THE PARIS ACCORD

Signed in New York on 2016 Earth Day, the Paris Agreement has entered its implementation phase.

All the nations in the world are called on to to reduce emissions of CO_2 and other greenhouse gases in order to hold the increase in the global average temperature below 2°C by the end of the century, and to pursue efforts to limit the temperature increase to 1.5°C.
Political talk is over – now it is time to walk the walk. And time is running short.

According to the International Energy Agency (IEA), to meet the Paris commitment

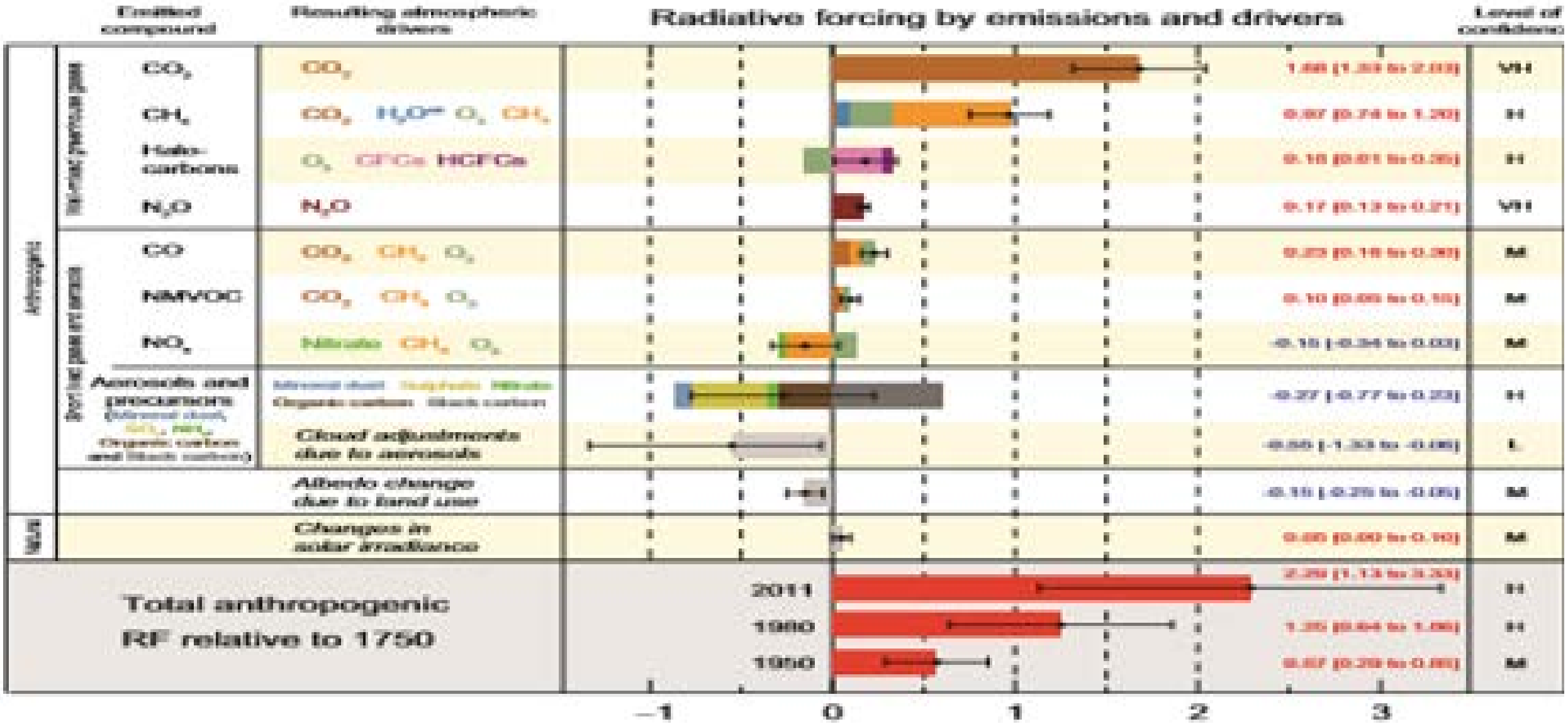
- ✓ **by 2040 the recourse to fossil fuels should be drastically reduced from today 86% until they account for no more than 50% of the world's energy consumption. And this is just the first step along a pathway that should lead to the decarbonisation of the world economy over the next thirty years.**

