



Pricing on gas: focus on LNG sectors

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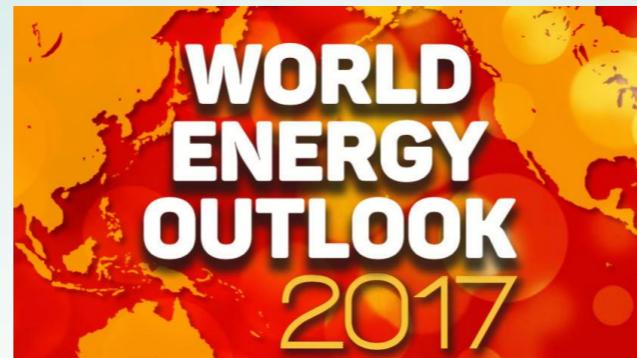
World Maritime University



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OVERVIEW



The current status of the energy in the world is investigated by International Energy Agency (IEA) in cooperation with OECD, with the “Outlooks of the World energy by 2040”

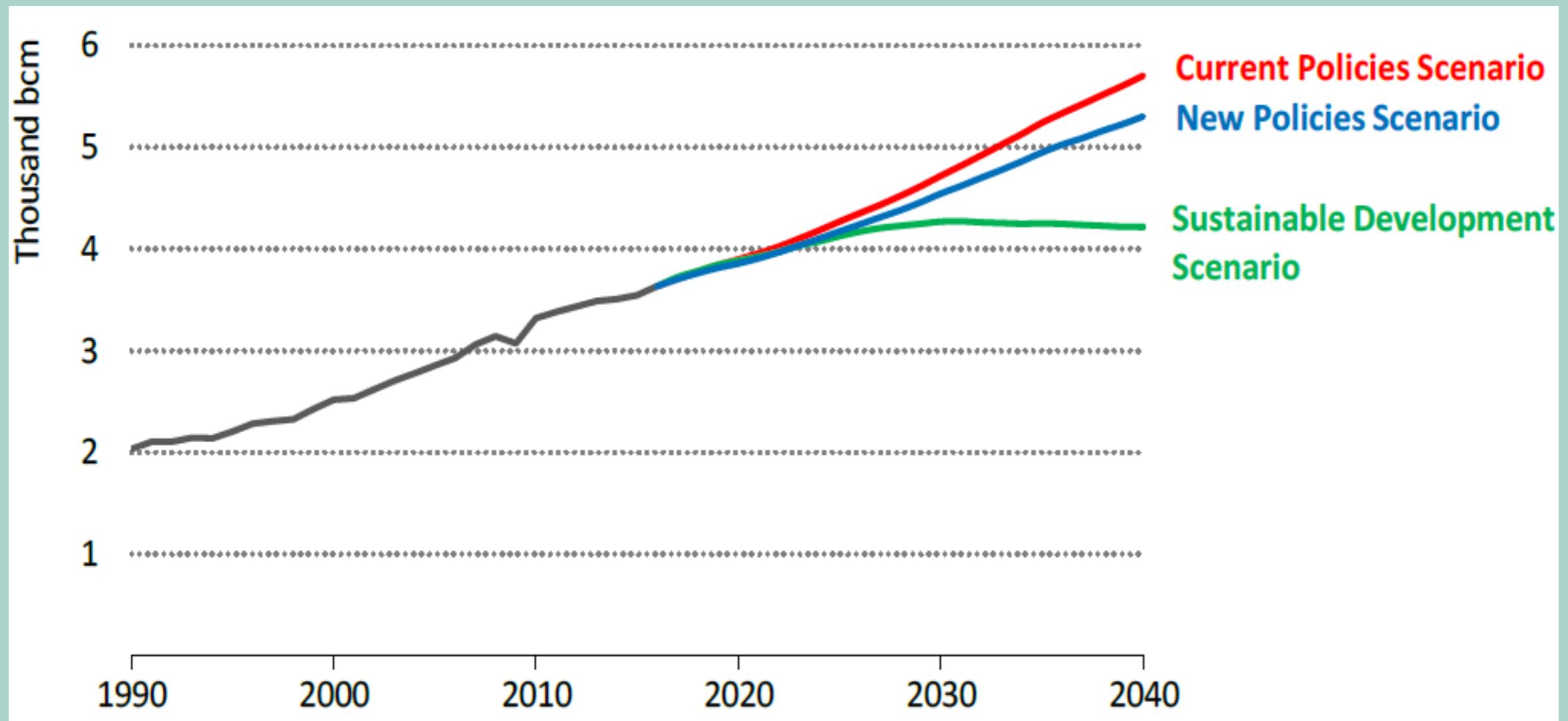
OVERVIEW

First scenario is the Current Policies Scenario in the world. (assumes no changes in policies)

Second one is the New Policies Scenario takes account of broad policy commitments and plans that have been announced by countries. Global energy needs rise more slowly than in the past but still expand by 30% between today and 2040(OECD/IEA, 2017).

