assets Held for Sale and Discontinued Operations, https://www.ifrs.org/issued-standards/list-of-standards/ifrs-5-non-current-assets-held-for-sale-and-discontinued-operations/

[13] Bank of England, Inflation Report and monetary policy data, https://www.bankofengland.co.uk/monetary-policy-report

[14] International Energy Agency, Energy Efficiency 2025, https://www.iea.org/reports/energy-efficiency-2025

[15] International Organization for Standardization, ISO 31000 Risk management, https://www.iso.org/iso-31000-risk-management.html

[16] International Labour Organization, Occupational safety and health, https://www.ilo.org/topics-and-sectors/safety-and-health-work

[17] IFRS Foundation, Effects of climate-related matters on financial statements, https://www.ifrs.org/news-and-events/news/2020/11/educational-material-on-the-effects-of-climate-related-matters/

[18] Network for Greening the Financial System, Climate scenarios, https://www.ngfs.net/ngfs-scenarios-portal/

[19] IFRS Foundation, IFRS 15 Revenue from Contracts with Customers, https://www.ifrs.org/issued-standards/list-of-standards/ifrs-15-revenue-from-contracts-with-customers/

[20] IFRS Foundation, IAS 38 Intangible Assets, https://www.ifrs.org/issued-standards/list-of-standards/ias-38-intangible-assets/

[21] IFRS Foundation, IAS 23 Borrowing Costs, https://www.ifrs.org/issued-standards/list-of-standards/ias-23-borrowing-costs/

[22] OECD, G20 OECD Principles of Corporate Governance 2023, https://www.oecd.org/corporate/principles-corporate-governance/

[23] IFRS Foundation, Supplier Finance Arrangements amendments to IAS 7 and IFRS 7, https://www.ifrs.org/projects/completed-projects/2023/supplier-finance-arrangements/

[24] International Energy Agency, World Energy Investment 2026, https://www.iea.org/reports/world-energy-investment-2026

[25] UK Financial Conduct Authority, Private market valuation practices, https://www.fca.org.uk/publications/multi-firm-reviews/private-market-valuation-practices

[26] UK Competition and Markets Authority, Merger assessment guidelines, https://www.gov.uk/government/publications/merger-assessment-guidelines

About the Author

Authored by Chennakeshav Adya, Independent Researcher

Chennakeshav (CK) is a corporate finance and investment banking executive with 25+ years of global experience in deal origination, structuring and execution across M&A, growth capital and corporate strategy. He has led value-creation mandates for founders, corporates and funds; bridging the boardroom view to hands-on execution and close.

His career spans Morgan Stanley, HSBC, Lloyds Banking Group, EWEC, ADQ portfolio companies and Emirates Growth Fund, across TMT, real estate, fintech, deeptech, cleantech, infrastructure and energy. He has partnered with C-suite leaders, private equity and venture funds, sovereign wealth funds and family offices to finance complex fund raises and scale-up ventures, and has led M&A due diligence, post-merger integration and business-transformation initiatives to create value.

At Matchpoint Partners he is Managing Partner, leading the firm's corporate finance, M&A and capital-raising practice. He holds an MBA from London Business School, an engineering degree from VTU and a Master of Laws (LLM, in progress) from UCL London.

An active start-up mentor, CK mentors at Techstars, DIFC FinTech Hive, Startup Grind, Founder Institute and IN5, serves as Entrepreneur Mentor in Residence (EMiR) at London Business School, and judges the Entrepreneurship World Cup.