- ✓ **despite the global energy demand is expected to increase by over 35% between 2016 and 2040 driven by the economic growth of India, China, emerging countries and the poorest countries of Asia and Africa where over 1.2 billion people do not yet have access to electricity.**

THE TREMENDOUS CHALLENGE IS TO MEET THE INCREASING ENERGY DEMAND WHILE REDUCING THE USE OF FOSSIL FUELS.
TO REACH THE GOAL, THE INTENDED NATIONALLY DETERMINED CONTRIBUTIONS (INDCS) SUBMITTED BY THE SIGNATORIES TO THE PARIS AGREEMENT ARE NOT ENOUGH.

GLOBAL WARMING IS GOING ON

The current level of radiative forcing is 4 times than the 1950 level, corresponding to a total warming effect of about 800 terawatts, more than 50 times the world's energy consumption



THE GLOBAL GAS MARKET - KEY FIGURES

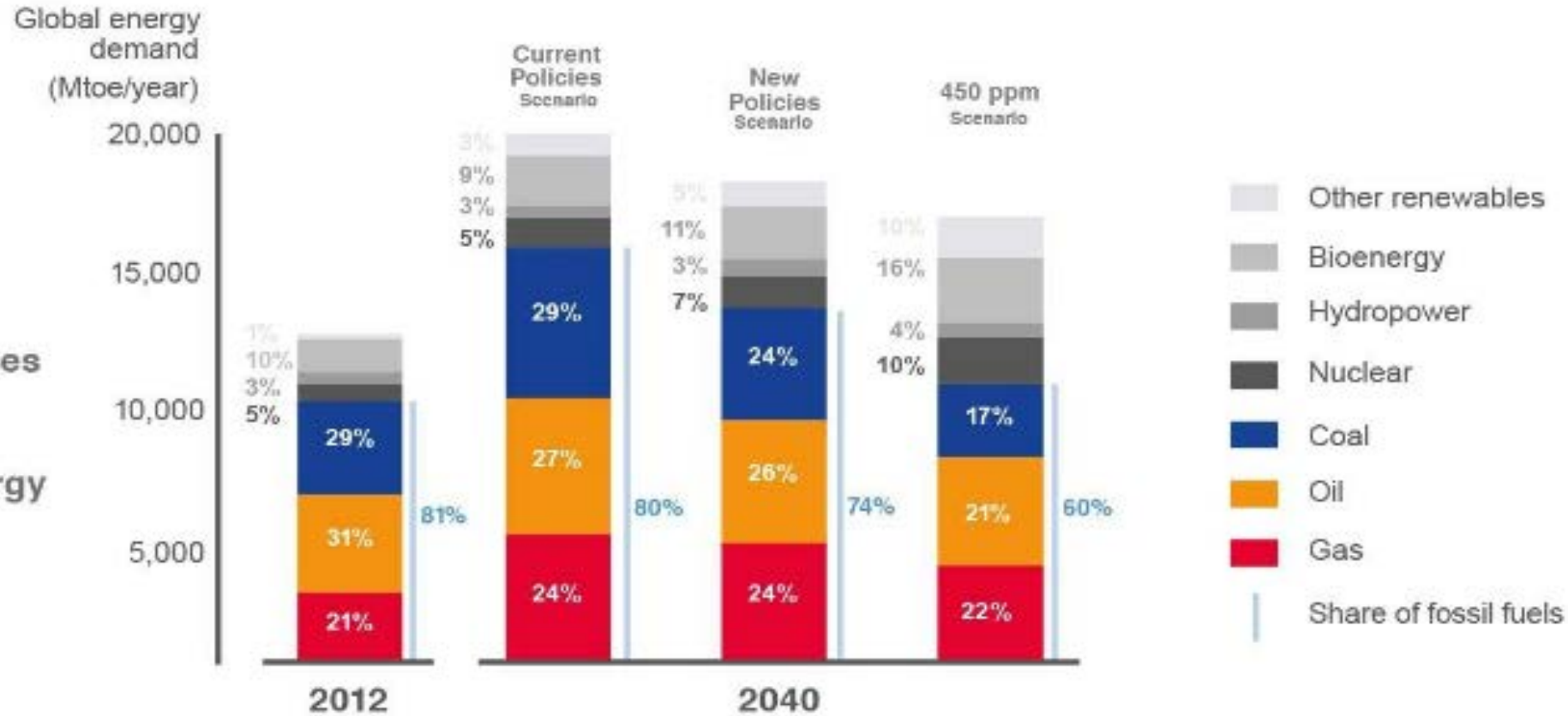
GAS, THE NO.2 ENERGY IN 2040?