Third scenario is the Sustainable Development Scenario, which outlines an integrated approach to achieve the energy-related aspects of the UN Sustainable Development Goals.

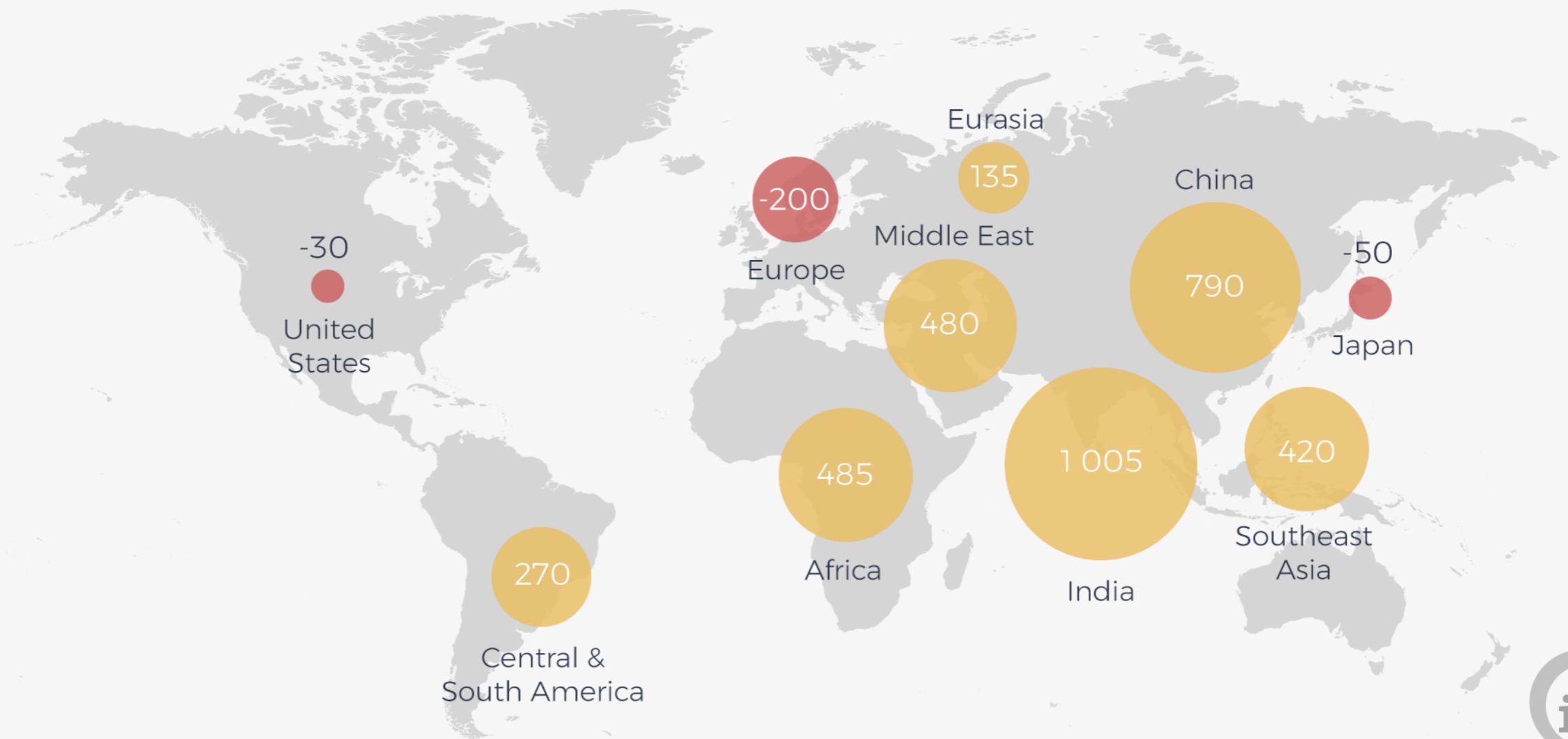
Worldwide NATURAL GAS DEMAND by three scenarios



