# Issues Management Working Group
# 27 June 2018

## Pre-read

Agenda Item 1: Context, Agenda, Minutes

Members of the Issues Management Working Group

IMWG agenda and pre-read for 27 June 2018

At this meeting, we will:

- Agree a new position on:
  - Fossil fuel subsidies

- Discuss and agree revised positions on:
  - Role of gas
  - Methane emissions from the oil and gas sector

- Review information notes on:
  - GHG emissions performance standards
  - Role of oil

- Review the IMWG forward agenda.

I look forward to our discussions on 27 June.

Dev Sanyal
15 June 2018

BP p.l.c.
ISSUES MANAGEMENT WORKING GROUP MEETING
Wednesday 27 June 2018
SJS 4.53 Caspian 14.00-17.00pm, St James's Square London

AGENDA

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|---|---|---|---|
| 14.00 | 1 | Context<br>• To confirm minutes from the March 2018 meeting and review actions*<br>• To confirm objectives for today's meeting<br>• To highlight key activities in current context | Dev Sanyal |
| 14.10 | 2 | Fossil fuel subsidies* (position review)<br>• To discuss and agree a position<br>• To review audiences for this position | Spencer Dale |
| 14.30 | 3 | GHG Emissions performance standards* (information note)<br>• To review and discuss a note on EPS<br>• To decide what position to take | Paul Jefferiss |
| 15.10 | 4 | Role of gas* (position review)<br>• To note current context and changes since position was last agreed<br>• To discuss and agree a position<br>• To review audiences for this position | Dominic Emery |
| 15.45 | 5 | Methane emissions from the oil and gas sector* (position review)<br>• To note current context and changes since position was last agreed<br>• To discuss and agree a position<br>• To review audiences for this position | Eamonn Naughton |
| 16.20 | 6 | Role of oil* (information note)<br>• To review a note on role of oil<br>• To decide if further information or a position is needed | Spencer Dale |
| 16.50 | 7 | IMWG process*<br>• To review the forward agenda | Antony Andrews |
| 16.55 | 8 | AOB and date of next meeting | Dev Sanyal |

* Papers attached

Dial in details are as follows:

UK Freephone Dial-In Number: [redacted]
Conference code: 3824491608

UK Local Call Dial-In Number: [redacted]
STD International Dial-In Numb
United States: [redacted]

Issues Management Working Group

IMWG Meeting Notes – 13 March 2018
Caspian 4.53
14.00 – 17.00

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| Attendees: | Dev Sanyal (chair), Antony Andrews, Richard Bridge, Dominic Emery, David Eyton, Paul Jefferiss, Peter Mather, Geoff Morrell, Mike Nash<br>By phone: Gordon Birrell, Spencer Dale, John Mingé, Bob Stout |
| Guests: | Mark Finley (by phone), Liz Rogers |
| Apologies: | Richard Harding, Edlyn Moy, Eamonn Naughton |

Context

- The Energy Outlook continues to attract significant interest, particularly the section on advanced mobility. The Technology Outlook will provide further opportunity for BP to inform and engage the debate on the future of energy.
- The forthcoming sustainability and energy transition reports will reflect more proactive positioning and are expected to have a significant impact.
- The importance of good and appropriate disclosure was highlighted, with particular reference to the recommendations of the Financial Stability Board's Task Force on Climate Related Financial Disclosures. There is considerable value in working with a third party to lay out our thinking, such as the IHS report on TCFD and stranded assets.
- The AGM briefing process hugely benefits from the outputs of IMWG. Members will have the opportunity to review the AGM briefs.
- The December minutes were agreed. All actions were complete.

Waste plastics

A verbal introduction to waste plastics was provided:

- Waste plastics are a growing global issue attracting significant coverage, particularly in Europe.
- There is opportunity for BP to provide technological and thought

leadership on the management of plastic waste and the impact of future consumer behaviour – focused on solutions, including policy.
- Helpful to have clarity around definitions (e.g. single use plastics).
- Group technology will conduct a six-month study on the circular economy and possible implications for BP.
- Members agreed that a position is required, but timed to benefit from the technology study. It should also combine with the IMWG position on the circular economy (December 2018).

Actions: Plastics/circular economy position for December; Prepare high-level bullets for use at the AGM (LR/EN) – by mid-April.

Carbon offsets
IMWG members made the following points:

- Need to emphasise the importance of offsets in the context of BP's emissions commitments and highlight that they work in concert with real sustainable reductions.
- The third bullet in the land use section should be elevated to a key message – recognizing that land offsets are just one type. If the data is uncertain then a range should be provided.
- In the fourth key message, swap "replace high emissions sources" for "reducing operational emissions."
- Bold face offsets criteria in the sixth bullet.
- The risks from land based offsets should be described – permanence, additionality, leakage.
- Consider stronger wording when describing our use of voluntary offsets.
- Data points to be updated to include the latest figures.

Action: Update position to reflect feedback and circulate to IMWG members (PJ) – by mid-June. Unless feedback is significant, the position will be considered agreed and uploaded to messagebank.

Life cycle assessment (LCA)
IMWG members made the following points:

- Change the title to Carbon LCA.
- Simplify the fourth key message and reconcile with the fifth key message. Bold face carbon leakage.

- In the appropriate use of LCA, specify that it can be helpful for policy if conditions are met, but not for regulation. Avoid repetition in this section with key messages.
- Divide and re-title the section on the specific applications of LCA into one covering its use for gas and oil policy and another covering its inappropriate use for land use and fuels regulation.

Action: Update position to reflect feedback and circulate to IMWG members (PJ) – by mid-June. Unless feedback is significant, the position will be considered agreed and uploaded to messagebank.

Revenue and contract transparency
IMWG members made the following points:

- Update with the view on Dodd-Frank, when available.
- Remove the reference to the Azerbaijan PSA.
- Consider providing a brief description of EITI and BP's experience with this initiative.

Action: Update and finalise position to reflect IMWG feedback and place on Messagebank (DEm/AA) – by mid-April.

Strategic resilience
IMWG members made the following points:

- A helpful paper and support for having a position – initially for the AGM and to revisit with IMWG in Q3.
- Add detail to the point about an internal carbon price, for example specific countries, materiality thresholds, etc.
- Explain why we see limited value in publishing a standalone paper on resilience, which a number of our peers have done.
- Expand on the role of RCM to cover consideration of GHG sensitivities.

Actions: Draft a short position for use at the AGM and circulate to IMWG members (DEm) – by mid-April. Bring a full position to the September meeting.

Fossil fuel subsidies
IMWG members made the following points:

- Important to note the net positive wealth generated through the production of oil and gas.
- Swap third and fourth key messages, and structure with affirmative point made first.
- Reframe fifth key message. Rational industrial policy will seek to maximise net value – be clear that this is not an incentive or subsidy.

Action: Update position to reflect IMWG feedback and bring back to next meeting (SD) – by mid-May.

IMWG process
IMWG members made the following comments on the forward agenda:

- The environmental performance standards paper will be a position rather than information note.
- Strategic resilience position to be reviewed as part of the September agenda.
- Role of natural gas position to be retitled Role of gas and include hydrogen and biogas.
- A position on waste plastics and the circular economy will be reviewed in December.
- The climate change adaptation position review will be deferred to December.

Action: IMWG members invited to provide comments on draft AGM briefs 23 – 28 March.

AOB
The next IMWG meeting is 27 June 2018.

| IMWG Action Log: Updated 15 June 2018 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Action | Lead | Issue | Complete by | Status | Notes | IMWG Meeting |
| 216 | Plastics/circular economy position for December; Prepare high-level bullets for use at the AGM | LR/EN | Waste plastics | mid-April 2018 | Complete | December agenda updated; bullets included in Environment AGM brief | 13/03/2018 |
| 217 | Update position to reflect feedback and circulate to IMWG members. | PJ | Carbon offsets | mid-June 2018 | In progress | Unless feedback is significant, the position will be considered agreed and uploaded to messagebank | 13/03/2018 |
| 218 | Update position to reflect feedback and circulate to IMWG members. | PJ | Life Cycle Assessment | mid-June 2018 | In progress | Unless feedback is significant, the position will be considered agreed and uploaded to messagebank | 13/03/2018 |
| 219 | Update and finalise position to reflect IMWG feedback and place on Messagebank | DEm/AA | Revenue and contract transparency | mid-April 2018 | Complete | | 13/03/2018 |
| 220 | Draft a short position for use at the AGM and circulate to IMWG members. Bring a full position to the September meeting. | DEm | Strategic resilience | mid-April 2018 | Complete | September agenda will include discussion of the position | 13/03/2018 |
| 221 | Update position to reflect IMWG feedback and bring back to next meeting | SD | Fossil fuel subsidies | mid-May | Complete | On June agenda to review | 13/03/2018 |
| 222 | IMWG members invited to provide comments on draft AGM briefs | All | IMWG process | 28 March | Complete | | 13/03/2018 |

# Agenda Item 2: Fossil fuel subsidies

Members of the Issues Management Working Group

## Fossil fuel subsidies

The fossil fuel subsidies position has been revised to reflect the discussion at the March IMWG meeting.

Communicating the position
The external audiences for this position are:

- Relevant governments, investors and NGOs, as appropriate

The internal staff that need to be aware of this position are:

- C&EA, including Press office
- Regional Presidents and Heads of Country
- GPA
- Tax

The purpose of this IMWG item is to review and approve the position.

