



6TH IEF IGU MINISTERIAL GAS FORUM

Session 2 Gas Demand Growth Beyond Power Generation

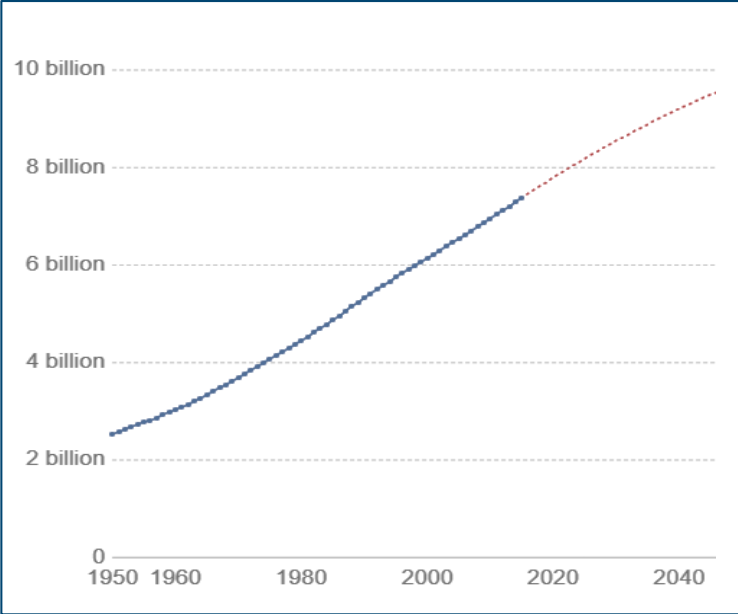
Barcelona 22nd November 2018

Robust growth in global energy demand

Energy demand growth drivers to 2040



Increase in population



Robust growth in global energy demand

Energy demand growth drivers to 2040



Increase in population

- **POPULATION:**
+25% in 2040, from 7,5 to 9 billion people
- **MIDDLE CLASS**
+66% in 2040, from 3 billion to 5 billion

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Energy demand growth drivers to 2040



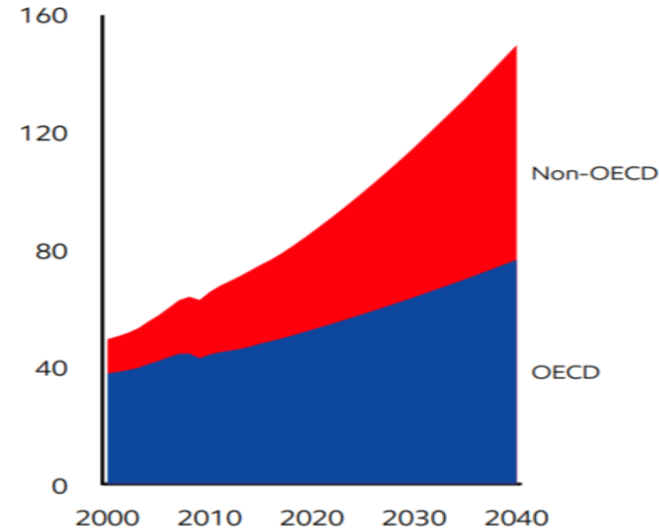
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Economic growth

Trillions of 2010 dollars



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Economic growth

- **WORLD GDP:**
x2 in 2040, CAGR 3,4%.

OECD 1,9% vs non-OECD 4,1%
- **CHINA:**
Growth equal to the sum of Europe and the US

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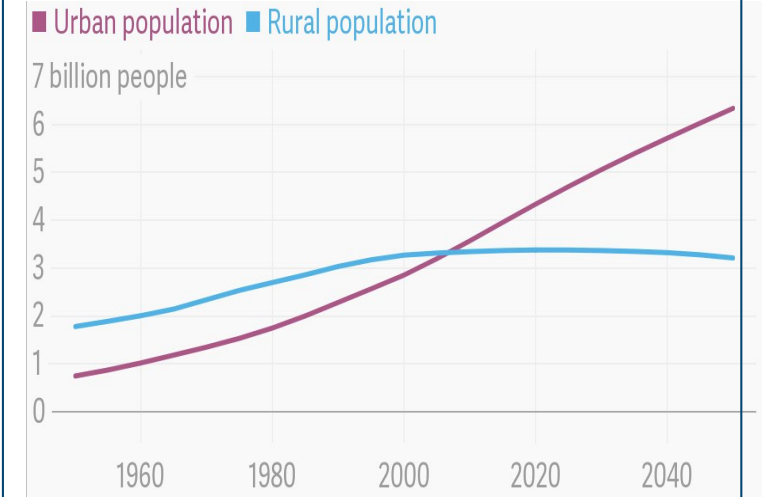
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Urbanization & IOT



