Shizuoka Gas Company

Project Escort

Market Selection Update

XX-Dec-2025

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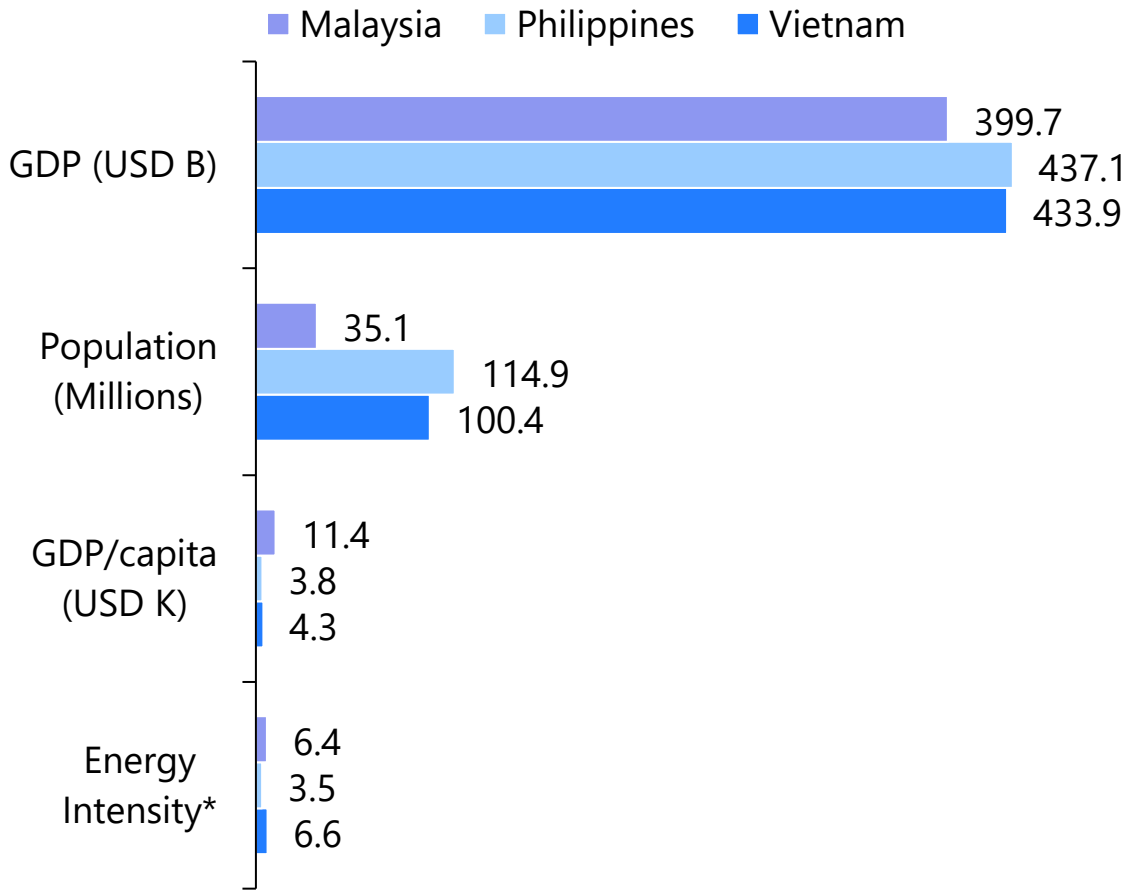
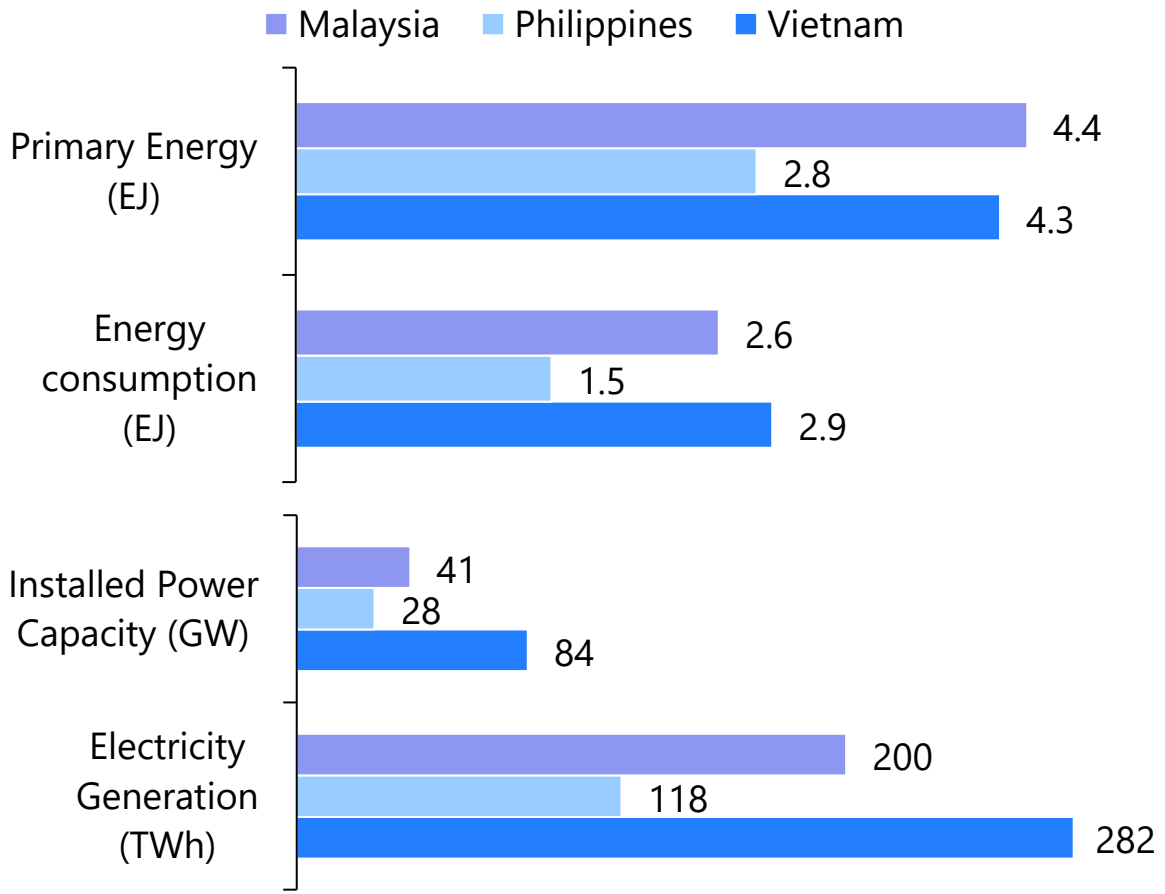
Key Indicators Snapshot

Malaysia and Vietnam have overall higher energy supply and consumption despite having a lower population indicating a higher energy intensity in these 2 countries

Key Macroeconomic & Energy Statistics (2023)

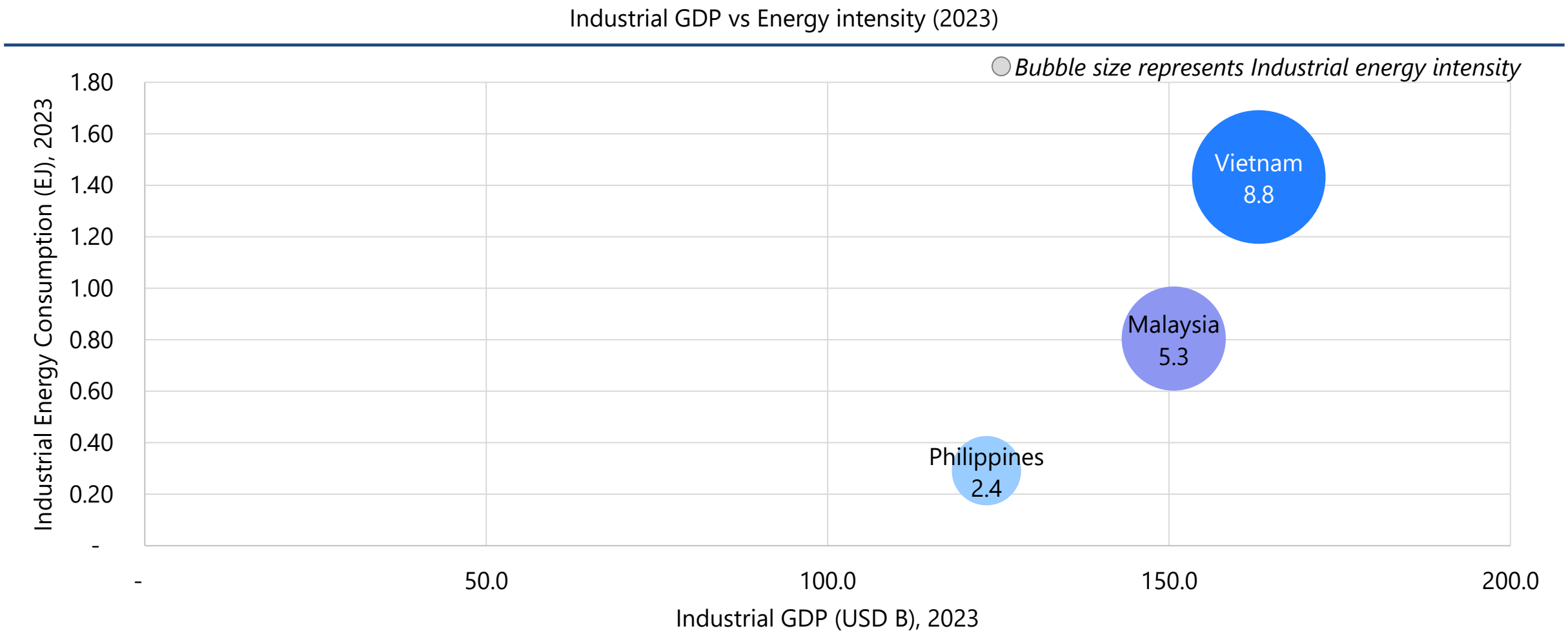




Note : *Energy intensity = Energy Consumption / GDP
Source: ASEANEnergy.org

Industrial Energy Intensity

Malaysia and Vietnam are industry heavy countries whereas Philippines is a service-based country which reflects in the energy intensity levels. Higher intensity suggests more room for ESCO players to improve energy efficiency



Source: Worldbank, IEA

Overview of Energy Services vs ESCO

An ESCO project is an energy efficiency or energy supply project delivered under an energy performance contract, where the provider assumes performance risk by guaranteeing energy or cost savings

		ESCO Project	Energy Service Project
Core offering		Implement energy measures	Advice, analysis, support
Typical scope		■ LED / HVAC retrofit with guaranteed savings ■ Solar PV with guaranteed output ■ District cooling with efficiency guarantees	■ Energy audits & assessments ■ Utility bill analysis ■ Energy management consulting ■ O&M (operations & maintenance) services
Contract type		Energy Performance Contract (EPC)	Service / consulting contract
Savings guarantee		Yes (energy or cost)	No
Performance risk		Transferred to provider	Remains with client
Payment basis		Linked to achieved performance	Fixed fee or time-based
Measurement & Verification		Mandatory	Optional
Policy treatment	Malaysia	Recognised under EECA and EPC frameworks, but adoption remains voluntary and commercially constrained by low electricity tariffs and financing limitations	Governed under the EECA and overseen by the Energy Commission, with regulation focused on accredited energy audits and compliance rather than performance guarantees
	Philippines	Explicitly defined and accredited by the DOE, with energy performance contracting formally recognised in law and policy	Governed by the Energy Efficiency and Conservation Act and administered by the DOE, centring on certified energy auditors and service providers
	Vietnam	Recognised in policy, but weak contract enforceability and underdeveloped financing frameworks limit effective performance-risk transfer	Energy service projects dominate in practice due to simpler contracting, lower risk, and limited EPC bankability, governed under national energy efficiency laws administered by MOIT

Notes: EECA: Energy Efficiency and Conservation Act (2023)
Source: International Energy Agency, YCP Research & Analysis

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The Foundational Acts: Defining Control & Competition in Malysia's Energy Sector

Policy | Market | Competitor

The Malaysian energy landscape is defined by a clear split between the Gas and Electricity sectors, each dominated by a key player making it a high-effort low-control market

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Regulator	Focus	Regulation	Key Player	Impact to Market Structure
Energy Commission - Suruhanjaya Tenaga (ST)	Oil & Gas Upstream	Petroleum Development Act 1974	**Petronas** - Absolute resource ownership	■ Petronas is the *Owner and Regulator* (via Malaysia Petroleum Management) for all oil and gas in Malaysia ■ All production is under Production Sharing Contracts with Petronas
	Piped Gas Downstream	Gas Supply Act 1993/ Third Party Access 2016		■ Designed to liberalize the gas market by allowing multiple Shippers (suppliers) to import and sell gas ■ However, these Shippers must pay regulated tariffs to utilize the existing pipelines and terminals, which are still owned by Petronas Gas Berhad
	Electricity	Electricity Supply Act 1990	**TNB** - Utility monopoly/ Single buyer	■ Regulates the generation, transmission, and distribution of electricity ■ Tenaga Nasional Berhad (TNB) is the single owner of the national grid & the sole buyer of power from all ■ IPPs sign Power Purchase Agreements with TNB
	ESCO	Energy Efficiency & Conservation Act* 2024, w.e.f. Jan'25		■ Mandated for facilities consuming >21,600 GJ/yr ~1,200 facilities mandated ■ Mandatory energy efficiency designs, energy managers and energy audits prescribed ■ Minimum energy performance standards set

Any gas-related ESCO projects MUST work within Petronas ecosystem which makes it difficult to compete

TPA Gas sourcing while legally possible, practically unviable. Can focus only on consumption optimization

No direct power generation opportunity for ESCOs. Focus must be on demand-side efficiency only

Creates mandatory compliance/ audit demand for ESCO but 2-3 years lag before full enforcement

Notes: *EECA: Energy Efficiency and Conservation Act; TPA: Third Party Access; IPPs: Independent Power Producers
Source: Suruhanjaya Tenaga, TPA regulations, EECA regulations summary from law sites

Policies

NETR highlights natural gas as a vital transitional fuel in ensuring energy security and affordability remain intact, effectively "future-proofing" gas-based ESCO projects against immediate electrification risks

National Energy Policy 2022-2040

Key Objectives

- Energy security
- Affordability
- Environmental sustainability

Targets	2018	2040
Public transport	20%	50%
Electric vehicle (EV) penetration	<1%	38%
Lower carbon fuels in heavy transport	B5 blend	B30 blend
LNG as alternative fuel in marine transport	0%	25%
Industrial/commercial energy efficiency	<1%	11%
Reduction of coal in installed capacity	31.4%	18.6%
RE in total primary energy supply	7.2%	17%

Source: Energywatch, NETR, ekonomi,gov.my

National Energy Transition Roadmap, 2023

Key Objectives

- Net Zero Green House Gas emissions by 2050
- 70% Renewable Energy capacity by 2050
- Position Natural Gas to bridge the gap

Achieved through 6 levers & 10 projects

Levers	Flagship Projects
Energy Efficiency	■ EECA Act; Energy audit for Rail Sector
Renewable Energy	■ Integrated RE Zone by Khazanah Nasional ■ Solar park and hybrid hydro-floating solar PV by TNB ■ Residential Solar by Sime Darby Property
Hydrogen	■ Sarawak Hydrogen Hub by SEDC Energy ■ Co-firing of hydrogen and ammonia by TNB
Bio energy	■ Biomass clustering by NRECC and SEDA ■ Biomass co-firing by Malakoff
Green Mobility	■ Mobility projects through electrification, solar, hydrogen ■ Biofuels Hub by Petronas
CCS	■ Regulatory Framework by Ministry of Economy ■ Kasawari carbon capture and storage (CCS) by Petronas

Regulations and Ownership restrictions for ESCO

Malaysia mandates the registration of ESCO with the Energy Commission. While 100% foreign ownership is allowed, to enjoy incentives, 60% local equity would be required, providing little control for foreign players

Regulations for ESCO

Regulation		■ The EECA 2024 is the primary legislation governing ESCOs and energy efficiency. The regulations became effective only recently from Jan-2025. ■ Key mandates: ➢ Mandatory Energy Audits: Industrial and commercial consumers exceeding 21,600 GJ per year must conduct audits every 5 years. ➢ Offices larger than 8,000 sqm must now display energy intensity labels, creating a massive market for ESCOs to provide "Retrofit" and "Performance Contracting" services.
Registration		All ESCOs must be registered with the Energy Commission (Suruhanjaya Tenaga - ST)
Requirement		Employ Registered Electrical Energy Manager (REEM) and/or a Registered Energy Auditor (REA) full-time
Foreign Ownership	100%	The Energy Commission (ST) traditionally allows *100% *if* ESCO employ local competent persons (REEM/REA)
	40%	To qualify for the GTFS 4.0 (financing), the company must have at least 60% Malaysian shareholding.

Source: Suruhanjaya Tenaga, RDS law partners

Key incentives for ESCO

Incentive	Notes
Green Investment Tax Allowance (GITA)	■ Applicability: Companies that implement green projects (e.g., waste heat recovery, energy management systems). ■ Incentive: 100% allowance on qualifying CAPEX for 5 years, which can be offset against 70% to 100% of statutory income.
Green Income Tax Exemption (GITE)	■ Applicability: Companies providing Green Services, including ESCO services, energy auditing, and green building consultancy. ■ Incentive: 70% to 100% income tax exemption for a period of 3 to 5 years (depending on the tier).
Green Technology Financing Scheme (GTFS 4.0)	■ Feature: A government-backed scheme providing a 1.5% p.a. interest/profit rate rebate for the first 7 years and a government guarantee on 60%–80% of the financing amount. ■ Eligibility: Requires 60% local equity.

