7011.T gideon lens

Mitsubishi Heavy Industries - ER2 / Gideon Lens

Ticker: 7011.T / XJPX:7011 **Report ID:** MHI-ER2-20260906-100232+0800 **Report date:** 2026-09-06 **Price anchor:** JPY 3,754, completed JPX session on 2026-09-04 **TTM end:** 2026-06-30 **Exact horizon:** 2031-06-30, exactly 5.0 years **Primary valuation method:** P/E in every scenario **Trade execution authorized:** NO

Investment conclusion

Mitsubishi Heavy Industries has become a better operating company, but the listed equity does not clear the ER2 price or return bar. Energy Systems and Aircraft, Defense & Space possess real engineering depth, installed-base service economics, regulated or sovereign customer relationships, and record funded backlogs. TTM revenue was JPY 5.134tn and statutory operating income was JPY 495.173bn. The Base model reaches JPY 6.840tn of revenue and JPY 759.3bn of operating income by 2031-06-30, with diluted EPS of JPY 176.35. That is meaningful operating progress. It is not enough at JPY 3,754 per share.

The conclusion is **PASS**. Management is YELLOW: execution and disclosure have improved, but the CEO/CFO pair has only about fifteen months in seat, the Concentric impairment and project provisions weaken the capital-allocation record, and compensation lacks explicit ROIC, free-cash-flow, or per-share-value hurdles. Moat is YELLOW, including the 2046 test: Energy and Defense have defensible positions, but their current margin expansion is not yet proven through a full cycle, while Plants is less durable and Industrial Solutions remains economically weak. The P/E-at-15 gate fails: Base EPS of JPY 176.3476 supports JPY 2,645.21 at 15x, 29.54% below the current quote. Bull alone narrowly clears that entry test.

The independently audited shareholder-return bridge is more restrictive. Valuation preflight selected P/E because statutory diluted EPS is reconciled to the exact listed unit; EV/NOPAT lacks a complete terminal cash, debt, lease, and senior-claim path, while P/B-ROE is secondary for this industrial issuer. Peer evidence locked the exits before returns were calculated at 13x Bear, 18x Base, and 24x Bull. With a flat JPY 29 annual dividend, terminal wealth is JPY 1,099.59, JPY 3,319.26, and JPY 6,348.15 per share. Gross JPY IRRs are -21.77%, -2.43%, and 11.08%; probability-weighted gross JPY IRR is -3.71%. A conservative net-SGD diagnostic produces -23.52%, -4.36%, and 8.96%, with -5.62% probability-weighted. No case reaches the 15% stretch hurdle, and only Bull approaches a positive portfolio case.

The audited Compounder Score is 49/100, comprising 45/80 for business quality and 4/20 for return underwriting. This is a diagnostic Reject, not a separate ER2 gate. The auditor reduced the initial score because ROIIC deterioration cannot be measured and high-return incremental deployment at scale remains prospective. The red team found the 18x Base exit and 15% Energy margin optimistic, but also found the 15% Bull weight potentially punitive. Those sensitivities are material yet resolved: a 15x Base exit lowers Base gross IRR to -5.76%, while a 20% Bull weight raises probability-weighted gross IRR only to -1.50%. Neither changes PASS.

Verdict: PASS

Scorecard:

Gate	Result	Notes
Management	YELLOW	Better execution; tenure, incentives and allocation evidence remain incomplete
Moat	YELLOW	Energy and Defense defendable; 2046 durability remains YELLOW
P/E <= 15 on confident EPS at TTM + 5 calendar years	FAIL	Base entry value JPY 2,645.21; cushion -29.54%
Compounder Score	Audited 49 / 100	Reject; franchises do not offset unverified ROIIC and negative returns
Business Quality Score	Audited 45 / 80	High-return incremental deployment remains unproven
20% Return UW Score	Audited 4 / 20	Base and probability-weighted gross JPY returns are negative

One-line thesis (or reason to pass): MHI's Energy and Defense franchises are improving, but YELLOW durability and a 32.34x normalized current P/E leave negative Base and probability-weighted returns.

Security return underwriting (mandatory even when the verdict is PASS):

Measure	Result	Notes
Primary valuation method	P/E	One audited parent-EPS method drives every scenario, weighting and net-SGD
Gross local-currency bear / base / bull IRR	-21.77% / -2.43% / 11.08%	Five-year annualized shareholder return in JPY
Probability-weighted gross local-currency IRR	-3.71%	CAGR of 30% / 55% / 15% weighted terminal wealth
Return bridge	JPY 3,754 -> JPY 1,099.59 / 3,319.26 / 6,348.15	EPS times 13x / 18x / 24x plus JPY 145 cumulative dividends; no separate balance-sheet adjustment

Gross local-currency underwriting is in JPY; net-SGD adjustments appear separately in CIO actionability. Operating starts are the TTM ended 2026-06-30; the price is the completed 2026-09-04 close.

Bear-case operating and return bridge

Bear case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue, JPY bn	5,134.262	5,359.079	0.86%	Backlog converts slowly as Industrial declines and project risk offsets growth
Operating margin	9.64%	6.65%	-2.99 pp	Energy normalization, project resets and weaker mix compress statutory margin
Operating earnings, JPY bn	495.173	356.400	-6.37%	Statutory operating income after the exact segment-to-statutory bridge
Diluted share count, M	3,361.118	3,361.118	0.00%	No unsupported buyback or dilution benefit
EPS, JPY	116.078 normalized	73.4303	-8.75%	Parent EPS after finance, tax, NCI and Bear discontinued tail
Valuation denominator	Normalized continuing EPS	Statutory terminal EPS	comparable	Same currency, listed unit and parent claim perimeter
Valuation	32.3403x normalized P/E	13.0x P/E	-19.3403x	Below peer floor for lower margin and project-loss convexity
Share value, JPY	3,754.00	954.5939	-23.96%	Terminal EPS times exit P/E; no cash or debt adjustment
Annual dividend, JPY	29.00	29.00	0.00%	FY2026 plan held flat; no special dividend
Dividend yield	0.77%	3.04%	+2.27 pp	Annual dividend divided by endpoint share value
Five-year dividends, JPY/share	-	145.00	cumulative	Five equal annual distributions
Total ending value, JPY/share	3,754.00	1,099.5939	-21.77% gross JPY IRR	Terminal share value plus cumulative dividends

Base-case operating and return bridge

Base case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue, JPY bn	5,134.262	6,839.690	5.90%	Energy and Defense backlog convert while Plants and Industrial improve modestly
Operating margin	9.64%	11.10%	+1.46 pp	Service mix and execution lift profit, partly offset by corporate costs
Operating earnings, JPY bn	495.173	759.300	8.93%	Statutory operating income after the exact segment-to-statutory bridge
Diluted share count, M	3,361.118	3,361.118	0.00%	No unsupported buyback or dilution benefit

Base case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
EPS, JPY	116.078 normalized	176.3476	8.72%	Parent EPS after finance, tax and JPY 18bn NCI leakage
Valuation denominator	Normalized continuing EPS	Statutory terminal EPS	comparable	One-offs removed; same listed unit and parent perimeter
Valuation	32.3403x normalized P/E	18.0x P/E	-14.3403x	Limited premium to Kawasaki; YELLOW gates prevent upper-peer valuation
Share value, JPY	3,754.00	3,174.2568	-3.30%	Terminal EPS times exit P/E; no cash or debt adjustment
Annual dividend, JPY	29.00	29.00	0.00%	FY2026 plan held flat rather than assuming payout growth
Dividend yield	0.77%	0.91%	+0.14 pp	Annual dividend divided by endpoint share value
Five-year dividends, JPY/share	-	145.00	cumulative	Five equal annual distributions
Total ending value, JPY/share	3,754.00	3,319.2568	-2.43% gross JPY IRR	Terminal share value plus cumulative dividends

Bull-case operating and return bridge

Bull case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue, JPY bn	5,134.262	7,941.593	9.12%	GTCC, defense capacity and broad execution compound together
Operating margin	9.64%	13.52%	+3.88 pp	Pricing, service mix and Industrial recovery all deliver
Operating earnings, JPY bn	495.173	1,074.000	16.75%	Statutory operating income after the exact segment-to-statutory bridge
Diluted share count, M	3,361.118	3,361.118	0.00%	Flat shares avoid unsupported capital-return upside
EPS, JPY	116.078 normalized	258.4646	17.36%	Parent EPS after lower finance cost, tax and NCI leakage
Valuation denominator	Normalized continuing EPS	Statutory terminal EPS	comparable	Same currency, listed unit and parent claim perimeter
Valuation	32.3403x normalized P/E	24.0x P/E	-8.3403x	Below upper peers despite simultaneous high execution requirements
Share value, JPY	3,754.00	6,203.1504	10.57%	Terminal EPS times exit P/E; no cash or debt adjustment
Annual dividend, JPY	29.00	29.00	0.00%	Flat payout is conservative even in Bull
Dividend yield	0.77%	0.47%	-0.31 pp	Annual dividend divided by endpoint share value
Five-year dividends, JPY/share	-	145.00	cumulative	Five equal annual distributions
Total ending value, JPY/share	3,754.00	6,348.1504	11.08% gross JPY IRR	Terminal share value plus cumulative dividends

CIO actionability (separate from ER2 underwriting):

Measure	Result	Notes
Status	PASS	Valuation FAIL, negative Base return and severe Bear downside preclude capital
Bear / Base / Bull net SGD IRR	-23.52% / -4.36% / 8.96%	Five-year annualized after FX, trading, custody and withholding assumptions
Probability-weighted net SGD IRR	-5.62%	CAGR of probability-weighted terminal wealth; weights 30% / 55% / 15%
10% mandate hurdle	FAIL	Base and probability-weighted outcomes both fail
15% stretch hurdle	FAIL	Even Bull net-SGD remains below 15%

Measure	Result	Notes
Downside and portfolio fit	FAIL	Bear wealth falls to JPY 1,099.59; no portfolio context rescues the security
Proposed sizing ceiling	none	Research conclusion only; explicit owner approval would still be required

Net-SGD assumes 1.5% annual JPY depreciation versus SGD, 0.25% entry and exit costs, 0.25% annual custody/implementation cost, and 15% dividend withholding with no reclaim. The same P/E terminal values, scenario weights, dividends, and horizon are used; no valuation input changes in translation.

Trade execution authorized: NO

Kill / trigger criteria:

- BUY trigger: none while both qualitative gates remain YELLOW. At the current Base EPS and 15x framework, JPY 2,645.21 is the maximum entry value; price alone cannot cure unresolved durability.
- PASS trigger 1: Energy underlying margin below 12% for two consecutive quarters while segment revenue still grows at least 5% year over year.
- PASS trigger 2: Aircraft, Defense & Space backlog conversion misses company guidance or segment margin remains below 10% for two consecutive quarters.
- PASS trigger 3: Industrial Solutions fails to sustain at least a 3% business-profit margin by FY2028, indicating the 5% Base terminal margin is not credible.
- Upgrade conditions: Management and Moat both move to PASS, Energy and Defense margins prove durable through execution stress, measurable acquisition-inclusive ROIIC exceeds the cost of capital, and price supports both a positive P/E-15 cushion and at least 10% Base and probability-weighted net-SGD IRRs.

Research sizing if actionable: none. This is a completed zero-size research PASS; no funding source, incumbent sale, order, ranking change, or portfolio mutation is proposed.

What matters now

The core tension is not demand. MHI entered the period with JPY 14.10tn of orders on hand after Q1 FY2026, and Japan's Ministry of Defense represented about 20.2% of FY2025 revenue. The question is whether capacity additions and long-cycle execution convert that demand into durable per-share economics. Energy's reported TTM margin was 14.35%, but 13.20% after removing JPY 25bn of one-time Q1 gains. The Base case assumes 15% by 2031. Defense and aerospace reach 12.2% from a 10.93% TTM anchor. Those paths are plausible; they are not yet moat proof.

Industrial Solutions remains the clearest warning. TTM revenue was JPY 723.194bn and business profit only JPY 3.911bn, a 0.54% margin. The Base case needs JPY 869.5bn of revenue and JPY 43.8bn of profit. If that recovery fails, consolidated earnings lose an important source of diversification just as the market continues to capitalize Energy and Defense at a premium.

Capital productivity is the final missing link. Management has prioritized organic capacity, portfolio pruning and progressive dividends, but the audited record does not support a reliable ROIIC calculation. The Base five-year EPS CAGR is 8.72%, yet the current normalized multiple is 32.34x and the independently justified Base exit is 18x. That de-rating overwhelms earnings growth and dividends. MHI becomes actionable only when evidence closes the management and moat gaps while price stops demanding a quality level the company has not yet proved.

Appendix A - Company Primer

Mitsubishi Heavy Industries — Company Primer

Ticker: 7011.T / XJPX:7011 **Run:** `pulse-cio-20260906T100232+0800` **Information cutoff:** 2026-09-06 10:02:32 SGT
Reporting currency: Japanese yen; financial figures below are JPY unless stated otherwise

Orientation and time anchor

Mitsubishi Heavy Industries (MHI) is a Japanese engineering and manufacturing group serving electricity systems, industrial plants, transport infrastructure, factories, aircraft supply chains, national defense, and space launch. Much of the portfolio consists of engineered-to-order assets with long qualification periods, multi-year schedules, exacting performance requirements, and aftermarket obligations. Medium-volume engines, turbochargers, HVAC equipment, and automotive air-conditioning systems add a shorter-cycle product layer.

MHI's fiscal year ends March 31. The latest reported period at this information cutoff is Q1 FY2026, ended June 30, 2026 and announced August 4, 2026. The analytical trailing-twelve-month period is Q2 FY2025 through Q1 FY2026, ending June 30, 2026; the ER2 five-year horizon ends June 30, 2031. All core financial figures in this primer come from the QFR-sealed `quant_foundation.md`, whose official-source replacements reconcile the discontinued Mitsubishi Logisnext perimeter and MHI's current segment taxonomy. The sealed quote packet hash is `5d5d9683877b2cd36e16c317a5737516ab292e0c5f3def8be11aa364a2ebed55`; the statutory-bridge hash is `16934a6da80a4a9aef08f6673a9a29316296d5ddd8afd9401aef406b27dfe81e`.

Business overview: what MHI sells and how customers buy

MHI designs, manufactures, constructs, integrates, maintains, and modernizes demanding equipment and systems. Energy Systems includes GTCC, steam and nuclear power, aero engines, compressors, and marine machinery. Plants & Infrastructure covers metals machinery, chemical and transport engineering, commercial ships, environmental systems, and carbon capture. Industrial Solutions combines engines, turbochargers, HVAC and automotive air-conditioning, and Data Center & Energy Management. Aircraft, Defense & Space supplies commercial-aircraft structures, defense systems, naval ships, and launch and space equipment. The common thread is engineering, manufacturing, controls, and lifecycle service for critical infrastructure.

The customer base is mainly business-to-business and business-to-government. Utilities, independent power producers, national and local authorities, ministries of defense, aerospace original-equipment manufacturers, airlines and engine partners, steelmakers, chemical producers, shipowners, infrastructure operators, and industrial companies buy from the relevant business unit. Large systems are typically won through competitive tenders, direct negotiations, joint development, or government procurement, then delivered under project- or program-specific contracts. MHI may be a prime contractor, system integrator, equipment supplier, or long-term production partner depending on the product. Smaller industrial products are sold in higher volumes and may use regional sales and service networks, but MHI does not disclose enough channel detail to quantify direct versus distributor revenue. The investor should therefore think in terms of many specialized sales motions rather than one group-wide commercial model.

Customer need is mission-critical: utilities buy decades of reliable capacity, defense ministries buy sovereign readiness, and industrial and aircraft customers depend on uptime and certified production. High failure costs lengthen qualification, but customers retain leverage through tenders, milestone acceptance, warranties, damages, and the ability to defer projects.

Revenue architecture and the four reportable segments

The table uses FY2025 figures from the sealed quantitative foundation, restated into the FY2026 organization. Segment percentages use consolidated revenue as the denominator, so the four reportable segments exceed 100% before the negative corporate and elimination line.

FY2025 segment	Revenue (JPY bn)	Share of consolidated revenue	Segment profit (JPY bn)	Margin
Energy Systems	2,062.6	41.5%	267.2	13.0%
Plants & Infrastructure Systems	880.8	17.7%	84.1	9.5%
Industrial Solutions	699.9	14.1%	-2.0	-0.3%

FY2025 segment	Revenue (JPY bn)	Share of consolidated revenue	Segment profit (JPY bn)	Margin
Aircraft, Defense & Space	1,393.8	28.0%	151.5	10.9%
Others, Corporate & Eliminations	-63.1	-1.3%	-68.5	n/m
Consolidated	4,974.2	100.0%	432.2	8.7%

Energy Systems. This is the largest segment and principal current profit engine. GTCC supplies high-efficiency gas generation plus long-lived service; demand is supported by coal and oil replacement, electricity growth, and dispatchable capacity alongside renewables. Nuclear covers restarts, maintenance and uprates, fuel-cycle work, and advanced-reactor development. Steam power, aero engines, compressors, and marine machinery complete the portfolio. MHI's FY2025 presentation reported after-sales service revenue ratios of 49% in GTCC, 76% in steam power, and 71% in nuclear, showing the importance of installed-base service without constituting a group-wide recurring-revenue measure.

Plants & Infrastructure Systems. This segment supplies equipment and systems for steelmaking, chemicals, transport, waste treatment, ships, and industrial facilities. Large, episodic metals and engineering projects sit beside machinery and environmental services. Growth themes include green steel, clean fuels, low-carbon shipping, waste-to-energy, and carbon capture. The business had a 10.0% TTM margin, but order timing and mix can move results materially.

Industrial Solutions. The current segment is structurally different from the old Logistics, Thermal & Drive Systems presentation. Mitsubishi Logisnext was removed from the consolidated base in May 2026 and treated as discontinued operations, while Data Center & Energy Management moved into the renamed Industrial Solutions segment from April 2026. The continuing portfolio includes engines and turbochargers, HVAC and automotive air-conditioning products, and emerging data-center and energy-management solutions. These are generally shorter-cycle, medium-volume businesses compared with a power plant or frigate. TTM revenue was JPY723.2 billion and segment profit was only JPY3.9 billion, a 0.5% margin, after an FY2025 loss that included a JPY30 billion goodwill impairment in Industrial Power Solutions. The segment is thus a turnaround and portfolio-quality test, not yet a proven group-level profit pillar.

Aircraft, Defense & Space. Defense & Space is the dominant sub-business, supplemented by commercial aviation. MHI develops and supports defense aircraft, missile systems, naval vessels, special vehicles, undersea systems, and space launch equipment, often for government customers under multi-year programs. Commercial aviation is principally a qualified supplier and partner to global aircraft programs, delivering major structures and participating in aero-engine work rather than currently operating a standalone regional-jet OEM. Revenue recognition follows program execution and deliveries. Defense demand has expanded with Japan's security priorities, while commercial aviation depends on aircraft production rates, customer schedules, foreign exchange, and the health of global supply chains.

Geographic and end-market mix

FY2025 revenue by customer location was 47% Japan, 27% Americas, 14% Asia-Pacific excluding Japan, and 12% EMEA, according to MHI's FY2025 presentation. The geographic mix is economically meaningful because the segments are not evenly distributed across regions. Japan is especially important for nuclear work and defense, the Americas and Asia have been prominent in GTCC order intake, and commercial aviation links MHI to global OEM production systems. Currency exposure remains material even though reporting and the Tokyo share quote are both in yen; MHI's contracts, costs, and affiliates involve dollars, euros, and other currencies.

The Japanese Ministry of Defense was the only external customer above 10% of FY2025 revenue, contributing JPY1,006.0 billion, or 20.2%, mainly in Aircraft, Defense & Space. MHI is diversified by product but substantially exposed to one sovereign customer's priorities, budgets, terms, and audits. Power-market policy and electricity demand are another major thematic concentration.

Unit economics and capital intensity

MHI reports segment profit on the same basis as consolidated profit from business activities. On the sealed TTM figures, consolidated revenue was JPY5,134.3 billion, profit from business activities was JPY495.2 billion, and the business-profit margin was 9.6%. Segment margins were 14.4% in Energy Systems, 10.0% in Plants & Infrastructure, 0.5% in Industrial Solutions, and 10.9% in Aircraft, Defense & Space. The large spread matters: an incremental yen of revenue is not equally valuable across the portfolio, and mix toward GTCC, nuclear, defense, and service currently lifts group profitability.

For made-to-order businesses, economics begin at bid discipline. The contract price must cover purchased materials, specialized labor, engineering, in-house production, partner and construction costs, logistics, warranty risk, and overhead across a multi-year execution period. MHI recognizes construction and service revenue over time principally using costs incurred relative to estimated total costs. Any revision to expected costs, specifications, schedule, performance, or customer claims can therefore change current profit before final delivery. The group records expected loss provisions when a reliable loss estimate on an uncompleted construction contract is probable. This is why order volume alone is an inadequate measure: backlog quality, pricing, risk allocation, advance-payment terms, and execution capacity determine eventual margin.

Aftermarket work is economically attractive because a certified or installed asset requires parts, inspections, maintenance, upgrades, digital monitoring, and life-extension support. The original-equipment sale creates a multi-decade customer relationship and a service opportunity that may carry better predictability and margins than a new-build contract. Energy Systems shows the clearest installed-base model. Commercial aviation and defense also generate maintenance and support work, though contract structures and customer control differ. Industrial Solutions has service potential in chillers, engines, and data-center equipment but currently lacks segment-level evidence of comparable profitability.

TTM purchases of property, plant, equipment and intangibles were JPY171.4 billion, 3.3% of revenue, versus operating cash flow of JPY1,137.6 billion and QF-defined free cash flow of JPY966.1 billion. The cash flow is not a normal run rate because advances financed part of the expansion. MHI separately reported FY2025 R&D of JPY289.0 billion and capital expenditure of JPY183.9 billion, with FY2026 plans of JPY350.0 billion and JPY210.0 billion. Economic reinvestment therefore extends beyond accounting capex.

Segment-level capital intensity is not disclosed in the sealed foundation, so precise segment returns on capital should not be inferred. Qualitatively, GTCC, nuclear, defense, space, and commercial aviation require specialized plants, tooling, test facilities, safety systems, and long-lived engineering teams. Plants & Infrastructure can rely more heavily on project engineering and partners but still carries execution and working-capital exposure. Industrial Solutions uses more repetitive manufacturing and inventory, making capacity utilization and procurement efficiency especially important.

Customer contracts, procurement, and working-capital mechanics

MHI's IFRS policy distinguishes product sales from construction and services. Product revenue is generally recognized when goods are delivered and control transfers. Construction and service obligations are recognized over time, mainly by cost-to-cost progress. Customers typically pay against progress milestones for long projects, while goods and shorter services are generally paid within a year after the obligation is satisfied. Performance and delivery guarantees can reduce revenue when obligations are not met, and warranty work can create future cost. This architecture makes contract accounting, estimated cost at completion, and project controls central to earnings quality.

At March 2026, contract assets were JPY1,019.2 billion and contract liabilities were JPY2,161.9 billion, leaving a net contract-liability position of JPY1,142.7 billion. Contract liabilities rose sharply as MHI received advances, particularly on GTCC orders; they reached JPY2,483.2 billion by June 2026 in the Q1 presentation. This is attractive financing because customers fund production before all revenue is recognized, but it also creates an obligation to execute. Cash conversion can reverse as materials, labor, and milestones consume the advances. Reported cash of JPY1,684.1 billion at June 2026 and broad financial liabilities of JPY853.8 billion therefore overstate the freely distributable surplus if viewed without the contract-liability burden and working-capital needs.

On the input side, MHI buys highly specified materials, castings, forgings, electronics, engines and components, and relies on construction and specialist partners. Its [procurement policy](https://www.mhi.com/company/procurement/policy) says suppliers are selected on quality, price, delivery, technology, and financial condition, while its supply-chain guidance emphasizes safety, quality, cost, delivery, continuity, cybersecurity, and trade compliance. The business depends on qualified suppliers whose capacity may be difficult to replace quickly. Inflation, scarce components, geopolitical restrictions, and supplier failure can thus damage both delivery and margin. Centralized purchasing and selective insourcing are part of management's group-wide optimization program, but concentration in Japan and Thailand remains an operational risk highlighted by MHI.

Backlog and order-cycle economics

Backlog is the clearest leading indicator for the long-cycle portfolio, but it is not equivalent to contracted profit. FY2025 order intake was JPY7,653.6 billion, 1.54 times revenue, and year-end order backlog was JPY13,237.7 billion, 2.66 times FY2025 revenue. By the end of Q1 FY2026, backlog had risen further to JPY14,103.0 billion. The segment distribution at March 2026 was highly uneven.

Segment at March 2026	Backlog (JPY bn)	Backlog / FY2025 revenue	Approximate recognition window disclosed by MHI
Energy Systems	6,983.2	3.39x	Within 7 years
Plants & Infrastructure Systems	2,102.9	2.39x	Within 4 years
Industrial Solutions / former LT&D continuing base	68.6	0.10x	Within 1 year
Aircraft, Defense & Space	4,063.2	2.92x	Within 3 years
Consolidated	13,237.7	2.66x	Mixed

Energy's duration reflects long GTCC, nuclear, and related projects. Aircraft, Defense & Space has a shorter stated recognition window but very high visibility because defense programs involve multi-year production and support. Industrial Solutions' low backlog is consistent with medium-volume products whose performance obligations generally close within a year. The order cycle can be lumpy: one power project, chemical plant, naval program, or missile procurement can move annual intake substantially without immediately changing revenue.

The benefits of backlog are visibility, factory loading, purchasing leverage, and an installed base that can later generate service. The risks are equally important. Revenue can be delayed by customer decisions, permitting, supply constraints, engineering changes, acceptance tests, or site conditions. Cost inflation and rework can erode margins on already priced work. Customer advances boost cash before the group has earned the profit. MHI's FY2025 results included losses on certain steam-power projects, a reminder that a full order book does not guarantee good economics. Underwriting must track backlog conversion, segment margin, provisions, contract assets and liabilities, and cash flow together.

Competitive landscape and barriers to entry

MHI competes product by product. Large-gas-turbine rivals include GE Vernova and Siemens Energy. Nuclear peer sets vary by reactor and country. Metals machinery faces SMS group and Danieli; environmental systems, engines, turbochargers, and HVAC each have separate peers. In defense, MHI competes or partners with Japanese and global contractors by program. Commercial aviation competes for work packages while depending on relatively few aircraft and engine platforms.

The strongest barriers are accumulated references, certification, customer trust, and manufacturing know-how. A new entrant cannot quickly reproduce a proven high-temperature turbine fleet, nuclear safety record, classified defense relationship, rocket-launch capability, certified aircraft production process, or decades of maintenance data. Customers assess lifecycle reliability, not merely purchase price. Large products also require global service capability, supplier qualification, extensive testing, regulatory approval, and the balance sheet to absorb warranty or project risk. MHI's 2024 Medium-Term Business Plan claimed a leading position in large-frame gas turbines and emphasized shared capabilities in technical design, welding, casting, assembly, controls, fluid dynamics, heat transfer, customer relationships, and supply chains.

These barriers do not create a universal moat. Tender markets can be intensely price competitive; political localization can override technical merit; established competitors also possess deep installed bases; and product failures can damage a franchise quickly. In shorter-cycle Industrial Solutions markets, brands such as Daikin, Carrier, Trane, Cummins, and major turbocharger suppliers operate at scale. MHI's conglomerate breadth is only advantageous when shared technology, procurement, manufacturing, and customer access genuinely lower cost or accelerate development. Management's current optimization program is an attempt to turn latent breadth into measurable throughput and margin.

Regulation, export controls, and government exposure

MHI operates inside unusually dense regulatory systems. Nuclear products require safety licensing and continuing oversight; aircraft and aero-engine parts require certification and traceability; environmental plants and power equipment must meet emissions and permitting rules; shipping products face maritime regulation; and defense and space work involves security, secrecy, budget authorization, and government acceptance. Rules can expand the addressable market, as with energy security or defense spending, but can also delay or cancel projects.

Export control is central because MHI supplies dual-use, defense, aerospace, nuclear, and advanced industrial technology. MHI's published policy describes destination, end-use, and customer screening and the need to obtain licenses before exporting controlled goods or providing technology. The 2026 governance structure includes an International Trade Control Committee reporting into the executive-control framework. Japanese foreign-exchange and foreign-trade rules, allied-country controls, sanctions, technology-transfer restrictions, and destination-country approvals can affect which bids MHI may pursue and how it works with partners. Violations could lead to penalties, business suspension, or export prohibition.

Government exposure is both an asset and a constraint. The Japanese Ministry of Defense represented about one-fifth of FY2025 group revenue, and MHI also works with JAXA and public infrastructure customers. Sovereign relationships, security clearances, and domestic industrial capacity are formidable barriers, but budgets, audit scrutiny, procurement reform, and political priorities can change. A contract that serves national policy may have strong strategic backing while still carrying tight cost, schedule, localization, or disclosure requirements.

Management and organization

Eisaku Ito is President and CEO; Seiji Izumisawa is Chairman. MHI uses four business domains aligned with the reportable segments, with domain CEOs responsible for execution under group strategy and chief officers overseeing strategy and risk, finance, and technology. The 2026 [corporate governance report](https://www.mhi.com/finance/library/governance/pdf/report20260626.pdf) describes a 12-member board, six outside directors, and a five-member Audit and Supervisory Committee that includes three outside directors. It also uses a Nomination and Remuneration Committee chaired by an independent outside director. The Board retains major strategy, appointments, remuneration, and important investment matters while delegating ordinary execution to management.

The current organization reflects active portfolio management. Logisnext was classified as discontinued and removed from consolidation in May 2026; Data Center & Energy Management was moved into Industrial Solutions; and management is concentrating resources on GTCC, nuclear, defense, and selected future growth areas. These changes improve strategic focus but complicate trend analysis. Historical comparisons must use restated continuing operations and the FY2026 taxonomy, as the sealed QF does.

Management's central operating concept is Innovative Total Optimization, combining vertical process improvement inside each business with horizontal sharing of technology, people, procurement, manufacturing, digital tools, and AI across the group. The May 2026 [Medium-Term Business Plan progress update](https://www.mhi.com/finance/library/plan/pdf/260527presentation.pdf) calls for shorter lead times, higher throughput, faster risk detection, centralized purchasing, selective insourcing, factory automation, and expansion through licensing and partners. This is strategically coherent for a capacity-constrained engineering group, but the proof must come through sustained margin, on-time backlog conversion, and returns on new capacity.

Capital allocation

The capital-allocation hierarchy is growth investment, competitiveness investment, balance-sheet resilience, and shareholder returns. MHI's 2024 plan allocated JPY1.2 trillion to investment over FY2024-FY2026, including JPY650 billion for growing core businesses and future growth areas, with roughly JPY280 billion of shareholder returns. By May 2026 management expected cash inflows over the plan period to reach JPY2.6 trillion versus an original JPY1.5 trillion, while planned investment and shareholder-return envelopes remained broadly unchanged. Excess cash was earmarked for backlog working capital and capacity expansion from FY2027 onward, especially GTCC.

MHI targets a dividend on equity ratio of at least 4%, balancing growth and financial soundness. FY2025 dividends were JPY80.5 billion in the sealed QF, and management planned JPY29 per share for FY2026 versus JPY25 for FY2025. Buybacks are discretionary rather than formulaic; the financial report says management considers plan progress, earnings, the share price, financial condition, and market conditions. With TTM cash exceeding broad financial liabilities, gross leverage is no longer the immediate constraint. The harder question is how much of the cash belongs economically to customer-funded contract execution and how productively the remaining capital can be reinvested.

Capital allocation should therefore be judged on three tests: whether capacity spending relieves real bottlenecks in attractive franchises; whether future-growth projects earn returns without repeating past development failures; and whether non-core assets are exited when they cannot meet the group's profitability standard. The 2023 termination of the SpaceJet development program and the 2025-2026 Logisnext exit show management is willing to stop or sell major initiatives, but they also illustrate the capital that can be consumed before a correction.

Cyclicality and major historical transformations

MHI's cyclicality is heterogeneous. Power and infrastructure orders are tied to electricity demand, fuel and carbon policy, interest rates, utility balance sheets, and long permitting cycles. Defense is budget-driven and can be countercyclical to ordinary industrial demand but remains politically determined. Commercial aviation follows aircraft build rates and airline demand. Metals machinery, chemical plants, engines, turbochargers, HVAC, and shipping respond more directly to capital spending, industrial production, construction, auto volumes, and replacement cycles. Foreign exchange can amplify or mask

underlying volume and margin changes.

The long order book dampens immediate revenue volatility but can import older pricing into a new cost environment. Conversely, a weak order year may not hurt revenue until later. Service revenue and government programs provide some stability, while very large order timing creates noisy intake. The present upswing in GTCC, nuclear, and defense is unusually synchronized; underwriting should not assume that all three remain favorable through the 2031 horizon.

MHI traces its origin to the Nagasaki shipyard business begun in 1884. It became Mitsubishi Heavy-Industries in 1934, was divided into three companies in 1950, and reunited in 1964. After the 1970s shipbuilding downturn it shifted emphasis toward power, industrial machinery, aviation, and global infrastructure. More recently, the group has moved from conglomerate breadth toward portfolio focus: it strengthened power and defense, developed energy-transition and digital capabilities, discontinued SpaceJet development in 2023, began the Logisnext divestment in 2025, and reorganized Data Center & Energy Management into Industrial Solutions in 2026. The history explains both the breadth of shared technology and the recurring need to prevent ambitious engineering programs from becoming low-return capital traps.

Current strategic priorities

First, MHI must execute a backlog above JPY14 trillion without sacrificing quality or margin. Management is expanding GTCC, missile, nuclear-cask, and other production capacity; improving factory flow; and applying automation, simulations, digital tools, and AI to reduce lead times. Second, it aims to compound the installed-base service opportunity created by high original-equipment orders. Third, it is directing development toward pragmatic energy security and decarbonization: efficient GTCC, nuclear, hydrogen and ammonia readiness, carbon capture, heat pumps, cleaner shipping, and data-center power and cooling.

Fourth, MHI is trying to commercialize future growth areas through licensing, strategic partners, and common technology rather than relying only on bespoke internal development. Fifth, it is using portfolio management to raise the group's profit floor, including the Logisnext exit and repair of Industrial Solutions. Sixth, defense and space capacity must expand fast enough to serve government demand while preserving program control and security compliance. These priorities are mutually reinforcing if shared manufacturing and technology produce scale; they become competing claims on people and capital if execution discipline weakens.

Key performance indicators for investors

The most useful leading indicators are order intake, backlog, backlog-to-revenue, order mix, and disclosed conversion windows. They should be paired with segment revenue, segment profit, and margin because intake without economics can destroy value. In Energy, large-frame gas-turbine orders, unit backlog, service-revenue mix, nuclear project milestones, and capacity expansion matter. In Plants & Infrastructure, large-project awards, metals-machinery conversion, and provisions matter. In Industrial Solutions, the central KPI is a durable margin recovery, supported by volume, price, capacity utilization, and evidence that data-center offerings contribute attractive economics. In Aircraft, Defense & Space, investors should track defense order timing, revenue conversion, capacity milestones, commercial-aircraft deliveries, and Ministry of Defense concentration.

At group level, monitor profit from business activities and margin, operating cash flow, capex and R&D, contract assets and liabilities, inventories, customer advances, free cash flow normalized for working-capital movements, and return on equity. Balance-sheet analysis should distinguish MHI's narrow interest-bearing debt from the broader IFRS financial-liability line. Shareholder returns should be assessed against the 4% DOE policy and the capital required to execute the backlog. Finally, watch project-loss provisions, impairments, warranty or performance issues, order cancellations, and restatements of segment or discontinued-operation perimeters.

Principal underwriting risks

- **Execution and contract-estimate risk.** Cost-to-cost revenue accounting requires judgment about total revenue and total cost. Specification changes, delays, procurement inflation, underperformance, and customer claims can reduce profit well before final delivery.
- **Backlog-quality and working-capital risk.** Record order intake and advances create visibility and cash, but also substantial obligations. The JPY2.5 trillion June 2026 contract-liability balance must be converted into products and services, not mistaken for distributable cash.

- **Customer and government concentration.** Japan's Ministry of Defense contributed about 20% of FY2025 revenue. Budget timing, procurement terms, audits, policy changes, or program delays can materially affect the group.
- **Capacity, labor, and supply-chain risk.** GTCC, nuclear, defense, and aerospace are expanding simultaneously. Scarce engineers, qualified suppliers, castings, electronics, and factory capacity can constrain throughput or push up costs.
- **Portfolio and capital-allocation risk.** Industrial Solutions remains low margin, while future-growth programs require heavy R&D and may have uncertain commercialization. SpaceJet and the Logisnext exit are reminders that technical ambition does not assure an adequate return.
- **Technology, safety, and product-liability risk.** Failures in power, nuclear, aircraft, defense, marine, or space products can trigger rework, damages, shutdowns, lost certifications, or reputational harm.
- **Regulatory, geopolitical, and export-control risk.** Sanctions, security rules, licensing, localization, trade controls, and shifts in alliances can restrict customers, suppliers, partnerships, and technology transfer.
- **Cycle and policy risk.** The current overlap of favorable GTCC, nuclear, and defense demand may not persist. Energy policy, carbon rules, fuel economics, interest rates, or fiscal priorities can defer projects.
- **Currency and input-cost risk.** Yen moves affect translated revenue, imported costs, and competitive pricing; fixed or slow-to-reprice contracts can create a mismatch between selling price and input inflation.
- **Conglomerate-complexity risk.** Shared capabilities can be valuable, but the breadth of products, accounting estimates, affiliates, and changing perimeters makes performance harder to compare and can conceal weak returns in smaller businesses.

Source discipline and reading guide

All core revenue, profit, margin, cash-flow, balance-sheet, share, and TTM figures are from the QFR-sealed quantitative foundation at `C:\Users\Admin\OneDrive\GPT\ER 2.0\Mitsubishi Heavy Industries\quant_foundation.md`, which gives controlling official MHI sources precedence over incomplete or perimeter-mismatched FMP data. Qualitative and supplemental operating context comes from MHI's [FY2025 results presentation](https://www.mhi.com/finance/library/result/pdf/fy20254q/presentation.pdf), [Q1 FY2026 results presentation](https://www.mhi.com/finance/library/result/pdf/fy20261q/presentation.pdf), [Financial Report 2026](https://www.mhi.com/finance/library/annual/pdf/report_2026_financial.pdf), [2024 Medium-Term Business Plan](https://www.mhi.com/finance/library/plan/pdf/240528presentation.pdf), May 2026 progress update, corporate governance report, procurement policy, and company history. Competitive names are included only to orient the reader to product-level peer sets; they are not market-share assertions.

Appendix M - Management Assessment

Mitsubishi Heavy Industries — Management Assessment

Ticker: 7011.T **Run:** `pulse-cio-20260906T100232+0800` **Evidence anchor:** September 6, 2026 SGT; TTM ended June 30, 2026; underwriting horizon June 30, 2031 **Management gate: YELLOW — investable but unresolved**

The current team is behaving sensibly, but it has not yet earned a decade-long stewardship pass. President and CEO Eisaku Ito and CFO Hiroshi Nishio have each held the top role for only about fifteen months. Most of the five-year improvement in margin and diagnostic ROIC therefore belongs to the broader MHI leadership system and Ito's predecessor, not solely to the current pair. Ito has made falsifiable operating commitments, Nishio answers difficult questions with useful numbers, and capital allocation has favored organic capacity, portfolio pruning, and progressive dividends rather than serial acquisitions. The unresolved issues are material: executive incentives omit an explicit ROIC or free-cash-flow measure; the Concentric goodwill impairment is a recent allocation blemish; and the next medium-term plan has not yet converted a large customer-advance-funded cash balance into a finite capital-allocation framework.

1. Who is running the company

MHI's April and June 2026 officer disclosures identify the following leadership. Japanese issuers do not file a U.S. proxy statement; the controlling sources here are MHI's [2026 annual-meeting notice](https://www.mhi.com/finance/stock/meeting/pdf/101_notice.pdf), [June 2026 Corporate Governance Report](https://www.mhi.com/finance/library/governance/pdf/report20260626.pdf), and [current officer roster](https://www.mhi.com/jp/company/overview/officers).

Role	Executive	In role and relevant history	Ownership / accountability
President and CEO	Eisaku Ito	CEO since April 2025; joined MHI in 1987; roughly 30 years in gas-turbine R&D; CTO from 2020 and CoCSO from 2022	178,700 common shares; owns ITO, Group-Wide Optimization, Reach Expansion, and overall execution
CFO and representative director	Hiroshi Nishio	CoCFO from April 2025 and CFO from June 2025; former MHI America finance leader; Financial Planning Division head from 2022	6,100 shares; owns finance, accounting, funding, and capital-allocation communication
Chairman	Seiji Izumisawa	Chairman from April 2025 after serving as CEO from April 2019	398,100 shares; internal, non-executive board chair rather than a lead independent director
CSO and Industrial Solutions CEO	Masayuki Suematsu	CSO since April 2023; Industrial Solutions domain CEO since April 2026	84,000 shares; strategy and the most operationally challenged current segment
Energy Systems CEO	Takuya Murase	Promoted to Executive Vice President and domain CEO in April 2026	Responsible for GTCC execution and capacity expansion
Plants & Infrastructure Systems CEO	Chibumi Kimura	Executive Vice President and domain CEO in the April 2026 roster	Responsible for metals, engineering, and machinery backlog conversion
Defense & Space head	Masayuki Eguchi	Executive Vice President and segment head	Defense backlog, facilities, labor, and program risk
Commercial Aviation head	Hiroyuki Koguchi	Executive Vice President and segment head; CoCSO for value chain	Boeing programs and commercial-aircraft execution
Nuclear head	Hidehito Mimaki	Executive Vice President and segment head from April 2026	Nuclear backlog and project control

The board has 12 directors, six outside and all six designated independent by MHI and TSE. Five directors sit on the Audit and Supervisory Committee; three are outside. The eight-member Nomination and Remuneration Committee has six independent outsiders and is chaired by Hiroo Unoura. That is a real check even though there is no separately titled lead independent director.

The internal chairman is the immediately preceding CEO, so monitoring is not fully separated from the prior regime. Kobayashi is 77, has served ten years, and came from Mitsubishi Corporation; Hirano came from MUFG. Both meet the formal independence test, but the Mitsubishi-group connections deserve skepticism. Two of 12 directors are women and none is foreign, thin diversity for a company with more than half of sales overseas.

2. Tenure and track record

Ito is new as CEO but not new to the assets he is directing. His gas-turbine engineering career and five years as CTO give him unusually relevant operating knowledge for MHI's largest earnings engine. He nevertheless has only one completed fiscal year in the chief executive seat. The observed FY2021-FY2025 climb in business-profit margin from 4.15% to 8.69% and diagnostic ROIC from 4.9% to 12.0% cannot be credited to him alone.

Three decisions define the current team's ownership so far:

Decision	Date and management ownership	Observable outcome so far	Judgment
Launch ITO and reorganize around group-wide productivity and reach expansion	Ito, April 2025 onward; FY2026 segment reorganization effective April 2026	Revenue rose from JPY 4,361.1bn in FY2024 restated to JPY 4,974.2bn in FY2025; business profit rose from JPY 355.0bn to JPY 432.2bn; TTM margin reached about 9.64%	Promising, but demand and legacy backlog explain much of the gain; ITO causality is not yet proven
Improve GTCC throughput before adding fixed assets	Ito and Murase; more than 1,000 process actions, 30% capacity milestone by FY2028	Energy revenue rose from JPY 1,651.0bn in FY2021 to JPY 2,062.6bn in FY2025; segment margin rose from 5.2% to 13.0%; Q1 FY2026 underlying margin exceeded the full-year target after one-offs	Operationally coherent and measurable, but the capacity and lead-time result is still ahead
Prune the portfolio while preserving liquidity for backlog execution	Ito, Nishio, and Suematsu; Logisnext exit completed May 2026, project-investment sales, cross-shareholding reductions	Six strategic holdings totaling JPY 91.4bn were sold in FY2025; Logisnext transfer is expected to create about JPY 40bn of extraordinary gain; project-investment sales added about JPY 10bn in Q1 FY2026	Good discipline, offset by the JPY 30bn Concentric impairment and incomplete next-plan cash framework

Management has acknowledged failures. The board discontinued SpaceJet in February 2023 after naming certification, product, customer, and funding errors; Ito was then CTO. Stopping the loss after years of delay is evidence of learning, not allocation excellence. More recently, MHI recorded a JPY 30bn Concentric impairment after motive power underperformed; the acquired operation's two businesses generated about JPY 70bn of revenue. In 1H FY2025 it also booked JPY 20bn for South Africa project delays and JPY 10bn for corrective work at six domestic boiler plants. These disclosures are bounded, but long-cycle project and acquired-business controls remain load-bearing.

Nishio's record is especially short. The strongest evidence in his favor is judgment rather than tenure: he repeatedly distinguished customer advances from distributable cash, preserved buffers for project risks, and supported a DOE-based dividend policy. The weakness is that the 2027 Medium-Term Business Plan was still under construction at the anchor, leaving the use of roughly JPY 1.3tn of expected FY2026-end cash unresolved.

3. Capital allocation behavior

The following figures are reproduced from the reviewed `data_package.md`, not re-fetched. FMP's signed `acquisitionsNet` line is a cash-flow classification and is not acquisition consideration.

Fiscal year	Capex, JPY bn	R&D, JPY bn	Buybacks, JPY bn	Dividends, JPY bn	AcquisitionsNet, JPY bn
FY2021	129.3	72.1	2.6	40.2	15.3
FY2022	131.9	75.3	0.0	38.5	-3.5
FY2023	160.5	77.6	0.0	50.3	-73.6
FY2024	240.7	74.3	12.4	77.2	71.7
FY2025	181.1	80.2	0.2	80.5	-7.5

The pattern matches strategy: capex rose sharply in FY2024 before normalizing, while R&D remained steady in yen. MHI separately disclosed JPY 289.0bn of broader FY2025 R&D including contracted work; that definition cannot be spliced into the series. The 2024 MTBP now expects JPY 2.6tn of inflows but holds allocation near JPY 1.51tn: JPY 680bn growth investment, JPY 280bn competitiveness investment, JPY 280bn shareholder returns, and JPY 280bn asset sales and other sources.

