



**GECF**

**Trends in global long-term natural gas  
business development.**

**GECF Global Gas Outlook**

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**Conference towards energy security, sustainability and  
resiliency and associated meetings.**

**Session 2. Natural gas as transition fuel.**

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- **About GECF**
- **Demand and supply projections**
- **Climate change and energy developments**
- **Conclusions**

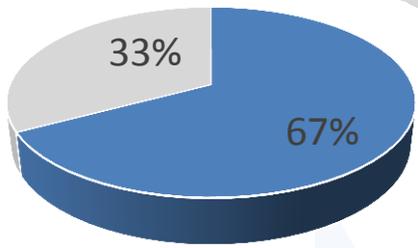
# We are the Gas Exporting Countries Forum (GECF)

GECF: the Reliable source of supply for the reliable source of energy - Natural Gas

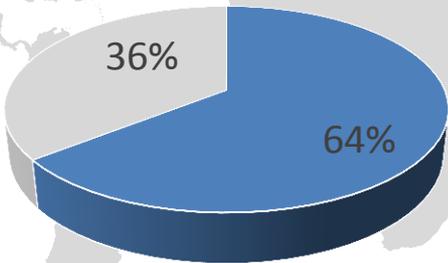


-  Algeria
-  Bolivia
-  Egypt
-  Equatorial Guinea
-  Iran
-  Libya
-  Nigeria
-  Qatar
-  Russia
-  Trinidad and Tobago
-  United Arab Emirates
-  Venezuela