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Urbanization & IOT

- **URBANIZATION:**
1,7 billion people will join urban population
63% of people lives in cities
- **IOT:**
>100 billion connected devices, from 20 billion nowadays

Robust growth in global energy demand

Energy demand growth drivers to 2040



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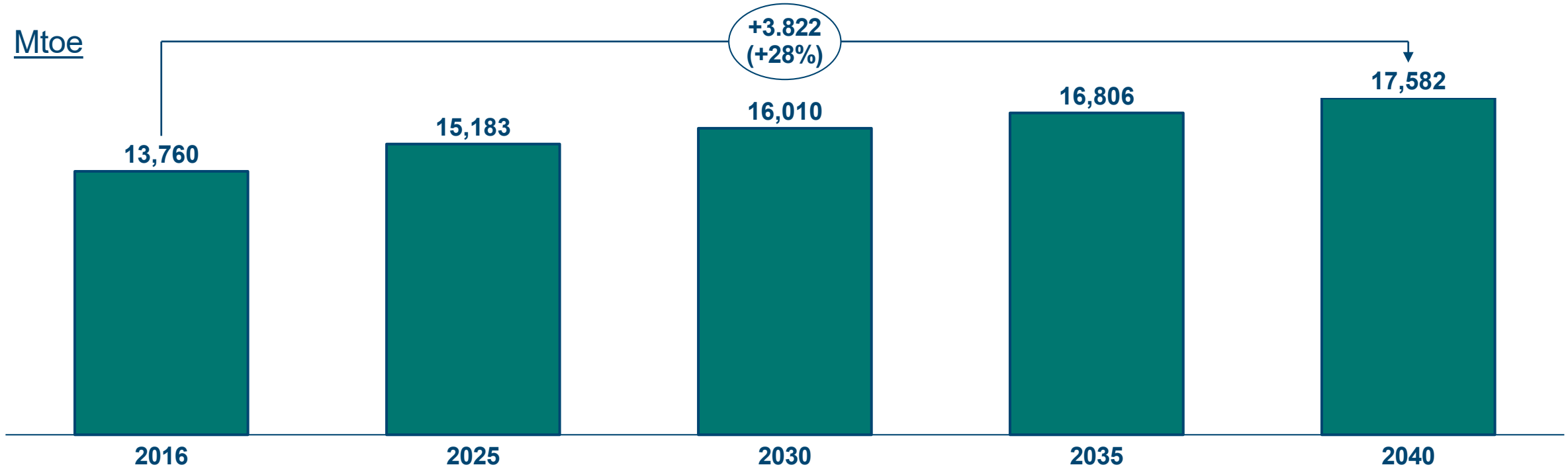


