

Energy transformation and challenges

Role of natural gas



Eugenides Foundation, Athens

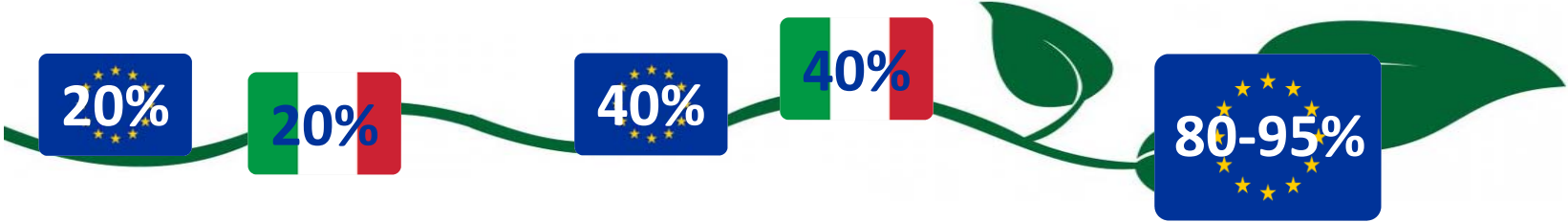
November 23rd, 2018

Nicola Battilana, Snam Representative for Greece and Balkans

The political debate on energy mix is evolving, Europe ahead and targeting a full decarbonisation by 2050



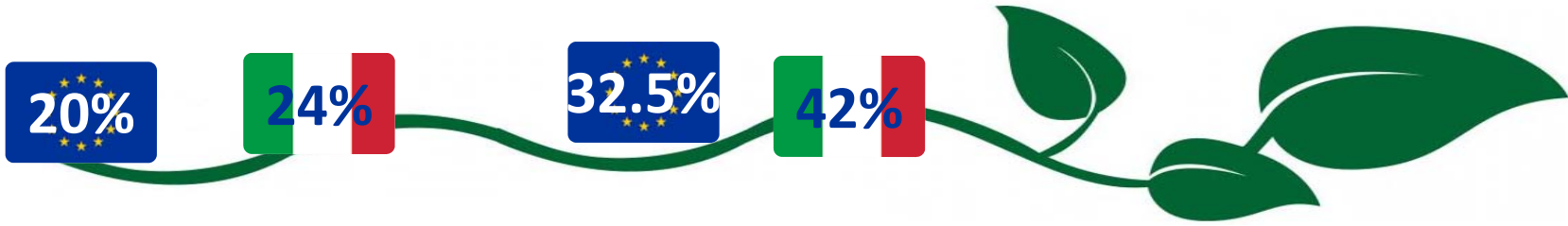
Emissions Reductions
compared to 1990 levels



Renewables sources binding penetration target



Energy efficiency objective
compared to baseline



Source: European commission

Gas is nowadays considered a core part of the solution with multiple potential uses



Cheap and immediately ready...



- **CNG vehicles** (compressed natural gas) as immediate available solution to reduce urban pollution



- **Small Scale LNG** (small-scale liquefied natural gas) as efficient and cheap solution to reduce emissions in the maritime sector and in heavy-duty transportation, replacing more polluting fuels



- **Biomethane** as CO₂ neutral renewable source, using existing infrastructures



- **Energy efficiency** for enterprises, public administrations and private buildings
- **Gas Heat Pumps (GHP)** aimed at increasing efficiency and promote the use of renewables in air conditioning



... with opportunity to further expand the scope



- **Power-to-gas** will close the loop to integrate renewable electricity into the gas grid and improve electricity grid flexibility



- **Hydrogen** could substitute methane in gas grids to fully decarbonize industries and heating sector
- **Hydrogen to methane** to reduce CO₂ footprint



- **Carbon Capture and Storage/Utilization**, pre and post combustion, would allow to use fossil natural gas with zero emissions and biomethane carbon negative

CNG has a key role to play in road transport, reducing pollution and emissions (28% of European Co2)