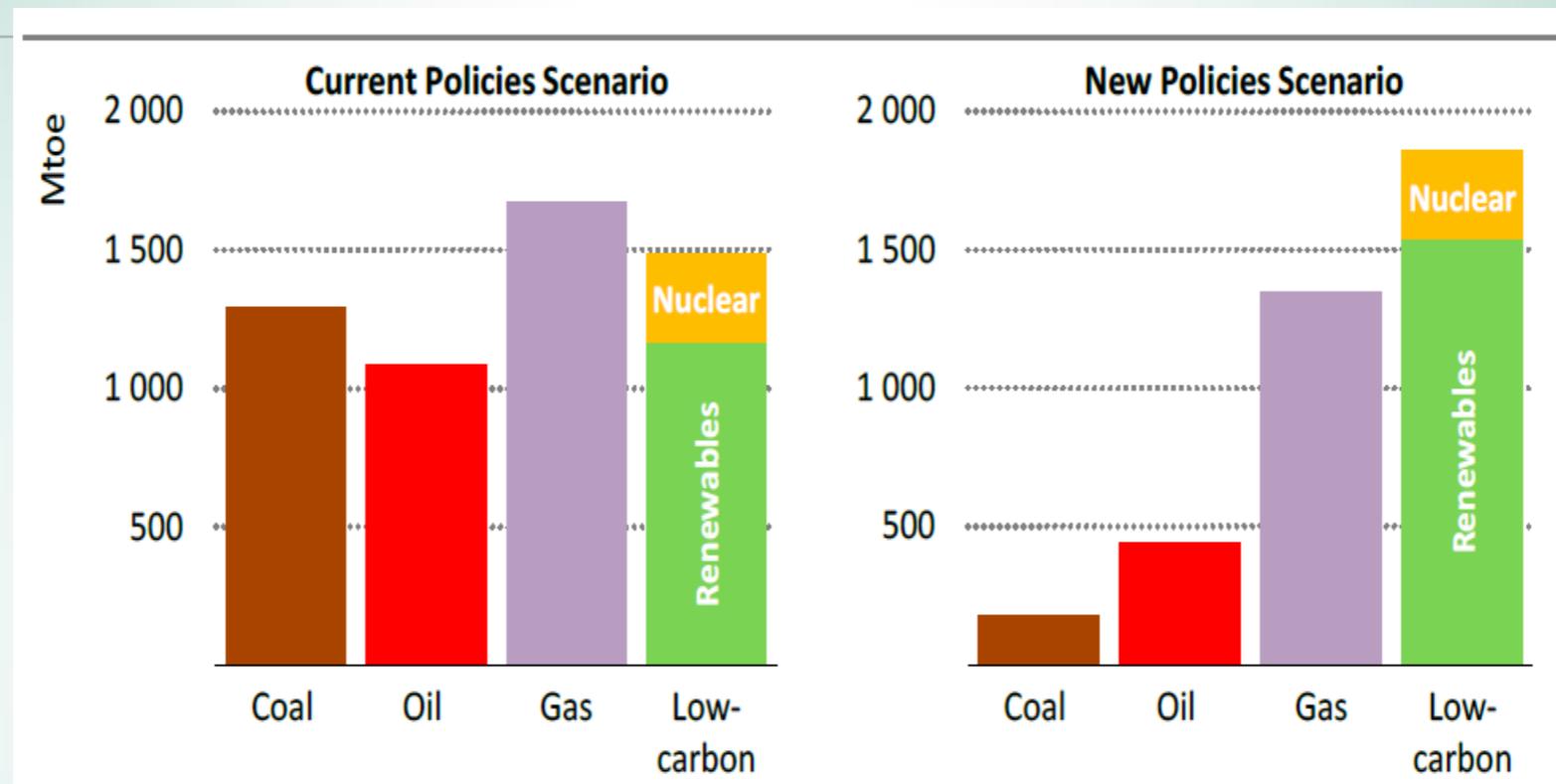
Source: World Energy Outlook, (2017)