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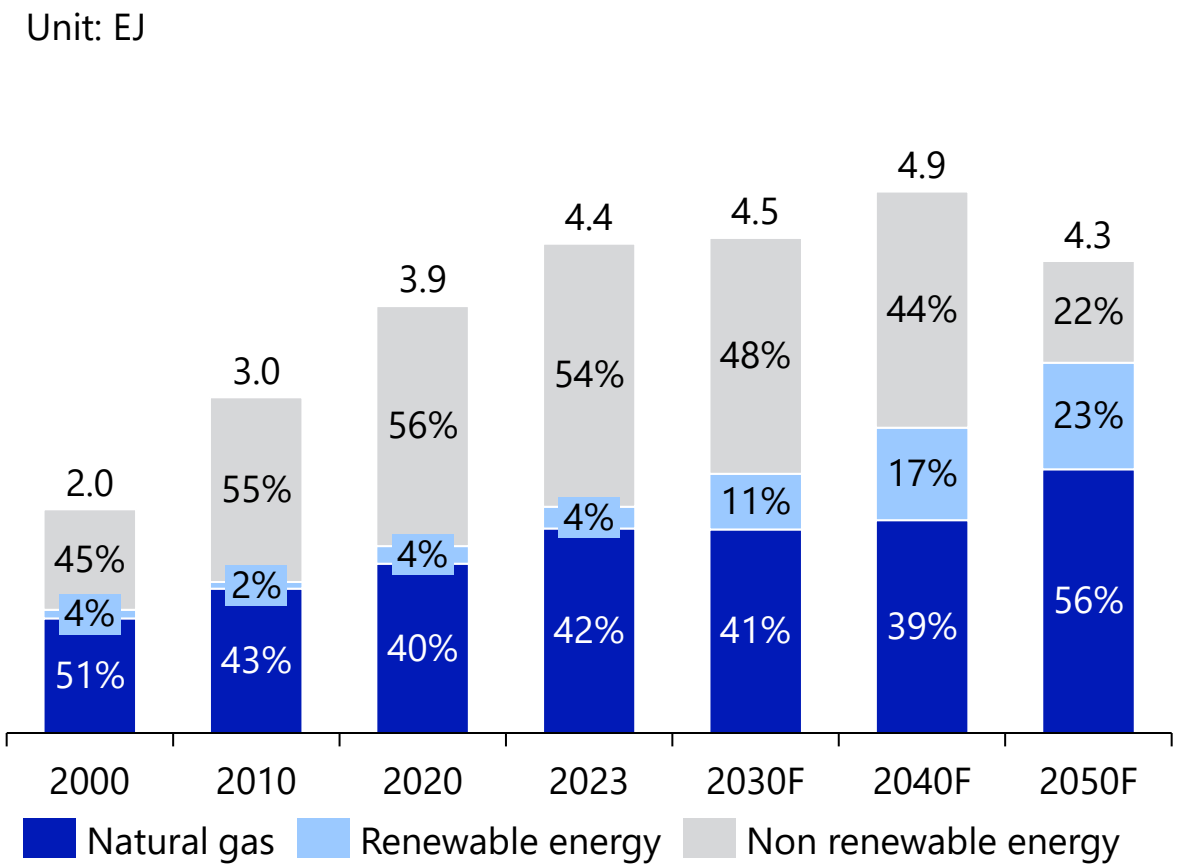
Total Primary Energy Supply (TPES)

Natural gas continues to be an anchor to Malaysia's energy security and transition. The TPES remaining constant with focus on improved efficiency. Together these present a policy guarantee for Shizuoka Gas as an ESCO

Total Primary Energy Supply by Source



Insights

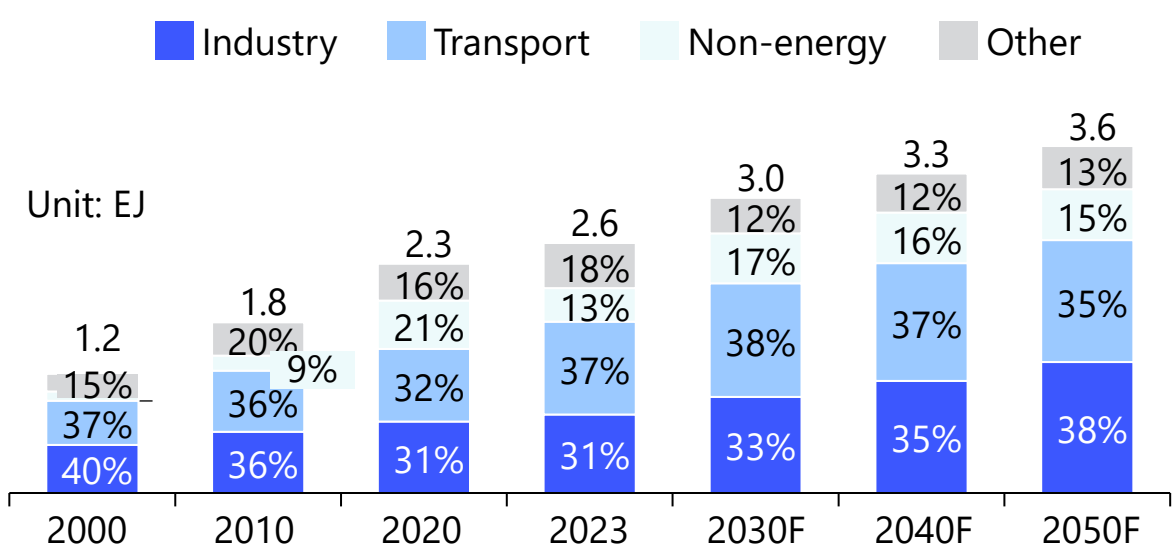
- Unlike many European roadmaps that aim for total electrification, Malaysia's NETR explicitly positions Natural Gas as the primary contributor to TPES (56% by 2050). It serves as a "swing fuel" to balance the intermittency of solar and wind.
- The striking part is the lack of growth in TPES growth despite high GDP targets.
  - The Mechanism: This is achieved through the Energy Efficiency Lever, which aims for 22% energy savings by 2050 compared to a "Business as Usual" scenario.
  - The ESCO Opportunity: This confirms that the government's priority is no longer just "building more plants," but "using less energy" at the primary supply level.
- Malaysia's remain a net exporter till 2040 signaling long-term fuel security but as the resources deplete and the shift toward market-priced imported LNG would mean Shizuoka Gas's efficiency expertise would become a mandatory financial hedge for factories against the rising cost of energy as cheap domestic gas disappears. This shift is already happening as peninsular Malaysia

Notes: Total primary energy supply excludes electricity and heat trade. Coal also includes peat and oil shale where relevant
EJ = 1,000,000 TJ. 1 terajoule is a quantity of energy, equal to 277.8 terawatt hours (TWh), 23.88 million tonne(s) of oil equivalent (Mtoe), 34.12 million tonne(s) of coal equivalent (Mtce)
Source: International Energy Agency, YCP Research and Analysis

Market Demand

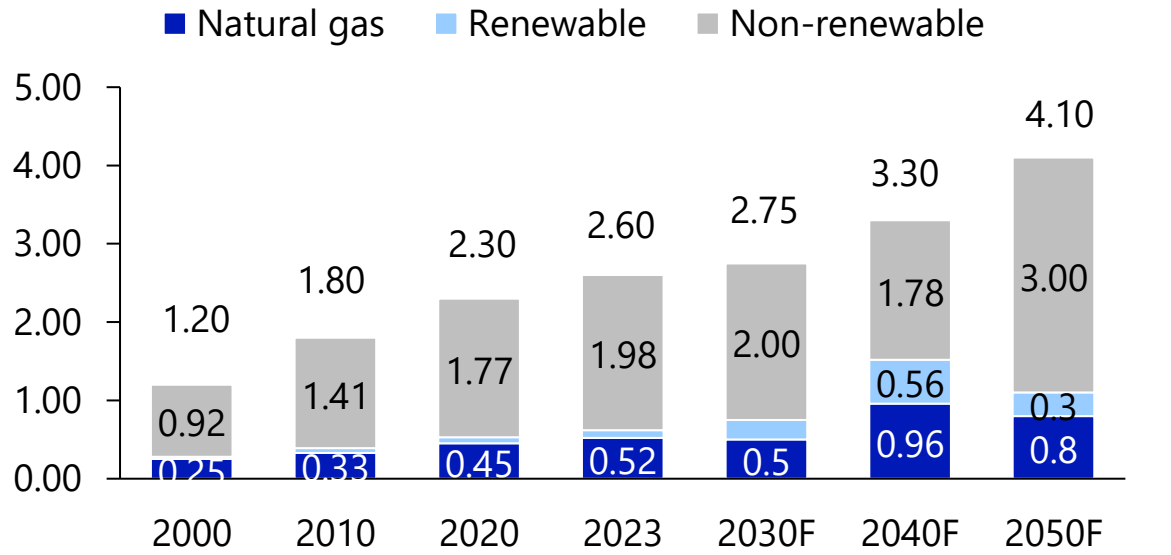
Malaysia's energy demand growth is structurally driven, with industry and transport anchoring long-term consumption expansion

Total Final Consumption by Sector



- Growing industrial demand and overall consumption signifies higher demand for ESCO given industries form the potential client pool
- Demand growth is persistent across decades, not cyclical → suitable for long-payback infrastructure and regulated-style assets
- Key industries besides Oil & Gas include chemicals, food, booming data centres etc.

Total Energy Consumption by Source



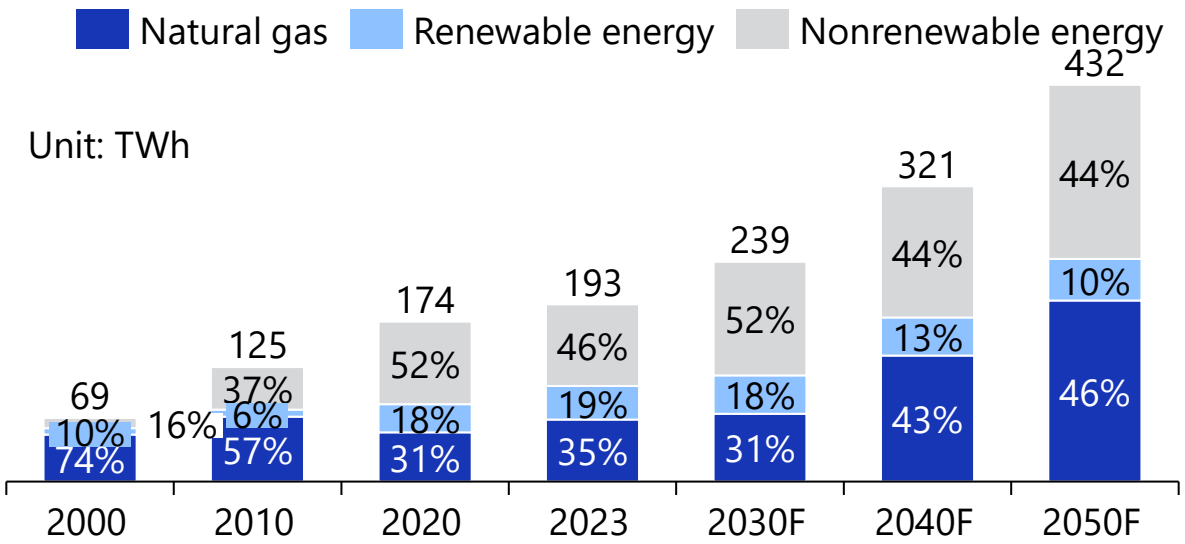
- In many markets, gas is being phased out for renewables. In Malaysia, gas is expected to displace coal (non-renewables) while supporting grid stability. This provides Shizuoka Gas with long-term regulatory certainty.
- 44% of Malaysia's power will still come from non-renewables which means ESCO can offer on-site Cogeneration which is roughly 80–90% efficient and manufacturers reduce their carbon footprint

Note: EJ = 1,000,000 TJ. 1 terajoule is a quantity of energy, equal to 277.8 terawatt hours (TWh), 23.88 million tonne(s) of oil equivalent (Mtoe), 34.12 million tonne(s) of coal equivalent (Mtce)
Source: International Energy Agency, YCP Research and Analysis

Electricity Generation

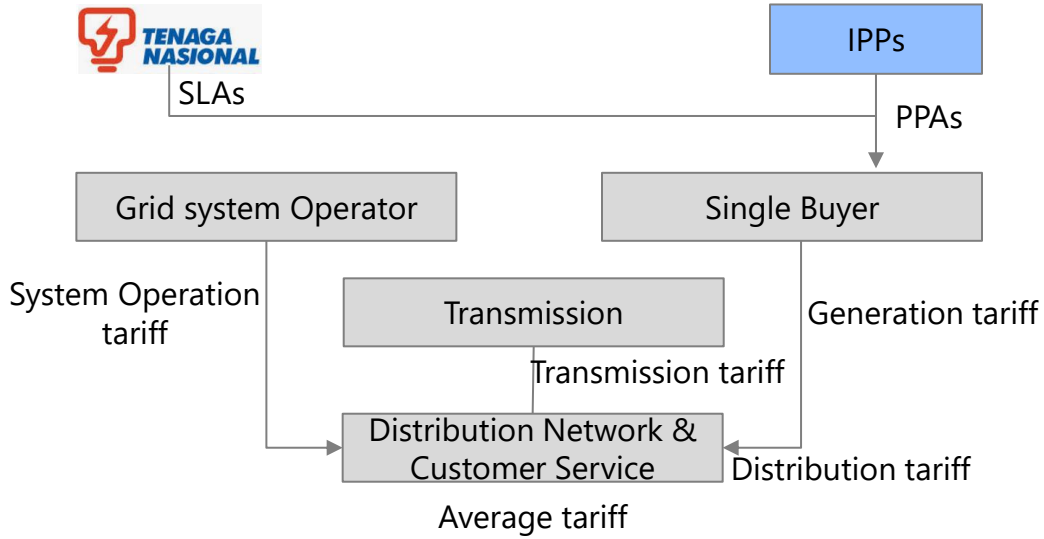
While Malaysia's electricity system does not offer any power generation opportunity for ESCOs, the continued high LNG to power mix offers demand side efficiency

Electricity Generation by Source



- LNG % to Electricity conversion to increase to 46% by 2050 confirming that Natural Gas is the "fuel of the future" in Malaysia.
- When a large power plant burns LNG to make electricity for the grid, about 60% of the energy is wasted as heat released into the atmosphere, plus more lost during transmission through power lines. This is where the opportunity lies for ESCO. They can take advantage of this efficiency gap to make it their selling point.

Electricity generation system



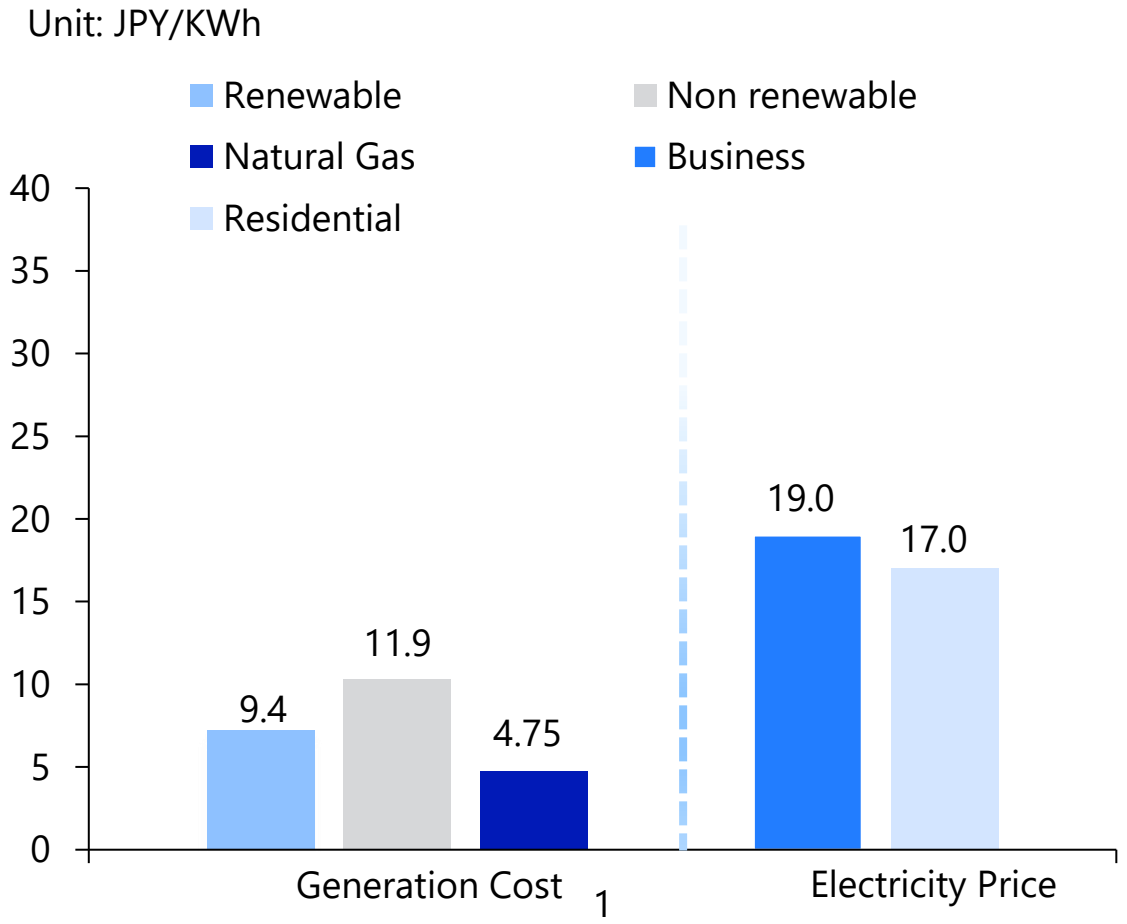
- Power market is structurally closed: Malaysia operates under a Single Buyer model with TNB as the sole electricity purchaser, and generation locked into long-term Power Purchase Agreement (PPA) with TNB Genco and Independent Power Producers – leaving no viable entry for new gas-to-power or ESCO models.
- Industrial gas-based energy solutions are the entry point: Shizuoka Gas's opportunity lies in industrial gas-based energy solutions, such as cogeneration, efficiency upgrades, and hydrogen-ready systems

