

Analyses Details: **Siemens Energy Gas Turbines**

April 10, 2025



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Operational
Efficiency & Process
Improvement
Analysis

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SITUATION

Context

Siemens Energy is pursuing cost reductions, improved throughput, quality enhancements, and faster operational flexibility in its global gas turbine business.

Why It Matters

Large-scale industrial manufacturing with high R&D investment, wide supply chains, and a strong need to maintain competitiveness (efficiency, hydrogen-readiness, customer satisfaction).



CHALLENGES

6 Months

- Managing potential employee burnout and skill gaps in management, impacting productivity.
- Supply chain complexities (global sourcing, specialized components) creating possible bottlenecks or delays.

24 Months

- Lean manufacturing adoption and further digital process integration to keep pace with cost and throughput goals.
- Global demand fluctuations—ensuring production capacity remains flexible while sustaining high quality.
- Sustaining a competitive edge in aeroderivative turbines, especially against major rivals like GE Vernova.



POTENTIAL CONSULTING NEEDS & URGENCY

Workforce Training & Management Best Practices

Urgency: 4 

To reduce stress, close skill gaps, and maintain productivity.

Lean Supply Chain & Process Optimization

Urgency: 4 

Streamline inbound logistics, reduce lead times, enhance inventory management.

Digital/IoT Implementation for Predictive Maintenance

Urgency: 4 

Further integrate analytics and real-time monitoring to improve operational efficiency.

Aeroderivative Market Strategy

Urgency: 4 

Assess smaller turbine offerings and potential new product lines or partnerships.

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BENCHMARKS

Efficiency & Power

World-record combined cycle efficiency of 64.18% (SGT5-9000HL), High simple-cycle power output; ramp rates exceed 100 MW/min (SGT6-9000HL)

Hydrogen Capability

Current: Up to 50% hydrogen co-firing, Target: 100% hydrogen capability by 2030

Emissions & Flexibility

NOx < 25 ppm with new burner designs for hydrogen, Designed for rapid load changes to stabilize power grids



SUPPLY CHAIN & LOCATIONS

Global Footprint

Major projects in Saudi Arabia, Taiwan, Romania; Local service hubs (e.g., Dammam, Saudi Arabia); Wide global presence with extensive EPC partnerships

Manufacturing & Partnerships

Collaborations with EPC firms (e.g., China Energy International Group, CTCI), Joint development for nuclear (SMR) technology with Rolls-Royce SMR



CAPACITY UTILIZATION, INVENTORY, QUALITY METRICS

Capacity Utilization

Extremely high efficiency in combined cycle operations (e.g., Keadby 2); Exact real-time utilization rates not publicly disclosed

Quality Metrics

Efficiency beyond 64%; Low NOx emissions (~25 ppm, potentially 2 ppm with SCR); Fast ramping (85+ MW/minute in some models)



MULTI-PERIOD OPERATIONAL TRENDS

Ongoing Technology Improvements

Advancing hydrogen capability from 50% to 100% by 2030; Retrofitting existing turbines to alternative fuels (e.g., methanol)

Global Deployments & Collaborative Projects

Kuo Kuang 2 (Taiwan), Mintia (Romania), others; Upgrades to reduce CO₂ emissions by up to 66% vs. older power generation

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INDUSTRY & MARKET RESEARCH, RISKS

Market Share

GE Vernova leads (~45%); Siemens Energy next (~30%)

Industry Benchmarks

Efficiency > 64% is considered top-tier; Increasing shift towards hydrogen-ready turbines

Operational Risks

Mechanical, corrosion, erosion risks mitigated via advanced materials and stringent maintenance

Environmental Risk

Emissions addressed through hydrogen blends, advanced combustion

Grid Resilience

Ability to ramp quickly supports system stability and integration with renewables



FACTORY MODERNIZATIONS & FAILURES

Modernization & Advanced Manufacturing

Heavy investment in R&D (e.g., 3D printing); Emphasis on reducing time-to-market and improving reliability

Failures

No major factory failures reported; focus remains on improving performance and reliability



COMPETITOR METHODS, KNOWN BEST PRACTICES

Competitors

GE Vernova focuses on hydrogen-ready turbines and partnerships; Mitsubishi Power also pursuing hydrogen and net-zero strategies

Best Practices

Heavy R&D investment in advanced, flexible designs; Strategic localization and partnerships; Emphasis on sustainability, net-zero targets, digitalization (IoT/AI)



ONLINE REVIEWS & SOCIAL MEDIA SENTIMENT

Employee Insights

Positive feedback on compensation, benefits, technical prowess; Negative feedback: Stressful environment, occasional skill gap in management, potential burnout

Customer & Delivery Feedback

No major customer complaints about turbine quality/delivery; Reputation for high-quality engineering work

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Annual/Quarterly Reports

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3. <https://globalenergymonitor.org/report/leading-three-manufacturers-providing-two-thirds-of-turbines-for-gas-fired-power-plants-under-construction/>
4. [https://elcom-team.com/Subjects/%D9%86%D8%A%D9%84%D9%8A%D9%84%20%D8%A7%D9%86%D8%B7%D9%85%D8%A9%20%D8%A7%D9%84%D9%82%D9%88%D9%89/power-system-analysis-book-\(6th-ed\).pdf](https://elcom-team.com/Subjects/%D9%86%D8%A%D9%84%D9%8A%D9%84%20%D8%A7%D9%86%D8%B7%D9%85%D8%A9%20%D8%A7%D9%84%D9%82%D9%88%D9%89/power-system-analysis-book-(6th-ed).pdf)
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5. <https://www.siemens-energy.com/us/en/home/press-releases/earnings-release-q2-fy-2024.html>

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3. <https://globalenergymonitor.org/report/leading-three-manufacturers-providing-two-thirds-of-turbines-for-gas-fired-power-plants-under-construction/>
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Financial Analysis

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REVENUE GROWTH

- FY 2024: Revenue of €34.5 billion, +12.8% year-over-year.
- Orders totaled €50.2 billion, boosted by a strong Gas Services segment (orders up +28% to ~€16.4 billion).
- Outlook (FY 2025): Targets 8–10% comparable revenue growth.

FREE CASH FLOW (FCF)

- FY 2024: FCF pre-tax was €1.859 billion, more than doubling year-over-year.
- Q1 FY 2025: FCF pre-tax ~€1.5 billion, indicating continued improvement in cash generation.

PROFIT & MARGINS

- FY 2024
- Profit before Special Items: €345 million (margin ~1%).
- Net Income: €1.335 billion (net margin ~3.9% on €34.5 billion revenue).
- The difference between Net Income and Profit before Special Items reflects significant positive special items in 2024.
- Quarterly Trends
- Q3 FY 2024: Profit of €119 million (turned positive from a ~€2.1 billion net loss in Q3 FY 2023).
- Q1 FY 2025: Profit margin before special items rose to 5.4%, net income of €252 million.
- Outlook (FY 2025)
- Profit margin before special items of 3–5%; net income around breakeven (excluding potential positive special items).



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