Economic growth



Urbanization & IOT

Mtoe



Robust growth in global energy demand

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Increase in population

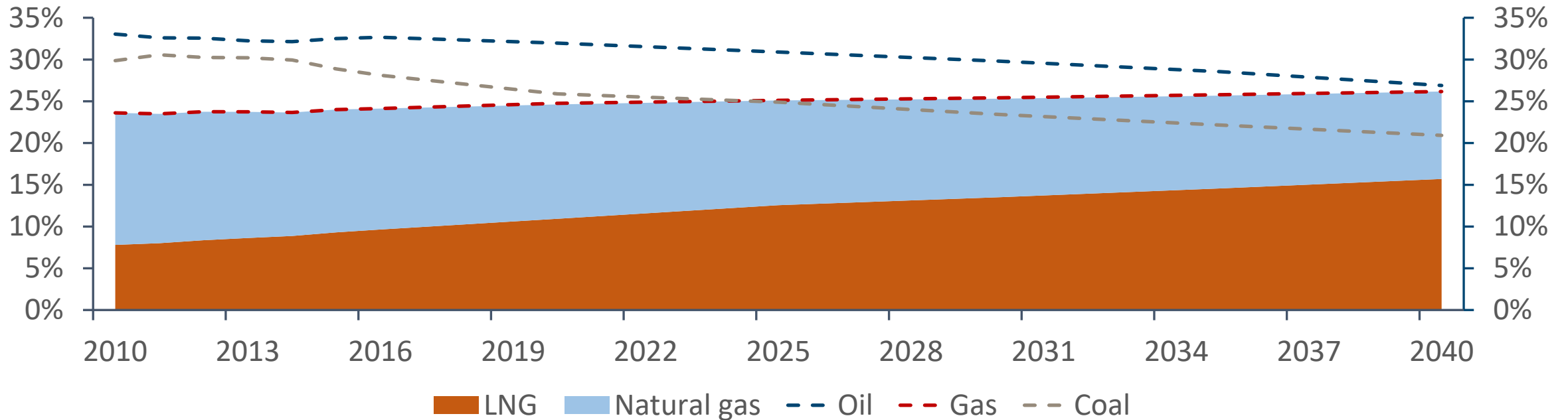


Economic growth