Widely available

1m natural gas vehicles in Italy today, 15 million in Europe by 2030



Fast charging

Unlike EVs, CNG cars can be charged in few minutes



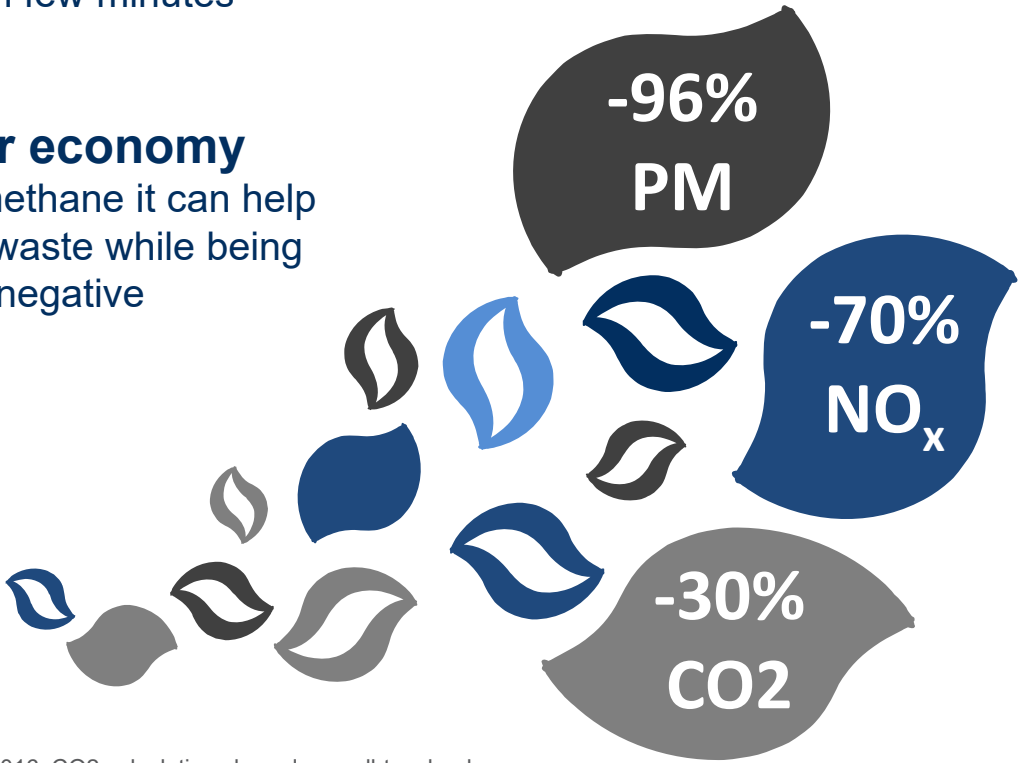
Economical

CNG cars cost half as much to run and pay back retrofit costs within two years



Circular economy

With biomethane it can help reducing waste while being emission negative



Sources: Snam; NOx and PM calculations are calculated based on emissions vs Euro 6, FCA-Iveco 2016; CO2 calculations based on well-to-wheel emissions of CNG vs Petrol by Thinkstep

as well as LNG in the maritime and heavy road transportation sectors



The number of orders of LNG or hybrid ferries is increasing ...



... as well as number of new LNG long haul trucks



Diesel trains and heavy duty vehicles are on their way...



A reliable, widespread and economically and environmentally sustainable network for LNG logistic must be created, able to cover both short terms needs and long terms development expectations

Poseidon MED II – LNG bunkering project and LNG Blue Corridors are good examples of cooperation

Renewable gas is a core energy resource for Europe



gasunie



FLUXYS



The Gas Wheel



~**122 bcm** of renewable gas (bio-methane and power to gas) bring to a yearly saving of 140 billion € for EU within 2050:

- Flexibility in the production of electricity for the balance of within day energy demand
- Avoiding the need to over dimension electricity production and transmission infrastructures, for balancing seasonal peaks of energy demand
- Industrial processes will still need natural gas

A key opportunity to reach the targets set by Paris Agreement, leveraging on the synergies between gas and electricity.

The synergies and complementarity of gas and electricity make a cost effective and sustainable decarbonisation possible...