Spencer Dale
15 June 2018

# Fossil fuel subsidies

## Key messages

- The term 'fossil fuel subsidies' is often used to cover a variety of different polices and issues: it is important to define exactly what is meant by fossil fuel subsidies.
- Governments are responsible for managing subsidies – any decision to reform or remove subsidies is for governments alone to make.
- In general, BP supports the gradual phasing out of direct subsidies to consumers. Direct fossil fuel subsidies to consumers distort market-driven price signals, leading to inefficiencies in energy use and allocation of capital.
- The implications for low-income groups should be considered as part of any reform process.
- Incentives to discover and develop a country's oil and gas resources are a legitimate form of industrial policy and shouldn't be regarded as unfair or distortionary, provided they conform to domestic and international competition and trade rules.
- The suggestion that the failure to tax fossil fuels to take account of their GHG emissions represents an implicit subsidy is best addressed by a well-designed carbon pricing framework.

Related briefs: Carbon pricing

## Additional information

Fossil fuel subsidy definition

- There is no universally agreed definition for fossil fuel subsidies. The lack of a common definition has led to wide ranging estimates of the scale of global subsidies.
- They can, however, broadly be grouped into three categories:

  Direct subsidies to end-users (consumers)

  – Result in prices that are lower than would otherwise be the case in a prevailing market environment. For example, subsidies applied to the price of a litre of petrol or a business's electricity bill.
  – These subsidies impede the functioning of the energy marketplace, including the efficient use of energy and the rational allocation of investment.
  – It is feasible to identify – and quantify – end-user subsidies.
  – In general, BP supports the gradual phasing out of direct subsidies to end users.

  Incentives for investment in/production of specific fuels

  – Oil and gas resources can bring considerable wealth to an economy in the form of royalties and tax revenues.
  – Government support can reduce the cost of supply for producers. For example, tax incentives for the development of a country's reserves such as accelerated depreciation and expensing.

- Policies designed to maximise the net positive wealth to a country from these resources do not represent a subsidy in any meaningful sense.
- Moreover, such policies are a legitimate form of industrial policy and shouldn't be regarded as unfair or distortionary provided they conform to domestic and international competition and trade rules.

Implicit subsidy from a failure to price externalities

- This refers to the argument that the failure of the end-user cost of energy to reflect the full social cost of their use, in terms of their implications for the environment and greenhouse gas emissions, represents an implicit subsidy.
- Pricing the externality of greenhouse gas emissions is already well-established BP policy: BP has for many years advocated a price on carbon.
- It is important to take into account varying national tax regimes when calculating the carbon price that corresponds to the externalities associated with fossil fuels.

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Implications of subsidy reform for BP

- The implications of subsidy reform will likely depend on the type, location and scale of any changes.
- Aggressive reform of consumer subsidies could have material social implications in countries where BP operates, including India, Egypt, Indonesia. In many countries, the impact of fuel subsidy reform on low-income groups has been offset by various forms of assistance.
- The reform of producer incentives would be likely to have the most direct impact on BP assets, with the potential to impact investments in projects across the company.
- Increases in carbon prices would directly impact BP assets and indirectly via their effect on market demand.
- The 2018 BP Energy Outlook assumes a reduction and eventual elimination of consumer fuel subsidies, and a gradual increase in carbon pricing across the leading global economies.

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Pressure to reform

- The decline in oil revenues in recent years has pushed some energy-exporting countries to reduce fossil fuel subsidies – in some cases as part of a broader package of economic reforms.
- Lower prices have eased the burden of subsidies on emerging countries that are energy-importers, providing them with opportunities to reduce subsidies without burdening consumers in the short run.
- Subsidies have become a focus in international climate discussions with some arguing that they can promote inefficient energy use and increase energy-related $CO_2$ emissions. This argument relates mostly to direct consumer subsidies.
- Eleven countries — including Egypt, India, Iran, Kuwait, the United Arab Emirates, and Vietnam — included fossil fuel subsidy reform commitments in their Nationally Determined Contributions (NDCs) under the Paris Agreement.

| Contact: Mark Finley |
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# Agenda Item 3: GHG Emissions performance standards

Members of the Issues Management Working Group

## Greenhouse gas (GHG) emissions performance standards (EPS)

An information note has been prepared to explain what a GHG EPS is, and some of its advantages and disadvantages, for BP and society, compared with an economy-wide carbon price. The note focuses on forms of GHG EPS that have been discussed or proposed for the power sector in the EU.

The purpose of this IMWG session is to decide whether, in principle, BP should consider supporting sector-specific alternatives to an economy-wide carbon price and, in practice, support a GHG EPS for power in the EU.

Paul Jefferiss
15 June 2018

Members of the Issues Management Working Group

Greenhouse Gas (GHG) Emissions Performance Standards (EPS)

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What is the issue?

There are two related issues. The first is that GHG Emissions Performance Standards (EPS) are being promoted as a policy tool to reduce GHG emissions in the power sector. They do this by setting GHG emissions standards that some $CO_2$ intensive fossil-fuel based technology cannot meet, effectively banning them. The primary, initial goal is usually to remove unabated coal and lignite use in electricity generation.[1] A GHG EPS aimed at banning unabated coal from power could create both opportunities (for natural gas) and risks (of future application to unabated natural gas in power, or to refining and fuels). This paper will concentrate on a specific form of GHG EPS for electricity generation which has been proposed in the EU[2].

**Redacted - First Amendment**

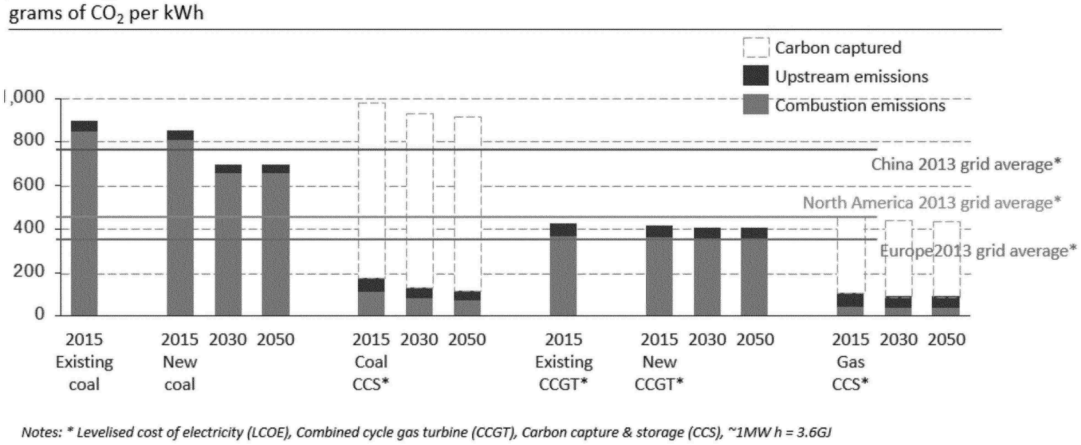
What is a GHG EPS for power generation?

For the purposes of this paper, a GHG EPS[3] is a limit on the "rate" of $CO_2$ or $CO_2$ equivalent emissions (usually tonnes or grams) per unit of electricity output (usually MWh, or kWh) in the power sector. See Figure 1 for average global emission rates from fossil fuel fired power generation. The GHG EPS can be applied directly to emissions from generating assets or, in some cases, be imposed as a condition for public financing, an approach which can influence funding for overseas plant

[1] See Appendix 1 for a summary of proposed or actual GHG EPS around the world.
[2] Letter to Commissioner Canete, via: http://d2ouvy59p0dg6k.cloudfront.net/downloads/canete_eps_final_march9_1.pdf.
[3] It is possible to apply an EPS to non GHG emissions, but here the intent would be to improve local air quality and is out of scope of this paper.

projects.[4]

Figure 1: Carbon emissions from power supply technologies (non-peaking)




*Notes: * Levelised cost of electricity (LCOE), Combined cycle gas turbine (CCGT), Carbon capture & storage (CCS), ~1MW h = 3.6GJ*

Source: BP Group Technology: LTTV2 – power sector

What is the purpose of an EPS?

EPS rates are selected by policy makers to set a threshold limit for GHG emissions. In some cases, this is to ensure that anything other than best available technologies are banned, but in many cases to ensure that some entire fuels or families of conversion technologies are effectively banned. Depending on how the EPS is designed and implemented such limits can be applied either to existing generation plant or to new build (see below).

What are some of the public policy advantages of an EU EPS?

The principal advantage of an EPS, like other forms of direct regulation, is that specific outcomes can be encouraged or even guaranteed. They are effective. For an EPS, the outcomes are that, within the power sector, which is widely acknowledged to be the source of a large proportion of low cost emissions reductions opportunities from energy use, the fuel and technology generation mix can be shaped and its average emissions intensity can be reduced over time by progressively banning higher emitting fuels and technologies, initially unabated coal, subsequently unabated gas, oil firing, etc.

What are some of the public policy disadvantages of an EPS?

A GHG EPS limits only the carbon intensity (emissions rate) of electricity

[4] For example, in July 2013 the European Investment Bank (EIB) announced that new and refurbished coal-fired power plants will not be eligible for funding unless they emit less than 550 gCO2/kWh. In 2015 the World Bank Group announced that it will provide financial support for greenfield coal power generation projects only in rare circumstances.

generation. It does not limit total absolute GHG emissions, as a cap and trade system would. If the policy goal is to reduce absolute GHG emissions to a specific level, further regulatory intervention(s) will be required, such as those contained in the EU's 2030 GHG emissions reduction strategy. Frequent updating and multiple interventions to achieve GHG reduction targets reduce investment and operational predictability for sectors and installations subject to the EPS mechanism.

An EPS also raises the cost of limiting GHG emissions, relative to a cap and trade or carbon tax, by effectively proscribing which fuels and technologies will be eligible to be used. If applied to a sector, such as power, which is already regulated under a carbon pricing system the Emissions Trading System in the EU), it will also undermine traded prices in the ETS itself.[5]

A GHG EPS is therefore a blunt regulatory policy that lacks the economic trade-offs and market-based flexibility that are possible with a $CO_2$ emissions trading scheme or an emissions tax.

