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Gas Exporting
Countries Forum

Global Gas Outlook 2055

Gas Exporting Countries Forum (GECF)

10th Edition

About the Report

The Global Gas Outlook 2055 provides a long-term, scenario-based assessment of the role of natural gas within an evolving global energy system. It analyses how key structural drivers, including population growth, economic expansion, urbanisation, electrification, and technological change, shape regional and sectoral natural gas demand, supply development, and international trade over the outlook horizon.

The Outlook is built around two complementary analytical frameworks. The Reference Case Scenario (RCS) presents a forward-looking assessment based on prevailing market trends, existing policy settings, and expected investment patterns. In parallel, the Sustainable Energy Scenario (SES) offers a normative, development-centred pathway that examines how higher levels of energy service delivery, stronger economic convergence, and long-term climate alignment can be achieved simultaneously while preserving reliability and affordability.

Across these scenarios, the Outlook covers the full natural gas value chain, including demand by region and sector, production and resource development, global trade flows, LNG expansion, and infrastructure requirements across upstream and midstream segments. It also evaluates the implications of geopolitics, energy security, market design, and system resilience for the long-term evolution of natural gas. Taken together, the Outlook provides a structured basis for understanding both the expected trajectory of global gas markets and the alternative pathways through which natural gas can continue to support energy security, development, and just, orderly and equitable energy transitions.

Content

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Global Gas Model (GGM): GECF hybrid energy system model

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6 Key Sub-models

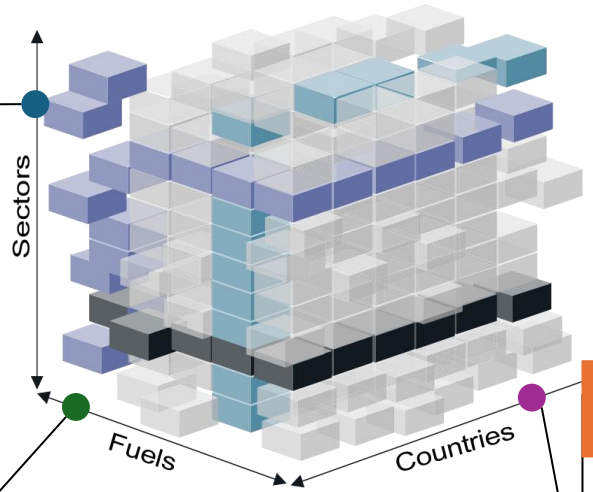
- Macro Sub-model
- Energy Price Sub-model
- Energy Demand Sub-model
- Natural Gas Supply Sub-model
- Natural Gas Trade Sub-model
- Emissions Sub-model

38 Sectors

- Residential
- Commercial
- Transport
- Industry
- Power
- Agriculture
- Hydrogen
- Heat
- Energy

35 Fuels

- Natural gas
- Coal
- Oil
- Biomass
- Solar
- Wind
- Geothermal
- Hydro
- Nuclear
- Hydrogen



140 Countries

- Africa (19)
- Asia Pacific (31)
- Eurasia (14)
- Europe (39)
- Latin America (16)
- Middle East (18)
- North America (3)

Key Pillars for GGO Reference Case Scenario (RCS)

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People and society

- Population rise stemming from developing countries
- Global ageing due to declining fertility and increased longevity
- Increased migration due to the pursuit of economic betterment

Technology and innovation

- Time for technology adoption is set to speed up
- Industry 4.0 will profoundly change the energy supply chains and energy consumption behavior
- Technological competitiveness improvement is on the rise in the developing countries
- AI will be a powerful frontier technology resulting in a new human-machine interaction

Environment and resources

- Emergency measures to revisit climate policies and targets
- Ongoing climate change concerns
- Beyond climate, other types of pollution will damage the environment and human health
- Significant demand for food, water and raw materials is expected in the long-term

Economic and business

- The balance between labour displacement and job creation is exposed to shifts due to ICT
- Increased trade policy uncertainty and emerging regionalisation trend
- Global economic power is shifting to emerging countries
- Global economy will be burdened by increasing levels of debt

Geopolitics and governance

- The evolving role of the Global South in shaping international policies and norms
- Formation of new alliances among Global South countries
- Weakening multilateralism and erosion of trust in international order

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Energy Policy Developments

Security and competitiveness take precedence over transition acceleration

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Recalibrating after the crisis

2023

Governments consolidated emergency measures into structured, long-term energy security policies

- Growing focus on energy security
- Shift from emergency measures to structural resilience
- Strengthened gas storage and LNG diversification
- Continued climate ambition integrated with strengthened energy security
- Acceleration of renewables and grid expansion

Balancing transition with competitiveness

2024

Rising affordability concerns, high financing costs and political shifts prompted a reassessment of transition speed and regulatory burden

- Greater emphasis on cost containment and economic competitiveness
- Slower renewable deployment in several markets
- Growing role of gas in adequacy and peak-shaving frameworks
- Intensifying debate over climate policy implementation costs

Pragmatic energy governance

2025

Energy governance entered a more pragmatic phase, balancing decarbonisation objectives with domestic production, system reliability and geopolitical realities

- Clear prioritisation of supply security and domestic production
- Streamlining of sustainability and compliance frameworks
- Emerging hydrocarbons prioritisation trend reshaping global policy dynamics

Natural gas policy support strengthened amid security and competitiveness priorities

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REGULATORY RECALIBRATION

Governments adjusted regulatory frameworks to facilitate gas investment and reinforce its reliability role

- Streamlining of upstream and LNG permitting procedures
- Reversal or easing of export and exploration constraints
- Simplification of sustainability compliance affecting gas operators
- Embedding gas within formal energy security and adequacy legislation

UPSTREAM & LNG EXPANSION

Policy tools increasingly support production and liquefaction growth

- Fiscal incentives to attract upstream capital expenditure
- Acceleration of LNG export approvals and infrastructure expansion
- Long-term national strategies reinforcing domestic production
- Strategic energy partnerships supporting export diversification

GAS IN POWER-SECTOR PLANNING

Natural gas formally embedded in adequacy and flexibility mechanisms

- Expansion of gas-fired peak-shaving capacity
- Inclusion in capacity remuneration and reliability mechanisms
- Gas positioned as complementary to renewable integration
- Policy support for gas-to-power in emerging markets

CONTRACTING AND TRADE FRAMEWORKS

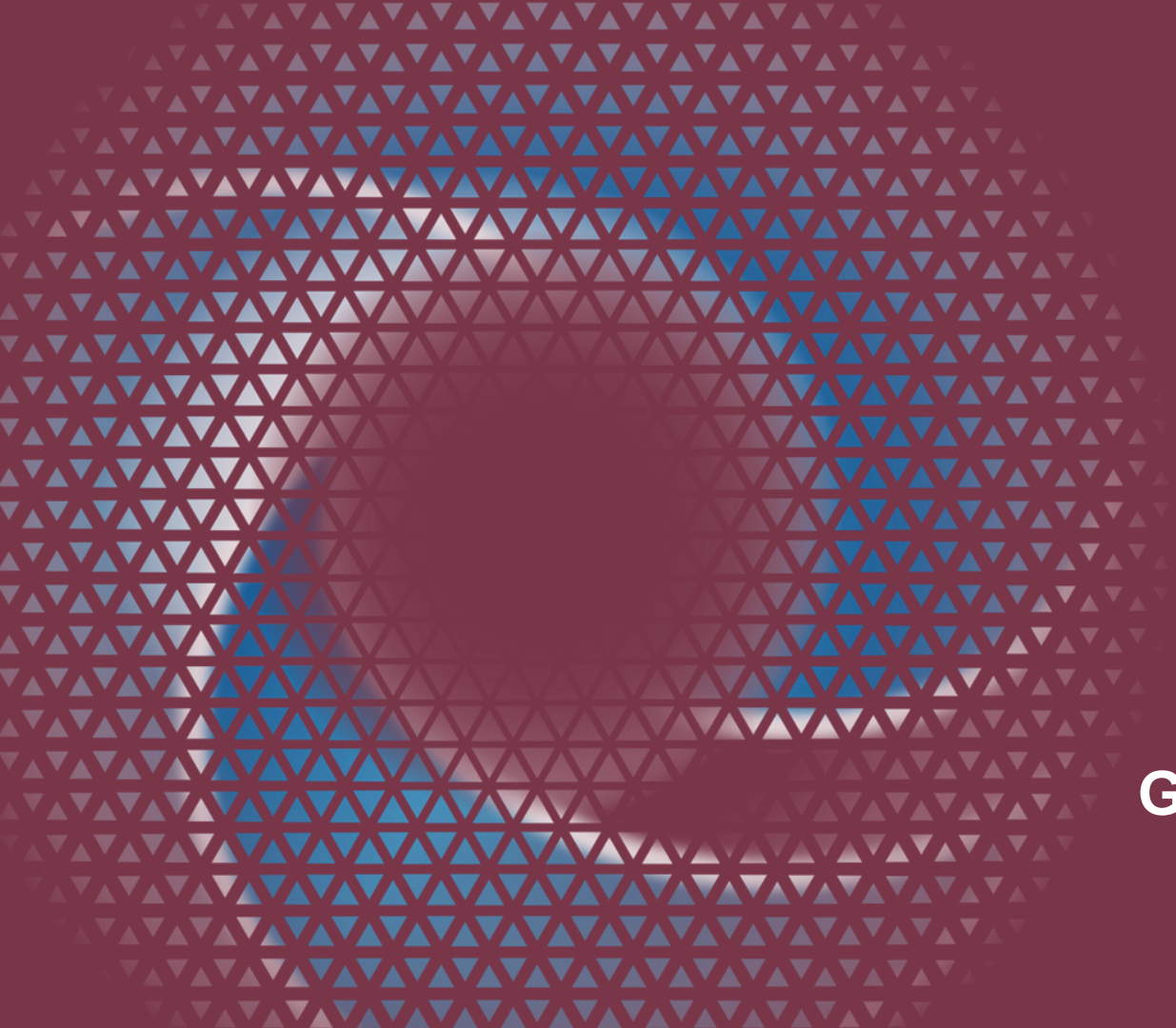
Governments reinforced secure and diversified gas trade structures

- Increased emphasis on long-term LNG contracting
- Supply diversification embedded in national policy frameworks
- Greater flexibility provisions to manage demand variability
- LNG positioned as a strategic stabiliser in global trade

DECARBONISATION ALIGNMENT

Gas policy increasingly linked with emissions governance

- Strengthened methane monitoring and reporting standards
- Expansion of low-carbon certification schemes
- CCUS incentives integrated into gas development policies
- Emissions performance influencing procurement and trade access



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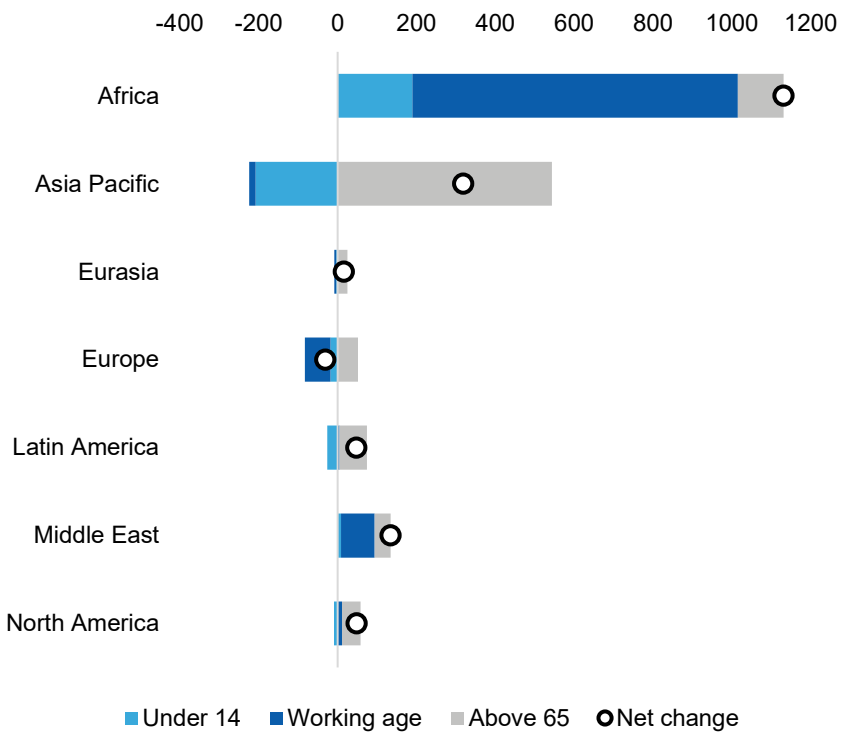
Energy and Natural Gas Demand Outlook