Notes: Coal also includes peat and oil shale where relevant; IPPs: Independent Power Producers; PPA: Power Purchase Agreement; SLAs: Service Level Agreements
Source: International Energy Agency

Malaysia's Electricity Price

Electricity prices are lower compared to other ASEAN markets due to implicit subsidies. However, new tariffs from July 2025, make it more suitable for ESCOs to be financially viable

Generation Cost vs Electricity Price (2025)



Note: Error bar represents highest and lowest for ranged values, higher value is listed
Source: International Energy Agency

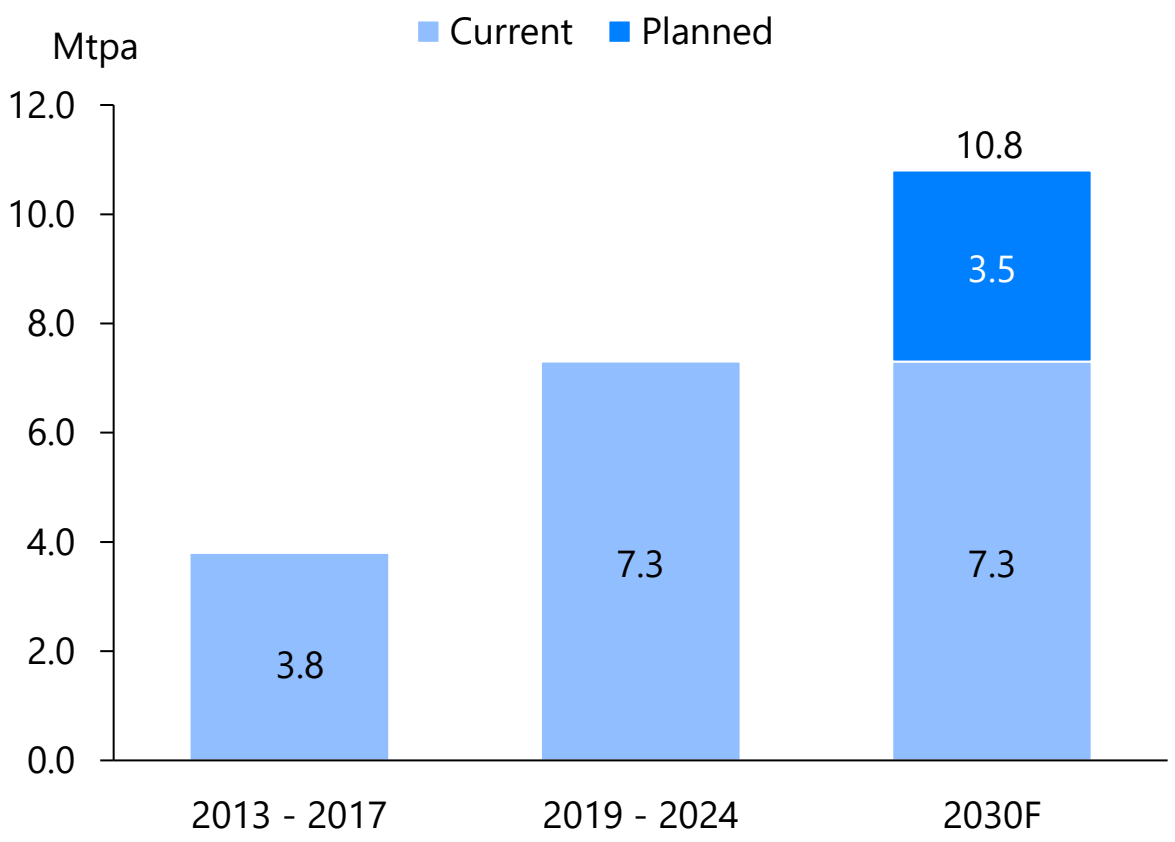
Electricity Price Assessment

- Electricity prices are policy-set under IBR: Tariffs are regulated by Malaysia's Energy Commission using the Incentive-Based Regulation (IBR) framework, smoothing fuel cost volatility rather than reflecting marginal generation costs
- Subsidies are implicit, not explicit: Low electricity prices are supported by controlled domestic gas pricing and cross-subsidies, with residential users benefiting most while industrial users pay higher, more cost-reflective rates. The electricity subsidy for 2022 is estimated to be ~MYR10B but mostly for residential use
- Impact of new tariff from July 2025 on Commercial/ Industrial users:
  - Added Maximum demand charge – split into capacity charge and network charge increasing tariffs from 2.8% - 200% depending on usage
  - Automatic Fuel Cost Adjustment will be reflected on monthly basis if there is any fluctuation in the market fuel prices and foreign exchange rates making prices more volatile
  - Thus, these new additional tariff and the increased volatility create the need for ESCOs

Malaysia's LNG Import

Despite increasing LNG regas capacity, Malaysia remains a Petronas-led market—creating opportunity for gas-based energy solutions

Total LNG Regas Capacity



Strategic Implications of LNG

	Key Facts	What it means
LNG Infrastructure (owned by Petronas)	■ Melaka ~3.8 mtpa ■ Pengerang ~3.5 mtpa ■ Lumut (proposed) ~3.5 mtpa	Sufficient regas capacity to support long-term gas-based projects
Market Structure	■ Petronas dominant ■ Limited participation by international players ■ Ad-hoc industrial buyers	Commercial access remains controlled and participation is primarily downstream
Supply Impact	Increased regas improves reliability vs domestic gas	Enables long-tenor performance guarantees
Solu Exp	Gas availability less	Supports CHP, high- oilers, and n
Proj Unl		tive power nergy

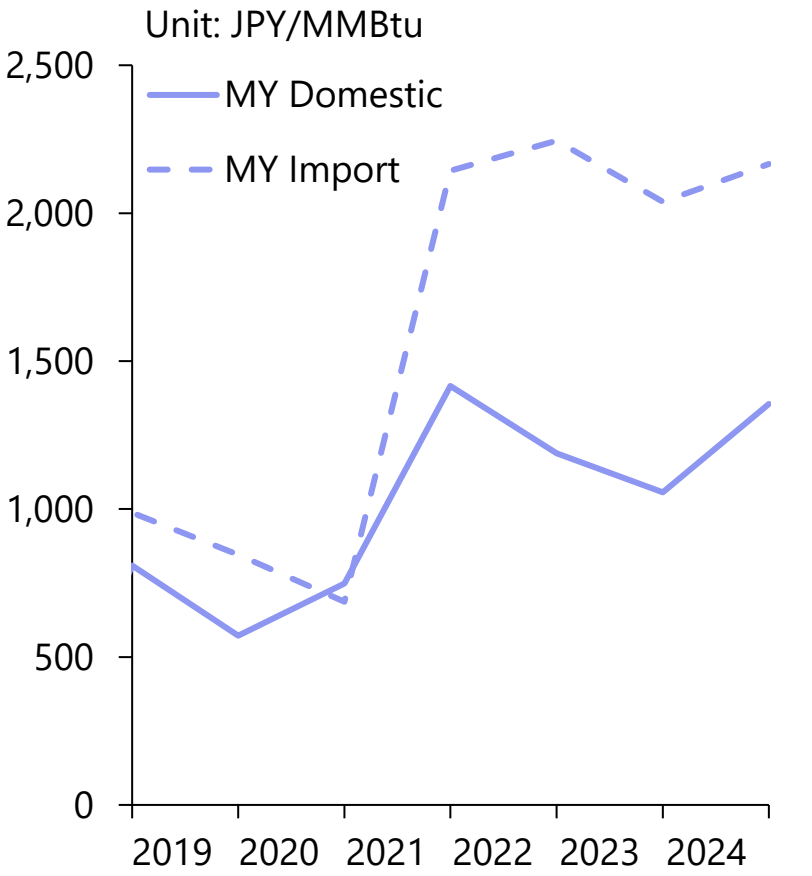
This point needs to be revised – the constraint is only on peninsular gas, Sarawak is a major exporter which makes MY a net exporter. Also if its imported LNG then pls state so

Notes: CHP – Combined heat and power
Source: Argus Media, The Edge Malaysia, Global Energy Monitor

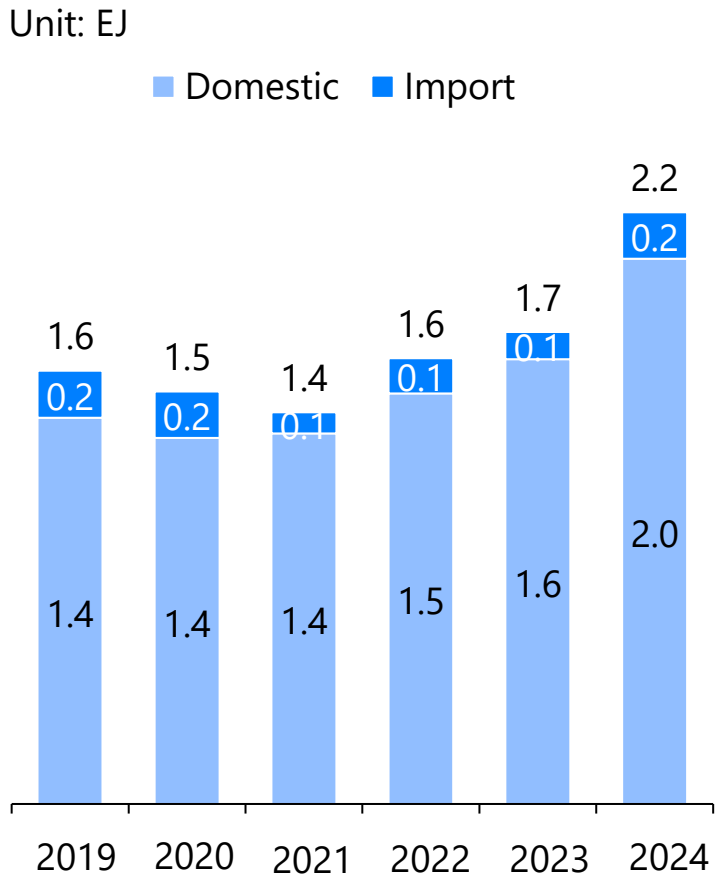
Market Price – Natural Gas

Malaysia's limited LNG import exposure prevents international price spikes from flowing through to local gas prices

Natural Gas Price



Natural Gas Domestic vs. Import



Insights

- Domestic production anchors supply:
  ~85–90% of Malaysia's gas demand is met by domestic production, with LNG imports used mainly for balancing
- Prices are policy-managed:
  Pricing is anchored to the Managed Reference Price (MRP) mechanism, with Petronas implementing the pricing through Gas Supply Agreements
- LNG imports remain volatile but limited:
  Import prices follow global markets, but low import volumes limit pass-through to domestic prices.
- Stable pricing favors incumbents:
  Regulated pricing and domestic dominance reduce arbitrage, benefiting incumbents and limiting new entrant upside.

Notes: MOF – Ministry of Finance
Source: Institute of Energy Economics, Department of Energy, MBS Research

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Japanese Major Gas Players' Presence in Malaysia's Energy Service Business

Exclude electricity provision / gas trading

	Energy Service in Malaysia
1. Tokyo Gas	JV (34%) with Gas Malaysia – Cogeneration system/waste heat recovery system
2. Osaka Gas	N/A
3. Toho Gas	N/A
4. Saibu Gas Holdings	N/A
5. Nippon Gas (NICIGAS)	N/A
6. Hokkaido Gas	N/A
7. Shizuoka Gas	N/A
8. Hiroshima Gas	N/A
9. Keiyo Gas	N/A
10. Sendai City Gas Bureau	N/A

Source: Company Website

Current State of the Energy Service Market in Malaysia

Malaysia's ESCO market is policy-enabled but commercially constrained, with activity concentrated in small- to mid-scale projects due to low energy prices, financing limitations, and dominance of incumbent utilities

Number of local players		373 registered as ESCO company (as of 2024)
No. of ESCO Projects		206 cumulative projects (as of 2024)
Situation of Market	Background	■ Malaysia's low and historically stable electricity prices reduced the economic urgency for deep energy efficiency investments ■ ESCO demand has therefore been regulation- and institution-led, rather than driven by pure cost arbitrage ■ Incumbent utilities refer to Petronas and TNB, whose regulated dominance limits ESCO participation to downstream, behind-the-meter efficiency services ■ The Energy Efficiency and Conservation Act (EECA, 2023) creates compliance demand for energy audits and reporting, which are energy services, but does not mandate implementation, limiting conversion into performance-based ESCO projects
	Current Situation	■ The implementation of Energy Performance Contract (EPC) framework was introduced in 2013, which formalized performance-based energy efficiency contracting but was not made mandatory, meaning it enabled ESCO projects without forcing clients or financiers to adopt risk-bearing EPC models ■ Most ESCOs remain engaged at the energy audit or small- to mid-scale retrofit stage, with many projects structured as fee-based or shared-savings arrangements rather than full, risk-bearing EPCs
	Continuing Challenges	■ While EPC has enabled performance-based contracting, most Malaysian ESCOs continue to face financing and balance-sheet constraints that limit project scale ■ Low energy prices and lender risk aversion (banks may be unwilling to lend money to ESCO projects where loan repayment depends mainly on future energy savings) reduce the viability of full risk-bearing EPC models, resulting in a predominance of smaller, service-oriented projects

Note: EPC is a contract where the ESCO guarantees that energy cost savings fully cover project costs, with the ESCO bearing any shortfall.
Source: Energy Commission Malaysia (ST), Institute of Power Management (IPM), Malaysia, Energy Transition Partnership (ETP)

Japanese gas-related energy service player in Malaysia

Out of major Japanese gas companies, major competitor is only Tokyo Gas - via its JV with Gas Malaysia, GMEA, introduced 2MW cogeneration and waste-heat cooling to cut energy use by 9% and CO_2 by 22%

Context

GMEA (JV between Tokyo Gas and Gas Malaysia) and Panasonic introduced an integrated electricity-heat-cooling system to Panasonic factory in Malaysia, creating a strong showcase for decarbonization and energy-efficiency solutions in Southeast Asia.

Approach and Deliverables

Approach

- GMEA installed a 2MW cogeneration system combining production of electricity and heat.
- Panasonic installed Genelink waste-heat absorption chiller to produce cooling using waste heat from cogeneration.
- GMEA provided end-to-end service, including design, construction, fuel procurement, and O&M.
- GMEA and Panasonic enabled the factory to adopt high-efficiency energy systems with minimal internal input.

Benefits of integrated energy system

- Achieved 9% reduction in total energy use at the factory
- Reduced CO_2 emissions by 22%, supporting Panasonic's decarbonization goals
- Improved energy efficiency and operational stability through unified energy management.
- The project created a strong reference model for future ESCO/EaaS projects in Southeast Asia.

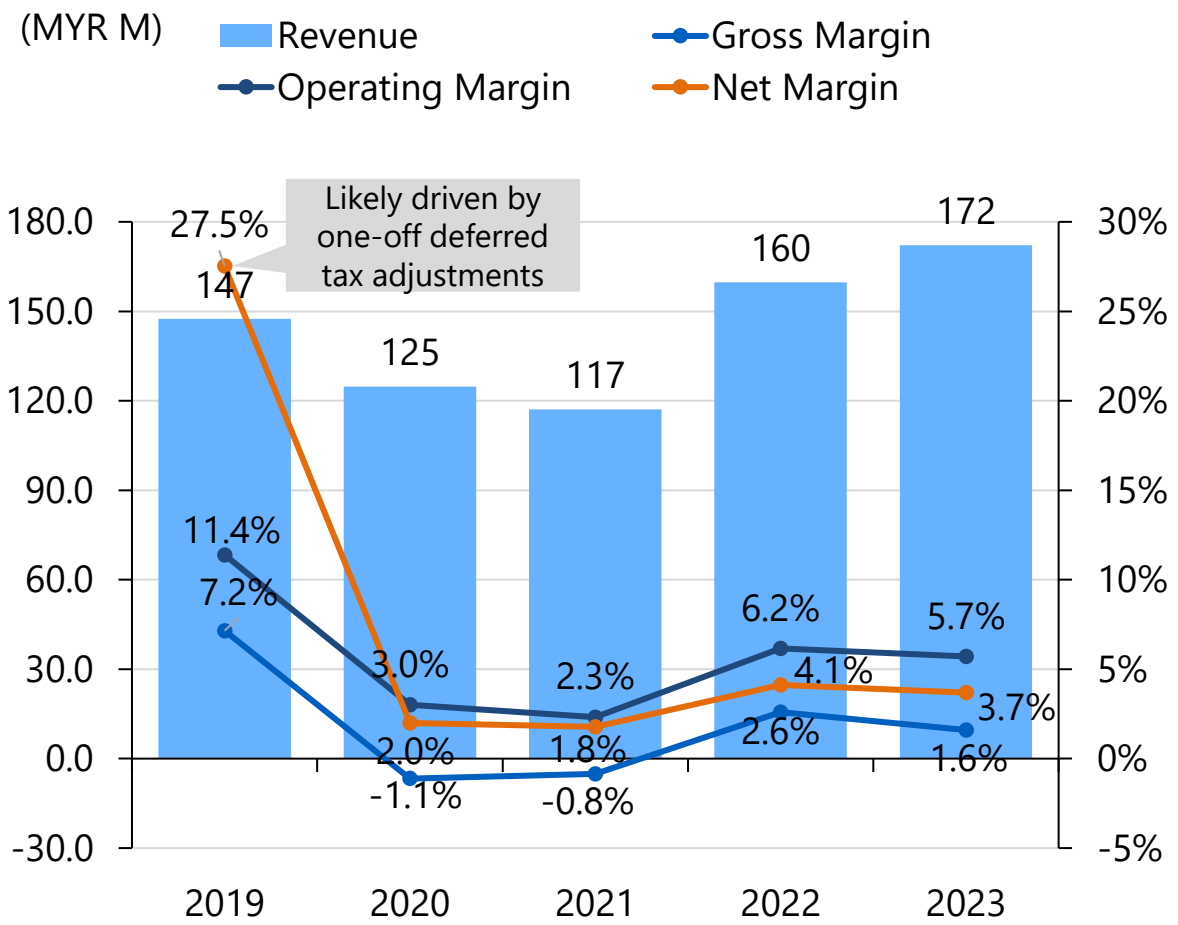
Outcome

GMEA delivered measurable improvements in efficiency and emissions, helping Panasonic achieve reliable on-site power, heat, and cooling while accelerating its decarbonization efforts.