The team's refusal to treat advances as free cash is correct. FY2025 FCF was JPY 761.6bn and TTM FCF JPY 966.1bn, but Q1 contract liabilities reached JPY 2,483.2bn. Those funds finance execution of a JPY 14.1tn backlog. In the August 2026 Q&A, Nishio directly rejected the premise that near-term cash accumulation was automatically surplus and deferred a fuller allocation plan to the 2027 MTBP.

Buybacks are too small and sporadic to establish price sensitivity. This is not a mechanical repurchase program; it is effectively a dividend-led policy. The [shareholder-return policy](https://www.mhi.com/finance/stock/allotment) targets DOE of at least 4%, with dividends rising from a split-adjusted JPY 13 in FY2022 to JPY 25 in FY2025 and JPY 29 planned for FY2026. That protects per-share income predictability, but it does not prove opportunistic capital return. M&A also does not look serial, yet the available cash-flow series cannot demonstrate deal-level returns. Concentric's impairment prevents a clean PASS on acquisition discipline.

4. Compensation alignment

MHI's remuneration is shareholder-aware but incomplete. At JPY 400bn of business profit, the CEO's standard mix is about 20% base, 25% annual performance pay, and 55% stock remuneration. Stock Award Points settle after three years. Ito owned 178,700 actual shares, Suematsu 84,000, Nishio 6,100, and Izumisawa 398,100. Ito's ownership is meaningful; the new CFO's is modest.

Both annual and stock awards are driven primarily by business profit, with an ESG-rating coefficient in stock awards. There is no explicit ROIC, FCF, cash-conversion, relative-TSR, or per-share-value hurdle. A three-year instrument helps, but profit can be purchased with capital and the plan does not charge for it. The CEO also allocates individual director compensation subject to committee review and board reporting.

The plan includes malus and clawback-like protection: MHI may withhold points or shares and demand repayment of delivered value after extremely improper conduct. The reviewed governance and remuneration documents do not disclose a director hedging prohibition, mandatory post-vesting holding period, or formal ownership multiple. Those are disclosure gaps, not evidence the protections do not exist.

MHI does not disclose a comparable five-year group-wide SBC expense series in the reviewed package; FMP's zero fields were classified as unavailable. Net dilution is disciplined: diluted shares moved only from 3,358.9m in FY2021 to 3,360.3m in FY2025, about 0.04% cumulative.

5. Disclosure quality and candor

MHI publishes official English Q&A summaries, not U.S.-style verbatim full call transcripts. The assessment therefore uses the last eight official reporting-event Q&A documents from [1H FY2024 through Q1 FY2026](https://www.mhi.com/finance/library/result), supplemented by the reviewed data package's correctly dated live transcript evidence. This avoids pretending that Japanese filing terminology maps to a U.S. proxy or Form 8-K convention.

Reporting event	Difficult issue tested	Quality of answer
1H FY2024	Apparently low second-half Energy and ADS profit	Quantified caution and named Boeing strike, FX, and project risks; direct
Q3 FY2024	Profit-guide revisions and equity-method project losses	Quantified the JPY 20bn loss and remaining JPY 10bn Energy buffer; direct
FY2024	Thermal-project costs, supply-chain issues, tariff uncertainty	Named JPY 20bn thermal one-offs and other operating issues; explicitly excluded tariff effects
Q1 FY2025	Logisnext guide cut and group offset	Said the segment had concerns but maintained group guidance because other segments were strong
1H FY2025	South Africa provision and boiler defects	Quantified JPY 20bn plus JPY 10bn, explained dispute status, and admitted turbocharger recovery was difficult
Q3 FY2025	Conservative fourth-quarter margins and FCF use	Explained rounding, rejected dividend use of customer advances, and identified no hidden segment negative
FY2025	Concentric impairment and GTCC competition	Disclosed JPY 30bn impairment, about JPY 70bn acquired-business revenue, and named GE Vernova and Siemens Energy strengths
Q1 FY2026	JPY 25bn Energy one-offs, cash use, capacity	Split the one-offs JPY 15bn and JPY 10bn, corrected an analyst's revenue adjustment, and explained why cash was not surplus

Guidance discipline is good but conservative. On the remuneration scorecard's then-current perimeter, FY2024 business profit was JPY 383.1bn versus a JPY 350bn initial target and FY2025 continuing business profit was JPY 432.2bn versus JPY 420bn. Across the eight reviewed events, group profit guidance was maintained or raised rather than cut; order and FCF forecasts were repeatedly raised. This is credible, although repeated buffers create a mild sandbagging risk.

At least one qualifier such as “buffer,” “uncertain,” “cautious,” “cannot disclose,” or “at this point” appeared in all eight Q&A events. The count is not itself adverse because most qualifiers were paired with figures. Management usually answers the load-bearing part: one-time amounts, backlog timing, price trends, customer advances, and segment margin drivers. The recurring omissions are exact GTCC capacity, a long-term Energy margin, a quantified Defense capacity plan, some project identities, and a finite post-FY2026 cash allocation. Q1 FY2026's refusal to identify one long-term project was understandable commercially; deferring capital allocation and Defense capacity detail is more consequential.

6. Strategic coherence

Ito describes ITO as a two-step cycle: improve profitability, then reallocate resources to growth. Its two pillars are Group-Wide Optimization and Reach Expansion. The [CEO message](https://www.mhi.com/finance/library/annual/pdf/report_2025_06.pdf) gives this a tangible operating form: shared engineering resources, standardized offerings, licensing and partnerships, and lower internal cost. In May 2026 he set a goal to cut internal expense by more than one percentage point of revenue and to raise GTCC capacity 30% by FY2028 before considering heavier fixed-asset expansion.

The investment pattern supports that direction. Capex, R&D, hot-parts capacity, defense facilities, and workforce additions align with GTCC, nuclear, and defense backlog. Divesting Logisnext and strategic holdings also fits a narrower high-return portfolio. Management names competitive threats directly: Ito discussed GE Vernova's broad product lineup and Siemens Energy's small- and mid-frame strength rather than presenting GTCC as uncontested.

The risk is initiative proliferation. “Reach Expansion,” physical AI, data centers, partnerships, and licensing are not yet a quantified profit pool. Industrial Solutions lost JPY 2.0bn on the current FY2025 taxonomy after the Concentric impairment, and its perimeter changed in April 2026. The strategy is coherent, but the next plan must translate slogans into segment capital, return hurdles, and exit rules through 2031.

7. Governance flags

MHI has one class of common shares, no controlling shareholder or parent, and no anti-takeover plan. The board is half independent and the audit committee majority-independent. FY2025 internal controls over financial reporting were assessed effective, and KPMG AZSA issued an unmodified audit opinion. No material financial restatement or company-specific enforcement action was identified in the current MHI, [JPX listed-company](https://www2.jpx.co.jp/tseHpFront/StockSearch.do?callJorEFlg=1&method=&topSearchStr=7011), and Japanese regulator materials reviewed to the anchor.

Related-party disclosure reflects operating affiliations, not executive self-dealing. Loans to affiliates and joint ventures were JPY 16.142bn at March 2026, mainly to Nakoso IGCC Power GK and Hirono IGCC Power GK. Some outside directors' other organizations transact with MHI, including research outsourcing and tire purchases; MHI characterizes these relationships as below independence thresholds. The sharper governance positive is cross-shareholding reduction: strategic holdings fell to 7.1% of equity after JPY 91.4bn of sales in FY2025.

Japan does not provide the same real-time Form 4 and Rule 10b5-1 trail as the United States. The annual-meeting notice discloses officer shareholdings, but the reviewed official sources do not support a complete twelve-month officer-selling ledger. No clustered sale should be asserted or ruled out from that absence.

8. Peer comparison

CEO and peer	Capital allocation	Disclosure	Five-year stewardship relative to Ito
Scott Strazik, GE Vernova	Explicitly returns at least one-third of cash generation; 2025 buyback authorization rose to USD 10bn alongside targeted core M&A	More granular and investor-oriented, with explicit return commitments	Ahead on capital-allocation clarity, though standalone history is short
Christian Bruch, Siemens Energy	Repaired the balance sheet and Gamesa trajectory, restored a dividend, and targets ROCE above 15%	More explicit on returns and troubled-business milestones	Ahead on crisis-tested tenure; MHI has cleaner recent execution but weaker return-linked pay
Yasuhiko Hashimoto, Kawasaki Heavy	Uses an explicit after-tax ROIC framework, but FY2024 ROIC was 8.0%	Detailed remediation after submarine-repair and marine-engine testing misconduct	MHI ranks ahead because execution, controls, and candor are cleaner

Ito ranks in the middle: ahead of Kawasaki's compliance-burdened stewardship, behind Strazik on allocation clarity, and behind Bruch on crisis-tested ownership. Large-frame GTCC operating strength is not yet proven company-wide allocation.

9. Management gate verdict

YELLOW — investable but unresolved. Ito and Nishio are credible operators with relevant internal experience, meaningful CEO ownership, disciplined balance-sheet judgment, and unusually numeric answers for a Japanese industrial issuer. The broader leadership system has lifted diagnostic ROIC to 12.0%, pruned assets, protected the dividend, and acknowledged project and acquisition failures. It does not pass the Gideon decade test today because the CEO/CFO pair has only about fifteen months in-seat, compensation ignores explicit ROIC and FCF, and the next capital-allocation framework remains unfinished while Concentric and long-cycle project charges are recent evidence.

Upgrade to **PASS** only if all three conditions occur: (1) the 2027 MTBP publishes finite segment capital, ROIC or cash-return hurdles, and a disciplined use for non-customer cash; (2) ITO delivers the promised cost and GTCC throughput gains through FY2028 without relying on one-offs or disproportionate fixed assets; and (3) Industrial Solutions returns to sustained profit with no further Concentric impairment while project provisions remain bounded. Downgrade to **FAIL** if MHI launches material M&A without deal-level return hurdles, repeats late large provisions or impairments, or uses business-profit-linked pay to reward growth that fails to improve per-share free cash flow and ROIC.

Primary sources

- [MHI Financial Report 2026](https://www.mhi.com/finance/library/annual/pdf/report_2026_financial.pdf)
- [Corporate Governance Report, June 26, 2026](https://www.mhi.com/finance/library/governance/pdf/report20260626.pdf)
- [Notice of the 101st Annual General Meeting](https://www.mhi.com/finance/stock/meeting/pdf/101_notice.pdf)
- [MHI Report 2025 CEO message](https://www.mhi.com/finance/library/annual/pdf/report_2025_06.pdf)
- [2024 MTBP progress, May 27, 2026](https://www.mhi.com/finance/library/plan/pdf/260527presentation.pdf)
- [Official financial-results and Q&A library](https://www.mhi.com/finance/library/result)
- [Official historical financial-results archive](https://www.mhi.com/finance/library/result_archive)
- [JPX listed-company search for security code 7011](https://www2.jpx.co.jp/tseHpFront/StockSearch.do?callJorEFlg=1&method=&topSearchStr=7011)
- [GE Vernova 2025 CEO letter](https://www.gevernova.com/investors/annual-report/ceo-letter)
- [Siemens Energy FY2025 results and outlook](https://www.siemens-energy.com/global/en/home/press-releases/earnings-release-q4-fy-2025.html)
- [Kawasaki Heavy FY2024 management discussion](https://global.kawasaki.com/en/corp/ir/library/pdf/etc_250625-1e.pdf)

Appendix W - Moat and 2046 Durability

Mitsubishi Heavy Industries — Moat and 2046 Durability

Ticker: 7011.T / XJPX:7011 **Run:** `pulse-cio-20260906T100232+0800` **Assessment date:** 2026-09-06 **Twenty-year test date:** 2046-09-06

This assessment is reconciled to the final reviewed `data_package.md` (SHA-256 `7133c2302d81ec044694e3e5edae03923c0a71a8eb9b8b03c4106bf95c29c869`) and all four peer-reviewed segment appendices. The sealed package controls historicals; appendices supply competitive dynamics, risks, and diagnostics.

1. Moat taxonomy applied

Network effects — absent. More MHI turbines, missiles, or chillers in use do not make another customer's unit inherently more valuable. A larger installed fleet can improve service data, field learning, parts availability, and engineering feedback, but that is a scale and learning advantage, not a true demand-side network. Digital fleet monitoring could create a modest data flywheel in Energy Systems, yet customers can still compare suppliers at the next greenfield procurement. No segment deserves network-effect credit.

Switching costs — strong only after asset or program selection. A utility that selects a turbine platform, a government that fields a missile or naval system, or an aircraft OEM that qualifies a structural supplier incurs major costs to re-engineer, recertify, retrain, restock parts, and assume new reliability risk. This protects Energy after-sales, nuclear maintenance, defense support, and certified aerospace work. It is weaker before an award: greenfield GTCC, metals machinery, engineering projects, HVAC, engines, and turbochargers still face competitive tenders. The moat is therefore "win once, monetize responsibly for decades," not automatic dominance of every new order.

Scale economies — meaningful but contested. MHI spreads R&D, test facilities, casting, welding, controls, global service, project-risk systems, and supplier qualification across a broad industrial base. Customer advances also help fund long-cycle production. Mitsubishi Power reports 1,776 cumulative gas-turbine orders as of January 2025, including 1,162 heavy-duty units, which supports field learning and parts economics ([Mitsubishi Power order summary](https://power.mhi.com/products/gasturbines/global-experience/)). But GE Vernova reports more than 7,000 installed gas turbines and a $69.7 billion services remaining-performance-obligation balance at year-end 2025, while Siemens Energy reports a 700 GW Gas Services fleet and 90% renewal rates on long-term service agreements ([GE Vernova 2025 annual report](https://www.gevernova.com/sites/default/files/gevernova_2025_annual_report.pdf); [Siemens Energy FY2025 shareholder letter](https://assets.siemens-energy.com/dam/9478ef65-c3f9-49de-97b0-b3aa00d5712d/2025-11-14--Shareholder-Letter-Q4-FY2025-EN_final-pdf_Original%20file.pdf)). MHI has efficient scale in chosen niches, not an unassailable cost lead.

Brand — useful as a trust marker, not consumer pricing power. The Mitsubishi name helps open doors in Japanese sovereign procurement and signals balance-sheet capacity for decades-long obligations. In power, nuclear, defense, and aerospace, references and reliability matter far more than advertising. Yet procurement committees buy technical performance, lifecycle cost, delivery confidence, and political acceptability; a famous name cannot rescue a weak bid or failed program. Brand reinforces high-trust procurement but is not a stand-alone moat.

Regulatory and certification barriers — strong in nuclear, defense, aerospace, and space. Safety cases, security clearances, export controls, classified interfaces, flight certification, traceability, test infrastructure, and long acceptance processes sharply restrict credible entrants. They also slow customers' ability to switch. Regulation is double-edged: an adverse safety event, failed launch, export restriction, or procurement reform can impair the same franchise. Industrial Solutions and much of Plants & Infrastructure face less protective regulation; environmental and efficiency rules can create demand but do not reserve it for MHI.

Intellectual property and tacit know-how — real, but not broad enough to monopolize markets. High-temperature materials, turbine cooling, combustion, control systems, composites, welding, hydrodynamics, nuclear systems, and missile integration combine formal IP with manufacturing recipes and accumulated failure data. MHI's Financial Report says it protects R&D outcomes through patents and licenses while acknowledging dependence on third-party technology and litigation risk ([MHI Financial Report 2026](https://www.mhi.com/finance/library/annual/pdf/report_2026_financial.pdf)). The strongest protection is tacit process capability validated in operating fleets, not a finite patent estate. GE, Siemens Energy, Danieli, SMS, Daikin, Carrier, Trane, Boeing's other suppliers, and global defense primes possess deep IP of their own.

High-trust procurement — the strongest group-wide moat, but uneven. Utilities, defense ministries, nuclear operators, aircraft OEMs, and launch customers cannot tolerate casual failure. References, security eligibility, engineering depth, liability capacity, and the ability to support assets for decades reduce the eligible bidder set. Japan's Ministry of Defense contracted MHI in March 2025 for development running through FY2032 of a new long-range precision-guided missile, illustrating program-duration lock-in rather than proof of unrestricted pricing power ([Japan Ministry of Defense](https://www.mod.go.jp/j/press/news/2025/04/01b.html)). This moat is strongest in Energy and Defense & Space, moderate in large infrastructure, and weakest in shorter-cycle HVAC, engines, and automotive components.

2. Per-segment moat

Energy Systems — current moat PASS; 20-year durability YELLOW. The defendable profit pool is the installed base and qualification flywheel in large-frame GTCC, nuclear, steam service, and aero engines. FY2025 Energy after-sales was 63% of segment revenue; product ratios were 49% for GTCC, 76% for Steam Power, and 71% for Nuclear. Switching costs begin after platform selection, and the 80-unit / 35 GW large-frame backlog at Q1 FY2026 extends the service funnel. MHI's own business Q&A says capacity expansion requires synchronized procurement, manufacturing, and assembly rather than one simple bottleneck, evidence that the chokepoint is a system of qualified physical capabilities ([MHI GTCC business Q&A](https://www.mhi.com/finance/library/business/pdf/2025_gtcc_qa.pdf)). The peer-reviewed segment appendix normalizes the reported 14.35% TTM margin to 13.20% after removing JPY25 billion of identified Q1 one-time profit; the normalized margin, not 18.9% Q1, is the durability anchor. Durability is high for 5–10 years because orders under discussion reach 2030–2031, but 20-year economics depend on gas remaining valuable as firm power and on MHI adapting combustion, carbon capture, and services. The earliest break signals are declining large-frame order share, service-mix erosion, loss of long-term-service renewals, or new-order margins falling despite a full factory.

Plants & Infrastructure Systems — current moat YELLOW; 20-year durability FAIL. Metals machinery, complex engineering, environmental systems, and certain ship projects have references and process know-how, but most awards remain contestable and project-specific. FY2025 margin reached 9.5%, up from 3.6% in FY2021, yet that is improvement rather than proof of stable pricing power. Danieli reports a €5.4 billion FY2024/25 backlog and promotes competing digital and decarbonization technologies, demonstrating that sophisticated rivals can fund innovation and bid globally ([Danieli results](https://www.danieli.com/en/m157/investors/results-and-financial_164.htm)). The reviewed segment appendix supports roughly 9–11% as a plausible normal-cycle margin range, but that range depends on bid discipline and clean execution rather than segment-wide lock-in. The earliest break signal is backlog growth accompanied by weaker margins, larger project-loss provisions, or contract-asset growth without cash conversion.

Industrial Solutions — current moat FAIL; 20-year durability FAIL. Engines, turbochargers, HVAC, automotive A/C, and emerging data-center energy management are physical products, but qualification and distribution advantages face scaled specialist competitors. The corrected current-taxonomy TTM is JPY723.194 billion of revenue and JPY3.911 billion of profit, a 0.54% margin; FY2025 profit was negative JPY2.0 billion. A moat that does not yet produce acceptable economics should not be inferred from product breadth. Daikin, for example, is already the global HVAC leader and is explicitly investing to gain share in applied and data-center cooling, where it says other manufacturers currently have larger sales ([Daikin applied-air-conditioning strategy](https://www.daikin.com/about/corporate/tic/topics/feature/2026/20260731)). Data Center & Energy Management may become platform-adjacent, but MHI has not disclosed stand-alone revenue, margins, backlog, or retention. A sustained mid-to-high-single-digit segment margin and disclosed service attachment would be evidence of repair; persistent sub-4% margins or another impairment would confirm commodity-like economics.

Aircraft, Defense & Space — current moat PASS; 20-year durability YELLOW. Defense and space combine sovereign trust, classified integration, export controls, domestic industrial policy, and long program lives. Commercial aerospace adds certified manufacturing and work-package switching costs. Boeing's 777-8F program identifies MHI among the key suppliers producing major assemblies, showing qualification inside a long-cycle platform rather than an easily replaceable job shop ([Boeing 777-8F supplier update](https://www.boeing.com/content/theboeingcompany/us/en/features/2025/07/a-spar-is-born--team-builds-first-777-8-freighter-wing-parts.html)). Japan's FY2026 defense budget continues large allocations to domestic stand-off missiles, sustaining addressable programs ([Japan MOD FY2026 major projects](https://www.mod.go.jp/en/d_act/d_budget/pdf/fy2026_20251226a.pdf)). The reviewed segment's weighted 2031 diagnostic is JPY234.8 billion of profit on JPY2,011.2 billion of revenue, an 11.67% margin; that supports mid-term resilience, not a 2046 guarantee. Customer concentration, government-controlled economics, Boeing dependence, and H3 Flight 8's failure followed by Flight 9's postponement show why sovereign relevance does not ensure returns ([JAXA Flight 8](https://global.jaxa.jp/press/2025/12/20251222-2_e.html); [JAXA Flight 9](https://global.jaxa.jp/press/2026/02/20260203-1_e.html)). Break signals are backlog conversion below plan, recurring cost

overruns, sovereign-program loss, prolonged launch disruption, or work-package dual-sourcing.

Blended-company effect. Energy and Aircraft, Defense & Space generated JPY418.7 billion, or 83.6%, of FY2025 reportable-segment profit before the corporate bridge. On TTM figures, they generated JPY467.311 billion, or 83.7%, of the JPY558.491 billion reportable-segment total. The strongest franchises therefore dominate profit more than revenue. However, Plants is only selectively defended, Industrial is not defended in observed economics, and corporate costs absorb part of the protected profit pool. MHI should not be valued as if every yen of its JPY5.134 trillion TTM revenue carries GTCC or defense switching costs.

3. Margin persistence evidence

The reviewed package provides five comparable fiscal years, not a clean ten-year current-taxonomy series. FY2021–FY2024 segment figures use the predecessor taxonomy and FY2025 uses the current restatement; Industrial is especially non-comparable after Logisnext's removal and the Data Center & Energy Management transfer. A ten-year moat claim would therefore outrun the reviewed evidence.

Business-profit margin	FY2021	FY2022	FY2023	FY2024	FY2025	TTM to 2026-06-30
Consolidated	4.15%	4.60%	6.07%	8.14% restated	8.69%	9.64%
Energy Systems	5.2%	4.9%	8.0%	11.3% predecessor	13.0% current	14.35% reported / 13.20% normalized
Plants & Infrastructure	3.6%	4.8%	6.9%	7.0% predecessor	9.5% current	10.0%
Industrial / LT&D predecessor	3.1%	3.2%	5.5%	3.8% predecessor	-0.3% current	0.54%
Aircraft, Defense & Space	4.0%	6.4%	9.2%	9.7% predecessor	10.9% current	10.93%

The pattern is expansion, not persistence: consolidated margin more than doubled, Energy rose roughly eight points, and Aircraft/Defense/Space rose roughly seven points. That may reflect better bid discipline, mix, service, scale, and backlog quality, but it also overlaps unusually strong GTCC, nuclear, defense, and aviation demand. Q1 FY2026 Energy's 18.9% margin included about JPY25 billion of one-time contract-price finalization and investment-sale gains; the segment review's 13.20% normalized TTM margin is the cleaner anchor. Diagnostic ROIC improved from 4.9% in FY2021 to 12.0% in FY2025 but still fell short of the Gideon 15% threshold. The numbers show material franchise improvement; they do not yet prove a full-cycle, 20-year high-return compounder.

4. AI disruption stress test

Energy Systems. The delivered value is mostly chokepoint economics: certified rotating equipment, nuclear systems, field service, parts, and contractual performance. A foundation model cannot manufacture a turbine hot section, perform a nuclear outage, or assume performance liability. AI can improve combustion simulation, predictive maintenance, scheduling, remote diagnostics, and bid estimation. It may reduce the value of proprietary monitoring software if customers can use interoperable analytics, but it should enhance rather than replace the physical platform.

Plants & Infrastructure. Engineering design, proposal generation, process optimization, and project-control work contain the group's most AI-replicable workflows. Models with domain data can compress hours and make smaller competitors more productive. The moat must therefore reside in reference plants, integration, guarantees, local permitting, construction execution, and proprietary equipment—not engineering documents. AI is an enhancer to execution but a potential commoditizer of engineering labor and digital controls.

Industrial Solutions. HVAC sizing, energy management, controls, diagnostics, and data-center optimization are software-rich and platform-adjacent. AI raises demand for power and cooling while also allowing specialist cooling vendors, chip firms, building-management platforms, and customers to optimize systems. MHI benefits only if it owns differentiated hardware, service access, or an integrated power-and-cooling channel. The current lack of stand-alone economics means no digital moat credit is warranted.

Aircraft, Defense & Space. AI can accelerate design, inspection, autonomy, mission planning, predictive maintenance, and factory throughput. It does not eliminate certification, classified integration, sovereign accountability, secure supply, weapons testing, shipyards, launch infrastructure, or composite manufacturing. Software-native defense entrants can still attack command-and-control, autonomy, and mission-software layers, potentially shifting value away from traditional primes. MHI's protected position is strongest in integrated physical platforms and weakest where software architecture becomes modular.

Plants & Infrastructure's engineering workflow is the most exposed; nuclear and sovereign defense hardware are the most protected. Across MHI, AI is more likely to alter cost curves and value allocation than directly substitute the company's core output.

5. The 2046 test

Specific 2046 description. On 2046-09-06, a plausible MHI sells dispatchable-power equipment and lifecycle service to utilities and power producers; nuclear maintenance, fuel-cycle systems, uprates, and selected new reactors to Japanese operators; missiles, naval vessels, aircraft, space launch and secure support to Japan and close allies; aerostructures and engine modules to certified OEM programs; and specialized metals, cooling, industrial-energy, and environmental systems to industrial customers. Conventional new-build Steam Power has withered, while service and conversion work remain. Defense, nuclear, GTCC repowering and low-carbon-fuel or carbon-management variants have grown in economic importance. Industrial Solutions is smaller, consolidated, or earns acceptable margins around data-center cooling and energy management; undifferentiated automotive and HVAC products are harvested or exited.

Directionally, 2046 business-profit margin could be stable to moderately higher than the current 9.6% TTM level—roughly low double digits—because service, defense, and nuclear are a greater share, not because all products gain pricing. Customers still pay MHI because changing a fielded sovereign system, certified aerospace process, turbine fleet, or nuclear-service provider is risky and costly. The intact moat is the installed base plus regulatory qualification plus high-trust procurement, supported by tacit manufacturing and integration know-how. That is specific enough to pass the "business still exists" test, but not enough to prove Gideon-grade returns.

2046 bear description. Long-duration storage, grid interconnection, renewables, or alternative firm-power technologies displace much of new GTCC demand; hydrogen-ready claims do not translate into economic retrofits; Japan's nuclear build remains politically stalled; and defense procurement shifts toward software-defined, modular, or foreign systems. Service contracts become interoperable, while AI commoditizes design and monitoring. MHI retains a large installed-base service and government-contracting business, but Plants and Industrial remain low return, major programs suffer overruns, and consolidated margin falls back toward mid-single digits. This bear is moderately plausible because energy and defense policy can change within twenty years and current margin expansion has not been cycle-tested.

2046 test: YELLOW. MHI can be described credibly in 2046 and has enduring buyers, physical assets, and regulated programs. The unresolved issue is not survival; it is whether the protected activities deliver persistently high returns after today's synchronized demand upswing normalizes.

6. Competitive threat inventory

Threat	Mechanism	Segment(s) affected	Earliest observable signal	Plausibility
GTCC capacity and service arms race	GE Vernova and Siemens Energy expand equipment capacity, bundle larger fleets with service, or price aggressively as the current shortage eases	Energy Systems	MHI order share falls; service mix declines; new-order profitability stalls despite backlog	High
Policy and architecture shift	Storage, renewables, modular software, foreign procurement, or budget normalization redirects spending away from MHI's incumbent platforms	Energy; Aircraft, Defense & Space	GTCC pipeline shortens; nuclear milestones slip; MOD orders or MHI program wins fall	Medium
Backlog execution and input inflation	Qualified-supplier scarcity, labor constraints, fixed-price exposure, rework, or customer changes consume the apparent moat rent	Energy; Plants; Aircraft, Defense & Space	Provisions, contract assets, delays, working-capital use, or segment margin worsen during revenue growth	High

7. Pricing power verification

Pricing power is observable only indirectly and mainly in Energy. Management says profitability on newly concluded GTCC contracts is improving gradually, and a JPY15 billion Q1 item reflected final contract-price recognition on a long-term project. Strong demand and constrained capacity plausibly support bid selectivity. However, MHI does not disclose customer-level price increases, adoption or churn, same-product price realization, gross margins, long-term-service renewal rates, or a group schedule of inflation escalators and minimum commitments. Margin expansion is encouraging but mixes price, volume,

service, currency, project closeouts, and one-offs.

Segment	Observable evidence	What is missing	Pricing-power judgment
Energy Systems	Improving new-order profitability; high service mix; long delivery queue	Price/volume split, churn, renewal, escalators, clean service margins	Moderate, not fully verified
Plants & Infrastructure	Margin rose to 9.5%; backlog supports selection	Repeatable price realization and contract risk-sharing terms	Weak / project-specific
Industrial Solutions	FY2026 guide implies recovery from loss	Durable margin, price realization, channel retention	Not demonstrated
Aircraft, Defense & Space	Long programs and high backlog reduce switching	Sovereign contract returns, inflation recovery, program-level margins	Moderate lock-in, limited price autonomy

The distinction is crucial: backlog and customer dependence can strengthen switching costs while weakening supplier pricing if contracts cap economics. MHI has evidence of favorable selection and mix, not yet proof of broad pricing power through a full inflation and demand cycle.

8. Moat verdict

Moat gate: YELLOW. MHI has real, concrete moats in Energy Systems and Aircraft, Defense & Space: installed-base service, qualification, regulation, sovereign trust, and tacit physical integration. Those segments produce most reportable profit, but the consolidated evidence shows rapid recent margin expansion rather than ten-year persistence, diagnostic ROIC is only 12%, Industrial fails the economic moat test, Plants is project-selective, and pricing power is incompletely disclosed. This is investable only as a monitored durability case, not yet a cleared Gideon compounder moat.

2046 test: YELLOW. A credible 2046 company still serves utilities, nuclear operators, Japan’s defense establishment, allied governments, and certified aerospace programs. The unanswered question is whether energy transition, procurement architecture, and peer capacity leave MHI with high returns rather than merely strategic relevance.

Upgrade both gates to PASS if Energy and Aircraft/Defense/Space sustain at least current underlying margins through backlog normalization while service attachment remains high, MHI discloses clean evidence of new-order price realization or contractual inflation protection, and Industrial reaches a durable acceptable margin without another impairment. Downgrade to FAIL if revenue growth brings larger provisions and weaker cash conversion, GTCC service or order share falls as peer capacity arrives, or defense/nuclear program economics deteriorate despite continued government demand.

Appendix B1 - Energy Systems

Energy Systems — Segment Deep Dive

Company: Mitsubishi Heavy Industries **Security:** 7011.T **Run:** `pulse-cio-20260906T100232+0800` **TTM anchor:** 2026-06-30 **Exact five-year horizon:** 2031-06-30 **Currency and scale:** JPY billions unless stated otherwise **Exact profit metric:** `Profit from business activities`

This appendix uses `data_package.md` and the sealed `statutory_bridge.json` as the only sources for MHI historical figures, accounting classifications, and management quotations. External sources are used only for competitive and industry context. Forecasts are analyst estimates built from the package's TTM anchors. Nothing in this appendix allocates `Others, Corporate & Eliminations` to Energy Systems; that line remains for the consolidated synthesis.

0. Segment boundary and taxonomy note

Energy Systems comprises GTCC, Steam Power, Aero Engines, Nuclear Power, and related services. The segment itself was not reorganized in the FY2026 change that renamed LT&D and moved Data Center & Energy Management into Industrial Solutions. Nevertheless, the package labels FY2021–FY2024 as predecessor context and FY2025 as the current restated perimeter because MHI did not publish a complete five-year current-taxonomy recast. The model therefore treats FY2025 and the TTM ended 2026-06-30 as controlling anchors, uses older figures only as directional history, and never silently combines the Energy line with `Others, Corporate & Eliminations` [data_package §1; §3, Energy Systems table].

1. What this segment actually is

Energy Systems is a long-cycle power and propulsion equipment franchise with a large installed-base service layer. The customer is usually a utility, independent power producer, government-linked energy company, nuclear operator, or civil aero-engine prime rather than an individual end user. The product is not a generic manufactured unit: it is an engineered system whose economics extend from design and manufacturing through installation, commissioning, scheduled maintenance, parts, upgrades, remote monitoring, and sometimes investment participation in the project.

GTCC is the largest disclosed product. MHI supplies large-frame gas turbines, steam turbines, generators, heat-recovery components, control systems, and long-term services that together turn natural gas into combined-cycle power. Original-equipment revenue is milestone-driven and sensitive to manufacturing slots, site readiness, and project schedules. Service revenue is earned over a much longer installed-base life through inspections, hot-gas-path work, parts replacement, upgrades, and long-term service agreements. Customers buy on lifecycle efficiency, output, reliability, emissions performance, and confidence that the supplier can support the plant for decades. This makes the initial sale partly a gateway to future service economics.

Steam Power serves conventional thermal plants and the steam cycle of power systems. The new-build market is structurally less attractive in many developed markets, but the installed base creates demand for repairs, life extension, emissions-related upgrades, and efficiency improvements. FY2025's 76% after-sales ratio shows why shrinking equipment demand does not imply the same rate of revenue erosion. The business resembles a managed runoff and service-harvest franchise, punctuated by project work, more than a secular volume compounder [D-O4 p.31; data_package §4, after-sales table].

Nuclear Power covers Japanese light-water-reactor work, fuel-cycle activity, maintenance, restart and safety upgrades, spent-fuel handling, and advanced-reactor development. Customers are highly regulated utilities and public-sector-linked institutions. Qualification, engineering pedigree, safety documentation, and installed-base knowledge matter as much as price. Revenue conversion can be slow because regulatory approvals and customer schedules govern the work. Conversely, once a supplier is embedded in a reactor fleet, switching is difficult and service relationships can endure for decades.

Aero Engines consists mainly of civil aero-engine components and maintenance, repair and overhaul activity. MHI participates within global engine programs rather than selling a complete commercial engine under its own name. Revenue therefore depends on aircraft production, engine shop visits, customer inventory, and program-partner economics. The Q1 FY2026 after-sales ratio was 72%, indicating a meaningful recurring maintenance component, though the package does not disclose an annual product ratio or program-level profit [D-O2 p.22; data_package §4, after-sales table].

The go-to-market model is direct and relationship-led. Large equipment awards involve lengthy technical qualification, engineering studies, financing and contract negotiation. Pricing is project-specific, with risk around material escalation, liquidated damages, design change, and performance guarantees. Services are sold either under long-term agreements, as in

many Americas GTCC projects, or through annual and outage-by-outage arrangements, which management says are more common in Japan [Q1 FY2026 Q&A, 2026-08-06, CFO Hiroshi Nishio, D-O3; data_package §6]. That distinction affects visibility: a signed long-term service agreement creates a better recurring-revenue claim than an annual renewal, even if both arise from the same installed base.

2. Current economics

Energy Systems generated TTM revenue of JPY 2,175.7bn, calculated from the package's four discrete segment quarters: JPY 447.8bn, JPY 483.7bn, JPY 707.9bn, and JPY 536.3bn. TTM `Profit from business activities` was the sealed JPY 312.195bn, producing a reported 14.35% margin [D-O2 p.10; D-O4 and D-O5 discrete-quarter derivations in data_package §5; sealed `MHI_TTM_RECONCILIATION` in data_package §3a]. Revenue was JPY 2,062.6bn and `Profit from business activities` was JPY 267.2bn in FY2025, for a 13.0% margin, versus JPY 1,815.7bn, JPY 205.3bn, and 11.3% in FY2024 predecessor context [D-O7 official annual workbook; sealed bridge; data_package §3, Energy Systems table].

The reported TTM margin is not a clean starting point. Q1 FY2026 included approximately JPY 15bn from final contract-price recognition and JPY 10bn from sales of power-project investments. Removing the full JPY 25bn from TTM Energy profit yields JPY 287.195bn and a 13.20% planning margin. This normalization does not assert that all unusual items will disappear forever; it prevents one discrete quarter from turning a contract closeout and investment disposal into a recurring five-year earnings rate. Management indicated that Q1 margin remained above the full-year target even after those items, so 13.20% is not intended as a punitive trough [Q1 FY2026 Q&A, 2026-08-06, CFO Hiroshi Nishio, D-O3; data_package §6, Energy Systems narrative].

The TTM product anchors are derived only from package figures. GTCC is JPY 1,070.3bn, equal to FY2025 JPY 992.2bn less Q1 FY2025 JPY 196.8bn plus Q1 FY2026 JPY 274.9bn. Steam Power is JPY 358.2bn on the same construction; Aero Engines JPY 290.7bn; Nuclear Power JPY 387.7bn. The four sum to JPY 2,106.9bn. A JPY 68.8bn `Other / inter-product residual` makes the total equal the reportable-segment TTM revenue. It is an arithmetic residual, not a newly disclosed product. The residual prevents the model from falsely assigning all segment revenue to the four named lines [D-O4 p.17; D-O2 pp.10–11; data_package §§4–5].

Current mix is approximately 49.2% GTCC, 16.5% Steam Power, 13.4% Aero Engines, 17.8% Nuclear Power, and 3.2% residual on the TTM basis. MHI disclosed an Energy Systems after-sales ratio of 63% for FY2025. Product ratios were 49% for GTCC, 76% for Steam Power, and 71% for Nuclear Power; the annual Aero Engines ratio was not disclosed. Q1 ratios were temporarily lower for GTCC and Nuclear because equipment revenue grew rapidly, while Steam and Aero remained service-heavy [D-O4 p.31; D-O2 p.22; data_package §4, after-sales table].

Capital intensity is substantial but uneven. GTCC requires foundry, machining, assembly, testing, supplier capacity, and field-service resources; nuclear requires specialist engineering, regulated manufacturing, documentation, and long-duration workforce capability; aero programs require certified manufacturing and MRO capacity. MHI's Growing Core Businesses personnel rose from about 26,000 in FY2023 to 31,000 in FY2025, with about 33,000 forecast for FY2026. More than 1,000 GTCC kaizen actions provided line of sight to roughly 30% capacity growth, while further expansion is still being paced against order certainty [D-O6 pp.17,20; D-O3 p.4; data_package §4, capacity table].

[DATA GAP: MHI does not disclose Energy Systems-specific capex, R&D, invested capital, or working capital. Consolidated capex and personnel evidence cannot support a precise segment ROIC.] This matters because backlog growth can consume working capital when manufacturing ramps, even though customer advances help fund projects. The group had JPY 2,483.2bn of contract liabilities at Q1 FY2026; the appendix does not attribute that balance to Energy Systems or treat it as free cash [D-O1; D-O4 p.12; data_package §§4,8].

3. Unit economics

Energy Systems converts revenue into `Profit from business activities` through three interacting economics: margin on new equipment, lifetime service contribution, and control of project risk. The installed base creates the moat, but the quality of the initial contract determines whether that installed base is acquired profitably. A turbine sold at a weak price can carry years of execution risk before attractive service revenue arrives. Conversely, disciplined slot allocation can protect equipment margin and seed decades of parts and maintenance demand.

GTCC new-equipment economics depend on factory utilization, configuration repeatability, material and component costs, engineering hours, warranty assumptions, logistics, customer-specific performance guarantees, and price escalation clauses.

When order demand exceeds near-term slot capacity, MHI can choose projects, negotiate better terms, and standardize execution. Management's statement that profitability on new orders "continues to improve gradually" is important: the benefit appears when orders booked at better terms convert to revenue, generally in 2028–2030, rather than immediately [Q1 FY2026 Q&A, 2026-08-06, CFO Hiroshi Nishio, D-O3; data_package §6 rows 2–3]. The model therefore phases margin rather than capitalizing all backlog pricing into the TTM year.

Service economics should be more stable than equipment economics because the supplier has proprietary drawings, operating data, certified parts, and outage know-how. A planned outage is costly for the operator, so reliability and speed matter more than the cheapest nominal part. Long-term service agreements also create scheduled revenue and can smooth the equipment cycle. But services are not automatically riskless: contract assumptions about utilization, parts life, inflation, and outage scope can be wrong. Competition from independent service providers is stronger on mature equipment, and customers may negotiate hard when contracts renew.

Steam Power's high service mix supports cash generation despite declining equipment revenue. Fixed engineering and field-service resources must be managed down with the equipment base, however. If new-project revenue falls faster than the cost base adjusts, mix alone will not preserve profit. The bear case assumes this operating-deleverage problem dominates. The base case assumes MHI harvests the installed base without chasing low-return new work. The bull case allows modest stabilization from life extension and grid-reliability projects, but not a return to large secular new-build growth.

Nuclear unit economics are constrained by regulation and long lead times. High barriers can support pricing, but custom scope, schedule changes, and responsibility for safety-critical work can produce overruns. The spent-fuel-cask bottleneck removal raises stated annual capacity from 20 to 25 units, a bounded 25% improvement rather than evidence that the entire nuclear business can grow 25% annually [D-O6 p.19; data_package §4, capacity table]. Japanese restart, life-extension, fuel-cycle, and advanced-reactor work can raise engineering utilization. Yet the realization schedule depends on regulatory and customer milestones, so backlog quality matters more than headline market growth.

Aero Engines has program-volume and aftermarket economics. Higher aircraft utilization and shop visits help MRO, while production growth benefits component volume. The downside is concentration in a small number of global programs and primes, limited control over end pricing, and exposure to supplier bottlenecks. FY2025 revenue rose 29.1%, and Q1 FY2026 rose 27.9% year over year, but management's FY2026 revenue guide of JPY 260bn is below FY2025's JPY 274.1bn. That combination warns against extrapolating one quarter or assuming industry recovery translates linearly into full-year MHI revenue [D-O4 p.17; D-O2 pp.11,18; data_package §4].

The segment's margin rose from 4.9% in FY2022 to 8.0% in FY2023, 11.3% in FY2024 predecessor context, and 13.0% in FY2025 current disclosure [D-O7 official annual workbook; sealed bridge; data_package §3]. That improvement plausibly reflects higher volume, service mix, better project execution, and price, but the data package does not provide product-level profit. [DATA GAP: GTCC, Steam Power, Aero Engines, and Nuclear Power product-level `Profit from business activities` and margins are not disclosed.] Accordingly, this appendix forecasts product revenue separately and applies margin only at the reportable-segment level. Assigning fabricated margins to products would create false precision and could make the weighted segment margin appear more grounded than it is.

The key margin-up mechanisms are higher-priced GTCC backlog, more equipment throughput without proportional overhead, subsequent service attachment, disciplined project selection, improved supply-chain execution, and nuclear engineering utilization. The key margin-down mechanisms are adverse contract finalization, warranty or performance costs, material and labor inflation not covered by price escalation, factory-ramp inefficiency, lower Steam volume, aero-program disruption, and a mix swing toward new equipment before service revenue matures. The Q1 one-offs demonstrate why project accounting and investment disposals must be separated from recurring operating leverage.

4. Competitive dynamics

GTCC and power services

Large-frame gas turbines are an oligopoly rather than a broad commodity market. MHI competes chiefly with GE Vernova and Siemens Energy on efficiency, output, reliability, emissions, hydrogen-readiness claims, project delivery, and lifecycle service. The entry barrier is not merely the turbine design. It includes decades of fleet data, hot-section materials, combustion know-how, validation facilities, certification, global field service, bankability, and the ability to honor long warranties. A new entrant would need customers to risk a multi-decade power asset on an immature fleet.

Competitive evidence supports strong industry demand but also argues against assuming MHI alone captures it. GE Vernova reported that its gas-power equipment backlog and slot reservations reached 83 GW at the end of 2025 and highlighted a fleet

of more than 7,000 gas turbines plus an USD 86bn services backlog. Siemens Energy reported FY2025 Gas Services revenue growth of 14.2%, a 13.0% margin before special items, and FY2026 guidance for 16%–18% comparable growth and a 14%–16% margin. Its 2025 Capital Market Day material showed a 66% service share of revenue and 77% of backlog ([GE Vernova FY2025 results](https://www.gevernova.com/news/press-releases/ge-vernova-reports-fourth-quarter-full-year-2025-financial-results); [GE Vernova 2025 CEO letter](https://www.gevernova.com/investors/annual-report/ceo-letter); [Siemens Energy FY2025 results](https://www.siemens-energy.com/global/en/home/press-releases/earnings-release-q4-fy-2025.html); [Siemens Energy Gas Services presentation](https://assets.siemens-energy.com/dam/5fc093ca-4fd8-482c-8390-b39b004f66f3/251120_CMD-2025_Gas_Services_FINAL-pdf_Original%20file.pdf)).

Those peer data points show that MHI's 9% base GTCC CAGR is not an industry-demand stretch. They also expose the competitive constraint: both peers are expanding capacity and defending service relationships. Customers can compare technical offers among bankable vendors and may dual-source across fleets. MHI's pricing power is strongest when capacity is scarce, its turbine efficiency lowers lifecycle fuel cost, and service capability reduces outage risk. It is weakest where a customer already owns a rival fleet, local-content rules favor another supplier, or project financing depends on a different vendor ecosystem.

Substitution risk is two-sided. Renewables, storage, grid expansion, demand response, and nuclear can reduce long-run gas generation needs. Yet intermittent renewable penetration can also increase the value of dispatchable, flexible gas capacity, especially where coal retirement, data-center load, and grid constraints move faster than storage deployment. Carbon policy may require lower utilization, carbon capture, hydrogen co-firing, or retirement before the turbine's technical life. The investment case therefore cannot treat current backlog as proof of a 20-year gas unit supercycle. It supports a five-year conversion thesis more strongly than a perpetual-growth thesis.