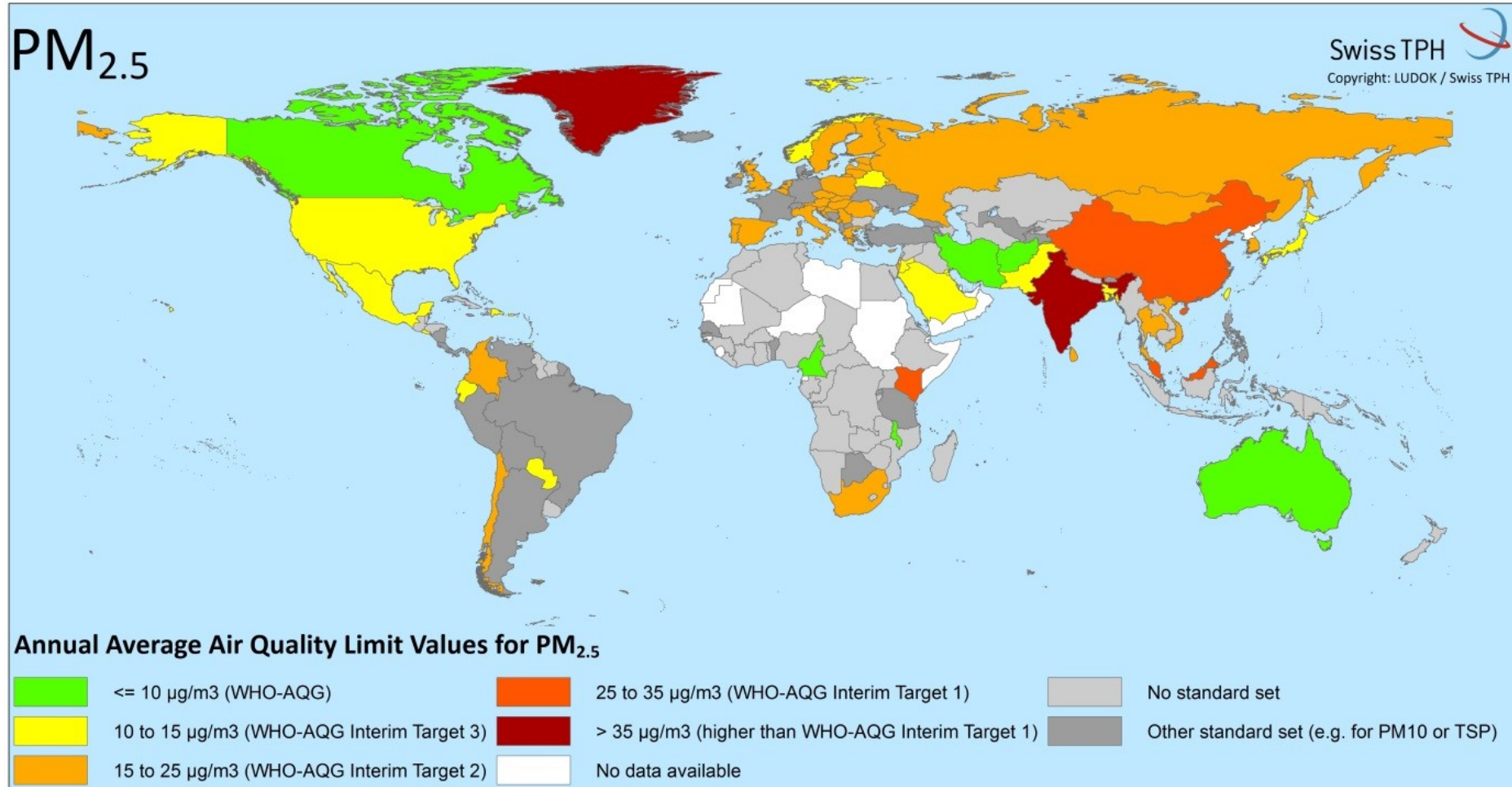
Urbanization & IOT

% Primary Energy 2040



Natural Gas, a clean option at hand

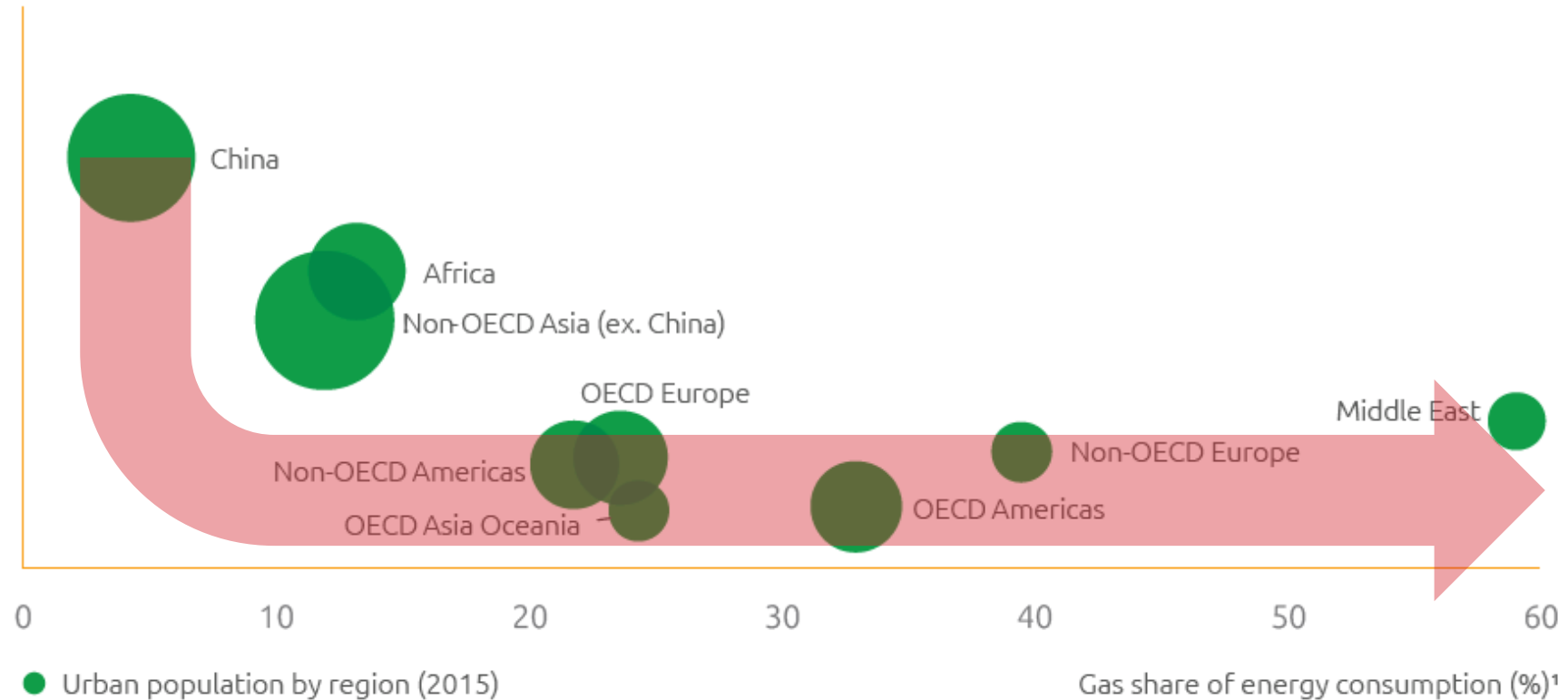
The response to the growing air pollution problem