How can EPS be made more flexible?
Policy options do exist to create more choice and flexibility in complying with GHG EPS. In general, the more flexible the EPS, the lower the cost of limiting emissions – though all EPS options are more restrictive (and costly) than a simple carbon price. More or less flexibility can be created in an EPS through choice of timing, definition of the emissions rate, and the choice of regulated entity and scope of coverage.

Timing
The timing of implementation is a key factor affecting flexibility. The least flexible form of GHG EPS applies a new standard to existing installations from the date of implementation, as a permitting condition for continued operation, effectively removing them from service if they cannot comply. Alternatively, the standard can be set to start applying to existing installations in the future, but this simply delays the date of closure, unless the facility can be adapted to meet the new standard, which may or may not be possible depending on the standard and the facility. A more flexible approach is the application of the GHG EPS only to new facilities, with "new" defined with increasing flexibility as not-yet-built, not-yet-

[5] If an EPS is effective, then it will reduce emissions (e.g. from coal fired power stations), but at a higher cost (otherwise other higher emitting sources would have already been substituted). Thus, EU ETS Allowance (EUA) demand falls and - all other things being equal - the EUA price reduces.

permitted or not-yet-planned. Given the longevity of electricity generation installation, if the EPS is applied only to new installations not yet in planning, it could take several decades to phase out existing or yet to be built higher emission electricity generators.

Rate of emissions

The definition of the standard GHG emission rate can also affect the flexibility of implementation. If it is applied as a fixed GHG emission limit per unit of electricity generated, there is no flexibility. But if it is set as annual GHG emissions budget, by multiplying the fixed EPS limit by an annual load factor (annual hours of operation), flexibility is given to higher emitting installations to operate for a reduced number of hours. This option potentially reduces the economic attractiveness of high emitting installations but could allow it to continue operating. The flexibility provided by this option could allow the continued use of a relatively carbon-intense facility for balancing and power system security purposes only (i.e. operating and emitting for a small percentage of hours in a year). This kind of low load factor thermal back up will become increasingly necessary due to the increasing penetration of intermittent renewables. It could provide significant power investment cost savings in customer savings in turn. In this case, absolute emissions and the emissions intensity of the generation fleet would be reduced, but the GHG emissions intensity of the facility would not.

Regulated entity and scope of coverage

The definition of a regulated entity affects flexibility. If each individual generating unit is subject to the specific limit, there is no flexibility. If the regulated entity is the owner of a portfolio of generating assets, there is the flexibility to average across the portfolio to meet the standard by, for example, combining renewables or nuclear with coal-fired generation. Even greater flexibility can be introduced by allowing trading between installations or owners to average across the entire generating fleet to meet the standard. This would be the least cost and most flexible form of EPS and is effectively a cap and trade system for the power sector. In this case, the wider the coverage of the EPS the more flexible and lower cost it would be, but the increased flexibility would make it less able to guarantee outcomes, such as the complete exclusion of unabated coal-fired power. This is because the average EPS rate could be achieved, for example, by a combination of coal and renewables, as well as by gas.

Flexible EPS Example: UK Emissions Performance Standard Regulations 2015[6]

These specify a UK Emissions Performance Standard of 450g$CO_2$/kWh. This is applied as an annual total tonnage allowance of $CO_2$ based on installed capacity x 85% load factor. It is applicable to new plant at or over 50MWe, permitted from 2014.

The level of 450g$CO_2$/kWh is about half the emissions for unabated coal fired electricity generation running at base load (i.e. 80-90% operation). By setting the GHG EPS rate below that of unabated coal, it effectively requires either coal with abatement, in the form of CCUS, or reduced operating hours, both of which are likely to render it uneconomic. It would not constrain new CCGT gas plant.

In a further measure to enable CCUS, any new fossil combustion plant at or over 300MW must be carbon capture ready (CCR) on the whole plant, i.e. it must demonstrate that there are no economic or technical barriers to retrofitting CCUS. While this enables CCUS, it does not necessarily promote it.

**Redacted - First Amendment**

[6] http://www.legislation.gov.uk/uksi/2015/933/pdfs/uksiem_20150933_en.pdf

[7] 'Open' cycle is also called 'simple' cycle

[8] Offshore oil & gas producing installations which use open cycle electricity generation.

# Redacted - First Amendment

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# Agenda Item 4: Role of gas

Members of the Issues Management Working Group

## The role of gas

Since the Role of natural gas position was agreed in 2015, BP has deepened its commitment to gas. It is a key part of BP's portfolio today and growth of gas has been identified as a Group priority. A revised position has been drafted to reflect the evolution of our strategy relating to gas and to reflect recent activity in Upstream, Midstream and Downstream.

Communicating the position
The external audiences for this position are:

- Regulators and policy makers
- Peer associations and organisations (e.g. IPIECA, IOGP, OGCI)
- Other external stakeholders, including investors

The internal staff that need to be aware of this position are:

- C&EA, including within the Upstream and Downstream
- Regional government and political affairs
- IST

The purpose of this IMWG item is to review and approve the position.

Dominic Emery
15 June 2018

# The role of gas

## Key messages

- Gas provides an abundant, flexible and reliable source of energy for power, industrial processes, heat and mobility, and is an essential feedstock for products such as petrochemicals.
- Natural gas demand is likely to grow over the next few decades. Our Energy Outlook Evolving Transition scenario projects this growth at 1.6% p.a., with LNG trade growing at over 3% p.a.
- Natural gas demand as a feedstock to industry is material and growing, and at less risk of substitution.
- Gas can complement renewable power as a cost-effective back-up to intermittency issues and base/peak loading.
- BP sees gas, coupled with Carbon Capture Use and Storage (CCUS) and progressive decarbonisation, as a destination fuel in a low carbon economy.
- BP has a major and growing natural gas business. BP projects that gas will account for up to 60% of its total production by the mid-2020s.
- BP believes that governments should play a key role in the development of infrastructure, access and markets for gas, whilst recognising that there will be regional differences in policy frameworks.

Related briefs: Methane; Unconventionals and hydraulic fracturing; Low carbon and the energy transition; Carbon capture, use and storage; Unburnable carbon.

## Additional information

Types of gas

- Unless otherwise specified, "gas" refers collectively to:
  - Natural gas: methane produced from conventional and unconventional sources.
  - Biogas: biomethane produced from the breakdown of organic matter.
  - Hydrogen: produced by refining units, methane reforming or electrolysis.

Future prospects for gas

- Projected natural gas demand growth out to 2040 is supported by broad-based demand, a strong pipeline of low-cost supplies, and continued expansion of LNG.
- Global LNG supplies are projected to more than double out to 2040. Development of floating storage regasification units, and small scale LNG, can unlock new markets.
- China, India, and others facing rapidly growing energy demand, are looking to diversify their sources of supply and reduce dependence on coal. BP's Evolving Transition (ET) scenario projects the majority of growth to come from industry and to a lesser extent power, though over 1 billion people have no access to electricity today.
- Gas is a material feedstock for chemicals and is starting to displace liquids in transport in niche applications.

- Gas projects can face difficulties which can only be solved by governments: insufficient state gas price, requirement to sell gas domestically, large unpaid government debts, and impractical fiscal or working environments for unconventionals.
- The prospects for gas demand could be adversely affected by either weaker or stronger environmental policies, and lack of investment in infrastructure and technologies to decarbonise gas.
- It is important for the oil and gas sector to demonstrate control over methane emissions. BP is targeting a methane intensity of 0.2%.

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Advantages of gas

- Natural gas abundance and its regional diversity is providing a new source of energy security and economic development – ~13,200 trillion cubic feet of natural gas has been discovered and could be recovered using today's technology.
- Gas is the lowest carbon fossil fuel and emits about 50% of the $CO_2$ of coal per unit of power.
- Gas is the cleanest burning fossil fuel with low emissions of NOx, SOx and $PM_{2.5}$, providing air quality benefits compared to coal and oil.
- Gas can be decarbonised through technologies such as CCUS, biogas/biomethane with CCUS, and hydrogen (using gas and CCUS, or from electrolysis using renewable power).

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BP's gas portfolio

- BP has access to competitive and strategic gas resources such as in Oman, Azerbaijan, Egypt, Indonesia, Mauritania and Senegal.
- Between 2017 and 2020, BP is projected to see the greatest growth in gas production of all the supermajors as new projects come onstream. Upstream has eleven material gas value chains with a strong portfolio of potential FIDs remaining.
- IST plans to grow BP's equity and merchant LNG portfolio to~25mtpa, providing portfolio flexibility and accessing premium markets for Upstream gas.
- An Integrated Gas Markets team has been established to create a participation strategy across Downstream gas markets, complementary to our Upstream/Midstream portfolio, and accelerate commercial opportunities.
- Group Technology is developing decarbonised gas technologies that will underpin the sustainable use of gas over the energy transition.
- With an abundance of gas in the world, it is important that we are at the low end of the cost of supply curve. BP's modernisation and transformation agenda supports this.

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Gas and policy

- The resilience of gas demand remains exposed to downside risk with the outlook subject to the possibility of adverse government policies.
- Policy makers are only likely to implement mechanisms that promote gas if they are convinced of its role in the longer term – if they are not, gas may be locked out by competing technologies even if costlier.
- Governments should provide appropriate support to encourage the development of infrastructure, facilitate open market access, and provide financial support towards investments in innovation and technology to decarbonise gas, especially CCUS.
- An economy-wide carbon price will help gas and other lower carbon options in the energy and other sectors, but should not be set to specifically incentivise gas.

| Contact Ben Slater / Dominic Emery |
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Members of the Issues Management Working Group

## The role of gas

What is the issue?
Gas is projected to play a significant role in the transition to a lower carbon economy. Gas provides an abundant, flexible and reliable source of energy for power, industrial processes, heat and mobility, and is an essential feedstock for products such as petrochemicals. However, the resilience of gas demand, in all its forms, remains exposed to downside risk with the outlook subject to the possibility of adverse government climate policies, underinvestment in infrastructure, substitution economics, or failure to decarbonize gas through technology solutions.