Nuclear Power

Nuclear competition is country- and reactor-fleet-specific. MHI's position in Japan benefits from regulatory qualification, customer relationships, and installed-base knowledge. Competitors and partners can include other Japanese heavy-electrical groups, reactor vendors, engineering contractors, and specialized nuclear-service companies. The domestic fleet creates strong switching costs for safety-critical maintenance, but political decisions and regulatory milestones can delay work for years.

The external demand backdrop is constructive without eliminating execution risk. The IAEA's 2025 outlook cited high- and low-case global nuclear-capacity projections of 992 GW and 561 GW by 2050, respectively, and described both new construction and life extension as drivers. That large scenario spread is itself useful: nuclear demand has upside, but policy, financing, construction capability, and public acceptance produce wide outcomes ([IAEA 2025 SMR platform report](https://nucleus.iaea.org/sites/smr/Shared%20Documents/IAEA%20SMR%20Platform%20Annual%20Report%202025.pdf); [IAEA PRIS analytics](https://pris-stats.iaea.org/)). MHI's five-year revenue opportunity is more likely to come from Japan-specific restart, maintenance, fuel-cycle, and capacity work than from immediately monetizing the full global projection.

Steam Power and Aero Engines

Steam Power competes with incumbent OEMs and independent service providers. Its service moat is strongest for proprietary components and integrated upgrades; it weakens as equipment ages, documentation diffuses, and third-party repair capability develops. The best economic response is selective service and life-extension work, not defending revenue at any price. In new coal-related equipment, policy and financing constraints are a major substitution risk.

Aero Engines competes less through a standalone MHI-branded product and more through execution within global engine consortia and supply chains. Qualification, certified processes, yield, delivery reliability, and cost determine share. The moat is real because aerospace components cannot be casually resourced, but bargaining power resides partly with the engine prime. MHI's MRO activity benefits from the installed fleet and shop-visit cycle; component activity remains exposed to program rates and production bottlenecks.

5. Moat at the segment level

Energy Systems has a defensible but not uniform moat. GTCC and Nuclear Power possess the strongest protection; Steam Power's moat is installed-base-specific and eroding at the new-equipment level; Aero Engines has qualification barriers but weaker control of end-market economics.

The first moat layer is technical and reputational. Power and nuclear customers cannot cheaply tolerate a design failure, unplanned outage, or safety problem. Proven efficiency, reliability, materials science, combustion performance, and the capability to resolve complex field issues narrow the qualified supplier set. MHI's order schedule extending into 2028–2030 and an 80-unit, 35-GW large-frame GTCC backlog are evidence that customers view the company as bankable [Q1 FY2026 Q&A, 2026-08-06, CFO Hiroshi Nishio, D-O3; data_package §6].

The second layer is switching cost after installation. Proprietary parts, maintenance procedures, digital monitoring, control systems, engineering records, and warranty relationships favor the original supplier. FY2025 after-sales ratios of 49% in GTCC, 76% in Steam, and 71% in Nuclear show that the installed base is economically material [D-O4 p.31; data_package §4, after-sales table]. The moat is deeper where a long-term service agreement binds the relationship and shallower where service is negotiated annually.

The third layer is manufacturing scarcity and project-selection capacity. When qualified vendors have multi-year backlogs, scarce slots can improve contract terms. This advantage is cyclical as well as structural: competitors are also adding capacity, and customers can delay projects. MHI's capacity work creates upside only if execution maintains quality and avoids excess fixed cost. More than 1,000 kaizen actions and line of sight to 30% higher GTCC capacity are credible operating evidence; a prospective doubling that is not yet online is not forecast fact [D-O6 p.17; D-O3 p.4; data_package §4, capacity table].

The fourth layer is lifecycle data and workforce know-how. Installed fleets produce failure, performance, and maintenance information that improves service decisions. Nuclear and turbine engineers accumulate tacit knowledge that is difficult to hire quickly. The personnel build in Growing Core Businesses is therefore a necessary moat investment. It is also a risk because rapid hiring can dilute experience and temporarily reduce productivity.

Durability over five to ten years is good for the current installed base and backlog. It is less certain beyond that horizon because decarbonization policy, storage cost, carbon capture, hydrogen economics, reactor policy, and competitor capacity can alter new-equipment demand. The moat protects MHI's share and service margins within served markets; it does not guarantee that every served market grows. A reasonable underwriting stance is "durable franchise, cyclical opportunity set," not "unassailable secular monopoly."

6. Historical growth rates

The table reproduces only package data. Each numeric cell identifies its exact package row. `n/d` means the official checked source set did not disclose a comparable figure. The FY2024 label remains predecessor context, and FY2025 is the controlling current disclosure.

Product / sub-segment	FY2023 revenue	FY2024 revenue	FY2025 revenue	3-year CAGR	Most recent YoY	Data package cite
Energy Systems total	JPY 1,761.5bn [§3 Energy row]	JPY 1,815.7bn [§3 Energy row]	JPY 2,062.6bn [§3 Energy row]	5.9% from FY2022 [§3 Energy row]	13.6% [§3 Energy YoY row]	data_package §3, Energy Systems rows
GTCC	JPY 735.6bn [§4 product row 1]	JPY 790.7bn [§4 product row 1]	JPY 992.2bn [§4 product row 1]	10.4% from FY2022 [§4 product row 1]	25.5% [§4 product row 1]	data_package §4, product table row 1
Nuclear Power	JPY 300.8bn [§4 product row 2]	JPY 299.0bn [§4 product row 2]	JPY 361.1bn [§4 product row 2]	8.3% from FY2022 [§4 product row 2]	20.8% [§4 product row 2]	data_package §4, product table row 2
Steam Power	n/d [§4 product row 3]	JPY 403.9bn [§4 product row 3]	JPY 367.5bn [§4 product row 3]	n/d [§4 product row 3]	-9.0% [§4 product row 3]	data_package §4, product table row 3
Aero Engines	n/d [§4 product row 4]	JPY 212.3bn [§4 product row 4]	JPY 274.1bn [§4 product row 4]	n/d [§4 product row 4]	29.1% [§4 product row 4]	data_package §4, product table row 4
Other / inter-product residual	n/d [§4 disclosure boundary]	JPY 109.8bn [§3 Energy; §4 rows 1–4]	JPY 67.7bn [§3 Energy; §4 rows 1–4]	n/d [§4 disclosure boundary]	-38.3% arithmetic residual [§3; §4]	data_package §3 Energy total less §4 product rows 1–4

No historical product revenue was back-solved from growth rates. The residual is the exact difference between the disclosed reportable-segment total and named product disclosures; it is retained because omitting it would break the segment rollup.

Arithmetic checks: Energy Systems FY2023 JPY 1,761.5bn × 1.031 = JPY 1,816.1bn versus reported FY2024 JPY 1,815.7bn, a 0.02% rounding difference; FY2024 JPY 1,815.7bn × 1.136 = JPY 2,062.6bn. GTCC FY2023 JPY 735.6bn × 1.075 = JPY 790.8bn and FY2024 JPY 790.7bn × 1.255 = JPY 992.3bn. Nuclear FY2023 JPY 300.8bn × 0.994 = JPY 299.0bn and FY2024 JPY 299.0bn × 1.208 = JPY 361.2bn. Steam FY2024 JPY 403.9bn × 0.910 = JPY 367.5bn. Aero FY2024 JPY 212.3bn × 1.291 = JPY 274.1bn. All disclosed year-over-year checks are within 2%; there is no upstream arithmetic inconsistency.

The history has two implications. First, GTCC and Nuclear, not Steam, explain most recent growth. Second, the latest year and Q1 accelerated far above multi-year CAGRs: Q1 FY2026 grew 39.7% in GTCC, 49.5% in Nuclear, and 27.9% in Aero

Engines, while Steam declined 9.7% [D-O2 p.11; data_package §4, Q1 table]. Forecasts must therefore show explicit deceleration rather than applying Q1 growth for five years.

7. Management guidance

Every Energy Systems forward quotation in data_package §6 is listed below without re-fetching or altering the wording.

- **Q1 FY2026, 2026-08-06, CFO Hiroshi Nishio, D-O3 — “GTCC demand remains strong.”** The statement supports continued order intake, but management also ties realization to project selection and capacity. It is evidence for a positive order environment, not a numerical five-year growth promise [data_package §6, Energy Systems row 1].

- **Q1 FY2026, 2026-08-06, CFO Hiroshi Nishio, D-O3 — “profitability ... continues to improve gradually.”** The word “gradually” anchors margin phasing. Better-priced orders should lift `Profit from business activities` as they convert, but the model should not reset the entire backlog to the latest order economics in one year [data_package §6, Energy Systems row 2].

- **Q1 FY2026, 2026-08-06, CFO Hiroshi Nishio, D-O3 — “scheduled for delivery between 2028 and 2030.”** This is the key duration anchor. Q1 orders generally support years 2–4 of the forecast, making throughput and site execution more important than near-term spot demand [data_package §6, Energy Systems row 3].

- **Q3 FY2025, 2026-02-04, senior presenter unidentified in FMP, D-F4 — “confidence in this figure.”** The package explains that management considered the planned JPY 130bn full-year year-over-year contribution from revenue growth and margin improvement achievable. The quote is useful as evidence of execution confidence but is not reused as a recurring annual increment [data_package §6, Energy Systems row 4].

- **FY2025, 2026-05-12, MHI IR AI narrator, D-F4 — “Revenue is expected to increase further.”** This refers to GTCC and supports FY2026 growth from equipment and service backlog. It does not identify an endpoint beyond the disclosed FY2026 GTCC revenue guide of JPY 1,100bn [data_package §6, Energy Systems row 5; D-O2 p.18].

- **2024 MTBP progress, 2026-05-27, CEO Ito, D-O6 — “reduce lead times and increase throughput.”** This is an operational mechanism for the bull case. It becomes economically meaningful only as completed capacity produces accepted deliveries without quality, warranty, or working-capital deterioration [data_package §6, Energy Systems row 6].

Disclosed FY2026 product revenue guidance is JPY 1,100bn GTCC, JPY 330bn Steam Power, JPY 260bn Aero Engines, and JPY 400bn Nuclear Power. The four sum to JPY 2,090bn versus segment revenue guidance of JPY 2,200bn, leaving JPY 110bn outside the named rows. Segment `Profit from business activities` guidance is JPY 300bn, a 13.6% margin [D-O2 p.18; data_package §§4,6].

[DATA GAP: Management has not disclosed a product-level or reportable-segment revenue and `Profit from business activities` target for the exact 2031-06-30 horizon.] The five-year estimates below are therefore analyst scenarios, not extensions of a management long-range guide.

8. Forward growth assumptions

The TTM anchors are JPY 1,070.3bn GTCC, JPY 358.2bn Steam Power, JPY 290.7bn Aero Engines, JPY 387.7bn Nuclear Power, and JPY 68.8bn Other / inter-product residual. FY+1 guidance in the tables refers to MHI’s FY2026 fiscal-year revenue guide, not to a twelve-month number beginning on the TTM date. Historical CAGRs use the longest clean disclosure available; `n/d` is preserved for lines with only two annual observations.

Base case growth

Product	Historical CAGR	Latest YoY	Management FY+1 guide	Base CAGR TTM to 2031-06-30	Justification
GTCC	10.4% FY2022–FY2025	39.7% Q1	JPY 1,100bn	9.0%	Backlog and better-priced orders support growth, while capacity and peer expansion force deceleration.

Product	Historical CAGR	Latest YoY	Management FY+1 guide	Base CAGR TTM to 2031-06-30	Justification
Steam Power	n/d; latest annual -9.0%	-9.7% Q1	JPY 330bn	-2.0%	Service mix slows decline, but the new-equipment market remains structurally weak.
Aero Engines	n/d; latest annual 29.1%	27.9% Q1	JPY 260bn	5.0%	Aviation recovery and MRO help, but the low guide and program concentration cap extrapolation.
Nuclear Power	8.3% FY2022–FY2025	49.5% Q1	JPY 400bn	6.0%	Restart, safety and fuel-cycle work support growth, gated by regulation and bounded capacity.
Other / inter-product residual	n/d; residual only	n/d	Implied JPY 110bn	1.0%	The residual is held near flat because its composition and economics are not separately disclosed.

GTCC's 9.0% base CAGR is slightly below its 10.4% historical CAGR and well below current Q1 growth. The implied annual path is JPY 1,166.6bn, JPY 1,271.6bn, JPY 1,386.1bn, JPY 1,510.8bn, and JPY 1,646.8bn. Growth is therefore modeled at 9% each year rather than dropping abruptly from 39.7% to a mature rate in one quarter. The backlog delivery window of 2028–2030 supports the middle years. Siemens Energy's high-teens near-term Gas Services guide shows that strong category growth can persist, but MHI's own capacity disclosure and a 30% line-of-sight improvement do not support a five-year high-teens extrapolation.

Steam's base path is JPY 351.0bn, JPY 344.0bn, JPY 337.1bn, JPY 330.4bn, and JPY 323.8bn. A 76% FY2025 after-sales mix cushions decline. The line nevertheless remains below the TTM anchor because service cannot fully erase declining equipment demand and because the FY2026 guide is JPY 330bn. Aero grows to JPY 371.0bn. The modest CAGR reconciles strong recent quarters with a management guide below FY2025 revenue. Nuclear grows to JPY 518.8bn; its 6% CAGR is below the historical 8.3% and far below Q1 growth because regulatory conversion is lumpy.

Bull case growth

Product	Historical CAGR	Latest YoY	Management FY+1 guide	Bull CAGR TTM to 2031-06-30	Justification
GTCC	10.4% FY2022–FY2025	39.7% Q1	JPY 1,100bn	12.0%	Capacity, slot discipline, data-center load and service attachment sustain above-history growth.
Steam Power	n/d; latest annual -9.0%	-9.7% Q1	JPY 330bn	1.0%	Life-extension and grid-reliability work stabilize the installed-base franchise.
Aero Engines	n/d; latest annual 29.1%	27.9% Q1	JPY 260bn	8.0%	Higher production and shop visits outweigh the cautious near-term guide.
Nuclear Power	8.3% FY2022–FY2025	49.5% Q1	JPY 400bn	9.0%	Restart and fuel-cycle work convert faster while cask and engineering capacity expand.
Other / inter-product residual	n/d; residual only	n/d	Implied JPY 110bn	4.0%	Adjacent services grow, but the small residual receives no speculative step-change.

The bull case requires evidence beyond demand. GTCC must translate capacity work into accepted deliveries without sacrificing quality, and MHI must retain improved contract terms as GE Vernova and Siemens Energy add capacity. The annual path is JPY 1,198.7bn, JPY 1,342.6bn, JPY 1,503.7bn, JPY 1,684.1bn, and JPY 1,886.2bn. Twelve percent is above the historical 10.4% CAGR but far below Q1's 39.7%, so the case assumes sustained strength rather than exponential growth.

Steam stabilization is intentionally modest. A 1% CAGR takes it to JPY 376.5bn, only slightly above TTM. Aero reaches JPY 427.1bn on an 8% CAGR; this needs aerospace production and MRO normalization without a major program interruption. Nuclear reaches JPY 596.5bn at 9%, just above its historical CAGR. The IAEA's broad nuclear outlook supports the demand direction, but actual MHI realization still depends on Japanese schedules, so even the bull does not use Q1 growth as a continuing rate.

Bear case growth

Product	Historical CAGR	Latest YoY	Management FY+1 guide	Bear CAGR TTM to 2031-06-30	Justification
GTCC	10.4% FY2022–FY2025	39.7% Q1	JPY 1,100bn	4.0%	Backlog converts, but capacity delays, competition and policy reduce awards and throughput.
Steam Power	n/d; latest annual -9.0%	-9.7% Q1	JPY 330bn	-6.0%	New-equipment decline outruns service resilience and creates fixed-cost deleverage.
Aero Engines	n/d; latest annual 29.1%	27.9% Q1	JPY 260bn	0.0%	Program or supply-chain disruption offsets MRO and traffic recovery.
Nuclear Power	8.3% FY2022–FY2025	49.5% Q1	JPY 400bn	2.0%	Regulatory and customer delays slow conversion despite a durable service base.
Other / inter-product residual	n/d; residual only	n/d	Implied JPY 110bn	-3.0%	Unidentified activities are not assumed to rescue disclosed product weakness.

The bear case still allows GTCC growth because an 80-unit backlog and deliveries scheduled through 2030 create real support. It does not assume that current orders vanish. Instead, annual revenue rises to JPY 1,113.1bn, JPY 1,157.6bn, JPY 1,203.9bn, JPY 1,252.1bn, and JPY 1,302.2bn as execution frictions and weaker subsequent bookings limit growth. Steam falls to JPY 262.9bn. Aero remains JPY 290.7bn, and Nuclear reaches JPY 428.1bn. This is a stagnation and mix-deterioration case, not an implausible immediate collapse of a funded backlog.

The three cases use probabilities of 30% bear, 55% base, and 15% bull. The lower bull weight reflects the operational proof needed for capacity expansion, the long-cycle risk that current contract economics change before completion, and the unusually strong recent comparison base. The 30% bear weight recognizes that fixed-price and delivery risk is material even while orders are strong.

9. Forward `Profit from business activities` margin assumptions

The reported TTM `Profit from business activities` margin is 14.35%. The normalized planning anchor is 13.20% after removing JPY 25bn of identified Q1 one-time profit from the sealed JPY 312.195bn TTM result. Both are shown so the adjustment is auditable. No corporate allocation, finance item, or statutory-bridge adjustment enters these margins.

Case and metric	TTM reported	TTM normalized	Year 1	Year 2	Year 3	Year 4	2031-06-30
Bear `Profit from business activities` margin	14.35%	13.20%	12.80%	12.40%	12.00%	11.70%	11.50%
Base `Profit from business activities` margin	14.35%	13.20%	13.60%	14.00%	14.40%	14.70%	15.00%
Bull `Profit from business activities` margin	14.35%	13.20%	14.00%	14.80%	15.60%	16.30%	17.00%

The base margin expands 180 basis points from the normalized anchor to 15.0%. The mechanism is not the JPY 25bn one-time item. It is a gradual conversion of better-priced GTCC orders scheduled for 2028–2030, volume leverage from throughput improvements, and service attachment as the equipment fleet grows. The path adds 40, 40, 40, 30, and 30 basis points by year. That staging follows management's description of profitability improving "gradually" and avoids treating Q1's 18.9% reported margin as recurring.

The bull reaches 17.0%, up 380 basis points from normalized TTM. It requires improved new-order pricing to survive competitive capacity additions, manufacturing output to rise faster than overhead, warranty and project losses to remain controlled, Steam service economics to hold, and Nuclear utilization to improve. Siemens Energy's FY2028 Gas Services target of an 18%–20% margin before special items provides external evidence that high-teens economics are possible in the strongest gas-service franchises, but it is not directly comparable to MHI's broader Energy segment or exact `Profit from business activities` definition. Seventeen percent is therefore an upside segment outcome rather than the base.

The bear falls 170 basis points from normalized TTM to 11.5%, and 285 basis points from the unadjusted reported margin. The mechanisms are factory-ramp inefficiency, slower project conversion, Steam operating deleverage, labor and material inflation, adverse contract settlements, and an equipment-heavy mix before service revenues mature. The margin stays

above FY2024 predecessor's 11.3% because the backlog contains some improved-price work and because the installed-base service franchise remains meaningful. A deeper downside is possible in a major project-loss event, but that belongs in risk sensitivity rather than the central bear endpoint.

[DATA GAP: Product-level `Profit from business activities` is not disclosed, so a revenue-weighted product-margin bridge cannot be constructed without inventing product margins.] The segment margin table is therefore the highest defensible granularity. Product revenue mix still shapes the scenario choice qualitatively: faster GTCC and Nuclear conversion supports the bull; faster Steam decline and new-equipment ramp costs pressure the bear.

10. Segment rollup

All product forecasts compound exactly five years from the 2026-06-30 TTM anchor. Rounded displayed rows can differ from unrounded totals by JPY 0.1bn; unrounded calculations control.

Product / sub-segment	TTM revenue	Bear 2031-06-30 revenue	Base 2031-06-30 revenue	Bull 2031-06-30 revenue
GTCC	JPY 1,070.3bn	JPY 1,302.2bn	JPY 1,646.8bn	JPY 1,886.2bn
Steam Power	JPY 358.2bn	JPY 262.9bn	JPY 323.8bn	JPY 376.5bn
Aero Engines	JPY 290.7bn	JPY 290.7bn	JPY 371.0bn	JPY 427.1bn
Nuclear Power	JPY 387.7bn	JPY 428.1bn	JPY 518.8bn	JPY 596.5bn
Other / inter-product residual	JPY 68.8bn	JPY 59.1bn	JPY 72.3bn	JPY 83.7bn
Energy Systems total	JPY 2,175.7bn	JPY 2,342.9bn	JPY 2,932.7bn	JPY 3,370.1bn

Case	Revenue CAGR	2031-06-30 revenue	Exact profit metric	2031-06-30 margin	2031-06-30 profit	Product tie-out
Bear	1.49%	JPY 2,342.9bn	Profit from business activities	11.50%	JPY 269.4bn	100.00%
Base	6.15%	JPY 2,932.7bn	Profit from business activities	15.00%	JPY 439.9bn	100.00%
Bull	9.15%	JPY 3,370.1bn	Profit from business activities	17.00%	JPY 572.9bn	100.00%

The base case increases segment revenue by JPY 757.0bn over five years. GTCC contributes approximately JPY 576.5bn of that increase, Nuclear JPY 131.1bn, Aero JPY 80.3bn, and Other JPY 3.5bn, offset by a JPY 34.4bn Steam decline. This is a concentrated forecast: about three quarters of absolute growth comes from GTCC. The base case therefore succeeds or fails primarily on GTCC throughput, pricing, and project execution rather than on a broad-based rise across every Energy product.

The bull adds JPY 1,194.4bn of revenue and JPY 285.7bn of `Profit from business activities` versus the normalized TTM profit of JPY 287.195bn. Both volume and margin must work. If capacity supports revenue but contract and ramp costs prevent margin expansion, bull revenue would not translate into bull profit. The bear grows revenue only JPY 167.2bn while profit falls below normalized TTM because adverse mix and margin offset backlog-supported GTCC growth.

The FY2026 guide provides a near-term reasonableness check. The named product guides total JPY 2,090bn and the reportable segment guide is JPY 2,200bn; this is broadly consistent with the TTM JPY 2,175.7bn anchor. The model does not compound from FY2025 or from the management fiscal-year guide. It compounds from the exact TTM end date, thereby avoiding a hidden sixth year.

`Others, Corporate & Eliminations` is absent from both tables. Its TTM value of negative JPY 63.237bn belongs to the synthesis bridge and must be forecast once at the consolidated level. Allocating it to Energy would overstate the segment's economic burden and risk double counting when the four reportable segments are combined [sealed `MHI_TTM_RECONCILIATION`; data_package §3a, forecast-driver ledger].

11. Key risks and wildcards

- **[Bear] Fixed-price and contract-finalization risk.** Long-duration projects can suffer material, labor, engineering, warranty, or schedule costs after the original price is set. Q1's positive contract-price finalization shows that settlements can help, but the sign can reverse. A single large adverse project can overwhelm incremental service margin.

- **[Bear] Capacity execution.** Announced kaizen and prospective expansion do not equal accepted output. New equipment requires skilled labor, qualified suppliers, test capacity, and field commissioning. A faster factory ramp can temporarily reduce yield and increase rework; a slower ramp delays backlog and cash conversion.

- **[Bear] Gas-policy and financing risk.** Carbon policy, permitting, fuel security, storage economics, or financing restrictions can delay or cancel gas projects. Backlog protects the first years, but lower follow-on bookings would become visible near the 2031 horizon.

- **[Bear] Competitor expansion.** GE Vernova and Siemens Energy also have strong backlogs, service fleets, and capacity plans. If supply catches demand before MHI converts improved-price orders, project selection and margin could normalize sooner than the base case assumes.

- **[Bear] Steam Power operating deleverage.** The service base cushions decline but does not eliminate fixed cost. Faster equipment erosion or aggressive third-party service competition could lower both revenue and segment margin.

- **[Bear] Nuclear schedule and regulatory delay.** The demand thesis can be correct while revenue realization slips. Restart, safety, fuel-cycle, and advanced-reactor projects depend on approvals, customer budgets, and public policy. The 25-unit cask capacity is a specific improvement, not a timetable guarantee.

- **[Bear] Aero program and supply-chain concentration.** Engine-prime schedules, certification events, component shortages, and quality issues can abruptly change volumes. MHI lacks full control of the final program price and production rate.

- **[Bear] Middle East disruption.** Current group guidance excludes uncertain Middle East effects. Fuel, logistics, customer, project-site, and payment disruption can affect Energy even if Q1 impact was limited [data_package §9].

- **[Base] Service attachment.** The most important base wildcard is whether new GTCC equipment carries durable long-term services. Americas projects often include long-term agreements, while Japan service is generally annual. A shift toward contracted service improves visibility; annual renegotiation weakens it.

- **[Base] Backlog quality.** Energy backlog of JPY 7,814.6bn at Q1 FY2026 is large relative to TTM revenue, but backlog is not profit. Contract terms, cancellation protections, customer credit, escalation clauses, and delivery phasing determine quality. [DATA GAP: The package does not disclose a product-level backlog revenue schedule, cancellation profile, or expected `Profit from business activities` margin.]

- **[Bull] Data-center and grid-reliability demand.** Rapid load growth can pull forward dispatchable generation and service demand. The bull case requires this demand to produce signed, well-priced MHI projects rather than merely a favorable industry narrative.

- **[Bull] Faster throughput without quality loss.** CEO Ito’s focus on reducing lead time and increasing throughput could create operating leverage if factory output rises without proportional overhead or warranty costs. This is the most concrete bull margin mechanism.

- **[Bull] Nuclear policy acceleration.** More Japanese restarts, life extensions, fuel-cycle investment, and credible advanced-reactor programs could lift revenue beyond the base. The model requires actual conversion; it gives no credit for global aspiration alone.

- **[Bull] Hydrogen or carbon-capture optionality.** Technology that extends the economic and policy life of gas assets could strengthen new-equipment demand and upgrade revenue. It remains optionality rather than a modeled discrete revenue line because the package provides no separated dollar history or guide.

Scenario summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	JPY 2,342.9bn	Profit from business activities	11.50%	JPY 269.4bn	30%
Base	JPY 2,932.7bn	Profit from business activities	15.00%	JPY 439.9bn	55%
Bull	JPY 3,370.1bn	Profit from business activities	17.00%	JPY 572.9bn	15%

The probability-weighted operating endpoint is JPY 2,821.4bn of segment revenue and JPY 408.7bn of `Profit from business activities`, but this weighted figure is not a separate scenario and should not replace the three-case distribution. The core underwriting judgment is that Energy Systems owns a strong installed-base and backlog franchise, while current Q1 profit quality, capacity execution, and product-level margin opacity prevent the recent 18.9% quarterly margin from being treated as the durable run rate.

Appendix B2 - Aircraft, Defense & Space

Aircraft, Defense & Space — Segment Deep Dive

Company: Mitsubishi Heavy Industries **Ticker:** 7011.T **Run:** pulse-cio-20260906T100232+0800 **Forecast anchor:** TTM ended 2026-06-30 **Exact horizon:** 2031-06-30, five calendar years **Reporting unit:** JPY billions unless otherwise stated **Exact segment profit metric:** Profit from business activities

0. Segment boundary and taxonomy note

Aircraft, Defense & Space remains a reportable segment comprising Defense & Space and Commercial Aviation. The April 2026 reorganization that renamed LT&D and moved Data Center & Energy Management did not change this segment's disclosed perimeter; however, the official data package still labels FY2021-FY2024 as predecessor-taxonomy history and FY2025 as the current sealed presentation. Accordingly, this appendix uses the FY2025 and TTM current perimeter as the forecast anchor, treats earlier segment totals as directional history, and never mixes Others, Corporate & Eliminations into segment economics. The TTM endpoint is 2026-06-30 and the forecast endpoint is exactly 2031-06-30. [data_package §1; §3, Aircraft, Defense & Space table; §3a]

1. What this segment actually is

This segment combines two businesses with very different customers and risk profiles. Defense & Space designs, develops, integrates, manufactures, launches and supports complex national-security systems. Its activities include defense aircraft, missiles, naval and land systems, space launch vehicles and related engineering. The primary economic customer is the Japanese government through the Ministry of Defense, the Self-Defense Forces and other public agencies; international cooperation and selected equipment transfers are growing options, not yet a diversified commercial customer base. The work is won through program awards and multiyear procurement rather than a high-frequency sales channel. Revenue is recognized as contracted work is performed or equipment is delivered, while cash can arrive earlier through advances. This makes backlog a useful visibility indicator but not a cash-equivalent or a guarantee of margin.

Commercial Aviation is principally a structures and components supplier to Boeing programs, including the 787 and the 777 family, rather than an aircraft original-equipment manufacturer with its own airline customer book. Its practical route to market runs through Boeing's production system: MHI's shipsets, structural assemblies and engineering support must match the customer's certified configuration, takt time and quality requirements. Pricing is therefore negotiated within long-duration supplier relationships. Volume, learning curves, productivity, foreign exchange, engineering changes, quality and customer schedule stability matter more than end-airline ticket demand in any single year.

The combined reporting segment can be misunderstood if the defense cycle is treated like ordinary industrial backlog. Japanese national-security demand is set through appropriations, multiyear contracting and strategic policy. The FY2023-FY2027 Defense Buildup Program targets roughly JPY 43tn of capability build and approximately JPY 40.5tn of defense budgets, far above the preceding plan, with explicit emphasis on stand-off missiles, integrated air and missile defense, cross-domain operations, resilience and the production base. That is a durable demand tailwind, but it also concentrates bargaining power in one sovereign customer and exposes schedules and economics to procurement rules. [Japan Ministry of Defense, Defense Buildup Program](https://www.mod.go.jp/j/policy/agenda/guideline/plan/pdf/program_en.pdf)

The space activity is strategically adjacent to defense but economically distinct. Launch revenue is event-driven, reliability is binary at the mission level, engineering and investigation costs can precede recovery, and a single failure can delay later missions. No stand-alone Space revenue or Profit from business activities is disclosed in the reviewed package. This appendix therefore does not invent a Space allocation inside Defense & Space. Space remains a separately discussed operational overlay within the disclosed Defense & Space revenue line.

2. Current economics

TTM segment revenue was JPY 1,419.3bn, derived from the four disclosed segment quarters: JPY 278.3bn in Q2 FY2025, JPY 352.4bn in Q3, JPY 502.6bn in Q4 and JPY 286.0bn in Q1 FY2026. TTM Profit from business activities was JPY 155.116bn in the sealed statutory bridge, producing a 10.93% margin. The segment represented roughly 27.6% of consolidated TTM revenue before considering corporate eliminations. The anchor is current-period economics; FY2025 revenue of JPY 1,393.8bn and Profit from business activities of JPY 151.5bn are annual reference points, not the

compounding base. [data_package §3, D-O7 official annual workbook and D-O4 p.20; §3a, MHI_TTM_RECONCILIATION; §5, D-O2/D-O4/D-O5 segment-quarter table]

The product TTM bridge is reconstructed only from reviewed data-package rows. Defense & Space was JPY 1,144.5bn in FY2025, less JPY 202.1bn in prior Q1 plus JPY 216.3bn in current Q1, or JPY 1,158.7bn. Commercial Aviation was JPY 249.2bn, less JPY 58.4bn plus JPY 69.7bn, or JPY 260.5bn. Their JPY 1,419.2bn sum is JPY 0.1bn below the segment TTM total solely because the published inputs are rounded. On that basis, Defense & Space is approximately 81.6% of segment revenue and Commercial Aviation 18.4%. [data_package §4, D-O4 p.20 annual rows and D-O2 p.14 Q1 FY2026 product-trend rows]

The near-term guide is deliberately less aggressive than the recent annual growth rate. FY2026 segment revenue guidance is JPY 1,500bn and Profit from business activities guidance is JPY 170bn, a margin of 11.33%. Defense & Space is guided to JPY 1,250bn, while Commercial Aviation is guided to JPY 250bn. Relative to the reconstructed TTM bases, that implies approximately 7.9% growth in Defense & Space and a 4.0% decline in Commercial Aviation, not a continuation of FY2025's 35.2% segment growth. Management also guides segment order intake to JPY 1,750bn after raising the order outlook by JPY 100bn, although it described the change as a pipeline reassessment rather than a single award. The guide is for MHI's fiscal year ending 2027-03-31, whereas the first model waypoint is 2027-06-30; the model therefore uses the guide as a conservative approximate year-one checkpoint, not as a date-matched TTM forecast. [data_package §4, D-O2 p.19 product-forecast rows; §6, Aircraft, Defense & Space]

Backlog is the dominant asset-like indicator. Aircraft, Defense & Space backlog was approximately JPY 3,898.3bn at Q1 FY2026, or about 2.75 times TTM segment revenue. Yet conversion is constrained by factory capacity, skilled labor, supplier readiness, acceptance milestones and government schedules. The most concrete operating evidence is MHI's target to reduce missile-system lead time to one-third, supported by a new Nagoya factory and automated inspection, while the facilities were still ramping. Growing Core Businesses personnel increased from about 26,000 in FY2023 to about 31,000 in FY2025, with about 33,000 forecast for FY2026; that supports capacity, but it is not evidence that output can rise proportionately. [data_package §4, capacity and execution table; §5 backlog paragraph]

Capital intensity is more than reported plant expenditure. Defense programs require secure facilities, controlled supply chains, qualification, tooling, test assets, long-lead inventory, software, engineering and trained labor. Customer advances help fund work but create future performance obligations. At the consolidated level, contract liabilities rose from JPY 1,443.9bn at FY2024 end to JPY 2,161.8bn at FY2025 end and JPY 2,483.2bn at Q1 FY2026; the appendix treats this as funding and evidence of orders, not distributable cash. Product-level capex, R&D, working capital and Profit from business activities are not separately disclosed. [data_package §4, contract-liabilities row; §10, open data gaps]

3. Unit economics

Defense revenue becomes Profit from business activities through a portfolio of development, production, integration and sustainment contracts. The favorable path is straightforward: sufficiently priced orders enter backlog; design stabilizes; long-lead material is secured; factory throughput rises; repeat lots reuse engineering and tooling; supplier quality holds; customer acceptance occurs on schedule; and learning-curve savings exceed wage and material inflation. The unfavorable path is equally important: requirements change, technical milestones slip, suppliers miss deliveries, fixed or capped prices fail to absorb cost escalation, acceptance moves right, or remedial engineering consumes capacity. Reported revenue can grow while profit disappoints if early production lots carry high learning costs.

The historical segment margin rose from 4.0% in FY2021 to 6.4% in FY2022, 9.2% in FY2023, 9.7% in FY2024 and 10.9% in FY2025. TTM margin was 10.93%. This pattern is consistent with strong volume absorption and better mix, but the disclosed record does not separate price, volume, productivity, program charges or product mix. The forecast therefore does not extrapolate the full historical margin expansion. Base margin reaches 12.2% by 2031, only 127 basis points above TTM, while Bear falls to 8.5% and Bull rises to 14.0%. [data_package §3, Aircraft, Defense & Space table; §3a]

Backlog conversion creates operating leverage because skilled engineering, secure manufacturing, test and administration contain substantial fixed or semi-fixed cost. It also increases execution risk because the company must add people and capacity before all revenue is recognized. The lead-time program is economically attractive only if automation and new facilities shorten cycle time without creating rework, underutilization or duplicate overhead. In Base, capacity comes online progressively, allowing the segment to deliver higher volumes at slightly better profitability. In Bear, staffing and plant costs arrive before schedule realization, and program charges reverse much of the recent margin gain. In Bull, stable requirements, successful automation and repeat missile or defense-system lots allow procurement scale and learning curves to move margin toward 14%.

Commercial Aviation economics are externally paced. MHI's volume depends on Boeing build rates and the timing of certified programs. Boeing reported in Q1 2026 that 787 production was stabilizing at eight aircraft per month and that first 777X delivery was anticipated in 2027; in Q2 it said 777X certification testing had advanced while still anticipating first delivery in 2027. These are supportive demand signals, but they are also evidence that supplier growth is gated by OEM certification and production discipline. [Boeing Q1 2026 results](https://investors.boeing.com/investors/news/press-release-details/2026/Boeing-Reports-First-Quarter-Results/default.aspx) [Boeing Q2 2026 results](https://investors.boeing.com/investors/news/press-release-details/2026/Boeing-Reports-Second-Quarter-Results/default.aspx)

For Commercial Aviation, more shipsets improve factory absorption, but rapid schedule changes can generate overtime, inventory and inefficiency. A higher 787 rate is favorable if suppliers receive stable notice and commercial terms cover escalation. The 777X transition adds engineering and ramp cost before mature-rate economics. MHI also has customer concentration: Boeing schedule decisions can overwhelm otherwise healthy airline demand. The reviewed package does not disclose product profit, contract currency, hedging or program-level pricing, so no separate Commercial Aviation margin is fabricated.

Space has a different payoff curve. A launch provider incurs engineering, vehicle, integration and launch-site cost before mission completion. Reliability establishes customer trust and cadence; failure can trigger investigation, hardware changes, delayed launches and lower asset utilization. JAXA reported that H3 Flight 8 failed in December 2025 after the second-stage engine's second ignition did not start normally, and later postponed H3 Flight 9 while investigation continued. That evidence prevents the Base case from assuming smooth space cadence or margin expansion. [JAXA H3 Flight 8 failure](https://global.jaxa.jp/press/2025/12/20251222-2_e.html) [JAXA H3 Flight 9 postponement](https://global.jaxa.jp/press/2026/02/20260203-1_e.html)

4. Competitive dynamics

Defense systems and national industrial position

MHI competes across a broad portfolio rather than a single global category. In Japan, relevant industrial peers include Kawasaki Heavy Industries, Subaru, IHI, Mitsubishi Electric, NEC and specialist missile, electronics, shipbuilding and component suppliers. Internationally, Lockheed Martin, RTX, Northrop Grumman, Boeing Defense, BAE Systems, Airbus Defence and Space, Leonardo and MBDA have greater global scale in selected domains. Competition is mediated by sovereign requirements, industrial policy, alliance interoperability, security clearance and domestic support obligations. A global market-share percentage would be misleading because Japanese programs are often national or collaborative and the disclosed segment bundles aircraft, missiles, maritime, land and space systems.

MHI's competitive advantage is its ability to integrate complex platforms across air, sea, land, missiles and space while maintaining a Japanese production base. The customer also values domestic sustainment, secure supply and life-cycle support. ATLA describes the production and technology base as the human, material and technology capacity needed to develop, produce, maintain, improve and refurbish equipment, and notes that much of Japan's base depends on private defense companies. That policy makes incumbent capacity strategically valuable and raises entry barriers. It does not eliminate cost scrutiny: ATLA also emphasizes efficient acquisition, inspection and audit. [ATLA production-base strategy](https://www.mod.go.jp/atla/en/policy/strategy_on_defense.html) [ATLA missions](https://www.mod.go.jp/atla/en/soubichou_gaiyou.html)

The demand backdrop is strong. The Defense Buildup Program shifts materially more resources toward stand-off defense, integrated air and missile defense, cross-domain capabilities, ammunition, sustainment, facility resilience and R&D. Those priorities overlap with MHI's portfolio and explain why backlog and guided order intake can remain elevated. Yet the same program calls for cost control and review of low-value projects. The customer can choose imports or international collaboration where domestic development is uneconomic. MHI's pricing power is therefore bounded: strategic indispensability supports a reasonable return, but a sovereign monopsony can demand transparency, cost reduction and risk sharing.

Lockheed Martin provides a useful scale and risk comparator, not a valuation comp for this appendix. Its 2025 backlog was USD 193.6bn, and it expected approximately 37% to convert within twelve months and 60% within twenty-four months. Its 2025 results also included a USD 950m loss on a classified program and unfavorable adjustments on other programs. The lesson is that enormous backlog does not prevent contract-level profit resets; long-duration defense work can convert into revenue while destroying expected margin. [Lockheed Martin 2025 annual report](https://www.lockheedmartin.com/content/dam/lockheed-martin/eo/documents/annual-reports/lockheed-martin-annual-report-2025.pdf) [Lockheed Martin FY2025 results](https://investors.lockheedmartin.com/news-releases/news-release-details/lockheed-martin-reports-fourth-quarter-and-full-yea

r-2025/)

Commercial aerospace supply chain

MHI does not compete with Boeing in Commercial Aviation; it is economically exposed to Boeing's program success. Its direct competition is other qualified aerostructures suppliers and the possibility that Boeing redesigns work packages, dual-sources, insources or reallocates content. Kawasaki and Subaru participate in Japanese widebody supply chains, while Spirit AeroSystems and other global structures businesses illustrate the scale, quality and capital demands of the work. Qualification, tooling and certification create switching costs, but the OEM retains purchasing leverage.

The end market is supportive. Boeing's 2026 market outlook projects passenger traffic growth of about 4% annually through 2045 and nearly 44,000 new airplanes over twenty years. Airbus delivered 793 commercial aircraft in 2025 and ended the year with 8,754 aircraft in backlog, including 1,124 widebodies. These statistics indicate broad demand exceeds near-term supply, but they do not directly determine MHI's revenue because its content is concentrated on Boeing widebodies. [Boeing 2026 Commercial Market Outlook](https://www.boeing.com/commercial/market/commercial-market-outlook) [Airbus 2025 orders and deliveries](https://www.airbus.com/en/newsroom/press-releases/2026-01-airbus-reports-793-commercial-aircraft-deliveries-in-2025)

The near-term driver is production execution. Boeing delivered 40 787s and 15 777s in the first half of 2026, while its commercial backlog exceeded 6,200 aircraft. The backlog indicates demand; the 787 monthly rate and 777X certification path determine MHI's actual shipset cadence. Boeing also disclosed that production of first 777-8 Freighter wing parts was underway across Boeing and key suppliers including MHI, Kawasaki and Subaru, with first delivery planned for 2028. This supports a multiyear ramp, but the timeline remains subject to certification and customer execution. [Boeing Q2 2026 deliveries](https://investors.boeing.com/investors/news/press-release-details/2026/Boeing-Announces-Second-Quarter-Deliveries/default.aspx) [Boeing 777-8 Freighter supplier update](https://www.boeing.com/content/theboeingcompany/us/en/features/2025/07/a-spar-is-born--team-builds-first-777-8-freighter-wing-parts.html)

Space launch and systems

The competitive space landscape includes SpaceX and other commercial launch providers globally, while Japan's sovereign missions value assured domestic access to space. H3 is designed for flexibility, reliability and cost performance, but the current record contains both successful missions and significant failures. JAXA's launch record shows H3 successes before Flight 8, including H3 Flight 7 carrying HTV-X1, followed by the Flight 8 failure. The economic moat depends on restoring reliable cadence, not merely possessing a national launch role. [JAXA launch records](https://global.jaxa.jp/projects/result.html) [JAXA H3 overview](https://global.jaxa.jp/projects/rockets/h3/)

5. Moat at the segment level

The segment has a real but conditional moat. Its strongest protection is sovereign capability: security clearances, classified know-how, installed manufacturing and test infrastructure, qualified suppliers, platform integration experience and decades of customer trust cannot be replicated quickly. MHI can support equipment through development, production, sustainment, upgrade and disposal. The Japanese government explicitly views the domestic production and technology base as integral to defense capability, which lowers the probability that critical work is casually moved offshore. [ATLA basic policy](https://www.mod.go.jp/atla/soubiseisaku_basicpolicy.html)

The second moat layer is accumulated engineering knowledge. Missile systems, combat aircraft, naval platforms and launch vehicles require multidisciplinary integration, qualification and assurance. The scarce asset is not simply a patent; it is a workforce and supplier network that knows how to convert requirements into certified hardware and sustain it safely. Long program lives deepen this advantage because incumbents own configuration knowledge and field history. The rising personnel count and new defense facilities in the data package show MHI is investing to preserve this capability.

The third layer is switching cost. A government customer changing prime contractor mid-program can incur recertification, security, data-rights, schedule and readiness risks. Boeing changing a structural work package also involves tooling, certification and industrial disruption. These costs support incumbent economics, but they do not create unlimited pricing power. Both the Japanese government and Boeing are concentrated, sophisticated buyers with the ability to audit cost, renegotiate terms and impose quality requirements.

The moat is weakest in commercial aerostructures, where MHI is a supplier to one dominant customer rather than the owner of aircraft economics. It is also unproven in commercial space launch, where global cadence and cost competition are severe. H3's sovereign role protects a base of Japanese missions but cannot by itself guarantee attractive returns. The Flight 8 failure

illustrates that technological capability must be renewed on every mission.

Over five to ten years, defense durability is high if MHI delivers backlog without material cost or schedule failures, hires and retains skilled labor, and participates economically in next-generation programs. GCAP is strategically important: Japan, the United Kingdom and Italy are pursuing a next-generation fighter for a 2035 in-service date, creating long-duration engineering opportunity beyond this appendix's 2031 horizon. It also creates governance, workshare, export and technical risk. The 2026 industry contract confirms the program has moved into a more substantive design phase, but the economic allocation to MHI is not disclosed in the data package and is not modeled separately. [UK Ministry of Defence GCAP joint statement](https://www.gov.uk/government/news/global-combat-air-programme-joint-statement) [UK Ministry of Defence July 2026 GCAP contract](https://www.gov.uk/government/news/over-4-billion-invested-in-next-generation-fighter-jet-with-new-international-contract)

Export optionality expands the moat only if policy permits scale. Japan revised its transfer framework in December 2023 and approved a GCAP-specific route for finished-product transfers to qualifying non-partner countries in March 2024, subject to international agreements and restrictions. Export controls protect technology and align transfers with national policy, but they also limit addressable markets and can delay decisions. The Bull case credits modest learning and shared-development benefits, not unrestricted global sales. [ATLA defense equipment cooperation framework](https://www.mod.go.jp/atla/en/policy/defense_equipment.html) [ATLA GCAP transfer guideline](https://www.mod.go.jp/atla/en/policy/pdf/detc_01_05_finished_products_from_japan_20240425.pdf)

6. Historical growth rates

The table reproduces reviewed data-package values. FY2023-FY2025 are used as the visible three-year span. The segment and Defense & Space three-year CAGRs use the disclosed FY2022 bases in the same cited rows. Commercial Aviation has only FY2024 and FY2025 annual dollars in the package, so a three-year CAGR is not estimated. Every numerical cell is tied to a specific row.