Global Energy Mix

Fossil fuels will still dominate in 2040 (80 to 60%)

Natural gas's share increases in all three scenarios

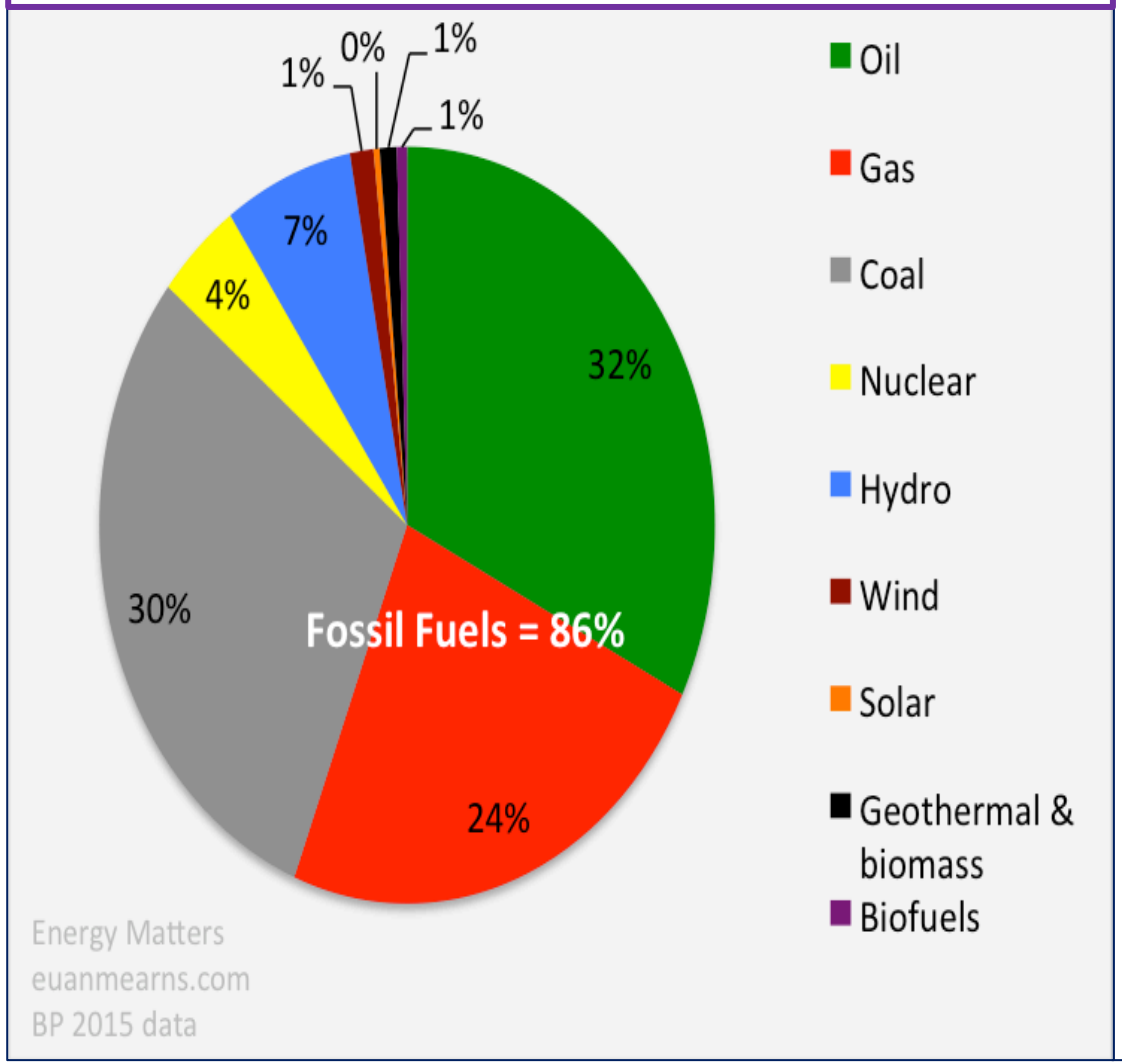
Gas becomes the No.2 energy in the two lowest-carbon scenarios