Source: Company website

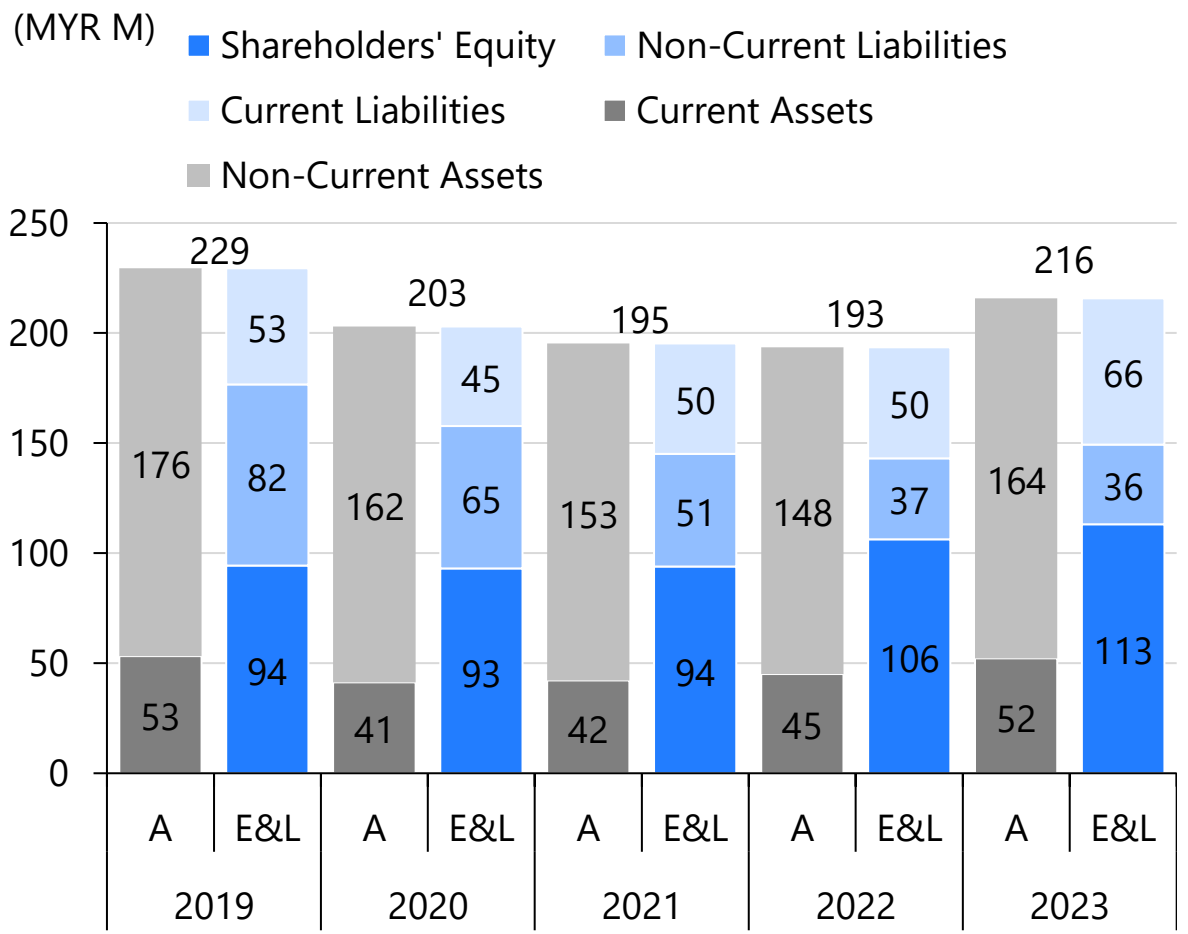
Financial Highlights of GMEA (Gas Malaysia Energy Advance)

Income Statement



Exchange Rate: MYR 10M = JPY 300M
Source: Speeda, YCP Research & Analysis

Balance Sheet



Malaysia Energy Services Market: Opportunities and Structural Barriers

While Malaysia has the best business environment, the combination of lowest regional electricity prices, regulations (implementation unclear), and Petronas's gas monopoly make it less attractive

Conclusion top no need bottom conclusion

	Advantages	Obstacles
Stable policy & regulatory environment	■ Predictable energy policy supports long-term energy service and efficiency contracts ■ Natural gas positioned as a transition fuel into the 2040s	
Reliable gas & LNG backbone	■ PETRONAS domestic pipeline gas as the core supply ■ LNG supplements supply, enhancing system reliability and energy security	
Large industrial energy demand	■ Strong base of energy-intensive industries (chemicals, E&E, palm oil, food) ■ Attractive use cases for cogeneration, process heat optimisation, and efficiency upgrades	
Energy transition & hybrid potential	■ Clear pathway for gas + solar + storage + hydrogen-ready solutions ■ Favourable environment for engineering-led, lifecycle energy solutions	
Concentrated gas market structure		■ Gas supply and pricing controlled by PETRONAS ■ Limited flexibility in upstream fuel sourcing for third parties
Closed power market		■ Single Buyer model with TNB and long-term PPAs ■ Limited entry for third-party gas-to-power generation
Regulated electricity tariffs		■ Stable but capped electricity prices ■ Limits upside from pure performance-based optimisation
Gradual market liberalisation		■ Conservative reform pace limits competitive dynamics ■ Value creation must come from engineering and system design, not market mechanisms

Conclusion	Malaysia offers a high-barrier but low-risk market for downstream energy services and efficiency solutions, centred on industrial energy optimisation and hybrid systems

Source: YCP Analysis

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The Foundational Acts: Promoting participation and legal clarity in Philippines' Energy Sector

Foundational laws progressively open the power and gas value chain, shifting fuel costs to consumer's bills and creating monetizable demand for efficiency and flexibility

Regulator	Focus	Regulation	Impact to Market Structure	
Department of Energy (DOE)	Oil & Gas Upstream	Oil Exploration & Development Act of 1972	■ State controlled upstream where private firms can participate via service contracts under state policy goals ■ Supports gas efficiency for imported LNG when indigenous output declines	Increased accessibility to participation stimulates industry growth
	Natural Gas Midstream/ Downstream	Philippine Natural Gas Industry Development Act of 2025	■ Mature competitive landscape with formalized rules which also help reduce regulatory ambiguity ■ Seeks to increase share of natural gas in country's energy mix	Clearer mandate + structure for downstream gas solidifies sector entry
	Electricity	Electric Power Industry Reform Act of 2001	■ Inefficiency from previous monopoly structure created wholesale market where competition was now possible ■ Restructuring means customers can be exposed to spot-price volatility when utilities/suppliers are short of contracted supply, e.g., during plant outages	Services that can cut peaks and volatility have better potential for monetization
	ESCO	Energy Efficiency & Conservation Act of 2019	■ Institutionalizes energy efficiency ■ Provides fiscal and non-fiscal incentives for energy efficiency services	Creates recurring needs for audits/energy management

Source: Department of Energy, YCP Analysis

Policies

Both plans signal a long runway for gas/LNG in reliability-critical uses while scaling renewables and tightening energy efficiency mandates—creating demand for ESCO-style optimization

Title bar

Regulations	Key Objectives	Targets/ Enabling Mechanism
Philippine Energy Policy 2023-2050	■ Energy security and reliability: Manage Malampaya decline by developing LNG supply options and downstream infrastructure ■ Sustainability: Increase renewable energy share and lower power-sector emissions while keeping dispatchable backup ■ Affordability/ Competitiveness: Reduce exposure to fuel-price and FX swings via efficiency and diversified supply	■ Renewable share - at least 35% by 2030 and 50% by 2040 ■ Natural Gas share - Retains sizeable natural-gas share for firming and reliability; Continued development of terminals & floating storage and regasification units ■ Energy intensity – Reduce 3% by 2040
Philippine Energy Transition Strategies (PETS), 2023	■ Increasing access to affordable energy ■ Improve reliability/resiliency ■ Lift renewable energy contribution	■ Renewable scaling – Implemented Renewable Portfolio Standards (RPS) & Green Energy Auction Program ■ Transport Electrification – 10% EV share in the vehicle fleet by 2040 under the Business-as-Usual Scenario, 50% of all vehicle fleets by 2040 under the Clean Energy Scenario ■ Governance – Energy Efficiency & Conservation Act to promote and govern ESCOs ■ Grid & flexibility – Smart & Green Grid Plan ■ Permitting speed – Energy Virtual One-Stop Shop Act- streamlines/centralizes permitting workflows

Source: Department of Energy

Regulations and Key Incentives for

Compliance demand is driven by Designated Establishment (DE) obligations; most fiscal/finance benefits are accessed by the energy efficiency project proponent (client-side), not by advisory-only firms

Regulations for Energy Consulting

Regulation		■ Energy Efficiency & Conservation Act provides compliance rules for Designated Establishments: ➢ Integrate an energy management policy ➢ Set targets, plans and measurement & verification (M&V) methods ➢ Keep monthly energy consumption records and submit required reports
Consulting Services	Energy Management	■ Energy baselining, policy & target-setting, training & governance
	Audit Support	■ Site data collection + analysis and draft audit deliverables
	M&V	■ M&V plan, savings tracking dashboards, and DE report preparation support (forms, evidence pack)
Operating Notes	Audit Sign-off	■ For Board of Investment endorsements/formal compliance packages, guidelines require an Energy Audit Report duly signed by a Registered or Certified Energy Auditor

Source: Department of Energy, Development Bank of the Philippines

Key incentives (client-side)

Incentive	Key insights
Income Tax Holiday (Energy Efficiency & Conservation Act)	■ Applicability: New builds, retrofits, or expansion projects that install energy efficiency equipment or systems (e.g., Lighting retrofits, heating ventilation, boiler replacement, building energy management systems, cogeneration etc.) ■ Incentive: Income tax holiday rate of ➢ 50% for 15%-20% energy savings ➢ 75% for 20%-25% savings ➢ 100% for more than 25% savings
Energy Efficiency Financing Program	■ Feature: Higher loanable amount for energy service company contracts, i.e., up to 80% of the contract or purchase order amount, net of margin ■ Eligibility: For energy audits or working capital requirements; can be an ESCO or a public/private company

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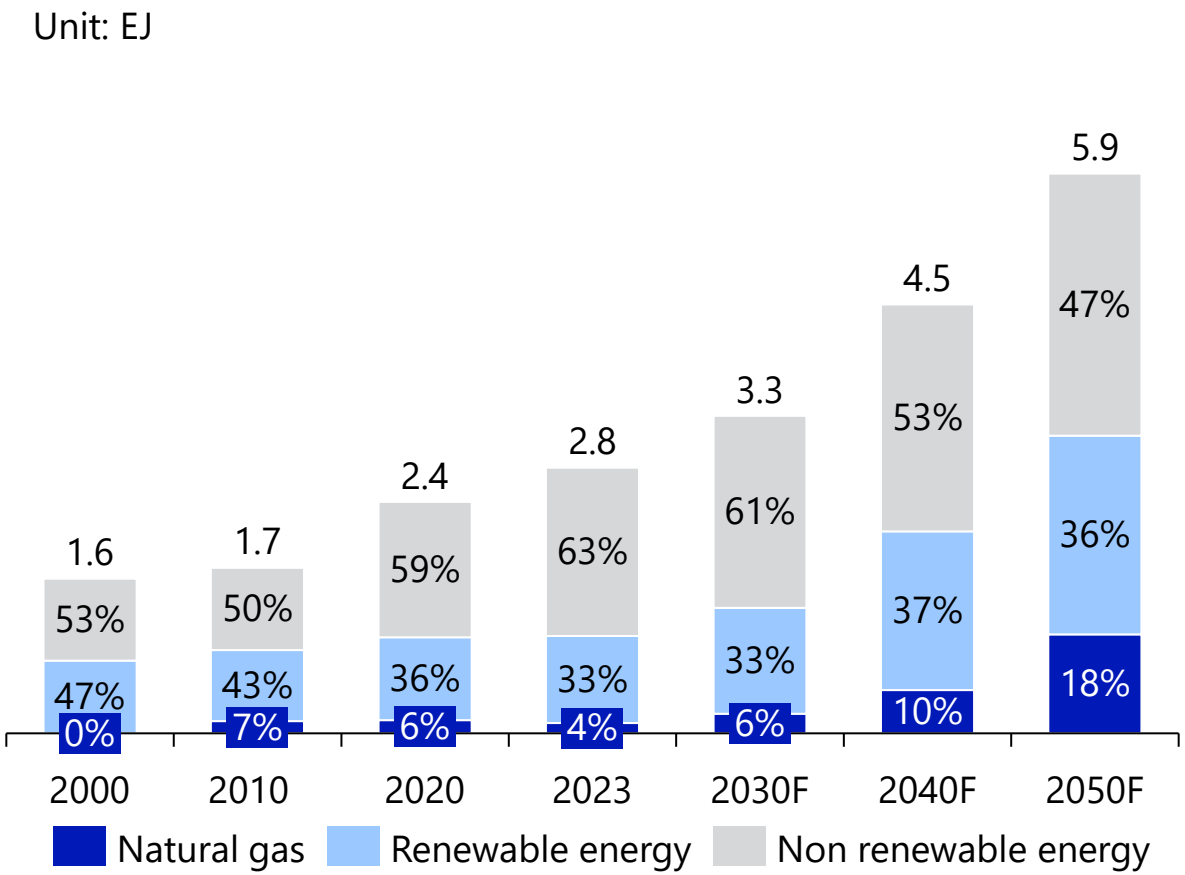
Total Primary Energy Supply

Natural gas grows from marginal to a material balancing fuel as primary energy supply nearly quadruples from 2000 to 2050, validating future demand for LNG-related services

Total Primary Energy Supply by Source



Insights

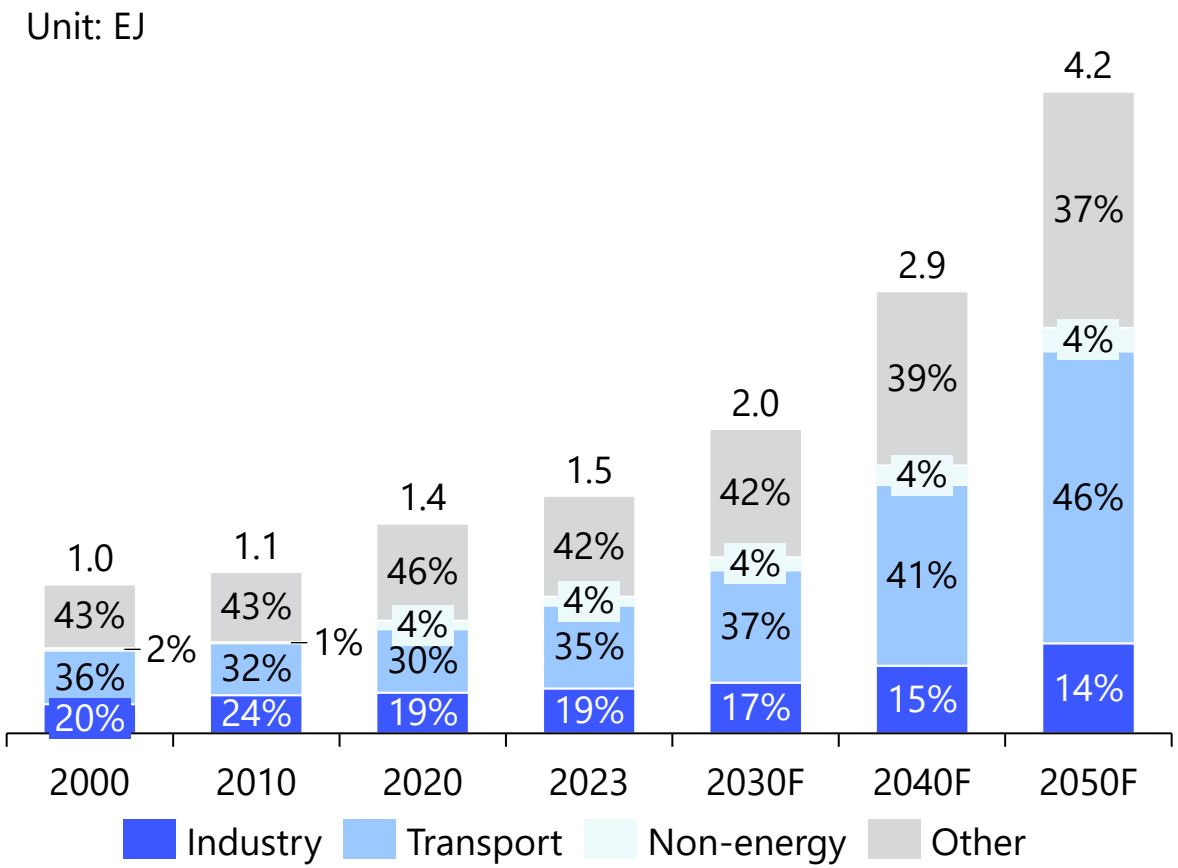
- Energy security becomes the governing constraint as demand scales: with total primary energy supply nearly quadrupling and fossil fuels still a large base through 2050F, the system prioritizes diversification and flexibility and not just decarbonization
- Building renewables alone does not solve reliability and price volatility due to grid and integration constrains; thus, even with renewable share growth in the energy supply, the grid still needs a flexible source of fuel to provide grid stability—this is the primary role that LNG will play which is reflected in its future growth
- Department of Energy planning materials frame natural gas as a transition fuel solution under coal constraints, while the Philippine Natural Gas Industry Development Act and its implementing rules and regulations are designed to formalize and accelerate gas transmission supporting LNG import infrastructure and downstream gas market development

