



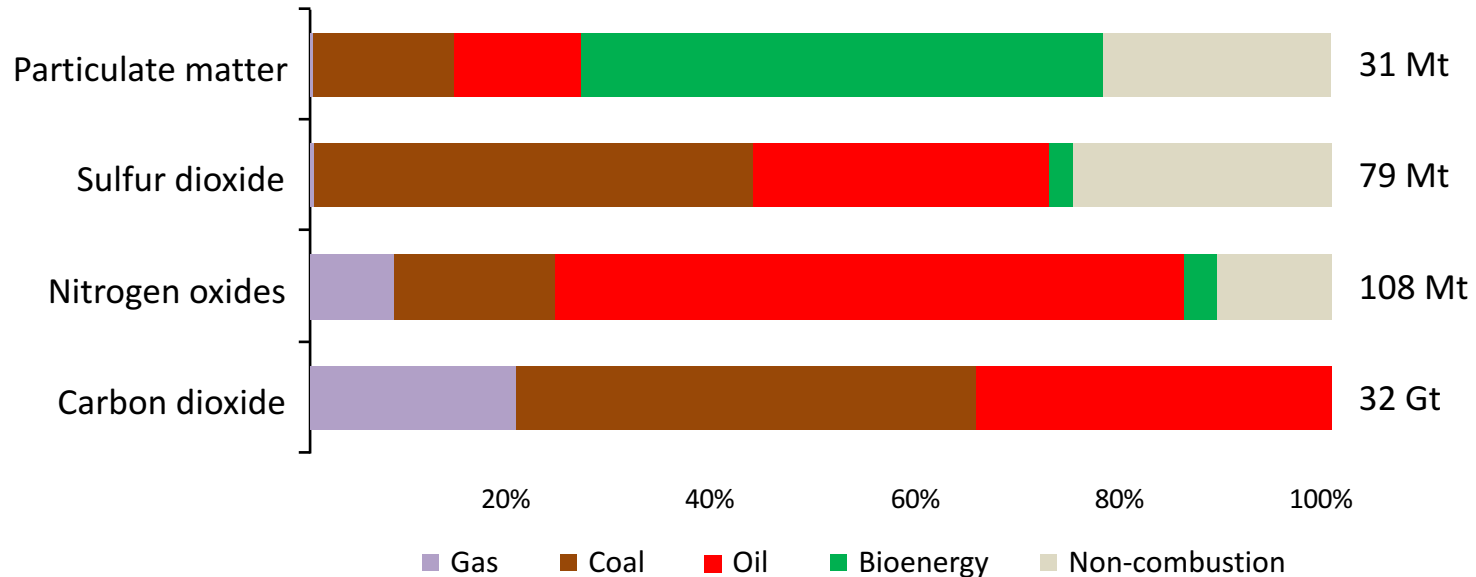
World Energy Outlook 2017

Dr Christophe McGlade
24th Meeting of the EU-Russia Gas Advisory Council
Vienna, 1 December 2017

- WEO focus on natural gas highlights four factors that will be pivotal for the future role of gas in the global energy mix:
 - **Competitiveness** in a world of relatively cheap coal & ever-cheaper solar & wind
 - How a **new global gas order**, spurred by LNG, reshapes trade, investment & gas security
 - The **position of gas in policies & strategies**, notably in developing countries in Asia
 - Perceptions & reality of the **environmental case** for gas
- On the latter, broad consensus over combustion emissions of gas: but significant uncertainty over methane emissions from oil and gas operations
- Aim of the analysis in *WEO-2017* was to investigate the sources of these emissions and explore what actions can be taken