Amid slow down in global population growth, humanity is set to become older, more urban and increasingly solitary

Global population increment outlook by age group, 2024-2055 (Millions)



Highlights

- Global population is set to slow down over the coming decades due to declining fertility rate and improved life expectancy
- Sub-Saharan Africa and developing Asia Pacific are projected to account for nearly all net addition to the global population by 2055
- By 2055, two out of three individuals will live in cities, surging demand for energy-intensive urban services, infrastructure and housing
- The proportion of people aged 65+ rises to nearly 18% by 2055, up from 10% in 2024, with significant repercussions on global labor productivity and economic growth potential
- Africa's working age population will surpass India and nearly 2 times larger than declining China by 2055

Source: GECF Secretariat based on GGM

Total factor productivity (TFP) will emerge as the dominant source of long-term economic growth

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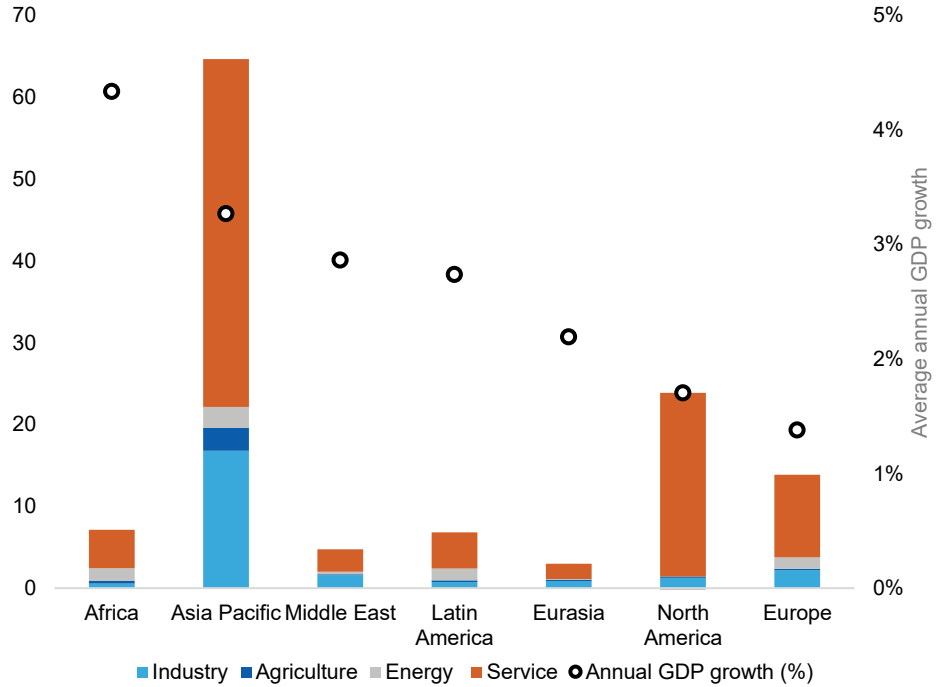
Highlights

- Global economy doubles by 2055, driven by digitalisation and innovation, with ageing and regionalisation as key headwinds
- Unlike previous decades where economic growth was underpinned by rapid population growth, future gains will rely primarily on technological innovation and productivity improvement
- By 2055, non-OECD countries are projected to account for 53% of global economy, signaling a continued rebalancing of global income, production and consumption
- With the rapid integration of automation and AI, the service sector will consolidate its position as the key driver in the global economy
- Driven by improved productivity, per capita GDP is expected to rise by 1.8% per year to reach USD 23,900 by 2055

Regional GDP change outlook by sector, 2024-2055
(real trillion USD, base year=2024)



Source: GECF Secretariat based on GGM

As the global energy system enters the age of electricity, natural gas strengthens its role in delivering efficiency, flexibility, and system value

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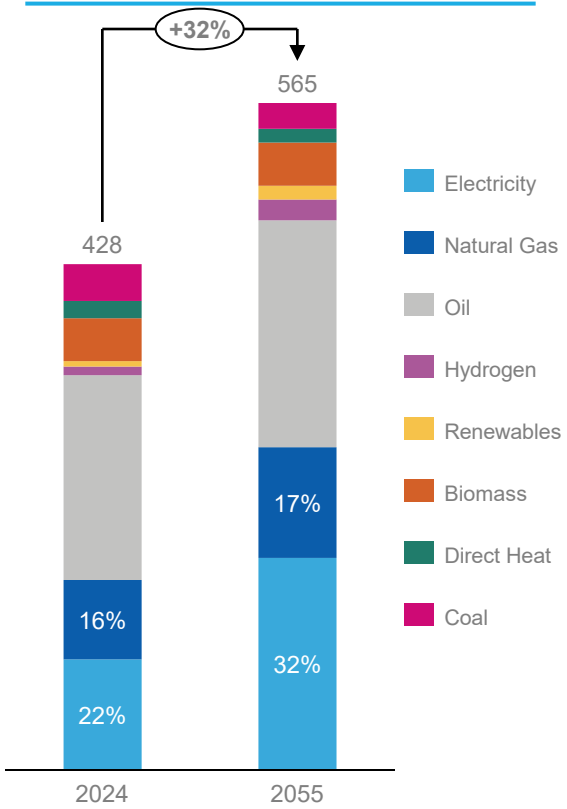
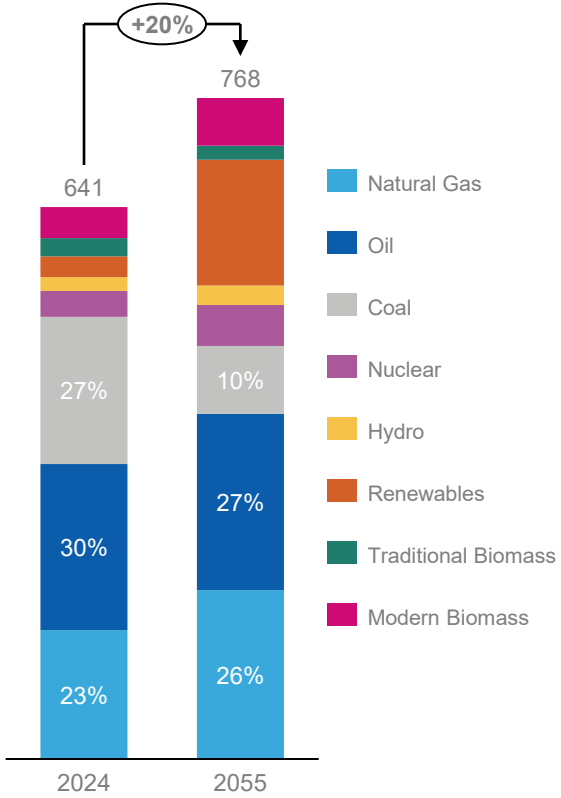
Global final energy mix outlook (EJ)



Source: GECF Secretariat based on GGM

Global primary energy mix outlook (EJ)



Note:. Renewables include solar, wind, tidal, and geothermal energy.

Highlights

- Primary energy demand is projected to increase by 20% (18% CAGR) by 2055, with new sources of energy service demand emerging from digitalisation and artificial intelligence amid continued expansion of the global energy system
- With electricity demand doubling over the forecast period, electrification remains the dominant structural trend, with electricity's share in final energy demand rising from 22% in 2024 to 32% by 2055
- Renewables are projected to be the fastest-growing source of primary energy, increasing sevenfold by 2055 despite rising system integration costs
- Hydrocarbons nevertheless remain central to the global energy system, accounting for around 62% of primary energy demand by 2055
- Within this mix, natural gas strengthens its role, rising from 23% of the global energy mix in 2024 to 26% by 2055, driven mainly by economic activity expansion and fuel switching

The centre of gravity of natural gas demand shifts increasingly towards developing Asia Pacific, the Middle East, Eurasia, and Africa

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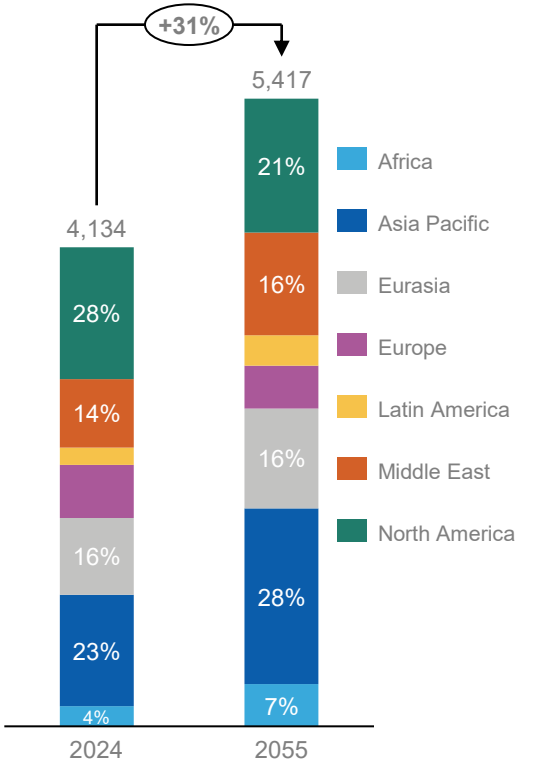
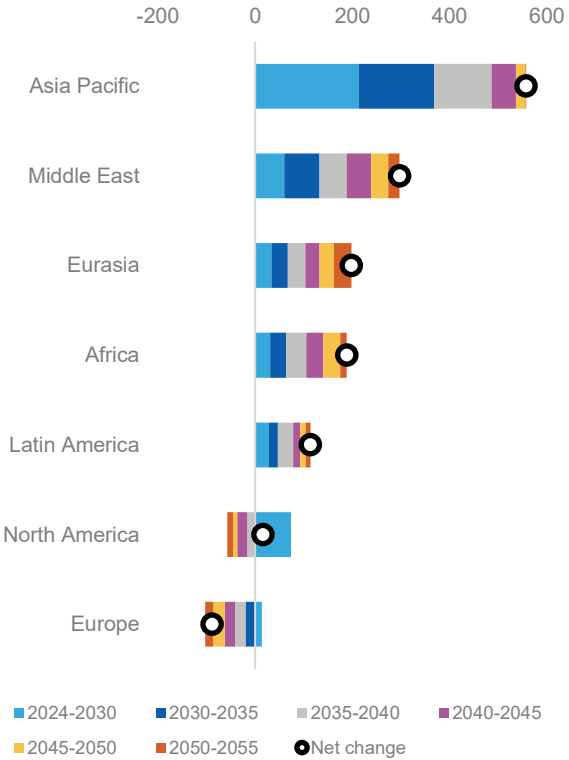
Natural gas demand outlook by region (bcm)



Natural gas demand increment outlook (bcm)



Highlights

- Macroeconomic growth, energy system transformation, and decarbonisation imperatives are projected to lift natural gas demand by 31% (27% CAGR) to 5,417 bcm by 2055
- Asia Pacific leads global natural gas demand growth, expanding by 560 bcm and accounting for 43% of total net increase, driven by electrification, coal-to-gas switching, air quality, and food security
- Natural gas demand in the Middle East is projected to rise by nearly 300 bcm, accounting for 23% of total net growth, driven by oil-to-gas switching in power generation, fertilizer production, and own-use consumption in upstream and liquefaction facilities
- Supported primarily by accelerating electricity demand, Africa is projected to record the fastest natural gas demand growth among all gas-consuming regions, at 2.4% per year
- Despite medium-term natural gas demand growth through the early 2030s, Europe is projected to be the only region facing long-term contraction over the forecast period

Source: GECF Secretariat based on GGM

Future natural gas demand is becoming more concentrated, more efficient, more flexible and cleaner