FUTURE ENERGY DEMAND

Change in primary energy demand, 2016-40 (Mtoe)
World Energy Outlook 2017



Change in global primary energy demand by scenario, 2016-40



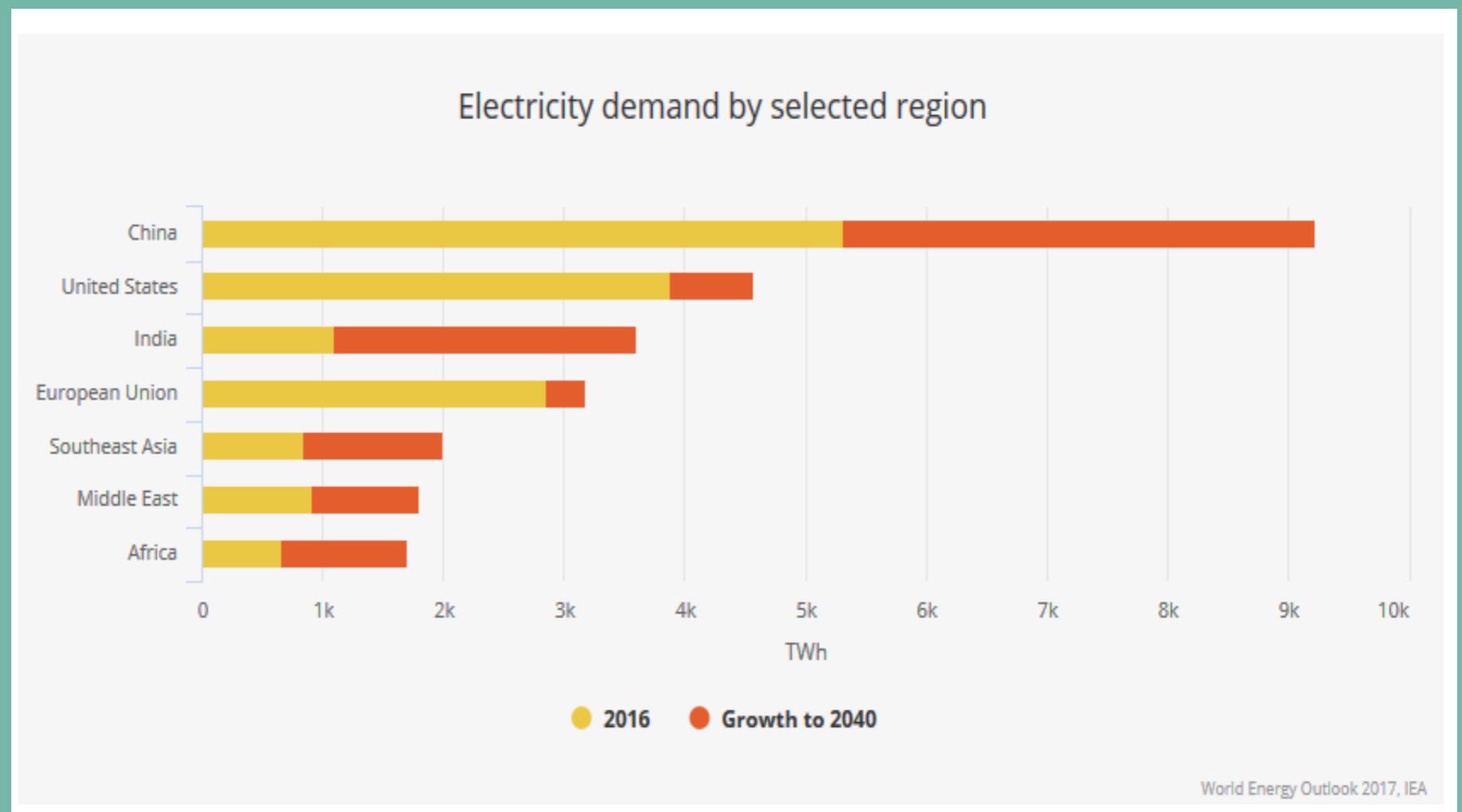
Source: World Energy Outlook, 2017

Natural gas makes a major contribution to meeting energy demand growth in the New Policies Scenario, with global demand rising by 45% between 2016 and 2040. With a few notable exceptions (including China), gas consumption is usually not an explicit focus of sustainability policies at national level. However, all fossil fuels grow in the Current Policies Scenario, while gas is the only fossil fuel to show significant growth in the New Policies Scenario

FUTURE ELECTRICITY DEMAND

The future is electrifying

Electricity is the rising force among worldwide end-uses of energy, making up 40% of the rise in final consumption to 2040 – the same share of growth that oil took for the last twenty-five years



Worldwide Natural Gas currently

Provides 22% of the energy used worldwide

Accounts for almost a quarter of electricity production

Playing a key role for industry as a raw material



Source: World Energy Outlook, (2017)

New Policies Scenario

- ❖ Worldwide consumption of the natural gas increases by 45% in the coming 25 years:

Industry will account for a third of the growth, slightly ahead of the gas consumption in the **power generation sector**



Source: World Energy Outlook, (2017)

FUTURE SUPPLIERS

- ❖ The **United States** will be the biggest global gas supplier (with 300bcm= billion cubic metres) over the next 25 years, more than any other country, followed by **China** (200 bcm), **Russia** and **Iran** (both around 145 bcm)

Gas consumer countries *are looking for gas with low prices and to secure additional volumes of LNG.*

Source: World Energy Outlook, (2017)

LNG ALTERNATIVE FUEL

LNG is the most promising alternative fuel in the **short to medium term**, at least for **short sea** (and possibly inland waterway transport), but also for **maritime activities outside transport**, e.g. fisheries and offshore services.

It will help to reach environmental targets of sulphur, nitrogen and particulate matters emissions in SECAS and NECAS spelled out by the IMO.