This has resulted in debate around role of gas as that of a 'transition' fuel or a 'destination' fuel. Natural gas is a key part of BP's portfolio today and growth of gas has been identified as a Group priority. This paper seeks to clarify BP's position and rationale: that gas will continue to play an important and enduring role in the energy slate, and as a 'destination' fuel, BP should invest and advocate to support this position.

BP's interest in the issue
Gas is a core part of BP's energy portfolio today and is intimately linked to our long-term participation in the energy transition:

- Growing gas [and advantaged oil] in the Upstream – is one of the four Group strategic priorities. We expect to increase its share of production in the Upstream from 54% today to around 60% by the mid-2020s
- Provide lower emissions gas – is one of our 'Improve' commitments within our Advancing the Energy Transition framework of 'Reduce - Improve - Create'.

BP participates across the gas value chain, from supplying upstream natural gas to liquefaction facilities, through transportation and storage to regasification and marketing (largely through trading). Of the supermajors we currently have the highest gas-oil Upstream production ratio (excluding Rosneft) with a portfolio focused on advantaged domestic / pipeline positions and more balanced gas price exposure versus peers through regulated markets such as Egypt and Oman. We are currently developing a downstream gas participation strategy with the intent of

expanding this portfolio.

Types of gas
Unless otherwise specified, "gas" in this paper refers collectively to:

1. Natural gas: conventional and unconventional gas processed into methane.
2. Biogas: produced from the breakdown of organic matter, purified into biomethane, it can be blended directly with natural gas or used as a substitute.
3. Hydrogen: produced by refining units or by methane reforming (using CCUS) with a small residual amount of carbon, or by electrolysis (using renewables) as a zero-carbon gas.

The benefits of gas
Gas is projected to play a significant role in the long-term energy slate as a source fuel for power, industrial processes, heat and mobility, and as the primary feedstock for other important products such as petrochemicals. The role of gas is underpinned by a number of benefits:

Abundance: In recent years, the gas sector has experienced the 'shale revolution', enabled by technologies such as horizontal drilling and hydraulic fracturing. Around 13,200 trillion cubic feet of natural gas (tcf) has been discovered around the world and could be recovered using today's technology – this is more than enough to meet anticipated demand to 2050. Resources are also geographically diversified. For resource rich countries, the abundance of natural gas can provide energy security. In developed and developing countries alike gas can enable economic development, and bring electricity to millions of people who live in poverty today. As the economics of producing biomethane and hydrogen improve, through technological advancements, these could provide similar benefits.

Valuable feedstock: Natural gas is the primary feedstock for several important industrial products – growing demand centres less sensitive to switching effects. Perhaps the most significant as a feedstock for the petrochemicals sector, where its uses are many and varied and include the production of fertilizer, animal and fish feed, and hydrogen.

Cleaner energy: Natural gas produces around half the carbon dioxide ($CO_2$) emissions of coal when burned to generate power. Gas also complements the drive toward renewables as it can be a lower carbon,

cost-effective back-up to the variability of wind, solar and hydropower generation. In the US, increased use of unconventional gas from shale has helped drive the country's $CO_2$ emissions back down to 1990s levels.

Gas also emits fewer other pollutants than coal and diesel, such nitrogen oxides (NOx), ozone and fine particulate matter ($PM_{2.5}$), making it better for local air quality. This is particularly important in urban areas where governments are actively seeking to improve air quality. A number of cities, and large industrial hubs, such as ports, have to banned the production of coal fired power and use of heavy-duty diesel vehicles, adopting gas as a substitute.

Decarbonized gas: Natural gas can be decarbonized through the application of CCUS, or by blending it with other low and zero carbon gas solutions such as biomethane and hydrogen. These new gas options can be at the centre of decarbonisation in the long-term, by providing complementary low and zero carbon gas solutions.

Gas demand and supply drivers

BP's Evolving Transition (ET) scenario[1] projects natural gas to grow by around 1.6% per year to 2040, enabled by strong increases in low-cost supplies and continuing expansion of liquefied natural gas (LNG). In this scenario, natural gas accounts for around a third of the entire increase in global energy demand.

The increasing accessibility and competitiveness of natural gas associated with LNG is expected to help to develop new and expanding markets, led by China together with other Asian countries, such as Pakistan and Bangladesh. This is amplified by the development of floating storage regassification units, which enable a faster and less capital-intensive access to LNG for developing countries. In the future, the development of small scale LNG could also help develop new markets.

While natural gas is becoming more accessible and affordable around the world, the pattern of demand and pace of growth reflects significant regional diversity. This includes increasing levels of industrialization and power demand (particularly in emerging Asia and Africa); continued coal-to-gas switching (especially in China); and the increasing availability of low-cost supplies (in North America and the Middle East).

Growth in industrial use of gas including use in the non-combusted sector

[1] Data presented in this section is based on BP's Evolving Transition (ET) scenario, unless stated.

(70 Bcf/d) is supported by both continued industrialization in developing economies, together with gas gaining share as some countries in both OECD and non-OECD switch away from coal.

The increase in gas used by the power sector (59 Bcf/d) is driven by the overall growth in global power demand. The competing trends in renewables and coal demand means the share of gas within the power sector is relatively flat over the Outlook.

Buildings account for 21 Bcf/d of growth, reflecting that almost all the incremental energy demand within buildings over the Outlook is for electricity to provide space cooling and power electrical appliances.

The fastest rate of growth reflects the penetration of gas in the transport sector as gas is increasingly used in trucking and marine transport. Although the increase in transport demand is small in absolute terms (11 Bcf/d), the share of gas within transport increases to almost 5% by 2040.

As resource availability and demand grows so too does supply, which more than doubles. Led by the US, Qatar and Iran, which contribute over half of all incremental production expansion – LNG expansion opens new markets. Global LNG supplies also more than double over the Outlook, with around 40% of that expansion occurring over the next five years. The sustained growth in global LNG supplies greatly increases the availability of gas around the world, with LNG volumes overtaking inter-regional pipeline shipments in the early 2020s.

Challenges to growth
Despite a positive outlook, there are downside risks for gas and it faces several challenges if it is to meet its full potential.

Lack of infrastructure: In the nearer term, infrastructure is key constraint for natural gas growth. While investment in LNG is progressively opening new markets, global gas penetration is still regionally uneven as infrastructure investment can have long lead times and be very capital intensive. Further, unlike biomethane, hydrogen can only be part blended with natural gas, and as a substitute requires additional infrastructure.

Policy: Adverse policy may block expansion, particularly if it creates closed markets by favouring incumbent monopoly or government controlled entities (e.g. existing coal facilities), limiting access to

infrastructure, or by fixing pricing structures below market rates. (see 'The Importance of Policy' below)

Competitiveness: The economics of switching from alternative fuels sources, such as coal-to-gas in power or fuel-to-gas in transport, can also be challenging when there are disparate carbon prices or equivalent policies, or economies of scale can't be achieved in market.

Decarbonizing gas through technological solutions, such as carbon capture and storage (CCUS), biogas, or hydrogen, is generally not competitive in the marketplace without policy support. However, the importance of decarbonizing natural gas using CCUS is underlined by its major presence in the modelling of the most economical energy system consistent with keeping the global temperature rise to two degrees, where it accounts for a significant share of power generation in North America and Europe.

By 2050, the technoeconomic merits of using natural gas as a fuel for combustion become less compelling, particularly in the power sector where it competes against renewables.

Affordability: The question of affordability is essential for natural gas – and even more so LNG – to win shares in developing markets which can be extremely price sensitive. There are around 1.1 billion people without access to electricity and 2.8 billion do not have access to clean cooking facilities. But the role of natural gas is often not credited as a solution.

Natural gas demand resilience

Despite challenges to growth, gas accounts for around a third of the entire increase in global energy demand in the ET scenario. Many commentators agree, in one form or other, that gas demand is likely to grow relatively robustly over the next few decades, and more quickly than oil and coal. BP's ET scenario aligns with the consensus view projecting growth of around 1.6% per year.

To test the resilience of this forecast, rather than considering gas demand growth in terms of sectors or regions driving that growth, it is possible to separate the growth profile into two alternative components:

1. Growth stemming from gas gaining share relative to coal (and relative to oil in transport) or 'switching'
2. Growth caused by other effects, mainly economic growth or

'other effects'.

Within the ET scenario, 52% of the gas demand growth originates from 'switching' effects, while 48% is the comes from 'other effects' (largely economic growth).

Switching effects are generally driven by simple economics, in particular the increasing availability of low-cost gas, especially in the US and the Middle East, allowing gas to gain share relative to coal, or by policy measures promoting a shift to a lower-carbon fuel mix, especially in Asia and EU.

The importance of policy
Policy makers are only likely to implement mechanisms that promote gas if they are convinced of its role in the longer term – if they are not, gas may be locked out by competing technologies even if more costly. A key risk to the outlook for gas therefore, is that policy measures fail to materialise as projected. In this example the gas outlook may be exposed to downside risk – although with aggregate demand generally still growing, out to 2040 – in both a lighter policy and certain forms of tighter policy environment.

At one end of the spectrum, policy measures supporting the transition to lower carbon fuels may fail to materialise, causing coal and oil demand to be stickier and limiting the scope for gas to grow. In such a scenario there might be no coal-to-gas switching in Asia and the EU – the two key regions in which this policy-induced switching is most pronounced – and virtually no oil-to-gas switching in transport anywhere in the world.

The growth of gas in this 'less gas switching' scenario remains around 1.1% per year, around one third slower than in the ET scenario, but still reasonably robust relative to the outlook for either oil or coal.