The complete five-year reportable-segment history is also preserved because it is available in the reviewed package:

Segment metric	FY2021	FY2022	FY2023	FY2024 predecessor	FY2025 current	Data package cite
Revenue	JPY 605.2bn [§3 ADS revenue row]	JPY 619.4bn [§3 ADS revenue row]	JPY 791.5bn [§3 ADS revenue row]	JPY 1,030.6bn [§3 ADS revenue row]	JPY 1,393.8bn [§3 ADS revenue row]	D-O7 official annual workbook for FY2021-FY2024; D-O4 p.20 and sealed QF for FY2025
YoY growth	n/m [§3 ADS YoY row]	2.3% [§3 ADS YoY row]	27.8% [§3 ADS YoY row]	30.2% [§3 ADS YoY row]	35.2% [§3 ADS YoY row]	Calculated from the revenue row sourced to D-O7/D-O4
Profit from business activities	JPY 24.0bn [§3 ADS profit row]	JPY 39.9bn [§3 ADS profit row]	JPY 72.6bn [§3 ADS profit row]	JPY 99.9bn [§3 ADS profit row]	JPY 151.5bn [§3 ADS profit row]	D-O7 official annual workbook for FY2021-FY2024; D-O4 p.20 and sealed bridge for FY2025
Profit from business activities margin	4.0% [§3 ADS margin row]	6.4% [§3 ADS margin row]	9.2% [§3 ADS margin row]	9.7% [§3 ADS margin row]	10.9% [§3 ADS margin row]	Calculated from D-O7/D-O4 revenue and profit rows

Product / sub-segment	FY2023 revenue	FY2024 revenue	FY2025 revenue	3-year CAGR	Most recent YoY	Data package cite
Aircraft, Defense & Space total [§3 ADS row]	JPY 791.5bn [§3 ADS revenue row]	JPY 1,030.6bn [§3 ADS revenue row]	JPY 1,393.8bn [§3 ADS revenue row]	31.0% [§3 ADS FY2022 JPY 619.4bn to FY2025]	35.2% FY2025 [§3 ADS YoY row]	D-O7 official annual workbook; D-O4 p.20 and sealed QF
Defense & Space [§4 product row 11]	JPY 606.4bn [§4 product row 11]	JPY 827.6bn [§4 product row 11]	JPY 1,144.5bn [§4 product row 11]	34.1% [§4 FY2022 JPY 474.9bn to FY2025]	7.0% Q1 FY2026 [§4 Q1 row 11]	D-O4 pp.8,20 annual; D-O2 p.14 Q1 FY2026
Commercial Aviation [§4 product row 12]	[DATA GAP: not separately disclosed] [§4 product row 12]	JPY 203.0bn [§4 product row 12]	JPY 249.2bn [§4 product row 12]	[DATA GAP: three-year series unavailable] [§4 product row 12]	19.3% Q1 FY2026 [§4 Q1 row 12]	D-O4 p.20 annual; D-O2 p.14 Q1 FY2026

No historical product dollars were back-solved. Arithmetic checks pass at displayed precision. Segment FY2024 revenue of JPY 1,030.6bn multiplied by 1.352 equals JPY 1,393.4bn, within 0.03% of the disclosed JPY 1,393.8bn. Defense & Space JPY 827.6bn multiplied by 1.383 equals JPY 1,144.5bn. Commercial Aviation JPY 203.0bn multiplied by 1.228 equals JPY 249.3bn, within JPY 0.1bn of the disclosed JPY 249.2bn. The small differences are rounding, not smoothing.

The history has two regimes. FY2021-FY2022 segment revenue was approximately flat, followed by three years of 27.8%, 30.2% and 35.2% growth. The forecast assumes the latter rates are a mobilization and backlog-conversion phase, not a perpetual base rate. Q1 FY2026 product growth already diverged: Defense & Space slowed to 7.0% while Commercial

Aviation grew 19.3%. That divergence supports separate product growth rates and a much lower five-year segment CAGR than the trailing three-year record.

7. Management guidance

All MHI guidance and quotations below come from the reviewed data package. They are not re-fetched or replaced with later paraphrase.

- **Q1 FY2026 transcript, 2026-08-04, MHI IR AI narrator, D-F4; data_package §6 Aircraft, Defense & Space row 1:** “order backlog remained high.” The statement supports visibility but not automatic revenue recognition. A JPY 3.9tn segment backlog must pass through capacity, milestone and acceptance constraints.

- **Q3 FY2025 transcript, 2026-02-04, senior presenter unidentified, D-F4; data_package §6 Aircraft, Defense & Space row 2:** “steady execution of the backlog.” This frames profit as an execution outcome. The forecast therefore links margin to throughput, learning and program discipline rather than simply to the backlog amount.

- **FY2025 transcript, 2026-05-12, MHI IR AI narrator, D-F4; data_package §6 Aircraft, Defense & Space row 3:** “We expect revenue growth to continue.” Management's JPY 1.25tn FY2026 Defense & Space guide supplies the numerical near-term anchor. The Base case accepts continuing growth but steps down sharply from the historical 34.1% three-year CAGR.

- **Q1 FY2026 Q&A, 2026-08-06, CFO Hiroshi Nishio, D-O3; data_package §6 Aircraft, Defense & Space row 4:** “revenue to increase gradually.” The word gradually is load-bearing. It implies that a roughly JPY 1.5tn annual order-intake level does not immediately become revenue because production facilities and people must expand first.

- **2024 MTBP progress, 2026-05-27, CEO Ito, D-O6; data_package §6 Aircraft, Defense & Space row 5:** “providing safety and security.” This supports strategic demand and government partnership. It does not remove budget, export-policy or delivery risk.

- **FY2026 numerical segment guidance, D-O2 p.19; data_package §6 Aircraft, Defense & Space paragraph:** order intake JPY 1,750bn, revenue JPY 1,500bn and Profit from business activities JPY 170bn. Defense & Space revenue guidance is JPY 1,250bn and Commercial Aviation JPY 250bn. The Base path uses these figures as the approximate first-year operating checkpoint because the guidance period ends three months before the 2027-06-30 model waypoint.

- **Capacity statement, D-O6 pp.18,20; data_package §6 and §4 capacity table:** defense revenue growth requires production facilities and workforce expansion; missile-system lead time is targeted to fall to one-third while the Nagoya factory and automated inspection ramp. The forecast withholds full backlog conversion until capacity evidence is visible.

- **Commercial execution evidence, D-O2 p.14 and D-O4 p.20; data_package §6 Aircraft, Defense & Space paragraph:** Q1 787 deliveries increased to 21 from 18, while FY2025 deliveries were 73 versus 45 in FY2024. The FY2026 Commercial Aviation revenue guide nevertheless remains approximately flat at JPY 250bn, showing that quarterly delivery growth cannot be translated mechanically into annual revenue growth.

[DATA GAP: the reviewed package does not disclose stand-alone Space revenue, order intake, backlog, margin or a five-year launch cadence.] This gap is material because space program outcomes can affect segment charges and capacity, but it does not justify an analyst allocation. [data_package §4, D-O4 p.20 combined Defense & Space disclosure; §10 open data gaps]

8. Forward growth assumptions

The TTM product bases are JPY 1,158.7bn for Defense & Space and JPY 260.5bn for Commercial Aviation, derived from reviewed FY2025 and Q1 comparison rows. The endpoint is exactly 2031-06-30. Scenario probabilities are 30% Bear, 55% Base and 15% Bull. The skew reflects strong demand visibility offset by high government concentration, capacity ramp risk, commercial OEM dependence and space program volatility. Because FY2026 guidance ends 2027-03-31, the 2027-06-30 model row is an approximate first-year checkpoint; all terminal CAGRs are nevertheless calculated over the exact five years from 2026-06-30 to 2031-06-30.

Base case

Product	3-year historical CAGR	Latest YoY	Management FY2026 guide	Base CAGR TTM to 2031-06-30	Justification
Defense & Space	34.1% [D-O4 pp.8,20]	7.0% [D-O2 p.14]	JPY 1,250bn; 7.9% above TTM [D-O2 p.19]	9.0%	Backlog and policy support sustained growth, but capacity and gradual conversion force a large deceleration from 34.1%.
Commercial Aviation	[DATA GAP: three-year series] [D-O4 p.20]	19.3% [D-O2 p.14]	JPY 250bn; 4.0% below TTM [D-O2 p.19]	5.0%	Boeing widebody rates recover after a flat guide year; OEM certification and supplier pacing cap the trajectory.

Base does not assume constant annual growth. Defense & Space reaches approximately JPY 1,250bn in the first year, then JPY 1,375bn, JPY 1,505bn, JPY 1,640bn and JPY 1,782.8bn at the horizon. The annual rates are roughly 7.9%, 10.0%, 9.5%, 9.0% and 8.7%. This is a capacity-gated path: first-year growth matches guidance, mid-period conversion improves as facilities and hiring mature, and terminal growth slows as the FY2023-FY2027 policy surge becomes a larger base.

Commercial Aviation falls to the JPY 250bn guide in the first year, then recovers to approximately JPY 268bn, JPY 289bn, JPY 310bn and JPY 332.5bn. The recovery is consistent with Boeing's 787 rate stabilization and 777X's planned entry, but it remains well below the current-quarter 19.3% rate. No incremental 777X production benefit is isolated before Boeing's anticipated 2027 first 777-9 delivery, and 777-8 Freighter work supporting a planned 2028 first delivery is embedded only in the later recovery rather than treated as a separate revenue line. The five-year CAGR is 5.0% because customer schedules, price negotiations and program timing remain binding. [Boeing Q1 2026 results](https://investors.boeing.com/investors/news/press-release-details/2026/Boeing-Reports-First-Quarter-Results/default.aspx) [Boeing 777-8 Freighter supplier update](https://www.boeing.com/content/theboeingcompany/us/en/features/2025/07/a-spar-is-born--team-builds-first-777-8-freighter-wing-parts.html)

Space is included only within Defense & Space. Base assumes investigation and remediation constrain early cadence, with no separate revenue credit. It assumes mission activity resumes sufficiently to avoid a large segment charge but does not assume H3 wins global share. This treatment is conservative relative to sovereign strategic value while respecting non-disclosure.

Bull case

Product	3-year historical CAGR	Latest YoY	Management FY2026 guide	Bull CAGR TTM to 2031-06-30	Justification
Defense & Space	34.1% [D-O4 pp.8,20]	7.0% [D-O2 p.14]	JPY 1,250bn [D-O2 p.19]	13.0%	Capacity comes online faster, missile lead times fall materially, orders stay near or above conversion and GCAP work deepens.
Commercial Aviation	[DATA GAP: three-year series] [D-O4 p.20]	19.3% [D-O2 p.14]	JPY 250bn [D-O2 p.19]	8.0%	787 output remains stable at a higher rate and 777X ramps without another major certification delay.

Bull Defense & Space reaches approximately JPY 1,280bn, JPY 1,460bn, JPY 1,665bn, JPY 1,900bn and JPY 2,134.8bn. This is still far below the trailing 34.1% CAGR but requires strong annual growth after the guide year. The drivers are repeat production lots, facility utilization, labor productivity, high order intake and better supplier flow. It also assumes defense budgets remain supportive after FY2027 and that collaborative programs create economically valuable engineering work.

Bull Commercial Aviation reaches approximately JPY 270bn, JPY 295bn, JPY 322bn, JPY 350bn and JPY 382.8bn. That requires both volume and satisfactory commercial terms. Boeing's broad backlog and widebody outlook support demand, but this case specifically needs stable 787 production, 777X certification and a successful supplier ramp. It is not merely a passenger-traffic scenario.

Bull Space assumes H3 reliability is restored, launch cadence resumes and sovereign missions absorb capacity without material remedial charges. Even here, no stand-alone dollar estimate is inserted. Export upside is limited to policy-approved collaborative or allied pathways; the case does not assume unrestricted arms exports.

Bear case

Product	3-year historical CAGR	Latest YoY	Management FY2026 guide	Bear CAGR TTM to 2031-06-30	Justification
Defense & Space	34.1% [D-O4 pp.8,20]	7.0% [D-O2 p.14]	JPY 1,250bn [D-O2 p.19]	3.0%	Capacity slips, program mix worsens and post-FY2027 budgets normalize; backlog converts slowly despite continued strategic demand.
Commercial Aviation	[DATA GAP: three-year series] [D-O4 p.20]	19.3% [D-O2 p.14]	JPY 250bn [D-O2 p.19]	-3.0%	Boeing schedules slip, 777X moves right and supplier pricing fails to offset low utilization or rework.

Bear Defense & Space reaches approximately JPY 1,200bn, JPY 1,240bn, JPY 1,280bn, JPY 1,315bn and JPY 1,343.3bn. This does not assume the Japanese defense build disappears; it assumes the economic conversion rate disappoints. Orders can remain high while factory commissioning, staffing, supplier quality or acceptance delays revenue. The terminal line remains above TTM because national-security demand and the installed base are durable.

Bear Commercial Aviation reaches approximately JPY 240bn, JPY 235bn, JPY 230bn, JPY 227bn and JPY 223.7bn. The path reflects an initial miss to the already-flat guide followed by weak rates, program delay or adverse contract terms. Long-term airline demand does not rescue the supplier if Boeing's specific programs fail to translate demand into stable production.

Bear Space assumes H3 investigation and schedule disruption continue long enough to create underutilization and remedial cost. Because the product is embedded in Defense & Space, the effect appears in the combined revenue growth and segment margin rather than a fabricated Space line.

Thesis-consistency and year-by-year revenue bridge

Date	Bear Defense & Space	Bear Commercial Aviation	Base Defense & Space	Base Commercial Aviation	Bull Defense & Space	Bull Commercial Aviation
TTM 2026-06-30	1,158.7	260.5	1,158.7	260.5	1,158.7	260.5
2027-06-30	1,200.0	240.0	1,250.0	250.0	1,280.0	270.0
2028-06-30	1,240.0	235.0	1,375.0	268.0	1,460.0	295.0
2029-06-30	1,280.0	230.0	1,505.0	289.0	1,665.0	322.0
2030-06-30	1,315.0	227.0	1,640.0	310.0	1,900.0	350.0
2031-06-30	1,343.3	223.7	1,782.8	332.5	2,134.8	382.8

The cadence makes the deceleration explicit. Base Defense & Space falls from a 34.1% historical CAGR to 7.9% in the first year and a 9.0% five-year CAGR. That is defensible because management itself guides gradual conversion and Q1 growth was 7.0%. Bull requires observable capacity evidence; Bear requires no collapse in orders, only delayed conversion. Commercial Aviation's Base path accepts an initial decline despite current-quarter growth, then uses mid-single-digit recovery as Boeing production stabilizes. No comparable path is invoked to justify an arbitrary cliff.

9. Forward Profit from business activities margin assumptions

Product-level Profit from business activities is not disclosed. The data package explicitly identifies this as a true non-disclosure for Defense and other products. Allocating a product margin would manufacture precision, so all margin forecasting remains at the reportable-segment level. Others, Corporate & Eliminations stays outside this appendix and will be projected once by synthesis. [data_package §3a forecast-driver ledger; §10 open data gaps]

Case	TTM Profit from business activities margin	2031-06-30 margin	Change	Mechanism
Bear	10.93%	8.50%	-243 bps	Program charges, delayed acceptance, premature capacity cost, supplier inflation and weak commercial utilization.
Base	10.93%	12.20%	+127 bps	Volume absorption, repeat-lot learning and automation, partly offset by ramp and engineering costs.

Case	TTM Profit from business activities margin	2031-06-30 margin	Change	Mechanism
Bull	10.93%	14.00%	+307 bps	Strong throughput, stable requirements, favorable mix and disciplined commercial ramp without major space charges.

The Base margin starts near management's FY2026 guide: JPY 170bn divided by JPY 1,500bn is 11.33%. It then rises to approximately 11.6%, 11.8%, 12.0% and 12.2%. The 127-basis-point expansion over five years is modest relative to the 693-basis-point FY2021-TTM improvement. The mechanism is not price alone. Defense volume absorbs secure-manufacturing and engineering overhead; mature lots benefit from learning; missile automation reduces inspection and cycle cost; and commercial volumes improve utilization. Offsets include wage inflation, new-site depreciation, supplier support, GCAP engineering and space remediation.

The Bear margin falls to 10.5%, 9.8%, 9.2%, 8.8% and 8.5%. The more than 100-basis-point decline is tied to specific economics: facilities and labor arrive before revenue; technical or configuration changes create rework; government acceptance shifts; customer pricing lags input cost; Boeing rates undershoot; and H3-related work consumes engineering resources. This remains above FY2022's 6.4% historical margin because backlog and the current defense mix are stronger than in the early history.

The Bull margin rises to 11.7%, 12.3%, 12.9%, 13.5% and 14.0%. The case requires more than revenue growth. New missile capacity must reduce cycle time as targeted, repeat orders must arrive on economically sound terms, labor productivity must rise, and 787/777-family work must ramp without destabilizing quality. Space must return to reliable cadence without a material charge. The Bull outcome is plausible but not the default because long-cycle defense and aerospace peers demonstrate that program charges can overwhelm aggregate backlog.

Date	Bear revenue	Bear margin	Bear Profit from business activities	Base revenue	Base margin	Base Profit from business activities	Bull revenue	Bull margin	Bull Profit from business activities
TTM 2026-06-30	1,419.3	10.93%	155.1	1,419.3	10.93%	155.1	1,419.3	10.93%	155.1
2027-06-30	1,440.0	10.50%	151.2	1,500.0	11.33%	170.0	1,550.0	11.70%	181.4
2028-06-30	1,475.0	9.80%	144.6	1,643.0	11.60%	190.6	1,755.0	12.30%	215.9
2029-06-30	1,510.0	9.20%	138.9	1,794.0	11.80%	211.7	1,987.0	12.90%	256.3
2030-06-30	1,542.0	8.80%	135.7	1,950.0	12.00%	234.0	2,250.0	13.50%	303.8
2031-06-30	1,567.0	8.50%	133.2	2,115.3	12.20%	258.1	2,517.6	14.00%	352.5

The table uses revenue-weighted segment economics by construction. No corporate expense, elimination, finance item, tax, discontinued operation or NCI is placed in Profit from business activities. The 2031 figures are rounded for presentation; arithmetic uses the displayed revenue and margin, with differences below JPY 0.1bn.

10. Segment rollup

Case	Defense & Space 2031 revenue	Commercial Aviation 2031 revenue	Segment 2031 revenue	Five-year segment CAGR	Profit from business activities margin	Profit from business activities
Bear	1,343.3	223.7	1,567.0	2.00%	8.50%	133.2
Base	1,782.8	332.5	2,115.3	8.31%	12.20%	258.1
Bull	2,134.8	382.8	2,517.6	12.15%	14.00%	352.5

All product revenue totals tie exactly at displayed precision. Bear is JPY 1,343.3bn plus JPY 223.7bn, equaling JPY 1,567.0bn. Base is JPY 1,782.8bn plus JPY 332.5bn, equaling JPY 2,115.3bn. Bull is JPY 2,134.8bn plus JPY 382.8bn, equaling JPY 2,517.6bn. Profit equals segment revenue multiplied by the scenario margin: JPY 133.195bn, JPY 258.067bn and JPY 352.464bn before display rounding.

The probability-weighted operating diagnostic is JPY 2,011.2bn of 2031 revenue and JPY 234.8bn of Profit from business activities using 30%, 55% and 15% weights. The arithmetic is `30% × Bear + 55% × Base + 15% × Bull`, applied separately to revenue and profit. This is not a fourth scenario and should not replace scenario-aware consolidation. It highlights the asymmetry: strong demand makes a revenue collapse unlikely, but execution can still leave Bear profit below the TTM JPY 155.1bn despite modest revenue growth.

The rollup consciously does not allocate the JPY 63.237bn TTM negative Others, Corporate & Eliminations bridge. That line belongs in consolidated synthesis. It also does not attribute separate profit to Defense, Space or Commercial Aviation because the issuer does not disclose product profit. This preserves the sealed Profit from business activities identity and avoids double counting.

11. Key risks and wildcards

Defense backlog and capacity conversion — Bear dominant

The central risk is confusing orders with throughput. Backlog of about JPY 3.9tn is large enough to support years of revenue, but the company must install equipment, qualify processes, hire and train people, secure suppliers, build inventory and pass customer acceptance. The target to reduce missile lead time to one-third is ambitious. If the new Nagoya factory or automated inspection ramps slowly, order intake can remain high while revenue misses. Premature fixed-cost growth would compress margin before backlog converts.

Monitoring should focus on segment revenue versus the JPY 1.5tn guide, order intake relative to conversion, backlog aging, disclosed lead-time progress, hiring, working capital and any program charges. A sustained book-to-bill above one is positive only if delivery cadence also accelerates. The kill signal is two consecutive periods in which Defense & Space revenue misses the capacity plan while backlog grows and segment margin declines.

Government-customer concentration — Bear and Base

The Japanese government is the dominant economic customer. This improves credit quality and strategic visibility but creates monopsony risk. Budgets, appropriations, requirements, inspection, pricing and acceptance are controlled by the customer. Policy can reallocate spending among domestic development, imports, allied programs, readiness and personnel. The current buildup is unusually large; a post-FY2027 plan that grows more slowly would reduce the terminal growth rate.

Concentration also makes public-policy compliance economically material. Security breaches, cyber incidents, cost disputes or audit findings can impair eligibility and reputation. The segment cannot diversify quickly without export approval, local support structures and international certification. Base assumes stable government partnership; Bear assumes slower post-plan growth and more pricing pressure. [Japan Ministry of Defense, Defense Buildup Program](https://www.mod.go.jp/j/policy/agenda/guideline/plan/pdf/program_en.pdf) [ATLA production-base strategy](https://www.mod.go.jp/atla/en/policy/strategy_on_defense.html)

Program-risk economics — Bear dominant

Long-duration defense and aerospace programs carry tail risk. Requirements may evolve after engineering has begun. Fixed-price or capped arrangements can turn inflation, design change or supplier failure into a charge. Even cost-type work can suffer incentive deterioration or disallowed cost. Lockheed Martin's 2025 classified-program loss demonstrates that portfolio scale and record backlog do not immunize a prime contractor from large program resets.

The model's Bear margin is intended to capture an aggregate program shock, not a forecast of one named contract. The reviewed data package does not identify a current material Aircraft, Defense & Space program-charge quantum, so this is an explicit scenario stress rather than normalization of a sourced MHI charge. The more dangerous failure mode is simultaneous capacity investment and schedule slippage, because depreciation, labor and inventory arrive before acceptance revenue. Synthesis should not normalize a material charge automatically; it should test whether the contract economics or process failure is repeatable.

Commercial Aviation execution — Bear and Bull

Commercial Aviation has one-customer and program concentration. Boeing's 787 rate, 777X certification, 777/777X mix and supplier-release schedule determine MHI demand. Airline traffic can remain strong while supplier revenue slips. Bull requires 787 stability and 777X ramp; Bear assumes delay, production volatility or pricing insufficient to cover a changing cost base.

Foreign exchange may affect reported economics because commercial contracts and cost bases can differ in currency, but the reviewed package does not disclose product contract currency or hedging. No numerical FX sensitivity is invented. The relevant monitoring evidence is MHI's disclosed Commercial Aviation revenue, Boeing's certified production rates and whether MHI margin rises with volume.

Space reliability and cadence — Bear dominant, Bull optionality

The H3 Flight 8 failure and Flight 9 postponement show that space outcomes are discontinuous. Investigation can delay missions, occupy engineers, require hardware modification and reduce launch-site utilization. Sovereign demand protects strategic relevance but cannot erase cost or credibility damage. Base assumes recovery without assigning extra revenue; Bear embeds prolonged disruption and charges; Bull requires reliable return to flight and repeat cadence.

The absence of stand-alone Space revenue, backlog and margin is itself a risk. A large issue could be hidden within the combined Defense & Space line. The appropriate response is not to allocate an assumed amount, but to monitor launch outcomes and any disclosed segment charge. [DATA GAP: stand-alone Space economics are unavailable in the reviewed data package.]

Export controls and international collaboration — Base and Bull

Exports and GCAP can expand scale, spread development cost and deepen allied interoperability. They also introduce political approval, end-use, technology-security, workshare and governance constraints. Japan's rules limit recipients and require control over purpose and third-country transfer. Policy liberalization is therefore a real option but not equivalent to an unrestricted commercial addressable market.

GCAP's 2035 service objective lies beyond this appendix's horizon. Through 2031, the economically relevant contribution is engineering, development and industrial preparation rather than mature unit production. Bull assumes meaningful work and learning, not full aircraft production. Base assumes strategic continuity with modest revenue contribution already embedded in Defense & Space growth. Bear assumes workshare or schedule complexity delays conversion. [ATLA GCAP transfer guideline](https://www.mod.go.jp/atla/en/policy/pdf/detc_01_05_finished_products_from_japan_20240425.pdf)

Labor, suppliers and inflation — Bear dominant

Skilled engineers, technicians and qualified suppliers are scarce. Hiring from 31,000 to 33,000 people across Growing Core Businesses demonstrates intent, but productivity lags headcount during training. Defense-specific suppliers may be small and financially fragile. Material inflation and weak yen can raise imported component cost, while sovereign pricing mechanisms may adjust slowly. Automation lowers long-term unit cost only after commissioning and process stabilization.

Scenario summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	JPY 1,567.0bn	Profit from business activities	8.50%	JPY 133.2bn	30%
Base	JPY 2,115.3bn	Profit from business activities	12.20%	JPY 258.1bn	55%
Bull	JPY 2,517.6bn	Profit from business activities	14.00%	JPY 352.5bn	15%

The Base case is the most reasonable operating path, not a low-risk forecast. It assumes Japan's defense demand remains structurally high, backlog conversion is capacity-gated rather than demand-gated, Commercial Aviation resumes mid-single-digit growth after the flat guide year, and Space recovers without a major persistent charge. The primary evidence that would move probability toward Bull is sustained Defense & Space delivery growth alongside higher margin and documented lead-time improvement. The evidence that would move probability toward Bear is backlog growth accompanied by revenue misses, worsening margin, persistent H3 disruption or renewed Boeing program delay.

Appendix B3 - Plants & Infrastructure Systems

Plants & Infrastructure Systems — Segment Deep Dive

Company: Mitsubishi Heavy Industries **Ticker:** 7011.T **Run:** `pulse-cio-20260906T100232+0800` **Forecast anchor:** TTM ended 2026-06-30 **Exact horizon:** 2031-06-30, exactly five calendar years **Currency:** JPY billions unless stated otherwise **Exact segment profit metric:** `Profit from business activities`

0. Segment boundary and taxonomy note

Plants & Infrastructure Systems comprises Engineering, Metals Machinery, Machinery Systems, Commercial Ships and other infrastructure equipment. The segment itself remains a reportable line in MHI's FY2026 organization, but only FY2025 and Q1 FY2025 were explicitly presented on the current company-wide taxonomy after the 2026-04-01 reorganization. The reviewed data package therefore treats FY2021–FY2024 as predecessor-context history and FY2025 as the current boundary. This appendix follows that rule: it uses the predecessor series to understand cycles, but does not imply that every old-taxonomy yen is perfectly comparable with the current perimeter. Commercial Ships and other activities are kept in a named residual because MHI does not disclose their individual revenue series. `Others, Corporate & Eliminations` is outside this segment, is not allocated here, and will be modeled once at consolidation. Source: D-O4 p.18 for the FY2025 current-taxonomy presentation and data package §1 for the reviewed boundary treatment.

1. What this segment actually is

Plants & Infrastructure Systems is a portfolio of long-cycle capital equipment, engineering and project-delivery businesses. It sells the physical and technical systems that allow industrial facilities, metals producers, transport networks and ship operators to function. Its customers are typically corporations, state-linked industrial groups, utilities, municipalities, port or transport operators and shipowners. Purchases are infrequent and large. A customer is not buying a standardized consumable; it is selecting a technical partner to design, integrate, supply, install, commission and often service an asset expected to operate for decades.

The segment's disclosed economic center is Metals Machinery. This activity supplies equipment and integrated lines used to produce and process steel. The commercial proposition includes process design, proprietary or accumulated production know-how, large mechanical and electrical systems, automation and lifecycle services. Revenue is recognized as contracts progress or equipment is delivered, so order timing and engineering milestones can separate reported sales from current demand. The segment competes not merely on initial equipment price, but on yield, throughput, energy consumption, product quality, uptime and the ability to integrate a complex line. A technically superior plant can lower a steelmaker's cost per tonne for years, which gives qualified vendors some pricing power; however, large orders remain competitively bid and customers are sophisticated.

Engineering covers chemical and other plant engineering. Here MHI is paid for engineering, procurement and construction-related execution, technology integration and project management. The economic value lies in turning a customer's process specification into a safe, functioning facility while coordinating thousands of components and contractors. Contracts can contain fixed-price, schedule and performance obligations. That structure creates a wide distribution of outcomes: disciplined bidding and clean execution can produce attractive profit, while one delayed or poorly scoped project can erase profit earned on several ordinary jobs. The FY2026 revenue guide explicitly depends on execution of the Turkmenistan project, illustrating why backlog is visibility, not risk-free revenue.

Machinery Systems is a collection of infrastructure and industrial machinery systems rather than one homogeneous product. The reviewed package does not provide a finer audited annual sales split. The commercial model nevertheless follows the same broad pattern: equipment or system sale, installation or integration, followed by parts, upgrades and maintenance where MHI retains the installed-base relationship. The line can include shorter-cycle equipment than major metals or chemical plants, but project timing, public-infrastructure budgets and customer capital spending still matter.

Commercial Ships and the remaining activities sit in the segment's residual. MHI disclosed that Commercial Ships orders increased significantly in Q1 FY2026, but did not separately disclose annual or quarterly revenue in the reviewed package. This boundary matters. A model that assigns the entire residual to ships would falsely imply a precision that the company does not provide. We therefore call the line `Commercial Ships and other activities`, calculate it only as the difference between sealed segment revenue and the three disclosed product anchors, and forecast it as a portfolio line.

The go-to-market model is direct and relationship-intensive. Winning requires references, technical qualification, balance-sheet credibility, engineering staff and the capacity to provide guarantees through multi-year delivery. The installed base can create repeat work, modifications and services, but the data package does not disclose an after-sales ratio for this segment. Consequently, recurring revenue should not be assumed to resemble Energy Systems' disclosed service mix. This is a project and equipment portfolio with some lifecycle benefits, not a subscription business.

Pricing is negotiated order by order. The strongest price lever is avoidance of customer operating cost or project risk: higher plant productivity, lower energy use, reliable commissioning, environmental compliance and lifecycle support. The weakest price position arises when specifications are commoditized, competitors have spare capacity, the customer can split the package among vendors, or steel and shipbuilding cycles weaken. Backlog gives MHI near-term production visibility, but it also locks in old pricing, scope and input assumptions. Margin therefore depends on the quality of the backlog as much as its nominal size.

2. Current economics

FY2025 current-perimeter revenue was JPY 880.8bn, up 3.4% from the FY2024 predecessor figure of JPY 852.1bn. Profit from business activities was JPY 84.1bn, up 41.1%, and the margin expanded to 9.5% from 7.0%. The historical series is from the D-O7 official annual workbook; the FY2025 current-boundary values are also shown in D-O4 p.18, and FY2025 profit is sealed under source `MHI_FY2025_PRESENTATION_RESTATED` in `statutory_bridge.json`. The latest TTM, built as Q2 FY2025 plus Q3 FY2025 plus Q4 FY2025 plus Q1 FY2026, produced revenue of approximately JPY 872.9bn from the four rounded quarterly rows and exact Profit from business activities of JPY 87.269bn from the bridge's archived `MHI_TTM_RECONCILIATION` source. The resulting TTM margin is approximately 10.0%. The exact profit measure is not relabeled operating income.

The disclosed FY2025 product mix was Engineering JPY 161.6bn, Metals Machinery JPY 365.6bn and Machinery Systems JPY 181.9bn. Together they represented JPY 709.1bn, or 80.5% of segment revenue. The JPY 171.7bn residual, 19.5%, comprises Commercial Ships and other activities; it is an arithmetic residual, not a separately reported ship-revenue figure. Metals Machinery alone represented 41.5% of the segment, making steel-project execution the largest single determinant of results. Engineering was 18.3%, Machinery Systems 20.7%, and the residual 19.5% [D-O4 p.18; residual calculated against the sealed FY2025 segment total].

For the TTM product anchor, this appendix applies the reviewed data package's transparent `FY2025 minus Q1 FY2025 plus Q1 FY2026` convention. Engineering becomes JPY 167.8bn: 161.6 minus 30.4 plus 36.6. Metals Machinery becomes JPY 359.2bn: 365.6 minus 97.9 plus 91.5. Machinery Systems becomes JPY 177.1bn: 181.9 minus 40.3 plus 35.5. The residual is JPY 168.8bn, which makes the product sum equal the rounded TTM segment total of JPY 872.9bn. These are analyst roll-forwards of D-O4 p.18 annual values and D-O2 p.12 Q1 comparatives, not newly sourced MHI historicals.

Q1 FY2026 reveals the timing dispersion inside the portfolio. Segment revenue was JPY 200.0bn and profit was JPY 21.7bn, versus quarterly lines of JPY 208.0bn and JPY 26.1bn in Q2, JPY 218.0bn and JPY 20.3bn in Q3, and JPY 246.9bn and JPY 19.2bn in Q4. The trailing sequence does not support a smooth seasonal extrapolation. Q1 Engineering grew 20.4% to JPY 36.6bn, Metals Machinery declined 6.5% to JPY 91.5bn, and Machinery Systems declined 11.9% to JPY 35.5bn [D-O2 p.12 for Q1 product and segment data; D-O4 and D-O5 cumulative releases for derived Q2–Q4]. Commercial Ships orders increased significantly even though aggregate segment revenue declined, showing the lag between order intake and conversion.

Management's FY2026 segment guide is JPY 1,000bn of orders, JPY 950bn of revenue and JPY 90bn of Profit from business activities. That implies 7.9% revenue growth from FY2025 but only 7.0% profit growth and a 9.47% margin, essentially flat with FY2025 and below the rounded TTM margin. Product revenue guidance is Engineering JPY 180bn, Metals Machinery JPY 400bn and Machinery Systems JPY 180bn. Those three sum to JPY 760bn, leaving JPY 190bn for Commercial Ships and other activities. The guide thus anticipates a meaningful conversion step in Metals Machinery and residual businesses without assuming that FY2025 margin improvement continues at the same rate [D-O2 p.18].

Capital intensity has two layers. MHI's reported consolidated cash capex cannot be assigned cleanly to this segment from the data package, so no segment capex number is invented. Economically, though, the segment needs engineering labor, software and design capability, manufacturing and assembly assets, test and commissioning capacity, working capital, contract guarantees and sometimes project-specific financing support. Customer advances can fund working capital across MHI, but they are obligations linked to delivery. The segment is less asset-light than a consulting engineering firm and less continuously capital-intensive than a steel producer; the binding capital is often skilled people, execution bandwidth and balance-sheet risk capacity.

3. Unit economics

Revenue starts with a qualified order. During bidding, MHI estimates equipment content, engineering hours, subcontracting, materials, logistics, construction or installation work, schedule, warranty exposure, foreign exchange and performance risk. The bid price must cover those costs and a return for technology and risk. Once won, the contract enters backlog and turns into revenue as milestones or performance obligations are satisfied. The time between order, procurement, fabrication, site work and acceptance can span years. That delay is why current orders can support future sales while still failing to protect near-term margin.

The gross economic spread is contract value less purchased components, raw materials, subcontractor costs, fabrication labor, logistics, site work and provisions for delay or remediation. Above that sit engineering and program-management labor, selling costs, R&D, digital-control development and overhead. Profit from business activities is the sealed segment measure after those operating economics but before the corporate/unallocated bridge that belongs outside the segment. This appendix neither imports MHI-wide corporate expense nor assigns consolidated finance items to product lines.

Metals Machinery unit economics depend on project selection and technology content. A commodity equipment package competes heavily on price. An integrated line with proprietary process design, automation, energy savings and proven commissioning can command a higher return because failure would cost the customer far more than the vendor's margin. Lifecycle service and modernization can enhance the installed-base economics, but the segment does not disclose a service ratio. The model therefore gives credit to pricing and execution through the margin scenario, not through an invented recurring-revenue stream.

Engineering has the sharpest tail risk. A fixed-price project may recognize a normal margin for several periods, then incur a cost revision when scope, site conditions, supplier performance or schedule changes. Large projects can create favorable working capital through customer advances, but cash received before delivery is not profit and may reverse as procurement and construction accelerate. The Turkmenistan-linked FY2026 guide increases visibility while concentrating execution risk. In the bear case, a combination of cost inflation, delayed site access and uncompensated scope absorbs part of the segment's margin.

Machinery Systems should have a mix of product and project economics. Standardized components and repeated platforms can benefit from manufacturing efficiency, sourcing leverage and installed-base service. Custom infrastructure systems can suffer the same schedule and contract problems as larger projects. The current package gives neither product-level profit nor installed-base service data, so the model uses moderate revenue growth and does not assume a structural margin premium.

Commercial Ships and other activities are the least transparent line. Ship projects can be large, cyclical and exposed to steel, labor, equipment and design changes. A strong order quarter need not translate promptly into sales. Decarbonization rules may create demand for new propulsion, efficiency systems and alternative-fuel-ready vessels, but regulatory timing and shipowner economics remain uncertain. The lack of disclosed revenue and profit boundaries is not a reason to eliminate the line; it is a reason to apply conservative assumptions and keep the residual visible.

The historical segment margin rose from 3.6% in FY2021 to 4.8% in FY2022, 6.9% in FY2023, 7.0% in FY2024 predecessor context and 9.5% in FY2025 current taxonomy [D-O7 official annual workbook; D-O4 p.18 for the current boundary]. That progression suggests better project mix, pricing and execution, consistent with management's statement that FY2025 profit growth was driven by improved margins. It is not proof that the segment has entered a permanent high-margin regime. Taxonomy differences, contract closeouts and mix can create step changes. The base case therefore moves from roughly 10.0% TTM to 10.8% at the horizon, not to a software-like margin.

4. Competitive dynamics

Metals Machinery

Metals Machinery competes globally with SMS group, Danieli and other specialized equipment and automation vendors. Competition is concentrated in capability but remains intense on every major award. Vendors differentiate through steelmaking routes, casting and rolling technology, electrification, automation, digital optimization, emissions reduction, commissioning record and installed-base support. Customer switching is possible at the next greenfield or modernization project, although installed automation, operator familiarity and spare-parts ecosystems can favor incumbents.

The external market is supportive but not uniformly strong. Danieli reported FY2024/25 plantmaking backlog within a EUR 5.384bn group backlog and described its plantmaking order book as satisfactory in margin and diversified by technology and grade. It also emphasized demand for lower-emission and digital production technologies. SMS group reported 2025 order

intake up 10% to EUR 4.0bn while sales fell to EUR 3.6bn because major projects had not yet completed; it expects only moderate sales growth in a challenging environment. These disclosures corroborate both sides of MHI's thesis: steelmakers are still investing in sophisticated plants, but revenue conversion is lumpy and vendors cannot rely on broad volume growth. Sources: [Danieli FY2024/25 results](https://www.danieli.com/en/m157/investors/results-and-financial_164.htm) and [SMS group 2025 results](https://www.sms-group.com/press-and-media/press-releases/press-release-detail/sms-group-boosts-profit-and-invests-in-sustainable-technologies).

Decarbonization can enlarge the value of an order even when global steel tonnage is mature. The International Energy Agency notes that blast-furnace/basic-oxygen-furnace routes still represent about 70% of global steel production and that hydrogen direct-reduced-iron/electric-arc-furnace routes are emerging in suitable regions. That transition creates opportunities for new furnaces, electrical systems, rolling integration and process optimization, but the technology path is not settled and project economics depend on energy and policy. It raises engineering content and also raises execution risk. Source: [IEA Breakthrough Agenda Report 2025 — Steel](https://www.iea.org/reports/breakthrough-agenda-report-2025/steel).

Pricing power belongs to the vendor that can demonstrate lower lifecycle cost and meet performance guarantees, not automatically to the largest bidder. Danieli's proprietary process claims and SMS's lifecycle positioning show why Primetals cannot coast on installed base. MHI must continue investing in digital control, low-emission routes and service responsiveness. The bear case assumes competitive bidding and weaker steelmaker capex after backlog conversion; the bull case assumes technology content offsets tonnage cyclicality.

Engineering

Engineering competes with Japanese EPC peers such as JGC and Chiyoda and with global players such as Technip Energies and Saipem, depending on project type and geography. The barriers are technical credentials, references, local execution capability, engineering talent, supplier networks and capacity to provide guarantees. Yet none prevents a qualified customer from bidding several contractors against each other. The winner may be the firm most willing to accept risk, which is dangerous if backlog growth becomes the objective.

JGC's FY2025 disclosure showed engineering order backlog of JPY 1,166.6bn after currency and contract adjustments, while Middle East conditions required safety and execution assumptions. Technip Energies' H1 2026 adjusted backlog reached EUR 25.0bn, 3.5 times FY2025 revenue, after major LNG awards. Those figures demonstrate abundant industry backlog but also the importance of geographic, security and execution exposure. Backlog coverage is not itself a moat; profitable delivery is. Sources: [JGC FY2025 financial results](https://www.jgc.com/en/ir/ir-library/assets/pdf/fy25_f_results.pdf) and [Technip Energies H1 2026 results](https://investors.technipenergies.com/news-releases/news-release-details/technip-energies-h1-2026-financial-results).

Technip Energies' 2025 Project Delivery adjusted recurring EBIT margin was about 7.0% while backlog represented more than two years of revenue. The denominator is not comparable to MHI's Profit from business activities, but the observation is useful directionally: even a strong global engineering franchise does not earn extraordinary project margins automatically. MHI's approximately 10% segment margin includes Metals Machinery and other equipment, so a sustained expansion must come from mix and discipline rather than assuming pure EPC peers set a higher floor.

Machinery Systems

Machinery Systems faces specialized industrial-equipment and infrastructure competitors. Konecranes is a useful public comparator for equipment and port-system economics, although its portfolio is not identical. In 2025 it reported sales broadly flat, order intake up 9.7%, a EUR 2.99bn order book and 14.0% comparable EBITA margin. Industrial Equipment's comparable EBITA margin was 9.4% and Port Solutions' 10.5%, while service was much higher at 21.8%. The pattern is important: lifecycle service can be substantially more profitable and stable than equipment, whereas project mix and timing create volatility. MHI has not disclosed a comparable service split, so our model does not import Konecranes' group margin. Sources: [Konecranes 2025 annual review](https://investors.konecranes.com/annual_report_2025) and [Konecranes business-area data](https://investors.konecranes.com/business-areas).

Konecranes also reported that pricing, execution and product mix drove profit improvement even when sales were flat. That is a plausible mechanism for MHI, but it is an outcome to earn. Machinery equipment can be copied over time, while safety certifications, control software, installed references and service reach slow entry. Chinese and other lower-cost vendors can pressure standardized hardware. MHI's defense is to retain systems integration, reliability and lifecycle value rather than competing on fabrication cost alone.

Commercial Ships and other activities

Commercial Ships competes in a deeply cyclical Asian shipbuilding market with larger-scale yards and specialist designers. MHI's advantage is likely stronger in complex ship types, engineering, propulsion integration and selected commercial programs than in undifferentiated volume. The regulatory opportunity is real but timing-dependent. The International Maritime Organization's Net-Zero Framework includes a proposed global fuel standard and emissions-pricing mechanism for large ocean-going ships, but formal adoption discussions were adjourned into 2026. That can stimulate demand for lower-emission vessels and retrofits while also delaying customer commitments until rules and fuel economics are clearer. Source: [IMO Net-Zero Framework FAQ](https://www.imo.org/en/mediacentre/hottopics/pages/faqs-the-imo-net-zero-framework.aspx).

The segment therefore has no single market share that usefully summarizes it. MHI may hold strong positions in specific metals technologies, project niches and machinery platforms, while being a smaller or selective participant elsewhere. `[DATA GAP: The reviewed data package does not disclose segment or product market shares, and no reliable common-denominator market-share series is available for this multi-industry portfolio.]` The model relies on disclosed backlog and revenue conversion rather than claiming a broad share gain.

5. Moat at the segment level

The segment has a moderate, uneven moat. Its best protection is accumulated engineering knowledge tied to real operating assets. A metals producer or industrial owner cannot easily substitute an unproven vendor when failure would interrupt production or compromise product quality. Reference plants, process guarantees, trained engineers, supplier coordination and decades of field data create a qualification barrier. In brownfield work, familiarity with installed systems can lower diagnostic and integration cost. These factors support repeat orders and some pricing power.

The second protection is risk capacity. Major customers need confidence that the vendor can absorb a long design cycle, provide guarantees, mobilize globally and remain solvent through commissioning. This screens out small entrants from the largest integrated projects. However, it does not prevent competition from SMS, Danieli, JGC, Technip Energies or other well-capitalized peers. The moat narrows the field; it does not eliminate bidding.

The third protection is systems integration. Combining mechanical equipment, controls, process design, safety, digital optimization and lifecycle support is more difficult than fabricating a component. Decarbonization increases the need to integrate unfamiliar processes, energy systems and emissions controls. If MHI can deliver those transitions reliably, the economic value to customers rises. If a competitor's platform becomes the de facto standard, the same transition can erode MHI's position.

The moat is weakest in standardized hardware, generic engineering labor and shipbuilding capacity. Those activities face global sourcing and lower-cost competition. They also have limited customer switching costs between major project cycles. A customer may value the incumbent during modernization but still choose a different vendor for a greenfield asset. That prevents this segment from qualifying as a classic high-recurring-revenue franchise.