Natural Gas, a clean option at hand

The response to the growing air pollution problem

Average urban PM 2.5 concentration ($\mu\text{g}/\text{m}^3$)²



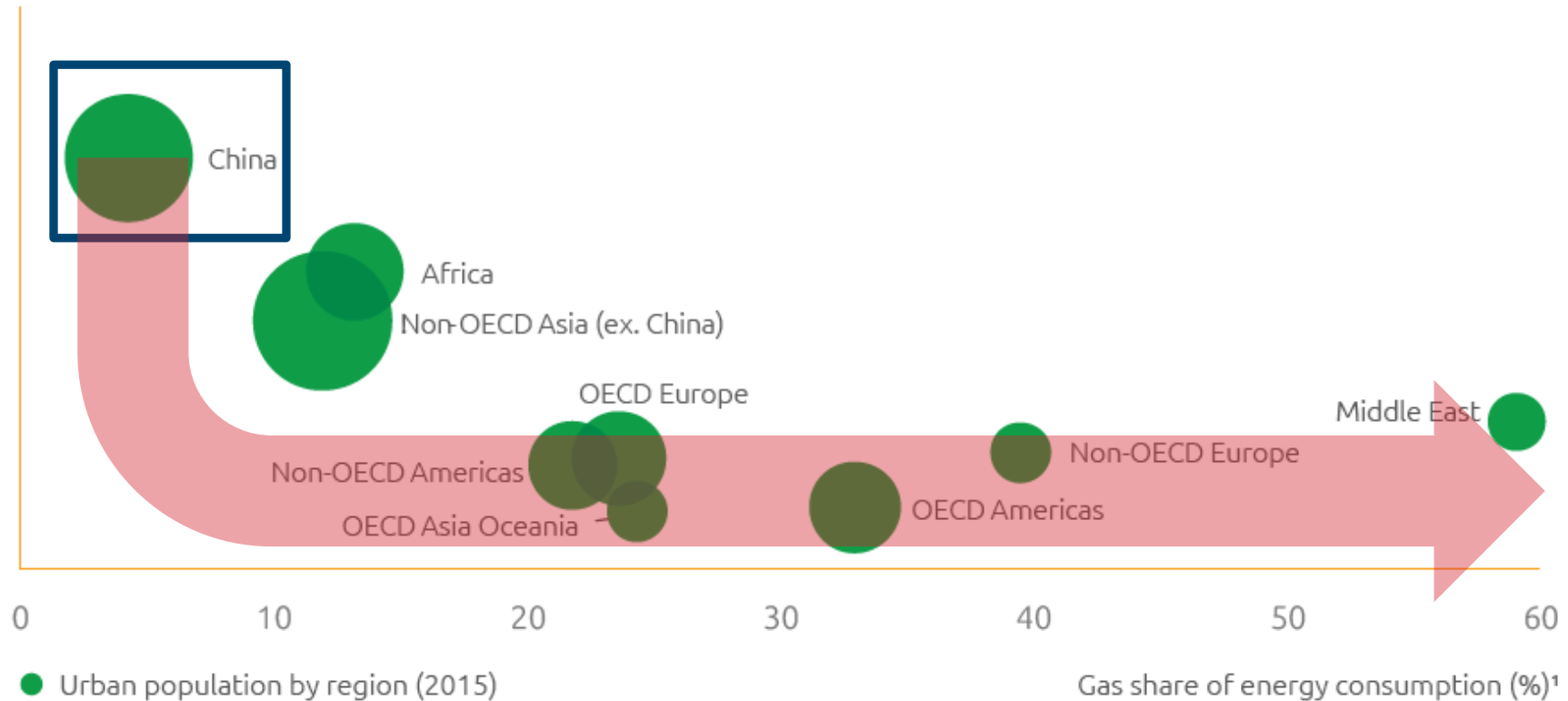
Source: Global gas report 2018

The use of gas is key to reduce urban pollution and a source of new demand

Natural Gas, a clean option at hand

The response to the growing air pollution problem

Average urban PM 2.5 concentration ($\mu\text{g}/\text{m}^3$)²