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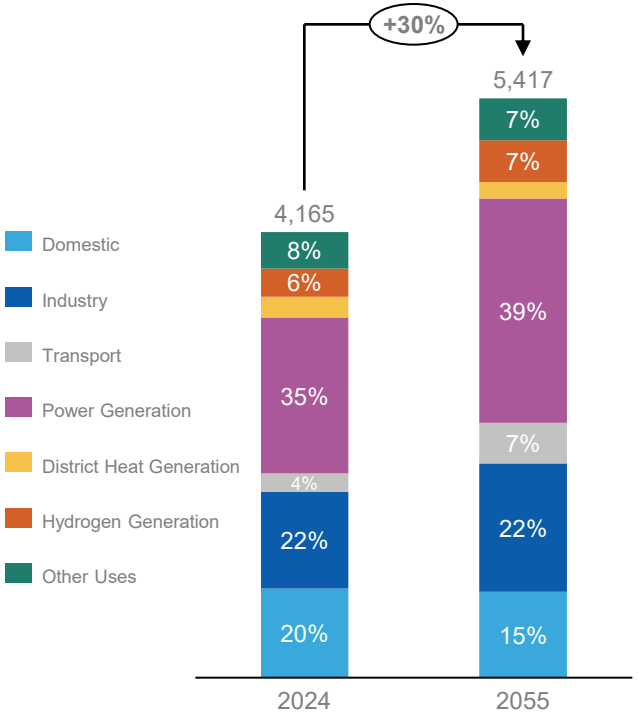
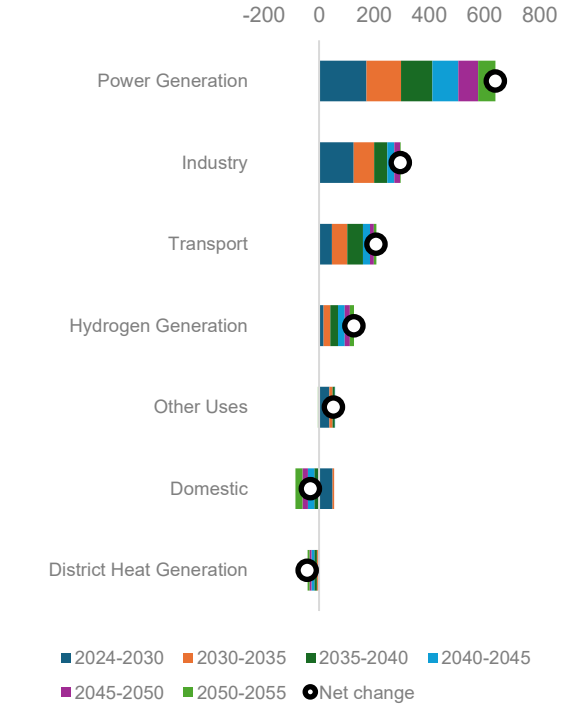
Highlights

- As natural gas moves away from baseload generation towards balancing and flexibility, the power sector is set to account for more than half of total incremental demand
- Natural gas demand in the industrial sector is projected to rise by nearly 300 bcm over the forecast period, accounting for 24% of total net growth, driven by rising demand for hard-to-electrify industries and the widening gas-to-electricity price gap
- Although starting from a low base, the transport sector is projected to be the fastest-growing source of natural gas demand, increasing by 209 bcm and accounting for 17% of total net growth.
- Natural gas demand in the residential sector is projected to decline by around 30 bcm over the forecast period, reflecting structural efficiency gains constraints and the wider deployment of alternative heating solutions

Total gas demand increment by sector (bcm)



Total gas demand by sector (bcm)



Note: Industry includes natural gas used directly as fuel and as feedstock in the chemical and petrochemical sectors, as well as gas consumed for refinery utilities and processes. Transport covers natural gas used in road transport, marine bunkers, rail transport and pipeline operations (e.g., compressor fuel). Other uses comprise natural gas consumed for the energy sector's own use, together with distribution losses. Total gas demand includes primary natural gas as well as gas works gas, hydrogen blending and biomethane blending, where applicable.

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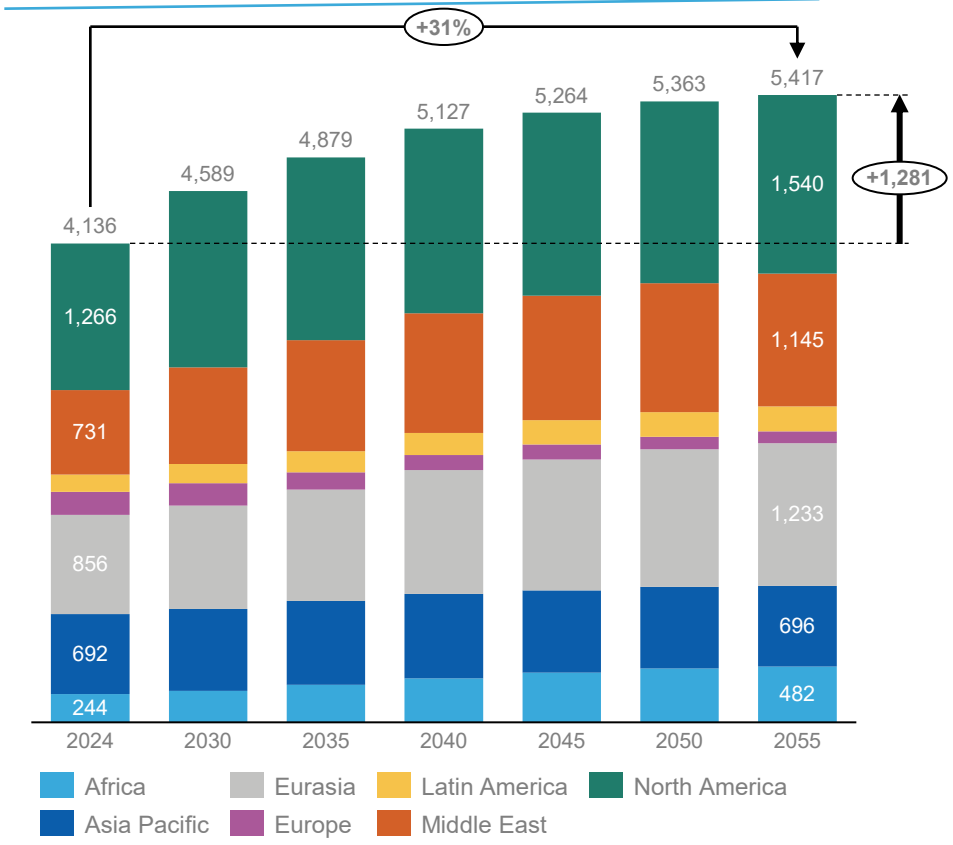
Natural Gas Supply Outlook and Upstream Investment

Natural gas production sustains growth to 2055, adding volume equivalent to North America's current production

Global natural gas production outlook (bcm)



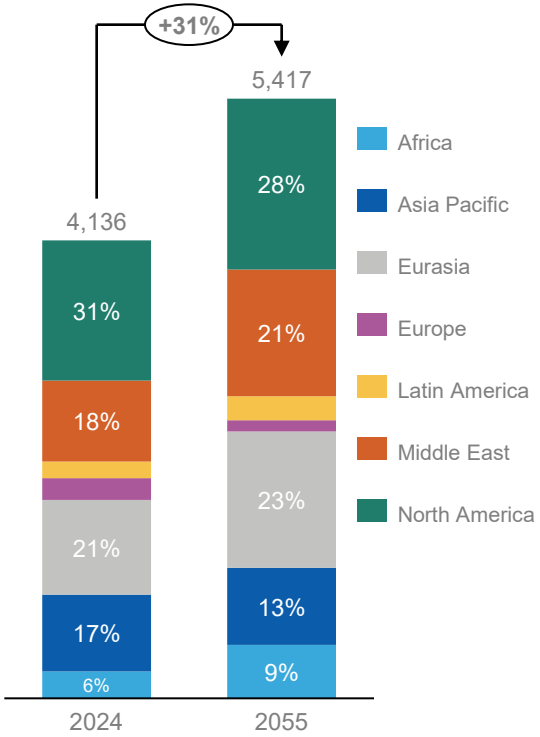
Source: GECF Secretariat based on GGM

Highlights

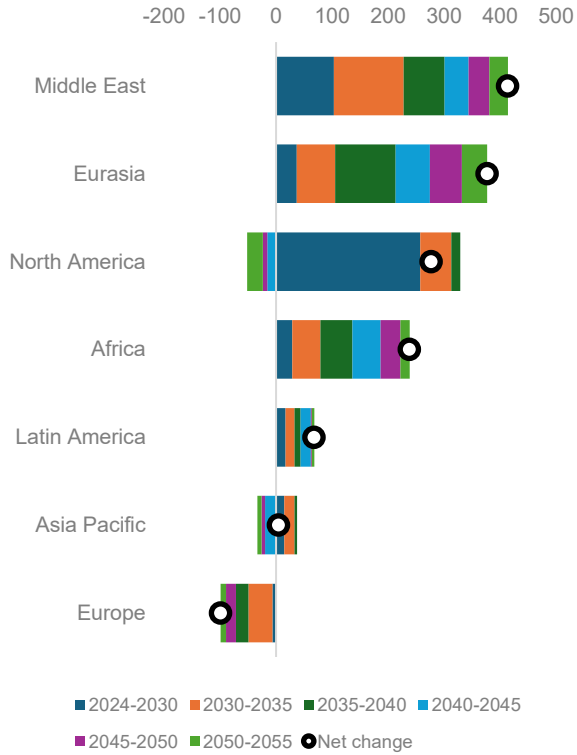
- Global natural gas production is projected to reach 5,417 bcm, with an average annual growth rate of 1%
- North America is expected to remain the world's largest natural gas producer reaching 1,540 bcm by 2055 (a growth of 22% from 2024 level)
- Eurasian production is forecast to reach 1,233 bcm by 2055 (a growth of 44%)
- The Middle East is projected to reach 1,145 bcm by 2055 (a growth of 57%)
- Africa is projected to nearly double its production by 2055, reaching 482 bcm
- Latin America is forecasted to reach 217 bcm by 2055 (a growth of 42%)
- Asia Pacific's gas production is set to remain unchanged by 2055 while Europe is set to decline by 50%

With North American production peaking, the Middle East, Eurasia, and Africa are projected to deliver nearly 75% of global production growth by 2055

Natural gas production outlook (bcm)



Natural gas production change outlook (bcm)



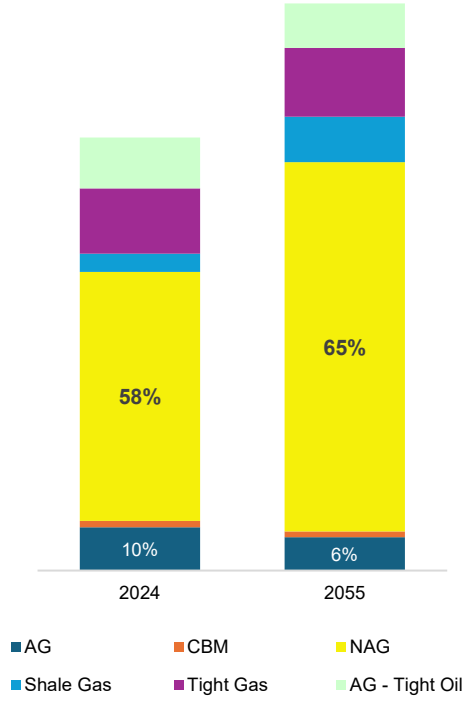
Highlights

- The **Middle East** will account for the largest incremental gas production growth in the forecast period, while **Africa** is the fastest growing region
- Supported by the expansion of both conventional and unconventional resources, the Middle East is projected to be the largest contributor to global natural gas production growth by 2055
- Driven by a strategic pivot towards Asian markets, **Eurasia**'s share of global natural gas production is projected to rise to 23% by 2055, supported by production growth of 377 bcm
- During 2030s, **North America**'s gas production begins to slow, reflecting maturity in unconventional plays despite gains from new unconventional projects. During 2040s, **North America**'s gas production will decline
- **Europe** falls to about 100 bcm by 2055 (2% of global gas production), reinforcing import dependence