Combustion emissions from gas are low

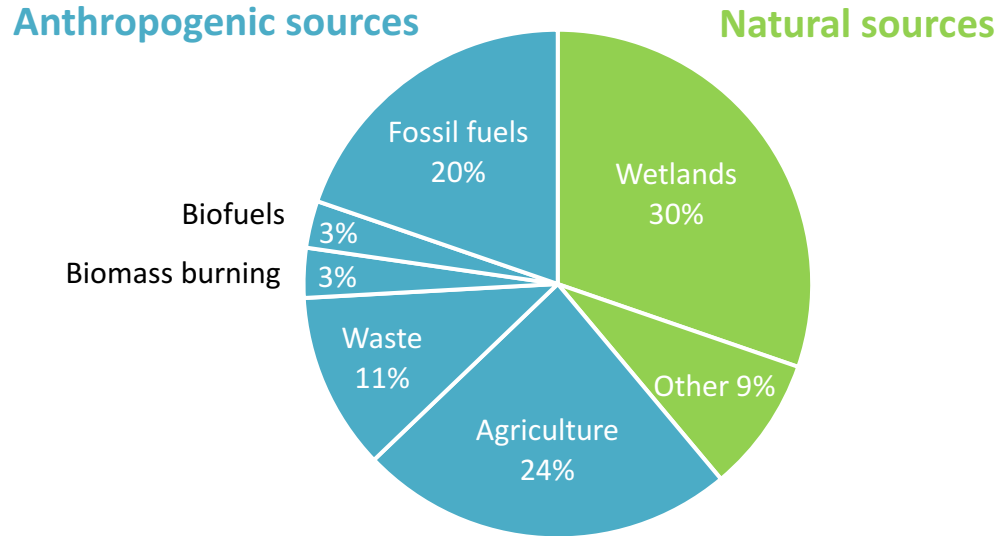
Share of gas in total energy-related emissions of air pollutants and CO₂, 2015



Compared with other sources, natural gas makes only a minor contribution towards today's combustion-related emissions

The energy sector is responsible for a quarter of annual methane emissions

Sources of methane emissions, 2012

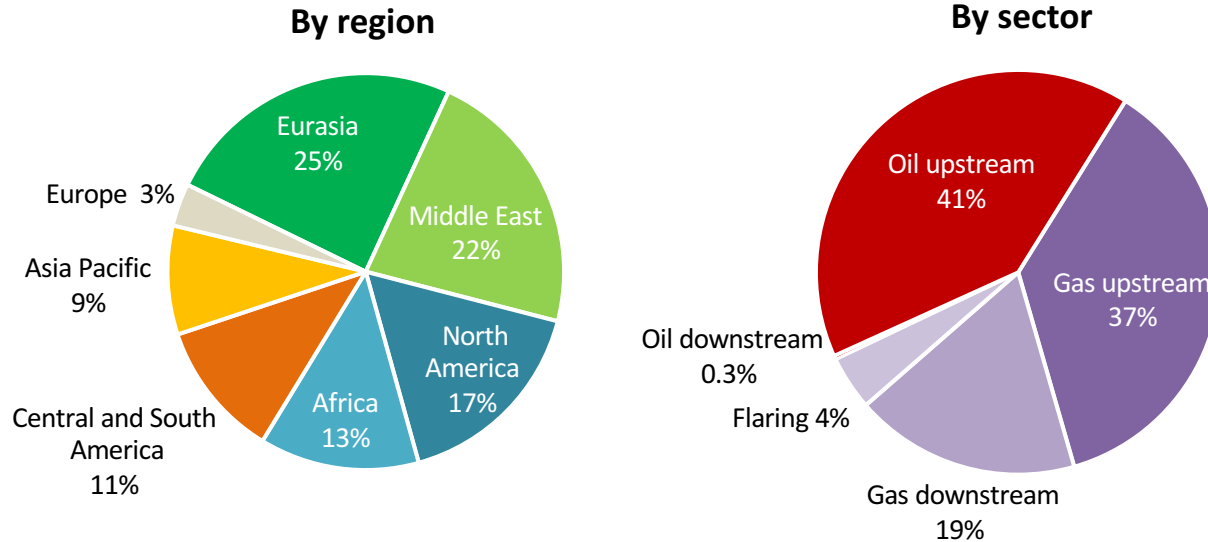


Source: Saunio et al. (2016)

Attributing methane emissions to specific sources is difficult, but human activity is likely to be responsible for the majority of the 570 Mt emissions in 2012