Fully decarbonizing Europe's energy system by 2050 – including Zero Emission Gas in the mix would save 1.15 tn EUR compared to a All Electric scenario



Gas for Climate – Green Gas can help achieving Paris Agreement for Europe with 120 bcm and an annual saving of 140 bln EUR (14% of the total system costs to decarbonize the EU energy by 2050 with “electricity only” system)



The indispensable role of gas infrastructures in the German energy transition – The savings on German energy infrastructures could reach about 12 bln EUR per year by 2050 achieving with a system using gas and electricity



A perspective on the potential role of biogas in smart energy grids gives a perspective on the potential role of biogas, power to gas and biomethane in meeting fluctuating demand for electricity integrated in smart grids

Global Gas Report - Gas is a clean, abundant, flexible and cost-effective fuel – The growth of global gas consumption, consequence of all these benefits, must be sustained by important investments and adequate policies to enable him to play its full role in decarbonisation

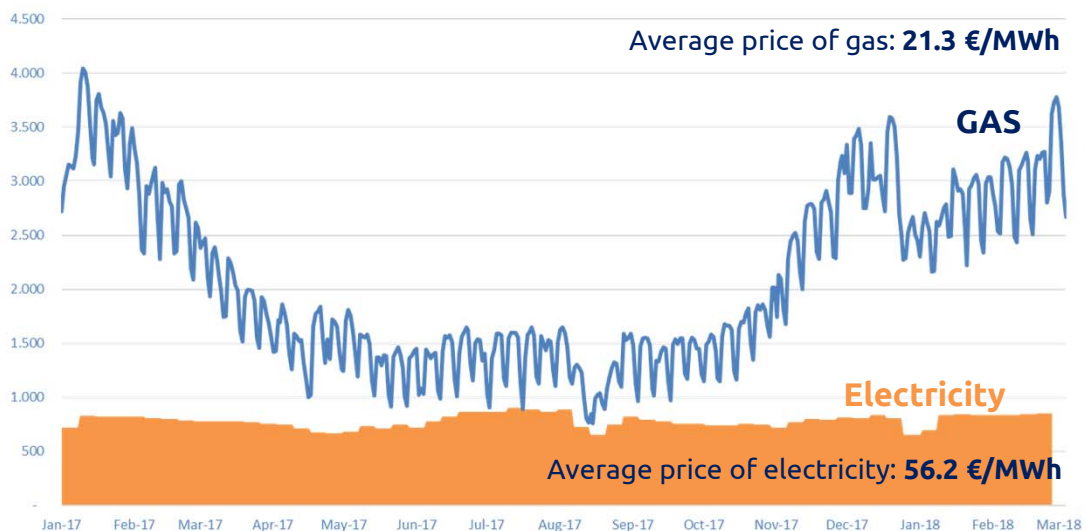


Making the energy transition happen – Fuel switch from coal and oil to gas would exceed EU 2030 GHG reduction target by 5% and innovative gas solutions enable higher share of renewable energy, providing optionality to meet 2050 targets

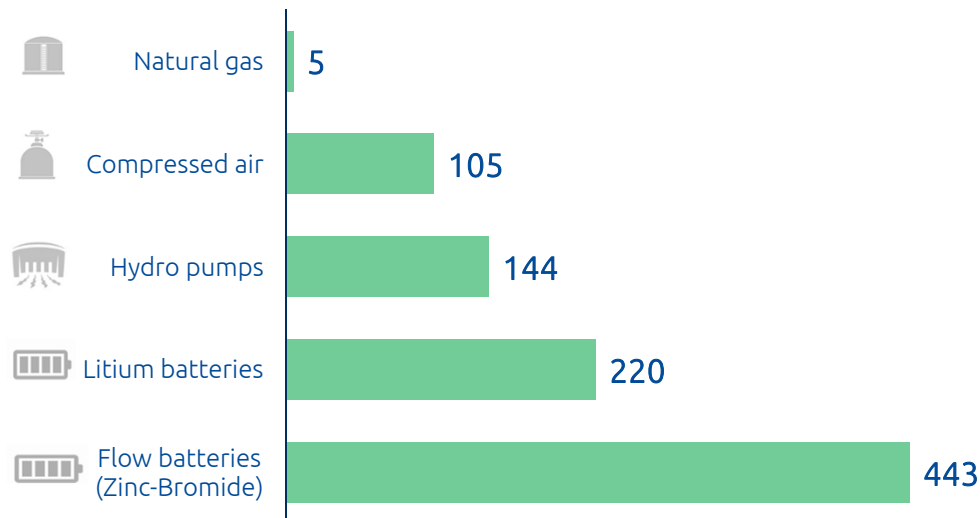
Natural and renewable gas are the most economical and reliable solution for energy storage and daily modulation of RES productions