LNG BENEFITS

ENVIRONMENTAL

Less polluting than petroleum, very eco friendly

LNG doesn't pollute the ground or the underground water because its byproducts are in gaseous form. It allows a reduction of CO₂ of considerable quantities compared to carbon and to oil.

Environmental Benefits

Table 3: Comparing alternative technologies and fuels

	Environmental features compared to the traditional HFO alternative				Factors influencing viability compared to the traditional HFO alternative		
Alternative	SO _x	NO _x	PM	CO ₂	Cargo capacity	Capital Investments	Operating costs
LNG	++	++	++	+	Restricted	Very high	Low
MGO	+	-	-	-	Not restricted	Low	Very high
HFO/Scrubber	+	--	+	-	Slightly restricted	High	Medium ^{a)}

++ very good, + good, - bad, -- very bad

Source: SSPA, TC/1208-05-2100

LNG drivers

MARKET DRIVERS

- ❖ **Environmental drivers** represented by the growing decarbonisation needs of the economy and the reduction of polluting emissions.
- ❖ **Macroeconomic drivers** such as growth rate of the general economy, the inflation rate, the cost of energy, the trend in exchange rates and the level of interest rates.
- ❖ **Technical drivers** can include new applications, or for example the modularity and flexibility of small-scale LNG technologies.
- ❖ **Economic and development drivers** given by the possibility of expansion and industrial development starting from the naval sector (through the fleet retrofitting, the construction of new ships and the relative growth of the port areas), up to the development of the modalities ' of transport.

LNG drivers

REGULATORY DRIVERS

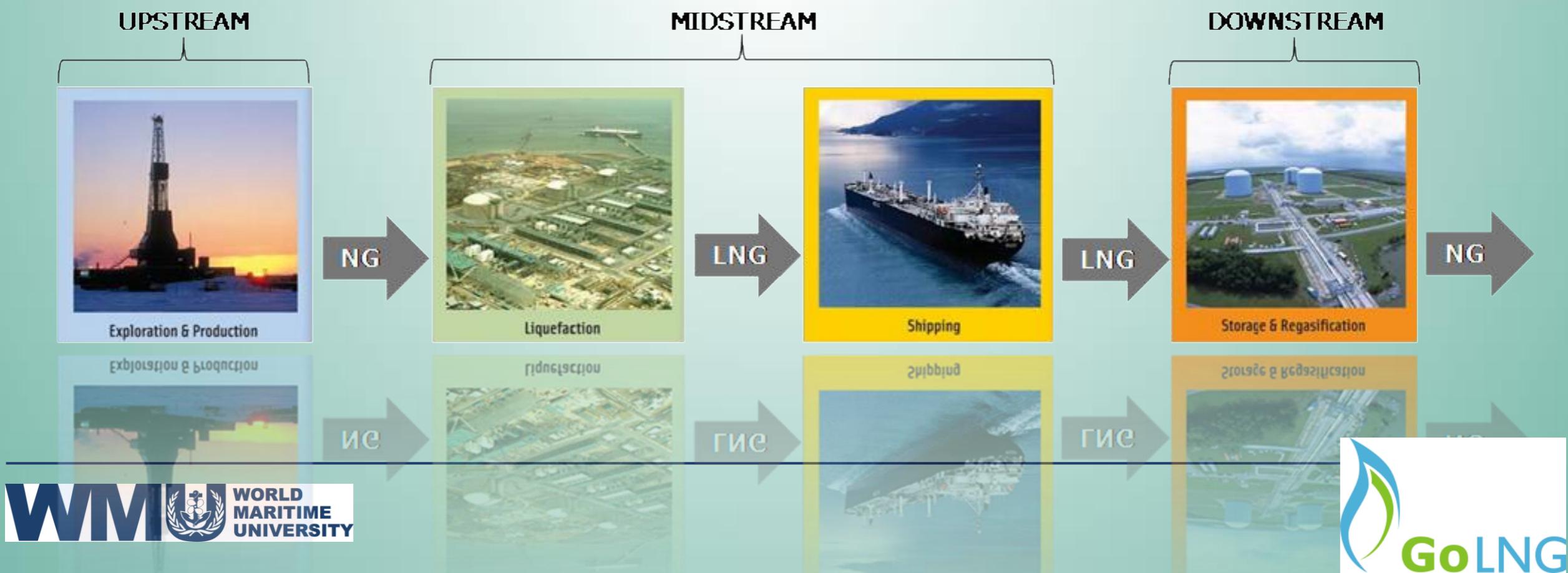
The regulatory drivers represented by environmental legislation (for example Nitrogen Oxides Control Areas - NECA and Sulfur Emissions Control Area - SECA) illustrated in the previous paragraphs play a role of primary importance in order to allow an adequate development of the entire value chain of the System and of LNG

LNG VALUE CHAIN CONCEPT

LNG VALUE CHAIN along the entire chain (liquefaction, storage, transport, regasification) allows the achievement of efficiency, through the minimization of costs and effectiveness, with the maximization of the services offered.