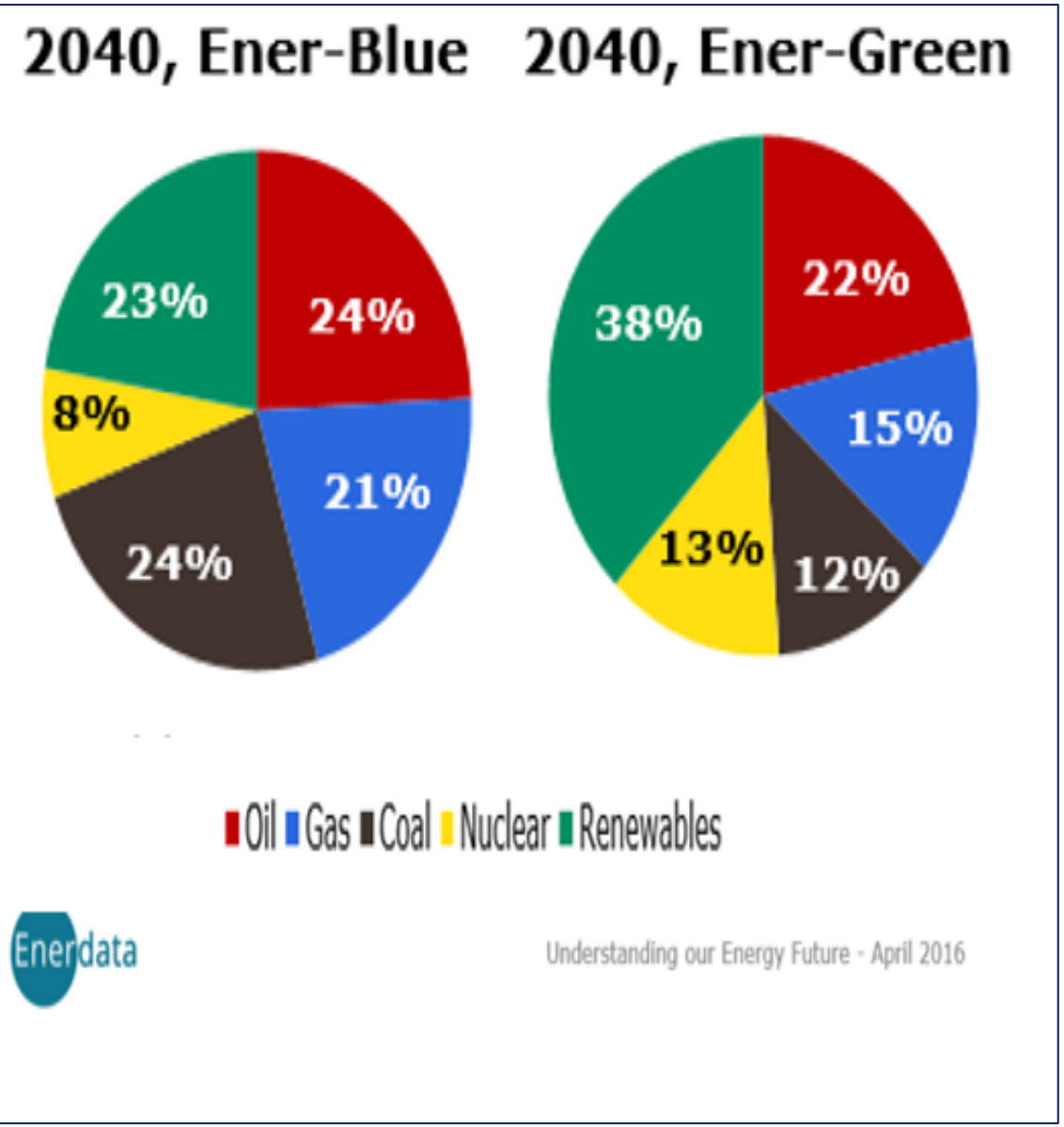


Source: IEA, 2014

IMPLEMENTING PARIS AGREEMENT : THE GAP

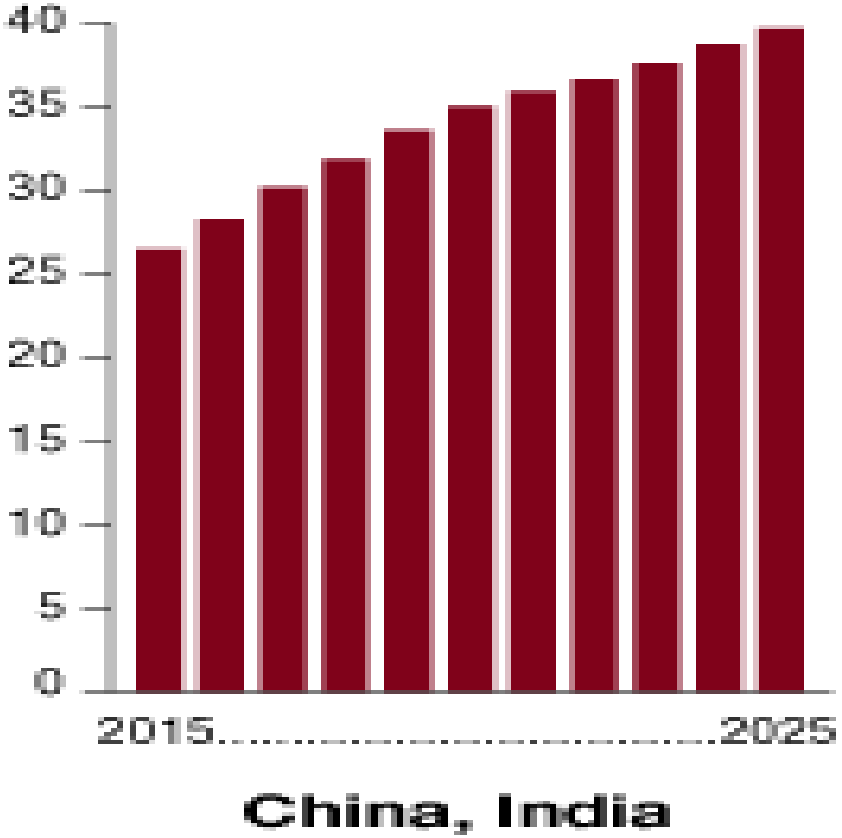
2015 Global Energy Mix





GLOBAL TRENDS IN MOBILITY DEMAND

In the next 10 years, the latter are expected to increase by 700-750 million cars, almost half in China and India.