Daily peaks of gas vs electricity demand (GWh) in Italy



Cost of storage €/MWh



Key roles of gas in energy storage

Matching seasonal demand and supply
Facing high season variations of energy demand with summer injection and winter withdrawal of gas in existing underground storage facilities

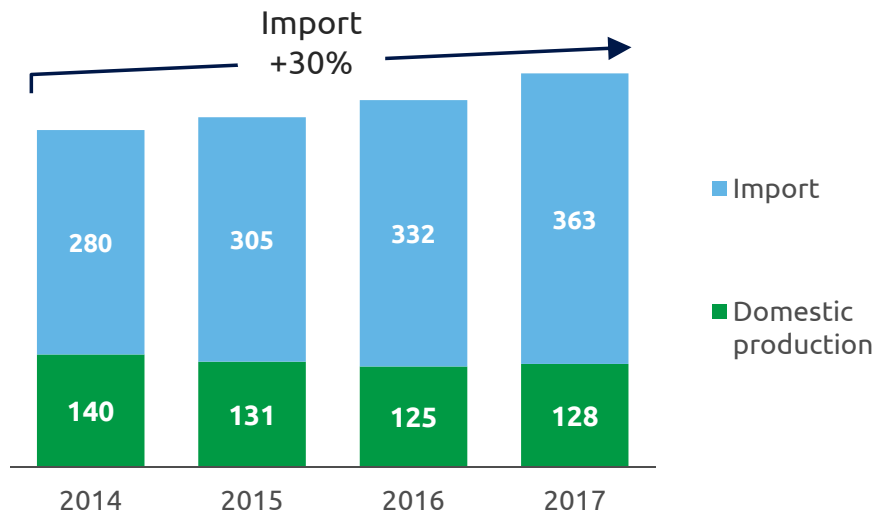
Short term flexibility
Ensuring within day flexibility to face consumptions peaks and production variations

Managing price variations
Enabling storage of gas bought at a lower price to be used when prices are higher

EU gas consumption increasingly influenced by policies



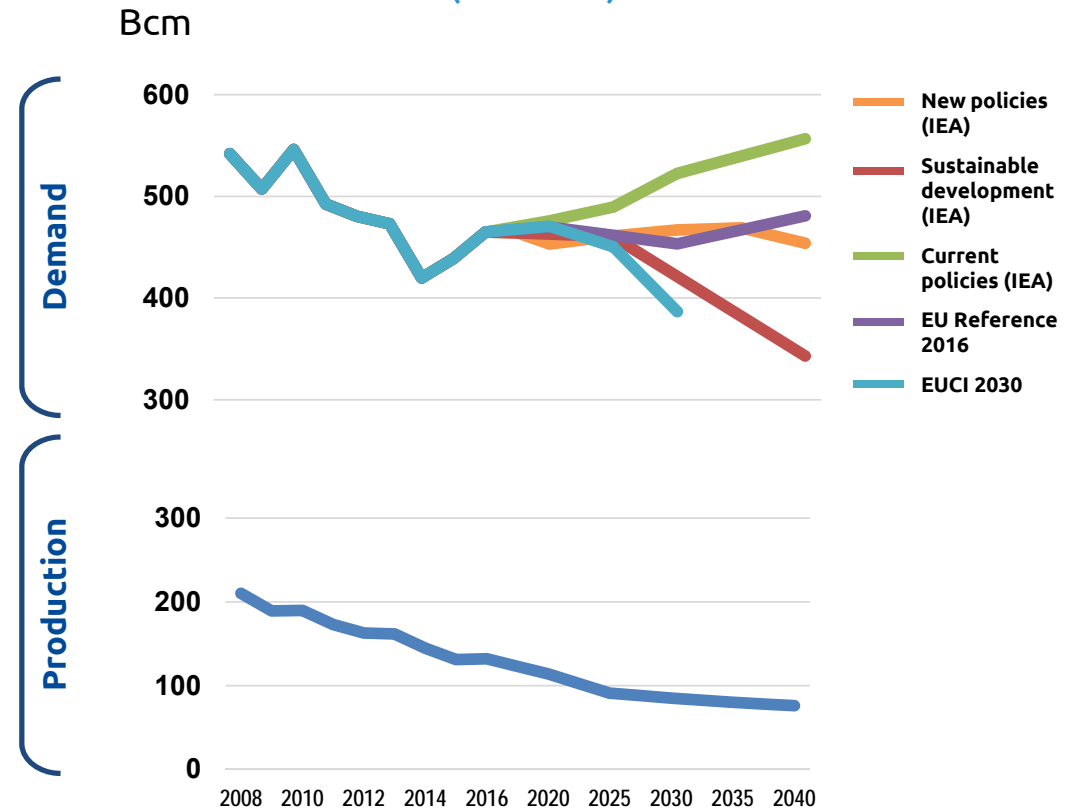
EU28 Natural Gas demand (YoY)