LNG competitive and a generator of economic growth: a key role will be played by technological innovation.

Figure 1: LNG Value Chain



LNG VALUE CHAIN CONCEPT

LNG Value chain includes different types of transport from the maritime, railway, road and heavy industries, industries

LNG VALUE CHAIN is represented by the creation of an **ecosystem of companies** that operate or wish to operate in the supply chain or in the value chain related to the production of LNG, also to allow the achievement of adequate **economies of scale**

LNG VALUE CHAIN CONCEPT

Diversification of supplies, ensuring greater security with regard to the energy supply, which would be lower in the case of monopoly by a single supplier.



Expansion of the portfolio of contracts underlying the development LNG infrastructures



Possibility of LNG delivery to end consumers without a pipeline infrastructure replaced by a **more flexible scheme** represented by the development of a **capillary network** that allows access to LNG to various end users: road, maritime, industrial and energy in general.

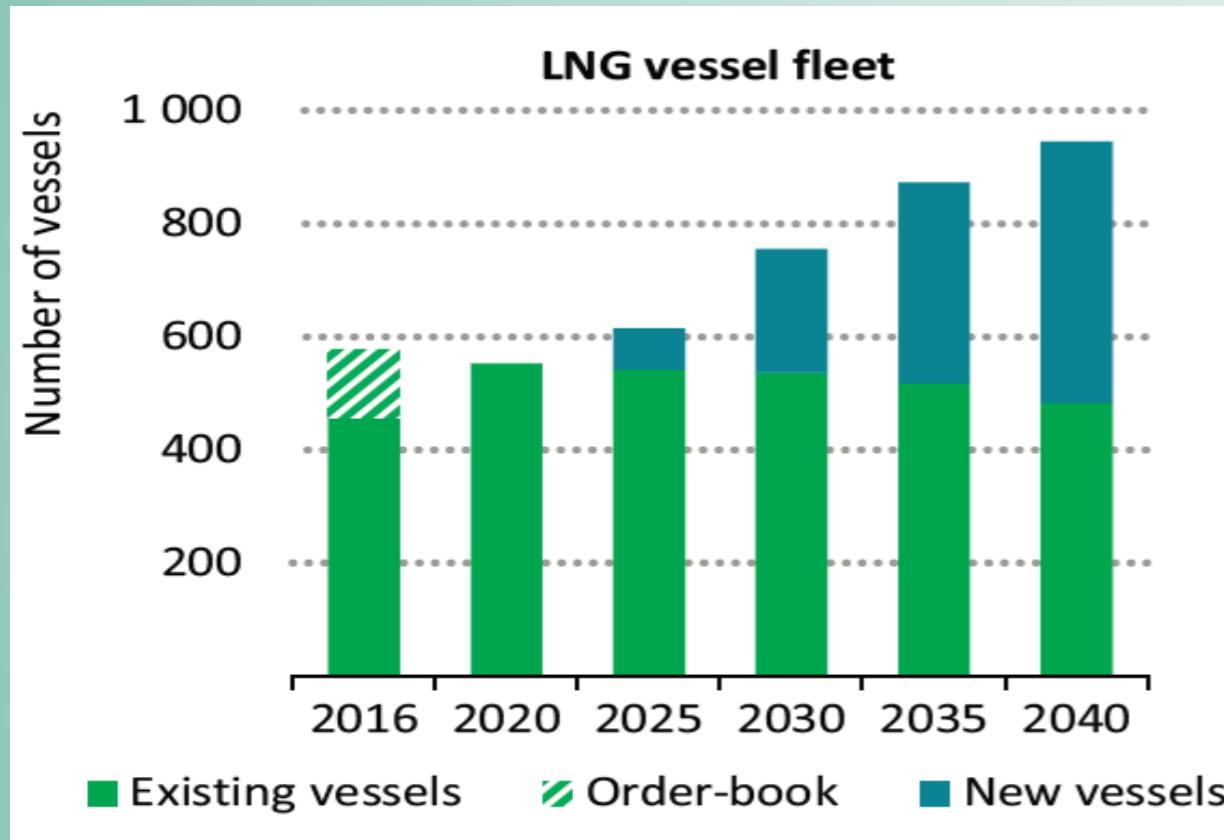
LNG VALUE CHAIN CONCEPT

In order to increase their competitiveness, countries importing LNG could evaluate the optimization of their portfolio, **renegotiating long-term LNG import contracts and spot contracts.**

The **development of small-scale LNG** also creates opportunities for new markets

How is the market for LNG shipping evolving?