Source: GECF Secretariat based on GGM

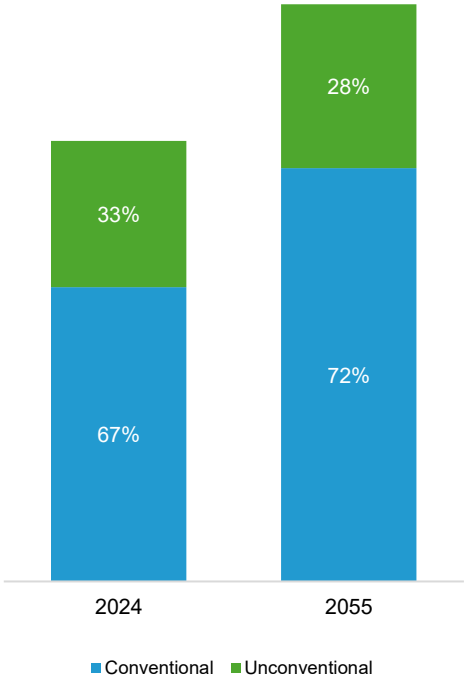
Non-associated gas will lead production growth to 2055, and global gas supply is shifting from shale-led expansion towards conventional growth

Natural gas production outlook by hydrocarbon type (bcm)



AG: Associated gas
NAG: Non-associated gas
CBM: Coal bed methane

Natural gas production outlook by hydrocarbon type (bcm)



Highlights

- Nearly all projected production growth comes from **non-associated sources**, which increase from 3,243 bcm in 2024 to 4,670 bcm by 2055 at a growth rate of 1.2% annually
- The share of non-associated gas from conventional sources is projected to rise from **58% in 2024 to 65%** by 2055
- **Conventional gas contributing 1,115 bcm (87%)** of incremental production growth along the Outlook to 2055 compared with 162 bcm from unconventional sources. This represents a structural departure from the 2010s, when unconventional resources dominated global expansion
- Conventional resources are projected to account for 72% of global natural gas production in 2055 compared to 67% in 2024
- **Unconventional gas production is expected to peak at 1,625 bcm in the late 2030s**, before declining to 1,538 bcm by 2055

Source: GECF Secretariat based on GGM

New projects and yet-to-find (YTF) resources are expected to deliver 86% of global natural gas production by 2055

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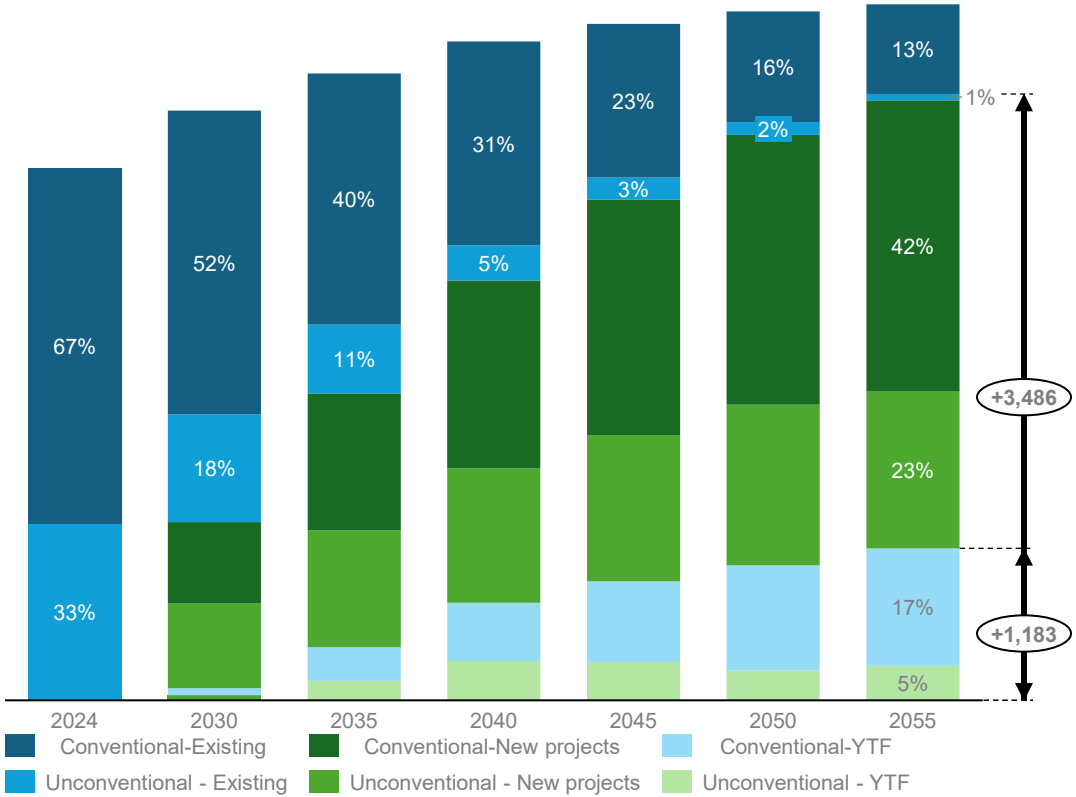
Natural gas production outlook by project type (bcm)



YTF: Yet to Find

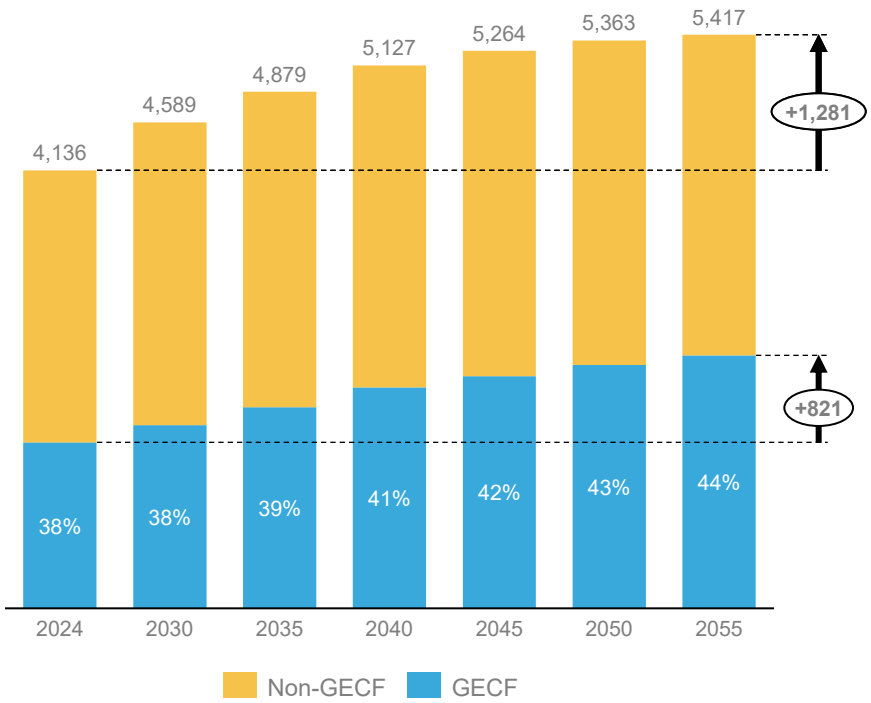
Source: GECF Secretariat based on GGM

Highlights

- Today's producing assets face natural decline, **conventional fields** declining at **4%** annually while **unconventional assets** deplete nearly three times faster at **11%** annually
- By 2055, 86% of global gas will flow from fields not yet producing today
- Future gas security hinges on successfully developing **new and undiscovered resources** along the outlook.
- The future stability of gas markets and energy security depend on maintaining a robust exploration and development activities across diverse geographies, making **upstream investment** a strategic priority

GECF Members Countries are set to expand their market share from 38% in 2024 to 44% in 2055

GECF Member Countries' contribution to global natural gas production, 2024-2055 (bcm)



Highlights

- Natural gas production from **GECF Member Countries** is expected to rise from 1,568 bcm in 2024 to 2,389 bcm in 2055, accounting for 44% of global production, up from 38% in 2024
- The average annual growth rate of natural gas production from **GECF Member Countries** is forecast at 1.4%, significantly outpacing the 0.5% growth rate for non-GECF producers
- **GECF Member Countries** are projected to account for 65% of the global net increase in gas production
- **Non-GECF** output peaks in the first half of 2040s at 3,070 bcm. This reflects the maturing production outlook for major non-GECF producers, including the United States and China

Source: GECF Secretariat based on GGM

A cumulative upstream investment of USD 11.6 trillion by 2055 is critical to meet growing gas demand, support LNG expansion and ensure energy security

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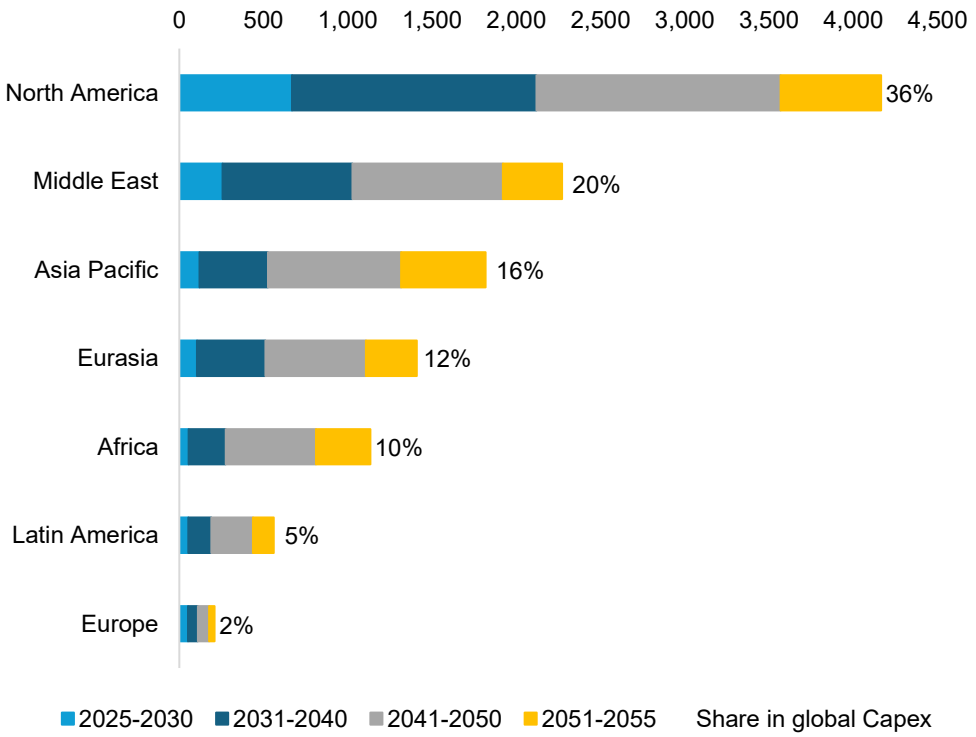
Capex requirement and share of global investment, 2025-2055 (real USD billion)



Highlights

- Cumulative capital investment in natural gas is projected to reach approximately USD 12.3 trillion by 2055, with 95-96% directed towards upstream investment. This underscores the capital-intensive nature of the sector, which is essential for sustaining global gas supplies
- USD 11.6 trillion will be invested in upstream activities between 2025 and 2055, averaging around USD 350 billion annually. Spending is projected to rise from USD 236 billion in 2025 to approximately USD 458 billion by the end of forecast period
- Upstream investment is influenced by energy security concerns, structural demand growth in emerging markets (Asia Pacific and Africa), decarbonisation and technological integration.
- North America (36%) and the Middle East (20%) lead global investment, while Asia Pacific and Africa stand out as corridors for growth; NOCs retain nearly half of the initial capital, with a shift from offshore LNG projects to more onshore and unconventional gas by the 2040s and dominance of conventional production towards 2055.