Emissions come from a wide variety of sources along the oil and gas value chains

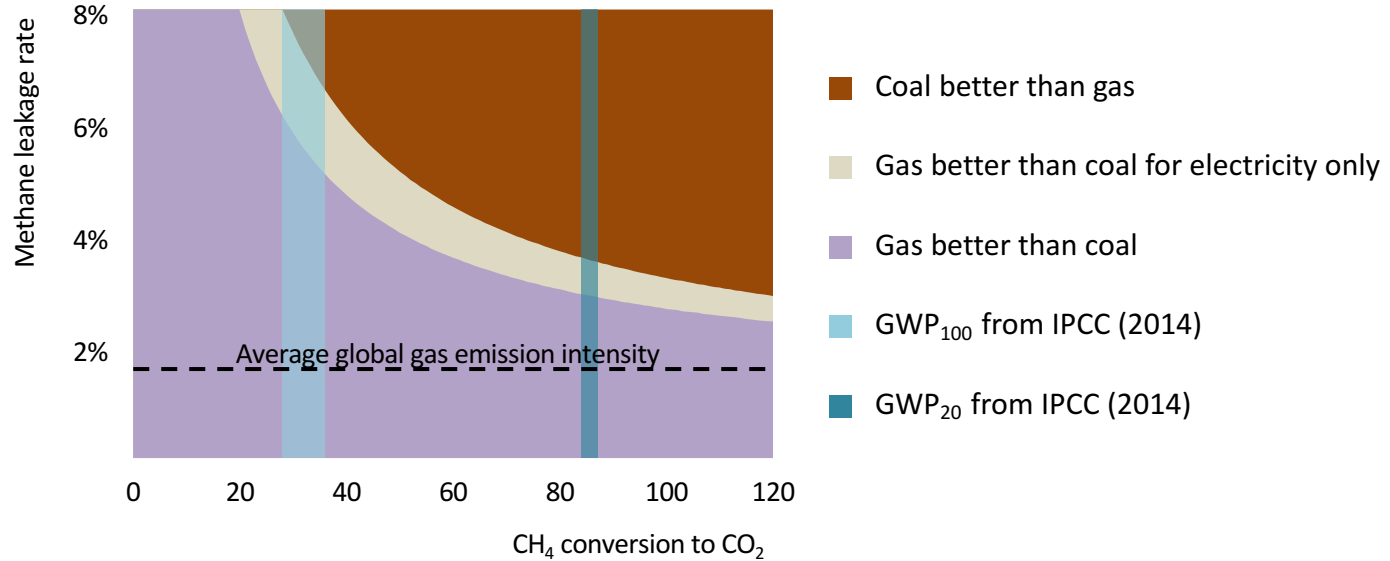
Regional and sectoral breakdown of methane from oil and gas operations, 2015



Natural gas operations account for around 55% of our estimated 76 Mt methane emissions in 2015, with Eurasia and the Middle East the largest emitting regions

The lifecycle emissions of gas are lower than coal

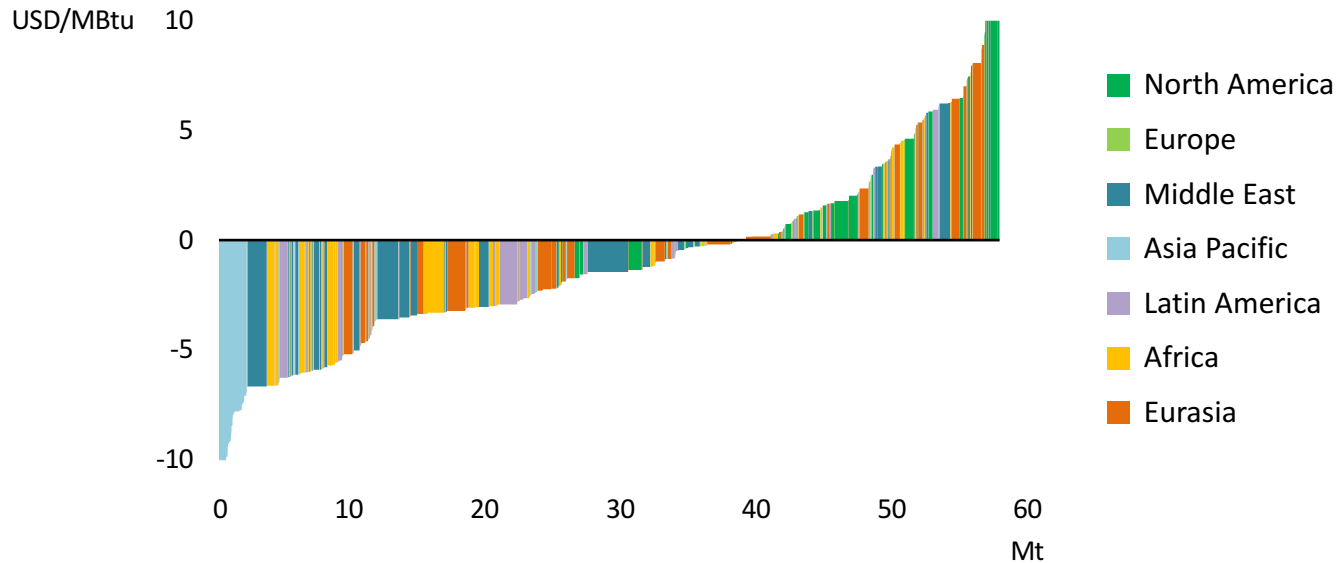
Greenhouse-gas emission intensity of natural gas compared with coal