Gas demand is mainly driven by:

- Power: French nuclear outages & low hydro production
- Residential: severe temperature in winter
- Industrial: growing industrial demand (+3.3% YoY)
- Commodity prices: Coal to gas switch in UK & NW Europe

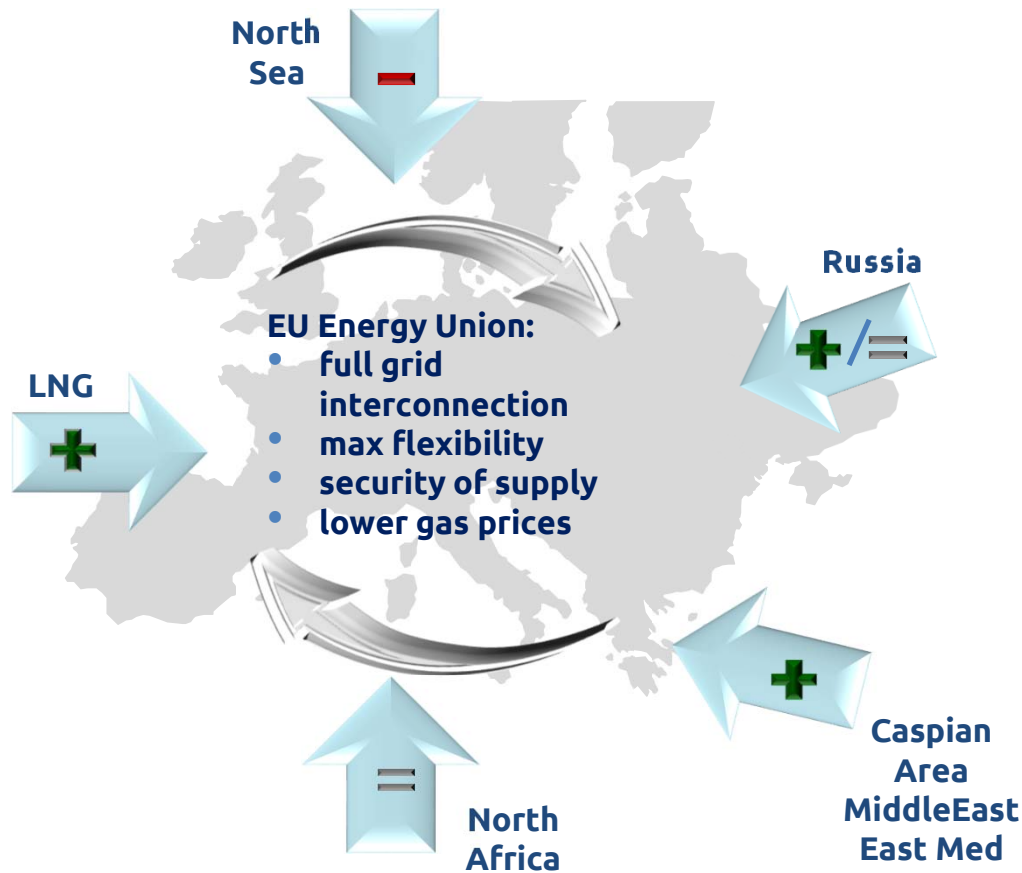
EU28 Natural gas demand evolution (to 2040)



In Europe, the energy union is under construction



Diversified and growing import sources



for an energy union where gas infrastructures play a crucial role