Source: GECF Secretariat based on GGM

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Natural Gas Trade and Midstream Investment Outlook

With rapid growth in traded natural gas volumes and a surge in LNG, global gas markets are becoming more interconnected, integrated, and flexible

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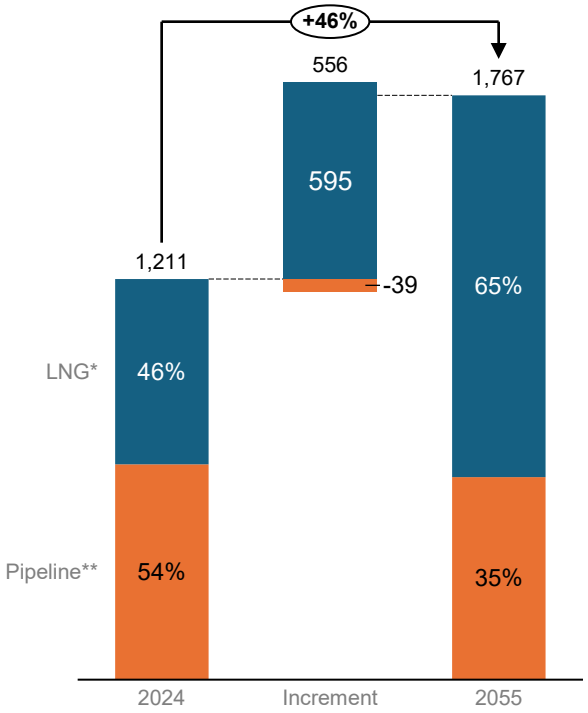
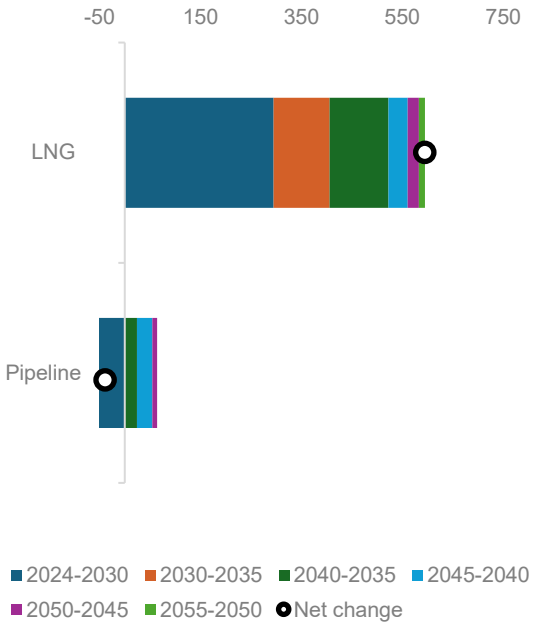
Natural gas trade outlook by flow type (bcm)



Source: GECF Secretariat based on GGM

Natural gas trade change by flow type (bcm)



LNG - liquefied natural gas*
*Pipeline** - cross-border export-import pipeline*

Highlights

As traded gas volumes are projected to grow faster than demand, the share of trade in global gas demand rises to nearly one-third, reinforcing more interconnected and trade-dependent global markets

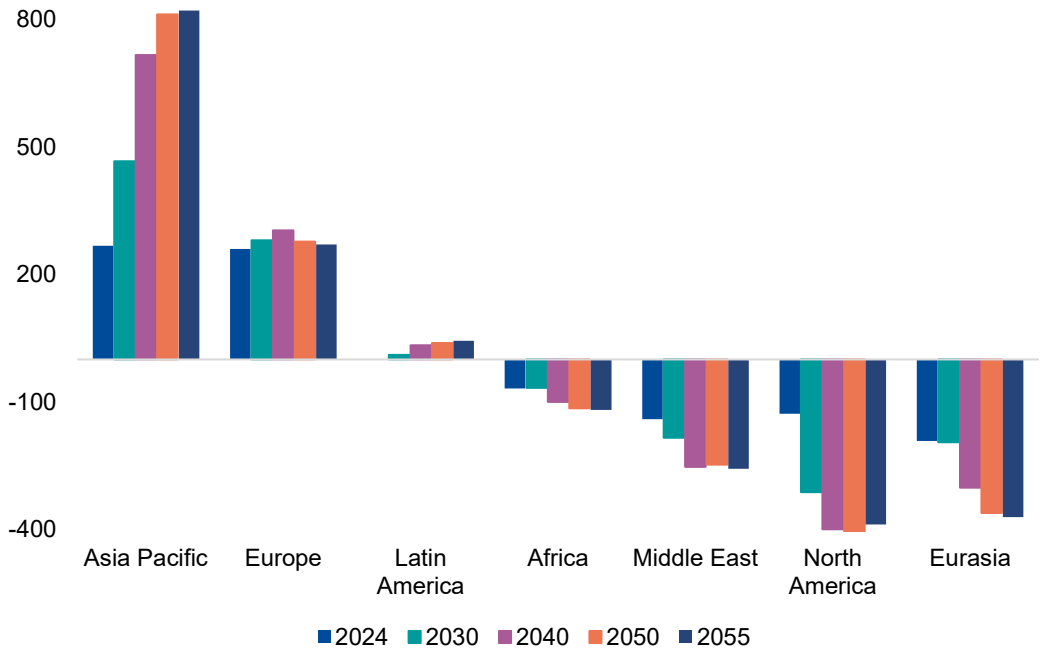
LNG is projected to dominate international gas trade, with volumes more than doubling to 837 Mt and its share of globally traded gas rising to 65% by 2055, reflecting greater market flexibility and integration

Given the unfolding supply overhang and international market easing, LNG trade growth is projected to be front-loaded, with 68% of the cumulative increase expected by 2035

After declining to 2035, pipeline trade is projected to gradually recover, mainly on the back of Eurasia's pivot to Asian markets, remaining broadly stable over the outlook period

Asia Pacific emerges as the anchor of global gas trade as regional imbalances widen

Natural gas balance (net imports) outlook by region, 2024-2055 (bcm)



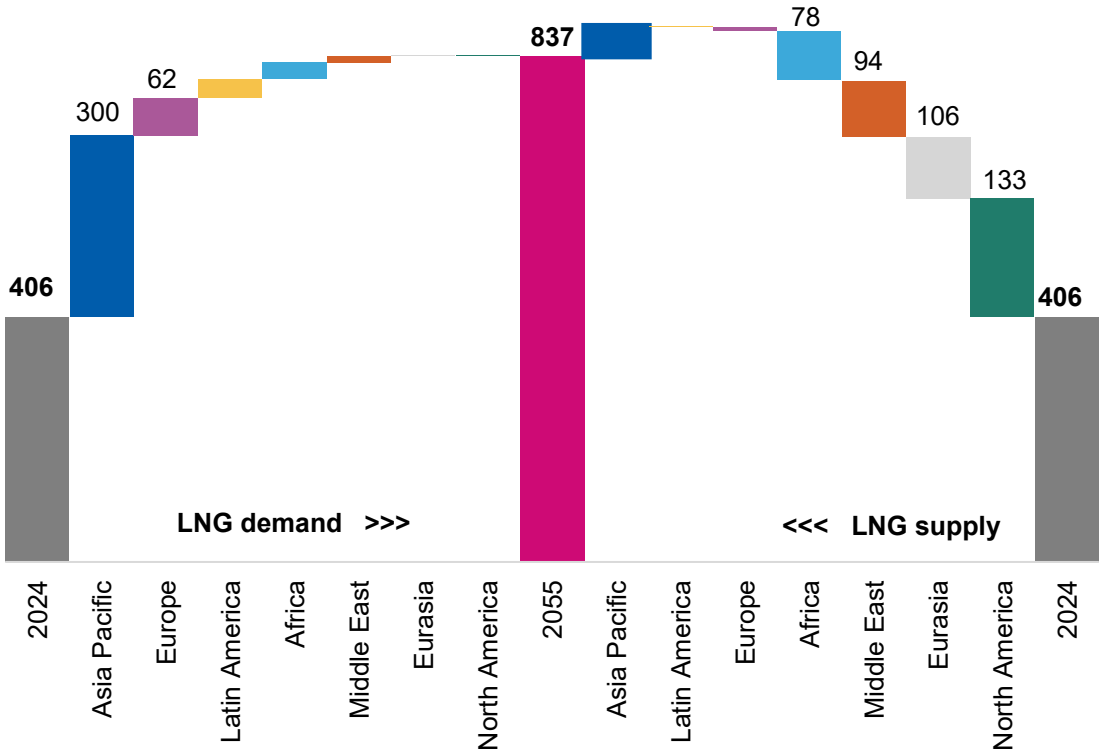
Highlights

- Global gas trade is reshaping through 2055, driven by widening regional imbalances and growing focus on Asia Pacific
- Asia Pacific remains the largest importer, with net imports rising from 267 to 820 bcm, while Latin America becomes a net-importing region
- Europe's imports gradually decline, while Africa's export growth moderates as domestic demand rises
- North America shows the strongest export growth, from 128 to 388 bcm, reinforcing its role as a key LNG supplier to Asia Pacific and Europe
- Eurasia and the Middle East strengthen export roles, redirecting more gas toward Asian markets

Source: GECF Secretariat based on GGM

Asia Pacific demand drives LNG growth, supported by North American & Middle Eastern supply

Change in regional LNG balance, 2024-2055 (Mt LNG)



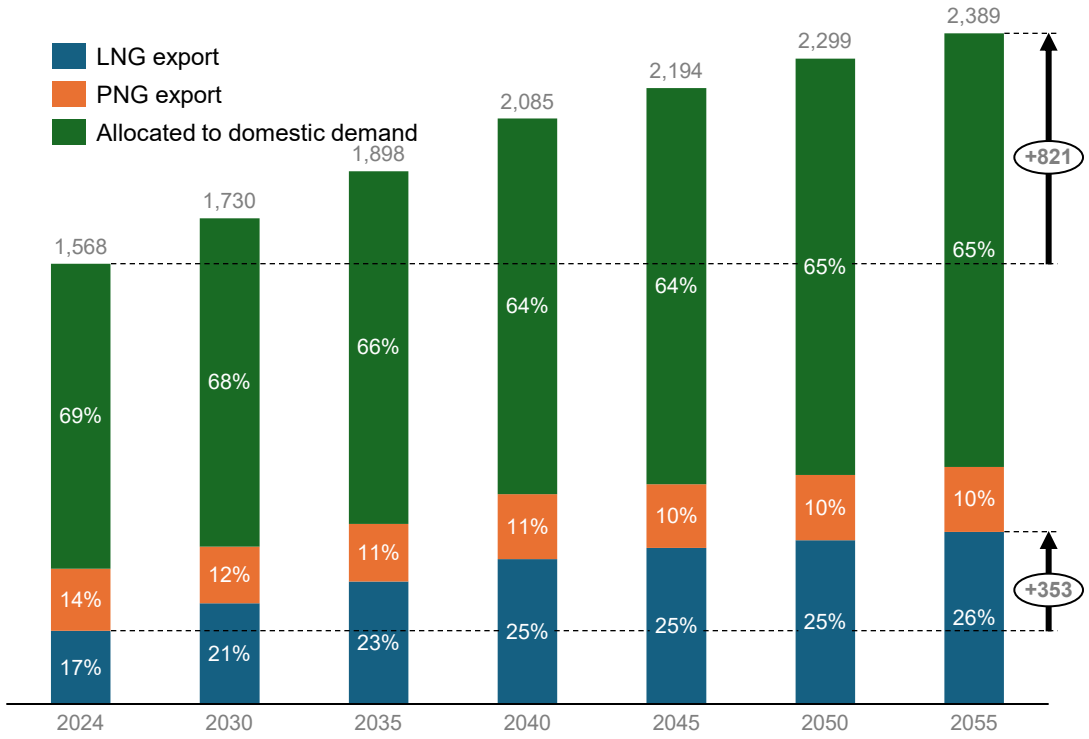
Highlights

- Asia Pacific drives the strongest LNG demand growth, accounting for nearly 70% of the global increase by 2055, with Europe also contributing toabout 15% demand expansion
- Europe's LNG demand still rises by about 62 Mt by 2055, despite decarbonisation and the energy transitions
- North America and Eurasia emerge as leading LNG suppliers, together providing almost 70% of global supply growth by 2055
- The Middle East and Africa strengthen their LNG supply role, led by Qatar's expansion and new projects in Mozambique, Nigeria, and West Africa, supporting exports to Europe and Asian markets

Source: GECF Secretariat based on GGM

Future expansion of GECF export capacity will be increasingly LNG-driven, reinforcing the strategic importance of flexibility, destination diversification, and resilience

Current GECF Member Countries natural gas allocation outlook (bcm)



