

THE ROLE OF NATURAL GAS IN GLOBAL ENERGY BALANCE FOR THE PERIOD TILL 2040

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Overview

The primary objective of Energy Economics and Forecasting Department (EEFD) of Gas Exporting Countries Forum (GECF) to conduct energy studies to support the sovereign rights of GECF Member Countries over their natural gas resources and their abilities to develop, preserve and use such resources for the benefit of their peoples. In 2016 EEFD has conducted the first edition of GECF Global Gas Outlook 2040, representing a 25 year look-ahead (2016-2040).

The coming 25-year period is expected to see strong growth for gas demand, as customers throughout the world seek energy to support economic development while treating environmental concerns in a responsible manner. The global economy is expected to double over the next quarter of a century and energy demand to increase by 25% over the same time. The gas market share in global energy balance will increase from just over 21% to 25% over the outlook period, as it gains market share in the power sector generation.

Methods

This study reflects the GECF *Outlook* reference case scenario and highlights the current situation and evolution of the gas market and energy trends in terms of the 2040 perspective. It is based on the global energy demand (by fuel/region/sector) and the global gas supply (conventional and unconventional) for GECF and non-GECF countries. This perspective reflects current energy policies and introduces those new policies that are likely to happen in the forecast period as per our assessment.

EEFD has used its model – GECF Global Gas Model (GGM), to project energy demand and supply by economy and for world as a whole. World-wide results are simply sums of results for the relevant economies. The modeling process included assembling a database of key assumptions for each economy, including historical data base of the natural gas sector. Sub-models estimate energy demand in key sectors. The result tables put together the results of all sub-models and present them in an organized way.

Results

A key message of the study is that gas resources in GECF countries are abundant. So much so, that the GECF member countries expect to be willing and able to contribute, with new exports, significant volumes to the growing international trade in gas, while simultaneously continuing to support strong domestic gas market growth. In 1990, gas represented 37% of GECF countries' domestic primary energy; it is expected to reach a share of 51% by 2040. This increase will allow a reduction in coal and oil use, and a corresponding reduction in CO₂ emissions, in line with our members' various INDC commitments under the 2015 Paris Agreement. Thus GECF countries can deliver on both the economic and environmental fronts within the international community.

The energy intensity of the Global GDP, as a proxy indicator for energy efficiency improvements across the economy, continues to decline to 116 toe per million USD in 2040 from 189 toe currently. Since 1990, energy intensity decreased by almost 1% per annum. It is expected that in next 25 years, the energy intensity reduction will accelerate; declining by 1.9% annually, mainly under the impetus of energy efficiency measures. It should be noted that energy intensity reduction is not a pure result of implemented efficiency measures as it also takes into account the effect of energy prices, structural changes in the economy, and fuel mix changes.

As the world economy continues to electrify – global electricity demand increases by 70% between 2015 and 2040 – the generation requirement correspondingly increases, and gas offers the least cost source of power in many countries. The longer-term risk is that deeper decarbonization of the power sector could undermine the position of gas in the absence of offsetting carbon capture and storage technologies. In the short to medium term, however, gas can displace coal as the global source of incremental power supply.

International trade in gas will grow at a faster rate than the overall growth in gas demand.

The Study sees gas trade increasing by 66% over the period, from about 1,000 bcm in 2015 to almost 1,700 bcm in 2040. And even more of this trade will be carried by sea, in the form of liquefied natural gas (LNG), than it is today. By 2040, LNG carriers may be moving the equivalent of about 660 bcm per year, compared with just over 320 bcm in 2015. In other words, LNG trades will more than double. The volume of gas traded through international pipelines will also grow significantly—from almost 700 bcm in 2015 to about 1,000 bcm. The share of LNG in international trade will increase therefore from 30% today, to between 40 and 45% between 2020 and 2040. Most of this dramatic increase will take place in the first 10 to 15 years of the period.

The modelling work that underpins this Study simulates the way in which future international trade in gas can develop in a cost-effective way. The work shows that GECF members are in a position to maintain, throughout the period to 2040, the share in international trade that is implied by the least-cost solutions of our modelling and forecasting exercise. The share of GECF members in global trade is forecast to be 47% in 2040 compared with 43% in 2015, and very close to the average share of 46% over the last twenty years.

Conclusions

The Outlook projects that by 2040 the annual global demand for gas will be about 5,200 billion cubic meters (bcm). This compares with the demand of about 3,500 bcm in 2015. In other words, demand is likely to increase by more than 50% in 25 years – a similar growth to that experienced over the past 16 years. And in the GECF countries (members and observers) domestic demand (excluding gas used for reinjection) is forecast to grow from 1,007 bcm to 1,309 bcm.

In addition the study explores the subject of competition from alternative sources of energy (mainly coal and renewables), as well as technological developments and their eventual impact on energy mix and gas market share. There is a focus on power generation as strategic sector for gas demand growth. Moreover energy efficiency, environmental policies and other regulations have been considered in the reference case scenario to study their impact on the penetration of gas in key markets/sectors and to enable GECF views on these subjects to be further developed.

EEFD GECF will continue develop and support GECF cooperative activities on the natural gas development as natural gas is and will remain the important global energy resource for the period up to 2040.

References

Gas Exporting Countries Forum. GECF Global Gas Outlook 2040. January 2017. Available from: <http://www.gecf.org>