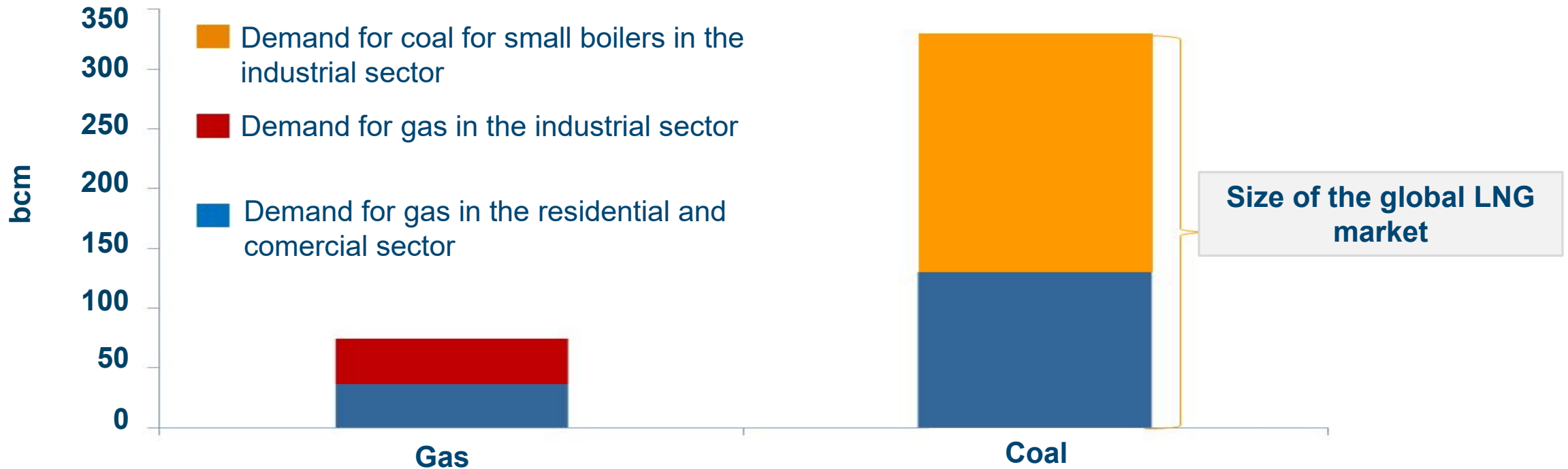
Source: Global gas report 2018

The use of gas is key to reduce urban pollution and a source of new demand

Natural Gas, a clean option at hand

China potential gas demand growth

Demand for fossil fuels in the industrial and domestic sector

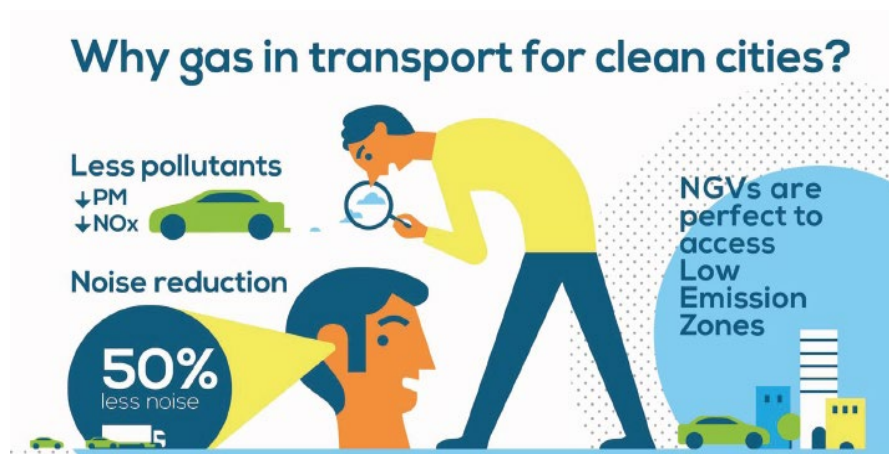


The potential for coal-to-gas switching is enormous

Natural Gas, a clean option at hand

Another source of gas demand growth

Transportation (1/2)