Notes: Total primary energy supply excludes electricity and heat trade. Coal also includes peat and oil shale where relevant
EJ = 1,000,000 TJ. 1 terajoule is a quantity of energy, equal to 277.8 terawatt hours (TWh), 23.88 million tonne(s) of oil equivalent (Mtoe), 34.12 million tonne(s) of coal equivalent (Mtce)
Source: International Energy Agency, YCP Research and Analysis, PEP 2023-2050

Market Demand

Energy consumption growth driven by transport sector while industrial demands relatively weaken

Total Final Consumption by Sector



Insights

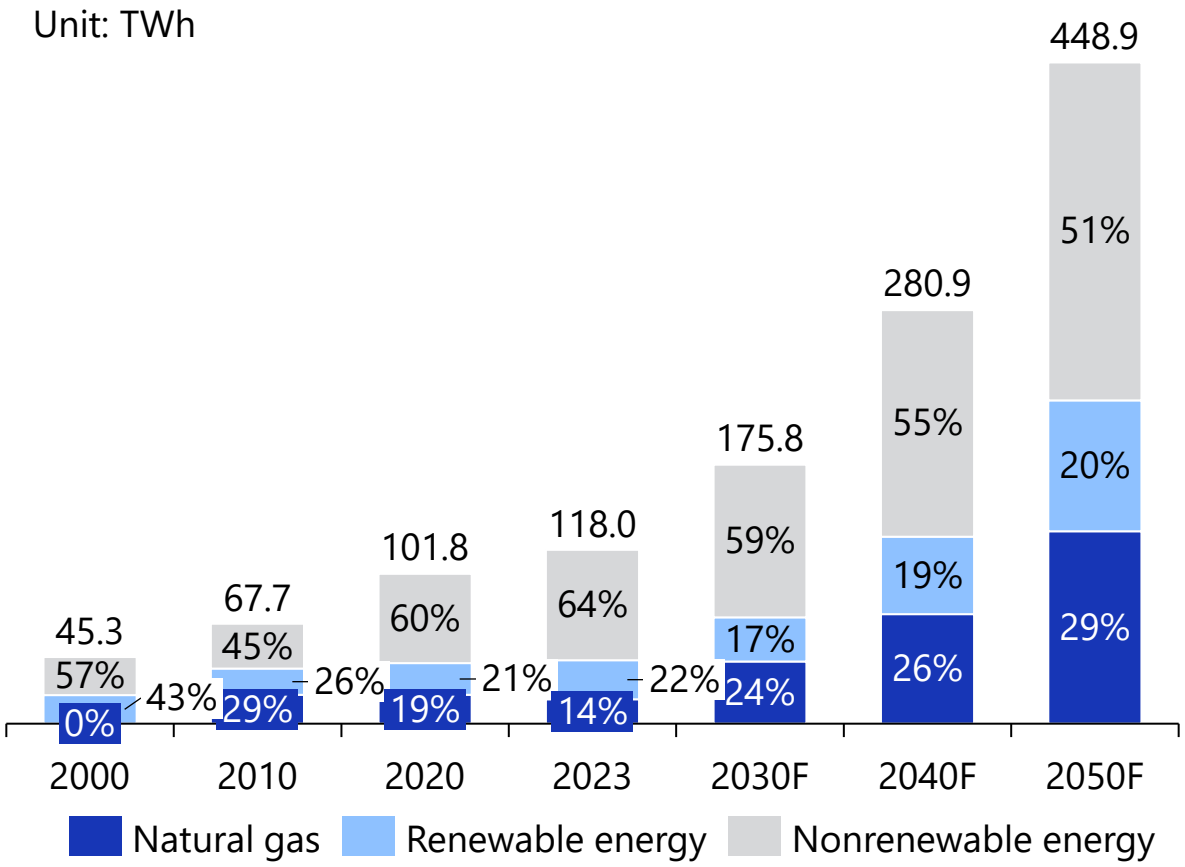
- EV adoption (including charging/industry measures) and government extensions on zero-tariff treatment for EVs and parts to accelerate uptake – positioning road transport as a key demand-side transition lever
- Energy-efficiency is given codified emphasis rather than simply being optional as the Energy Efficiency and Conservation Act institutionalizes programs and incentives, reinforcing a long-run market for energy-related services such as retrofits, audits, and performance-based savings projects (especially as a hedge against imported-fuel price exposure)
- Philippines industrial sector lags behind many ASEAN pears and is forecasted to shrink (relative to the total consumption of other sectors) due to various, i.e., corruption concerns (which harms foreign investment), red tape, high electricity costs, and the lack of supporting infrastructure

Note: EJ = 1,000,000 TJ. 1 terajoule is a quantity of energy, equal to 277.8 terawatt hours (TWh), 23.88 million tonne(s) of oil equivalent (Mtoe), 34.12 million tonne(s) of coal equivalent (Mtce)
Source: International Energy Agency, YCP Research and Analysis

Market Supply

Market access is segmented: captive customers remain effectively tied to their distribution utility (single-buyer-like), while commercial and industrial parties can choose suppliers

Electricity Generation by Source



Notes: Coal also includes peat and oil shale where relevant
Source: International Energy Agency, Department of Energy, YCP Research and Analysis

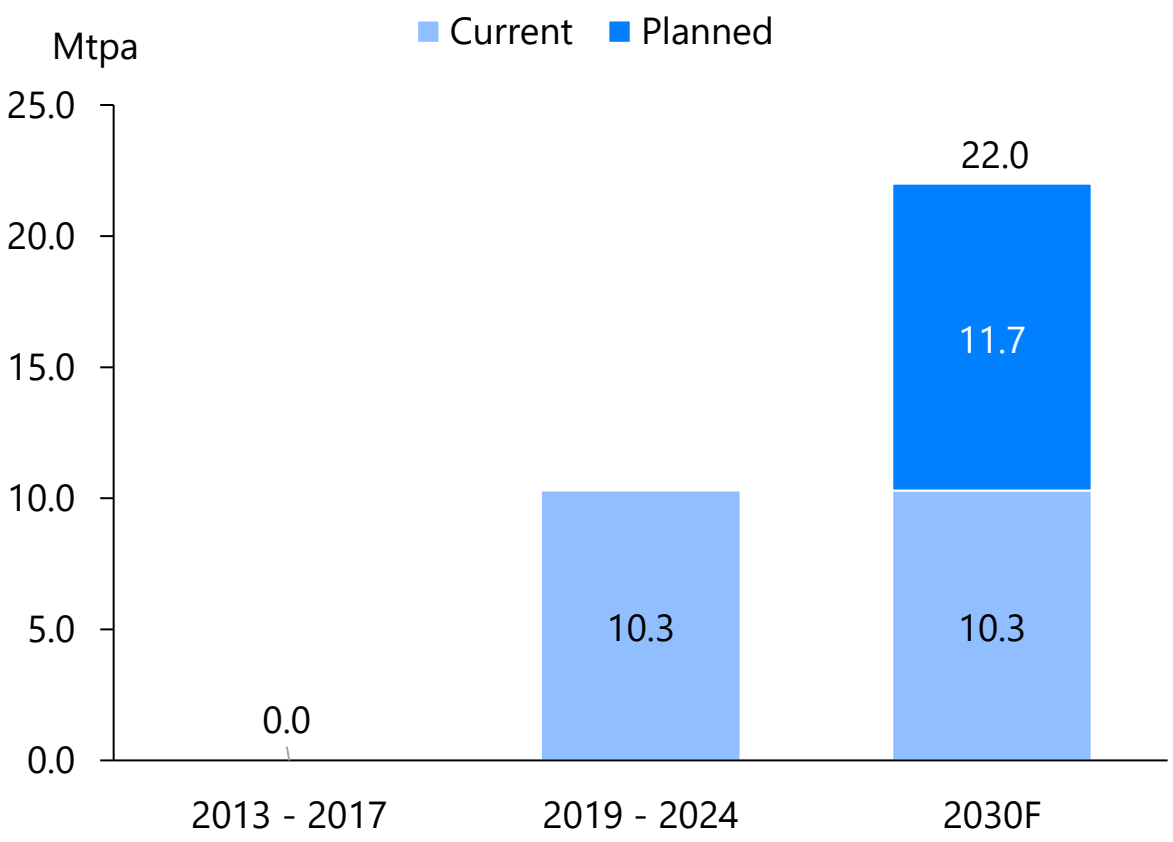
Insights

- Most small/medium users are effectively locked into buying power from their local distribution utility under regulated tariffs, which limits the ability for retails players to switch and makes savings harder; however, effective June 2026, the Energy Regulatory Commission will lower the eligibility threshold in the retail electricity market to 100kw (from previously 500kw), opening the door for more consumers to select their preferred power supplier
- Renewable generation remains a large share, implying the system will continue to value dispatchable/flexible capacity even as RE grows; this raises the importance of reducing peaks, improving load factors, and tightening energy intensity at customer sites
- Coal additions are constrained but with no hard official hard stopping stance: the 2020 coal moratorium remains a key signal for new build decisions, while DOE clarifications emphasize limited exemptions, which effectively raises the strategic value of dispatchable non-coal options (gas, storage, and flexible capacity) for system reliability

Philippines' LNG Import

Philippines plans to more than double regas capacity by 2030, shifting gas supply towards an import-led and price-variable system where efficiency and flexibility become monetizable

Total LNG Regas Capacity



Source: Global Energy Monitor, First Gen Corp., YCP Research and Analysis

Strategic Implications of LNG for Energy Services

	Key Facts	Implication
LNG Infrastructure (regas)	■ FGEN Batangas (20% ownership by Tokyo Gas) ~5.25 mtpa ■ Ilijan Batangas: 5.0 mtpa	Sufficient regas capacity to support long-term gas-linked solution in Luzon; value shifts to managing delivery costs & demand peaks
Market Structure	■ Led by gas-fired power plants ■ Currently limited third party gas distribution	Maximizing efficiency of regasification, storage, and distribution is key
Supply Impact	Import-linked pricing increases exposure to global LNG shocks	Design performance contracts around avoided costs
Solution Expansion	Gas availability less constrained	Supports cogeneration where loads are stable and are tariffs applicable
Project Unlock	Department of Energy approved 22 mtpa pipeline	Enables long-term performance and capacity

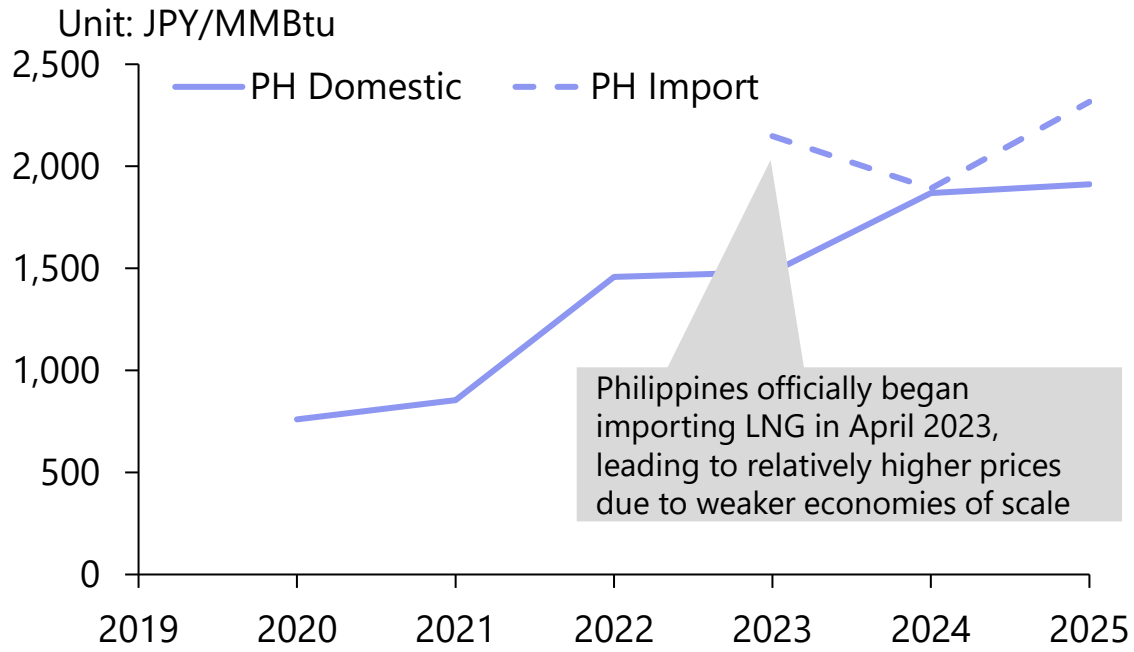
Market Price – Natural Gas

al gas is forecasted to be almost exclusively imported due to local depletion of Malampaya gas fiel

ne

Axis

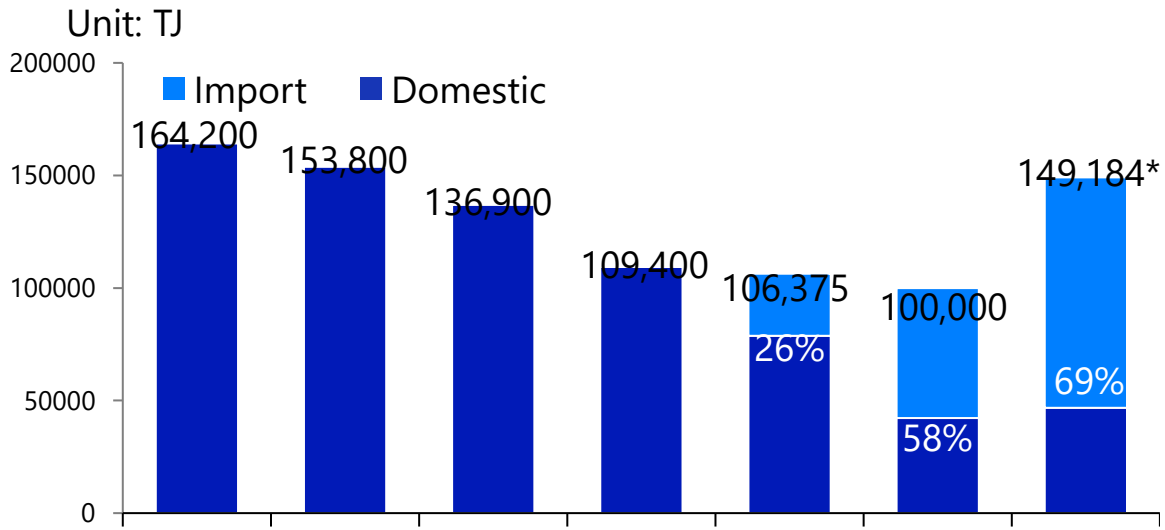
Natural Gas Price



- Depleting domesti ility to global price shocks, thus a redu k can offset this via aggregation and c