Margin durability over five to ten years therefore depends on behavior. MHI must reject underpriced contracts, maintain scarce technical talent, convert backlog without major charges and attach lifecycle work. The historical margin increase is encouraging evidence of better behavior, not independent proof of a structural moat. In a normal cycle, a roughly 9–11% Profit from business activities margin appears defensible. A sustained 13% or higher outcome requires favorable mix, technology value and unusually clean execution; that is why it is reserved for the bull case.

6. Historical growth rates

FY-3 is FY2023 ended 2024-03-31, FY-2 is FY2024 ended 2025-03-31, and FY-1 is FY2025 ended 2026-03-31. The segment total uses the data package's predecessor-to-current boundary labels. Product rows show only disclosed years; `n/d` is preferable to back-solving because the data package contains no FY2023 product dollars. The segment `3-yr CAGR` is the two-interval CAGR across the three displayed annual observations.

Product / sub-segment	FY-3 rev	FY-2 rev	FY-1 rev	3-yr CAGR	Most recent YoY	Data package cite
Plants & Infrastructure Systems total	JPY 795.2bn	JPY 852.1bn predecessor	JPY 880.8bn current	5.25%	-3.8% Q1, from JPY 208.0bn to JPY 200.0bn	D-O7 official annual workbook; D-O4 p.18 current boundary; D-O2 p.12 Q1
Engineering	n/d	JPY 137.8bn	JPY 161.6bn	n/a, only two annual values	20.4% Q1	D-O4 p.18 annual; D-O2 p.12 Q1
Metals Machinery	n/d	JPY 395.2bn	JPY 365.6bn	n/a, only two annual values	-6.5% Q1	D-O4 p.18 annual; D-O2 p.12 Q1

Product / sub-segment	FY-3 rev	FY-2 rev	FY-1 rev	3-yr CAGR	Most recent YoY	Data package cite
Machinery Systems	n/d	JPY 172.3bn	JPY 181.9bn	n/a, only two annual values	-11.9% Q1	D-O4 p.18 annual; D-O2 p.12 Q1
Commercial Ships and other activities	n/d	Not separately disclosed	JPY 171.7bn residual	n/a, residual has no comparable history	Not separately disclosed; orders increased significantly	Residual calculated from D-O4 p.18; order comment from D-F4 Q1 FY2026 transcript dated 2026-08-04

Arithmetic checks pass where a YoY rate is disclosed. Engineering: JPY 30.4bn × 1.204 = JPY 36.60bn, matching JPY 36.6bn. Metals Machinery: JPY 97.9bn × 0.935 = JPY 91.54bn, matching JPY 91.5bn. Machinery Systems: JPY 40.3bn × 0.881 = JPY 35.50bn, matching JPY 35.5bn. All differences are well within 2% [D-O2 p.12]. The segment annual check also passes: JPY 852.1bn × 1.034 = JPY 881.1bn versus reported JPY 880.8bn, a 0.03% difference caused by the displayed growth rate's rounding [D-O7 official annual workbook; D-O4 p.18].

No product annual values were back-solved. The only residual calculation is FY2025 Commercial Ships and other activities: JPY 880.8bn minus JPY 161.6bn minus JPY 365.6bn minus JPY 181.9bn equals JPY 171.7bn [D-O4 p.18]. This residual is used to preserve the segment total, not to claim Commercial Ships revenue.

Historical profit context is segment-only because product profit is not disclosed. Profit from business activities and margins were JPY 54.8bn and 6.9% in FY2023, JPY 59.6bn and 7.0% in FY2024 predecessor context, and JPY 84.1bn and 9.5% in FY2025 current taxonomy [D-O7 official annual workbook; D-O4 p.18; `MHI_FY2025_PRESENTATION_RESTATED` in the sealed bridge]. `[DATA GAP: Product-level Profit from business activities is not disclosed for Engineering, Metals Machinery, Machinery Systems or Commercial Ships and other activities; no historical product margin is inferred.]`

7. Management guidance

All guidance and quotations in this section are reproduced from data package §6, Plants & Infrastructure Systems. They were already reviewed against the archived sources; this appendix does not re-fetch MHI transcripts.

- **Q1 FY2026 transcript, 2026-08-04, MHI IR AI narrator, D-F4:** “Commercial ships increased significantly.” This refers to orders, not reported revenue. It supports a constructive residual-line pipeline but does not justify assigning the Q1 order increase to the five-year sales base immediately.

- **Q3 FY2025 transcript, 2026-02-04, senior presenter unidentified, D-F4:** “steady progress in Engineering and Metals Machinery.” The important word is execution. Progress on signed work can lift revenue and release margin, but it does not establish perpetual demand growth.

- **FY2025 transcript, 2026-05-12, MHI IR AI narrator, D-F4:** “driven by improved margins.” Management attributed the segment's 41% profit increase to margin improvement in Metals Machinery and Machinery Systems. The base case allows modest further margin expansion but recognizes that FY2025 already captured a meaningful step.

- **Q1 FY2026 presentation, 2026-08-04, D-O2 p.12:** “Aiming to steadily execute backlog.” This is the direct anchor for the JPY 400bn Metals Machinery FY2026 revenue guide. It also implies that conversion discipline, not aggressive new market-share assumptions, should drive the model.

- **2024 MTBP progress presentation, 2026-05-27, CEO Ito, D-O6:** “deploy growth investments with a long-term outlook.” The segment should receive capital only where expected lifecycle returns compensate for project and cycle risk. The forecast therefore does not equate capital deployed with value created.

Management's numerical FY2026 guide is order intake JPY 1,000bn, revenue JPY 950bn and Profit from business activities JPY 90bn. Engineering revenue is guided to JPY 180bn, Metals Machinery to JPY 400bn and Machinery Systems to JPY 180bn [D-O2 pp.12,18]. The residual implied by the segment guide is JPY 190bn. Q1 performance was mixed: Engineering and the segment-level residual activities helped profit, while Metals and Machinery Systems declined on lower revenue; this residual is not `Others, Corporate & Eliminations`. The model treats FY2026 guidance as a near-term bridge, not the terminal growth rate.

[DATA GAP: MHI did not provide product-level Profit from business activities guidance, product backlog for all four modeled lines, a service-revenue mix, or a five-year segment revenue target in the reviewed package.]

8. Forward growth assumptions

The forecast starts with the TTM product anchors described in Section 2: Engineering JPY 167.8bn, Metals Machinery JPY 359.2bn, Machinery Systems JPY 177.1bn, and Commercial Ships and other activities JPY 168.8bn. Those sum to JPY 872.9bn. Each CAGR compounds exactly five years to 2031-06-30. `Historical CAGR` is unavailable for product rows with only two annual observations; the nearest disclosed annual change is shown rather than manufacturing a three-year statistic. The annual anchors and FY2026 guide come from D-O4 p.18 and D-O2 p.18; Q1 changes come from D-O2 p.12.

Base case growth

Product	3-yr historical CAGR	Latest YoY	Mgmt FY+1 guide	Base CAGR TTM→TTM+5y	Justification
Engineering	n/a; FY2025 annual +17.3%	+20.4% Q1	JPY 180bn	4.0%	Turkmenistan execution supports FY2026, then the long-cycle project base normalizes; global EPC backlogs are strong but contract selection caps durable growth.
Metals Machinery	n/a; FY2025 annual -7.5%	-6.5% Q1	JPY 400bn	3.0%	Backlog conversion drives a near-term rebound, followed by mature steel demand; decarbonization and automation offset but do not eliminate capex cyclicality.
Machinery Systems	n/a; FY2025 annual +5.6%	-11.9% Q1	JPY 180bn	2.0%	The flat FY2026 guide and weak Q1 argue against acceleration; installed-base modernization and infrastructure spending provide low-single-digit support.
Commercial Ships and other activities	n/a; residual only	Revenue n/d; ship orders rose	Implied JPY 190bn residual	1.5%	Strong ship orders lift the near term, but regulatory timing, yard competition and residual opacity require a below-segment growth rate.

The base path is intentionally front-loaded rather than a constant economic reality. Engineering uses an approximate annual cadence of 7%, 5%, 4%, 3% and 1%, producing about 4.0% compounded growth. Metals Machinery uses roughly 11%, 4%, 2%, -1% and -1%, consistent with the JPY 400bn FY2026 guide followed by normalization. Machinery Systems uses approximately 2% each year. The residual uses 3%, 2%, 1%, 1% and 0.5%. The result is not a sharp deceleration from a structurally high growth rate; it is the conversion of a strong guide year followed by mature end-market growth.

The implied horizon revenue is Engineering JPY 204.2bn, Metals Machinery JPY 416.4bn, Machinery Systems JPY 195.5bn, and Commercial Ships and other activities JPY 181.8bn. Total revenue is JPY 997.9bn, a 2.71% segment CAGR. This is slightly above the JPY 950bn FY2026 guide but does not extrapolate the guide's first-year growth across all five years.

Bull case growth

Product	3-yr historical CAGR	Latest YoY	Mgmt FY+1 guide	Bull CAGR TTM→TTM+5y	Justification
Engineering	n/a; FY2025 annual +17.3%	+20.4% Q1	JPY 180bn	7.0%	MHI executes Turkmenistan cleanly and wins follow-on low-carbon and industrial projects without accepting poor terms; engineering capacity remains utilized.
Metals Machinery	n/a; FY2025 annual -7.5%	-6.5% Q1	JPY 400bn	6.0%	Better-priced backlog converts, and steel decarbonization, electrification and digital upgrades create higher-content awards across Asia and the Middle East.

Product	3-yr historical CAGR	Latest YoY	Mgmt FY+1 guide	Bull CAGR TTM→TTM+5y	Justification
Machinery Systems	n/a; FY2025 annual +5.6%	-11.9% Q1	JPY 180bn	4.0%	Standardization, automation and infrastructure replacement produce growth above mature industrial demand after the soft Q1.
Commercial Ships and other activities	n/a; residual only	Revenue n/d; ship orders rose	Implied JPY 190bn residual	5.0%	Commercial-ship orders convert on schedule and alternative-fuel or efficiency demand adds content without major yard bottlenecks.

The bull cadence also decelerates: Engineering about 10%, 8%, 7%, 6% and 4%; Metals Machinery 14%, 8%, 5%, 3% and 1%; Machinery Systems 6%, 5%, 4%, 3% and 2%; residual 8%, 6%, 5%, 4% and 2%. These paths recognize that the initial backlog year is strongest. The endpoint is Engineering JPY 235.3bn, Metals Machinery JPY 480.7bn, Machinery Systems JPY 215.5bn and residual JPY 215.4bn, totaling JPY 1,146.9bn. The segment CAGR is 5.61%, credible only if MHI captures technology-rich demand and maintains execution.

External evidence supports possibility, not certainty. Danieli's substantial plantmaking backlog and SMS's EUR 4bn order intake show continued spending despite weak steelmaker conditions. The IEA's steel-transition work supports investment in new routes. Technip Energies' high backlog shows that large project markets can expand abruptly when major awards close. None proves MHI's share, so the bull case remains 15% probability.

Bear case growth

Product	3-yr historical CAGR	Latest YoY	Mgmt FY+1 guide	Bear CAGR TTM→TTM+5y	Justification
Engineering	n/a; FY2025 annual +17.3%	+20.4% Q1	JPY 180bn	-1.0%	The guided project converts initially, but weak replacement awards, geopolitical disruption and customer deferrals leave a post-project air pocket.
Metals Machinery	n/a; FY2025 annual -7.5%	-6.5% Q1	JPY 400bn	-2.0%	Steel margin pressure, tariffs and policy uncertainty delay capex; competitors price aggressively after current backlog converts.
Machinery Systems	n/a; FY2025 annual +5.6%	-11.9% Q1	JPY 180bn	0.0%	Replacement demand prevents a collapse, but standardized-equipment competition and public-budget delays eliminate growth.
Commercial Ships and other activities	n/a; residual only	Revenue n/d; ship orders rose	Implied JPY 190bn residual	-3.0%	Current orders convert unevenly, then shipowner uncertainty, regulation delays and Asian yard competition cause a material decline.

The bear cadence is Engineering 2%, 0%, -2%, -2% and -3%; Metals Machinery 3%, -3%, -3%, -3% and -4%; Machinery Systems approximately flat throughout; residual 1%, -2%, -4%, -5% and -5%. This preserves some FY2026 guide conversion but captures a serious order-replacement downturn. Horizon revenue becomes Engineering JPY 159.6bn, Metals Machinery JPY 324.7bn, Machinery Systems JPY 177.1bn and residual JPY 145.0bn, totaling JPY 806.3bn. That is a -1.57% segment CAGR rather than a catastrophic collapse, consistent with a diversified installed base and essential physical infrastructure.

9. Forward Profit from business activities margin assumptions

Product-level Profit from business activities is not disclosed. To avoid pretending otherwise, the table below distinguishes the sealed current segment margin from analytical horizon product-margin assumptions. These product margins exist solely to build an explicit revenue-weighted segment rollup; they are not attributed to MHI. The allocation reflects relative project risk: Engineering and Commercial Ships/other receive lower margins, while Metals Machinery and Machinery Systems receive higher margins when technology, standardization and execution are favorable.

Case	TTM segment margin	Engineering horizon margin	Metals Machinery horizon margin	Machinery Systems horizon margin	Commercial Ships and other horizon margin	Weighted segment horizon margin	Mechanism
Bear	10.0%	6.5%	8.5%	9.0%	3.5%	7.32%	Project charges, weak replacement orders, price competition and unfavorable ship/residual mix reduce margin by about 268 bps.
Base	10.0%	10.0%	12.0%	12.0%	7.5%	10.77%	Better-priced backlog and execution lift equipment lines, partly offset by lower-margin Engineering and residual work; margin expands about 77 bps.
Bull	10.0%	12.0%	14.0%	14.0%	10.0%	12.84%	High-technology mix, clean commissioning, lifecycle work and procurement discipline expand margin by about 284 bps.

The bear margin is near FY2023's 6.9% and well below FY2025's 9.5%. The mechanism is not generic recession. Metals backlog converts at weaker realized margin, Engineering takes an uncompensated project revision, and Commercial Ships/other grows less profitably. A 7.32% segment outcome is painful but consistent with the segment's historical 3.6–7.0% range before FY2025.

The base margin of 10.77% assumes that FY2025's improvement is mostly structural but not unlimited. Metals Machinery reaches a 12% analytical margin through backlog pricing, technology content and execution. Machinery Systems reaches 12% through standardization and mix. Engineering holds 10%, above the 7% adjusted recurring EBIT margin reported by Technip Energies' Project Delivery business but on a different metric and within MHI's blended portfolio. Commercial Ships/other remains 7.5% because opacity and project risk merit a discount. The weighted result is only 77 bps above the TTM segment margin.

The bull margin requires every mechanism to work: new orders are priced for input and schedule risk, the segment avoids major provisions, decarbonization content raises customer value, and lifecycle or upgrade revenue grows. Metals and Machinery Systems reach 14%, Engineering 12% and residual 10%. These are not historical facts. The greater-than-100-bps segment expansion is explicitly tied to mix and execution, not scale alone.

No corporate/unallocated amount is included. The FY2026 corporate bridge of negative JPY 90bn mentioned in the data package belongs to synthesis. Finance income, finance costs, taxes, discontinued operations and non-controlling interests also remain outside this appendix.

10. Segment rollup

The tables below compound each product anchor for exactly five years. Profit is each product's modeled revenue multiplied by the analytical case margin from Section 9. Rows sum directly; no hidden plug is used.

Bear rollup

Product	TTM revenue	Five-year CAGR	2031-06-30 revenue	Profit from business activities margin	2031-06-30 Profit from business activities
Engineering	167.8	-1.0%	159.6	6.5%	10.4
Metals Machinery	359.2	-2.0%	324.7	8.5%	27.6
Machinery Systems	177.1	0.0%	177.1	9.0%	15.9
Commercial Ships and other activities	168.8	-3.0%	145.0	3.5%	5.1
Segment total	872.9	-1.57%	806.3	7.32%	59.0

The bear product sum is JPY 806.3bn and product profit sum JPY 59.0bn. JPY 59.0bn divided by JPY 806.3bn equals 7.32%. Differences from unrounded calculations are below 0.1%, comfortably inside the 1% rollup tolerance.

Base rollup

Product	TTM revenue	Five-year CAGR	2031-06-30 revenue	Profit from business activities margin	2031-06-30 Profit from business activities
Engineering	167.8	4.0%	204.2	10.0%	20.4
Metals Machinery	359.2	3.0%	416.4	12.0%	50.0
Machinery Systems	177.1	2.0%	195.5	12.0%	23.5
Commercial Ships and other activities	168.8	1.5%	181.8	7.5%	13.6
Segment total	872.9	2.71%	997.9	10.77%	107.5

The base product revenue sum is JPY 997.9bn and product profit sum JPY 107.5bn. JPY 107.5bn divided by JPY 997.9bn equals 10.77%. The result does not depend on allocating Others, Corporate & Eliminations.

Bull rollup

Product	TTM revenue	Five-year CAGR	2031-06-30 revenue	Profit from business activities margin	2031-06-30 Profit from business activities
Engineering	167.8	7.0%	235.3	12.0%	28.2
Metals Machinery	359.2	6.0%	480.7	14.0%	67.3
Machinery Systems	177.1	4.0%	215.5	14.0%	30.2
Commercial Ships and other activities	168.8	5.0%	215.4	10.0%	21.5
Segment total	872.9	5.61%	1,146.9	12.84%	147.2

The bull product revenue sum is JPY 1,146.9bn and product profit sum JPY 147.2bn. JPY 147.2bn divided by JPY 1,146.9bn equals 12.84%. Rounding residuals are immaterial.

Probability-weighted operating outcome

Using 30% Bear, 55% Base and 15% Bull, probability-weighted horizon revenue is JPY 962.8bn: 0.30 × 806.3 plus 0.55 × 997.9 plus 0.15 × 1,146.9. Probability-weighted Profit from business activities is JPY 98.9bn: 0.30 × 59.0 plus 0.55 × 107.5 plus 0.15 × 147.2. The implied 10.27% ratio is a diagnostic of weighted outcomes, not a fourth scenario, because revenue and profit are weighted separately.

The probability distribution is deliberately non-uniform. The base case has 55% because current backlog and FY2026 guidance make moderate conversion the central outcome. Bear receives 30%, twice Bull's 15%, because project portfolios have asymmetric downside: a few cost overruns can erase many normal contracts, while competitive bidding constrains upside. Evidence does not justify a higher Bull probability.

11. Key risks and wildcards

[Bear] Large-project cost revision. The most important risk is not demand but execution. A fixed-price Engineering or Metals project can suffer design change, site delay, supplier failure, inflation or performance penalties. The signal is a sudden provision, project-cost re-estimate or margin decline despite rising revenue. This risk drives the Bear margin down to 7.32%.

[Bear] Steel-capex air pocket after backlog conversion. Metals Machinery is 41% of FY2025 segment revenue and the largest modeled line. Current backlog can support FY2026 while new awards weaken. Steelmaker margins, tariffs, energy costs and uncertainty could delay investment, producing a revenue gap in FY2028–FY2031. SMS's recent experience—higher orders but lower sales due to incomplete projects—shows the timing volatility; weak order intake would add a later demand problem.

[Bear] Aggressive competition in decarbonization technology. Danieli and SMS are investing in low-emission routes and digital systems. If their solutions deliver lower cost or become reference standards, Primetals may lose share or price. The threat is especially serious if customers defer hydrogen-based projects and concentrate spending on a smaller set of proven platforms.

[Bear/Base] Commercial Ships and other residual opacity. About one-fifth of FY2025 segment revenue is not split into a clean annual line. The residual can hide different cycles and margins. A strong order comment cannot substitute for revenue, margin and backlog data. This uncertainty is the reason the residual's base growth and margin remain below those of

disclosed equipment lines.

[Bear/Base] Regulation timing. Shipping and steel decarbonization are structural opportunities, but standards, subsidies, fuel availability and customer economics can shift. The IMO's adjourned adoption process illustrates timing risk. Delays can strand engineering effort or push customer final investment decisions beyond the five-year horizon.

[Bear] Foreign exchange and cross-border execution. Projects are sourced and delivered across currencies and jurisdictions. The segment can hedge transaction exposure, but translation, local cost inflation, sanctions, logistics and site-security risks remain. Middle East or Central Asian disruption could affect Engineering even if consolidated guidance initially excludes an impact.

[Base/Bull] Better-priced backlog. The constructive wildcard is that FY2025's margin improvement reflects a durable upgrade in bidding discipline and contract pricing rather than only mix. If newer orders contain escalation protection and more proprietary technology, margin can remain above the old cycle while revenue grows only modestly.

[Base/Bull] Lifecycle and modernization mix. A larger installed-base service, upgrade and automation stream could raise margins and reduce cyclicality. Konecranes' large margin gap between service and equipment demonstrates the economic mechanism. MHI has not disclosed the segment's service share, so this remains upside rather than a base assumption.

[Bull] Decarbonization investment cycle. Hydrogen DRI, electric furnaces, process electrification, digital optimization and alternative-fuel ships can increase engineering and equipment content per customer project. MHI benefits only if it wins qualified, profitable orders and executes them. Industry spending does not automatically translate into segment economics.

[All cases] Skilled labor and supplier capacity. Engineering and commissioning expertise cannot be scaled instantly. Strong demand can create wage pressure, schedule bottlenecks and quality risk. Conversely, retaining talent through a downturn burdens margin. The bull case requires controlled throughput; the bear case captures the cost of overextension.

Summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	JPY 806.3bn	Profit from business activities	7.32%	JPY 59.0bn	30%
Base	JPY 997.9bn	Profit from business activities	10.77%	JPY 107.5bn	55%
Bull	JPY 1,146.9bn	Profit from business activities	12.84%	JPY 147.2bn	15%

The segment is a credible but not exceptional compounder. Backlog, qualification barriers and technical know-how support the base case, while project risk, cyclicality and limited product-profit disclosure prevent a more aggressive forecast. Metals Machinery remains the fulcrum. The most important underwriting test is whether MHI can deliver the FY2026 JPY 950bn revenue guide near the JPY 90bn profit guide without a new project provision, then replenish backlog at equal or better pricing. Until that is demonstrated, recent margin improvement should be treated as partially earned and partially vulnerable.

Appendix B4 - Industrial Solutions

Industrial Solutions — Segment Deep Dive

Company: Mitsubishi Heavy Industries **Ticker:** 7011.T **Run:** `pulse-cio-20260906T100232+0800` **Forecast anchor:** TTM ended 2026-06-30 **Forecast horizon:** 2031-06-30, exactly five calendar years **Exact profit metric:** `Profit from business activities` **Units:** JPY billions unless stated otherwise

0. Segment boundary and taxonomy note

Industrial Solutions has a material taxonomy break at 2026-04-01. It is the renamed successor to Logistics, Thermal & Drive Systems, but Mitsubishi Logisnext was classified as discontinued and removed from consolidation on 2026-05-01, while Data Center & Energy Management was transferred into the segment from 2026-04-01. MHI recast FY2025 and the prior-year Q1 comparison to the new perimeter, but did not publish a complete five-year current-taxonomy series. Accordingly, FY2021–FY2024 are shown only as predecessor context; FY2025 is the first full-year current-perimeter anchor; and no old-taxonomy total is silently compounded into the 2031 forecast. [data_package §1, paragraphs 1–2; §10, Five-year segment history row]

1. What this segment actually is

Industrial Solutions is a portfolio of three economically different activities rather than one homogeneous franchise. The first is Engines & Turbochargers: compact and medium industrial engines, power-generation applications, and turbochargers supplied into vehicle and industrial original-equipment programs. Customers are equipment manufacturers, vehicle OEMs, distributors and end users in construction, agriculture, logistics, distributed power and related industrial applications. Revenue is generated through multi-year OEM programs, unit shipments, replacement demand, spares and service. Pricing is negotiated program by program and must absorb commodity, labor, freight, warranty and regulatory-compliance costs. The Q1 evidence points to engines for Asian markets as the immediate order driver. [data_package §4, Industrial Solutions / Engines & Turbochargers row; §6, Industrial Solutions row 1]

The second activity is HVAC & Car A/C. It combines building and room air-conditioning equipment with automotive air-conditioning products. The customer and channel mix is broad: distributors and installers in residential and light-commercial HVAC, project and institutional customers for larger systems, and automobile manufacturers for car air-conditioning components. Building HVAC can earn better economics from differentiated inverter controls, energy efficiency, reliability, product breadth and local distribution; automotive thermal products are generally tougher, with concentrated OEM customers, annual cost-down pressure, platform risk and high qualification requirements. MHI is trying to expand cooling-system sales in the United States and India, while China residential weakness remains a real volume headwind. [data_package §4, Industrial Solutions / HVAC & Car A/C row; §6, Industrial Solutions rows 2 and 4]

The third activity is Data Center & Energy Management, transferred into Industrial Solutions only at the FY2026 organizational boundary. The reviewed package describes data-center power and energy-management activity but does not provide a clean stand-alone revenue or profit series. Economically, the opportunity should encompass engineered power, cooling, controls, integration and lifecycle support around high-density facilities, but the disclosed perimeter is not detailed enough to credit it with peer-like growth or margin. The model therefore carries it as a combined “Other / Data Center & Energy Management” line and treats rapid data-center demand as optionality, not as a proven MHI franchise. [data_package §1, paragraph 1; §4, Data Center & Energy Management row; §10, Stand-alone Data Center & Energy Management row]

Go-to-market differs across these activities. Engines and automotive components are won through engineering qualification, durability records, application support and global manufacturing. HVAC requires a local route to market, installer relationships, service coverage and region-specific product configurations. Data-center solutions require consultative selling, technical integration, credible delivery schedules and post-installation service. That diversity makes the segment less exposed to any one end market, but it also makes reported revenue and margin a blend of very different pricing power, capital needs and cycles. The central underwriting mistake would be to assign the whole segment the growth and economics of its most attractive new activity.

2. Current economics

FY2025 current-perimeter revenue was JPY 699.9bn and `Profit from business activities` was negative JPY 2.0bn, a margin of negative 0.3%. The QFR-verified current-taxonomy TTM reconstruction is exact at the source-row precision: JPY

699.900bn FY2025 revenue less JPY 154.608bn recast Q1 FY2025 plus JPY 177.902bn Q1 FY2026 equals JPY 723.194bn. The sealed TTM bridge reports JPY 3.911bn of `Profit from business activities`; JPY 3.911bn divided by JPY 723.194bn is 0.540795%, rendered as 0.54%. The prior JPY 734.1bn planning estimate overstated the QFR-verified TTM revenue by JPY 10.906bn, or 1.5%, and has therefore been removed from every scenario. [data_package §3, Industrial Solutions revenue, profit and margin rows; §5, Industrial Solutions current-taxonomy TTM bridge; §3a, TTM bridge, Industrial Solutions profit row]

The disclosed FY2025 legacy-ex-Logisnext product rows were JPY 285.6bn for Engines & Turbochargers and JPY 353.1bn for HVAC & Car A/C. Those two lines sum to JPY 638.7bn. Against current-perimeter segment revenue of JPY 699.9bn, the residual is JPY 61.2bn, but the package warns that Data Center & Energy Management lacks a clean stand-alone series and that the segment was reorganized. In Q1 FY2026, Engines & Turbochargers revenue was JPY 71.4bn, up 17.6%, while HVAC & Car A/C was JPY 87.2bn, up 7.7%. Current-segment Q1 revenue was JPY 177.9bn and `Profit from business activities` was JPY 9.9bn, a 5.6% quarterly margin. That is encouraging, but one quarter at the new boundary is not enough to establish normalized economics. [data_package §4, product rows 8–10 and Q1 product rows 8–9; §5, Industrial / legacy LT&D row]

Management's FY2026 current-taxonomy guide is order intake of JPY 750bn, revenue of JPY 750bn and `Profit from business activities` of JPY 30bn, or a 4.0% margin. Product revenue guidance is JPY 300bn for Engines & Turbochargers and JPY 370bn for HVAC & Car A/C; the JPY 80bn residual includes other activities, including transferred Data Center & Energy Management. This guide is the strongest near-term normalization evidence. It does not, by itself, prove a return to the predecessor segment's best historical margin or justify applying a data-center peer multiple or margin to the whole segment. [data_package §6, Industrial Solutions guidance paragraph]

Capital intensity cannot be isolated from the package at segment level. Engines, turbochargers, automotive thermal systems and HVAC all require tooling, factories, testing, inventory and working capital. OEM programs also demand engineering before revenue and may carry launch, warranty and volume-risk exposure. Data-center activity may be less asset-heavy when it is design, integration and controls, but more working-capital intensive when MHI takes responsibility for equipment packages. The consolidated FY2025 cash-flow capex ratio was 3.64% of revenue and R&D was 1.61% on the FMP expense definition, but these are company-wide context and are not allocated into the segment. [data_package §7, FY2025 row]

The current economics should therefore be read as a fragile recovery: the TTM margin is about 0.5%, the latest quarter was profitable, and management guides to 4.0%, but the portfolio's internal profit pool is undisclosed. A JPY 30bn FY2026 result would represent a JPY 32bn swing from FY2025, much more than revenue growth alone can explain. Supply-chain normalization, mix, pricing and cost recovery must all contribute. The model gives partial credit to that stated recovery and then requires new evidence before assuming further expansion.

3. Unit economics

Engines & Turbochargers

Revenue begins with a design win or distributor/end-user order, followed by engineering, tooling, component procurement, assembly, testing and shipment. The OEM portion is attractive when a qualified platform runs for years, but the supplier normally bears upfront development and tooling costs and then faces customer cost-down demands. Unit profit is sensitive to plant utilization, raw-material and purchased-component costs, warranty experience, foreign exchange, product mix and whether price resets keep pace with inflation. Aftermarket parts and service should be more recurring and less price-sensitive than original equipment, but the reviewed package does not disclose the split.

Turbochargers add a technology and emissions-compliance element. Higher efficiency, durability and packaging support pricing, while scale and quality reduce scrap and warranty expense. However, the addressable market is not a straight line. Hybrid vehicles can still use advanced turbochargers, and industrial engines remain relevant in distributed power and equipment, but battery-electric vehicle penetration reduces the long-duration combustion-engine unit pool. Garrett reported that global turbocharger production fell from about 50 million units in 2023 to 49 million in 2024 and expected further decline as EV penetration rises; its 2025 filing also describes intense global competition and OEM pricing pressure. That evidence supports a low-single-digit base CAGR for MHI's combined Engines & Turbochargers line rather than extrapolating Q1's 17.6% growth. [Garrett 2024 Form 10-K](https://www.sec.gov/Archives/edgar/data/1735707/000173570725000013/gtx-20241231.htm) and [Garrett 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/1735707/000173570726000009/gtx-20251231.htm)

HVAC & Car A/C

Building HVAC economics depend on product efficiency, refrigerant and inverter technology, brand, distribution reach, installer loyalty, warranty performance and service. A manufacturer can earn better margin with high-value systems and solutions rather than undifferentiated room units. Geographic mix matters: India and the United States offer structural cooling and replacement demand, while the package records declining China HVAC unit sales. Daikin's 2025 integrated report similarly describes prolonged Chinese real-estate weakness, while highlighting investment in new plants and growth in applied systems and service solutions. That is an important comparison: the market tailwind is real, but winning it requires distribution, installed-base service and sustained investment, not merely product availability. [Daikin Integrated Report 2025](https://www.daikin.com/-/media/Project/Daikin/daikin_com/investor/library/annual/2025/2025_E-pdf.pdf)

Car A/C is economically different. Vehicle OEMs are concentrated buyers, launch schedules are unforgiving, and suppliers face recurring productivity and price-reduction demands. Electrification increases the technical value of whole-vehicle thermal management because battery temperature, cabin comfort and driving range interact. It also raises development cost and favors suppliers with system-level capability. DENSO describes itself as the global leader in thermal products, citing more than 2,500 environmental-technology patents and 56 global bases, and says it is moving from air-conditioning components to comprehensive vehicle thermal management. This illustrates both the opportunity and the competitive bar MHI faces. [DENSO Integrated Report 2025](https://www.denso.com/global/en/-/media/Global/about-us/investors/annual-report/2025/annual-report-doc-2025-viewing-en.pdf)

Other / Data Center & Energy Management

Data-center power and cooling revenue can have strong structural demand, but unit economics depend on scope. Product sales may carry manufacturing margin; engineered systems can carry project and commissioning risk; controls and lifecycle service can be higher quality and recurring. The attractive outcome is an installed base that generates maintenance, monitoring and retrofit work. The unattractive outcome is low-margin equipment pass-through, project delays and warranty exposure. Vertiv projects 10%–13% five-year data-center market growth and 15%–17% for cloud and colocation, while emphasizing integrated power, thermal and service capabilities. Its 2025 shareholder letter also points to substantial capacity and engineering investment and more than 5,000 field-service engineers. That is evidence of the market's growth and the resources needed to compete, not evidence that MHI's transferred activity already has Vertiv-like economics. [Vertiv 2024 shareholder letter](https://investors.vertiv.com/financials/annual-reports/2025-Shareholder-Letter/default.aspx) and [Vertiv 2025 shareholder letter](https://investors.vertiv.com/financials/annual-reports/2026-Shareholder-Letter/)

At segment level, margin improves when higher-value HVAC, aftermarket, energy-management controls and service grow faster than commodity or pass-through equipment; supply availability normalizes; plants fill; and price/cost recovery becomes embedded. Margin deteriorates when China units fall, automotive OEM volume misses, materials or freight rise faster than repricing, turbo programs are lost, launches incur warranty or inefficiency costs, or data-center packages carry low-value hardware and execution risk. With product-level profit undisclosed, any precise product margin is an analyst allocation. The segment margin, not those allocations, is the decision variable.

4. Competitive dynamics

Industrial Solutions competes in several overlapping markets, and there is no single meaningful segment market-share number. The reviewed package gives no MHI share for Engines & Turbochargers, HVAC & Car A/C or Data Center & Energy Management. A market-share claim for the combined segment would therefore be fabricated. The more useful approach is to identify the competitive basis in each activity and ask whether MHI has a differentiated reason to win.

In industrial engines and power applications, global competitors include Cummins, Caterpillar, Rolls-Royce Power Systems / mtu, Kohler and multiple regional manufacturers. Cummins' 2025 annual report identifies Caterpillar, mtu and Kohler/SDMO as primary Power Systems competitors and explicitly names Mitsubishi Heavy Industries among additional competitors. It also says the market includes independent engine makers, generator assemblers and vertically integrated OEMs. This confirms MHI is a recognized participant, but also that scale, distribution, service and full-system offerings matter. [Cummins 2025 Annual Report](https://investor.cummins.com/sec-filings/annual-reports/content/0000026172-26-000009/cmi-20251231.htm)

In automotive turbochargers, Garrett, BorgWarner, IHI, Cummins Turbo Technologies and regional suppliers compete on efficiency, durability, cost, delivery and application engineering. Garrett called itself the number-one global turbo player in a 2026 investor presentation based on management estimates, and reported a greater-than-50% average new-business win rate since 2018. These are competitor claims rather than audited market-share facts, but they show the scale and program-win intensity of the market. MHI can defend positions through engineering qualification and customer relationships; it cannot rely on industry growth alone because global turbo unit volumes face long-term electrification pressure. [Garrett 2026 investor presentation](https://www.sec.gov/Archives/edgar/data/1735707/000095014226001458/eh260781731_ex9902.htm)

In building HVAC, Daikin, Mitsubishi Electric, Carrier, Trane Technologies, Johnson Controls, Panasonic and strong Chinese manufacturers such as Midea and Gree bring larger dedicated platforms or formidable local scale. Pricing power is strongest in premium, applied, high-efficiency and service-intensive systems. It is weakest in standardized residential units sold through price-competitive channels. Daikin's investment in manufacturing across India, Mexico, Indonesia, China and Poland, and its emphasis on acquired service networks in North America, illustrate the distribution and capital commitment needed to translate secular cooling demand into durable margins. MHI's stated U.S. and India expansion is directionally sensible, but the package provides no market-share or channel-density evidence to assume rapid share capture.

In automotive thermal systems, DENSO, Hanon Systems, Valeo, Mahle and other global Tier 1 suppliers compete for platform awards. Electrification increases the value of heat pumps, battery cooling and integrated controls, but it also shifts competition from individual A/C components toward whole-vehicle energy management. DENSO's declared leadership, patent base and 56-site footprint highlight a high barrier for a smaller competitor. MHI can retain niches through customer relationships and engineering quality, but this is not obviously a price-setting market.

In data-center power and cooling, Vertiv, Schneider Electric, Eaton, ABB, Siemens, Johnson Controls, Carrier, Trane and specialist cooling providers have large installed bases and system-integration capabilities. Demand is expanding quickly, but customer concentration, rapid technology change and delivery requirements can move bargaining power toward hyperscalers and large integrators. MHI's cross-domain power, cooling and engineering knowledge is potentially useful. Yet there is no disclosed stand-alone revenue, margin, backlog, service mix or customer count in the data package. The prudent conclusion is "credible adjacency, unproven economics," not "automatic AI winner."

Substitution risk differs by product. Battery-electric vehicles pressure conventional turbochargers and some internal-combustion engine applications. Heat pumps and low-global-warming-potential refrigerants create replacement demand but can obsolete older HVAC designs. Chinese local competition can compress pricing. In data centers, liquid cooling, direct-to-chip designs and modular power architectures change the specification faster than traditional industrial product cycles. MHI must keep investing across all three activities merely to hold position, which limits the extent to which modest revenue growth converts automatically into margin.

5. Moat at the segment level

The segment has pockets of defensibility, but not a uniformly wide moat. Engines and turbochargers benefit from application engineering, certification, tooling, durability data, embedded OEM relationships and switching costs during a program. Once a component is qualified, replacing it mid-cycle can be expensive and risky. An installed base also supports parts and service. These are real barriers, but they do not eliminate rebids, annual cost-downs, technology substitution or powerful customers. The moat is therefore moderate and program-specific.

HVAC's moat rests on brand, energy efficiency, controls, refrigerant expertise, distribution, installer familiarity and service. Those advantages can be durable in established markets, but the package does not show MHI's share, dealer density, service revenue or installed-base retention. China weakness demonstrates that brand and technology do not remove local-cycle risk. U.S. and India expansion could strengthen the network effect of distribution and service over time, but it is currently a plan rather than an evidenced moat.

Car A/C has qualification and engineering barriers, but customer concentration and system transition constrain pricing power. DENSO's scale and technology position show that industry leaders can build a strong moat; the package does not establish that MHI occupies a comparable position. Data Center & Energy Management could acquire a moat from integrated design, mission-critical reliability, controls, service and cross-selling with MHI power assets. However, the transferred business has no disclosed history in the reviewed package, so its moat must be scored as unproven.

Over five to ten years, the most durable assets are engineering know-how, reliability reputation, long OEM relationships and service capability. The least durable are undifferentiated equipment volumes and any temporary benefit from supply-chain normalization. The segment can become a respectable mid-single-digit-margin industrial portfolio, but it does not yet demonstrate the high recurring revenue, share leadership or transparent returns required to call it a wide-moat compounder. The valuation model should reward evidence of service mix, Data Center & Energy Management backlog and sustained margin—not the label "Industrial Solutions."

6. Historical growth rates — reproduced from the reviewed data package

The table deliberately preserves the taxonomy discontinuity. FY-3, FY-2 and FY-1 correspond to FY2023, FY2024 and FY2025. n/d means not disclosed, and n/c means not comparable. Product rows have only FY2024 and FY2025 dollar

disclosure; no FY2023 value is back-solved. Every historical cell points to a specific reviewed-package row.

Product / sub-segment	FY-3 rev	FY-2 rev	FY-1 rev	3-yr CAGR	Most recent YoY	Data package cite
Industrial Solutions / LT&D predecessor	JPY 1,314.5bn [§3, Industrial Solutions revenue row]	JPY 1,307.1bn predecessor [§3, Industrial Solutions revenue row]	JPY 699.9bn current perimeter [§3, Industrial Solutions revenue row]	n/c due perimeter reset [§3, Industrial Solutions YoY row]	n/c [§3, Industrial Solutions YoY row]	data_package §3, Industrial Solutions table, Revenue and YoY rows
Engines & Turbochargers	n/d [§4, Engines & Turbochargers row]	JPY 279.1bn [§4, Engines & Turbochargers row]	JPY 285.6bn legacy ex-ML [§4, Engines & Turbochargers row]	n/d; two years only [§4, Engines & Turbochargers row]	17.6% Q1 [§4, Q1 product trend, Engines row]	data_package §4, product table row 8 and Q1 product row 8
HVAC & Car A/C	n/d [§4, HVAC & Car A/C row]	JPY 369.8bn [§4, HVAC & Car A/C row]	JPY 353.1bn legacy ex-ML [§4, HVAC & Car A/C row]	n/d; two years only [§4, HVAC & Car A/C row]	7.7% Q1 [§4, Q1 product trend, HVAC row]	data_package §4, product table row 9 and Q1 product row 9
Data Center & Energy Management	n/d [§4, Data Center row]	n/d [§4, Data Center row]	Included in restated segment; not isolated [§4, Data Center row]	n/d [§4, Data Center row]	n/d [§4, Data Center row]	data_package §4, product table row 10

Arithmetic checks. The predecessor segment's FY2022 revenue of JPY 1,203.7bn multiplied by 1.092 equals JPY 1,314.4bn, within 0.01% of FY2023 JPY 1,314.5bn. FY2023 JPY 1,314.5bn multiplied by 0.994 equals JPY 1,306.6bn, within 0.04% of FY2024 JPY 1,307.1bn. [data_package §3, Industrial Solutions revenue and YoY rows] Engines & Turbochargers increased from JPY 279.1bn to JPY 285.6bn, an internally calculated 2.3%; HVAC & Car A/C declined from JPY 369.8bn to JPY 353.1bn, an internally calculated 4.5%. Both tie exactly to the disclosed package dollars. No product back-solves were used.

The predecessor total's apparent drop from JPY 1,307.1bn to current-perimeter JPY 699.9bn is not economic contraction. It primarily reflects Mitsubishi Logisnext's removal and Data Center & Energy Management's transfer. Treating it as a 46% decline would contaminate every forecast and margin inference. Conversely, using the predecessor's JPY 1.3tn as the TTM base would overstate the current segment by nearly one predecessor business. The only defensible approach is to model the current products and residual activity from the new boundary.

7. Management guidance — quoted from data package Section 6

- **"Engines for Asian markets" — Q1 FY2026 transcript, MHI IR AI narrator, D-F4.** Management identified this as an order driver. The interpretation is near-term support for Engines & Turbochargers, but not a reason to extrapolate Q1's 17.6% product growth for five years. [data_package §6, Industrial Solutions row 1]

- **"HVAC units sold continued to decline" — Q3 FY2025 transcript, senior presenter unidentified, D-F4.** This refers to China exposure and establishes a concrete volume headwind. The base case assumes other regions offset it gradually; the bear case assumes the decline persists and price competition spreads. [data_package §6, Industrial Solutions row 2]

- **"resolution of a supply chain disruption" — FY2025 transcript, MHI IR AI narrator, D-F4.** The turbocharger profit rebound benefited from normalization. Because a resolved disruption cannot recur as a fresh benefit every year, the model treats it as a bridge toward FY2026 profitability, not a perpetual growth driver. [data_package §6, Industrial Solutions row 3]

- **"expand sales of cooling systems" — FY2025 transcript, CEO Ito, D-F4.** Management points to the United States and India. This supports a positive HVAC base CAGR despite China, but the package provides no stand-alone sales, orders, channel count or share target, so the bull case—not the base case—captures substantial share gains. [data_package §6, Industrial Solutions row 4]

- **"physical AI in automated manufacturing" — 2024 MTBP progress, CEO Ito, D-O6.** This is strategic optionality around automation and energy management. The forecast requires actual disclosed revenue to emerge; it does not capitalize the phrase as if it were backlog. [data_package §6, Industrial Solutions row 5]

- **FY2026 numerical guide.** Order intake is JPY 750bn, revenue JPY 750bn and `Profit from business activities` JPY 30bn. Engines & Turbochargers revenue is guided to JPY 300bn, HVAC & Car A/C to JPY 370bn, and the JPY 80bn residual includes other activities and transferred Data Center & Energy Management. This is the controlling near-term anchor for revenue and margin. [data_package §6, Industrial Solutions guidance paragraph]

[DATA GAP: management did not disclose a clean five-year Data Center & Energy Management revenue/profit history, product-level profit for Engines or HVAC, or a quantified U.S./India cooling share target.]

8. Forward growth assumptions — explicit and bottom-up

8.1 TTM planning split

The QFR-verified JPY 723.194bn segment TTM anchor is allocated to products with the reviewed product disclosures as constraints. Engines & Turbochargers is set at JPY 296.3bn, equal to FY2025 JPY 285.6bn plus the disclosed Q1 dollar increase of JPY 10.7bn. HVAC & Car A/C is set at JPY 359.3bn, equal to FY2025 JPY 353.1bn plus the disclosed Q1 dollar increase of JPY 6.2bn. The remaining JPY 67.594bn is assigned to Other / Data Center & Energy Management solely as the balancing current-perimeter residual: JPY 723.194bn less JPY 296.3bn less JPY 359.3bn. The core-product lines and residual are model allocations, not issuer-reported TTM product revenue; only the segment total is QFR verified.

TTM planning line	Construction	TTM planning revenue	Share of segment
Engines & Turbochargers	FY2025 JPY 285.6bn plus Q1 YoY dollar change JPY 10.7bn	JPY 296.3bn	41.0%
HVAC & Car A/C	FY2025 JPY 353.1bn plus Q1 YoY dollar change JPY 6.2bn	JPY 359.3bn	49.7%
Other / Data Center & Energy Management	Balancing residual; no clean stand-alone history	JPY 67.594bn	9.3%
Industrial Solutions	Sum	JPY 723.194bn	100.0%

8.2 Base case growth

Product	3-yr historical CAGR	Latest YoY	Mgmt FY+1 guide	Base CAGR TTM→TTM+5y	Justification
Engines & Turbochargers	n/d; two-year revenue +2.3%	17.6% Q1	JPY 300bn, +5.0% vs FY2025	3.0%	Asian engine demand and supply normalization support growth, but turbo unit pressure and OEM bargaining power force a sharp fade from Q1.
HVAC & Car A/C	n/d; two-year revenue -4.5%	7.7% Q1	JPY 370bn, +4.8% vs FY2025	3.5%	U.S. and India expansion offsets weak China; growth stays below dedicated HVAC peers because share and service evidence are absent.
Other / Data Center & Energy Management	n/d	n/d	Residual JPY 80bn	8.0%	Data-center demand is structurally strong, but MHI has no isolated backlog or margin disclosure, so growth is well below focused-peer market claims.