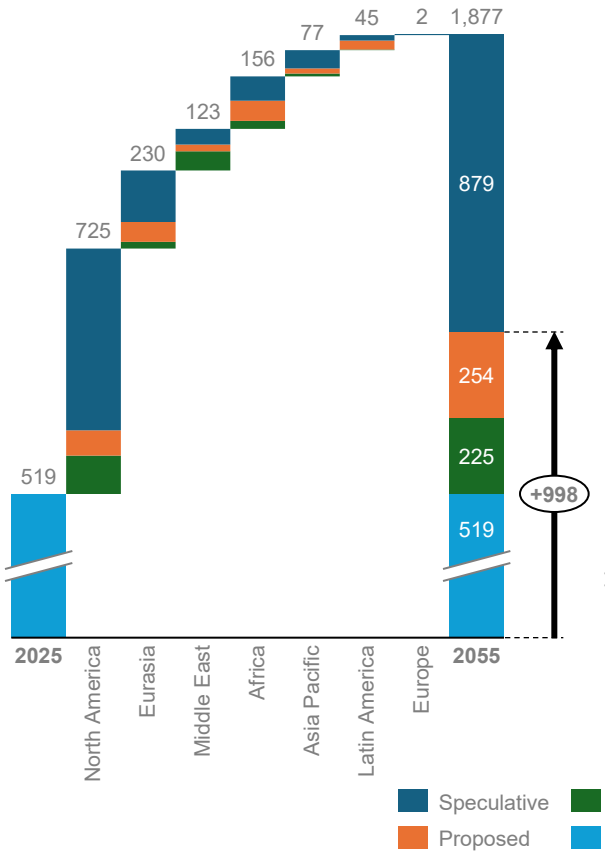
Source: GECF Secretariat based on GGM

Highlights

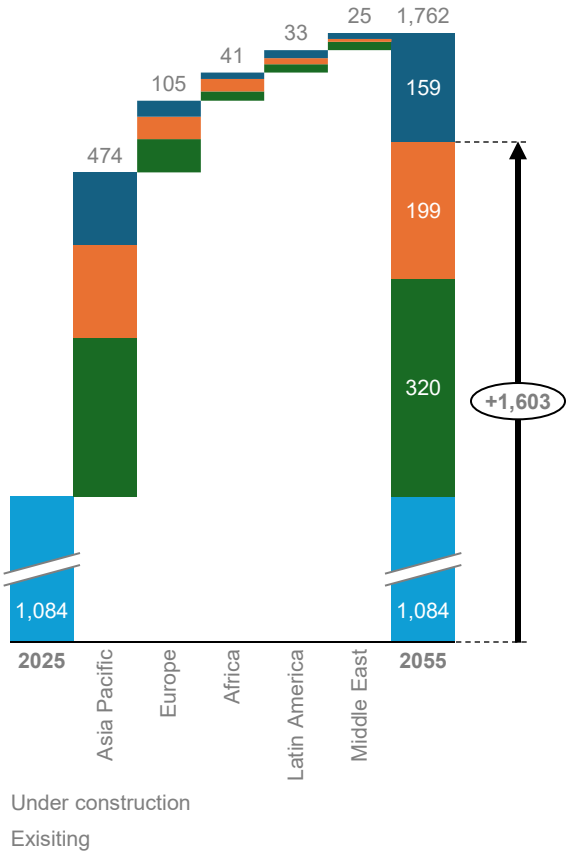
- Current GECF Member Countries are projected to export around 845 bcm of natural gas by 2055, raising their share of global gas exports to 48%, up from 40% in 2024
- By 2055, current GECF Member Countries are expected to account for 53% of global LNG exports, compared with 47% in 2024
- The share of LNG in total natural gas exports of current GECF Member Countries is projected to rise to 36% by 2055, up from 31% in 2024, confirming LNG's growing weight within the export mix
- More than three-quarters of the additional natural gas exports from current GECF Member Countries over the outlook period are expected to come from LNG
- Despite growth in absolute terms, the share of pipeline gas in the export mix is projected to decline to 10% by 2055, from 14% in 2024, with most of the increase in pipeline exports associated with Eurasia

New LNG supply capacity buildup growth anchored in North America, the Middle East, Eurasia, and Africa

LNG liquefaction capacity outlook (Mtpa LNG)



LNG regasification capacity outlook (Mtpa LNG)



Speculative | Under construction | Proposed | Exisiting

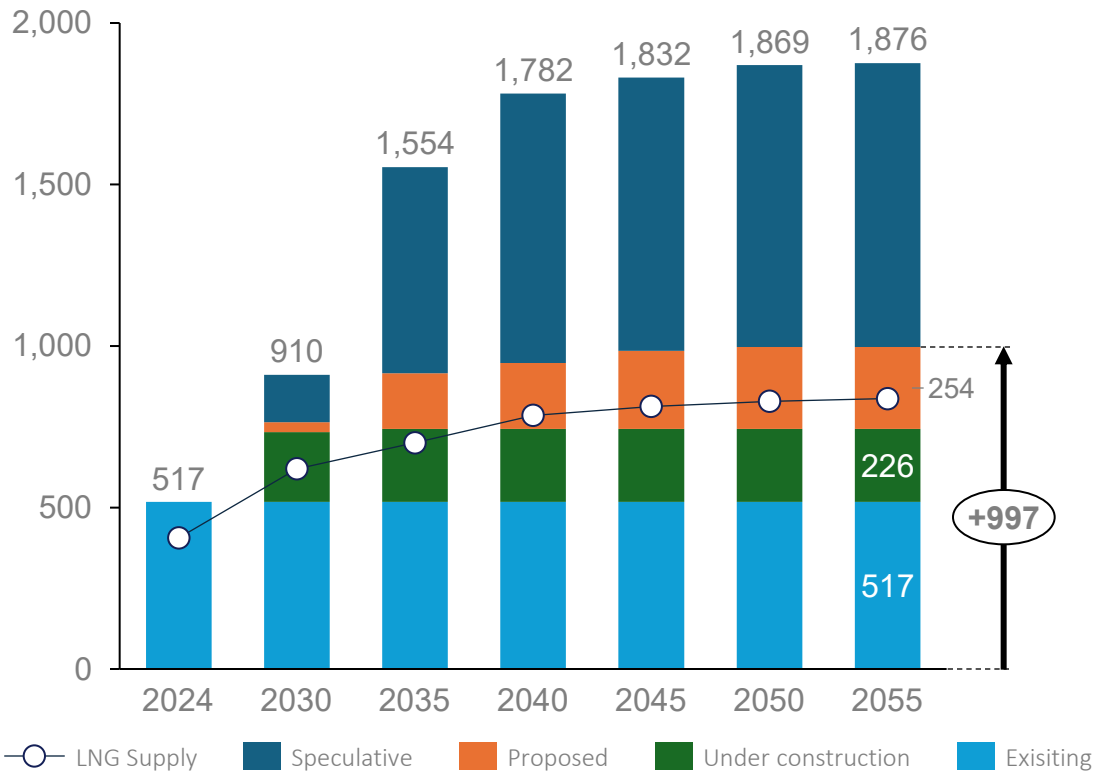
Highlights

- Global LNG liquefaction capacity is projected to reach around 1,000 Mtpa by 2055, exceeding expected LNG supply of about 837 Mt and pointing to continued capacity expansion in key producing regions
- North America, Africa, and the Middle East are projected to lead global liquefaction capacity growth, accounting for approximately 39%, 17%, and 16% of total additions by 2055, respectively
- Current GECF Member Countries are projected to lift total LNG liquefaction capacity to around 481 Mtpa by 2055, equivalent to 48% of expected global liquefaction capacity
- Global regasification capacity, including existing, under-construction and proposed facilities, is set to rise from around 1,084 Mtpa in 2025 to around 1,603 Mtpa by 2055, driven primarily by Asia Pacific reaching around 1,037 Mtpa by 2055
- Europe's regasification expands more moderately, increasing to just about 326 Mtpa by 2055, while Africa, Latin America and the Middle East register smaller but steady additions

Source: GECF Secretariat based on GGM and Rystad Energy

A timely conversion of part of the currently pre-FID portfolio into sanctioned capacity will be essential to maintain sufficient liquefaction availability for long-term export flows

Projected global LNG exports and liquefaction capacity by project status, 2024–2055 (Mtpa LNG)



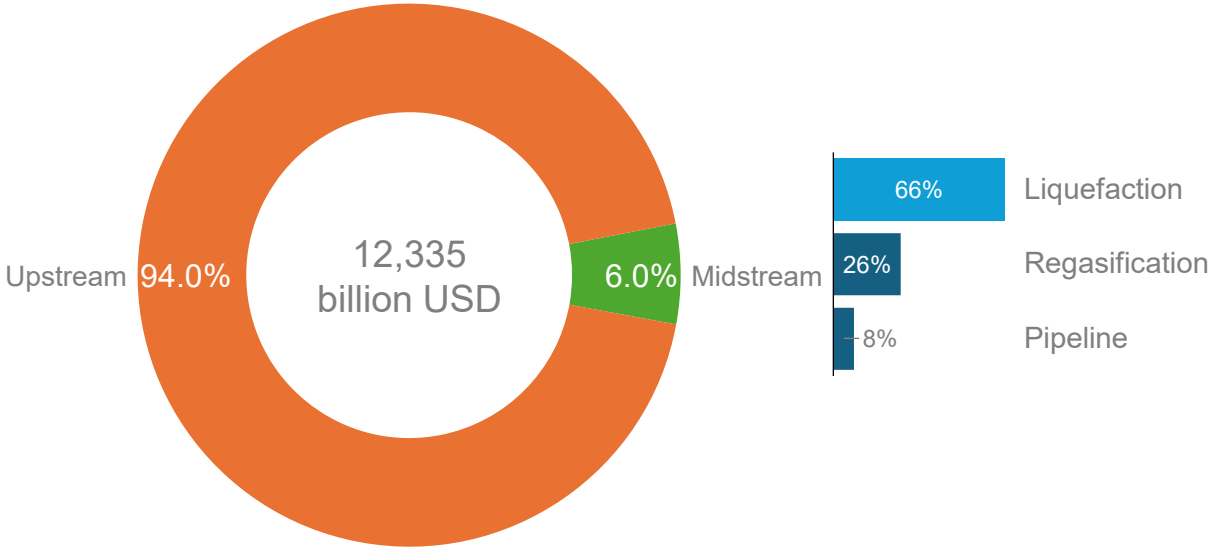
Source: GECF Secretariat based on GGM and Rystad Energy

Highlights

- Forecast LNG exports approach the combined capacity of existing and under-construction facilities by 2035 and surpass it from 2040 onward
- In the absence of timely project sanctioning, the global LNG market could face a significantly tighter supply-demand balance later in the Outlook
- In Eursia and the Middle East sustaining the projected export trajectory will require not only the timely sanctioning and development of the current pre-FID proposed project pipeline, but also the eventual materialisation of part of the speculative capacity portfolio
- Long-term deliverability of North American LNG exports will increasingly depend on whether planned capacity can be converted into effective liquefaction supply before 2030 to preserve adequate export headroom and avoid a structural tightening in evacuation capability

Around USD 735 billion required for gas midstream infrastructure to sustain global gas trade by 2055

Upstream and midstream required capex in natural gas industry, 2025-2055 (real USD billion)



Highlights

- Between 2025 and 2055, cumulative gas midstream investment reaches about USD 735 billion
- Liquefaction dominates midstream Capex, accounting for roughly two-thirds of total investment
- Asia Pacific leads midstream investment with about USD 173 billion, driven by LNG import infrastructure in China, India, and Southeast Asia, with most spending before 2030
- Eurasia and North America anchor supply expansion through LNG liquefaction and export infrastructure
- Africa and the Middle East are anticipated to strengthen export liquefaction capacity, while Europe and Latin America might see comparatively limited investment

