

Air Quality and Natural Gas

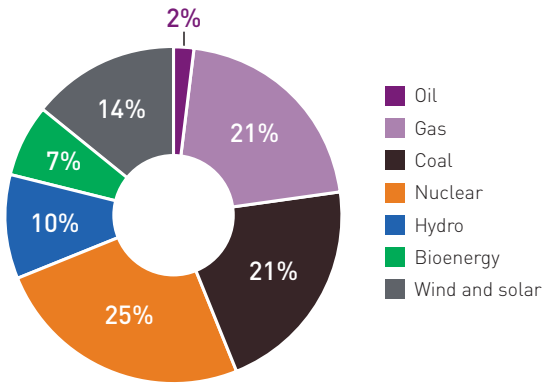
Cleaner Air for Europe



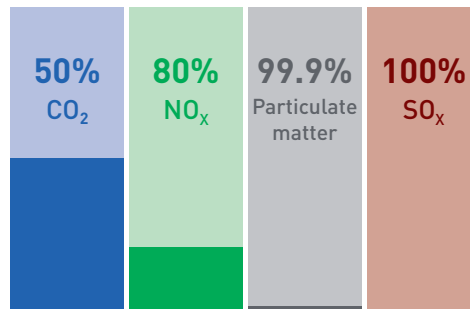
Power Generation



EU Electricity Generation by fuel, 2017 ⁽¹⁾



Natural gas can reduce emissions from power generation by ⁽²⁾



A gas fired CCGT emits 350 kg CO₂/MWh⁽³⁾ ...which is **70% fewer CO₂ emissions** than coal

...compared to coal

Competitive technologies ensure natural gas for power generation is the most **EFFICIENT** and **FLEXIBLE** fuel

Coal-fired power plant



Energy efficiency rate:

33-45% ⁽³⁾

Combined Cycle Gas Turbine (CCGT)



Energy efficiency rate:

up to 60% ⁽³⁾

About air quality and emissions ⁽⁴⁾

Pollution/Emissions Sources

Environment/Health Effects

CARBON DIOXIDE



Combustion of fuels such as coal, oil, natural gas and biomass for industrial, domestic and transport purposes.

CO₂ is the most significant greenhouse gas influencing climate change.

NITROGEN OXIDE

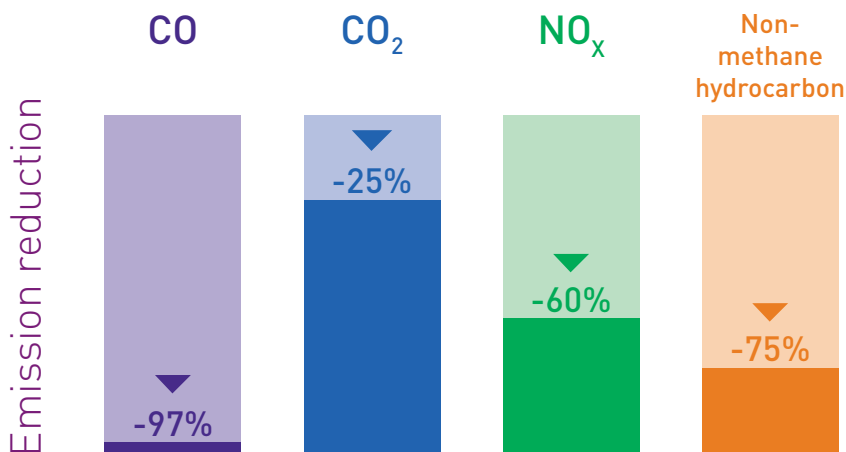


Transport



Natural gas is well suited for use in fleet vehicles in urban environments, increasing energy efficiency while reducing emissions. Opportunities also exist for the use of liquefied natural gas (LNG) for heavy duty trucks and in shipping.

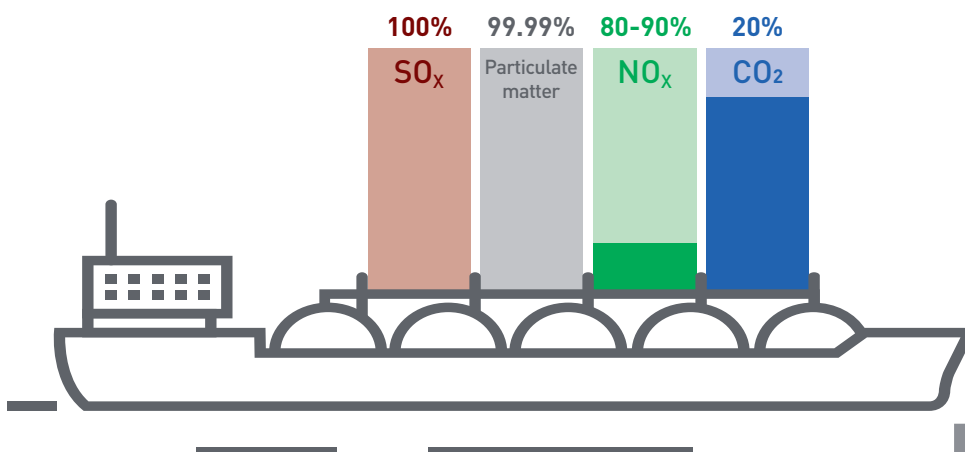
Compressed Natural Gas (CNG) vehicles reduce emissions by up to: ^(5,6)