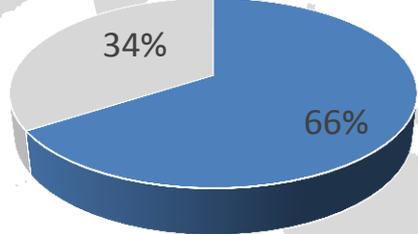
## Gas Reserves



## Pipeline Trade



## LNG Trade

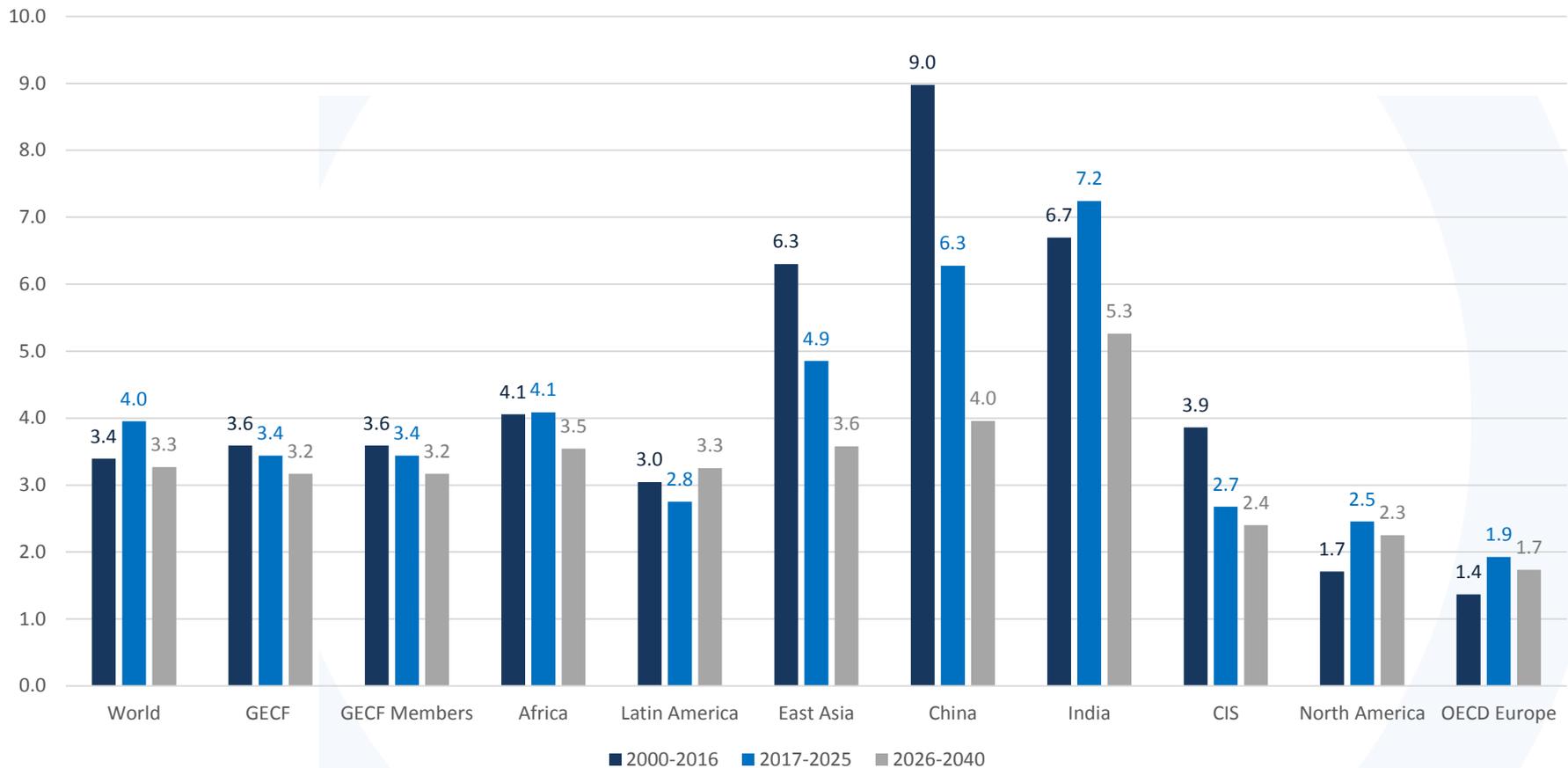


■ Total GECF    ■ Rest of World

## Observers (7):

-  Azerbaijan
-  Iraq
-  Kazakhstan
-  The Netherlands
-  Norway
-  Oman
-  Peru

# Global economic long-term outlook



Source: GECF Secretariat based on the data from GECF GGM

- Global GDP growth is to accelerate between 2017 and 2020, at 3.5% per year, but starts to slow down after 2025 as developing Asia, including China and India, slow to a more sustainable long-term rate.

# Energy Demand to 2040: Key Figures

30%

Primary energy demand is set to increase by 30% by 2040

1%

Over the next 25 years, primary energy demand grows by 1% per annum showing an increase of 3.9 Gtoe from 13.8 Gtoe in 2015 to 17.7 Gtoe by 2040

50%

Gas demand will rise by 50% over the outlook period, increases from almost 3500 bcm in 2015 to over 5200 bcm by 2040

25%

Gas demand grows by 1.6% per year, stronger than growth in primary energy demand. Then gas share in primary energy mix increases from over 21% today to 25% in 2040

