16. Gas

What role can gas play through the energy transition?

Key messages

- **Natural gas has a key role to play in getting the world to net zero - now and for decades to come - complementing renewable energy sources, reducing emissions and providing better air quality.**
    - Switching from coal to gas in the power sector can cut emissions rapidly, dramatically and affordably.
    - Gas can support the increased penetration of renewables in the power sector, including providing for large scale seasonal storage.
    - Gas offers an alternative route to decarbonization for hard-to-abate industrial and transport sectors.
- **In the longer term, the real emissions benchmark for gas is net zero, so developing decarbonized gases will be critical.**
- **Tackling methane emissions is vital if gas is to play its fullest role in the transition.**
    - Further information on tackling methane and our Aim 4 is in the Methane and flaring position.
- **The contribution of gas to a net zero world and the pace at which it can be decarbonised will vary regionally.**

Additional talking points

- **Coal-to-gas switching**
    - Taking into account both CO_2 and methane, on average, coal-to-gas switching reduces lifecycle GHG emissions by about 50% when producing electricity and by about 33% when providing heat.[3].
    - Since 2010, coal-to-gas switching has delivered important global savings of carbon emissions – equivalent to an extra 200 million electric vehicles running on renewable power[1].
    - Gas has also contributed to improvements in local air quality.
- **Support the increased penetration of renewables**
    - Flexible gas generation will play an increasingly important role in supporting growing demand for power and the variability of renewable power generation – managing intermittency, providing for seasonal storage and in some cases reducing the overall cost of electricity.
- **Hard-to-abate sectors**
    - Natural gas provides a lower carbon and cleaner alternative to coal and oil in industrial manufacturing processes such as textiles, ceramics, glass, cement, aluminium and steel.

[3] IEA report – The Role of gas in today's energy transitions

- It also offers an additional route to decarbonise transport – particularly suited to applications such as heavy goods vehicles or ships where electrification is difficult.
- As a transport fuel, gas also offers environmental benefits as it emits virtually no nitrogen oxides, particulate matter, or sulphur oxides

- **The production, supply and use of natural gas must be decarbonised as fully and quickly as is practical to meet the Paris climate goals.**
  - Natural gas can be a source of near-zero carbon energy when combined with carbon capture use and storage (CCUS), either as a direct source of energy to the power and industrial sectors or to produce blue hydrogen. See Hydrogen and CCUS positions.
  - Renewable gas – biogas/biomethane created from biomass, including organic wastes – has an increasingly important contribution to make.
  - Existing gas infrastructure can enhance the timely shift to decarbonized and renewable gases as it can in some cases be repurposed at a relatively low cost – for example, to transport blue or green hydrogen.
  - New gas infrastructure and equipment should be CCUS or hydrogen-compatible or ready to avoid lock-in of unabated gas.
- **Our new Gas & Low Carbon Energy business group brings together energies that complement one another.**
  - This combination can address intermittency by presenting a single face to power markets.
  - The combination of renewables and gas can also help find solutions for hard-to-abate sectors and provide a basis for the development of hydrogen – whether blue (from gas) or green (from renewables).
- **The contribution of gas to a net zero world and the pace at which it can be decarbonised will vary regionally.**
  - This depends on the local cost and availability of natural gas resources relative to the cost and availability of alternative resources in that region – and on its stage of economic development, and economic, population and demand growth rates.

Further information

- **Key points from the 2020 Energy Outlook Rapid Transition (RT) scenario**
  - Natural gas demand grows fairly robustly out to 2035 driven primarily by economies in developing Asia and peaking at 4600bcm. Demand then falls away so that global gas demand in 2050 is around 4000bcm – its approximate level in 2018.
  - The pattern of gas demand differs significantly across the EO scenarios. The main area of growth out to 2050 is hydrogen production, with buildings experiencing the largest fall.
  - Consumption declines in the US and EU due to a reduction in primary energy demand and a decline in the overall share in the energy mix.
  - In both RT and net zero (NZ) scenarios, China's consumption strongly increases despite a relatively limited increase in overall energy demand. The share of gas in the energy mix doubles as a result of the displacement of coal.
  - Also, in both RT and NZ, India's demand increases strongly - driven by gas's share in the primary energy mix expanding at the expense of coal.

- The main areas of increasing gas production are China and Africa supported by rising domestic consumption. US and Middle East production by 2050 are largely unchanged from 2018 levels with marked falls in domestic demand offset by

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short and long term.

- **Market support for decarbonized gas**
  - Purchasers of natural gas are starting to place a premium on verified "low emissions" intensity supply, using third-party verification and certification.
  - In 2018, New Jersey was the first US state to purchase certified "responsibly sourced" gas from Southwestern Energy at a premium.
- **Decarbonised gas in transport**
  - Decarbonised gas offers an additional route to decarbonize transport – building the infrastructure to power certain hard-to-abate transport applications and markets with natural gas. It can create a route to decarbonise by allowing the substitution of biogas into the fuel.
  - This infrastructure can also enable use of natural gas in applications such as heavy goods vehicles or marine use where electrification is difficult, or in markets with existing gas refuelling infrastructure.
- **Biomethane and biogas**
  - Biogas is estimated to result in at least two thirds lower greenhouse gas emissions than from equivalent gasoline or diesel-fuelled vehicles, depending on the biomass material used for generation and extent of methane slip.
  - Biogas can have the potential to be a negative emission energy source if it is derived from captured methane that otherwise would have been released into the atmosphere.
  - Biomethane can be used as a direct substitute for natural gas across all sectors of the economy driving emissions reductions even further.
  - According to an IEA analysis in 2018[4], full utilisation of the available sustainable feedstocks could cover some 20% of today's worldwide gas demand.
  - Biomethane could help decarbonize industry and transport.
  - Depending on the digestible biomass of the used feedstock, typical overall efficiency of the biogas supply as fuel is between 70% and 85%.

[4] https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth

- Due to the additional cost of biogas and biomethane compared to natural gas and other fossil fuels, support policies are key to increase biogas and biomethane production and use.
- In the transport sector, we continue our support for sector-specific targets to ensure demand for biogas/biomethane as well as refuelling infrastructure.

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See also positions on: CCUS, Hydrogen, Methane and flaring, Our purpose and ambition. The gas narrative is in the bp positions' supporting information folder in the S&S stakeholder Teams.
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