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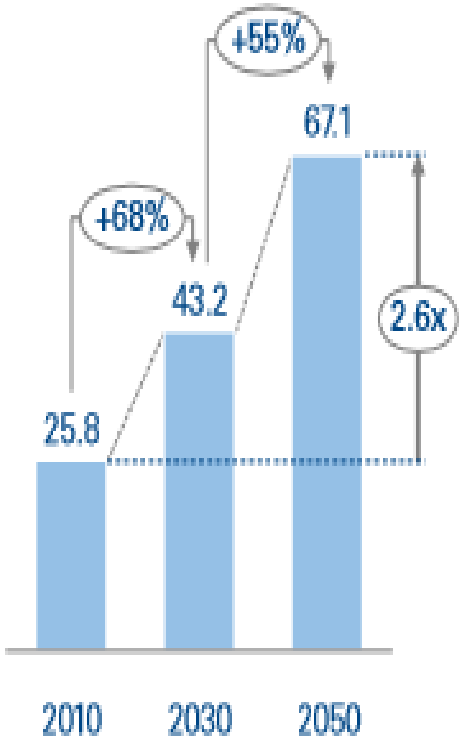
Urban mobility demand explodes

Urban mobility demand, 2010-2050 [trillions pkm p.a.; %]



Cities are confronted with new challenges

Planet
- Air pollution
- CO_2 emissions
- Noise
- Increasing ecological footprint

People
- Traffic chaos
- Traffic security
- Traffic jam
- Decreasing quality of life and convenience

Profit
- Overloaded infrastructures
- Insufficient public transport capacities
- Increasing motorization
- Limited parking places

Arthur D. Little The Future of Urban Mobility 2.0,2014

Gas, a “Clean,” Efficient, Energy Option

The issue of monetizing gas resources is becoming increasingly crucial for producing nations and oil and gas operators alike. It is a clean-burning fuel whose combustion generates no unburned residues, particulates or soot, and releases less greenhouse gas than the other fossil fuels.

LIQUEFACTION, ONE OF THE MAIN REASONS FOR THE EMERGENCE OF THE LNG INDUSTRY IS THAT IT MAKES TRANSPORTING NATURAL GAS OVER LONG DISTANCES BOTH TECHNICALLY AND ECONOMICALLY FEASIBLE.

Exporting LNG by carrier means that **huge reserves of gas located far from major consumer regions** can be tapped.

In addition, **liquefaction** often contributes to the reduction of gas flaring associated with crude oil production, thus limiting greenhouse gas emissions.

- The LNG value chain not only promotes the use of an energy source with a smaller environmental footprint than other fossil resources, it also addresses the concerns of **consumer nations regarding their diversity of supply** while reducing their **energy dependence** on countries that supply natural gas via pipeline.
- Unlike piped natural gas, **a cargo of LNG can be diverted en route. This promotes the flexibility** that consumer nations need to manage their supply, and enables producing nations to optimize the monetization of their assets. This flexibility has been spurred by the increase in short-term LNG trading tied to market deregulation.
- That same flexibility is proving an advantage for some countries such as Brazil, which are counting on **the forthcoming growth of this sector in an offshore context.**

Natural gas is one of the world’s most important sources of energy. Today approximately 30% of the world's energy demand is derived from natural gas. The majority of natural gas is delivered by pipeline in gaseous form. However, in the past two decades Liquefied Petroleum Gas (LPG), Natural Gas Liquids (NGL) and Liquefied Natural Gas (LNG) have become much more important in the world's energy market. Natural gas and LNG in particular is expected to play an essential role in the world’s transition to cleaner sources of energy.

LNG is natural gas in its liquid form. In order to liquefy natural gas, it must be cooled to cryogenic temperatures of approximately -160°C. As a liquid, natural gas occupies only 1/600 of the volume of natural gas (at atmospheric pressure) in its gaseous form and therefore allows for more economic and practical storage. It is also easer to transport over great distances.