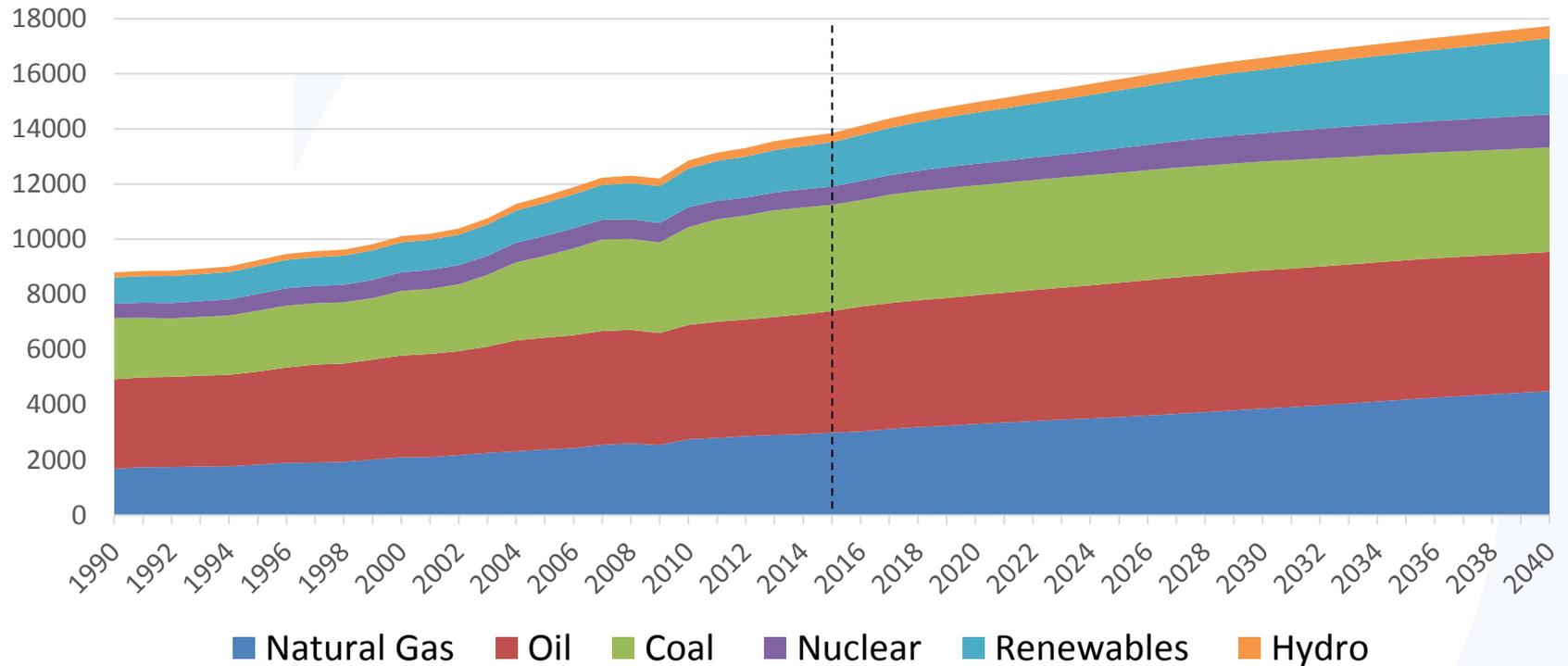
2.2%

Gas for power sector will grow by 2.2% over the outlook period, make power sector the main source of additional gas demand

16%

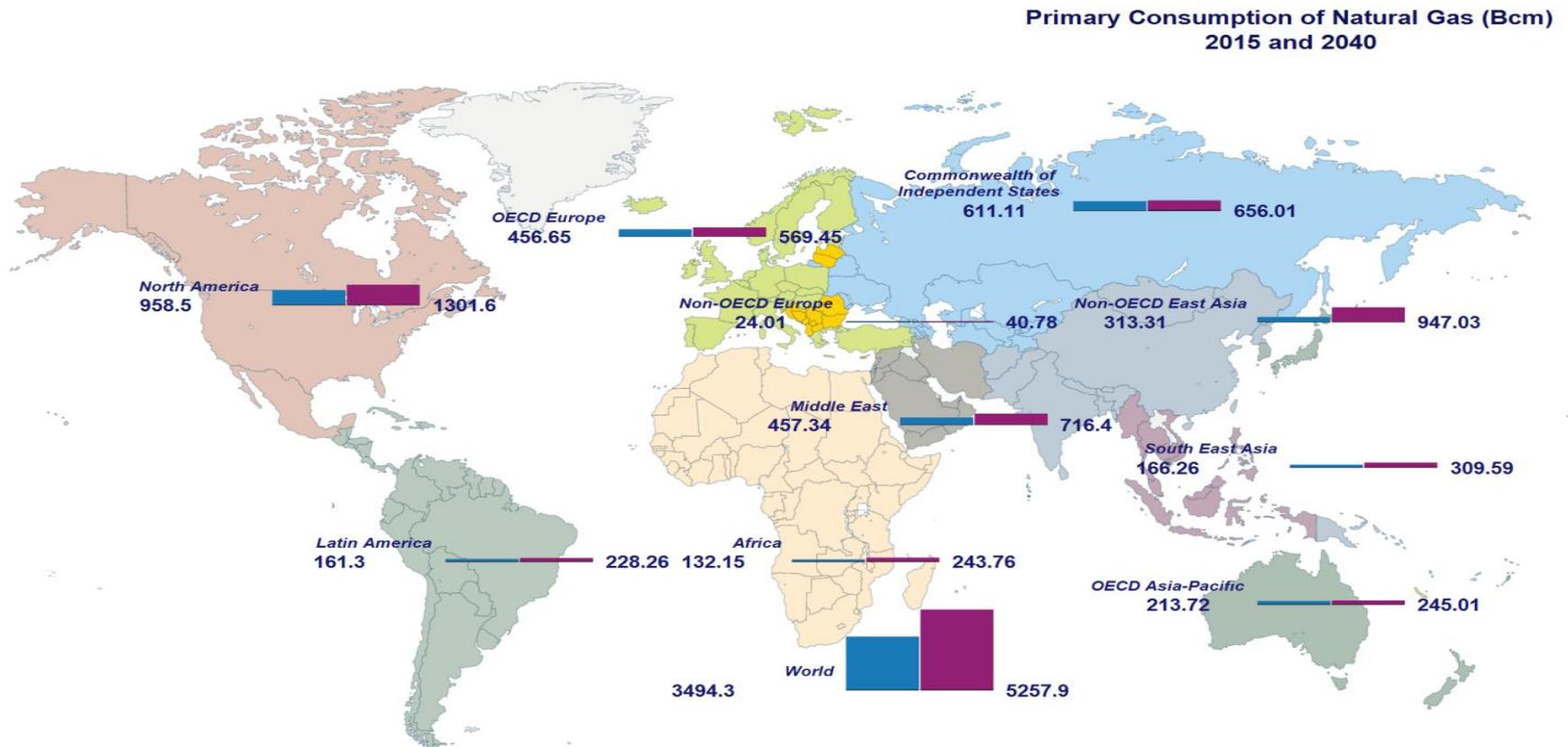
Non-hydro renewables are also growing strongly over the outlook period, their share rises from 12% today to 16% in 2040, still well below of that for gas (25%)