At the other end of the policy spectrum, there is a risk that lower carbon policy measures may not be even-handed between different sources of energy. The Energy Outlook considers policy measures supporting a more rapid transition to renewable fuels may tighten considerably more than expected – a 'renewable push' scenario. In the 'renewable push' scenario, the stronger growth of renewables crowds out natural gas from the power sector such that the annual growth in gas demand slows to around 1.0%.

Gas demand is also more subdued in the 'faster transition' and 'even faster transition (EFT)' scenarios (growing annually at 0.5% and 0.1% respectively), reflecting the impact of a more comprehensive set of climate policies, leading to significant improvements in energy efficiency as well as providing strong support for renewables. Even in the EFT scenario, gas demand in 2040 is roughly the same as today.

Regional policy perspectives
While directionally aligned, policy approaches vary by region.

The European Commission is currently working on a communication on the Future Visions for energy until 2030, to be published in June 2018. It is expected to focus on EU's climate action and additional measures that could accelerate the EU's existing ambition and have implications for the role of gas, including proposal for carbon tax and to address variability of renewables.

**Redacted - First Amendment**

In China, the Government has set a target to increase the percentage of gas utilization from 7% today to 10% by 2020. Since 2016, China's gas market has been driven by a coal-to-gas switching policy but imbalance has also grown, both regionally and seasonally. During this time, import dependency has increased from 32% in 2015 to 39% in 2017. LNG as a flexible supply source has played a bigger role in meeting China's fast growing demand and its extreme seasonality.

India is planning to increase the share of gas in primary energy demand to 15% by 2030, against 6% today to achieve the so-called gas-based economy. While the growth of gas in the power generation sector is particularly challenging due to the competition of coal and solar, there is potential in other sectors such as industry, transport and city gas distribution.

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# Agenda Item 5: Methane emissions from the oil and gas sector

Members of the Issues Management Working Group

## Methane emissions from the oil and gas sector

A position on methane was originally agreed by IMWG in 2013, and then updated in 2015. Methane remains a significant issue for BP and the oil and gas sector and BP wants to be a leader in methane management. An updated position reflects recent scientific, policy and technological developments, as well as providing context to BP's aspiration to lead and to align with existing external communication.

Communicating the position
The external audiences for this position are:

- Regulators and policy makers
- Peer associations and organisations (e.g. IPIECA, IOGP, OGCI)
- Other external stakeholders, including investors and NGOs

The internal staff that need to be aware of this position are:

- C&EA, including within the Upstream and Downstream
- S+OR
- Upstream HSE

The purpose of this IMWG item is to review and approve the position.

Eamonn Naughton
15 June 2018

# Methane emissions from the oil and gas sector

## Key messages

- BP recognizes that methane is a powerful but short-lived greenhouse gas that plays an important role in global warming.
- While agriculture is the main source of man-made methane emissions, the oil and gas sector is also a major source – although data remains poor.
- For natural gas to play a full role in advancing the energy transition, methane emissions need to be kept to a minimum.
- BP aims to take a leading role in addressing the methane challenge; we have set a methane intensity target and are in action.
- We are partnering with our peers in OGCI, governmental and non-governmental organizations (NGOs) and academic institutions to advance understanding of the science, improve data and identify and deploy leak detection and reduction technology.

Related briefs: Low carbon and the energy transition, Unconventional gas and hydraulic fracturing, Role of gas

## Additional information

Methane emissions and climate change

- According to data published by the Intergovernmental Panel on Climate Change (IPCC), methane is the second largest contributor to global warming after carbon dioxide ($CO_2$).
- There is significant uncertainty in the global estimates of methane emissions from oil and gas, the contribution to global manmade GHG emissions and hence to the reasons behind the currently observed increase in atmospheric methane concentrations.
- Based on figures from 2010, global methane emissions are estimated to be about half from natural sources (e.g. wetlands) and half from human sources. Of the latter, agriculture is by far the largest source of anthropogenic methane emissions followed by oil and gas. The oil and gas sector is estimated to account for about 23% of the anthropogenic methane emissions.
- Global estimates of methane emissions may be too high by a factor 5 or more when compared to data reported by large oil and gas companies, scaled up for global production levels.
- The Oil and Gas Climate Initiative (OGCI) is working with the UN Environment and EDF to undertake independent scientist-led global methane measurement studies to reduce the uncertainty in methane emission estimation outside of onshore US. Ultimately this should lead to improved global estimates and a better understanding of the potential role of reducing methane emissions from oil and gas in meeting the climate challenge.

What we're doing

- Across much of our Upstream operations, we have adopted standard procedures for leak detection and repair using infrared cameras that determine the scheduling and number of inspections, as well as how we track and report methane leak repairs.

- Thirteen of our 22 Upstream major projects scheduled to be delivered by 2021 are gas. We're designing them in ways to reduce methane emissions from the outset.
- Where economically feasible we have switched from gas-driven pneumatic pumps to solar in parts of our US L48 onshore operations, leading to fewer methane emissions.
- In L48, we've replaced thousands of high-bleed controllers with ones that emit less methane over the past decade.
- Upstream has a stated ambition to be a leader in methane reductions with plans currently being developed in support of that ambition.
- We will target a methane intensity of 0.2%, and hold it below 0.3%. The intensity, as defined, refers to operated upstream methane oil and gas operations where the gas reaches a market. Assets such as Prudhoe Bay where the gas is reinjected are out-of-scope.
- According to Steve Pacala of Princeton University, quoted in the Economist, if all the world's gas producers attained BP's leakage rate of 0.2%, this would spare as much warming as cutting all the carbon dioxide emitted since the 19th century by one-sixth.

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Working with others

- Oil and Gas Climate Initiative is investing in technologies to improve measurement and reduce emissions. In 2017, it announced its aim to work towards near-zero methane emissions from the gas value chain. It is also seeking deployment opportunities where investment itself is not a viable option.
- In 2017, BP and seven peers, including Exxon and Shell, signed up to five "Guiding Principles" for reducing methane emissions across the gas value chain. Others, such as Chevron and Gazprom, signed up in May 2018 taking the total to twelve companies. These guiding principles were developed in participation with NGOs and others.
- BP also participates in the Oil and Gas Methane Partnership, part of the Climate and Clean Air Coalition, which looks at improving technical guidance and reducing emissions.
- We support research such as Princeton University's work to enhance the scientific understanding of the global methane cycle.

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Policy context

- There is pressure on the industry to reduce emissions on numerous fronts including from investors, NGOs and inter-governmental agencies. This has prompted voluntary action from players across the sector.
- US: In June 2017, the Trump Administration announced its intent to withdraw from the Paris climate agreement and is no longer pursuing the goal of 40-45% methane reduction from the oil & gas sector by 2025. Certain regulatory measures to achieve the US Paris goals are being reconsidered.
- EU: There is a push to continue monitoring methane emissions, their effect on ambient air quality and measures to tackle methane levels. As part of the revision of the Offshore Safety Directive, expected in 2019, the Commission are looking at methane emissions from plugged and abandoned wells.

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Technology context

- Methane detection technology is progressing with the ARPA-E methane programme and the EDF Methane Detectors Challenge selecting several technologies for further development.
- OGCI is focused on prioritizing investment in methane detection, measurement and mitigation.

Contact: Liz Rogers

Methane emissions from the oil and gas sector

# Redacted - First Amendment

Methane as a greenhouse gas (GHG)
According to data published by the Intergovernmental Panel on Climate Change (IPCC), methane is the second largest contributor to global warming after carbon dioxide ($CO_2$) even though it is emitted in much smaller quantities and atmospheric concentrations are much lower. This is because molecule for molecule, methane absorbs infra-red radiation much more effectively than $CO_2$.

The measured concentration of methane in the atmosphere continues to increase faster than $CO_2$, increasing the relative contribution of methane on future warming. However, the relatively short lifetime (10-12 years) of methane in the atmosphere means that the atmospheric concentration would be expected to fall rapidly if global emissions are reduced by modest amounts. This is in contrast to the behaviour of $CO_2$ where concentrations would be expected to rise even with reductions in global $CO_2$ emissions of well over 50%.

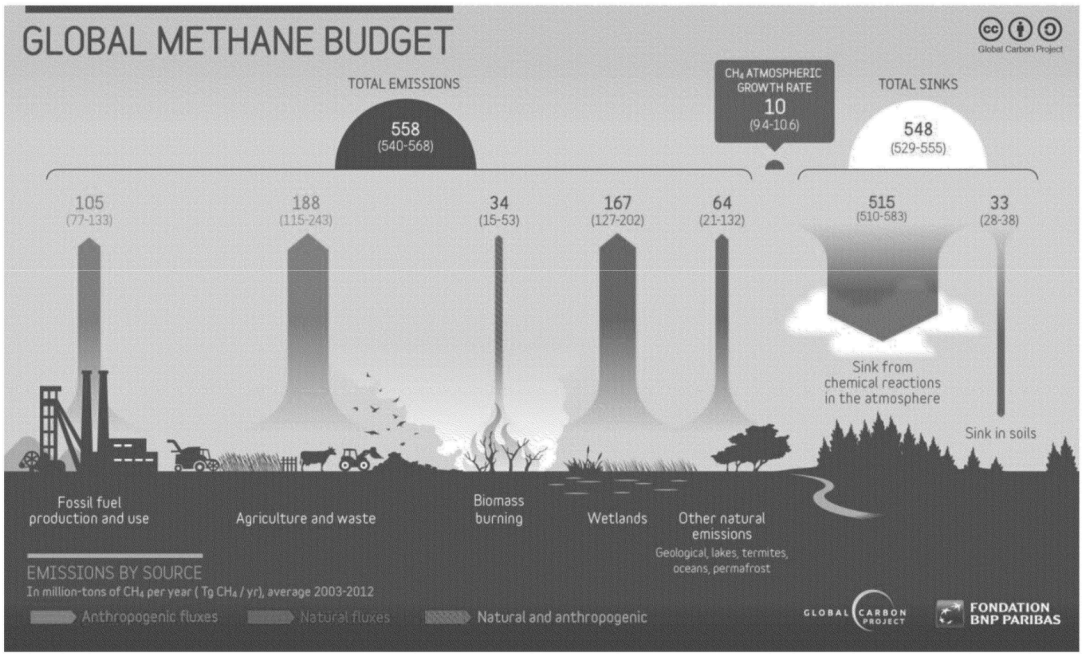
These fundamental characteristics of high radiative potency and short atmospheric lifetime have focussed attention on the potential contribution of mitigation of methane emissions in meeting the climate challenge. However, the climate challenge cannot be achieved through methane mitigation alone, and with $CO_2$ the predominant greenhouse gas (GHG) overall, reductions in both methane and $CO_2$ are needed.