The global average emission intensity of gas is low enough for gas to result in fewer GHG emissions than coal regardless of the timeframe considered

Three quarters of current oil and gas methane emissions are technically avoidable

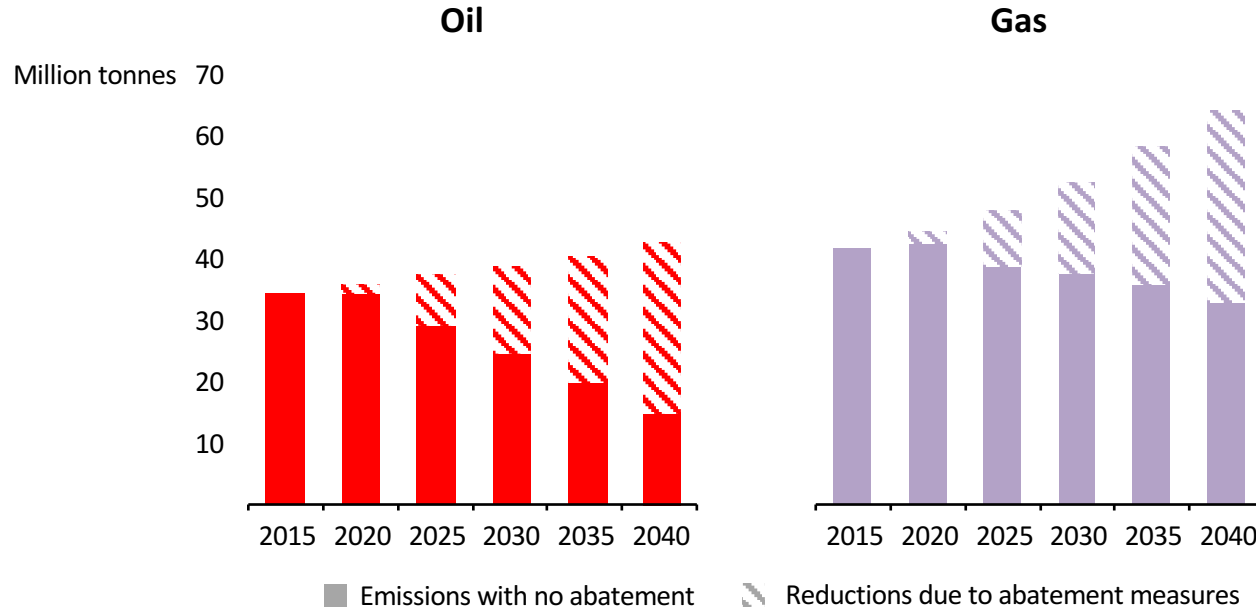
Global marginal abatement cost curve for oil and gas methane emissions, 2015



It is technically possible to reduce the 76 Mt current oil and gas emissions by 58 Mt; half (38 Mt) can be avoided using approaches with positive net present values

Just implementing measures with no net cost would yield huge benefits for the climate

Methane emissions in the New Policies Scenario with and without abatement measures



Implementing measures with positive net present values reduces methane emissions to around 50 Mt in 2040, 55% lower than they would have been otherwise

- Methane emissions along the value chain threaten some of the emissions advantages natural gas holds over the other fossil fuels
- On average, gas generates far fewer GHG emissions than coal when generating heat or electricity regardless of the timeframe considered
- Over 75% of the current 76 Mt emissions can be technically avoided; around 40-50% can be mitigated at no net cost
- These measures would have the same impact on climate change as immediately shutting all existing coal-fired power plants in China
- Achieving these reductions means stepping up the level of ambition; few countries have specific mitigation frameworks in place



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