Year between tick marks

Natural Gas Import vs Domestic Production



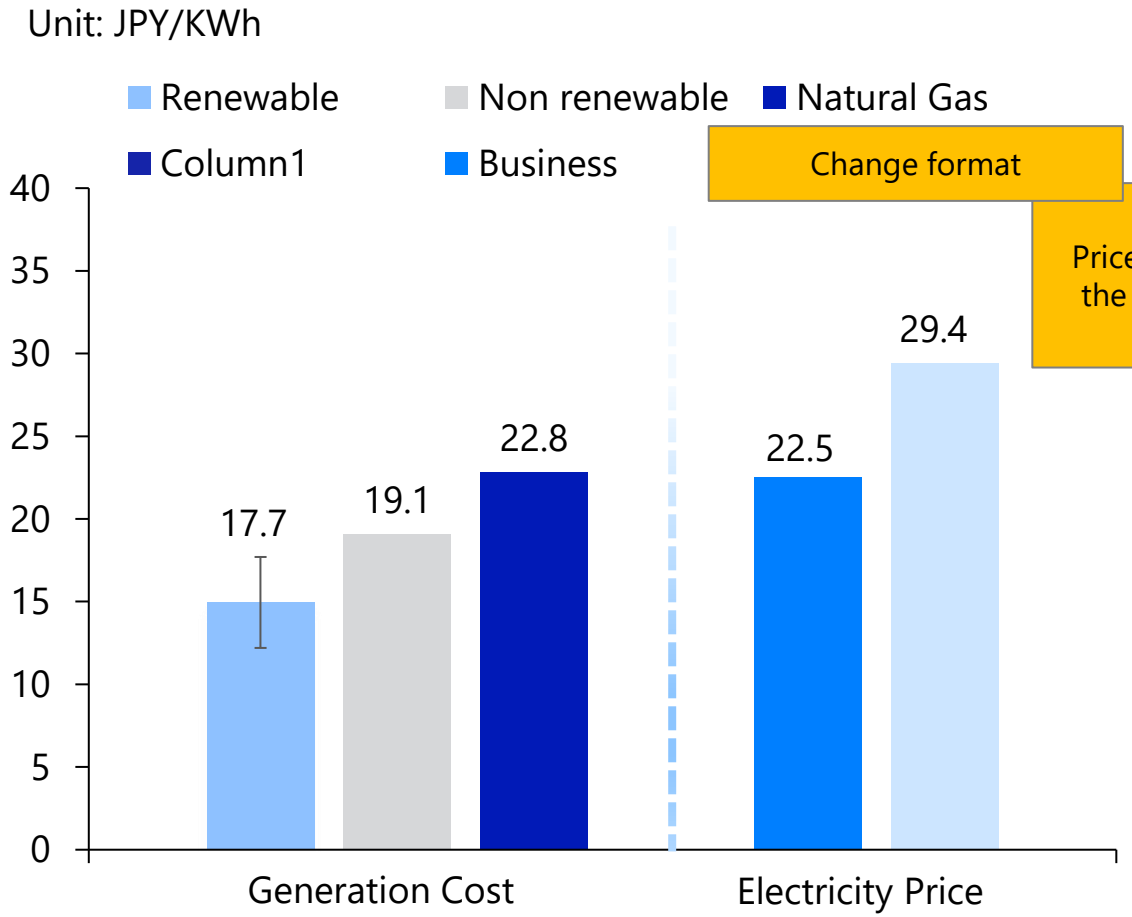
- Implied import share to be ~89% of all LNG by 2040
- Overall demand for energy services for the domestic supply chain may not have much opportunities due to declining volume, focus should be on importing (e.g., procurement, importing logistics, etc)

Notes: Import/export 2025* data is forecasted
Source: Department of Energy, Gas Outlook, YCP Research and Analysis

Philippines' Electricity Price

The Philippines' high baseline costs create the strongest financial incentive for energy efficiency interventions

Generation Cost vs Electricity Price (2025)



Note: Error bar represents highest and lowest for ranged values, higher value is listed
Source: Global Petrol Prices, Meralco, Energy Regulatory Commission, YCP Research and Analysis

Electricity Price Assessment

2nd highest price in SEA (2025 average) → More energy efficiency opportunities

market structure:

- Unsubsidized/ private electricity market means costs are passed through to customers
- Switching from cheaper domestic gas to importing higher priced LNG + operational inefficiencies from the transition
- FX volatility (weaking peso in recent years)

- Ideal price environment for consulting services:
  - Market driven pricing means savings are converted into cash
  - Shorter payback for energy efficiency solutions (retrofitting, HVAC optimisation, etc)
  - Performance contracts are more appealing due to high baseline costs for all parties involved

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Check Tokyo gas services in PH – they have a terminal

formatting

Japanese Major Gas Players' Presence in Philippines' Energy Service Business

	Energy service in Philippines
1. Tokyo Gas	Equity stake (20%) in First Gen's FGEN LNG – Offshore floating LNG import/regas terminal
2. Osaka Gas	N/A
3. Toho Gas	N/A
4. Saibu Gas Holdings	N/A
5. Nippon Gas (NICIGAS)	N/A
6. Hokkaido Gas	N/A
7. Shizuoka Gas	N/A
8. Hiroshima Gas	N/A
9. Keiyo Gas	N/A
10. Sendai City Gas Bureau	N/A

Source: First Gen Corp.

Current State of the Energy Service Market in Philippines

The Philippines energy services market is policy-ready but constrained in scale by financing and performance-risk limitations

Number of local players		■ 13 certified ESCOs: Qualified to deliver full energy performance contracts with guaranteed savings & performance risk ■ 56 registered ESCOs: Provide ESCO services and implement projects but typically without large, risk-bearing guarantees
No. of ESCO Projects		71 cumulative projects (as of 2024)
Situation of Market	Background	■ Historically high and volatile electricity prices in the Philippines created a strong economic case for energy efficiency and performance-based contracting ■ Chronic power supply constraints and fuel import dependence increased policy focus on demand-side efficiency ■ Government introduced the ESCO concept early (2009-2013) with strong support from multilaterals (ADB, World Bank, JICA) ■ ESCO development has been policy- and donor-led, rather than purely market-driven, but with clearer performance-risk concepts than most ASEAN peers
	Current Situation	■ Philippines has a formally defined ESCO framework, with DOE-accredited ESCOs and standardized contract concepts ■ Common project types include lighting retrofits, HVAC upgrades, building management systems, chillers and motors ■ Energy Performance Contracting (EPC) is recognized, with both: guaranteed savings models and shared savings models ■ Most projects remain small to mid-scale, with limited off-balance-sheet financing ■ Multilateral agencies continue to play a catalytic role via technical assistance, pilot projects, and credit enhancement
	Continuing Challenges	■ Financing constraints remain the primary bottleneck: commercial banks are cautious about lending against future energy savings and ESCOs often lack balance-sheet strength to assume full performance risk ■ Measurement & Verification (M&V) capacity varies across projects, increasing perceived risk for financiers ■ Government procurement rules can be slow and complex, limiting EPC uptake despite policy support

Source: Republic of the Philippines Department of Energy, Copenhagen Centre on Energy Efficiency

Philippines' Energy Services Market: Opportunities and Structural Barriers

Highly liberalized regulations and market with high electricity prices ensures low effort and the best financial case for ESCOs. The downside is the industrial demand is comparatively smaller, and financing options are limited

Client criteria:
1.Market maturity: infra, policy in place, etc
2. Demand potentiality: industrial sector (quantitative figures)
3. Electricity price: low prices may inhibit entry
4. Competitive environment: JP gas players
5. Risks in politics/regulatory changes (friendliness: future unfriendly) e.g. natural gas phase out eventually -> no good

Advantages	
Electricity Pricing	High retail tariffs and cost pass-through dynamics* make savings easier to monetize via KWh savings
Policy & Market liberalization	Direction towards market liberalization increases the number of eligible customers that can contract directly, widening the base for energy solutions
Energy efficiency	Energy efficiency requirement forces large energy users to actively look for savings, increasing demand for ESCOs
Clear ESCO recognition	Clear and defined role for ESCOs standardizes language for audits, measurement, and project development (ease of business is improved)
Competition	Lack of competition from Japanese and local players creates easier market entry
LNG transition	LNG importing growth will create new demand for related services and optimization

Landscape	
Industrial Sector	Premature industrial sector and weak projected growth, lowering overall demand for industrial-related services
Market Volume	Relatively lower current/projected energy demand and generation, causing lower volume
LNG Volatility	Heavy dependence on importing leads to price shock-vulnerability, challenging savings
Financing	Domestic financing options are limited and expensive for customers and energy-service providers, slowing down implementation

Conclusion	While market volume is smaller compared to other countries, the combination of deregulation and high tariffs creates the strongest business case for entering if Shizuoka can leverage own capital to navigate financing bottlenecks

Note: C&I: Commercial and Industrial players; * meaning costs are passed to consumers
Source: YCP Analysis

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The Foundational Acts: Defining Control & Competition in Vietnam's Energy Sector

Vietnam's energy sector is shaped strong central coordination, proving clear regulatory roles and defined entry pathways for private and ESCO participation

Regulator	Focus	Regulation	Key Player	Impact to Market Structure	
Ministry of Industry and Trade (MOIT)	Oil & Gas Upstream	Law on Oil & Gas (2022)	**PVN –** State-owned O&G group	■ Petroleum rights and upstream activities are governed by national law ■ Strong rate oversight and approval for exploration, development, and contracts ■ Market remains highly centralized and closed	Upstream gas access is outside ESCO control; impact is indirect via fuel availability and pricing
	Piped Gas Downstream	Decree 87/2018/ND-CP on Gas Business		■ Licensing framework defines distribution rights, safety standards, and operating conditions ■ Downstream gas segment is more open than upstream, allowing multiple licensed operators	Limited flexibility in gas sourcing; ESCO mainly focus on efficiency, not fuel supply
	Electricity	Electricity Law 2024; Decree 58/2025/ND-CP	**EVN –** state owned utility	■ New Electricity law supports competitive generation and wholesale market reforms ■ Transmission and distribution remain under EVN monopoly	ESCOs limited to behind-the-meter and demand-side solutions
	ESCO	Law on Economical & Efficient Use of Energy (revised 2025)		■ National EE law mandates energy management, audits and reporting ■ Establishes legal basis for EE incentives, public programs, and funding mechanisms	Clear legal basis exists, but market scale depends on enforcement and financing

Source: Law on Oil and Gas No. 12/2022/QH15, Decree No.87/2018/ND-CP on Gas Business, Electricity Law No. 61/2024/QH15, Law on Economical and Efficient Use of Energy (No. 50/2010/QH12) and revision, Law on Esco/energy service (No.77/2025/QH15)

Policies

Vietnam's National Energy Development Strategy and PDP VIII position gas/LNG as a transitional fuel while scaling renewables to ensure energy security, affordability, and a pathway to net zero

National Energy Development Strategy & PDP VIII

Key Objectives

- Energy security
- Affordability
- Environmental sustainability & Decarbonisation

Output Capacity Targets	2030*	2050*
Onshore Wind	21.9	60.1 – 77.1
Offshore Wind	6.0	70.0 - 91.5
Solar PV	12.8	168.6 – 189.3
Hydropower	31.7	36.0
Gas + LNG	37.3	20.9 – 29.0
Hydrogen and Ammonia	-	32.6 – 39.3
Energy Storage + Flexible	0.6	61.5 – 91.7

National Energy Transition & Net Zero Roadmap

Key Objectives

- Net Zero Green House Gas emissions by 2050
- Scale renewable energy capacity
- Position LNG/gas as a transition fuel to bridge coal phase-down and RE intermittency

Levers	Flagship Projects
Offshore Wind	■ Thang Long complex (5-6 GW, post 2030) ■ Can Gio offshore wind project (7 GW)
Onshore Wind	■ South Central: Onshore wind project cluster (3-4 GW) ■ Central Highlands: 2 onshore wind projects (1-2 GW)
Solar	■ Ninh Thuan - Trung Nam solar-wind-storage (450 MW) ■ Son La Floating Solar Project by Vingroup
LNG	■ Nhon Trach 3 & 4 (1.6 GW), Long An LNG (3 GW) ■ Bac Lieu LNG (3.2 GW), Quang Ninh LNG (1.5 GW)
GH2	■ Green H2 pilot projects (post-2030 scale up)
EE/Esco	■ VNEEP (2019 - 2030) ■ VSUEE – Esco-led retrofits in cement, steel, F&B

Note: (*) unit in GW; VNEEP – Vietnam National Energy Efficiency Programme, VSUEE – Vietnam Scaling-Up Energy Efficiency project
Source: PDP VIII, Vietnam's National Energy Development Strategy by 2030, with a vision towards 2045

Regulations and Ownership restrictions for ESCO

Vietnam offers a supportive and structured market with clear regulations and incentives for energy efficiency initiatives, along with easy registration, creating strong opportunities for ESCO entry and growth

Regulations for ESCO

Regulation	■ Energy efficiency is governed by the Law on Economical and Efficient Use of Energy and supporting decrees, which establish mandatory audits and energy management for large energy users ■ Electricity pricing remains regulated, limiting arbitrage but creating a stable cost environment for efficiency-led savings models
Registration	■ ESCO operate as standard service providers; no exclusive licensing regime ■ Market entry is primarily customer-driven, via industrial and commercial demand
Market Structure	■ Power generation, transmission and dispatch are centrally managed, while customer-side energy solutions are open to private participation ■ LNG and gas pricing is negotiated case by case, increasing the importance of optimisation rather than fuel trading

Key incentives for ESCO

Incentive	Notes
Law on Economical and Efficiency Use of Energy	Enables state-backed support mechanisms for energy efficiency projects, forming the legal basis for ESCO contracting, audits, and retrofit services
National GGS	Prioritizes energy efficiency and low-carbon investments, improving ESCO eligibility for government-supported green programs and projects
Green Credit & Finance Policies	Domestic banks are encouraged to provide preferential loans for green and energy-efficient projects, lowering financing costs for ESCOs
Green Investment Framework	EE and green projects may access tax incentives and investment support when aligned with national sustainability priorities

Source: Law on Economical and Efficient Use of Energy (No. 50/2010/QH12) and revision, Law on Esco/energy service (No.77/2025/QH15)

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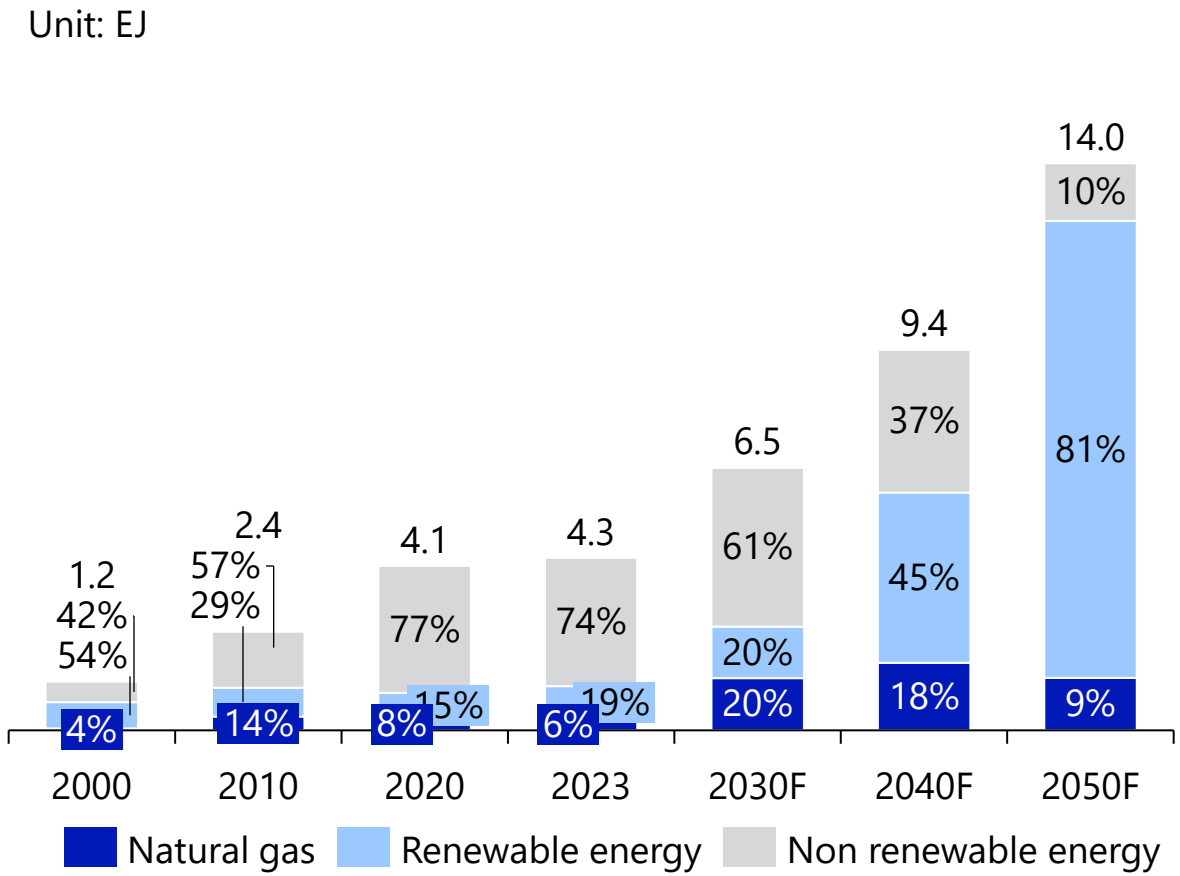
Market Supply

Gas supply is expected to grow at 4.5% CAGR, with natural gas supporting the transition, while PDP8 shifts the long-term focus toward renewables and energy efficiency, creating opportunities for ESCO services to support efficiency upgrades