# World primary energy demand by fuel (Mtoe)



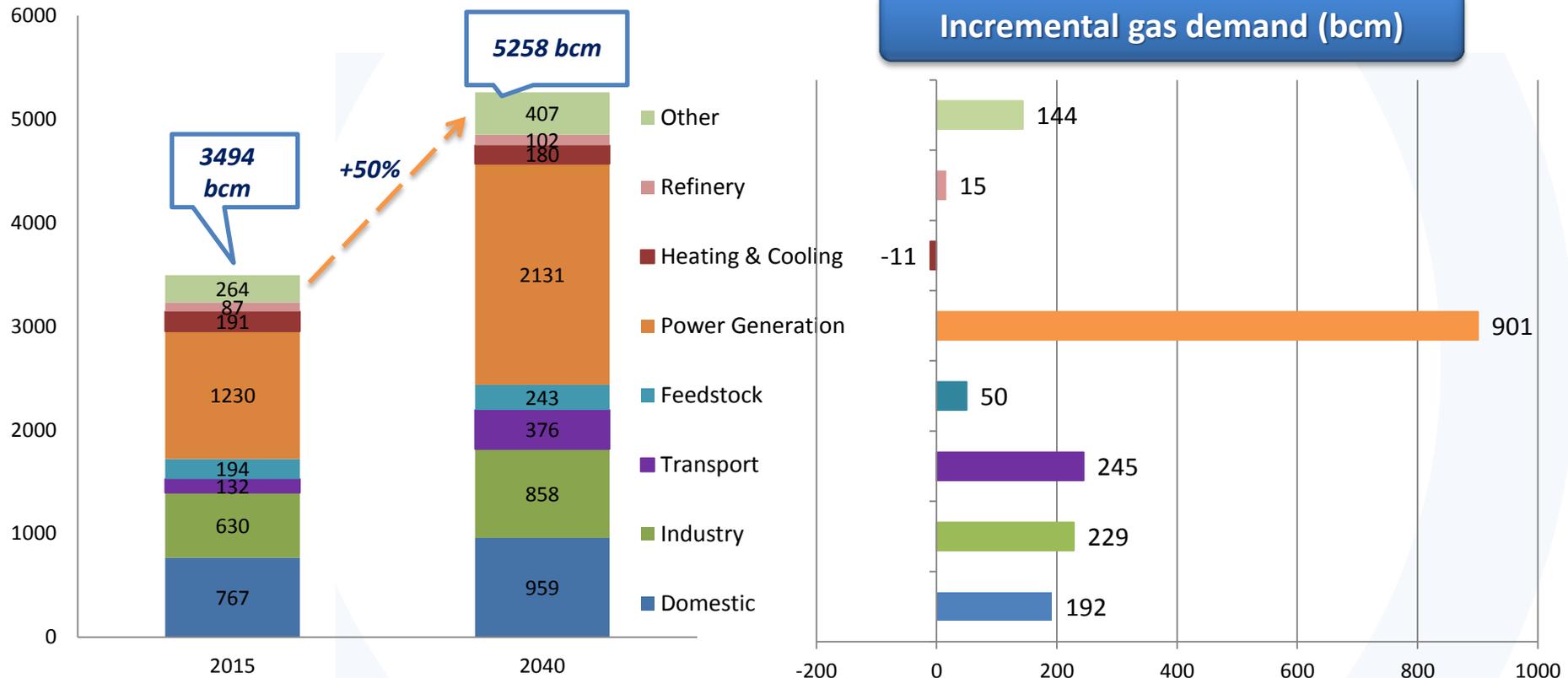
- World energy consumption is projected to grow by 1% per annum between 2015 and 2040, climbing from 13.8 Gtoe to 17.7 Gtoe (almost 30% increase).
- Natural gas will be the largest contributor to the increase in total primary energy consumption, with a share of almost 40% over the projection period, and 1.6% average growth rate per annum.