Source: NGVA Europe

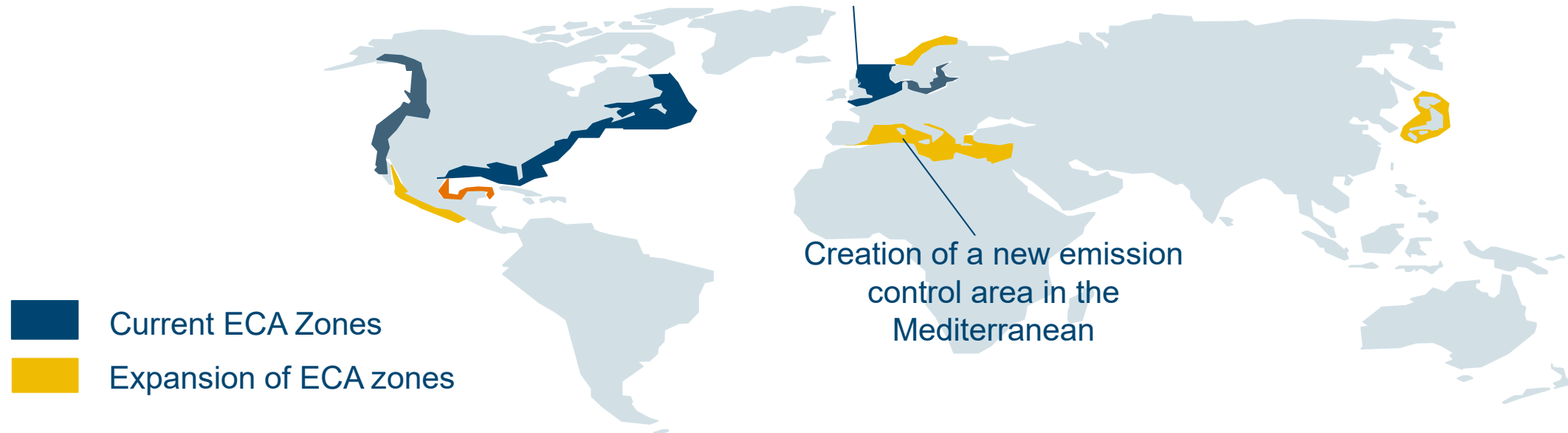
Gas in transport is a very good option to clean air in the cities