Total Primary Energy Supply by Source



Insights

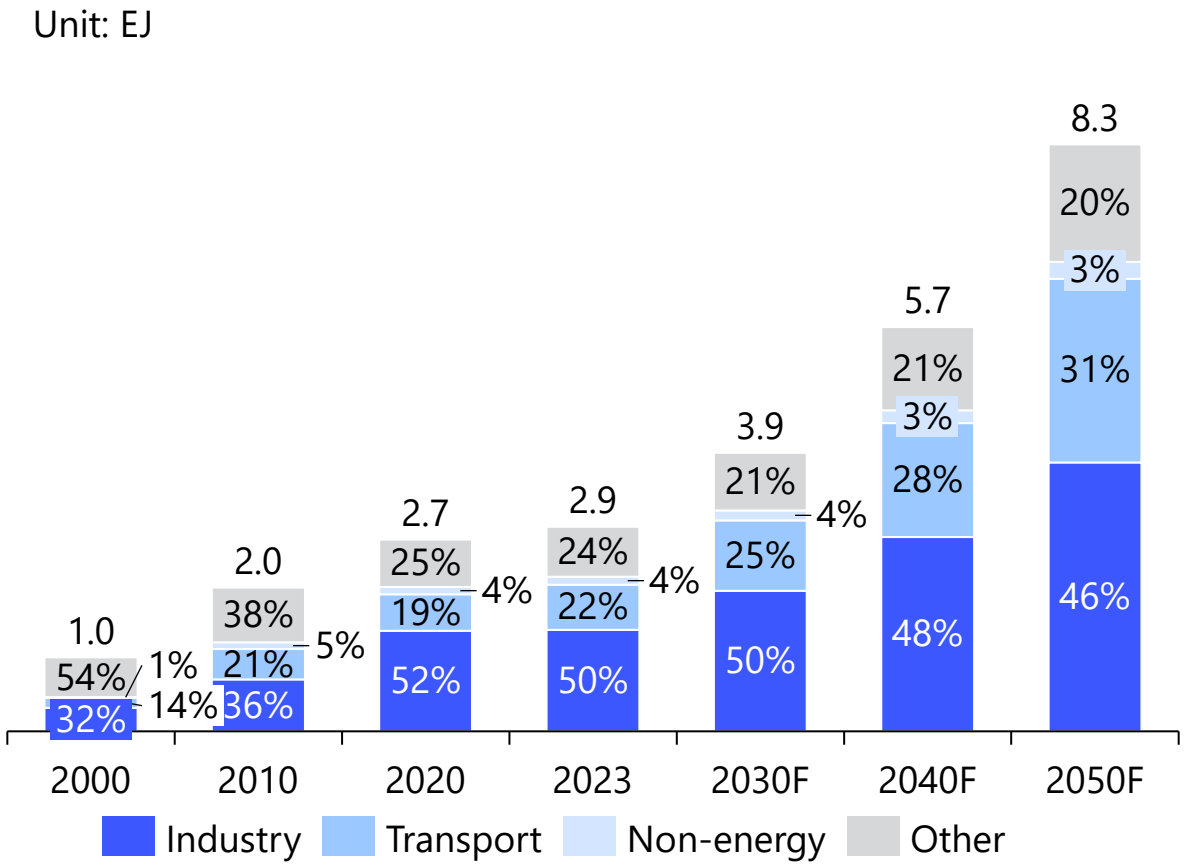
- Renewables are the primary driver of long-term energy growth, underpinned by policy commitments under the Power Development Plan (PDP8) for 2021–2030 with a Net-zero vision to 2050
- The high renewables mix suggests by 2050, Vietnam will electrify everything (transport, residential, light industry) using renewables
- Natural gas plays a critical transition role through 2035 by enhancing grid stability and diversifying fuel supply, particularly for power generation. Beyond the 2040s, its role gradually shifts toward industrial feedstock use (e.g., hydrogen and ammonia), as tighter decarbonization policies and higher renewable penetration reduce gas-fired power to align with PDP8

Notes: Total primary energy supply excludes electricity and heat trade. Coal also includes peat and oil shale where relevant
EJ = 1,000,000 TJ. 1 terajoule is a quantity of energy, equal to 277.8 terawatt hours (TWh), 23.88 million tonne(s) of oil equivalent (Mtoe), 34.12 million tonne(s) of coal equivalent (Mtce)
PDP8: Power Development Plan VIII is national strategy to transition the country's energy sector towards renewables, decarbonization, and increased grid capacity by 2030 (with a 2050 vision)
Source: International Energy Agency, YCP Research and Analysis

Market Demand

Industry is the largest energy-consuming sectors, driven by electrification after 2040. Electrification and limited energy efficiency service providers expands the market for ESCOs, but shifts from simple retrofits to system-level optimization

Total Final Consumption By Sector



Insights

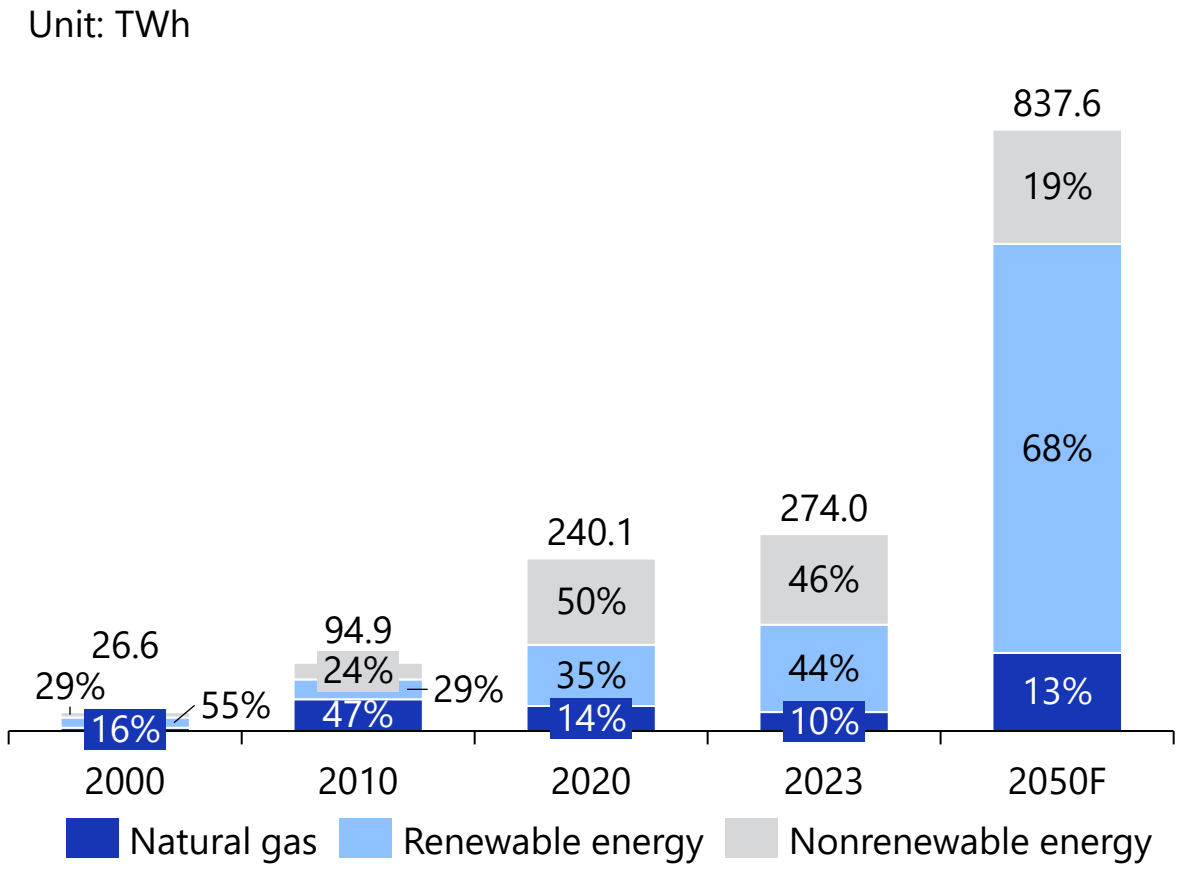
- Industrial energy demand will continue to grow, driven by GDP and population growth, as industry's share of GDP rises from 36% in 2019 to 40% by 2030 and stays at that level until 2050
- Industry sector grows steadily (3.3% CAGR) but gradually loses share after 2040 as economy-wide electrification accelerates. Despite this, industry remains the largest energy consumer in 2050, with hard-to-abate subsectors (e.g cement and steel) continuing to rely on fossil fuels due to high costs and technical limits of full electrification and renewable alternatives
- Vietnam's National Program on Energy Efficiency and Conservation (2019–2030) places responsibility on large industrial energy users, requiring energy audits, energy management systems, and efficiency action plans. However, compliance remains low due to weak regulatory enforcement and limited technical capacity within industrial firms and energy efficiency service providers to design and implement large-scale projects

Note: EJ = 1,000,000 TJ. 1 terajoule is a quantity of energy, equal to 277.8 terawatt hours (TWh), 23.88 million tonne(s) of oil equivalent (Mtoe), 34.12 million tonne(s) of coal equivalent (Mtce)
Source: International Energy Agency, Vietnam National Program on Energy Efficiency and Conservation for 2019-2030, YCP Research and Analysis

Market Supply

Power demand grows to 2050, driven by industrialization, with gas dominating growth before transitioning toward hydrogen, ammonia, and low-emissions generation.

Electricity Generation by Source



Notes: Coal also includes peat and oil shale where relevant
Source: International Energy Agency, PDP8, YCP Research and Analysis

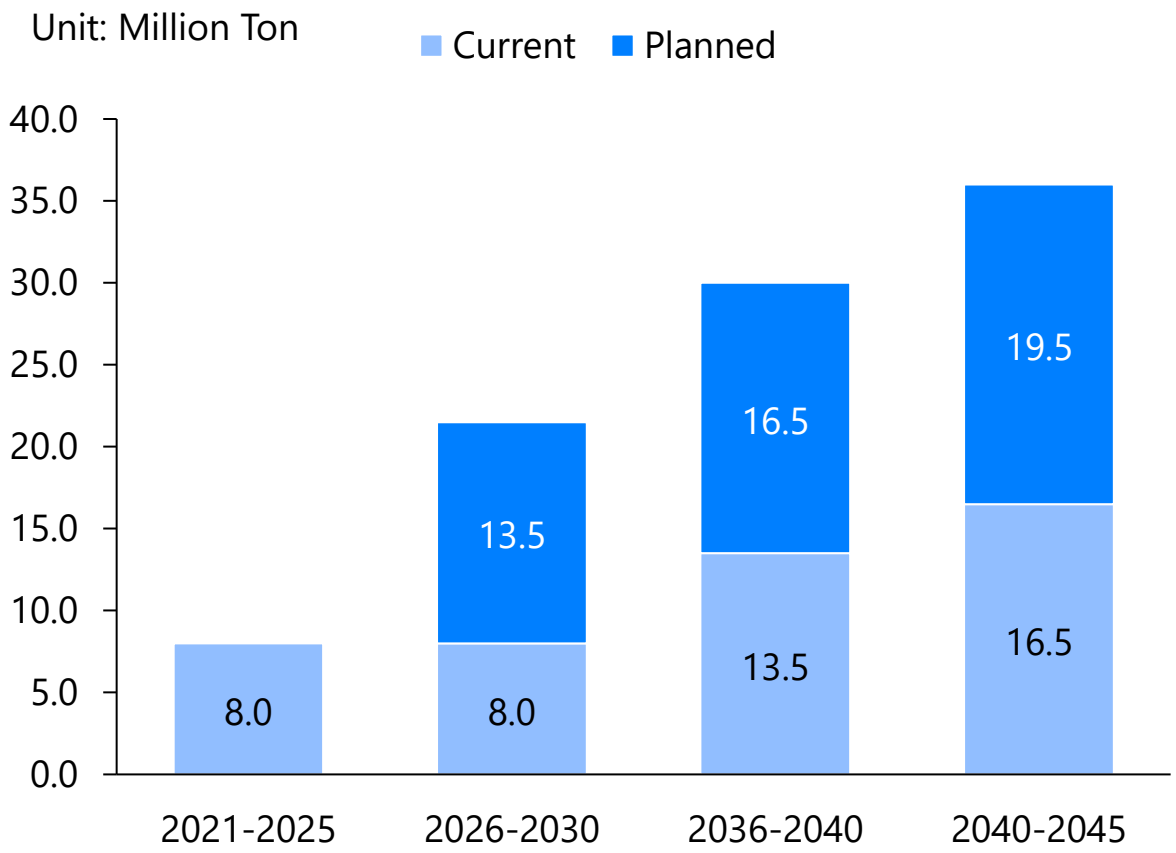
Insights

- Electricity demand rises structurally, driven by industrial upgrading, urbanization, digital infrastructure, and accelerating electrification across end-use sectors
- Natural gas is becoming less important to the whole economy (TPES) but more critical to the power grid (Electricity), signaling that while everything will be electrified using renewables, natural gas will be used to do one specific job: provide high-reliability electricity for the grid.
- Given the high electricity demand growth, Shizuoka Gas should focus on Electrification ESCO services. Help factories switch from coal boilers to high-efficiency heat pumps or electric furnaces powered by the gas-heavy grid.
- Target High-Value Manufacturing (semiconductors, electronics). These clients cannot risk the intermittency of the 81% renewable supply. Shizuoka Gas can offer On-site Gas Cogeneration (CHP) as a "Premium Reliability" service that guarantees stable power while the national grid transitions.

Vietnam's LNG Capacity

LNG capacity will increase as Vietnam imports more gas to meet rising power demand

LNG Terminal Capacity



Source: PDP8 (Power Development Plan VIII), PwC, Local News

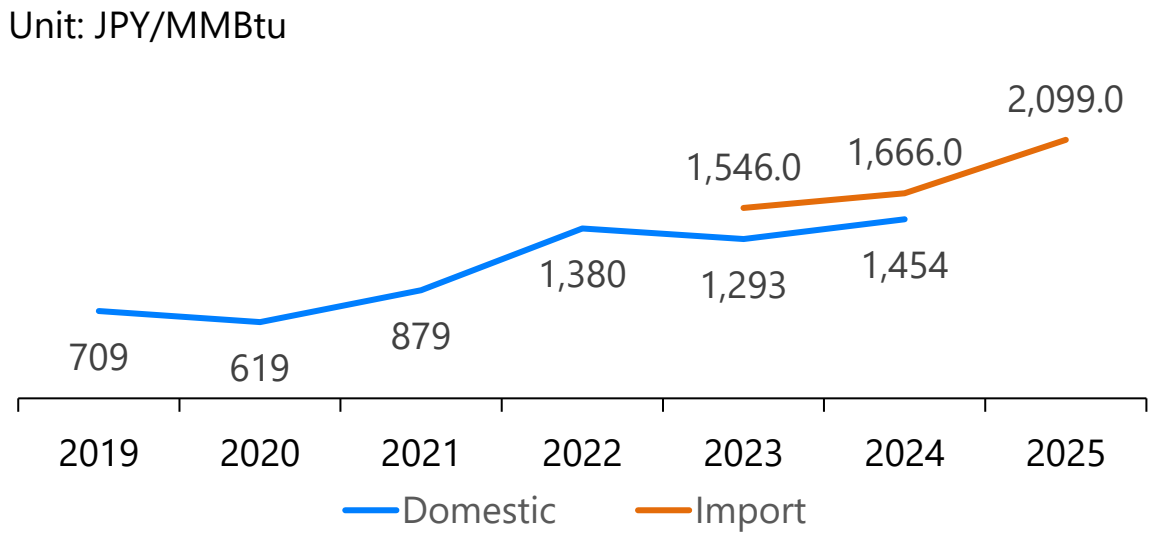
Insight

- LNG Infrastructure: most of LNG projects are under construction and not entered operation, even two main LNG import terminals in the country, Thi Vai and Hai Linh
- Demand Driver
  - Rising power demand and peaking domestic gas supply underpin LNG expansion. PDP8 projects 93,300 MW of additional load by 2030 domestic gas peaks around 2026
  - Gas reserves (e.g., Ca Voi Xanh, Block B) are higher-cost due to deeper, offshore, fragmented, and impurity-heavy fields, limiting their ability to close the gap
  - Vietnam's Gas Master Plan requires multiple LNG terminals to support imports of 0.7–3.0 Mtpa in 2021–2025, rising to 4.5–7.4 Mtpa by 2035 to meet growing gas demand

Natural Gas – Import vs. Domestic Production

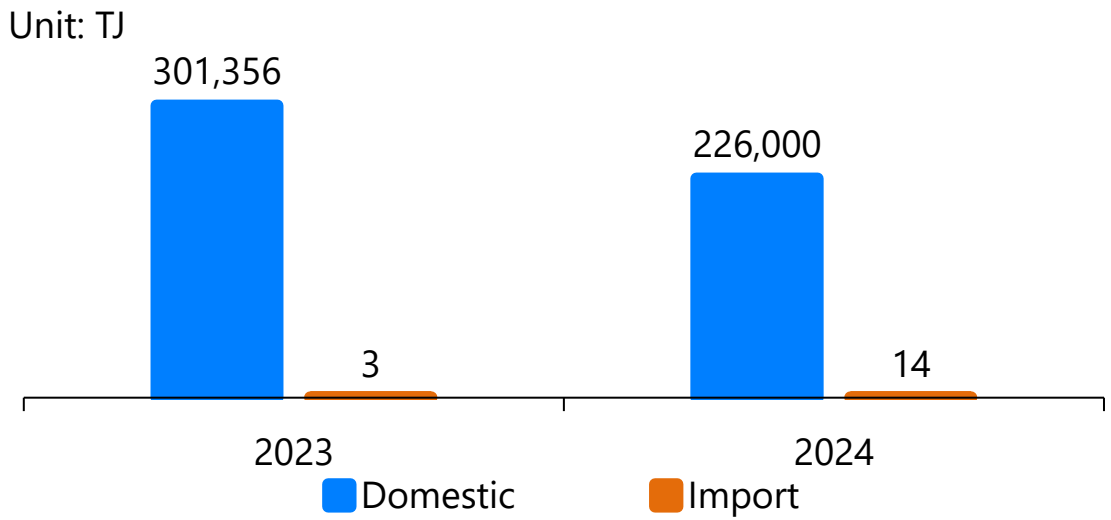
Vietnam prioritizes domestic gas production, with natural gas imports only emerging in the past two years, mainly from Indonesia, Malaysia, and Qatar