LNG vessel fleet in the New Policies Scenario



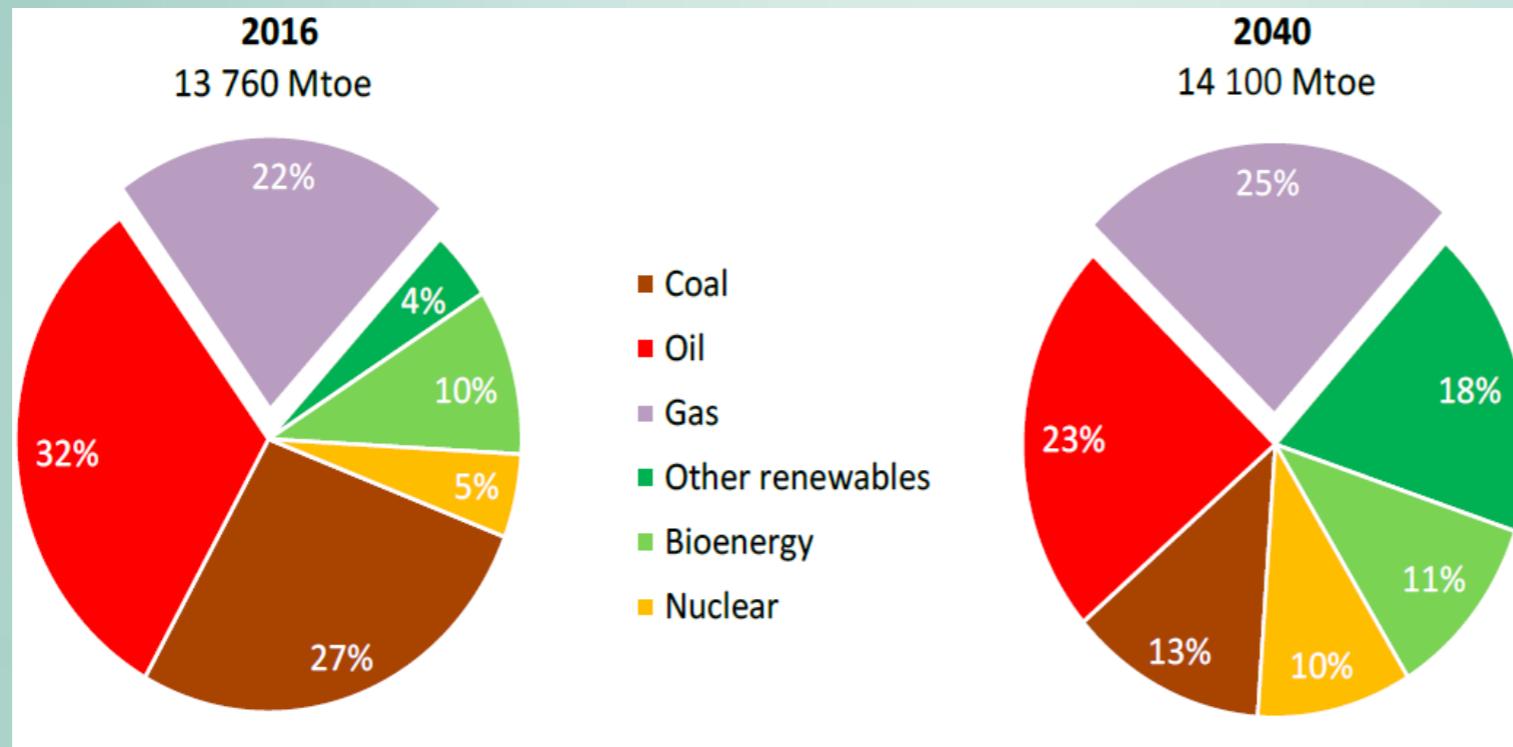
Source: World Energy Outlook, 2017

The number of the LNG vessels increased from 340 to 460 between 2011-2016, which reflects 70 million cubic meters in 2016, with a rise of 35% from 2011 levels. Currently, the LNG shipping market is in over-capacity phase which resulted in low charter rates. New LNG vessels will be needed in the first-half of the 2020s and, along with the growth of the US LNG export