The observed increase in the concentration of methane in the atmosphere provides an accurate measure of the quantity by which emissions from all sources (anthropogenic and natural) exceed the

removal by sinks. However, there is a relatively poor understanding of the absolute magnitude of the sources and sinks and how these might change in the future due to climate change.

Sources of methane emissions

There are numerous estimates of methane by sector (anthropogenic) and of natural sources. These are summarised periodically by the Global Carbon Project in the form of a Global Methane Budget. The most recent one providing a budget averaged over the decade to 2012.




According to this, anthropogenic and natural source are of similar scale, and the imbalance between sources and sinks leading to the observed increase in methane concentration is only 10 million tonnes which is small compared to the magnitude of the sources, and the uncertainty. Hence the rate of increase (or decrease) in the concentration can be changed by very small relative changes in the emissions from a source whether natural or anthropogenic.

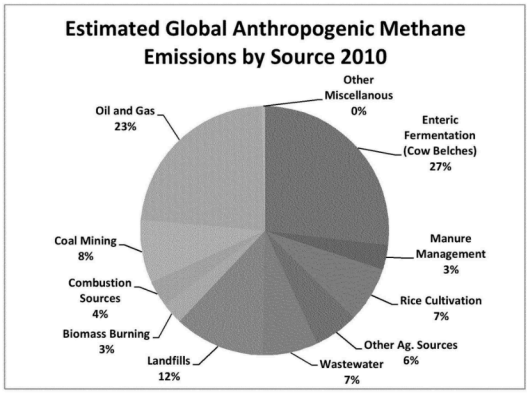



Figure 1: Global Sources of Methane

US EPA publish estimates of global non-$CO_2$ emissions with the latest being for 2010. This shows that agriculture is by far the largest source of anthropogenic methane emissions followed by oil and gas. The oil and gas sector is estimated to account for about 23% of the anthropogenic methane emissions[1] (Figure 1).

Methane emissions from the oil and gas sector

There are numerous potential sources of methane emissions from the oil and gas sector. While the potential sources of emissions are well understood, the quantification of the emissions at all levels from individual sources to global inventories is a significant challenge. This means there is significant uncertainty in the available global estimates of methane emissions from oil and gas, the contribution to global manmade GHG emissions and the relative contribution to the currently observed increase in atmospheric methane concentrations.

Estimates of methane emissions from global oil and gas operations published in the last 5 years range from just over 60 million tonnes to well over 80 million tonnes[2]. These estimates have been produced using a combination of bottom up emission inventories and top down techniques based on $^{13}C$ isotope analysis of atmospheric methane.

The most recent of these estimates was published by IEA in the World Energy Outlook 2017 and provides an estimate of methane emissions from the oil and gas sector at 76 million tonnes. At this level, methane from oil and gas would represent around 4% of global manmade GHG emissions[3]. IEA do acknowledge the uncertainty, with estimates as low as a quarter of the IEA estimate, and others considerably higher. Dividing this 76 Mt by the global natural gas production results in a methane intensity of 3% for the full natural gas value chain and 2.3%from the

[1] US EPA Global Anthropogenic Non-CO2 Greenhouse Gas Emissions:1990-2030 (EPA Report 430-S-12-002)
[2] IEA WEO 2017
[3] On a $CO_2$ equivalent basis using 100 year global warming potential.

upstream part of the value chain.

Data uncertainty

Many in the industry have expressed concern that the IEA and other estimates in this range are overestimates. IEA acknowledge this concern; stating that many O&G companies had reported methane intensities of 0.1% of hydrocarbons produced corresponding with the global average of member companies published by IOGP. While a direct comparison between the IEA and IOGP data is not possible, IEA have estimated that if the IOGP data were representative of global operations then the discrepancy could be a factor of 5. IEA recognise that such a major discrepancy warrants further investigation and suggests a number of possible causes such as that IOGP reporting company make-up may be biased towards better performers.

There is also considerable uncertainty in the estimates from other manmade sources of methane and in those from natural sources such as wetlands and forest fires. This means that it is not possible to accurately quantify the contribution of methane emissions from oil and gas on the observed rate of increase of methane concentration.[4] This in turn could lead to increased debates as to the primary causes for any changes.

To reduce uncertainty in estimates of methane emissions from the oil and gas sector a number of field measurement studies have been undertaken in the US, and more are planned in the US and other regions in the near future.

A series of high profile field measurement studies, organized by the Environmental Defense Fund with industry partners and academia were conducted on some of the top emissions sources from the onshore US sector. The studies showed that some of the emissions estimation methods used in the EPA GHG Reporting Rule were underestimated while others were over estimated. However, EPA has not modified any of the emission factors based on the EDF studies.

The Oil and Gas Climate Initiative (OGCI) is working with the UN Environment and EDF to undertake a series of independent scientist-led global methane measurement studies. The focus of these studies,

[4] BP has commissioned a mufti-year study at Princeton to better understand the global methane cycle and the relative contributions of the different manmade and natural sources.

planned for the period 2018 – 2021 - is on assets outside of onshore North America and will start to address the data voids in the global measurement space in key Regions. Aerial measurement campaigns together - with ground level measurements where possible - have been undertaken in the offshore Gulf of Mexico and the Southern UK North Sea. Further studies are planned to cover LNG, midstream and the Middle East. Other researchers are also undertaking similar such studies, for example the NERC funded UK studies planned for the West of Shetland area of the UK North Sea.

Where emissions occur and what policy actions are necessary to regulate methane emissions from the sector are growing questions. Some people claim that the majority of emissions come from a small number of sources with very high emissions – the so-called super-emitters. However, studies claiming this are based on limited data sources and are not conclusive. Identifying and addressing such episodic high emission sources would be a very different logistical, policy and regulatory challenge than implementing broad engineering or work practice controls. It is not clear how policies will be developed to address this. It is also not yet clear if the US based analysis is translatable to global oil and gas operations given the very unique nature of the onshore dispersed operations in the US. Facilities are typically spread over large areas with thousands of unmanned wells (e.g. L48), which is quite different to typical facilities elsewhere.

Technology Development

There is a continued and rapid development of methane detection and measurement technology with new products starting to reach the market for either enhanced testing or actual deployment. In particular, technology is starting to provide lower cost remote detection and quantification of methane emissions from our facilities. This technology is available to third parties. For example, EDF announced that they will be launching a satellite that by 2021 will "identify and measure methane emissions from human-made sources worldwide, starting with the oil and gas industry".

- The ARPA-E Methane Observation Networks with Innovative Technology to Obtain Reductions (MONITOR) programme supports methane research for developing innovative technologies to cost-effectively and accurately locate and measure methane emissions associated with natural gas production. It is expected that prioritised technologies will be highlighted by the end of 2018 which is the end

date for the programme.

- The Methane Detectors Challenge (MDC), launched in 2014, is a partnership between EDF, oil and gas companies, U.S.-based technology developers, and other experts that supports the development of real-time methane detection. Two technologies have been identified as worthy of further development and testing.
- The OGCI is focused on prioritising investment in methane detection, measurement and mitigation. OGCI Climate Investments is committing 20 million dollars to invest in selected technologies and business ideas. In addition the OGCI is committed to piloting or deploying technologies which have reached appropriate maturity

Policy developments

The outlook for direct regulation of methane emissions from oil and gas operations appears less certain than in 2015 with potential initiatives in both US and EU not being pursued at present. However, there is pressure on the industry to reduce emissions on numerous fronts including from investors, NGOs and inter-governmental agencies. This has prompted voluntary action from players across the sector.

US: In June 2017, the Trump Administration announced its intent to withdraw from the Paris climate agreement and is no longer pursuing the Obama Administration goal of 40-45% methane reduction from the oil & gas sector by 2025. Certain regulatory measures introduced under Obama by the Environmental Protection Agency (EPA) and Bureau of Land Management (BLM) to achieve the US "Intended Nationally Determined Contribution (INDC)" to the Paris goals are being reviewed and likely revised.

Europe: At the European Commission, there is a push for the Commission to continue monitoring methane emissions and their effect on ambient air quality and to consider measures to tackle methane levels. This may lead to legislative proposals in late 2019. As part of the revision of the Offshore Safety Directive, expected in 2019, the Commission and some Member State regulators are looking at methane emissions from plugged and abandoned wells. In the European Parliament, MEPs have proposed a Union Strategy on methane emissions as part of the Energy Union governance regulation. Whilst unlikely to pass in its current form, it could return following edits next year. The proposal for a reduction target under the revision of the National Emission Ceilings Directive (NECD) was deleted during the final negotiations in December 2016.

Stakeholder perception
Improved information (particularly in the US), has led to fewer claims that natural gas used in power generation has a larger climate footprint than coal. The dialogue has generally moved to maximizing the climate benefits of natural gas by reducing methane emissions.

Despite uncertainty around data, there is intense pressure on the sector to effectively manage methane emissions irrespective of the quantity of emission reductions actually achieved. IEA estimate that the reductions available from the oil and gas sector at no net cost would have the same impact on temperature rise in 2100 as shutting down all the coal-fired power plants in China.