Source: GECF Secretariat based on GGM

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Sustainable Energy Scenario

Sustainable Energy Scenario (SES) building blocks

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Energy Poverty Eradication

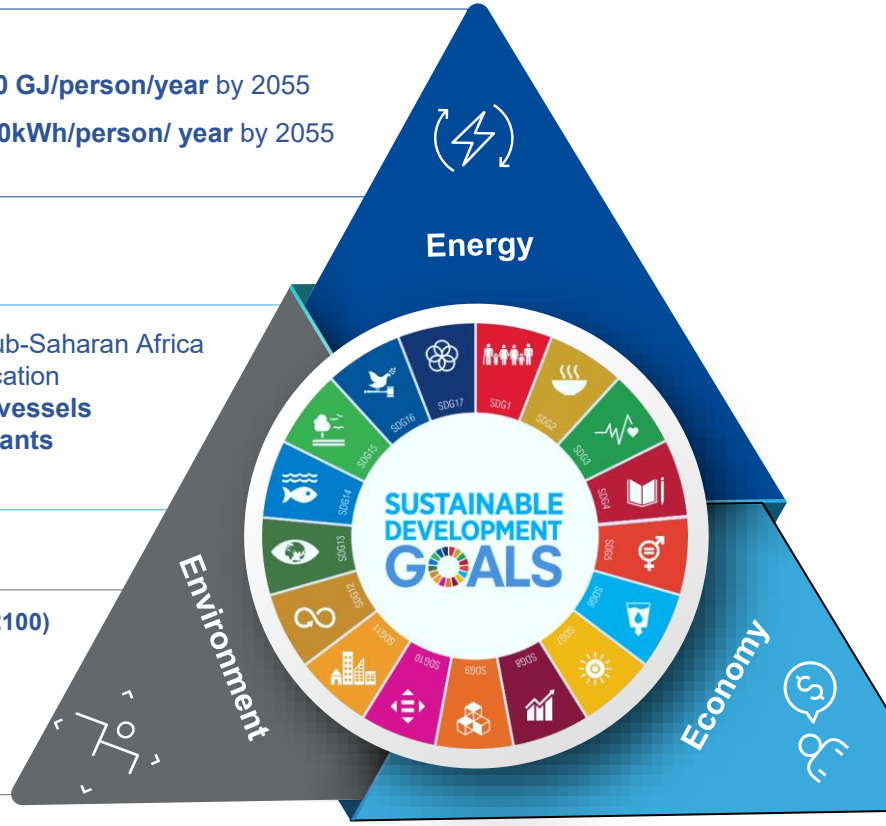
- Minimum national final energy requirement: **50 GJ/person/year** by 2055
- Minimum national electricity requirement: **1000kWh/person/ year** by 2055

Sectoral Fuel Switching

- Rapid decline in **traditional biomass** use in Sub-Saharan Africa
- Rapid expansion of **data centers** and AI-Application
- Improved adoption of **LNG-fueled trucks and vessels**
- Increased energy efficiency of **CCGT power plants**
- Inclusion of **integration costs** in the LCOE

Accelerated Decarbonisation

- Alignment with the **Paris Agreement goal (2°C by 2100)**
- Accelerated **CCUS** upscaling
- Rapid **efficiency improvement**
- Accelerated **coal-to-gas switching**
- Introduction of **Direct Air Capture** after 2040



In SES, higher GDP is both the means and the consequence of accelerated development

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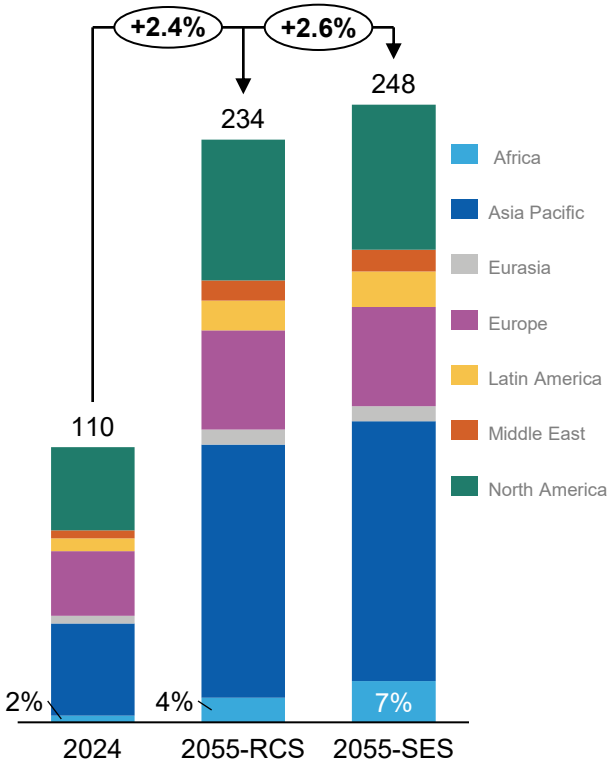
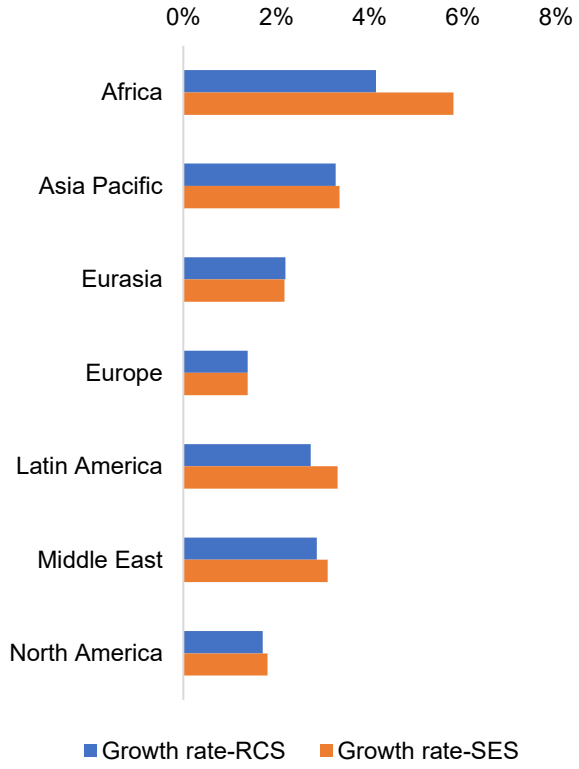
Global real GDP by region (real USD billion)



Average annual economic growth rate (%)



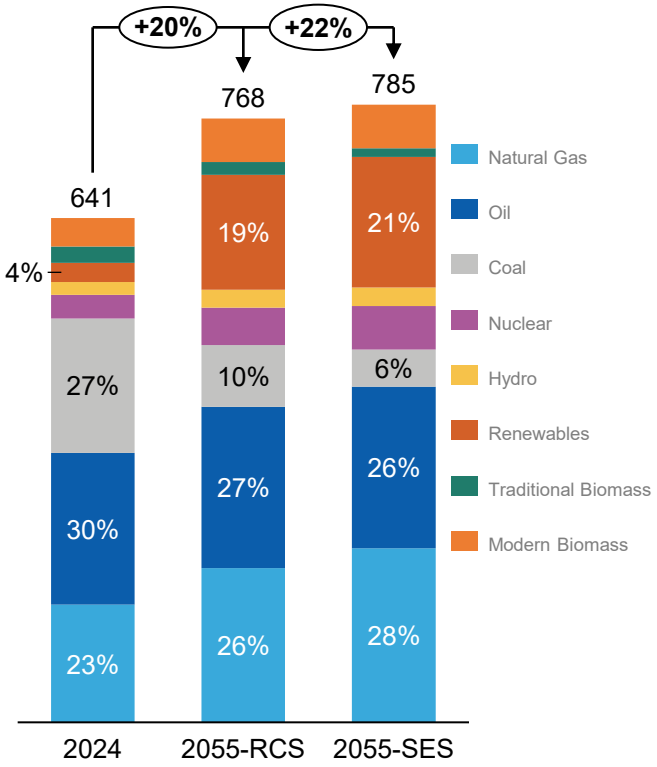
Highlights

- World real GDP rises from about USD 110 trillion in 2024 to around USD 248 trillion by 2055 in SES, compared with USD 233 trillion in RCS
- Average annual economic growth rate over 2024–2055 is 2.6% in SES versus 2.4% in RCS
- Africa's real GDP rises from about USD 2.5 trillion in 2024 to roughly USD 16.6 trillion by 2055, implying average annual growth of 5.8%, compared with 4.3% in RCS
- Economic growth enables the financing of energy and public infrastructure, and it is enabled by the productivity gains that follow when modern energy services become reliable and widespread

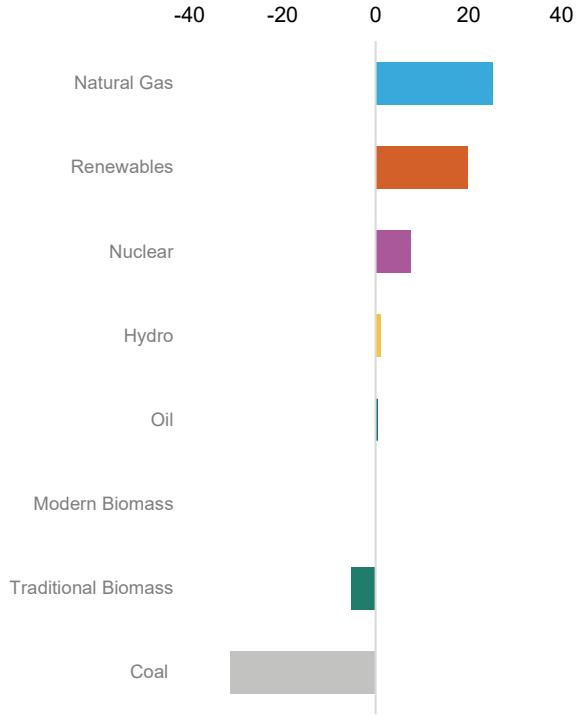
Source: GECF Secretariat based on GGM

SES requires a larger energy system to deliver development-consistent services, but it achieves a faster decline in energy intensity and a more decisive shift in the fuel mix

Primary energy demand outlook by fuel type (EJ)



Primary energy demand change by fuel type (EJ)



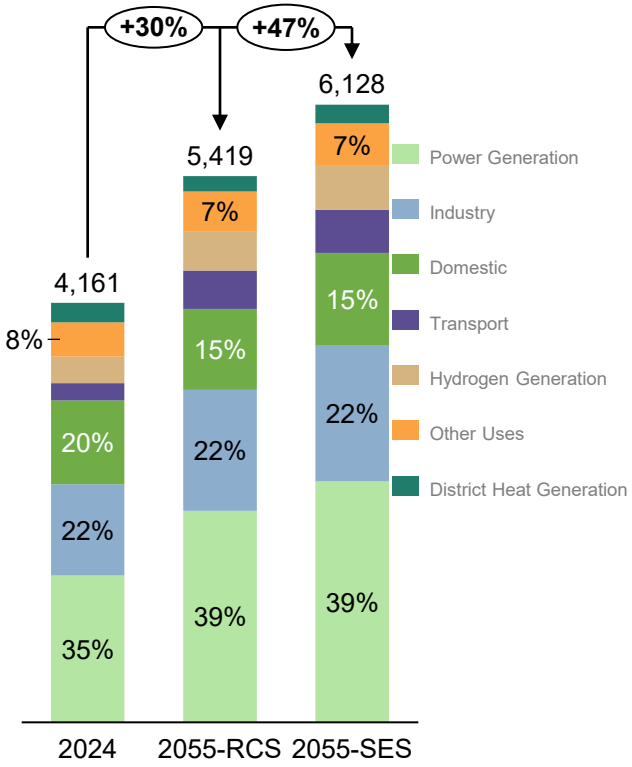
Highlights

- Global primary energy demand in the SES will rise 22% by 2055, reaching 785 EJ, 17 EJ higher than the RCS, comparable to Japan's energy consumption
- Between the two scenarios, natural gas and renewables see the largest increases in incremental primary energy consumption, while coal and traditional biomass use declines
- Contribution of natural gas in the global energy mix by 2055 increases to 28%, compared with 26% in the RCS, taking the leading position in the global energy mix
- Primary energy intensity declines faster in the SES, at around 2.6% per year compared to 2.4% in the RCS, signalling stronger efficiency gains across the system.