# Regional breakdown of primary gas demand (2015 and 2040) in the GECF Global Gas Outlook 2040



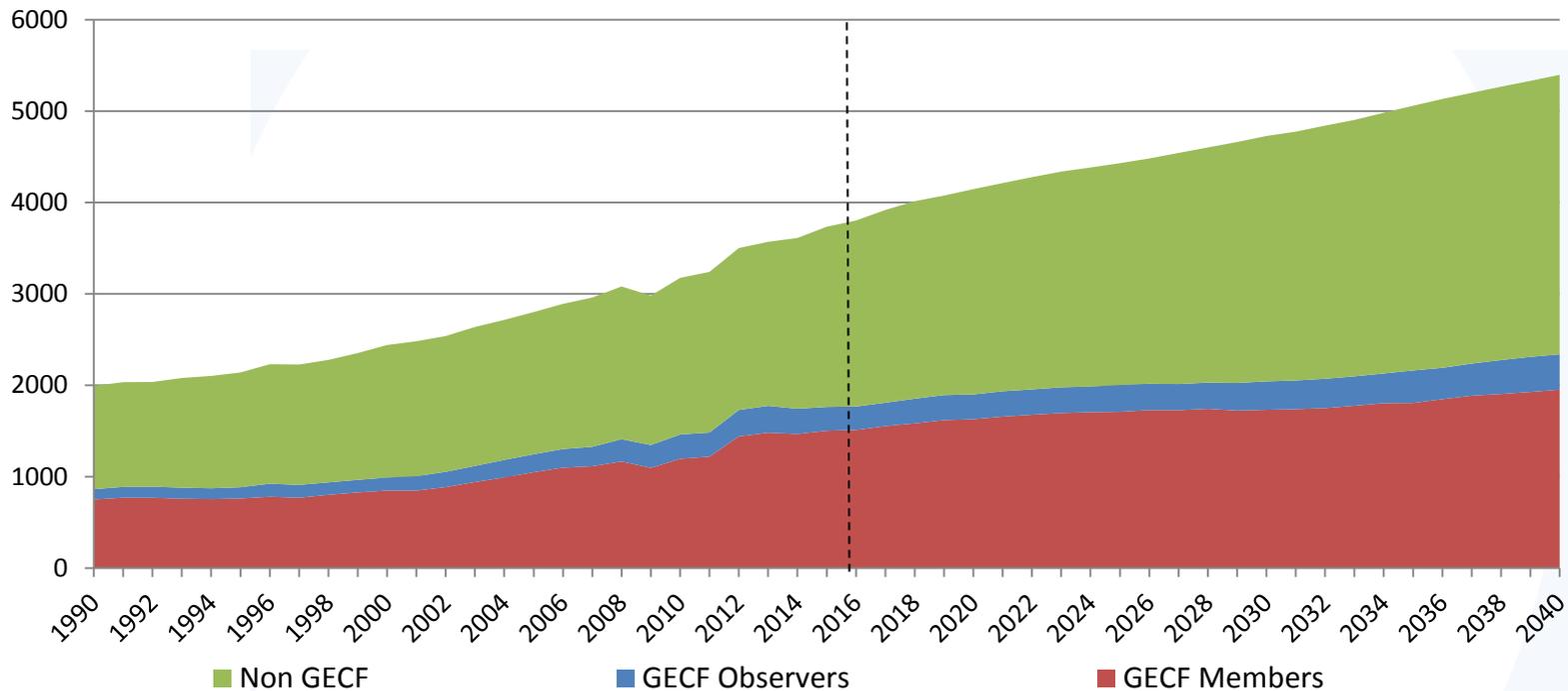
- In the OECD region, natural gas approaches oil consumption as a dominant fuel by 2040 with a share of 32% in primary energy.
- In non-OECD, natural gas remain third most-consumed fuel with a share of around 22%.
- Non-OECD Asia accounts for 43% of additional gas demand mainly derived by China and India, while North America led by U.S., accounts for 19% and Middle East 15%

# Global gas demand by sector



- Gas use is set to increase in power, transport, domestic and industry sectors.
- Gas use in power sector is projected to grow by 2.2% per year, which is faster than global gas demand growth (1.6%).
- Transport sector share from global gas demand is expected to increase from 4% today to 10% by 2040.