The importance of methane emissions for BP
Natural gas has significant advantages over other fossil fuels due to lower emissions of GHGs and other local air pollutants. Gas-fired power plants are well-suited to the demand for flexible operation that comes with the increasing share of renewables in the power mix. Natural gas therefore has a vital role to play in a world demanding more energy, but with lower GHG emissions.

Methane is a major component of natural gas. Emissions of methane from anywhere in the natural gas value chain can detract from its overall environmental credentials. Recognising this vital role for natural gas in reducing GHG emissions in the energy transition, BP expects to increase the proportion of gas in the upstream portfolio to around 60% by the mid-2020s from the current level of around 54% This growth in gas is one reason why BP wants to address methane emissions from our operations and the wider gas value chain.

Group level methane target
BP wants take a leadership role in tackling the challenge of methane emissions. To help reduce emissions from our operations, we will target methane intensity of 0.2%, and hold it below 0.3%. The intensity, as defined, refers to operated upstream methane oil and gas operations where the gas reaches a market.

We have set this target based on our current methane emissions inventory which uses industry standard methods based primarily on estimation and calculation rather than direct measurement. We are in action to improve the understanding of our own emissions. For example,

at our Sangachal terminal in Azerbaijan, we trialled infrared cameras with specialized software to detect and more accurately quantify methane emissions. This will help us prioritize leak repairs and improve our reporting. It is possible our emission numbers might change with the possibility we may to revisit our target?

According to Steve Pacala of Princeton University, quoted in the Economist in April 2018, if all the world's gas producers attained BP's leakage rate of 0.2%, this would spare as much warming as cutting all the carbon dioxide emitted since the 19th century by one-sixth.

What BP is doing in our operations
The majority of the methane reported by BP is from our Upstream businesses. However, many of the techniques for improved methane detection and quantification will be applicable for use in a Downstream context.

Across much of our upstream operations, we have adopted standard procedures for leak detection and repair that determine the scheduling and number of inspections, as well as how we track and report methane leak repairs. We inspect our major operations for leaks at least annually and often more frequently, depending on the technique used and regulatory requirements. In many locations, we use technology like infrared cameras to identify and fix small seeps preventing them from becoming more hazardous leaks.

We have trialled infrared cameras with specialized software to detect and more accurately quantify methane emissions. This will help us prioritize leak repairs and improve our reporting. We're also designing projects in ways that should reduce methane emissions from the outset. As one example, our Khazzan site in Oman has a central processing facility so there is reduced need for well site processing equipment – which can be a source of methane emissions.

Support to and deployment of real time methane detection technologies is an area BP is actively supporting. BP Technology teams, BP Ventures and also OGCI CI teams are also all actively working in this space.

BP joined the Climate and Clean Air Coalition Oil & Gas Methane Partnership (CCAC OGMP) in 2015. BP is, as per the OGMP expectations, gradually increasing participation of its Upstream assets

within the initiative. Currently included are the Angola, Asia Pacific and Trinidad regions.

Our L48 business has been actively reducing methane emissions for many years which, for example, include the change out of thousands of high bleed controllers and the expanded use of solar pumps to replace gas powered pumps in remote locations with no access to grid power. This work continues.

Upstream held a leadership hosted methane workshop in March 2018 where plans were discussed for BP to become a "leader in methane reductions". The outcomes are still being developed and incorporated into the Upstream Methane Plan and, could for example, could see BP rapidly deploy methane monitoring and/or reduction technology, and possibly increase the number of assets included within the CCAC OGMP.

External initiatives
BP is partnering with peers, NGOs and academic institutions to advance how the industry as a whole can detect, quantify and reduce emissions. These include;

- OGCI will invest in technologies to improve measurement and reduce emissions and has an aim to work towards near-zero methane emissions from the gas value chain. OGCI will also publish a baseline for methane intensity and aims to announce a methane intensity target in September 2018. OGCI is looking at the distribution element of the gas value chain and will propose concrete actions to support methane management in that space.
- Methane Guiding Principles - In November 2017, BP and seven peers, including Exxon and Shell, signed up to five "Guiding Principles" for reducing methane emissions across the gas value chain. Chevron and Gazprom together with a number of others signed up in May 2018, talking the total to 12 companies. These guiding principles were developed in participation with NGOs and others. They are:
    1. Continually reduce methane emissions;
    2. Advance strong performance across gas value chain;
    3. Improve accuracy of methane emissions data;
    4. Advocate sound policies and regulations on methane
    5. Increase transparency.
- Oil and Gas Methane Partnership - part of the Climate and Clean Air

Coalition, this supports the improved knowledge and targets reduction in methane emissions at an operational site level. Technical Guidance Documents were published in 2017 for none core methane sources.

- The Environmental Partnership - BP's US onshore business has signed up to this API initiative, in which member companies commit to minimize methane emissions and to share information on technology deployment.
- Carbon Mitigation Initiative – BP is funding a multi-year program at Princeton University to better understand the global methane cycle, including the variability of the natural and anthropogenic sources and sinks, and how these might change in the future as a result of climate change.

Peer activity

All our major peers acknowledge the importance of methane emissions for the sector, but announcements on public targets have been fairly limited. A summary of current targets is provided below for reference, recognizing that these are subject to change as focus on methane and demand for action by the sector increases;

- Eni has a target of a 80% reduction in upstream fugitive methane by 2025 compared to 2014.
- Exxon has a target to reduce methane emissions by 15% by 2020 and plan to phase out high-bleed pneumatic devices from their onshore US operations within 3 years from 2017.
- OGCI aims to announce its target for methane emissions in 2018, applicable to emissions from aggregated member companies' operated facilities.

Conclusions and Recommendations

The methane issue has developed in many ways since BP's position was last reviewed in 2015. This has already been recognized internally, culminating in BP setting the external methane intensity target in April 2018. It is essential that BP's position is updated to reflect the external statements, and the changes in the external environment that prompted BP to take this action.

Muhunthan Sathiamoorthy & Mike McMahon
15 June 2018

Agenda Item 6: Role of oil

Members of the Issues Management Working Group

## Role of oil

An information note has been prepared to summarise BP's view on the outlook and future role of oil. The paper considers current and projected supply and demand for oil and the possible implications of technology, policy and societal preference changes.

The purpose of this IMWG session is to note this information.

Spencer Dale
15 June 2018

Members of the Issues Management Working Group

## The role of oil

What is the issue?
Oil has been the world's leading fuel by market share for nearly 60 years, and it plays a critical role in meeting the first of the "dual challenges" – the need for energy to fuel continued global economic growth. Predictions in relation to consumption and production of oil in a transitioning energy system are subject to a number of uncertainties.

Oil in today's energy mix
Today, oil is the world's leading energy source, as it has been since surpassing coal in the early 1960s. Oil's share of the global energy mix, however, has been eroding, from a peak of nearly 50% in 1973 to about one-third today.

Consumption
Consumption in recent years has grown robustly, and global consumption is approaching 100 Mb/d. Just over half of global consumption (and by far the most rapid growth) is in emerging economies, with China alone accounting for half of global growth over the past decade.

By sector, oil use is focused in transportation (roughly 55% of current consumption). Within the transport sector, oil accounts for about 95% of current consumption. By mode, trucks comprise the largest share of oil consumed in transport (just over 40%), followed by cars (about one-third) with the remainder consumed in other modes (largely air, marine, and rail). Just under 30% of oil use today is in industry (half of which is non-combusted, largely petrochemical feedstocks), with the remainder split between power and other applications.

Production
Global oil production is also approaching 100 Mb/d. OPEC today accounts for just over 40% of global production – well below the peak share of over 50% seen in the early 1970s, but well above the low-point of about 28% in

1985. A key variable in recent years has been the behaviour of OPEC (and more recently, some non-OPEC countries including Russia). The decision by OPEC in 2014 to not cut production in order to make room for US tight oil growth was followed by the collapse in prices; more recently, OPEC, Russia and several other non-OPEC countries have cooperated in cutting production to reduce surplus inventories and support prices.

By far the most rapid growth in global production in recent years has been in the US, where the tight oil revolution has made the US the world's largest oil producer.

Reserves

Oil resources are ample. Indeed, industry has proved to be far better at finding oil than the world has been at consuming it, as evidenced by data showing that global proved reserves have more than doubled since 1980 (when our data set begins) even though cumulative production since then has exceeded global proved reserves in 1980.

Proved reserves at end-2016 were about 1.7 trillion barrels, sufficient to cover current production for roughly 50 years. Just over 70% of current proved reserves are in OPEC countries, led by Venezuela and Saudi Arabia. On a broader definition, technically recoverable resources are estimated to exceed 2.5 trillion barrels, sufficient to meet potential demand to 2050 in most scenarios more than twice over.

Recent policy developments

Recent policy developments have sought to restrict support for the extraction of and demand for oil.

In the summer of 2017, the French and UK governments announced plans to halt the sale of vehicles powered by diesel and gasoline ICEs by 2040. Similar measures have also been considered by Norway and Germany. India declared its ambition to have all cars sold in the country be electric by 2030. In September, China announced that it is also considering a ban on gasoline and diesel engines.[1]

[1] Note that the term "electric" often includes battery electric and plug in hybrid electric vehicles, as well as hybrid electric vehicles (which are primarily propelled by ICEs).

Federal supply side policies to restrict oil exploration and supply have been announced in several countries. In December 2017, France became the first country to ban new oil exploration licenses with immediate effect and all oil extraction by 2040. The move was largely seen as symbolic, since oil and gas produced in France accounts for just 1% of domestic consumption. Belize has since adopted a full oil moratorium for all its offshore waters. In April 2018, New Zealand announced there will be no further offshore oil and gas exploration permits granted. The decision does not affect current reserves or potential finds from current exploration permits.