The base case deliberately decelerates Engines & Turbochargers from 17.6% Q1 growth to 3.0% annual growth. The reason is specific: Q1 benefited from Asian engine orders and a prior supply-chain disruption had resolved, while Garrett's industry evidence points to declining global turbo units as EV penetration rises. The HVAC base case accelerates from the two-year decline to 3.5% because the latest quarter grew 7.7% and management is expanding U.S. and India cooling sales, but it does not assume China immediately recovers. Other / Data Center & Energy Management receives the highest growth because its market is strongest, but the balancing residual is only 9.3% of the anchor and reaches roughly 11% of segment revenue by the horizon.

8.3 Bear case growth

Product	3-yr historical CAGR	Latest YoY	Mgmt FY+1 guide	Bear CAGR TTM→TTM+5y	Justification
Engines & Turbochargers	n/d; two-year revenue +2.3%	17.6% Q1	JPY 300bn	-1.0%	Asian orders normalize, EV substitution and lost turbo programs outweigh industrial-engine resilience, and OEM price-downs limit nominal growth.
HVAC & Car A/C	n/d; two-year revenue -4.5%	7.7% Q1	JPY 370bn	0.0%	China weakness persists, U.S./India channel expansion underdelivers, and price competition offsets replacement demand.
Other / Data Center & Energy Management	n/d	n/d	Residual JPY 80bn	-2.0%	MHI fails to convert the transferred capability into competitive packages and rationalizes low-return activity despite a growing market.

The bear case is not an industry-collapse case. It is a share, mix and execution case: attractive end markets do not translate into MHI revenue because dedicated competitors have stronger channels and installed bases. Segment revenue slips only modestly, but weak price/cost recovery prevents earnings normalization.

8.4 Bull case growth

Product	3-yr historical CAGR	Latest YoY	Mgmt FY+1 guide	Bull CAGR TTM→TTM+5y	Justification
Engines & Turbochargers	n/d; two-year revenue +2.3%	17.6% Q1	JPY 300bn	5.0%	MHI sustains Asian engine wins, hybrids prolong advanced-turbo demand, and industrial power applications offset pure-BEV pressure.
HVAC & Car A/C	n/d; two-year revenue -4.5%	7.7% Q1	JPY 370bn	6.0%	U.S. and India distribution scales, premium cooling mix rises and China stabilizes without requiring a return to prior property conditions.
Other / Data Center & Energy Management	n/d	n/d	Residual JPY 80bn	15.0%	MHI wins integrated power/cooling work and service attachments in a market focused peers expect to grow at low-to-mid teens.

The bull case still does not maintain Q1 Engines growth. It requires five years of program wins and industrial demand but caps the CAGR at 5.0%. HVAC's 6.0% assumes regional expansion becomes tangible. Other / Data Center & Energy Management at 15.0% is the only line near focused data-center market forecasts; it is explicitly conditional on backlog, customers and service evidence that does not yet appear in the package.

8.5 Base-case cadence

Product	TTM 2026-06-30	2027-06-30	2028-06-30	2029-06-30	2030-06-30	2031-06-30
Engines & Turbochargers	296.3	305.2	314.4	323.8	333.5	343.5
HVAC & Car A/C	359.3	371.9	384.9	398.4	412.3	426.7
Other / Data Center & Energy Management	67.6	73.0	78.8	85.1	92.0	99.3
Industrial Solutions	723.2	750.1	778.1	807.3	837.8	869.5

The base cadence reaches JPY 750.1bn after one year, effectively matching the JPY 750bn FY2026 guide despite the period mismatch between a June TTM and a March fiscal year. There is no abrupt step-up hidden late in the model. Segment growth is 3.8% annually, supported by low-single-digit growth in the two disclosed core products and faster growth in the smaller transferred activity.

9. Forward `Profit from business activities` margin assumptions

The current TTM `Profit from business activities` margin is 0.54% on QFR-verified TTM revenue, versus negative 0.3% for FY2025 current perimeter and 4.0% in management's FY2026 guide. The large near-term swing is management's, not this model's invention. However, the exact source of the FY2025 loss and the FY2026 recovery is not disclosed at product

level. The model therefore uses conservative product allocations that sum to the segment result and focuses on the blended margin.

Product / segment	Current evidence	Bear 2031 margin on `Profit from business activities`	Base 2031 margin on `Profit from business activities`	Bull 2031 margin on `Profit from business activities`
Engines & Turbochargers	Product profit n/d; supply disruption resolved	1.5%	5.0%	7.0%
HVAC & Car A/C	Product profit n/d; China volume pressure	0.5%	4.5%	7.0%
Other / Data Center & Energy Management	Product profit n/d; transferred perimeter	-2.0%	7.5%	12.0%
Industrial Solutions blended	QFR-verified TTM margin 0.54%; FY2026 guide 4.0%	0.7%	5.0%	7.7%

Bear mechanism. Engines remain barely profitable as price-downs and lower turbo volumes offset industrial demand. HVAC earns only 0.5% because China weakness, under-utilization and automotive customer pressure prevent cost recovery. Other / Data Center & Energy Management loses money as project and integration costs exceed gross profit. The blended margin of 0.7% is close to the current TTM level: no mean reversion is assumed merely because predecessor LT&D once earned more.

Base mechanism. FY2026 guidance establishes a 4.0% near-term bridge. From that level, only about 100 basis points of additional blended expansion is assumed by 2031. Engines & Turbochargers reaches 5.0% as the supply chain stabilizes and factories absorb low-single-digit growth, but OEM pricing prevents a high margin. HVAC reaches 4.5% as U.S./India mix and higher-value systems offset China and automotive pressure. Other / Data Center & Energy Management reaches 7.5% because a growing installed base supports service and controls, but remains far below the economics of a pure software or leading focused infrastructure company. The blended 5.0% is not a return to an assumed historical norm; it is a modest step beyond the explicit 4.0% guide.

Bull mechanism. The 7.7% blended margin requires favorable mix and execution: advanced turbo and engine applications hold pricing, premium HVAC and regional expansion lift contribution, and Data Center & Energy Management develops a service-rich model. This is above the predecessor segment's 5.5% FY2023 margin and therefore demands new evidence. It is not the default. The case should be cut if product-level disclosure shows the transferred activity is low-margin equipment pass-through or if FY2026 profit misses JPY 30bn.

[DATA GAP: MHI does not disclose product-level `Profit from business activities`, product gross margin, service mix or capital employed for Engines & Turbochargers, HVAC & Car A/C, or Data Center & Energy Management. Product margins above are analyst allocations used only to reconstruct the segment total.]

10. Segment rollup — bottoms-up and arithmetically tied

Bear case rollup

Product	TTM revenue	CAGR to 2031-06-30	2031 revenue	`Profit from business activities` **margin**	**2031** `Profit from business activities`
Engines & Turbochargers	296.3	-1.0%	281.8	1.5%	4.2
HVAC & Car A/C	359.3	0.0%	359.3	0.5%	1.8
Other / Data Center & Energy Management	67.6	-2.0%	61.1	-2.0%	-1.2
Industrial Solutions	723.2	-0.6% blended	702.2	0.7% blended	4.8

The product revenue sum is JPY 702.2bn and the product profit sum is JPY 4.8bn. Using unrounded product values, JPY 4.801bn divided by JPY 702.178bn is 0.684%, rendered as 0.7%. The rollup has no corporate allocation and no `Others, Corporate & Eliminations` line.

Base case rollup

Product	TTM revenue	CAGR to 2031-06-30	2031 revenue	`Profit from business activities` **margin**	**2031** `Profit from business activities`
Engines & Turbochargers	296.3	3.0%	343.5	5.0%	17.2
HVAC & Car A/C	359.3	3.5%	426.7	4.5%	19.2

Product	TTM revenue	CAGR to 2031-06-30	2031 revenue	Profit from business activities margin	2031 Profit from business activities
Other / Data Center & Energy Management	67.6	8.0%	99.3	7.5%	7.4
Industrial Solutions	723.2	3.8% blended	869.5	5.0% blended	43.8

The product revenue sum is JPY 869.5bn and the product profit sum is JPY 43.8bn. Using unrounded product values, JPY 43.827bn divided by JPY 869.546bn is 5.04%, rendered as 5.0%. The case implies JPY 13.8bn of profit growth from the FY2026 guide to the 2031 horizon despite JPY 119.5bn of additional revenue, an 11.6% incremental `Profit from business activities` margin. That is attainable if mix and utilization improve, but not so high that the forecast depends on software-like economics.

Bull case rollup

Product	TTM revenue	CAGR to 2031-06-30	2031 revenue	Profit from business activities margin	2031 Profit from business activities
Engines & Turbochargers	296.3	5.0%	378.2	7.0%	26.5
HVAC & Car A/C	359.3	6.0%	480.8	7.0%	33.7
Other / Data Center & Energy Management	67.6	15.0%	136.0	12.0%	16.3
Industrial Solutions	723.2	6.6% blended	994.9	7.7% blended	76.4

The product revenue sum is JPY 994.9bn and the product profit sum is JPY 76.4bn. Using unrounded product values, JPY 76.444bn divided by JPY 994.942bn is 7.683%, rendered as 7.7%. This is a genuine upside case: it requires MHI to convert data-center adjacency into material revenue and service, expand cooling successfully outside China, and defend engine/turbo programs through the propulsion transition.

Probability-weighted operating view

Using the required 30% Bear, 55% Base and 15% Bull probabilities, probability-weighted 2031 revenue is JPY 838.1bn and probability-weighted `Profit from business activities` is JPY 37.0bn. The implied margin on probability-weighted dollars is 4.4%. This is below the base-case 5.0% because the 30% bear weight captures the real possibility that the near-term JPY 30bn recovery is not durable.

Check	Bear	Base	Bull	Result
Product revenue sum vs segment revenue	702.2 / 702.2	869.5 / 869.5	994.9 / 994.9	Ties within rounding
Product profit sum vs segment profit	4.8 / 4.8	43.8 / 43.8	76.4 / 76.4	Ties within rounding
Corporate or unallocated items included	0.0	0.0	0.0	Correct; left for synthesis
Forecast period	5.0 years	5.0 years	5.0 years	2026-06-30 to 2031-06-30

11. Key risks and wildcards

Bear — taxonomy and disclosure risk. The segment was substantially reorganized at the forecast boundary. A loss-making transferred activity, restructuring cost or elimination effect could be hidden inside the aggregate. Without product profit and a clean TTM revenue bridge, analysts may mistake accounting perimeter change for operational recovery. The most important near-term test is whether FY2026 reaches JPY 750bn revenue and JPY 30bn `Profit from business activities` on the same perimeter.

Bear — China HVAC weakness. Management explicitly said HVAC units continued to decline. A prolonged property downturn, aggressive local competition and channel destocking could offset India and U.S. growth. Because HVAC represents nearly half the planning revenue anchor, a few percentage points of volume or price miss can erase much of segment profit at low margins.

Bear — vehicle electrification and turbo substitution. The global turbo market can remain substantial through hybrids and industrial applications, but pure-BEV penetration reduces the conventional addressable pool. Program losses have long tails because awards run for years. If MHI under-invests in e-turbos, compressors or adjacent thermal products, the current

product portfolio can become a cash-harvest business rather than a growth platform.

Bear — OEM bargaining power and cost recovery. Automotive and equipment customers can demand price reductions while input, labor and logistics costs remain volatile. Supply-chain resolution helped the recent comparison, but future disruptions, warranty claims or inefficient launches can reverse that benefit. With a roughly 0.5% TTM margin, a small negative price/cost gap is economically material.

Bear/Base — data-center execution. Focused competitors have integrated power and cooling portfolios, large engineering organizations and extensive service networks. MHI may win only component or low-margin project work. High-density AI cooling also changes quickly, creating obsolescence and warranty risk. The base case requires only moderate success; the bull case requires stand-alone orders, backlog and service evidence.

Base — regional expansion. U.S. and India cooling sales are a credible positive wildcard. Successful channel build-out, local manufacturing and premium mix could offset China without a macro rebound. Evidence should include unit growth, local share, dealer coverage, service attachment and margins, not only consolidated segment revenue.

Bull — integrated energy and cooling. MHI's broader power, thermal and engineering knowledge could support differentiated data-center offerings, particularly where reliability, on-site generation, energy management and cooling must be designed together. This cross-domain position is potentially useful, but it could also create internal complexity and low-margin equipment pass-through. The bull case should not receive credit until customers, backlog and economics are disclosed.

Bull — hybrid and industrial turbo resilience. Garrett's outlook argues that hybridization and industrial applications can support advanced turbo demand longer than a simple combustion-engine decline thesis. If MHI wins higher-content hybrid, distributed-power and Asian industrial programs, Engines & Turbochargers can compound at mid-single digits even with lower pure internal-combustion vehicle volume.

All cases — foreign exchange and geography. Engines for Asia, HVAC in China/India/U.S. and global automotive programs expose revenue and margin to currency, tariffs and regional demand. Yen weakness can lift translated revenue but does not automatically improve profit when inputs and local manufacturing costs rise. Corporate FX assumptions belong in synthesis, not in the segment margin.

All cases — capital intensity. The portfolio requires continuing R&D, tooling, production equipment, inventory and channel investment. Revenue growth that consumes disproportionate working capital or capex may destroy value despite a higher accounting margin. Segment capital employed and cash conversion are undisclosed, so the model cannot claim high incremental ROIC.

The decisive monitoring sequence is clear. First, verify the FY2026 JPY 30bn profit guide on the new perimeter. Second, require product profit or at least qualitative attribution of the recovery. Third, look for stand-alone Data Center & Energy Management orders, revenue, backlog and service mix. Fourth, test whether HVAC growth outside China and engine growth in Asia persist after supply normalization. If those signals fail, the base case should move toward bear rather than assuming a return to predecessor economics.

Scenario summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	JPY 702.2bn	Profit from business activities	0.7%	JPY 4.8bn	30%
Base	JPY 869.5bn	Profit from business activities	5.0%	JPY 43.8bn	55%
Bull	JPY 994.9bn	Profit from business activities	7.7%	JPY 76.4bn	15%

The probabilities are intentionally non-uniform and retain a substantial bear weight. The segment's current roughly 0.5% TTM margin, new organizational perimeter, opaque product profit and exposure to China HVAC and propulsion transition do not support casual mean reversion. The base case is earned only if management substantially delivers the FY2026 4.0% margin guide; the bull case requires evidence that the transferred data-center activity is more than a low-margin adjacency.

Appendix S - Synthesis (Combined Earnings Model)

Mitsubishi Heavy Industries — Synthesis (Combined Earnings Model)

Production mode. This appendix consolidates only the final reviewed segment appendices, the reviewed data package, the QFR-sealed quote packet, the QFR-sealed statutory bridge, and `gate_manifest.json`. It performs no source discovery and changes no upstream artifact. All monetary values are JPY billions unless explicitly stated otherwise; share counts are millions and per-share amounts are JPY per Tokyo-listed ordinary share.

1. Anchors

- Today: 2026-09-06.
- Fiscal year end: 31 March.
- TTM anchor: 2026-06-30.
- TTM construction: Q2 FY2025 ended 2025-09-30, Q3 FY2025 ended 2025-12-31, Q4 FY2025 ended 2026-03-31, and Q1 FY2026 ended 2026-06-30. The equivalent sealed cumulative bridge is FY2025 ended 2026-03-31 less Q1 FY2025 ended 2025-06-30 plus Q1 FY2026 ended 2026-06-30.
- Latest completed FY used only for the historical tie-out: FY2025 ended 2026-03-31.
- Dispatch-label correction: the supplied FY label `FY2025 ended 2025-03-31` and supplied 2024/2025 quarter-end dates were transposition errors. The final reviewed `gate_manifest.json`, `statutory_bridge.json`, and `data_package.md` consistently establish the sealed periods above; no packet was edited.
- Horizon: 2031-06-30, exactly 5.0 calendar years after 2026-06-30. No row compounds for six fiscal years.
- Valuation price: JPY 3,754 per ordinary share, XJPX:7011, raw exchange close for the completed 2026-09-04 session. Raw-source SHA-256 is `5834c599c0a65d95380534c63c51743f37738a0067247c94518509b99c03356c`; packet SHA-256 is `5d5d9683877b2cd36e16c317a5737516ab292e0c5f3def8be11aa364a2ebed55`; actionability expiry is 2026-09-07T14:30:00+08:00.
- Security unit: one MHI common share. Reporting and quote currency are both JPY. The instrument is not a depositary receipt.
- Split bridge: 3,361.118m financial-statement diluted shares at 2026-06-30 multiplied by the sealed split factor of 1.0 equals 3,361.118m quote-basis diluted financial shares. The packet records no intervening split through 2026-09-04.
- Listed-unit bridge: depositary ratio 1.0 multiplied by share-class factor 1.0 equals one financial share per listed unit. Thus 3,361.118m quote-basis financial shares divided by 1.0 equals 3,361.118m listed-unit equivalents.
- FX bridge: JPY 1.0 per JPY 1.0 on 2026-09-04, identity because the quote and reporting currencies match.
- Historical bridge SHA-256: `16934a6da80a4a9aef08f6673a9a29316296d5ddd8afd9401aef406b27dfe81e`. The installed validator returned `STATUTORY_BRIDGE_VALID`, and `gate_manifest.json` records `STATUTORY BRIDGE VERIFIED - CLEARED FOR FORECASTING` with no unresolved issues.
- P&C lane: **NOT TRIGGERED — issuer is not a P&C insurer or reinsurer.** No `insurer_return_bridge.json` is created.

The strict quote validator was run at 2026-09-06T12:14:36.0450121+08:00 and returned `QUOTE_PACKET_VALID`. The packet was unexpired, its exact bytes matched the orchestrator-provided SHA-256, and the price, listing, security unit, split/share factors, and identity-FX bridge were complete. The statutory validator independently reproduced the provided bridge hash.

2. Segment-level forward assumptions

The exact profit metric for all four rows is issuer-disclosed `Segment profit (represents profit from business activities)`, referred to below as Profit from business activities. TTM revenue is reproduced from each final reviewed

segment appendix; horizon values and margins are not re-derived in this section.

Segment	Exact profit metric	TTM revenue	Bear 2031 revenue	Base 2031 revenue	Bull 2031 revenue	Bear margin	Base margin	Bull margin
Energy Systems	Profit from business activities	2,175.700	2,342.9	2,932.7	3,370.1	11.50%	15.00%	17.00%
Plants & Infrastructure Systems	Profit from business activities	872.900	806.3	997.9	1,146.9	7.32%	10.77%	12.84%
Industrial Solutions	Profit from business activities	723.194	702.2	869.5	994.9	0.70%	5.00%	7.70%
Aircraft, Defense & Space	Profit from business activities	1,419.300	1,567.0	2,115.3	2,517.6	8.50%	12.20%	14.00%

Sources: `appendix_B_energy_systems.md` Sections 8-10; `appendix_B_plants_infrastructure_systems.md` Sections 8-10; `appendix_B_industrial_solutions.md` Sections 8-10; and `appendix_B_aircraft_defense_space.md` Sections 8-10. The post-review hashes of those four files match `gate_manifest.json`: `dd14...0198`, `f368...40d6`, `e59b...acb4`, and `1358...7393`, respectively.

The central operating shape is concentrated. In Base, Energy supplies JPY 439.9bn of segment profit and Aircraft, Defense & Space JPY 258.1bn; together they account for 82.2% of the JPY 849.3bn reportable-segment total. That concentration is consistent with the reviewed moat appendix: installed-base service, qualification, regulation, and sovereign trust are real advantages, but the consolidated moat remains YELLOW because margin persistence, pricing evidence, and Industrial Solutions economics are not yet strong enough for a clean long-duration compounder conclusion.

3. Combined revenue build

At the TTM anchor, the four segments sum to JPY 5,191.094bn and the exact consolidated revenue is JPY 5,134.262bn. The difference is negative JPY 56.832bn, or negative 1.094798% of gross segment revenue. Because the reviewed package provides no separate forward elimination driver, the model carries that exact TTM ratio against scenario segment revenue. This is a transparent consolidating rule, not a fifth operating segment and not a profit plug.

Line	Bear	Base	Bull
Energy Systems	2,342.9	2,932.7	3,370.1
Plants & Infrastructure Systems	806.3	997.9	1,146.9
Industrial Solutions	702.2	869.5	994.9
Aircraft, Defense & Space	1,567.0	2,115.3	2,517.6
Sum of segment TTM+5y revenue	5,418.4	6,915.4	8,029.5
Corporate eliminations at negative 1.094798%	-59.321	-75.710	-87.907
Combined TTM+5y revenue	**5,359.079**	**6,839.690**	**7,941.593**
Implied TTM-to-2031 CAGR over exactly 5.0 years	0.86%	5.90%	9.12%

The Base revenue CAGR of 5.90% is not a simple extrapolation of the latest 15.5% consolidated quarter. Energy decelerates materially from recent GTCC and Nuclear growth, Aircraft/Defense/Space decelerates from its historical mobilization phase, Plants grows only low single digits, and Industrial must first prove that its new perimeter can reach the FY2026 guide. Bear still grows slightly because funded GTCC and defense backlogs prevent a plausible immediate collapse, while weak Plants and Industrial performance limits the group.

4. Combined operating-income build

The operating bridge has only one non-segment line: `Others, Corporate & Eliminations`. The sealed TTM value is negative JPY 63.237bn, the latest completed FY value is negative JPY 68.500bn, and FY2026 guidance is negative JPY 90.000bn. Base therefore holds the sourced JPY 90bn guide at the horizon. Bear uses negative JPY 110bn for heavier project, integration, and corporate burden; Bull uses negative JPY 75bn, which remains worse than TTM and does not assume the corporate burden disappears. The sealed bridge has no separate operating adjustment, so no additional line is invented.

Line	Bear	Base	Bull
Energy Systems segment profit	269.4	439.9	572.9
Plants & Infrastructure Systems segment profit	59.0	107.5	147.2
Industrial Solutions segment profit	4.8	43.8	76.4
Aircraft, Defense & Space segment profit	133.2	258.1	352.5
Sum of segment TTM+5y profit on sealed metric	466.4	849.3	1,149.0
Others, Corporate & Eliminations	-110.0	-90.0	-75.0
Consolidated TTM+5y segment-profit metric	356.4	759.3	1,074.0
Operating bridge adjustments	0.0	0.0	0.0
Combined statutory TTM+5y operating income	**356.4**	**759.3**	**1,074.0**
Implied operating-income margin	6.65%	11.10%	13.52%

The Base margin expands from the 9.64% reported TTM group margin to 11.10%, but the build is not broad-based. Energy reaches 15.0% as better-priced GTCC backlog converts gradually; Aircraft/Defense/Space reaches 12.2% through volume absorption and learning; Plants reaches 10.77%; Industrial reaches only 5.0%. The Base corporate burden is intentionally not allowed to improve from FY2026 guidance. Bear reverses recent operating leverage, and Bull requires simultaneous throughput, pricing, program discipline, and an Industrial recovery.

5. Net income and EPS build

Below-line assumptions preserve the sealed classifications. Finance income is JPY 55bn, JPY 70bn, and JPY 85bn in Bear/Base/Bull, below or around the JPY 76.111bn TTM line and reflecting different returns on a large but working-capital-linked cash position. Finance costs are negative JPY 20bn, negative JPY 15bn, and negative JPY 10bn versus negative JPY 8.827bn TTM; the scenarios do not net finance cost into finance income. Tax rates are 28%, 25%, and 23%, bracketing the 24.8% TTM effective rate. Discontinued operations are negative JPY 15bn in Bear and zero in Base/Bull after the Logisnext cessation. NCI leakage is negative JPY 20bn, negative JPY 18bn, and negative JPY 16bn around the negative JPY 14.076bn TTM anchor. These are explicit scenario rules, not residuals.

Line	Bear	Base	Bull
Combined TTM+5y OI	356.400	759.300	1,074.000
Finance income	55.000	70.000	85.000
Finance costs	-20.000	-15.000	-10.000
Other income beyond identified finance lines	0.000	0.000	0.000
Pre-tax income	391.400	814.300	1,149.000
Tax rate	28.0%	25.0%	23.0%
Income taxes	-109.592	-203.575	-264.270
Discontinued operations	-15.000	0.000	0.000
NCI leakage	-20.000	-18.000	-16.000
Net income attributable to owners	**246.808**	**592.725**	**868.730**
Quote-basis diluted financial shares at TTM+5y	3,361.118	3,361.118	3,361.118
EPS in JPY per quote-basis financial share	73.4303	176.3476	258.4646
Financial shares per listed unit	1.0000	1.0000	1.0000
EPS in JPY per listed unit before FX	73.4303	176.3476	258.4646
FX: JPY per JPY	1.0000	1.0000	1.0000
EPS in quote currency per listed unit at TTM+5y	**73.4303**	**176.3476**	**258.4646**

The unit bridge is exact in every case: `NI in JPY bn × 1,000 ÷ 3,361.118m` equals JPY EPS per quote-basis financial share. Multiplying by one financial share per listed unit and JPY 1 per JPY 1 reproduces listed-share EPS. No second price, ADR ratio, split factor, or FX rate enters.

5a. Return-method input bridge

Stage S supplies operating inputs but does not select the primary shareholder-return method. Normalized NOPAT uses statutory operating income and the same scenario cash-tax rate as Section 5.

Input	Bear	Base	Bull	Source or status
Statutory operating income	356.400	759.300	1,074.000	Section 4
Normalized cash tax rate	28.0%	25.0%	23.0%	Section 5 scenario rule
Normalized NOPAT	256.608	569.475	826.980	OI multiplied by one minus tax rate
Terminal cash	Unavailable	Unavailable	Unavailable	Q1 anchor is 1,684.1; no reviewed five-year capital path
Terminal gross debt	Unavailable	Unavailable	Unavailable	Q1 broad financial liabilities are 853.8; no reviewed five-year gross-debt path
Terminal lease liabilities	Unavailable	Unavailable	Unavailable	Included in broad liabilities; no separate terminal path
Preferred equity	Unavailable	Unavailable	Unavailable	No reviewed terminal preferred-equity path
Minority interest	Unavailable	Unavailable	Unavailable	NCI earnings leakage is modeled, but terminal balance is not sourced
Other senior claims	Unavailable	Unavailable	Unavailable	No reviewed terminal path
Separately valued non-operating assets	Unavailable	Unavailable	Unavailable	No reviewed terminal valuation path
Diluted listed-equivalent shares, millions	3,361.118	3,361.118	3,361.118	Section 6 and sealed quote packet

This deliberately prevents an EV/NOPAT model from controlling unless Valuation Preflight later locks a fully source-bound terminal capital-structure treatment from approved evidence. There is no residual net-debt plug. The fully reconciled EPS bridge remains available to VP and CS for a P/E method.

6. Share-count path

MHI's five-year buybacks were sporadic and tiny relative to its current market capitalization: JPY 2.6bn, zero, zero, JPY 12.4bn, and JPY 0.2bn. The reviewed management appendix says this does not establish a mechanical repurchase program. The package also flags group-wide SBC expense as unavailable, while historical diluted shares increased only from 3,358.9m to 3,360.3m over four annual intervals. To avoid unsourced EPS accretion or an invented SBC conversion, the forward schedule uses zero buyback and zero SBC issuance. Flat shares are therefore the arithmetic result of an explicit zero-minus-zero path, not an unsupported buyback offset assumption.

Year	Starting quote-basis financial shares	Buyback	Average buyback price	Shares retired	SBC issuance	Ending quote-basis financial shares
2026-06-30 to 2027-06-30	3,361.118	0.000	n/a	0.000	0.000	3,361.118
2027-06-30 to 2028-06-30	3,361.118	0.000	n/a	0.000	0.000	3,361.118
2028-06-30 to 2029-06-30	3,361.118	0.000	n/a	0.000	0.000	3,361.118
2029-06-30 to 2030-06-30	3,361.118	0.000	n/a	0.000	0.000	3,361.118
2030-06-30 to 2031-06-30	3,361.118	0.000	n/a	0.000	0.000	3,361.118

The five-year identity is `3,361.118 + Σ(0.000 SBC - 0.000 retired) = 3,361.118m`. The schedule is run in financial shares, not ADR units. Because both share classes and currencies are identical, listed-equivalent diluted units also remain 3,361.118m.

7. P/E 15 test

Required EPS at the immutable JPY 3,754 quote is JPY 250.2667, calculated as `3,754 ÷ 15`. Cushion is `(EPS × 15 - 3,754) ÷ 3,754`.

Case	EPS in JPY per listed unit at TTM+5y	EPS multiplied by 15	Quote-packet price	Cushion	Pass?
Bear	73.4303	1,101.45	3,754.00	-70.66%	FAIL
Base	176.3476	2,645.21	3,754.00	-29.54%	FAIL
Bull	258.4646	3,876.97	3,754.00	3.28%	PASS

The confident Base case controls. Base EPS multiplied by 15 is JPY 2,645.21, well below the JPY 3,754 packet price, so the P/E 15 gate **fails with a negative 29.54% cushion**. Bull's narrow pass cannot rescue the entry-price test.

8. Reflexivity check

The TTM revenue reconstruction is `2,175.700 + 872.900 + 723.194 + 1,419.300 = 5,191.094`; adding the exact negative JPY 56.832bn consolidation bridge gives JPY 5,134.262bn, equal to reported TTM revenue. The residual is zero.

The TTM segment-profit reconstruction is `312.195 + 87.269 + 3.911 + 155.116 = 558.491`. Adding negative JPY 63.237bn of Others, Corporate & Eliminations gives JPY 495.254bn versus statutory OI of JPY 495.173bn. The JPY 0.081bn difference is the packet-disclosed corporate rounding residual, within the JPY 0.2812285bn tolerance and equal to 0.016% of OI.

For FY2025 ended 2026-03-31, the four segment revenues sum to JPY 5,037.1bn; negative JPY 63.1bn of corporate/eliminations produces JPY 4,974.0bn versus exact consolidated JPY 4,974.168bn, a 0.003% displayed-rounding difference. Segment profit totals JPY 500.8bn and, after negative JPY 68.5bn corporate, reaches JPY 432.3bn versus statutory JPY 432.218bn. The JPY 0.082bn residual is within the JPY 0.2504bn sealed tolerance. No plug or reclassification is made.

9. Latest interim bridge reconciliation

The permitted cumulative bridge is triggered. For consolidated TTM, the reviewed QF/QFR arithmetic uses FY2025 ended 2026-03-31, subtracts the comparable Q1 FY2025 period ended 2025-06-30, and adds Q1 FY2026 ended 2026-06-30. Both Q1 periods cover exactly 1 April through 30 June, so the construction has identical duration and no overlap. The same bridge produces TTM revenue JPY 5,134.262bn, OI JPY 495.173bn, pretax JPY 562.457bn, parent NI JPY 398.582bn, and diluted shares of 3,361.118m.

The discrete-quarter description is equivalent: Q2 FY2025 ended 2025-09-30, Q3 ended 2025-12-31, Q4 ended 2026-03-31, and Q1 FY2026 ended 2026-06-30. No cumulative half-year or nine-month amount is added on top of these standalone quarters. Industrial Solutions receives special scrutiny because of the perimeter change: `699.900 - 154.608 + 177.902 = 723.194bn`, exactly the QFR-verified current-taxonomy TTM revenue. Period integrity therefore passes.

10. Sensitivity — which variable matters most

All sensitivities hold the other Base assumptions constant. Energy revenue sensitivity changes its aggregate five-year CAGR from 6.15% to 4.15% or 8.15%, applies the Base 15.0% segment margin, and sends the OI change through the 25% Base tax rate. Plants margin sensitivity changes only its horizon margin by 200 basis points. Share-count and tax tests use the exact Base NI or pretax anchor.

Variable	Down case	Base EPS	Up case	EPS impact versus Base
Energy revenue CAGR minus/plus 200 bps	167.43 at 4.15% CAGR	176.35	185.93 at 8.15% CAGR	-8.92 / +9.59
Plants margin minus/plus 200 bps	171.89 at 8.77%	176.35	180.80 at 12.77%	-4.45 / +4.45
Ending share count plus/minus 5%	167.95 at 3,529.174m	176.35	185.63 at 3,193.062m	-8.40 / +9.28
Tax rate plus/minus 300 bps	169.08 at 28%	176.35	183.62 at 22%	-7.27 / +7.27

Energy throughput and the share denominator are the largest of these bounded tests, followed by tax. The practical operating variable is Energy: Base EPS still remains far below the JPY 250.27 P/E-15 requirement even after adding 200 basis points to Energy's five-year revenue CAGR. Plants margin is less decisive. The gate needs a much broader combination of higher revenue, higher margins, lower corporate burden, and/or sustained share retirement than the reviewed evidence supports.

11. Combined earnings summary

Scenario probabilities are 30% Bear, 55% Base, and 15% Bull, consistent across all four reviewed segment appendices. The 55% Base weight reflects strong backlog and FY2026 guidance; the asymmetric 30% Bear and 15% Bull weights reflect project-loss convexity, capacity execution, the YELLOW management and moat gates, and unusually strong recent comparisons. The weights are not uniform.

Case	Revenue	OI	OI margin	NI	EPS in JPY per listed unit	Probability	EPS multiplied by 15	Versus JPY 3,754
Bear	5,359.079	356.400	6.65%	246.808	73.4303	30%	1,101.45	-70.66%
Base	6,839.690	759.300	11.10%	592.725	176.3476	55%	2,645.21	-29.54%
Bull	7,941.593	1,074.000	13.52%	868.730	258.4646	15%	3,876.97	3.28%
Probability-weighted outcome	6,560.792	685.635	10.45%	530.351	157.7900	100%	2,366.85	-36.95%

Probability-weighted EPS is `0.30 × 73.4303 + 0.55 × 176.3476 + 0.15 × 258.4646 = 157.7900`. It is a diagnostic of expected scenario earnings, not a fourth scenario. The central conclusion is robust: the current price requires Base EPS to reach JPY 250.27 for the P/E-15 gate, 41.9% above modeled Base EPS. Only Bull barely crosses the threshold.

Tie-out checks

1. Reported-financial and statutory-bridge tie-out — PASS

TTM segment revenue plus elimination equals reported revenue exactly: `5,191.094 - 56.832 = 5,134.262`. TTM segment profit plus corporate is `558.491 - 63.237 = 495.254`, versus statutory OI JPY 495.173bn; the JPY 0.081bn residual is inside the packet tolerance. FY segment profit plus corporate is `500.800 - 68.500 = 432.300`, versus statutory OI JPY 432.218bn; JPY 0.082bn is inside tolerance. FY displayed revenue is within 0.003% of the exact consolidated value. Sources: `statutory_bridge.json` both periods and `data_package.md` Sections 2, 3, and 3a.

2. NI / shares / listed unit / FX equals EPS — PASS

Bear: `246.808 × 1,000 ÷ 3,361.118 = 73.4303`, then `× 1 × 1 = JPY 73.4303`. Base: `592.725 × 1,000 ÷ 3,361.118 = 176.3476`, then `× 1 × 1 = JPY 176.3476`. Bull: `868.730 × 1,000 ÷ 3,361.118 = 258.4646`, then `× 1 × 1 = JPY 258.4646`. Source: Section 5 and `quote_packet.json` unit/FX fields.

3. Segment sum tie-out at horizon — PASS

The consolidating revenue adjustment is disclosed rather than hidden. Bear: `5,359.079 ÷ (5,418.400 - 59.321) = 100.000%`. Base: `6,839.690 ÷ (6,915.400 - 75.710) = 100.000%`. Bull: `7,941.593 ÷ (8,029.500 - 87.907) = 100.000%`. Before consolidation, each case's four-segment total also sums exactly to the Section 3 subtotal.

4. Product-to-segment rollup — PASS

Energy product revenue sums are JPY 2,342.9bn, JPY 2,932.7bn, and JPY 3,370.1bn in Bear/Base/Bull, each 100.00% of segment revenue. Plants sums are 806.3, 997.9, and 1,146.9; Industrial 702.2, 869.5, and 994.9; Aircraft/Defense/Space 1,567.0, 2,115.3, and 2,517.6. Every case is within 0.1% after display rounding. Sources: each final reviewed segment appendix Section 10.

5. Weighted margin check — PASS

Plants explicitly weights product margins: Bear `59.0 ÷ 806.3 = 7.32%`, Base `107.5 ÷ 997.9 = 10.77%`, Bull `147.2 ÷ 1,146.9 = 12.84%`. Industrial likewise produces 0.684%, 5.04%, and 7.683% on unrounded product profit/revenue, rendered as 0.7%, 5.0%, and 7.7%. Energy and Aircraft/Defense/Space do not disclose or model product profit margins; their reviewed appendices intentionally apply the sealed segment-level metric to the segment total. Their direct checks are `269.4 ÷ 2,342.9 = 11.50%`, `439.9 ÷ 2,932.7 = 15.00%`, `572.9 ÷ 3,370.1 = 17.00%`, and `133.2 ÷ 1,567.0 = 8.50%`, `258.1 ÷ 2,115.3 = 12.20%`, `352.5 ÷ 2,517.6 = 14.00%`. No product margin is fabricated.

6. Share-count and security-unit path — PASS

3,361.118m financial-statement diluted shares × 1.0 split factor = 3,361.118m quote-basis shares; dividing by 1.0 depositary × 1.0 class factor gives 3,361.118m listed-unit equivalents. Across five years, 3,361.118 + Σ(0.000 SBC - 0.000 repurchased) = 3,361.118m. Source: quote_packet.json, data-package Section 7, management Section 3, and synthesis Section 6.

7. Growth plausibility — PASS

Energy Base CAGR of 6.15% is below 1.2 times its disclosed 5.9% historical CAGR, or 7.08%. Plants Base CAGR of 2.71% is below 1.2 times its 5.25% history, or 6.30%. Aircraft/Defense/Space Base CAGR of 8.31% is far below 1.2 times its disclosed 31.0% history, or 37.2%, and matches the capacity-gated slowdown in current guidance. Industrial history is non-comparable after the perimeter reset; its 3.8% Base CAGR is below focused comparable trajectories cited in its final reviewed appendix and matches the JPY 750bn first-year guide. No unjustified excess-growth exception is required.

8. Historical arithmetic — PASS

Every displayed product forecast uses exactly five calendar years. Values below reproduce the segment appendices within 1% after rounding.

Product and TTM anchor	Bear five-year calculation	Base five-year calculation	Bull five-year calculation
Energy GTCC 1,070.3	1,070.3 × 1.04^5 = 1,302.2	1,070.3 × 1.09^5 = 1,646.8	1,070.3 × 1.12^5 = 1,886.2
Energy Steam 358.2	358.2 × 0.94^5 = 262.9	358.2 × 0.98^5 = 323.8	358.2 × 1.01^5 = 376.5
Energy Aero 290.7	290.7 × 1.00^5 = 290.7	290.7 × 1.05^5 = 371.0	290.7 × 1.08^5 = 427.1
Energy Nuclear 387.7	387.7 × 1.02^5 = 428.1	387.7 × 1.06^5 = 518.8	387.7 × 1.09^5 = 596.5
Energy Other 68.8	68.8 × 0.97^5 = 59.1	68.8 × 1.01^5 = 72.3	68.8 × 1.04^5 = 83.7
Plants Engineering 167.8	167.8 × 0.99^5 = 159.6	167.8 × 1.04^5 = 204.2	167.8 × 1.07^5 = 235.3
Plants Metals 359.2	359.2 × 0.98^5 = 324.7	359.2 × 1.03^5 = 416.4	359.2 × 1.06^5 = 480.7
Plants Machinery 177.1	177.1 × 1.00^5 = 177.1	177.1 × 1.02^5 = 195.5	177.1 × 1.04^5 = 215.5
Plants Ships/other 168.8	168.8 × 0.97^5 = 145.0	168.8 × 1.015^5 = 181.8	168.8 × 1.05^5 = 215.4
Industrial Engines 296.3	296.3 × 0.99^5 = 281.8	296.3 × 1.03^5 = 343.5	296.3 × 1.05^5 = 378.2
Industrial HVAC 359.3	359.3 × 1.00^5 = 359.3	359.3 × 1.035^5 = 426.7	359.3 × 1.06^5 = 480.8
Industrial Other/DCEM 67.594	67.594 × 0.98^5 = 61.1	67.594 × 1.08^5 = 99.3	67.594 × 1.15^5 = 136.0
Defense & Space 1,158.7	1,158.7 × 1.03^5 = 1,343.3	1,158.7 × 1.09^5 = 1,782.8	1,158.7 × 1.13^5 = 2,134.8
Commercial Aviation 260.5	260.5 × 0.97^5 = 223.7	260.5 × 1.05^5 = 332.5	260.5 × 1.08^5 = 382.8

9. Recency anchor — PASS

The Base first-forward-year segment revenue is approximately Energy JPY 2,303.285bn, Plants JPY 932.764bn, Industrial JPY 750.1bn, and Aircraft/Defense/Space JPY 1,500.0bn. Their JPY 5,486.149bn subtotal receives negative JPY 60.062bn of eliminations, producing JPY 5,426.087bn consolidated revenue. This is 5.68% above TTM JPY 5,134.262bn and therefore within 10%. Base first-year OI is approximately 313.247 + 90 + 30 + 170 - 90 = 513.247bn, 3.65% above TTM JPY 495.173bn. The comparison is anchored to the reviewed FY2026 guides and the segment year-one cadences, not to an unexplained step change.

10. Period and horizon integrity — PASS

The cumulative bridge uses like-for-like 1 April to 30 June periods: FY2025 ended 2026-03-31 less Q1 FY2025 ended 2025-06-30 plus Q1 FY2026 ended 2026-06-30. The equivalent discrete quarters are the four non-overlapping quarter ends 2025-09-30, 2025-12-31, 2026-03-31, and 2026-06-30. All product CAGRs begin at TTM 2026-06-30 and end at 2031-06-30, exactly 5.0 years later. The stale dispatch labels are disclosed in Section 1 and do not alter the sealed arithmetic.

11. Valuation, unit bridge, packet hash, and probability arithmetic — PASS

The exact quote packet SHA-256 recomputes to 5d5d9683877b2cd36e16c317a5737516ab292e0c5f3def8be11aa364a2ebed55; the exact statutory bridge recomputes to 16934a6da80a4a9aef08f6673a9a29316296d5ddd8afd9401aef406b27dfe81e. XJPX:7011 is one

ordinary share priced at raw JPY 3,754; split, depositary, class, and FX factors are all 1.0. Bear/Base/Bull EPS multiplied by 15 equals JPY 1,101.45, JPY 2,645.21, and JPY 3,876.97. Probabilities sum to `30% + 55% + 15% = 100%`; weighted EPS is JPY 157.7900. Cushions recompute to negative 70.66%, negative 29.54%, and positive 3.28%. Base controls and fails.

SYNTHESIS CLEARED — 11/11 TIE-OUTS PASSED

The operating synthesis is arithmetically complete and internally coherent. It does not imply an investment verdict, portfolio action, sizing authorization, or trade authority. `trade_execution_authorized=false` remains binding.

Appendix CS - Compounder Score

Mitsubishi Heavy Industries - Compounder Score

Ticker: 7011.T / XJPX:7011 **Analysis date:** 2026-09-06 **Price anchor:** JPY 3,754 per ordinary share, last completed close on 2026-09-04 **TTM end:** 2026-06-30 **Horizon:** 2031-06-30, exactly 5.0 years **Primary valuation method:** P/E **Valuation preflight:** CLEARED; SHA-256 fed56f730b1dd4e8231c892b247b7657e1d4e377bcb406f587718b7c0e26efb4 **Trade execution authorized:** NO

1. Executive Verdict

Mitsubishi Heavy Industries scores **53/100**, comprising a **Business Quality Score of 49/80** and a **20% Return Underwriting/Stretch Score of 4/20**. The score-implied classification is **Reject**. This is a diagnostic classification only and does not override the separate ER2 verdict.

The evidence supports a real improvement in operating quality, substantial funded demand in GTCC and Japanese defense, strong liquidity, restrained dilution, and genuine installed-base and qualification advantages. The evidence does not support a Gideon-grade compounder score. Five-year median diagnostic ROIC is only 7.9%, a credible acquisition-inclusive ROIIC cannot be calculated from the reviewed data, management and moat gates are both YELLOW, pricing power is only partly verified, and current cash conversion is flattered by large customer advances.

The valuation failure is decisive. Using the hash-locked P/E method, terminal EPS values of JPY 73.4303 / 176.3476 / 258.4646 and VP-locked 13x / 18x / 24x exit P/Es produce gross JPY shareholder IRRs of **-21.77% / -2.43% / 11.08%** for Bear / Base / Bull. The probability-weighted gross JPY IRR is **-3.71%**, calculated as the CAGR of probability-weighted terminal shareholder wealth, not an average of scenario IRRs. Even the Bull case does not reach 20%.

The locked normalized current P/E is 32.3403066143901x. A 20% return on Base EPS would require a 52.14787884836538x terminal P/E, far above both the normalized current multiple and the independently underwritten Base exit P/E of 18x. The evidence therefore supports neither “investable now” nor “buy only at a modestly lower price”; it supports a Reject classification under this demanding score.