TRANSPORT SECTOR

Global primary energy demand in the Sustainable Development Scenario

Transport sector



GROWTH OF
GAS,
BIOENERGY,
OTHER
RENEWABLES

Source: World Energy Outlook, 2017

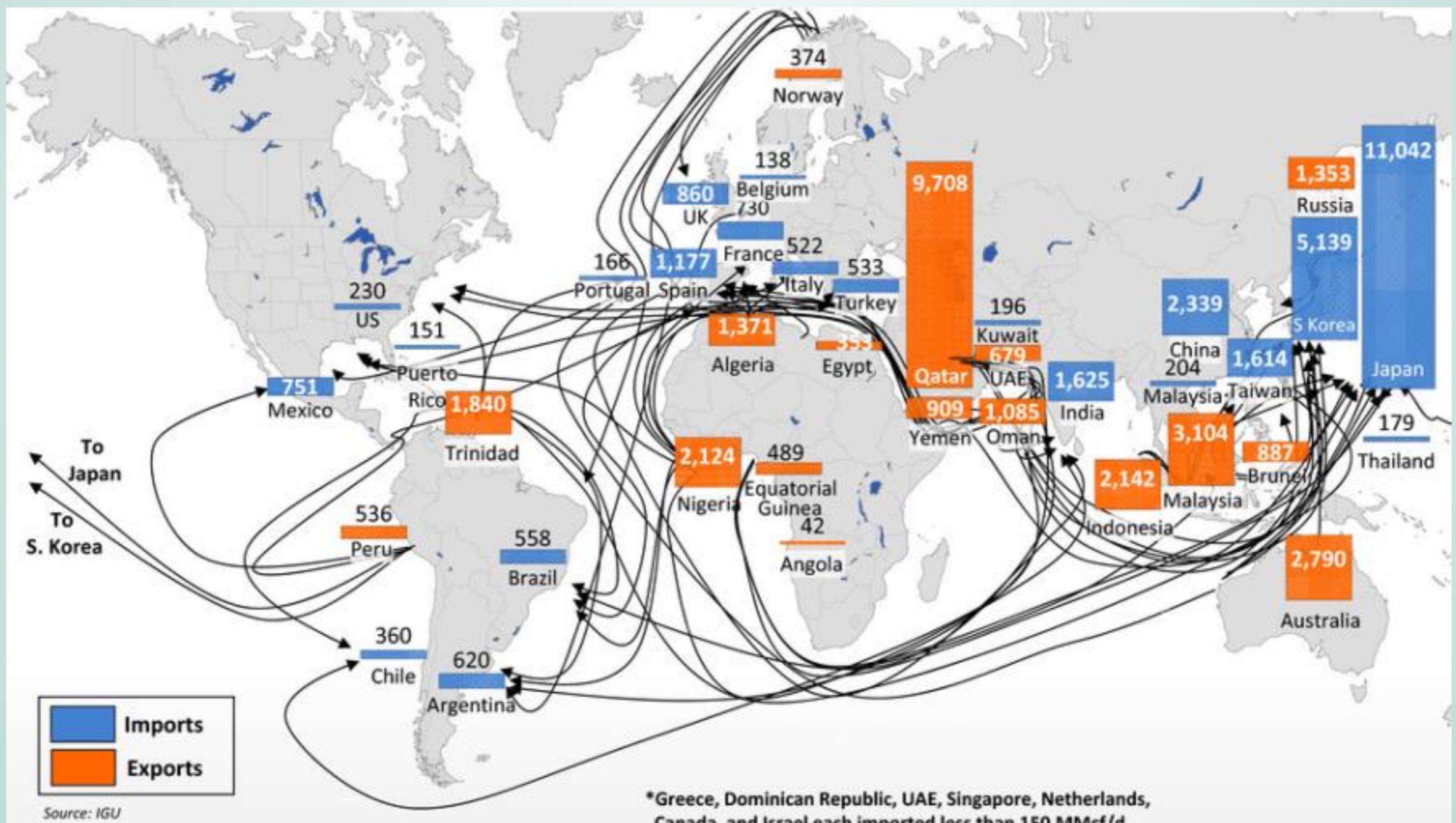
LNG MARKET TRENDS

A number of key factors have contributed to the rapid growth of non long-term trade in recent years:

- The **growth in LNG contracts** with destination flexibility, chiefly from the **Atlantic Basin** and **Qatar**, which has facilitated diversions to higher priced markets.
- The **increase in the number of exporters and importers**, which has amplified the complexity of the trade and introduced new permutations and linkages between buyers and sellers. In 2014, 26 countries (including re-exporters) exported spot volumes to 28 end-markets
- The **large increase in demand in Asia and in emerging markets such as Southeast Asia and Latin America**, which accelerated tightness in the LNG market.
- The **large growth in the LNG fleet**, which has allowed the industry to sustain the long-haul parts of the spot market (chiefly the trade from the Atlantic to the Pacific).
- The legal enforcement
- Impact of new liquefaction capacity

Export Liquefaction Terminals and increasing supply

LNG Trade Routes



Thank you !