CNG could increasingly be used in urban fleets of buses, utility trucks and taxis.



Liquefied Natural Gas (LNG) is an alternative shipping fuel of choice, reducing emissions by up to ⁽⁷⁾



Developing LNG refueling infrastructure for vessels in all ports will help

improve air quality and pave the way to **lower CO₂ emissions**

Fuel combustion, such as from power plants, industrial facilities & transport.

Acidification and eutrophication of water and soils. Formation of particulate matter and ground-level ozone. Adverse effects on human respiratory systems.

(SO₂)
SULPHUR DIOXIDE

Fuel combustion of fuels containing sulphur.

Acidification of local environments.

(PM)
PARTICULATE MATTER

Industry, shipping, coal combustion, wood combustion, etc.

Can cause or aggravate cardiovascular and lung disease.

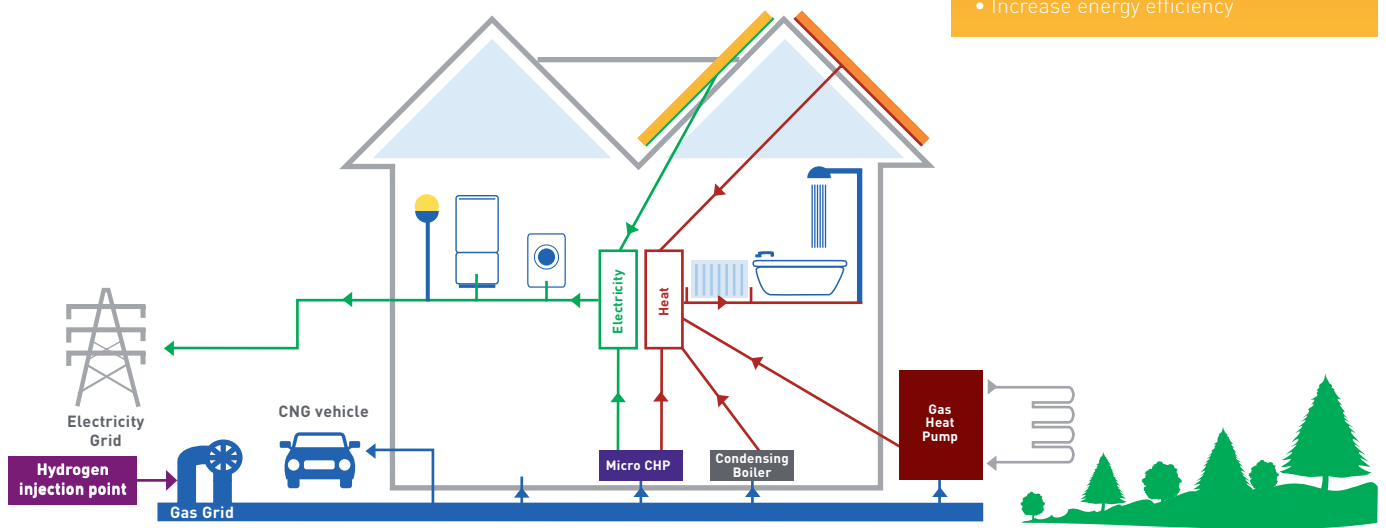


New Technologies

New technologies are making gas use in households more **energy efficient** and less polluting

Solar Energy Systems

- Use solar energy to generate power through photovoltaics
- Harness energy for thermal heat through solar thermal collectors
- Increase energy efficiency



Hydrogen blending

- Hydrogen is a zero-carbon energy carrier which emits only water when burned
- A hydrogen content of up to 20% can safely be blended into the gas grid
- 20% hydrogen in the EU gas grid would reduce current CO₂ emissions by 60 Mt ^[8]

Gas Heat Pumps

- Use conventional refrigeration technology to extract the sun's energy stored in the environment and raise it to a temperature suitable for heating purposes
- Are more efficient than electric heat pumps

REFERENCES

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