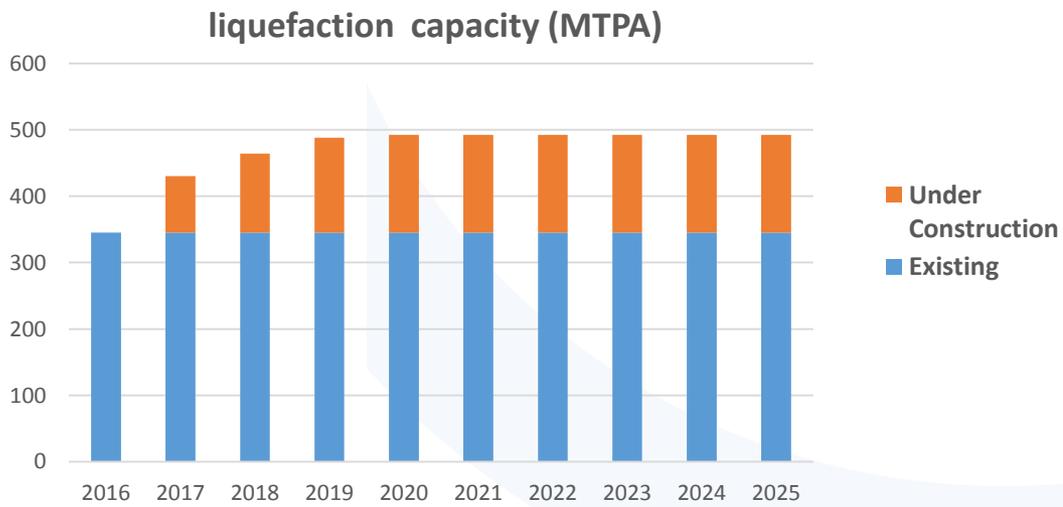
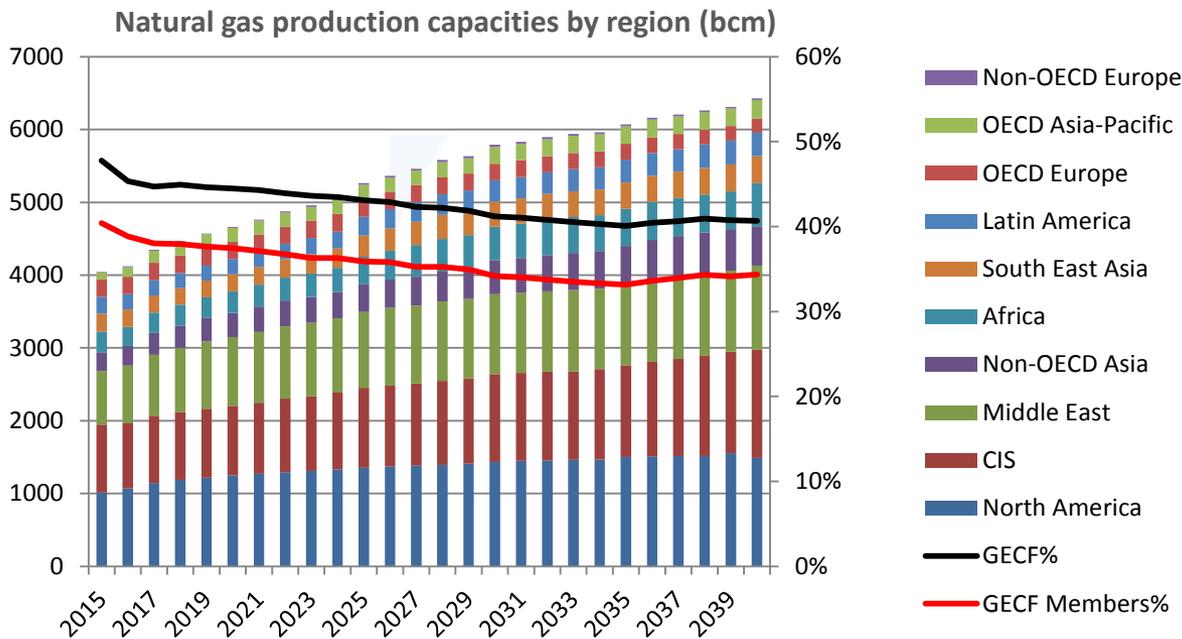
# Global gas production by GECF and non-GECF countries (bcm)



Source: GECF Secretariat based on the data from GECF GGM

- GECF Members' gas output is expected to rise to around 1,630 bcm in 2020 (39% of the world total), to over 1,700 bcm (37%) in 2030, and to almost 2,000 bcm (39%) in 2040.
- The share of the GECF member countries in global marketed gas production is expected to remain relatively stable at an average of 38% during the outlook period, while the historical average starting from 1990 was about 37%.