Natural gas is typically transported in liquid form when vast distances, geological conditions or political dynamics do not allow for the construction of pipelines.

FAST-EXPANDING LIQUEFIED NATURAL GAS SHIPPING

LNG Today: 330 bcm/year

Main exporting regions

Middle East (Qatar)
Pacific (Indonesia, Malaysia)

New growth regions

U.S.A., Russia, Australia, East Africa

MARPOL

MARPOL, the International Convention for the Prevention of Pollution from Ships, is concerned with preventing marine pollution from ships. Specifically, Annex VI of MARPOL addresses air pollution from ocean-going ships. The international air pollution requirements of Annex VI establish limits on nitrogen oxides (NOx) emissions and require the use of fuel with lower sulfur content, protecting people's health and the environment by reducing ozone-producing pollution, which can cause smog and aggravate asthma.

MARPOL Annex VI

MARPOL was developed through the International Maritime Organization (IMO), a United Nations agency that deals with maritime safety and security, as well as the prevention of marine pollution from ships. MARPOL is the main international agreement covering all types of pollution from ships. Annex VI of the MARPOL treaty is the main international treaty addressing air pollution prevention requirements from ships Annex VI includes requirements applicable to the

Entro il 2020 l’applicazione in tutta Europa delle regole MARPOL VI imporrà il limite dello zolfo nei combustibili navali allo 0,5%, già in vigore nel Mare del Nord: obiettivo ottenibile usando carburante a basso contenuto di zolfo disponibile in quantità non adeguate alla domanda della flotta mondiale e molto costoso, oppure sostituendo il combustibile tradizionale con LNG.

Dal 2011 la Commissione Europea ha avviato un programma finalizzato a creare le condizioni normative e infrastrutturali per la realizzazione di una rete distributiva di LNG per navi e mezzi pesanti, anche tenendo conto che ad oggi nel Mar Mediterraneo non esistono impianti di distribuzione di gas naturale liquido.
Il programma della Commissione Europea attua le disposizioni della direttiva 94/2016, che prevede tra l’altro che entro il 2016 gli Stati Membri definiscano le caratteristiche, le procedure e i tempi per la realizzazione della rete distributiva di LNG.

IN QUESTO CONTESTO L’ITALIA DEVE

Progetto europeo COSTA, 2013-2014

- ✓ sono necessari investimenti per almeno due miliardi € per ogni paese costiero, assumendo che ciascun paese realizzi almeno un Hub per LNG;
- ✓ la trasformazione della flotta dei paesi costieri, ovvero il passaggio dai motori tradizionali ai motori a LNG, avverrà gradualmente. Come già verificato nel Mare del Nord, saranno prima di tutto coinvolte le navi con raggio d'azione limitato come i traghetti. Nel Mediterraneo la navigazione di corto raggio riguarda 658 navi: 299 portacontainer, 182 traghetti, 76 traghetti tutto-merci, 53 navi da crociera, 48 navi-bisarca;
- ✓ la domanda di LNG verrà trainata sia dal traffico di corto raggio, sia dal traffico di lungo raggio in particolare proveniente dall'Estremo Oriente e diretto ai porti del Nord Europa e del Nord America che già rientrano nelle aree di protezione ambientale cosiddette ECA (Emission Control Area) dove è imposto l'impiego di combustibile a basso tenore di zolfo: ovvero è previsto un sempre più intenso traffico nel Mediterraneo di navi alimentate da LNG, che hanno un'autonomia media di circa 400 miglia nautiche e che dunque richiedono stazioni di rifornimento nel viaggio verso le destinazioni finali.

La realizzazione delle infrastrutture per la distribuzione di LNG, finalizzate prioritariamente al trasporto marittimo, costituisce dunque un obiettivo "politico" europeo e insieme una grande opportunità per la diversificazione del business nella fornitura e distribuzione di prodotti energetici per i motori navali.