2. Data Source Map

Required evidence	Controlling source	Period / treatment
Price, listing, shares and market value	quote_packet.json, SHA-256 5d5d9683877b2cd36e16c317a5737516ab292e0c5f3def8be11aa364a2ebed55	XJPX:7011; JPY 3,754; 3,361.118m diluted shares
Statutory income bridge	statutory_bridge.json, SHA-256 16934a6da80a4a9aef08f6673a9a29316296d5ddd8afd9401aef406b27dfe81e	FY2025 and TTM ended 2026-06-30
Historical financials, cash flow and balance sheet	quant_foundation.md and data_package.md	FY2021-FY2025 plus TTM
Segment economics and runway	Four reviewed appendix_B files	Energy, Plants, Industrial, Aircraft/Defense/Space
Management and capital allocation	appendix_management.md	Gate YELLOW
Moat, pricing power and 2046 durability	appendix_moat.md	Moat YELLOW; 2046 YELLOW
Terminal revenue, OI, NI, EPS and shares	appendix_synthesis.md	Synthesis cleared, 11/11 tie-outs
Method, denominator, capital structure and multiples	valuation_preflight.json	Validator-cleared, exact hash above
Market-size and competitor context	Primary links archived and cited in segment/moat appendices	Secondary to the verified ER2 chain

The implied market capitalization is JPY 12,617,636,972,000. A contextual broad enterprise value using the Q1 cash and broad-financial-liability perimeter is JPY 11,787,374,972,000. It is not used in the controlling P/E return method.

3. Key Financial and Quality Metrics

Metric	Result	Interpretation
Revenue CAGR, FY2021-FY2025	6.54%	Healthy, with much faster recent Defense growth
NOPAT CAGR, FY2021-FY2025 diagnostic	29.56%	Strong rebound from a low-return base

Metric	Result	Interpretation
FCF CAGR, FY2021-FY2025	48.57%	Mechanically strong but highly affected by advances and endpoints
Five-year median diagnostic ROIC	7.90%	Below the Gideon 15% quality threshold
Latest FY diagnostic ROIC	12.00%	Improving, but not yet through-cycle proof
Five-year aggregate FCF / diagnostic NOPAT	125.61%	Strong reported conversion, qualified by customer advances
Diluted share CAGR, FY2021-FY2025	0.01%	Essentially flat; per-share discipline is a positive
FY2025 broad net debt / EBITDA	-0.83x	Strong liquidity on the disclosed broad perimeter
Contextual normalized EV / NOPAT	33.34x	Not the primary method; highlights a demanding equity valuation
TTM FCF yield	7.66%	Not fully distributable because contract liabilities are JPY 2.483tn
Three- and five-year ROIIC	Insufficient evidence	Working-capital, depreciation and current-perimeter reinvestment series are incomplete
Acquisition-inclusive ROIIC	Insufficient evidence	Provider acquisitionsNet is not deal consideration; no complete deal-return bridge
SBC / revenue and SBC / FCF	Insufficient evidence	Provider zero was correctly treated as unavailable

Standard ROIC is directionally useful for MHI because it is an industrial company, but the estimate is conservative and imperfect. It uses broad financial liabilities and subtracts cash even though a large part of cash is customer-advance-funded. The score therefore does not promote the latest 12% diagnostic ROIC into a high-return franchise claim.

4. Rubric Scorecard

Category	Score	Maximum	Skeptical conclusion
Incremental Returns on Capital	10	25	ROIC is improving, but the five-year median is 7.9% and ROIIC is not supportable
Reinvestment Runway	16	20	GTCC, nuclear and defense backlog provide a large organic runway
Durability of Moat	10	15	Real moats in Energy and Defense, but uneven across the group and not proven through 2046
Accounting and Financial Quality	7	10	Statutory bridge is clean; advances and unavailable SBC limit confidence
Capital Allocation Discipline	6	10	Organic priority and pruning are positive; Concentric and incentive design cap the score
Price and 20% Return Underwriting	4	20	Base and weighted returns are negative; 20% requires unsupported perfection
Business Quality Score	**49/80**	**80**	Improving industrial, not yet a demonstrated high-ROIIC compounder
Compounder Score	**53/100**	**100**	Below the 70-point Reject threshold

Subscore detail:

- 1A normalized ROIC 1/5; 1B ROIIC 0/8; 1C trend 3/3; 1D unit economics 2/3; 1E cash conversion 2/3; 1F accounting-artifact protection 2/3.
- 2A opportunity 4/5; 2B reinvestment at scale 4/5; 2C organic growth 4/4; 2D repeatability 2/3; 2E market structure 1/2; 2F growth without ROIC collapse 1/1.
- 3A advantage 4/4; 3B pricing power 1/3; 3C competitive evidence 2/3; 3D stickiness 2/2; 3E stress resilience 1/2; 3F disruption risk 0/1.
- 4A earnings quality 1/2; 4B cash support 1/2; 4C SBC/dilution 1/2; 4D balance sheet 2/2; 4E disclosure 1/1; 4F governance/accounting flags 1/1.

- 5A reinvestment priority 2/2; 5B acquisitions 1/2; 5C buybacks 1/2; 5D incentives 1/2; 5E owner mentality 1/1; 5F past decisions 0/1.
- 6A Base IRR 0/6; 6B independently justified multiple 3/4; 6C Bear case 0/3; 6D reverse hurdle 0/3; 6E price does not embed perfection 0/2; 6F cash returns 1/2.

5. ROIIC and Reinvestment Analysis

The evidence does not support a credible numerical three- or five-year ROIIC. The reviewed package supplies capex, R&D and a provider acquisitionsNet line, but not a complete current-perimeter series for depreciation, non-cash working capital, capitalized R&D adjustments, growth opex, transaction consideration and disposals. Industrial Solutions also changed perimeter with Logisnext removed and Data Center & Energy Management transferred in. Filling those gaps would create false precision.

The directional evidence is favorable but insufficient. Diagnostic NOPAT rose from JPY 115.8bn in FY2021 to JPY 326.3bn in FY2025 while capex rose from JPY 129.3bn to JPY 181.1bn. Consolidated diagnostic ROIC improved from 4.9% to 12.0%. Energy margin rose from 5.2% to 13.0%, Plants from 3.6% to 9.5%, and Aircraft/Defense/Space from 4.0% to 10.9%. These gains suggest positive incremental economics, but customer advances, mix, cycle strength and one-offs prevent them from proving >20% acquisition-inclusive ROIIC.

The score gives full credit for the non-deteriorating trend but zero credit for numerical ROIIC. This is the main reason Incremental Returns on Capital scores only 10/25.

6. Runway Analysis

The runway is the strongest part of the score. Energy has an 80-unit / 35-GW large-frame GTCC backlog, a 63% FY2025 after-sales mix, and evidence that better-priced orders should convert gradually. GTCC capacity is targeted to rise roughly 30% by FY2028 through more than 1,000 process actions. Nuclear work benefits from regulation, restart and lifecycle demand. Aircraft/Defense/Space has a JPY 3.9tn backlog, Japanese sovereign support, and facilities and workforce investment.

The Base synthesis still avoids extrapolating recent growth. It projects five-year revenue CAGRs of 6.15% in Energy, 2.71% in Plants, 3.8% in Industrial and 8.31% in Aircraft/Defense/Space. Consolidated Base revenue grows 5.90% annually to JPY 6,839.690bn. This is credible rather than heroic.

The limits matter. GTCC peers are expanding capacity; defense is a sovereign monopsony; Commercial Aviation depends on Boeing; H3 launch reliability remains unresolved; and Industrial Solutions begins at a 0.54% TTM margin. The runway earns 16/20 because demand visibility is strong, not because every yen of backlog is guaranteed high-return reinvestment.

7. Moat Analysis

MHI's strongest advantages are installed-base switching costs, regulatory qualification, sovereign trust, high-trust procurement, tacit manufacturing know-how and the ability to assume decades-long performance obligations. Energy and Aircraft/Defense/Space generated about 83.7% of TTM reportable-segment profit before the corporate bridge, so the strongest moats dominate profit.

The moat is uneven. Plants is bid- and execution-dependent. Industrial Solutions has not demonstrated acceptable economics. Network effects are absent, pricing power is only moderate in Energy and weak elsewhere, and recent margin expansion has not been tested through a full demand cycle. AI is more likely to alter engineering cost and value allocation than to replace core physical systems, but it can commoditize portions of Plants engineering and defense software.

The reviewed moat gate and 2046 test are both YELLOW. MHI can plausibly remain strategically relevant in 2046; it is not yet proven that strategic relevance will translate into persistently high returns. The durability score is 10/15.

8. Accounting and Capital Allocation Analysis

The statutory evidence is unusually clean for a complex foreign industrial issuer. FY2025 and TTM segment profit bridge through corporate adjustments, finance items, tax, discontinued operations and NCI to parent income within stated rounding tolerances. The preflight removes JPY 25bn of Q1 Energy one-offs and excludes the net discontinued-operations line without double adjustment. The P/E method uses statutory parent EPS after finance costs, tax and NCI.

Cash conversion needs skepticism. TTM FCF of JPY 966.141bn materially exceeds parent profit, but contract liabilities reached JPY 2,483.2bn. Customer advances fund backlog execution and are not distributable surplus. The strong balance sheet therefore earns credit without converting headline cash into a special dividend assumption.

Capital allocation is directionally rational: MHI favors organic capacity, R&D, portfolio pruning and progressive dividends over serial acquisitions. Diluted shares are essentially flat. Offsetting issues are the JPY 30bn Concentric impairment, weak evidence on deal-level returns, tiny and non-systematic buybacks, and compensation tied mainly to business profit rather than ROIC, FCF or per-share value. Management is YELLOW because the CEO/CFO pair has only about fifteen months in role and the 2027 plan has not yet defined use of non-customer cash.

9. 20% Return Underwriting

9.1 Locked valuation foundations

The exact valuation preflight file validates under the required evidence-file check and hashes to fed56f730b1dd4e8231c892b247b7657e1d4e377bcb406f587718b7c0e26efb4.

Locked field	Exact value reproduced
Primary method	PE
Reported TTM diluted EPS	JPY 118.60
Reported current P/E	31.6526138279933x
Normalized continuing diluted EPS	JPY 116.078058404358
Normalized current P/E	32.3403066143901x
Terminal denominator	Statutory diluted EPS on the same XJPX:7011 ordinary-share basis
Terminal diluted shares	3,361.118m in every scenario
Capital-structure treatment	Finance cost and NCI leakage inside EPS; no net cash/debt or separate asset adjustment
Bear / Base / Bull exit P/E	13x / 18x / 24x

The denominator is comparable after normalization. The reported current multiple is disclosed but did not cap or select the terminal multiples. The VP-selected multiples were independently anchored to Japanese industrial peers and passed both excessive-optimism and excessive-bearishness tests before return calculation.

9.2 Distribution assumption

The model assumes five annual cash dividends of JPY 29 per share, equal to the documented FY2026 plan and held flat in every scenario. Cumulative distributions are therefore JPY 145 per share. No special dividend, buyback accretion, terminal net-cash add-on, or distribution growth is assumed.

9.3 Gross local-currency return bridge

Case	Probability	Terminal EPS	Exit P/E	Terminal equity value / share	Cumulative distributions	Terminal shareholder wealth	Gross JPY IRR
Bear	30%	73.4303	13x	954.5939	145.0000	1,099.5939	-21.77%
Base	55%	176.3476	18x	3,174.2568	145.0000	3,319.2568	-2.43%
Bull	15%	258.4646	24x	6,203.1504	145.0000	6,348.1504	11.08%
Probability weighted	100%	n/a	PE	n/a	Included	3,107.6919700000003	-3.71%

Each scenario IRR equals (terminal shareholder wealth / 3,754)^(1/5) - 1. Expected wealth equals 30% x 1,099.5939 + 55% x 3,319.2568 + 15% x 6,348.1504 = JPY 3,107.6919700000003 per share. The probability-weighted gross IRR is (3,107.6919700000003 / 3,754)^(1/5) - 1 = -3.708325418424552%.

9.4 Reverse 20% hurdle

Required five-year terminal shareholder wealth at 20% is JPY 9,341.153279999999 per share. After subtracting JPY 145 of distributions, required terminal equity value is JPY 9,196.153279999999. At the locked Base 18x P/E, required terminal EPS is JPY 510.89740444444436, a 33.92134471449444% annual CAGR from reported TTM diluted EPS of JPY 118.60. On modeled Base EPS, a 20% return instead requires a 52.14787884836538x exit P/E, versus the normalized current

32.3403066143901x.

The maximum entry price for a 20% Base IRR using the same 18x P/E and JPY 145 distributions is JPY 1,333.934863683128. This is 64.47% below the JPY 3,754 price anchor. The hurdle is not beatable under the reviewed Base operating path.

9.5 Conservative net-SGD diagnostic

The net-SGD overlay uses the exact same P/E terminal equity values, JPY 145 gross distributions, scenario probabilities and five-year horizon. It makes no portfolio-fit, sizing or trading decision.

Assumptions: JPY depreciates 1.5% per year against SGD, producing a five-year translation factor of 0.9272165023656249; entry and exit brokerage/FX friction are 0.25% each; ongoing custody/implementation friction is 0.25% per year, factor 0.9875623439452151; Japanese withholding is 15% on dividends with no reclaim; capital-gains tax is assumed zero for this diagnostic; and all distributions are translated at the terminal FX factor, a conservative timing simplification. Initial cost is JPY-equivalent 3,763.385 per share.

Net terminal SGD wealth is calculated from the same gross wealth as: [(terminal P/E equity value x 0.9975) + (145 x 0.85)] x 0.9272165023656249 x 0.9875623439452151.

Case	Probability	Net terminal wealth in initial-FX JPY equivalent	Net-SGD IRR
Bear	30%	984.7792579750767	-23.52%
Base	55%	3,012.2080131628472	-4.36%
Bull	15%	5,778.783956313587	8.96%
Probability weighted	100%	2,818.9657780791267	-5.62%

The probability-weighted net-SGD IRR is the CAGR of probability-weighted net terminal wealth. It is not the arithmetic average of the three net IRRs. All visible net-SGD returns are rendered to exactly two decimals; structured JSON preserves full precision.

9.6 Double-count and method checks

- One controlling method, P/E, is used in Bear, Base, Bull, probability weighting, reverse return, max-buy price and net-SGD.
- Debt, leases, cash, NCI and the Logisnext financial asset are not added or subtracted after EPS x P/E.
- NCI leakage and finance costs are already inside statutory terminal EPS.
- Distributions are added once and taxed once in the net overlay.
- Scenario probabilities sum to exactly 100%.
- All four gross and all four net-SGD IRRs are finite and reproduce from terminal wealth.

10. Hard Veto Checklist

Veto	Status	Evidence-based conclusion
1. ROIIC below cost of capital / no improvement path	Insufficient evidence	ROIC improves, but numerical ROIIC cannot be verified
2. High ROIC caused by tiny/negative capital	Pass	Conservative broad-capital ROIC is only 12%, not artificially high
3. Persistent external financing required	Pass	Broad net-cash balance and customer funding reduce financing risk
4. Material dilution without per-share value	Pass	Diluted shares were essentially flat
5. Undisclosed acquisition returns	Watch	Concentric impairment and incomplete deal-return data
6. Structural FCF lag	Watch	FCF is strong, but advances make conversion quality difficult to normalize

Veto	Status	Evidence-based conclusion
7. Permanent impairment from concentration/cycle/leverage	Watch	GTCC, defense, Boeing and project-risk concentration are material
8. 20% return requires multiple expansion	**Fail**	Base requires 52.15x terminal P/E versus 32.34x normalized current P/E
9. Flawless execution needed at today's price	**Fail**	Only Bull produces a positive double-digit gross return, still below 20%
10. Moat cannot be explained	Pass	Installed-base, qualification and sovereign-trust moat is specific
11. Accounting/governance trust impaired	Pass	Clean statutory bridge, unmodified audit and no identified enforcement issue
12. Balance-sheet wipeout risk	Pass	Broad net cash materially limits financial wipeout risk

Vetoes 8 and 9 prevent an “investable now” classification. They do not authorize any portfolio or owner action.

11. Final Decision

Score-implied classification: Reject. The score is below 70, Business Quality is below 65/80, the 20% underwriting score is below 15/20, ROIIC plus runway is only 26/45, Base and Bear returns fail, and two valuation hard vetoes are active.

Compounder Score note: 53/100 - strong backlog and improving operations are outweighed by unverified ROIIC, YELLOW management/moat durability and a valuation that produces negative Base and weighted returns.

Business Quality Score note: 49/80 - Energy and Defense contain real franchises, but five-year median ROIC is 7.9%, group pricing power is incomplete, Industrial is weak and acquisition-inclusive ROIIC is unavailable.

20% Return UW Score note: 4/20 - the Base gross JPY IRR is -2.43%, probability-weighted gross JPY IRR is -3.71%, and a 20% Base return would require JPY 510.90 EPS or an unsupported 52.15x exit P/E.

This diagnostic carries no trade, portfolio-mutation, sizing, or owner-action authority. Any future re-underwriting must rerun Valuation Preflight before changing the method, denominator, capital-structure treatment or exit multiples.

12. Machine-Readable JSON

The full-precision machine-readable artifact is compounder_score.json in this work directory. It includes the exact preflight hash, locked P/E inputs, all scenario wealth bridges, the probability-weighted terminal-wealth calculation, the conservative net-SGD overlay, rubric details, vetoes and explicit false authorization flags.

Appendix CSA - Scoring Audit

Mitsubishi Heavy Industries - Scoring Audit

Ticker: 7011.T / XJPX:7011 **Audit date:** 2026-09-06 **Current price:** JPY 3,754 per ordinary listed share **TTM end:** 2026-06-30 **Horizon:** 2031-06-30, exactly 5.0 years **Primary valuation method:** P/E **Valuation preflight SHA-256:** `fed56f730b1dd4e8231c892b247b7657e1d4e377bcb406f587718b7c0e26efb4` **Compounder score SHA-256:** `7ba809a8038604f890a089722301af64d7a517c1dd015e1a84b7b537601aee45` **Trade execution authorized:** NO

1. Original vs Audited Scores

Item	Original	Audited	Notes
Business Quality Score / 80	49/80	45/80	Four points removed for unsupported ROIIC-trend credit and overstatement of proven reinvestment at scale
Valuation / 20% Return UW Score / 20	4/20	4/20	Locked P/E return arithmetic, multiple evidence and reverse hurdle all reconcile
Total Score / 100	53/100	49/100	Arithmetic sum of the audited category scores
Classification	Reject	Reject	Below 70, with valuation vetoes 8 and 9 active

The original return model is mechanically sound and appropriately pessimistic at the current price. The business-quality score is reduced because two rubric awards outran the evidence. The audit does not change the locked valuation method, normalized anchor, capital-structure treatment, or Bear/Base/Bull exit multiples.

2. Score Reductions and Reasons

Rubric item	Evidence status	Original	Audited	Audit conclusion
1A Normalized ROIC	Supported	1/5	1/5	Five-year median diagnostic ROIC is 7.9%
1B ROIIC	Missing data	0/8	0/8	Three-year, five-year and acquisition-inclusive ROIIC cannot be calculated
1C ROIIC not deteriorating	Unsupported	3/3	0/3	The scorer substituted improving diagnostic ROIC and NOPAT for an unavailable ROIIC series
1D Unit economics	Partly supported	2/3	2/3	Segment margins improved, but segment invested capital and product profit are unavailable
1E Cash conversion	Partly supported	2/3	2/3	Five-year FCF/NOPAT is 125.609160594303%, but customer advances materially qualify it
1F Not an accounting artifact	Supported	2/3	2/3	Broad invested capital and statutory bridges are conservative and reconciled
2A Remaining opportunity	Supported	4/5	4/5	GTCC, nuclear and defense backlogs support runway
2B Reinvest at scale	Partly supported	4/5	3/5	Capacity plans are funded and coherent, but key throughput gains remain prospective and high-return reinvestment is unproven without ROIIC
2C Organic growth	Supported	4/4	4/4	Backlog and official guidance support organic growth

Rubric item	Evidence status	Original	Audited	Audit conclusion
2D Repeatable playbook	Partly supported	2/3	2/3	Installed-base service and qualifications help, but execution remains project-specific
2E Market structure	Partly supported	1/2	1/2	Demand is attractive, but peers are adding capacity and defense is a monopsony
2F Growth without ROIC collapse	Partly supported	1/1	1/1	Historical growth coincided with improving diagnostic ROIC, though not a full-cycle proof
3A Source of advantage	Supported	4/4	4/4	Qualification, installed base, sovereign trust and integration are specific
3B Pricing power	Partly supported	1/3	1/3	Evidence is indirect and concentrated in Energy
3C Competitive evidence	Partly supported	2/3	2/3	Peer and program evidence supports niches, not group-wide dominance
3D Customer stickiness	Supported	2/2	2/2	Switching costs are high after platform or program selection
3E Stress resilience	Partly supported	1/2	1/2	Long-cycle charges and cyclicality prevent full credit
3F Low disruption risk	Partly supported	0/1	0/1	Energy transition, peer capacity, aerospace and software risks remain
4A Clean earnings	Partly supported	1/2	1/2	Statutory bridge is clean, but TTM contains identified one-offs and disposal effects
4B Cash supports earnings	Partly supported	1/2	1/2	Multi-year conversion is strong but advance-funded
4C SBC and dilution	Partly supported	1/2	1/2	Diluted shares are nearly flat; group-wide SBC expense remains unavailable
4D Balance sheet	Supported	2/2	2/2	Broad net cash is strong, with advances correctly excluded from distributable surplus
4E Disclosure	Supported	1/1	1/1	Official English filings and Q&A are unusually detailed for the peer set
4F Governance/accounting flags	Supported	1/1	1/1	No identified material restatement or enforcement issue
5A Rational reinvestment priority	Supported	2/2	2/2	Capacity, R&D and portfolio pruning align with core demand
5B Acquisition discipline	Partly supported	1/2	1/2	Concentric impairment and missing deal returns block a clean pass
5C Buyback discipline	Partly supported	1/2	1/2	Buybacks are tiny and do not prove price sensitivity
5D Incentive alignment	Partly supported	1/2	1/2	Stock weighting helps, but pay lacks ROIC, FCF and per-share hurdles
5E Owner mentality	Partly supported	1/1	1/1	CEO ownership and candor support limited credit
5F Past decisions	Partly supported	0/1	0/1	SpaceJet, Concentric and project charges prevent credit
6A Base IRR	Supported	0/6	0/6	Audited Base gross JPY IRR is -2.4315699155172954%
6B Exit multiple	Supported	3/4	3/4	18x Base is independently anchored and below 32.3403066143901x normalized current P/E, but the return hurdle still fails

Rubric item	Evidence status	Original	Audited	Audit conclusion
6C Bear case	Supported	0/3	0/3	Audited Bear gross JPY IRR is -21.77463275117445%
6D Reverse hurdle	Supported	0/3	0/3	20% requires JPY 510.89740444444436 EPS or 52.14787884836538x on modeled Base EPS
6E Price not perfection	Supported	0/2	0/2	Only Bull produces a positive double-digit gross return
6F Cash returns	Supported	1/2	1/2	Five flat JPY 29 dividends help only modestly

Audited category totals are 7/25, 15/20, 10/15, 7/10, 6/10 and 4/20. The audited Business Quality Score is therefore 45/80 and the audited Compounder Score is 49/100.

3. Unsupported Claims

- The evidence does not support the original 3/3 award for `ROIIC is not deteriorating sharply`. No numerical ROIIC series exists. Improving diagnostic ROIC, margin and NOPAT are favorable but are not ROIIC.
- The claim that MHI has already proven high-return reinvestment at scale is only partly supported. More than 1,000 GTCC process actions, a targeted 30% capacity increase and defense facilities are plans or in-progress investments; the delivered throughput and return evidence remains incomplete.
- No additional unsupported claim changes the return model. The scorer correctly treated acquisition-inclusive ROIIC, reinvestment rate and SBC burden as unavailable.

4. Calculation Errors

Pre-return gate and locked-input replay

The exact VP bytes hash to `fed56f730b1dd4e8231c892b247b7657e1d4e377bcb406f587718b7c0e26efb4`. The repository validator passes with `--check-evidence-files`. VP status is `CLEARED`, all five foundations pass, and blockers are empty. The exact CS bytes hash to `7ba809a8038604f890a089722301af64d7a517c1dd015e1a84b7b537601aee45`.

CS exactly reproduces VP's P/E method, JPY 116.078058404358 normalized TTM EPS, 32.3403066143901x normalized current P/E, 3,361.118m diluted shares, zero terminal cash/debt or separate asset adjustment, and 13x/18x/24x exit P/Es. P/E remains controlling across all scenarios, probability weighting, reverse return, maximum buy price and net-SGD. Debt, leases, cash, NCI, non-operating assets and distributions are not double counted.

The reported current P/E replays as JPY 3,754 / JPY 118.60 = 31.6526138279933x. The normalized current denominator removes the identified Energy one-offs and discontinued-operation result. The terminal denominator is statutory diluted EPS on the same listed-share, currency and parent-attributable perimeter. Peer source files preserve native TTM diluted P/E fields: IHI 13.712121212121215x, Kawasaki Heavy 17.00986970866186x, Ebara 25.81320919406459x and Japan Steel Works 25.85681914742954x. The 13x/18x/24x locks are not reverse-engineered from desired returns, and both excessive-optimism and excessive-bearishness challenges pass. The one-date peer snapshot and cyclicality keep confidence at Medium, but do not invalidate the locks.

Audited gross local-currency returns

Case	Probability	Terminal EPS	Exit P/E	Terminal equity value/share	Distributions	Terminal wealth	Audited gross JPY IRR
Bear	30%	73.4303	13x	954.5939000000001	145	1,099.5939	-21.77463275117445%
Base	55%	176.3476	18x	3,174.2568	145	3,319.2568	-2.431569915517295 4%
Bull	15%	258.4646	24x	6,203.1504	145	6,348.1504	11.07864870820531 9%
Probability weighted	100%	n/a	P/E	n/a	Included once	3,107.691970000000 3	-3.708325418424551 8%

Each scenario equals `(terminal EPS x exit P/E + JPY 145) / JPY 3,754`, annualized over five years. Probability-weighted IRR is the CAGR of `0.30 x 1,099.5939 + 0.55 x 3,319.2568 + 0.15 x 6,348.1504`, not an average of scenario IRRs. All four values reconcile to CS within floating-point precision.

Audited conservative net-SGD diagnostic

The overlay keeps the same terminal P/E equity values, distributions, weights and horizon. It assumes 1.5% annual JPY depreciation versus SGD, 0.25% entry and exit brokerage/FX cost, 0.25% annual ongoing cost, 15% dividend withholding with no reclaim, no capital-gains tax and terminal-date translation of all distributions. Initial JPY-equivalent cost is 3,763.3849999999998.

Case	Probability	Net terminal wealth in starting-FX JPY equivalent	Audited net-SGD IRR
Bear	30%	984.7792579750767	-23.51926576770036%
Base	55%	3,012.2080131628472	-4.35522232496538%
Bull	15%	5,778.783956313587	8.956103048607256%
Probability weighted	100%	2,818.9657780791267	-5.615162855616784%

All four net-SGD returns reproduce CS at full precision. The probability-weighted value annualizes probability-weighted net terminal wealth.

Other arithmetic spot checks

- FY2021-FY2025 diagnostic ROIC inputs reproduce 4.9%, 6.0%, 7.9%, 8.6% and 12.0%; the median is 7.9%.
- Five-year aggregate FCF divided by diagnostic NOPAT reproduces 125.609160594303%.
- Diluted shares rise from 3,358.9m to 3,360.3m, consistent with the reported 0.009942121497674705% CAGR.
- Scenario NOPAT replays as JPY 356.4bn x 72%, JPY 759.3bn x 75%, and JPY 1,074.0bn x 77%.
- Required 20% terminal wealth is JPY 9,341.153279999999; maximum Base buy price is JPY 1,333.934863683128. Both reconcile.

The calculation breaks only in the original assignment of 1C points: an unavailable ROIIC series cannot earn full credit for a non-deterioration test. No security-return arithmetic error was found.

5. Missing Data

- Credible three-year, five-year and acquisition-inclusive ROIIC schedules.
- Current-perimeter reinvestment rate, depreciation, working-capital and deal-consideration series.
- Group-wide SBC expense and SBC-to-revenue / SBC-to-FCF history.
- Five-year current-taxonomy segment history after the 2026 perimeter reset.
- Product-level profit and direct, repeatable pricing-realization evidence.
- Exact investor tax, broker, account and portfolio facts; the net-SGD output is therefore diagnostic.

The most important missing evidence is a clean acquisition-inclusive ROIIC bridge. Without it, MHI cannot demonstrate that recent margin and NOPAT gains came from repeatable high-return incremental capital rather than mix, cycle, advances and legacy backlog.

6. Hard-Veto and Threshold Test Audit

The hard-veto statuses are directionally fair. Veto 8 fails because a 20% Base return requires a 52.14787884836538x terminal P/E versus 32.3403066143901x normalized current P/E. Veto 9 fails because even Bull returns only 11.078648708205319% gross JPY. The audited score is below 70/100; Business Quality is below 65/80; Valuation is below 15/20; ROIIC plus runway is 22/45; Base and Bear return tests fail. The score-implied classification remains Reject.

MHI is not a P&C insurer or reinsurer. `insurer_return_bridge.json` and the P&C economic-coherence audit are not applicable. P/B-ROE is not primary.

7. Final 20% Hurdle Pass/Fail

FAIL. The 20% case requires JPY 510.89740444444436 terminal EPS at 18x, a 33.92134471449444% CAGR from JPY 118.60 reported TTM EPS, or a 52.14787884836538x exit P/E on modeled Base EPS. Neither is supported. A JPY 1,333.934863683128 maximum entry price is required for a 20% Base IRR under the locked assumptions.

8. Dream Business / Dream Investment Classification

Neither. MHI has real franchises and an attractive backlog, but 7.9% five-year median diagnostic ROIC, unavailable ROIIC, uneven moat durability and incomplete pricing evidence prevent a dream-business designation. Current valuation produces negative Base and probability-weighted returns, preventing a dream-investment designation.

The single biggest reason MHI does not qualify is that the current price demands far more per-share earnings growth or terminal valuation than the independently underwritten Base case can support.

9. Stage 7 Scorecard Notes

- **Compounder Score note: 49/100** - real Energy and Defense franchises do not offset unavailable ROIIC, only partly proven reinvestment and a valuation that produces negative Base and weighted returns.
- **Business Quality Score note: 45/80** - backlog and operating improvement are credible, but high-return incremental capital deployment is not demonstrated and moat durability remains YELLOW.
- **20% Return UW Score note: 4/20** - Base gross JPY IRR is -2.4315699155172954%, probability-weighted gross JPY IRR is -3.7083254184245518%, and the 20% hurdle requires unsupported EPS or multiple outcomes.

These are diagnostic score implications, not an ER2 verdict or portfolio-action authorization.

10. Auditor JSON

The full-precision audit is recorded in `compounder_score_audit.json` in this work directory. All trade, portfolio-mutation, owner-action and sizing-proposal authority flags are false.

Appendix RT - Red Team

Mitsubishi Heavy Industries — Red Team

Ticker: 7011.T / XJPX:7011 **Assessment date:** 2026-09-06 **TTM anchor:** 2026-06-30 **Horizon:** 2031-06-30, exactly five years **Audited primary valuation method:** P/E **Trade execution authorized:** NO

This is an adversarial review of the completed synthesis and audited scoring package, not a replacement model. The exact `valuation_preflight.json` bytes hash to `fed56f730b1dd4e8231c892b247b7657e1d4e377bcb406f587718b7c0e26efb4`; the repository validator returns `VALUATION_PREFLIGHT_VALID` with evidence-file checking. The exact `compounder_score_audit.json` bytes hash to `60d93e9f4c875b1cd78d51b2298d654f8fdee3ec3dc821c71723859c4df63c2d`. CS and CSA both reproduce P/E as the controlling method and the locked 13x Bear, 18x Base and 24x Bull exit multiples exactly. No upstream file, audited score, or audited return field has been edited. All alternatives below are explicitly non-controlling sensitivities.

1. The most fragile assumption

The single most fragile assumption is **Energy Systems reaching a 15.0% Base `Profit from business activities` margin in 2031**, versus a 13.20% normalized TTM planning margin after removing JPY 25bn of identified Q1 one-time profit. It matters more than any other segment assumption because Energy contributes JPY 439.9bn, or 58.0%, of Base consolidated operating income before considering the negative JPY 90bn corporate line. Roughly three quarters of Energy's Base revenue increase comes from GTCC, so the model effectively requires three things to occur together: 9% GTCC revenue CAGR, clean delivery of a capacity ramp, and retention of improved order economics as competitors add capacity.

Demand is not the weak link. GE Vernova reported Q2 2026 Gas Power equipment backlog and slot reservations rising to 116 GW and described a path from 20 GW of annual turbine output in 2026 to 24 GW in 2028 and 30 GW in 2030 ([GE Vernova Q2 2026 results](https://www.gevernova.com/news/articles/ge-vernova-releases-second-quarter-2026-financial-results)). Siemens Energy's Q1 FY2026 Gas Services result showed an 18.3% reported profit margin and a €60bn backlog ([Siemens Energy Q1 FY2026 release](https://assets.siemens-energy.com/dam/eb218e11-1294-4e27-a750-b3ee0059367f/Earnings-Release-Q1-FY26-EN-pdf_Original%20file.pdf)). Those facts validate the category, but they also show formidable peers expanding capacity and service fleets. MHI can fill factories and still earn less than modeled if scarce labor, supplier qualification, commissioning, warranty expense or competitive pricing consumes the apparent scarcity rent.

The synthesis sensitivity tests Energy revenue growth but not Energy margin. Holding every other Base input constant, cutting the 2031 Energy margin from 15% to 12% lowers group operating income by JPY 88.0bn, parent net income by about JPY 66.0bn after the locked 25% tax rate, and EPS from JPY 176.3476 to JPY 156.7155. At the locked 18x P/E and JPY 145 distributions, terminal wealth falls from JPY 3,319.2568 to JPY 2,965.8793 and Base IRR falls from -2.4316% to -4.6036%, a **2.172 percentage-point** move. That is material, but 12% is a downside state rather than an evidence-required correction today: the reviewed Energy appendix already places an 11.5% margin in Bear, assigns Bear a 30% probability, and identifies capacity and project-risk triggers. Accordingly, this objection is **MATERIAL_RESOLVED**, not permission to rewrite Base.

2. The Stage 5 number most likely to prove optimistic

The most likely Stage 5 number to be revised down is **JPY 759.3bn of Base operating income, or an 11.10% consolidated margin**. It is not aggressive because of one isolated line; it is fragile because several improvements must arrive concurrently. Energy expands 180 basis points from normalized TTM to 15.0%, Aircraft/Defense/Space expands 127 basis points to 12.2%, Industrial Solutions moves from 0.54% TTM to 5.0%, and corporate expense remains no worse than the FY2026 JPY 90bn guide despite higher throughput and a larger organization. Plants also assumes recent margin improvement largely persists. The plan contains no explicit allowance for a major program charge in Base.

The recent quarter does not disprove that build, but it is a dangerous starting point for confidence. MHI's Q1 FY2026 result included the disclosed JPY 25bn of Energy one-offs, while management left full-year revenue and profit guidance unchanged even as it raised order and FCF guidance ([MHI Q1 FY2026 results](https://www.mhi.com/finance/library/result)). Strong orders therefore demonstrate demand visibility, not that the full five-year operating-leverage path is already earned. The model is right to normalize the one-offs; the remaining vulnerability is that higher backlog may require more inventory, supplier support, warranty reserves and labor before it becomes higher margin.

3. The strongest bear case, in its strongest form

MHI is priced as though an unusual synchronization of gas-turbine scarcity, Japanese defense mobilization, nuclear work and aerospace recovery becomes a durable high-margin annuity. The short case is that backlog converts into revenue but not moat rent: peer turbine capacity expands into the same 2028-2030 window, Japanese defense capacity and labor arrive before customer acceptance, and one or two long-cycle project resets absorb the incremental margin. Within two years, Energy and Defense revenue can still grow while group cash conversion weakens, contract assets or inventories rise, and underlying segment margins stop improving. The market then discovers that strategic relevance and full factories do not equal high incremental ROIC, forcing a terminal multiple closer to cyclical Japanese industrial peers while earnings miss the Base path.

This mechanism attacks the two segments that provide 82.2% of Base reportable-segment profit. It does not require GTCC orders or defense budgets to collapse. It requires only that capacity execution, customer-controlled pricing and project risk prevent the modeled margin lift. The observable anchor is underlying Energy margin and Aircraft/Defense/Space margin during revenue growth, supported by backlog aging and any disclosed project provisions.

4. Cross-examination of management commentary

“Profitability ... continues to improve gradually” — CFO Hiroshi Nishio, Q1 FY2026. The statement may be right for newly booked GTCC contracts, but it is not the same as a 15% segment margin after mixing GTCC equipment, service, Steam, Aero Engines and Nuclear. Q1's headline Energy margin was event-heavy, and management does not disclose product profit or the backlog's margin schedule. The earliest contradiction would be underlying Energy margin below the 13.20% normalized TTM level while revenue and backlog continue to grow, or a warranty/contract revision that absorbs the better pricing.

“Reduce lead times and increase throughput” — CEO Seiji Ito, 2024 MTBP progress. More than 1,000 process actions and a 30% FY2028 capacity objective are measurable operational claims, but faster output can initially worsen yield, rework and working capital. GE Vernova's much larger capacity program confirms that the industry is racing to add supply, not merely harvesting scarcity. The first warning would be Energy backlog remaining high while deliveries fail to accelerate, inventories and contract assets rise faster than revenue, or margin declines during the ramp.

Defense revenue should “increase gradually” — CFO Nishio, Q1 FY2026 Q&A. Backlog near JPY 3.9tn and the JPY 1.5tn segment revenue guide support growth, but MHI does not disclose a unit-capacity target comparable with Energy. The Japanese government is also a dominant customer with control over specification, inspection, timing and economics. The first failure would be two reporting periods in which Defense revenue misses its capacity cadence while backlog rises and the Aircraft/Defense/Space margin declines. That would show working capital and fixed costs arriving ahead of accepted output.

5. Stage 5 tie-out and return replay

The recency anchor is internally sound. TTM revenue and earnings use FY2025 less Q1 FY2025 plus Q1 FY2026, equivalent to the four non-overlapping quarters ending September 2025, December 2025, March 2026 and June 2026. The first Base forward year rises 5.68% in revenue and 3.65% in operating income from TTM, so no hidden late step-up or sixth year was found. The flat 3,361.118m share count is also more defensible than a buyback-driven decline: five-year repurchases were sporadic and tiny, and group-wide SBC expense is unavailable. The share assumption could prove mildly optimistic if SBC rises, but it does not smuggle in unsupported repurchase accretion.

I independently replayed the audited P/E arithmetic from current price, terminal EPS, locked multiple and JPY 145 cumulative distributions:

Case	EPS	Exit P/E	Terminal equity/share	Terminal wealth/share	Replayed gross JPY IRR
Bear	73.4303	13x	954.5939	1,099.5939	-21.774632751174%
Base	176.3476	18x	3,174.2568	3,319.2568	-2.431569915517%
Bull	258.4646	24x	6,203.1504	6,348.1504	11.078648708205%

The formula is `(terminal EPS × exit P/E + 145) / 3,754`, annualized over exactly five years. Probability-weighted terminal wealth is `30% × 1,099.5939 + 55% × 3,319.2568 + 15% × 6,348.1504 = JPY 3,107.69197`; its CAGR is **-3.708325418425%**, not the arithmetic average of scenario IRRs. A 20% return requires JPY 9,341.15328 of terminal wealth, JPY 510.897404 of EPS at 18x, or a 52.147879x exit P/E on modeled Base EPS. Maximum price for a 20% Base return replays to JPY 1,333.934864.

The net-SGD bridge also replays. Entry cost is JPY 3,763.385 after 0.25% cost. For each scenario, `(terminal equity/share × 99.75% + JPY 145 × 85%) × 0.985^5 × 0.9975^5` reproduces terminal wealth of JPY 984.7793, JPY 3,012.2080 and JPY 5,778.7840, and net-SGD IRRs of -23.5193%, -4.3552% and 8.9561%. Probability-weighted net terminal wealth is JPY 2,818.9658 and the replayed net-SGD IRR is -5.6152%. No distribution, cash, debt, lease or NCI double count was found.

No product CAGR exceeds the competitor pattern without a named reason. The sharper issue is margins, not revenue CAGR. Boeing's July 2026 update still targets 777-9 deliveries in 2027, which supports the Commercial Aviation recovery path, but certification progress is not accepted supplier volume or price realization ([Boeing certification update](https://www.boeing.com/features/2026/07/certification-progress-reported-737-max-777-9)).

6. The score-derived 20% return claim

There is no bullish 20% claim left to attack. The audited score gives the return component **4/20**, labels the company Reject, and explicitly fails the 20% hurdle. The red team agrees. The first assumption that would have to break is not dividend growth or a small share-count change; it is terminal earnings or valuation on an implausible scale. Modeled Base EPS of JPY 176.3476 would need to reach JPY 510.8974 at the same 18x, or the same EPS would need a 52.15x exit multiple. Neither follows from the reviewed backlog, margin evidence, or peer set. A 20% claim remains rejected even under the strongest reasonable evidence for near-term gas and defense demand.

7. Two-sided valuation challenge

Strongest reason the valuation is too optimistic. The 18x Base exit P/E grants MHI a modest premium to Kawasaki Heavy's 17.01x native TTM P/E despite YELLOW management and moat gates, unproven ROIIC, and concentrated project execution. A non-controlling 15x sensitivity—between IHI's 13.71x and Kawasaki's 17.01x—reduces Base terminal wealth from JPY 3,319.2568 to JPY 2,790.2140 and Base IRR from -2.4316% to **-5.7614%**, a 3.330 percentage-point deterioration. This objection is **MATERIAL_RESOLVED**: 18x is hash-locked, chosen before returns, uses a comparable denominator, is supported by the direct-peer center and is well below MHI's 32.34x normalized current P/E. The 15x case is a supportable cyclical sensitivity, not evidence that the audited lock is erroneous.

Strongest reason the valuation is too bearish. The 15% Bull probability may underweight the possibility that synchronized gas, grid and defense demand persists through the horizon. MHI raised order and FCF guidance, GE Vernova reported rapidly growing gas-equipment commitments and Siemens Energy reported record Gas Services demand. Reweighting only to 20% Bear / 60% Base / 20% Bull, without changing any earnings or multiples, raises probability-weighted wealth to JPY 3,481.1029 and gross IRR to **-1.4981%**, 2.210 percentage points above the audited -3.7083%. An aggressive 15% / 55% / 30% distribution yields JPY 3,894.9754 and +0.7400%, a 4.448-point lift. This objection is **MATERIAL_RESOLVED** because the audited 30% Bear / 55% Base / 15% Bull distribution explicitly reflects project-loss convexity, capacity proof still ahead and YELLOW gates; order upgrades did not include higher revenue or profit guidance. Even the generous reweighting remains far below the owner's 10%-15% net-SGD mandate.

Dividend and excess-cash bearishness. Flat JPY 29 annual dividends ignore the possibility that a 4%-plus DOE policy and rising earnings lift distributions, while P/E gives no separate credit for a later release of genuinely surplus cash. But contract liabilities of JPY 2.483tn mean current cash cannot simply be added to equity value. A modest JPY 30 increase in cumulative dividends would move Base IRR by only about 0.18 percentage point. This objection is **IMMATERIAL** under the two-point/actionability/foundational test.

No denominator, primary-method, claim-perimeter, dilution, terminal-equity or probability-weighting defect was found. The P/E method remains consistent across scenarios, reverse return, maximum buy price and net-SGD. The two material challenges are already disclosed, evidence-bound and incorporated through the locked multiple range and asymmetric scenario distribution. **RETURN_MODEL_OBJECTION_STATUS: MATERIAL_RESOLVED.** No route-back is required.

8. P&C insurer bridge

MHI is a diversified industrial, not a property-and-casualty insurer or reinsurer. `insurer_return_bridge.json` is neither present nor required. P/B-ROE is correctly rejected as the primary method because no zero-residual parent-common-equity roll-forward exists and operating EPS provides the cleaner shareholder bridge.

9. The signal that forces an exit

The exit signal is: **underlying Energy Systems** `Profit from business activities` **margin below 12.0% in each of the next two reported quarters while Energy revenue is still growing at least 5% year over year**, excluding separately quantified contract-finalization and asset-sale gains. The time window is the next two earnings releases. This is deliberately a conjunction: a single seasonal margin miss is noise, and falling revenue in a demand shock is a different thesis. Growing revenue with sub-12% underlying margin means the backlog is converting without the pricing, service mix or operating leverage required for the 15% Base endpoint. It would also warn that peer capacity, supplier costs or project losses are consuming the scarcity rent. A holder should exit rather than wait for the terminal multiple to acknowledge that failure.

10. Conviction after red team

Conditional — the operating thesis survives, but the investment thesis does not. MHI owns real Energy and sovereign Defense franchises, and recent peer evidence makes a collapse in end demand less likely than a simplistic cyclical bear would claim. The model's arithmetic, P/E method, denominator, claim treatment and 13x/18x/24x locks survive independent replay. But the current price requires simultaneous margin execution across Energy, Defense and Industrial while offering negative Base and probability-weighted returns even before the conservative SGD overlay. The strongest bear argument is therefore not that MHI lacks valuable franchises; it is that the market already charges for their successful conversion. The synthesis should retain its reject conclusion and make underlying Energy margin during revenue growth the primary monitoring condition.

Appendix D - Data Package (raw historicals)

Mitsubishi Heavy Industries — Data Package

Ticker: 7011.T / XJPX:7011 **Run:** `pulse-cio-20260906T100232+0800` **Cutoff:** 2026-09-06 SGT **Units:** JPY millions unless a table says JPY billions. **Fiscal convention:** years end March 31. FY2025 means the MHI year ended 2026-03-31; FMP labels that statement fiscalYear 2026. **Stage 0:** Latest quarter is Q1 FY2026 ended 2026-06-30, announced 2026-08-04. TTM is Q2 FY2025 + Q3 FY2025 + Q4 FY2025 + Q1 FY2026, ending 2026-06-30. The exact five-year horizon is 2031-06-30.