# Natural gas production and liquefaction capacity outlook



- Natural gas production in the world is anticipated to grow on average around 1.9% yearly by the end of 2040
- GECF countries' share in global gas production capacity is expected to slide slightly
- 340 million tonnes per annum of liquefaction capacity
- 110 MTPA of LNG capacity under construction, leading to an increase of about 40% of the total operating liquefaction capacity in the medium term

# **GECF view on climate change and energy developments: Some key messages**

# Paris Agreement appeared as a turning point, but achievement of announced commitments will face many challenges and uncertainties



## COP 21: Adoption of Paris Agreement

- It involved more than 190 countries;
- Commitments to limit the temperature increase (Targets: “< 2 ° C” and continued efforts to reach “< 1.5 ° C” )
- Intended National Determined Contributions (INDCs) as main mechanism;

## Entry into force

- Countries Ratification of PARIS AGREEMENT
- INDCs transformed into NDCs.

## COP 22: strengthened political support

- Release of Marrakesh Action Proclamation
- GHGs reduction momentum was called as “irreversible”
- Announced initiatives for funding and supporting GHGs mitigation and adaptation

## *Main challenges and uncertainties to meet the targets:*

- Political issues and support (ex: The Trump effect, Brexit,);
- Lobbying and resistance to change;
- Security of supply priorities;
- Growing energy needs;
- Funding and affordability issues;
- Economic viability of green projects;
- Non-binding and conditional commitments;
- Implementation of the detailed agreement mechanisms.

# NDCs have set GHGs emissions targets, and some global policy directions, but still large flexibilities on the options and measures to be really implemented

*A review of NDCs allows to identify 4 main policy directions and levers to mitigate greenhouse gases emissions*

Promoting energy efficiency

Encouraging switching to less carbon intensive fuels in different usages (Natural gas against coal)

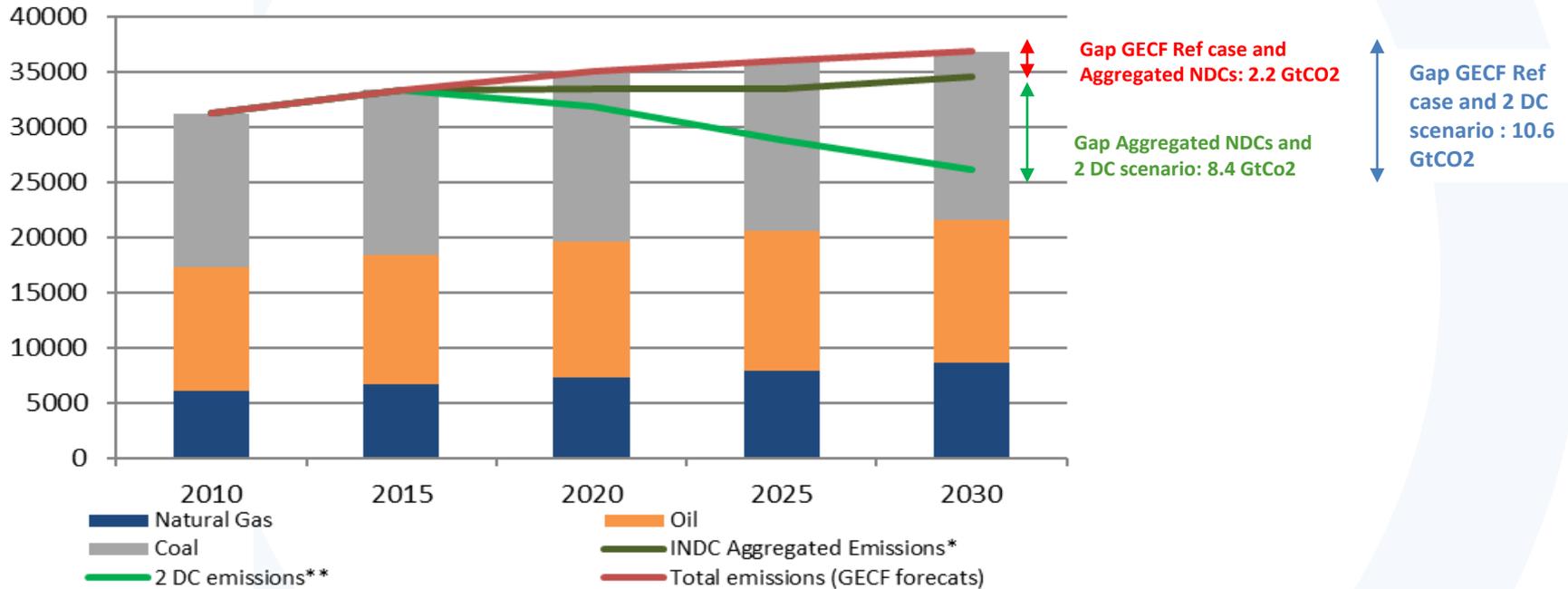
Supporting GHGs free energy alternatives (Renewables, Nuclear...)