Natural Gas, a clean option at hand

Another source of gas demand growth

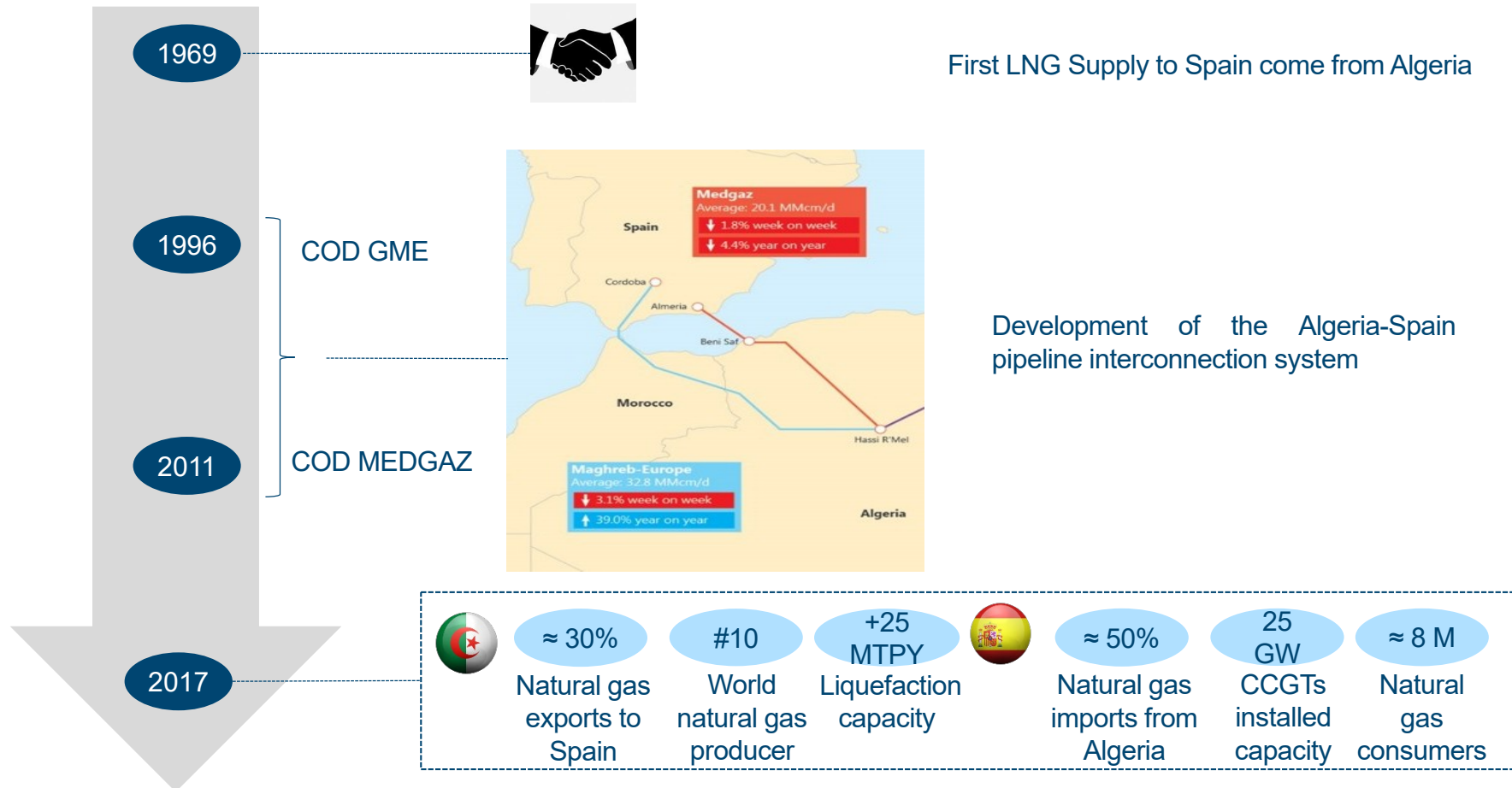
Transportation (2/2)

Includes Baltic Sea, North Sea and English Channel. Extension to the Norwegian Sea



LNG bunkering will also be key to reduce vessels emissions

Producers-consumers collaboration



First LNG Supply to Spain come from Algeria

Development of the Algeria-Spain pipeline interconnection system

Algeria-Spain long term collaboration is a clear example of successful partnership between producing and consuming countries

Naturgy's commitment to innovation in the value chain

Small Scale LNG Solutions

directlinkLNG



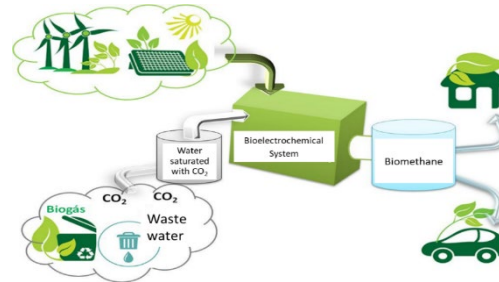
Project Description

Floating ship to shore LNG transfer system

- First floating cryogenic hose in the world.
- First LNG discharge to land through a floating terminal without fixed maritime infrastructure.

Power-2-Gas

Power2Biomethane



Project Description

Biogas upgrading converting the CO₂ and biogas into biomethane.

Main Milestones

- The integration of the gas and electricity grids could play a significant role in a future renewable energy scenario.
- Emerging technology with the potential to become a competitive option to produce renewable gas.

Biomethane

Edar Bens



Biogas plant and CNG system.

Main Milestones

- Capacity production equivalent to the annual consumption of 2.800 houses or 3.000 light duty vehicles.
- Pilot project for the feeding of municipal vehicles fleet from biogás.

Industry has been able to innovate and develop technology to boost accessibility, affordability and sustainability of natural gas



Thanks

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