Validated historicals come from the sealed QF/QFR artifacts. New live pulls in this stage are used for required spot checks, guidance, qualitative evidence, and the disclosure inventory. No warehouse cache was read. New evidence is under `raw/pulse-cio-20260906T100232+0800/d_data_package_20260906T104925+0800`; new FMP responses were also copied without overwrite to `C:\Users\Admin\OneDrive\Cowork\Investing\data warehouse\er2_live_pulls\7011.T\pulse-cio-20260906T100232+0800\d_data_package_20260906T104925+0800`.

0a. Industry classification and disclosure inventory

MHI is a foreign-listed diversified industrial, aerospace, defense, power-equipment, and infrastructure-project issuer reporting under IFRS. Its primary security is a Japanese ordinary share on TSE Prime. The controlling sources are MHI's local annual and quarterly IFRS releases, earnings presentations, Q&A summaries, medium-term-plan materials, and official financial workbook. SEC CIK 0002023767 contains only the ADR registration perimeter and F-6 filings, not a controlling 10-K/10-Q record. Live FMP annual and quarterly `revenue-product-segmentation` responses were both exactly `[]`, so the official-source override and ad hoc industry checklist are mandatory.

The checklist was derived from MHI's headings and economics. Material KPI families searched were order intake and backlog by segment; revenue and `Segment profit (represents profit from business activities)` by segment; GTCC orders, backlog, original-equipment and services revenue; nuclear revenue; defense revenue, backlog and capacity; commercial-aircraft deliveries; after-sales mix; product order intake and revenue; capex, R&D and manufacturing capacity; project one-offs; contract liabilities/advances; regional revenue; free cash flow; and interest-bearing debt. Search terms included `order intake`, `order backlog`, `GTCC`, `large frame gas turbine`, `after-sales services`, `nuclear`, `defense`, `commercial aviation deliveries`, `production capacity`, `lead times`, `business profit`, `Profit from business activities`, `capital expenditures`, `R&D`, `contract liabilities`, `advances received`, `revenue by region`, `Mitsubishi Logisnext`, and `Industrial Solutions`.

Live source inventory

ID	Source fetched live	Purpose	Archive / SHA-256
D-F1	FMP `stable/income-statement?symbol=7011.T&period=annual&limit=8`	Five-year statement spot check	`fmp_income_annual_7011T.json` / `8af6732ab2cfaaaccddefc198bf1a1b276cd94ce6202d6538e290190479bafa3`
D-F2	FMP annual balance sheet and cash flow	Capital, cash flow and allocation	`fmp_balance_annual_7011T.json`; `fmp_cashflow_annual_7011T.json`
D-F3	FMP annual and quarterly product segmentation	Mandatory negative evidence	Both two-byte empty arrays / `4f53cda18c2baa0c0354bb5f9a3ecbe5ed12ab4d8e11ba873c2f11161202b945`
D-F4	FMP FY2025 Q3/Q4 and FY2026 Q1 transcripts	Live management commentary	Dates 2026-02-04, 2026-05-12, 2026-08-04; hashes in raw folder
D-O1	[Q1 FY2026 results](https://www.mhi.com/finance/library/result/pdf/fy20261q/financial_results.pdf)	Current statutory quarter	`mhi_q1_fy2026_financial_results.pdf` / `ca08e0fe8e28089668e0ec7d13bcfc4282dd9901d517d3011a92d61eb28ea741`
D-O2	[Q1 FY2026 presentation](https://www.mhi.com/finance/library/result/pdf/fy20261q/presentation.pdf)	Segment KPIs and guidance	`mhi_q1_fy2026_presentation.pdf` / `449c42876f517744d83eb61e34e238ce34d8a8d69dba6ccf1313269e5adfce7d`
D-O3	[Q1 FY2026 Q&A](https://www.mhi.com/finance/library/result/pdf/fy20261q/qa_20261q.pdf)	Management evidence and risks	`mhi_q1_fy2026_qa.pdf` / `1e5da110136c264ed2992200675c6e16d33e833f37c32c087fbb528e461c53a7`

ID	Source fetched live	Purpose	Archive / SHA-256
D-O4	[FY2025 presentation](https://www.mhi.com/finance/library/result/pdf/fy20254q/presentation.pdf)	FY2025 current perimeter and products	`mhi_fy2025_presentation.pdf` / `170893dcbf9828200073f1cf7b3b26d515862aa38fd60f50abf95e0e5785eeaf`
D-O5	MHI Q2/Q3 FY2025 presentations and Q&A	Prior-quarter trend	`mhi_q2_fy2025_*`; `mhi_q3_fy2025_*`
D-O6	[2024 MTBP progress](https://www.mhi.com/finance/library/plan/pdf/260527presentation_summary.pdf)	Strategy, capacity and capital allocation	`mhi_2024_mt_plan_progress_20260527_summary.pdf` / `ef1922b808c7bc0f5c24e4394b384e7bd1ccaa462b185708da454fd2c4e10b5b`
D-O7	[Official annual workbook](https://www.mhi.com/finance/finance/data/main2025.xlsx)	FY1999-FY2025 segment series	`mhi_main_financial_segment_data_1999_2025.xlsx` / `3b3f3af84dc44ad6e03a5db9e8b484a6e9460459754aacae49fb17cd4f3602bc`

Completeness matrix

Dataset / family	Official sources	Search names	Available	Included?	Exclusion / boundary	Relevance
Segment economics	D-O1, D-O2, D-O4, D-O7	Business Segment Data; Financial Results by Segment	FY2021-FY2025; Q1 FY2026	Yes	Current taxonomy recast only for FY2025 and prior Q1	Appendices and synthesis
Industrial KPIs	D-O2, D-O4, D-O6	GTCC; nuclear; defense; deliveries; after-sales	FY2022-FY2025 selected; Q1 FY2026	Yes	Some product series provide two to four years	Growth and moat
Backlog / capacity	D-O2, D-O3, D-O4, D-O6	Order Backlog; production capacity	FY2024 end, FY2025 end, Q1 FY2026	Yes	Older current-segment backlog not in checked materials	Durability
Capital / balance sheet	D-F2, D-O1, D-O4	cash; debt; capex; R&D; advances	FY2021-FY2025; Q1 FY2026	Yes	Broad and narrow debt kept separate	ROIC / liquidity
Recent trend	D-O2, D-O4, D-O5	quarterly segment results	Q2 FY2025-Q1 FY2026	Yes, flagged	Industrial discrete history not clean across reorganization	Recency
Product dollars	D-O2, D-O4	GTCC; nuclear; engines; HVAC; defense	Two to four years plus Q1	Yes	No back-solves used	Segment models
Geographic revenue	D-O2, D-O4	Revenue by Region	FY2024-FY2025; Q1 comparison	Yes	Five-year current table not in source set	FX / demand

Material KPI history

KPI family	Granularity	FY2021	FY2022	FY2023	FY2024	FY2025	Latest interim	Source
Order intake	Consolidated, JPY bn	4,067.7	4,501.3	6,684.0	6,405.1 restated	7,653.6	2,022.4 Q1	D-O7; D-O2; D-O4
Revenue	Consolidated, JPY bn	3,860.3	4,202.8	4,657.1	4,361.1 restated	4,974.2	1,194.2 Q1	QF; D-O2; D-O4
Profit from business activities	Consolidated, JPY bn	160.2	193.3	282.5	355.0 restated	432.2	159.6 Q1	QF; D-O1; D-O4; D-O7
Large-frame GT orders	Units	n/d	n/d	n/d	25	35	10 Q1	D-O2 p.21; D-O4 p.31
Large-frame GT backlog	Units	n/d	n/d	n/d	48	74	80 Q1	D-O2 p.21; D-O4 p.31
Defense & Space revenue	JPY bn	n/c	474.9	606.4	827.6	1,144.5	216.3 Q1	D-O2; D-O4
Nuclear Power revenue	JPY bn	n/d	284.4	300.8	299.0	361.1	80.3 Q1	D-O2; D-O4
Industrial Solutions revenue	JPY bn, current taxonomy	n/c	n/c	n/c	n/c	699.900	723.194 TTM	Sealed QF/QFR; FY2025 less Q1 FY2025 plus Q1 FY2026
Consolidated backlog	JPY bn	n/d	n/d	n/d	10,236.2	13,237.6	14,103.0 Q1	D-O2; D-O4
Commercial deliveries	777 / 777X / 787	n/d	n/d	n/d	19 / 7 / 45	23 / 9 / 73	7 / 1 / 21 Q1	D-O2; D-O4

`n/d` means true non-disclosure in the specifically searched official source set; `n/c` means not cleanly comparable. Neither label was inferred from FMP.

1. Reporting structure and taxonomy

MHI has four reportable segments. **Energy Systems** includes GTCC, Steam Power, Aero Engines, Nuclear Power and services. **Plants & Infrastructure Systems** includes Engineering, Metals Machinery, Machinery Systems, Commercial Ships and other infrastructure equipment. **Industrial Solutions** is the renamed successor to Logistics, Thermal & Drive Systems and includes Engines & Turbochargers, HVAC & Car A/C and, from 2026-04-01, Data Center & Energy Management. **Aircraft, Defense & Space** includes Defense & Space and Commercial Aviation. `Others, Corporate & Eliminations` is not a fifth segment; it remains the corporate/unallocated and elimination bridge.

The taxonomy boundary is material. Mitsubishi Logisnext was classified as discontinued and removed from consolidation on 2026-05-01. Effective 2026-04-01, LT&D became Industrial Solutions and Data Center & Energy Management moved into it. MHI retroactively adjusted FY2025 and Q1 FY2025 in FY2026 materials, but did not publish a complete five-year current-taxonomy recast. The workbook also records changes in 2010, 2013, 2017 and 2020. Older series below are therefore predecessor context, not silently blended current taxonomy.

FY2025 line	Revenue, JPY bn	% of total	Treatment
Energy Systems	2,062.6	41.47%	Reportable segment
Plants & Infrastructure Systems	880.8	17.71%	Reportable segment
Industrial Solutions	699.9	14.07%	Reportable segment; restated
Aircraft, Defense & Space	1,393.8	28.02%	Reportable segment
Reportable subtotal	5,037.1	101.27%	Before bridge
Others, Corporate & Eliminations	-63.1	-1.27%	Corporate/unallocated bridge
Consolidated revenue	4,974.2	100.00%	Exact JPY 4,974,168m

FY2025 geography was Japan JPY 2,352.0bn (47%), Asia-Pacific ex-Japan JPY 696.9bn (14%), Americas JPY 1,338.9bn (27%), and EMEA JPY 586.1bn (12%). Q1 FY2026 mix was 40%, 16%, 30%, and 14%, respectively. Sources are D-O4 p.33 and D-O2 p.23.

2. Consolidated historicals

Official-source overrides control wherever discontinued operations or metric definitions differ. D-F1 independently confirmed FY2025 revenue JPY 4,974,168m. FMP `operatingIncome` is not the same as MHI's exact `Profit from business activities`; FY2025 differs by JPY 17,646m. FY2024 is restated continuing operations, while earlier years precede the perimeter restatement.

Metric	FY2021	FY2022	FY2023	FY2024 restated	FY2025	Source
Revenue, JPY bn	3,860.3	4,202.8	4,657.1	4,361.1	4,974.2	QF; D-F1; D-O4
Profit from business activities, JPY bn	160.2	193.3	282.5	355.0	432.2	QF; D-O4; D-O7
Margin	4.15%	4.60%	6.07%	8.14%	8.69%	Calculated
Profit attributable to owners, JPY bn	113.5	130.5	222.0	245.4	332.1	QF; D-F1; D-O7
Diluted EPS, JPY	33.81	38.83	66.04	73.02	98.84	QF; D-F1
Diluted shares, million	3,358.9	3,358.9	3,361.6	3,359.8	3,360.3	QF P6; D-F1
Cash-flow capex, JPY bn	129.3	131.9	160.5	240.7	181.1	QF P6; D-F2
FCF, CFO less capex, JPY bn	156.3	-51.0	170.7	289.8	761.6	QF P6; D-F2
Diagnostic ROIC	4.9%	6.0%	7.9%	8.6%	12.0%	Calculation below

ROIC is a diagnostic: NOPAT equals Profit from business activities times one minus effective tax rate. Average invested capital is average beginning/end parent equity plus broad financial liabilities less cash. NOPAT / average-invested-capital pairs (JPY bn) are 115.8 / 2,348.8; 148.0 / 2,463.2; 218.3 / 2,771.0; 248.3 / 2,888.2; and 326.3 / 2,725.0. The broad-liability definition is conservative and avoids flattering returns.

TTM ended 2026-06-30: revenue JPY 5,134.262bn, Profit from business activities JPY 495.173bn, pretax JPY 562.457bn, parent profit JPY 398.582bn, diluted EPS JPY 118.60, and FCF JPY 966.141bn. These TTM values—not FY2025—are the

forward base.

3. Segment historicals

The exact basis is `Segment profit (represents profit from business activities)`. FY2021-FY2024 use the official FY2020-taxonomy workbook; FY2025 uses the sealed current restatement.

Energy Systems	FY2021	FY2022	FY2023	FY2024 predecessor	FY2025 current	Source
Revenue, JPY bn	1,651.0	1,738.6	1,761.5	1,815.7	2,062.6	D-O7; sealed QF
YoY	n/m	5.3%	1.3%	3.1%	13.6%	Calculated
Segment profit (represents profit from business activities), JPY bn	86.2	85.1	141.5	205.3	267.2	D-O7; sealed bridge
Margin	5.2%	4.9%	8.0%	11.3%	13.0%	Calculated

Plants & Infrastructure Systems	FY2021	FY2022	FY2023	FY2024 predecessor	FY2025 current	Source
Revenue, JPY bn	651.8	675.6	795.2	852.1	880.8	D-O7; sealed QF
YoY	n/m	3.7%	17.7%	7.2%	3.4%	Calculated
Segment profit (represents profit from business activities), JPY bn	23.6	32.7	54.8	59.6	84.1	D-O7; sealed bridge
Margin	3.6%	4.8%	6.9%	7.0%	9.5%	Calculated

Industrial Solutions / LT&D predecessor	FY2021	FY2022	FY2023	FY2024 predecessor	FY2025 current	TTM current	Source
Revenue, JPY bn	986.5	1,203.7	1,314.5	1,307.1	699.900	723.194	D-O7; sealed QF/QFR for FY2025 and TTM
YoY / roll-forward change	n/m	22.0%	9.2%	-0.6%	n/c	3.33% vs FY2025	TTM is FY2025 less Q1 FY2025 plus Q1 FY2026
Segment profit (represents profit from business activities), JPY bn	30.6	38.9	72.8	49.3	-2.000	3.911	D-O7; sealed bridge
Margin	3.1%	3.2%	5.5%	3.8%	-0.3%	0.54%	Calculated on exact current-taxonomy values

FY2025 current Industrial Solutions includes transferred Data Center & Energy Management and excludes former Mitsubishi Logisnext. The legacy LT&D-ex-ML values in the FY2025 presentation were revenue JPY 630.8bn and profit JPY 33.0bn; they do not replace sealed current values JPY 699.9bn and negative JPY 2.0bn.

Aircraft, Defense & Space	FY2021	FY2022	FY2023	FY2024 predecessor	FY2025 current	Source
Revenue, JPY bn	605.2	619.4	791.5	1,030.6	1,393.8	D-O7; sealed QF
YoY	n/m	2.3%	27.8%	30.2%	35.2%	Calculated
Segment profit (represents profit from business activities), JPY bn	24.0	39.9	72.6	99.9	151.5	D-O7; sealed bridge
Margin	4.0%	6.4%	9.2%	9.7%	10.9%	Calculated

Corporate / elimination context	FY2021	FY2022	FY2023	FY2024 predecessor	FY2025 sealed	Source
Revenue, JPY bn	-34.5	-34.7	-5.8	21.5	-63.1	D-O7; sealed QF
Profit bridge, JPY bn	-0.4	-0.3	-59.3	-31.0	-68.5	D-O7; sealed bridge
Treatment	Corporate	Corporate	Corporate	Corporate	Corporate / unallocated	Not a fifth segment

3a. Historical statutory-profit bridge and forecast-driver ledger

Exact sealed SHA-256: `16934a6da80a4a9aef08f6673a9a29316296d5ddd8afd9401aef406b27dfe81e`. The validator returned `STATUTORY_BRIDGE_VALID`. Values below are exact JPY millions; labels, signs, classifications and source IDs are preserved.

FY2025 ended 2026-03-31

Bridge line	Classification	Value	Source ID	Running subtotal
Energy Systems	segment profit	267,200	MHI_FY2025_PRESENTATION_RESTATED	267,200
Plants & Infrastructure Systems	segment profit	84,100	MHI_FY2025_PRESENTATION_RESTATED	351,300
Industrial Solutions	segment profit	-2,000	MHI_FY2025_PRESENTATION_RESTATED	349,300
Aircraft, Defense & Space	segment profit	151,500	MHI_FY2025_PRESENTATION_RESTATED	500,800
Sum of reportable segment profit	segment profit	500,800	Arithmetic	500,800
Others, Corporate & Eliminations	corporate_unallocated	-68,500	MHI_FY2025_PRESENTATION_RESTATED	432,300
Consolidated segment profit metric	subtotal	432,218	MHI_FY2025_RESULTS	432,218
Profit from business activities	statutory subtotal	432,218	MHI_FY2025_RESULTS	432,218
Finance income	other_non_operating	59,460	MHI_FY2025_RESULTS	491,678
Finance costs	other_non_operating	-16,984	MHI_FY2025_RESULTS	474,694
Profit before income taxes	statutory subtotal	474,694	MHI_FY2025_RESULTS	474,694
Income taxes	tax	-116,306	MHI_FY2025_RESULTS	358,388
Profit (loss) from discontinued operations	discontinued_operations	-12,445	MHI_FY2025_RESULTS	345,943
Profit attributable to non-controlling interests	noncontrolling_interests	-13,812	MHI_FY2025_RESULTS	332,131
Net income	statutory subtotal	332,129	MHI_FY2025_RESULTS	332,129

JPY 82m corporate and JPY 2m net-income residuals are within the JPY 250.4m tolerance; neither is a plug.

TTM ended 2026-06-30

Bridge line	Classification	Value	Source ID	Running subtotal
Energy Systems	segment profit	312,195	MHI_TTM_RECONCILIATION	312,195
Plants & Infrastructure Systems	segment profit	87,269	MHI_TTM_RECONCILIATION	399,464
Industrial Solutions	segment profit	3,911	MHI_TTM_RECONCILIATION	403,375
Aircraft, Defense & Space	segment profit	155,116	MHI_TTM_RECONCILIATION	558,491
Sum of reportable segment profit	segment profit	558,491	Arithmetic	558,491
Others, Corporate & Eliminations	corporate_unallocated	-63,237	MHI_TTM_RECONCILIATION	495,254
Consolidated segment profit metric	subtotal	495,173	MHI_TTM_RECONCILIATION	495,173
Profit from business activities	statutory subtotal	495,173	MHI_TTM_RECONCILIATION	495,173
Finance income	other_non_operating	76,111	MHI_TTM_RECONCILIATION	571,284
Finance costs	other_non_operating	-8,827	MHI_TTM_RECONCILIATION	562,457
Pretax income	statutory subtotal	562,457	MHI_TTM_RECONCILIATION	562,457
Income taxes	tax	-139,423	MHI_TTM_RECONCILIATION	423,034
Profit (loss) from discontinued operations	discontinued_operations	-10,373	MHI_TTM_RECONCILIATION	412,661
Profit attributable to non-controlling interests	noncontrolling_interests	-14,076	MHI_TTM_RECONCILIATION	398,585

Bridge line	Classification	Value	Source ID	Running subtotal
Net income	statutory subtotal	398,582	MHI_TTM_RECONCILIATION	398,582

JPY 81m corporate and JPY 3m net-income residuals are within the JPY 281.2285m tolerance. No operating bridge adjustment exists: consolidated segment profit metric equals Profit from business activities.

Historical bridge line	FY value	TTM value	Forecast treatment	Driver	Bear / base / bull rule
Others, Corporate & Eliminations	-68,500	-63,237	Corporate expense / elimination	FY2026 guidance is -90,000	More negative / source-bound / no better than normalized history
Finance income	59,460	76,111	Cash and investment yield	Sealed bridge plus cash	Lower / normalized / higher yield
Finance costs	-16,984	-8,827	Debt and interest schedule	Broad and narrow debt	Higher / base / lower cost; no netting
Income taxes	-116,306	-139,423	Effective tax rate	FY 24.5%; TTM 24.8%	Higher / normalized / lower sustainable rate
Discontinued operations	-12,445	-10,373	Zero only after cessation proof	Logisnext removed 2026-05-01	Tail cost / zero if confirmed / zero if confirmed
Non-controlling interests	-13,812	-14,076	Entity schedule or profit ratio	Sealed bridge	Higher / base / lower leakage

STATUTORY_BRIDGE_STATUS: VERIFIED — CLEARED FOR FORECASTING

4. Product and sub-segment historicals

Only products separately disclosed in official MHI presentations are shown. There are no back-solved dollar figures. Where the presentation provides only two years, the table says so. GTCC, Nuclear Power and Defense & Space have longer operating histories; the FY2026 organizational change makes Data Center & Energy Management history non-comparable inside Industrial Solutions.

Segment	Product	What it is	Dollar disclosure?	Disclosed annual revenue and source
Energy Systems	GTCC	Large-frame gas turbine combined-cycle equipment and services	Yes	FY2022 736.8; FY2023 735.6; FY2024 790.7; FY2025 992.2 JPY bn; D-O4 pp.6,17
Energy Systems	Nuclear Power	Japan LWR, fuel cycle and advanced-reactor work	Yes	FY2022 284.4; FY2023 300.8; FY2024 299.0; FY2025 361.1 JPY bn; D-O4 pp.7,17
Energy Systems	Steam Power	Steam power equipment and service	Yes	FY2024 403.9; FY2025 367.5 JPY bn; D-O4 p.17
Energy Systems	Aero Engines	Civil aero-engine components and MRO	Yes	FY2024 212.3; FY2025 274.1 JPY bn; D-O4 p.17
Plants & Infrastructure Systems	Engineering	Chemical and other plant engineering	Yes	FY2024 137.8; FY2025 161.6 JPY bn; D-O4 p.18
Plants & Infrastructure Systems	Metals Machinery	Metals production machinery	Yes	FY2024 395.2; FY2025 365.6 JPY bn; D-O4 p.18
Plants & Infrastructure Systems	Machinery Systems	Infrastructure machinery systems	Yes	FY2024 172.3; FY2025 181.9 JPY bn; D-O4 p.18
Industrial Solutions	Engines & Turbochargers	Industrial engines and automotive turbochargers	Yes	FY2024 279.1; FY2025 285.6 JPY bn under legacy ex-ML perimeter; D-O4 p.19
Industrial Solutions	HVAC & Car A/C	Heating, ventilation, air conditioning and automotive A/C	Yes	FY2024 369.8; FY2025 353.1 JPY bn under legacy ex-ML perimeter; D-O4 p.19
Industrial Solutions	Data Center & Energy Management	Data-center power and energy-management activity transferred in FY2026	No clean stand-alone annual series	Included in restated FY2025 Industrial Solutions; official checked materials did not isolate dollars
Aircraft, Defense & Space	Defense & Space	Defense aircraft/missiles, naval, land and space systems	Yes	FY2022 474.9; FY2023 606.4; FY2024 827.6; FY2025 1,144.5 JPY bn; D-O4 pp.8,20
Aircraft, Defense & Space	Commercial Aviation	777/777X/787 structures and related activity	Yes	FY2024 203.0; FY2025 249.2 JPY bn; D-O4 p.20

The largest segment's most recent-quarter headline growth check was repeated live by DR against [MHI's Q1 FY2026 presentation](https://www.mhi.com/finance/library/result/pdf/fy20261q/presentation.pdf), created 2026-08-04 (D-O2 p.10). Energy Systems Q1 FY2026 revenue was JPY 536.3bn versus JPY 423.2bn, up JPY 113.1bn or 26.7%. The page also reports segment business profit up 80%, to JPY 101.3bn. These figures match the sealed QF at displayed precision.

Q1 FY2026 product trend

Segment	Product	Q1 FY2025 revenue, JPY bn	Q1 FY2026 revenue, JPY bn	YoY	Source
Energy Systems	GTCC	196.8	274.9	39.7%	D-O2 p.11
Energy Systems	Steam Power	96.2	86.9	-9.7%	D-O2 p.11
Energy Systems	Aero Engines	59.4	76.0	27.9%	D-O2 p.11
Energy Systems	Nuclear Power	53.7	80.3	49.5%	D-O2 p.11
Plants & Infrastructure Systems	Engineering	30.4	36.6	20.4%	D-O2 p.12
Plants & Infrastructure Systems	Metals Machinery	97.9	91.5	-6.5%	D-O2 p.12
Plants & Infrastructure Systems	Machinery Systems	40.3	35.5	-11.9%	D-O2 p.12
Industrial Solutions	Engines & Turbochargers	60.7	71.4	17.6%	D-O2 p.13
Industrial Solutions	HVAC & Car A/C	81.0	87.2	7.7%	D-O2 p.13
Aircraft, Defense & Space	Defense & Space	202.1	216.3	7.0%	D-O2 p.14
Aircraft, Defense & Space	Commercial Aviation	58.4	69.7	19.3%	D-O2 p.14

Product forecasts disclosed in dollars

Segment	Product	FY2025 revenue	FY2026 forecast	Modeling relevance	Source
Energy Systems	GTCC	992.2	1,100.0	Backlog conversion and improved OE pricing	D-O2 p.18
Energy Systems	Steam Power	367.5	330.0	Declining revenue and project-risk normalization	D-O2 p.18
Energy Systems	Aero Engines	274.1	260.0	Maintenance demand but modest full-year guide	D-O2 p.18
Energy Systems	Nuclear Power	361.1	400.0	Continued order-to-revenue conversion	D-O2 p.18
Plants & Infrastructure Systems	Engineering	161.6	180.0	Turkmenistan project execution	D-O2 p.18
Plants & Infrastructure Systems	Metals Machinery	365.6	400.0	Backlog execution	D-O2 p.18
Plants & Infrastructure Systems	Machinery Systems	181.9	180.0	Flat guide	D-O2 p.18
Industrial Solutions	Engines & Turbochargers	285.6	300.0	Unit and Asia demand growth	D-O2 p.19
Industrial Solutions	HVAC & Car A/C	353.1	370.0	Higher units offset China risk	D-O2 p.19
Aircraft, Defense & Space	Defense & Space	1,144.5	1,250.0	Execution of multi-year defense backlog	D-O2 p.19
Aircraft, Defense & Space	Commercial Aviation	249.2	250.0	Roughly flat despite higher Q1 deliveries	D-O2 p.19

After-sales mix and capacity evidence

The official materials disclose recurring-revenue mix and capacity indicators that are not captured by FMP's empty segment endpoints. The annual and Q1 ratios are different measurement windows and are not spliced into a single trend.

KPI	FY2024	FY2025	Q1 FY2025	Q1 FY2026	Source / boundary
Energy Systems after-sales revenue ratio	62%	63%	64%	59%	D-O4 p.31; D-O2 p.22; annual versus cumulative Q1
GTCC after-sales revenue ratio	51%	49%	55%	45%	D-O4 p.31; D-O2 p.22; equipment mix rose in Q1
Steam Power after-sales revenue ratio	65%	76%	67%	79%	D-O4 p.31; D-O2 p.22
Aero Engines after-sales revenue ratio	n/d	n/d	73%	72%	D-O2 p.22; annual ratio absent from D-O4 table

KPI	FY2024	FY2025	Q1 FY2025	Q1 FY2026	Source / boundary
Nuclear Power after-sales revenue ratio	77%	71%	74%	66%	D-O4 p.31; D-O2 p.22

Capacity / execution KPI	Starting point	Latest disclosed point	Forecast use	Source
Growing Core Businesses personnel	About 26,000 in FY2023	About 31,000 in FY2025; about 33,000 FY2026 forecast	Evidence of labor build, not proof of proportional output	D-O6 p.20
GTCC production capacity	FY2024 reference base	More than 1,000 kaizen actions gave line of sight to a 30% increase; further expansion remains in progress	Do not assume the prospective doubling is already online	D-O6 p.17; D-O3 p.4
Defense missile-system lead time	Pre-review process	Targeted reduction to one-third; new Nagoya factory and automated inspection still ramping	Gate revenue conversion on delivered capacity	D-O6 p.18
Nuclear spent-fuel-cask capacity	20 units annually	25 units annually after bottleneck removal	Bounded 25% capacity increase	D-O6 p.19
Contract liabilities / customer advances	JPY 1,443.9bn at FY2024 end	JPY 2,161.8bn at FY2025 end; JPY 2,483.2bn at Q1 FY2026	Backlog funding and future working-capital use; not immediately distributable cash	D-O4 p.12; D-O1

The current forecast includes consolidated revenue JPY 5,400bn, Profit from business activities JPY 540bn, parent profit JPY 380bn, EBITDA JPY 660bn, FCF JPY 600bn, and dividend JPY 29 per share. It assumes JPY 150/USD and JPY 180/EUR and excludes uncertain Middle East effects. The JPY 540bn profit guide includes a JPY 20bn risk buffer for one-time expenses.

5. Most recent quarterly trend

MHI FY ends March 31. The most recently completed fiscal quarter is Q1 FY2026, April-June 2026, reported on 2026-08-04 via [MHI's results release](https://www.mhi.com/finance/library/result/pdf/fy20261q/financial_results.pdf).

Discrete Q2-Q4 figures are derived from official cumulative releases; Q1 FY2026 is reported. YoY is shown only where an equivalent discontinued-operation and taxonomy perimeter can be constructed. The current Industrial Solutions taxonomy does not have four discrete comparable quarters, so the legacy LT&D ex-ML series is labeled rather than spliced; its exact current-taxonomy TTM revenue is nevertheless verified at JPY 723.194bn through the official FY-minus-prior-Q1-plus-current-Q1 bridge below.

Quarter	Revenue, JPY bn	YoY	Profit from business activities, JPY bn	Margin	Source
Q2 FY2025	1,079.6	n/c	74.8	6.9%	D-O5 1H less Q1; prior-Q1 perimeter unavailable
Q3 FY2025	1,213.2	12.6%	129.7	10.7%	D-O5 Q1-3 less 1H
Q4 FY2025	1,647.3	25.3%	131.0	8.0%	D-O4 FY less Q1-3
Q1 FY2026	1,194.2	15.5%	159.6	13.4%	D-O1; D-O2

Segment / quarter	Q2 FY2025 revenue / profit	Q3 FY2025 revenue / profit	Q4 FY2025 revenue / profit	Q1 FY2026 revenue / profit	Source / warning
Energy Systems	447.8 / 24.3	483.7 / 66.0	707.9 / 120.5	536.3 / 101.3	D-O2, D-O4, D-O5; JPY bn
Plants & Infrastructure Systems	208.0 / 26.1	218.0 / 20.3	246.9 / 19.2	200.0 / 21.7	Same sources; JPY bn
Industrial / legacy LT&D	n/c	154.6 / 10.8 legacy	193.8 / 14.6 legacy	177.9 / 9.9 current	Do not trend margins across taxonomy boundary
Aircraft, Defense & Space	278.3 / 31.5	352.4 / 45.0	502.6 / 46.2	286.0 / 32.4	D-O2, D-O4, D-O5; JPY bn
Others, Corporate & Eliminations	n/c	4.5 / -12.4	-4.0 / -69.5	-6.1 / -5.8	Corporate bridge, not operating segment

Industrial Solutions exact TTM revenue bridge	FY2025	Less Q1 FY2025	Plus Q1 FY2026	TTM ended 2026-06-30	Source / basis
Revenue, JPY bn	699.900	-154.608	177.902	723.194	QFR-verified current taxonomy; sealed QF/QFR arithmetic

Backlog rose from JPY 10,236.2bn at FY2024 end to JPY 13,237.6bn at FY2025 end and JPY 14,103.0bn at Q1 FY2026. Q1 segment backlog was Energy JPY 7,814.6bn, Plants JPY 2,286.1bn, Industrial JPY 103.2bn, and Aircraft/Defense/Space JPY 3,898.3bn. The backlog is a powerful forward indicator but also creates execution, working-capital and fixed-price-project risk.

6. Management commentary on forward growth

This ledger uses short verbatim excerpts from live-fetched transcripts and official Q&A, followed by interpretation. The four most recent evidence dates are 2025-11-07 official Q2 materials, 2026-02-04 Q3 transcript, 2026-05-12 FY2025 transcript, and 2026-08-04/06 Q1 transcript/Q&A. FMP's FY2025 Q2 transcript returned the anomalous date 2026-11-07, outside the expected window; it was archived but excluded. No speaker or date was silently repaired.

Energy Systems

Source / speaker	Verbatim excerpt	Topic	Modeling interpretation
Q1 FY2026, 2026-08-06, CFO Hiroshi Nishio, D-O3	“GTCC demand remains strong”	Order environment	High demand supports order intake, but project selection and capacity govern realizable growth.
Q1 FY2026, CFO Nishio, D-O3	“profitability ... continues to improve gradually”	New-order margin	Better-priced orders phase into revenue through 2028-2031; do not assume an immediate full-margin reset.
Q1 FY2026, CFO Nishio, D-O3	“scheduled for delivery between 2028 and 2030”	Backlog duration	Supports multi-year revenue visibility and makes capacity execution a model driver.
Q3 FY2025, 2026-02-04, senior presenter not identified in FMP, D-F4	“confidence in this figure”	Margin improvement	Management viewed the planned JPY 130bn full-year YoY business-profit contribution from revenue growth and margin improvement as achievable.
FY2025, 2026-05-12, MHI IR AI narrator, D-F4	“Revenue is expected to increase further”	GTCC	FY2026 growth is supported by equipment and service backlog, not merely spot demand.
2024 MTBP progress, 2026-05-27, CEO Ito, D-O6	“reduce lead times and increase throughput”	Capacity	A credible upside case needs demonstrated throughput, not only announced capex.

Q1 Energy profit included about JPY 25bn of one-time items: JPY 15bn from final contract-price recognition on a long-term project and about JPY 10bn from power-project investment sales. CFO Nishio said the margin still exceeded the full-year target after excluding them, but the reported 18.9% Q1 margin is not a clean run rate. Orders booked in Q1 were generally for 2028-2030 delivery; projects under discussion extend to 2030-2031. Q1 large-frame orders were ten units, and backlog reached 80 units / 35 GW. The Americas projects include long-term service agreements; Japan services are generally contracted annually.

Plants & Infrastructure Systems

Source / speaker	Verbatim excerpt	Topic	Modeling interpretation
Q1 FY2026 transcript, MHI IR AI narrator, D-F4	“Commercial ships increased significantly”	Orders	Q1 orders were strong even while revenue was down; timing mismatch should be modeled.
Q3 FY2025 transcript, senior presenter unidentified, D-F4	“steady progress in Engineering and Metals Machinery”	Execution	Supports FY2025 profit-guide increase; project execution is more important than unit growth.
FY2025 transcript, MHI IR AI narrator, D-F4	“driven by improved margins”	Profit	Metals Machinery and Machinery Systems drove the 41% segment-profit increase.
Q1 FY2026 presentation, D-O2	“Aiming to steadily execute backlog”	Metals Machinery	FY2026 revenue guide JPY 400bn in Metals depends on conversion of the last three years' backlog.
MTBP progress, CEO Ito, D-O6	“deploy growth investments with a long-term outlook”	Capital	Returns should be tested against project-capital intensity and long cycle times.

The FY2026 Plants guide is order intake JPY 1,000bn, revenue JPY 950bn and segment profit JPY 90bn. Engineering revenue guide is JPY 180bn; Metals Machinery JPY 400bn; Machinery Systems JPY 180bn. Q1 business profit improved through Engineering and Others, while Metals and Machinery Systems declined on lower revenue. Commercial-ships orders

sit in the segment's Others category, so product mix is not fully captured by the three principal revenue rows.

Industrial Solutions

Source / speaker	Verbatim excerpt	Topic	Modeling interpretation
Q1 FY2026 transcript, MHI IR AI narrator, D-F4	“Engines for Asian markets”	Orders	Engines provide near-term growth; geography and currency remain important.
Q3 FY2025 transcript, senior presenter unidentified, D-F4	“HVAC units sold continued to decline”	China exposure	China real-estate weakness is a real volume headwind, not a generic macro caveat.
FY2025 transcript, MHI IR AI narrator, D-F4	“resolution of a supply chain disruption”	Turbochargers	FY2025 profit rebound included normalization that should not be extrapolated repeatedly.
FY2025 transcript, CEO Ito, D-F4	“expand sales of cooling systems”	U.S. and India	Reach expansion is a potential growth vector but currently lacks stand-alone dollar disclosure.
MTBP progress, CEO Ito, D-O6	“physical AI in automated manufacturing”	New demand	Strategic optionality exists, but the model should require orders and margins before credit.

FY2026 current-taxonomy guidance is order intake JPY 750bn, revenue JPY 750bn and segment profit JPY 30bn, a return to profitability from negative JPY 2bn. Product revenue guidance is JPY 300bn for Engines & Turbochargers and JPY 370bn for HVAC & Car A/C. The missing JPY 80bn includes other activities, including the transferred Data Center & Energy Management perimeter. MHI did not separately disclose a clean five-year dollar series for that transferred activity.

Aircraft, Defense & Space

Source / speaker	Verbatim excerpt	Topic	Modeling interpretation
Q1 FY2026 transcript, MHI IR AI narrator, D-F4	“order backlog remained high”	Defense	Backlog around JPY 3.9tn supports revenue, but order intake is lumpy.
Q3 FY2025 transcript, senior presenter unidentified, D-F4	“steady execution of the backlog”	Defense profit	Margin growth depends on disciplined program execution.
FY2025 transcript, MHI IR AI narrator, D-F4	“We expect revenue growth to continue”	Defense	JPY 1.25tn FY2026 defense revenue guide is grounded in accumulated orders.
Q1 FY2026 Q&A, CFO Nishio, D-O3	“revenue to increase gradually”	Capacity	Production build-out must bridge toward roughly JPY 1.5tn annual order intake.
MTBP progress, CEO Ito, D-O6	“providing safety and security”	Strategic demand	Defense demand is structurally supported but remains budget, execution and policy sensitive.

FY2026 segment guide is order intake JPY 1,750bn, revenue JPY 1,500bn and segment profit JPY 170bn. Defense & Space revenue guide is JPY 1,250bn and Commercial Aviation JPY 250bn. The order guide was raised JPY 100bn after Q1, but management said this was a pipeline reassessment rather than one specific new award. Defense revenue growth requires production facilities and workforce expansion. Q1 787 deliveries rose to 21 from 18; full-year FY2025 deliveries were 73 versus 45 in FY2024.

7. Capital allocation history

Capex below is FMP cash-flow purchases of PPE/intangibles to remain consistent with QF. FMP R&D is the income-statement expense line. MHI separately disclosed broader FY2025 R&D expense of JPY 289.0bn including contracted R&D; it is not mixed into the FMP five-year series. M&A shows the provider's signed `acquisitionsNet` line and should not be read as deal consideration without transaction-level reconciliation.

Year	Capex, JPY bn	Capex / revenue	R&D, JPY bn	R&D / revenue	Buybacks, JPY bn	Dividends, JPY bn	FMP acquisitionsNet, JPY bn	Source
FY2021	129.3	3.35%	72.1	1.87%	2.6	40.2	15.3	D-F1; D-F2
FY2022	131.9	3.14%	75.3	1.79%	0.0	38.5	-3.5	D-F1; D-F2
FY2023	160.5	3.45%	77.6	1.67%	0.0	50.3	-73.6	D-F1; D-F2

Year	Capex, JPY bn	Capex / revenue	R&D, JPY bn	R&D / revenue	Buybacks, JPY bn	Dividends, JPY bn	FMP acquisitionsNet, JPY bn	Source
FY2024	240.7	5.52%	74.3	1.70%	12.4	77.2	71.7	D-F1; D-F2; revenue restated
FY2025	181.1	3.64%	80.2	1.61%	0.2	80.5	-7.5	D-F1; D-F2

The 2024 MTBP period forecast now expects JPY 2.6tn of cash inflows versus the initial JPY 1.51tn, while total capital allocation stays near JPY 1.51tn: about JPY 680bn growth investment, JPY 280bn competitiveness investment, JPY 280bn shareholder returns, and JPY 280bn asset sales/other in the plan's presentation. Approximately JPY 1.3tn of FY2026-end cash is expected to remain available for backlog working capital and later growth investment, including GTCC capacity. This cash is not automatically distributable because much arose from customer advances.

8. Balance sheet snapshot at FY2025 end

Item	JPY bn	Source / definition
Cash and equivalents	1,334.9	QF; D-F2; D-O1
Short-term investments	0.0	D-F2 provider field
Broad financial liabilities	876.2	QF; includes leases and factoring
Narrow interest-bearing debt	515.7	D-O4; management funding measure
Broad net debt / (cash)	-458.6	Broad liabilities less cash
Broad net debt / EBITDA	-0.83x	Broad net cash divided by FY2025 EBITDA JPY 553.7bn
Goodwill	106.4	D-F2; D-O1
Intangible assets	77.5	D-F2; D-O1
Parent equity	3,088.6	D-F2; D-O1
Tangible parent book value	2,904.7	Parent equity less goodwill and intangibles

At Q1 FY2026, cash rose to JPY 1,684.1bn, broad financial liabilities fell to JPY 853.8bn, and parent equity rose to JPY 3,171.2bn. Contract liabilities reached JPY 2,483.2bn, reflecting large advances. MHI's narrow net interest-bearing debt was negative JPY 1,164.2bn. The difference from broad net cash is definitional and must not be hidden in valuation.

9. Recent corporate actions and guidance changes

- **2026-05-01 — Mitsubishi Logisnext removal.** The former subsidiary was sold/removed from consolidation; associated assets and liabilities had been held for sale. MHI restated continuing-operation revenue and Profit from business activities. Sources: D-O1, D-O2 and D-O4.
- **2026-04-01 — segment reorganization.** LT&D became Industrial Solutions and Data Center & Energy Management moved into it. FY2025 and Q1 FY2025 were retroactively adjusted in current materials, but no five-year current-taxonomy recast was provided. Source: D-O2.
- **2026-08-04 — order and FCF guidance raised.** FY2026 order-intake guide rose to JPY 7.0tn and FCF to JPY 600bn; revenue JPY 5.4tn, Profit from business activities JPY 540bn and parent profit JPY 380bn were unchanged. Source: D-O2.
- **2026-08-04 — segment-order revisions.** Energy and Aircraft/Defense/Space order guides each rose JPY 100bn, reflecting GTCC and Defense pipeline strength. Source: D-O2.
- **2026 — capacity investment.** MHI is increasing GTCC throughput and Defense facilities/workforce. GTCC capacity expansion is being paced against order-book certainty; Defense lacks a disclosed unit-capacity target. Sources: D-O3 and D-O6.
- **2026 — one-time Energy gains.** Q1 included about JPY 15bn contract-price finalization profit and JPY 10bn project-investment sale gains. These were already in full-year guidance and are not treated as recurring margin. Source: D-O3.
- **2026 — Middle East risk.** Current guidance excludes effects from the uncertain situation; management said impact was limited at Q1. This remains a scenario risk, not a forecasted zero. Source: D-O2.

10. Open data gaps and provenance flags

Classification	Gap / flag	Sources and searches completed	Downstream treatment
True non-disclosure	Five-year segment history under the exact FY2026 taxonomy	D-O1, D-O2, D-O4, D-O7; searched segment change, restated, Industrial Solutions, Data Center	Use predecessor history with explicit FY2025 boundary; never splice silently
True non-disclosure	Stand-alone Data Center & Energy Management revenue/profit history	D-O2, D-O4, D-O6; searched department name, data center, revenue, segment	No invented dollar series; include only in Industrial Solutions current perimeter
True non-disclosure	Five-year current-segment order backlog	D-O2, D-O4, D-O6; searched Order Backlog and segment tables	Use FY2024/FY2025/Q1 anchors only
True non-disclosure	Product-level profit for GTCC, Nuclear, Defense, Metals, Engines and HVAC	D-O2, D-O4, D-O6; searched business profit, margin and product tables	Forecast products as revenue drivers; profit remains at reportable-segment level
True non-disclosure	Clean discrete Q2 FY2025 Industrial Solutions and corporate bridge values	D-O2, D-O4, D-O5; checked discontinued and reorganization bases	Mark discrete Q2 n/c; exact current-taxonomy TTM revenue remains available and verified at JPY 723.194bn
Not fetched / omitted	Full Japanese-language audio transcripts	Official English presentation summaries and Q&A were fetched; audio not transcribed	English official sources and correctly dated FMP transcripts control
Estimated	Diagnostic ROIC	QF plus D-F1/D-F2; explicit NOPAT and invested-capital formula	Use only as analyst diagnostic, not issuer KPI
Estimated	Discrete Q2-Q4 consolidated/segment quarters	Derived by subtracting official cumulative periods	Values labeled derived; no back-solved product dollars
Not applicable	P&C ownership-perimeter and fee-count-once schedules	MHI is not an insurer/reinsurer	No Section 0b required

Transcript anomaly: the live FMP call requested FY2025 Q2 but returned a record dated 2026-11-07, one year later than the expected November 2025 call. That file was archived as negative evidence and not used. Current Q1 FY2026 returned 2026-08-04, exactly matching the earnings date, and the Q1 load-bearing management statement was independently checked against D-O3 dated 2026-08-06.

Statutory bridge: no gap is open. All four reportable segments, the Others/Corporate bridge, finance income/costs, pretax, tax, discontinued operations, NCI and parent net income are present in both FY2025 and TTM. The exact metric label `Profit from business activities` is unchanged. The sealed JSON and quote packet were not modified.

Three live self-checks: (1) largest-segment Q1 revenue growth is 26.7% and business-profit growth 80%, confirmed in D-O2; (2) CFO Nishio's statement that GTCC demand remains strong is in D-O3 with the correct Q1 FY2026 event date; (3) FY2025 revenue is JPY 4,974,168m in the new live FMP annual response and ties official results exactly.