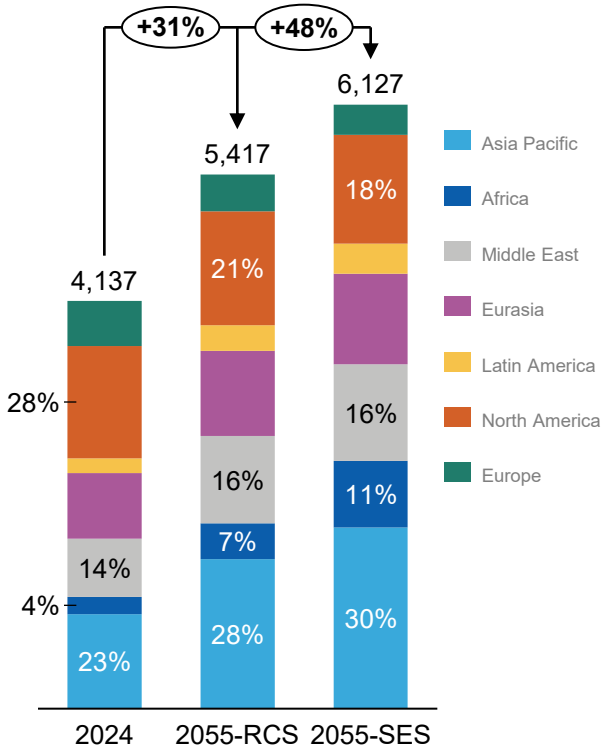
Source: GECF Secretariat based on GGM

Natural gas demand increases in the SES because development-driven growth in electricity, industry and modern household services requires scalable and reliable energy carriers

Natural gas demand outlook by sector (bcm)



Natural gas demand outlook by region (bcm)



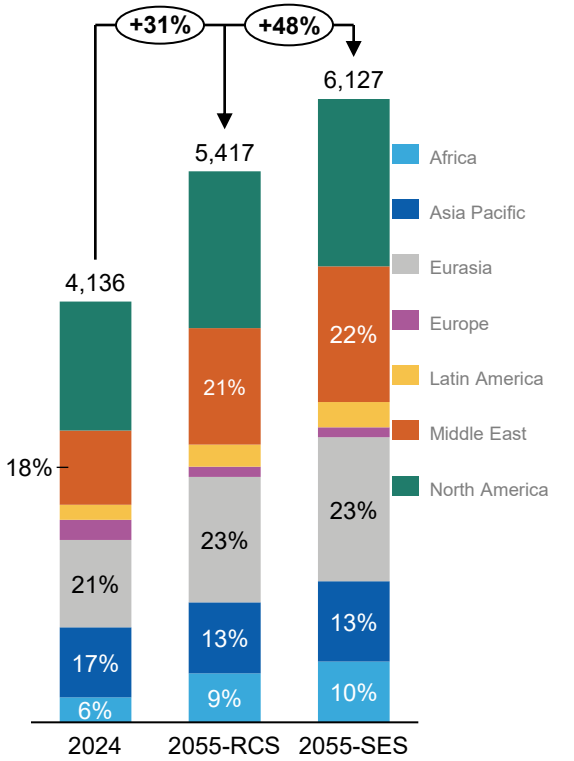
Highlights

- By 2055, natural gas demand in the SES exceeds that in the RCS by 708 bcm, a volume greater than Eurasia's current total gas consumption
- The SES–RCS demand gap is concentrated in power generation (41%), industry (21%), and the domestic sector (16%)
- Asia Pacific and Africa account for nearly 90% of the additional gas demand in the SES, contributing around 322 bcm (45%) and 310 bcm (44%), respectively
- By contrast, natural gas demand in North America and Europe under the SES is projected to either decline gradually or remain broadly flat through 2055
- The SES does not imply uniformly higher gas demand; rather, it shifts the centre of gravity of gas demand decisively towards regions where development-driven energy services expand most rapidly

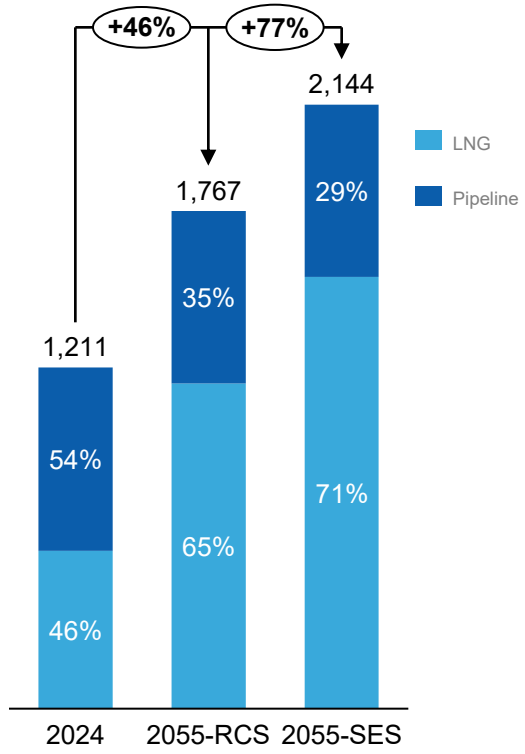
Source: GECF Secretariat based on GGM

Meeting development driven demand growth requires elevated upstream and midstream investment, infrastructure delivery and stable trade linkages for market balance

Natural gas production outlook by region (bcm)



Natural gas trade outlook by flow type (bcm)



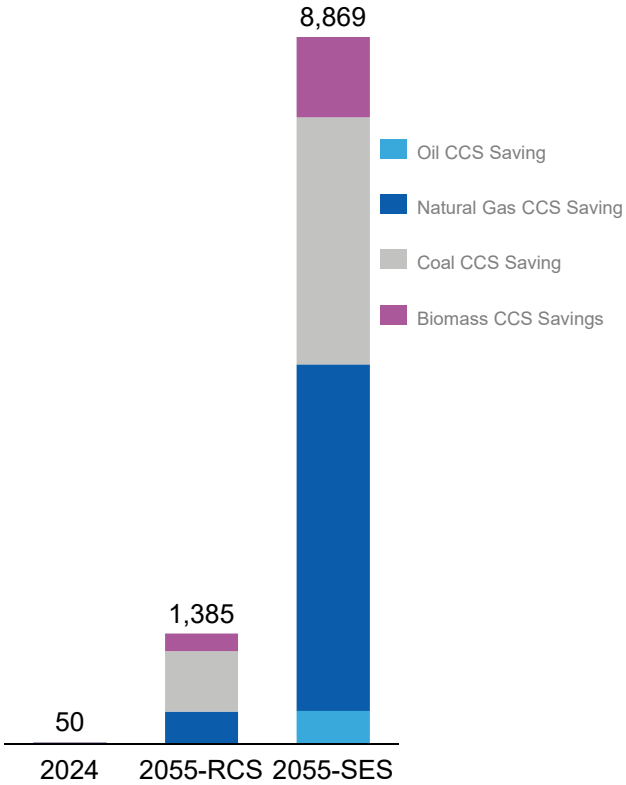
Highlights

- The Middle East emerges as the single largest contributor to supply uplift under SES, reflecting 190 bcm additional supply by 2055 compared to the RCS
- Eurasia Is the second largest contributor to the gap, with its production reaching 1,415 bcm by 2055 in the SES compared with 1,233 bcm in RCS
- By 2055, total cross-border natural gas trade reaches about 2,144 bcm in SES, around 377 bcm higher than in RCS, reflecting higher trend intensity
- LNG's share of global trade rises to about 71% by 2055 under the SES, up from 65% in the RCS, as SES prioritizes reliable, flexible and scalable mechanisms for international balancing
- LNG imports in Africa rises from 3 Mt in 2024 to about 171 Mt by 2055 in the SES, about 141 Mt above RCS in 2055.

Source: GECF Secretariat based on GGM

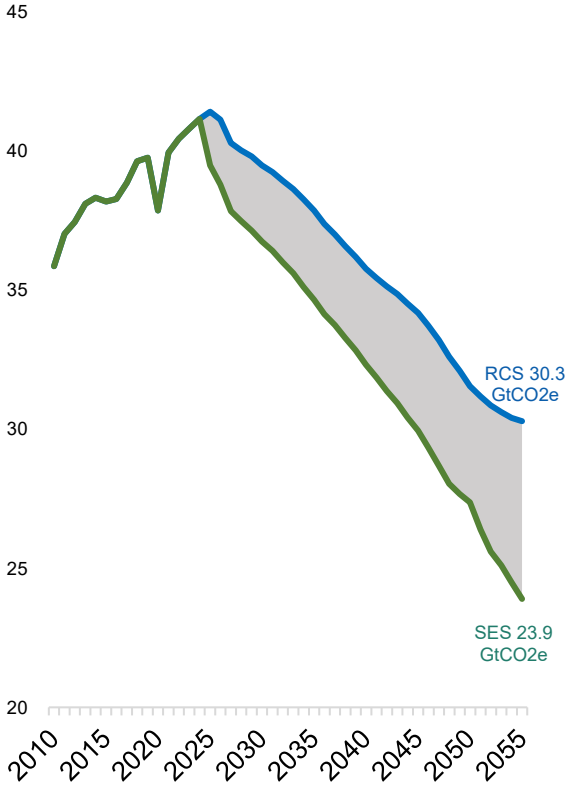
With emission reductions from NbS and carbon sinks, the SES trajectory aligns with the Paris Agreement's 2°C target, with a 50% likelihood

CCUS saving requirement ($MtCO_2e$)



Source: GECF Secretariat based on GGM

Energy-related emission outlook ($GtCO_2e$)



Highlights

- Despite a growing energy system in the SES, energy-related emissions drop from 39.5 $GtCO_2e$ in 2024 to 23.9 Gt CO_2e by 2055, a reduction equal to 33% over the outlook period, up from 26% in the RCS
- Over the full scenario horizon, cumulative energy-related emissions in the SES amount to 993 $GtCO_2e$, which is 116 $GtCO_2e$ lower than the RCS
- Under the SES, the contribution of CCUS to emissions reduction is expected to grow from 41 $MtCO_2e$ in 2023 to 8.9 $GtCO_2e$ by 2055
- By 2055, natural gas-based CCUS is projected to cut emissions by over 4.3 $GtCO_2e$ in the SES, 3.9 $GtCO_2e$ more than in the RCS
- Asia Pacific is expected to account for 63% of total CCUS savings by 2055, under the SES
- SES results imply that net negative emissions beyond 2055 would likely be required to lock in end-of-century alignment, particularly if overshoot occurs during the period of fastest development-driven energy expansion

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Key Takeaways

Key takeaways

- Global energy demand is expected to grow persistently over the long term, while the energy system becomes progressively more diversified, efficient, flexible, cleaner, and increasingly electrified
- In line with the transformation of the global energy system, rapidly expanding natural gas demand is expected to evolve toward higher efficiency, enhanced flexibility, wider versatility, and lower emissions intensity
- Natural gas supply adequacy increasingly depends on decline replacement and execution discipline: the world is moving from shale-led expansion toward conventional growth led by the Middle East, Eurasia and Africa
- Global natural gas trade is shifting toward a more interconnected and trade-dependent market, with LNG at the center, enhancing supply flexibility, enabling long-distance cross-regional flows, and improving the market's ability to respond to shocks in demand and supply
- Timely sanctioning of part of today's pre-FID LNG project portfolio will be essential to ensure sufficient liquefaction capacity and support long-term export growth
- Accelerated development and deeper decarbonisation can advance together only through a balanced portfolio that combines economic growth, electrification backed by firm capacity, and large-scale carbon management, with natural gas and CCUS playing an increasingly integral role across energy value chains

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About GECF

The Gas Exporting Countries Forum (GECF or Forum) is an international governmental organisation established in May 2001. It became a fully fledged organisation in 2008, with headquarters in Doha, Qatar.

As of April 2026, the GECF comprises twelve Members and eight Observer Members (hereafter referred to as the GECF Countries) from four continents. The Member Countries of the Forum are Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Qatar, Russia, Trinidad and Tobago, the United Arab Emirates and Venezuela (hereafter referred to as Members). Angola, Azerbaijan, Iraq, Malaysia, Mauritania, Mozambique, Peru and Senegal have the status of Observer Members (hereafter referred to as Observers).

Cooperation was extended to technology with the establishment of the Gas Research Institute in 2019, headquartered in Algiers, the People's Democratic Republic of Algeria.

In accordance with the GECF Statute, the organisation aims to support the sovereign rights of its Member and Observer Countries over their natural gas resources and their abilities to develop, preserve and use such resources for the benefit of their peoples through the exchange of experience, views, information and coordination in gas-related matters.

In accordance with its Long-Term Strategy, the vision of the GECF is "to make natural gas the pivotal resource for inclusive and sustainable development", and its mission is "to shape the energy future as a global advocate of natural gas and a platform for cooperation and dialogue, with the view to support the sovereign rights of member countries over their natural gas resources and to contribute to global sustainable development and energy security.

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