Promoting carbon sequestration and storage, and also carbon sinks

Large flexibilities still exist on the options and measures to be really implemented by each country to reach its NDCs commitments

# Post Paris Agreement policies will contribute in slowing down CO<sub>2</sub> emissions, but large efforts are needed, beyond the NDCs commitments

Energy related CO<sub>2</sub> emissions by fossil fuels for GECF Reference case (MtCO<sub>2</sub>)



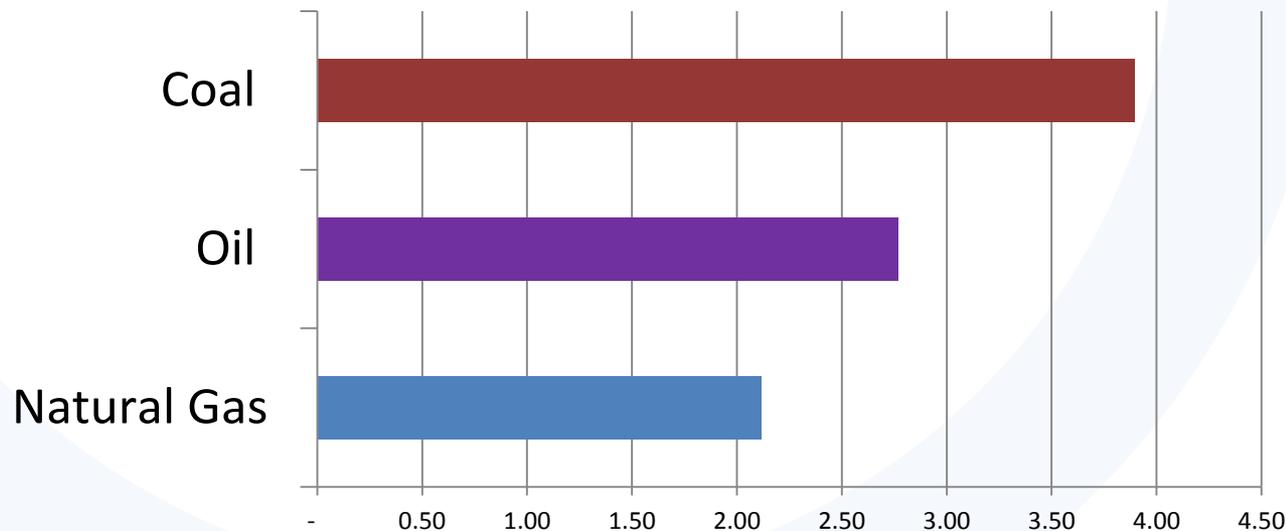
- Energy related CO<sub>2</sub> emissions expected to grow slowly to reach 36.8 GtCO<sub>2</sub> by 2030 (2.2 GtCO<sub>2</sub> more than emissions estimated from aggregated NDCs, and around 10.6 GtCo<sub>2</sub> more than emissions estimated to be consistent with Paris Agreement target).
- To achieve Paris Agreement target, efforts beyond NDCs is required.
- Around 35% of CO<sub>2</sub> emissions in GECF forecasts by 2030 are expected to come from coal.

\* Estimation of energy related CO<sub>2</sub> emissions based on IPCC updated assessment for COP 22 Conference-

\*\* Emissions pathway compatible with 2 Degree Celsius temperature increase objective (WEO 2016)

# Natural Gas, as cleanest fossil fuel, has to play a key role in this GHGs mitigation efforts

## CO2 emission by unit of energy consumed (T.CO2/Toe)



Gas emits less CO2 than other fossil fuels, and also less harmful by-products (Particles, NOx, SO2...);

***Gas enjoys many advantages making it compatible with sustainable development***

- Good complementarity between gas and renewables;
- Good energy performance of gas-based technologies and processes;
- Gas is clean, abundant, affordable and allows to improve energy accessibility.

# Conclusion

- Natural gas is the fuel of choice because it is less capital-intensive than renewables and cleaner than coal.
- Cautious about the important role of natural gas for socio-economic benefits of the societies and for sustainable energy transition, GECF is determined to continue to be a key player in supplying reliably natural gas known as a triple "A" asset, to the market over the next decades.
- The role of natural gas in the battle with greenhouse gas emissions gains momentum especially after the ratification of the COP21 agreement.