Natural Gas Price



- Imported LNG prices are around 1.2 times higher than domestic gas prices because it requires liquefaction, long-distance shipping, storage, and regasification, while domestic gas is delivered directly by pipeline at cost-based, more stable prices
- Limited LNG import capacity keeps per-unit logistics and infrastructure costs high. Most of LNG terminal in Vietnam are still under construction and not started to operate

Natural Gas Import vs Domestic Production



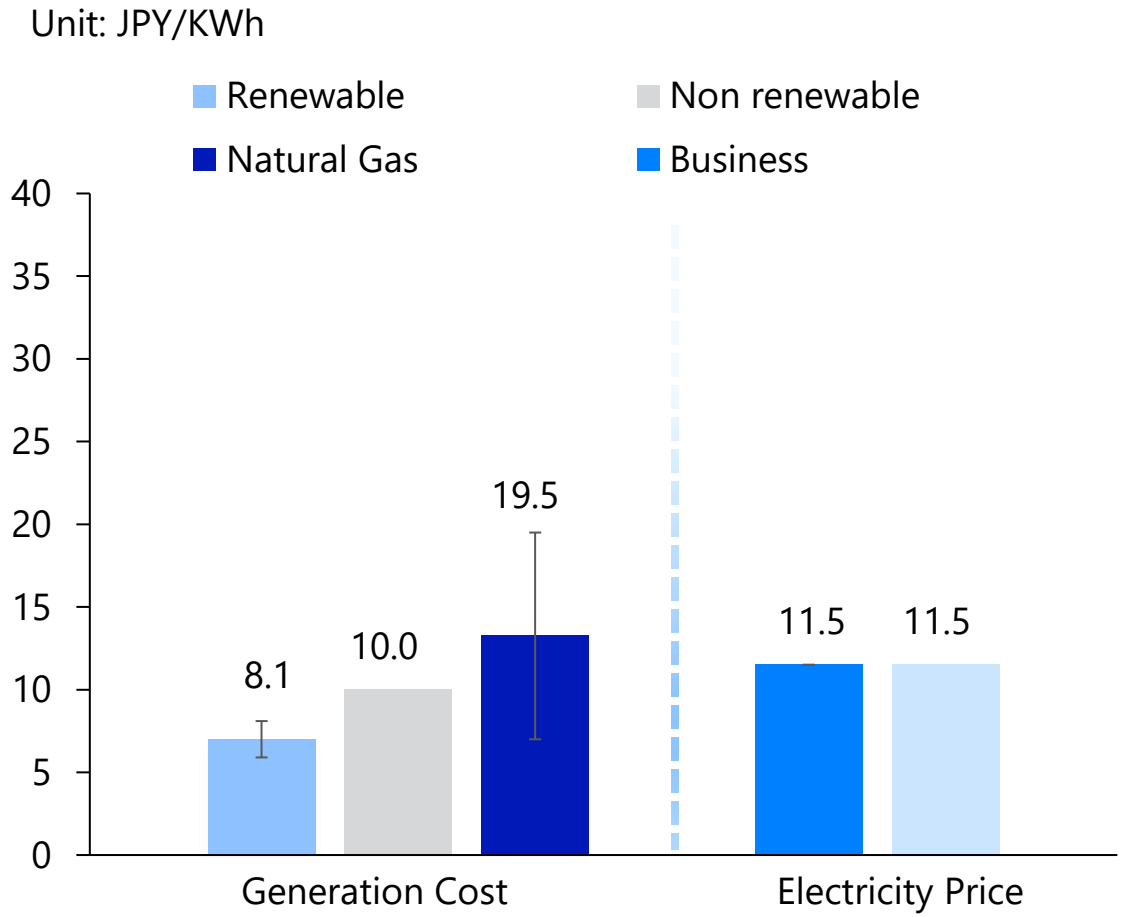
- Vietnam's first imports of LNG started in Jul-23 and increased 5 times in 2024. This momentum is expected to continue with its rising energy demand, becoming crucial for its power sector and clean energy goals
- PDP8 pushes to reduce coal reliance for air quality and climate commitments, focus on gas as a transition fuel to rioritizing in power demand

Source: EVN, Local News

Vietnam's Electricity Price

Low electricity prices from government subsidies limits energy efficiency opportunities

Generation Cost vs Electricity Price (2025)



Note: Error bar represents highest and lowest for ranged values, higher value is listed; EVN: Vietnam Electricity
Source: EVN

Electricity Price Assessment

- Highly regulated tariff environment. Tariff prices rarely vary year-on-year due to state-owned utility distribution apart from periodic adjustments issued by the EVN
- Electricity generation costs from natural gas are higher than other sources due to limited supporting infrastructure. Vietnam's first LNG-fired power plants, Nhon Trach 3 and Nhon Trach 4, were inaugurated in December 2025 and commenced commercial operations in January 2026
- Natural gas is expected to play a significant role in the future Vietnamese energy system. Historically the natural gas market price has been more volatile than e.g., coal. The potential price volatility creates a risk for an energy system highly relying on natural gas

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Japanese Major Gas Players' Presence in Vietnam's Energy Service Business

	Energy service in Vietnam
1. Tokyo Gas	N/A
2. Osaka Gas	JV (49%) with Sojitz (SOGEC) – Coal-to-gas boiler conversion
3. Toho Gas	N/A
4. Saibu Gas Holdings	N/A
5. Nippon Gas (NICIGAS)	N/A
6. Hokkaido Gas	N/A
7. Shizuoka Gas	N/A
8. Hiroshima Gas	N/A
9. Keiyo Gas	N/A
10. Sendai City Gas Bureau	N/A

Source: Company Website

Current State of the Energy Service Market in Vietnam

Vietnam's energy services market has strong efficiency potential, but weak risk allocation and financing structures continue to limit true ESCO scale

Number of local players		~200 operating in the ESCO field (no government-issued "ESCO license")
No. of ESCO Projects		ESCO project activity in Vietnam is limited, with few true EPC model implementations reported due to early market stage, financing constraints, and low policy enforcement
Situation of Market	Background	■ Rapid industrialisation and rising electricity demand created strong technical potential for energy efficiency ■ Electricity prices have increased gradually, but remain partially regulated, muting urgency for deep efficiency investment ■ ESCO concept introduced in the 2000s with strong multilateral support (World Bank, ADB, GIZ, JICA) ■ Policy intent has consistently supported ESCOs, but legal and financial frameworks lag implementation
	Current Situation	■ ESCOs are active mainly in industrial energy efficiency; boilers, motors, compressed air; waste heat recovery ■ EPC and performance-based contracting are formally recognised, but guarantees are often partial or informal ■ Projects are typically client-financed, with limited third-party or non-recourse financing ■ State-owned and large industrial clients dominate demand
	Continuing Challenges	■ Performance risk is rarely fully transferred to ESCOs due to: Weak contract enforceability, limited lender confidence in savings-based repayment, local ESCOs generally lack balance-sheet capacity to guarantee savings at scale ■ Banks show low appetite for EPC lending, preferring asset-backed or corporate loans ■ Regulatory uncertainty and slow approval processes discourage long-term ESCO contracts

Source: EVN, Vietnam Energy Conservation and Efficiency Association (VECEA), UNEP

Japanese gas player in Vietnam

Out of major Japanese gas companies, major competitor is only Osaka gas whose project core is lightly overlapping.
One example is SOGEC's natural-gas boiler project at Acecook Vietnam, targeting 76,300 tons of CO_2 reduction over 10 years

Context

SOGEC (JV between Sojitz and Osaka Gas) supported a major Vietnamese food manufacturer in shifting from coal-fired boilers to natural-gas boilers to improve efficiency in 2021, reduce emissions, and meet rising decarbonization requirements in Vietnam.

Approach and Deliverables

Approach

- Replaced the factory's existing coal-fired steam boiler with a high-efficiency natural-gas boiler.
- Provided a one-stop service, including fuel supply contracting, equipment installation, and operational support.
- Utilized Japan's JCM program to certify CO_2 reduction benefits and lower project cost burden.
- Enabled the factory to adopt a cleaner and more stable boiler system with minimal internal resources.

Benefits of integrated energy system

- Planned to achieve 76,300 tons of CO_2 reduction over 10 years to be certified under Japan's JCM scheme.
- Eliminated coal use, significantly reducing SOx, NOx, and PM emissions (major air pollutants).
- Improved steam efficiency and operational stability through cleaner combustion and optimized boiler performance.
- Established a scalable ESCO/EaaS fuel-switching model for Vietnam's large industrial sector.

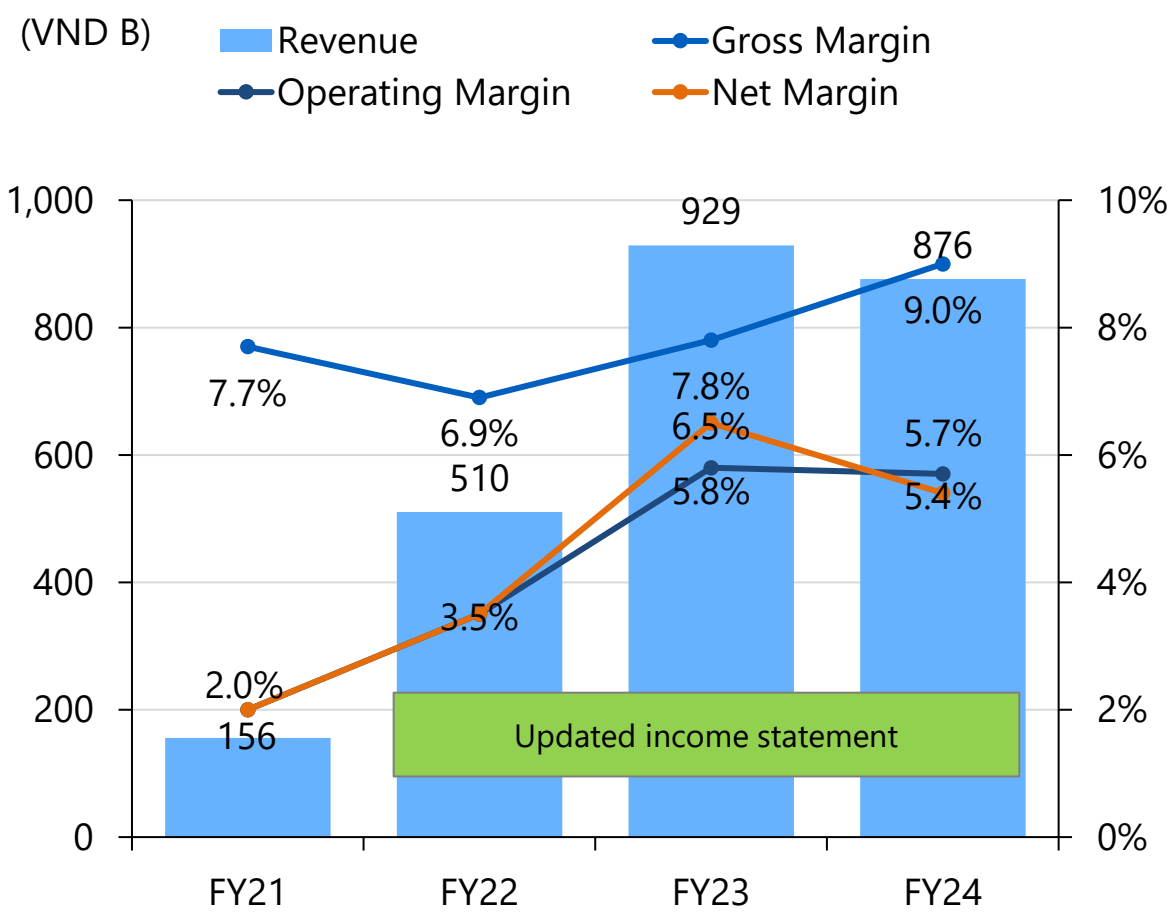
Outcome

SOGEC delivered measurable improvements in energy efficiency and emissions, helping the manufacturer achieve cleaner, more stable operations while contributing to Japan's CO_2 reduction targets under the JCM framework.

Source: Company website

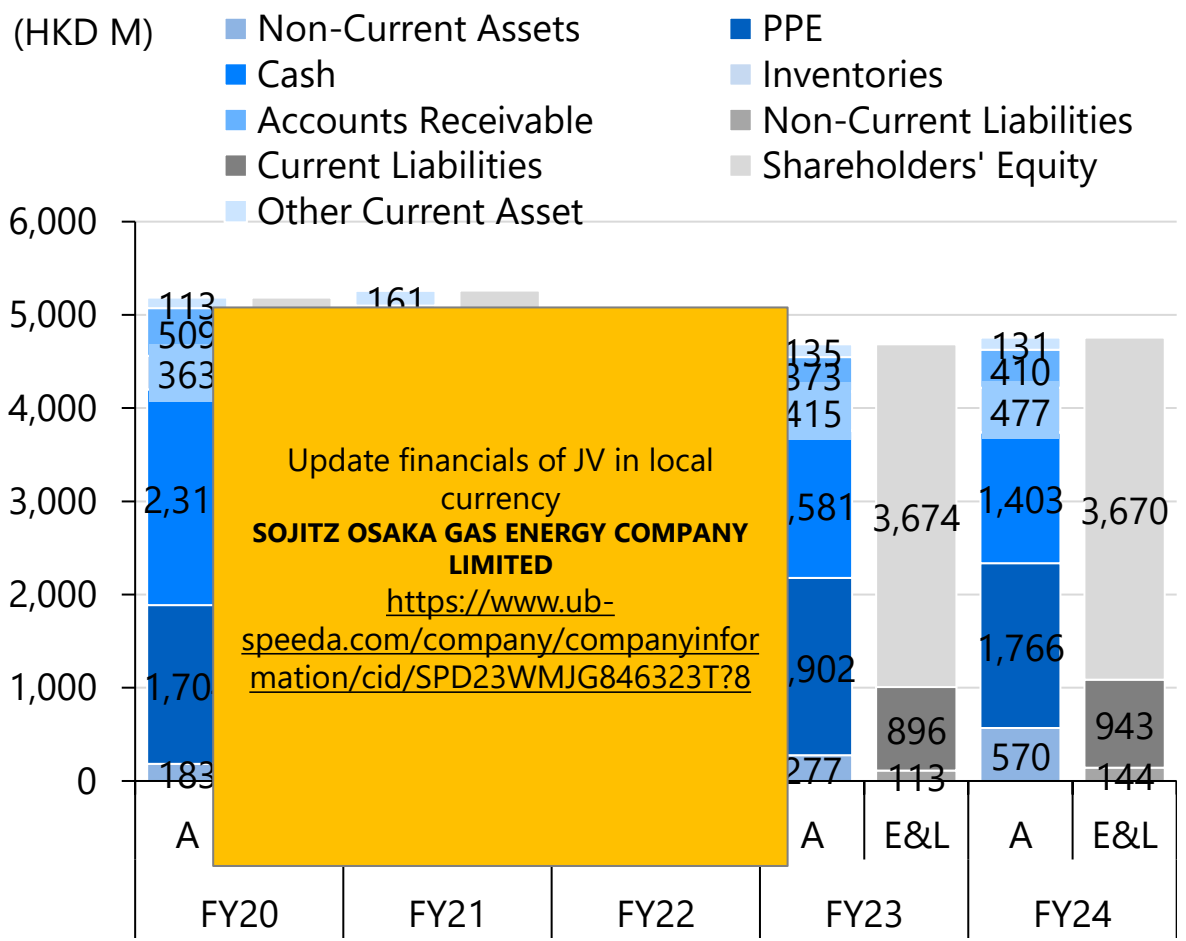
Financial Highlights of SOGEC (Sojitz Osaka Gas Energy)

Income Statement



Exchange rate: VND 100B = JPY 600M
Source: Speeda, YCP Research

Balance Sheet



Vietnam Energy Services Market: Opportunities and Structural Barriers

Vietnam's energy services market combines strong structural demand and rising system complexity with near-term regulatory constraints that are expected to ease, unlocking improved commercial-viability for scalable, efficiency-led energy services model

	Advantages
Stable policy & Sector governance	■ Power and gas led by a few state-owned entities ■ Predictable decisions support long-term energy service contracts
Rising system copmplexity	■ LNG, renewables, and C&I growth increase system complexity ■ Drives demand for optimisation and integrated solutions
Large industrial energy demand	■ Concentrated demand from industrial parks and manufacturers ■ Enables scalable, behind-the-meter energy service deployment
Effiency-driven value recognition	■ Efficiency increasingly used for cost control ■ Supports guaranteed-savings energy service models
Long-term electricity demand growth	■ Electricity demand remains structurally strong ■ Supports long-term, lifecycle-based energy service engagement

	Obstacles
Limited market liberalisation	■ Transmission, dispatch and retail pricing remain centralised ■ Merchant and trading-based models are limited
Fuel and offtake uncertainty (LNG)	■ LNG pricing and offtake negotiated case by case ■ Elevates risk for gas-linked energy services and CHP projects
Regulated electricity tariffs	■ Electricity prices are capped with limited pass-through ■ Constrains upside from performance-only optimisation
Dispatchment and curtailment risk	■ Centralised dispatch and renewable priority reduce utilisation ■ Weakens economics for grid-connected assets
Evolving regulatory framework	■ DPPA and LNG rules still evolving ■ Favours pilots, phased entry and flexible contracts at present

Source: YCP Analysis