In January 2018, the World Bank announced that it will no longer finance upstream oil and gas projects after 2019, apart from certain gas projects in the poorest countries in exceptional circumstances.

Through the Talanoa dialogue – the facilitative dialogue convened through the Paris Agreement – the UNFCCC secretariat and component bodies has solicited stakeholders' views on policy issues. The UNFCCC Secretariat's overview of inputs received to April 2018 noted managing fossil fuel production and phasing out fossil fuel subsidies as one trend for those submissions received.[2] Some countries have announced fossil fuel subsidy reforms as part of their Paris commitments.

Oil in the future energy mix

Future prospects for oil in the global energy mix are subject to a number of uncertainties. Key factors including the pace of technological change (impacting both supply and demand), policy, and consumer preferences will have potentially significant impacts. However, under a wide range of scenarios (including a scenario consistent with a world on track to meet sustainable development objectives[3]), two key conclusions emerge:

[2] https://img1.wsimg.com/blobby/go/9fc76f74-a749-4eec-9a06-5907e013dbc9/downloads/1cbos7k3c_792514.pdf

[3] In the IEA's Sustainable Development Scenario, global $CO_2$ emissions peak before 2020 and decline swiftly. By 2040, emissions are at the lower end of a range of publicly available decarbonisation scenarios, all of which estimate a temperature increase of around 1.7-1.8°C in 2100.

- Global oil demand is unlikely to drop sharply at least out to 2040. Oil is expected to play a key role in fuelling continued global economic growth; and
- Significant investment is needed to enable new production, due to the natural decline of the current global production base.

In the BP Energy Outlook's Evolving Transition case, an emerging Age of Abundance influences the behaviour of key oil producers, with important implications for oil's competitiveness in the world energy mix. (See discussion below.)

Consumption

In the BP Energy Outlook, a range of scenarios are examined; in the Evolving Transition scenario, oil consumption rises to around 110 Mb/d, plateauing in the 2030s.

The slowdown in oil consumption in this scenario is concentrated in the transport sector as efficiency is assumed to improve. Oil consumption in the non-combusted sector continues to grow, largely for petrochemical feedstocks. This scenario assumes that more aggressive government policies are implemented to slow the growth of consumer plastics.

The Energy Outlook explores a range of potential outcomes for oil consumption. In a scenario which bans the sale of internal combustion engines in cars by 2040, oil consumption by cars is cut in half, although growth elsewhere (as in the ET scenario) means that total oil consumption is still higher than in 2016. In a scenario consistent with a world on track to meet sustainable development objectives (the Even Faster Transition, EFT), oil consumption falls – but not precipitously – to about 85 Mb/d by 2040.[4]

Oil remains a leading part of the world energy mix under all of these scenarios. In the ET scenario, oil's share of global energy consumption declines slowly but remains a leading fuel, accounting for 27% of global energy consumption (roughly equal to the natural gas share). Among other forecasters, there is a relatively narrow range of views regarding the future

[4] Note that scenarios consistent with achieving sustainable development objectives would require much steeper declines in consumption of oil – and other fossil fuels – beyond 2040.

growth of oil and gas. Under the EFT scenario, oil's share falls to 22%. While oil consumption declines in this scenario, by 2040 it remains more than 80% of current consumption and, as discussed below, this scenario would still require significant investment in new oil production to meet future demand.

Peak oil demand

Predictions for the date that oil demand will peak often dominates discussion of the role of oil in the future energy mix. To this end, company statements on demand peaks are of significant interest. Shell has suggested the peak could come as early as the late-2020s. Equinor (Statoil) believes it could be between the mid-2020s and the late-2030s.

BP has expressed the view that this focus is misplaced. The date at which oil demand will stop growing is highly uncertain and small changes in assumptions can lead to vastly different estimates. The significance of peak oil is more that it signals a shift from an age of perceived scarcity to an age of abundance – and with it, a likely shift to a more competitive market environment. This change in paradigm is also likely to pose material challenges for oil producing economies as they try both to monetize their oil resources, and at the same time diversify their economies for a world in which they can no longer rely on oil revenues to provide their main source of revenue.

<u>Production</u>

As with oil consumption, the BP Energy Outlook examines a range of scenarios for oil production; in the Evolving Transition scenario, oil production rises to meet consumption, reaching about 110 Mb/d and plateauing in the 2030s.

The growth in supply is roughly split between OPEC and US tight oil, with US production rising in the early years and OPEC capturing much of the net increase in later years.

A key assumption behind this scenario is that, for now, key OPEC producers have economies that are highly dependent on oil revenues. Accordingly, they manage production to support revenues and prices in the near-term. But over time, the abundance of global oil resources is assumed to prompt OPEC members to reform their economies, reducing their dependency on

oil and allowing them gradually to adopt a more competitive strategy of increasing their market share.
For there to be sufficient oil supplies to be able to meet demand in any of the demand scenarios considered requires significant levels of new investment in oil production. If there were no new investment in oil production from today, and existing production declined at a conservative 3% p.a., global oil supplies would be around 45 Mb/d in 2040.

Decarbonisation of oil – biofuels
Biofuels help provide a lower-carbon future as they can be used in existing cars and infrastructure without major changes, subject to specification limits. In the longer term, biofuels can also help reduce emissions in aviation and haulage where moving to electrification is much more difficult.

In the Energy Outlook's ET Scenario, biofuels production rises to almost 4.5 Mb/d by 2040, an increase of about 2 Mb/d from current levels. While the volumetric increase is similar to that seen over the past 25 years, the annual average growth rate (2.6%) is considerably slower (nearly 9% p.a.). This slowdown is due to (i) concerns over land use impacts (e.g. clearing forests; competition with agricultural land or food crops) and (ii) a gradual realization that carbon can be reduced more efficiently elsewhere. Policy support in many countries is trying to switch from food-based biofuels (e.g. corn) to second generation (e.g. agricultural wastes). This is more difficult and will contribute to a slower rate of growth in the future.

Advantaged oil
BP's strategy to address these uncertainties is focused on identifying and developing advantaged oil assets. These are either low cost or high margin, or both, with the intent to build a portfolio that is resilient to whatever the price environment. This is underpinned by our focus on quality execution and investment discipline. This overall approach will help ensure that BP remain competitive regardless the external environmental factors.

In addition, BP is actively pursuing opportunities in low carbon energy to build a platform of new businesses to help ensure the business is well positioned for the energy transition.

Conclusions

We expect oil to remain a significant part of the world's energy system for decades to come. It is crucial to meeting one of the "dual challenges": of securing sufficient energy to sustain continued economic growth. And continued oil consumption is not incompatible with meeting sustainability objectives.

The future path of oil consumption is uncertain. However, under any scenario, including ones that are consistent with meeting Paris commitments, the natural decline of the current production base means that considerable investment will be required for oil production to meet potential future demand.

The dawning of an age of abundance means that previous concerns about future oil availability and cost are unlikely to be an obstacle to oil's future in the world energy system. Indeed, changes in the strategic behavior of key oil producers could result in oil pricing that is more competitive vis-à-vis competing fuels, potentially complicating efforts to transition to a lower-carbon energy future.

A well-designed carbon pricing framework is the most comprehensive and economically efficient policy to limit GHG emissions. Government policy should avoid the temptation to "pick winners" by adopting policies focused on a single fuel or technology.

Mark Finley
15 June 2018

# Agenda Item 7: IMWG process and forward agenda

Members of the Issues Management Working Group

## IMWG process

The purpose of this IMWG session is to review and approve the remaining 2018 agenda.

Antony Andrews
15 June 2018

Members of the Issues Management Working Group

2018 forward agenda

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The following issues are scheduled for discussion in September 2018:

- Electrification and automation of transport (revision): Recent commitments by auto-manufacturers and states/cities have prompted significant media interest in electric vehicles. The position should reflect activity by the downstream taskforce and any changes in BP's outlook for future mobility as a result of that activity and the evolving external environment.

- Strategic resilience (new position): In an uncertain and changing world, all companies – including those in the energy sector – must ensure that they are able to adapt. Investors and other stakeholders are pressing companies to articulate and demonstrate this ability, including through the disclosure of evaluations against a range of future scenarios. Following discussion of an information note on strategic resilience in March, we will discuss a position succinctly describing how we ensure our business is, and will remain, 'resilient'.

- Sensitive and protected areas (revision): External stakeholders, including investors, have continued to raise concerns with BP about operating in sensitive and protected areas. Extraction companies continue to be pressured to declare specific "no go" commitments. A review of this position is proposed to reflect external changes, as well as any internal developments.

- Air quality (revision): Since the position was agreed in 2015, air quality has continued to grow as an issue. The use of diesel cars in cities is particularly relevant for BP and engagement with stakeholders, primarily in Europe. A revised position should reflect this changing focus. An alternative option would be to develop a position on diesel itself.

Given the probable need in September also to conclude discussion of several of the June topics, four issues for September may be too much, making it prudent to defer Air Quality until December. On the other hand, several new topics are rapidly rising up the agenda - including Advocacy

and Lobbying, Long-term and Science-based Targets, and the Role of gas in transport – which we may wish to consider in December in place of some of those currently scheduled. There are also existing positions that are several years old and may need to be revisited, including Arctic and Oil sands.

The full 2018 agenda is at Appendix 1 for information.

Antony Andrews
15 June 2018

IMWG 2018 Forward agenda

| Issue | Lead | Type | Notes |
|---|---|---|---|
| | | March IMWG | |
| Fossil fuel subsidies | Group Economics | New position | Calls to remove (inefficient) fossil fuel subsides continue to mount from certain stakeholder groups (e.g. IMF, NGOs, G20), particularly after the Paris Agreement. Definitions of what is meant by a subsidy vary widely and there is a risk that the debate is dominated by an overly simplistic narrative. |
| Portfolio resilience | Group strategic planning / Group policy / C&EA | Information note | The resilience of BP's and peer companies' portfolios to a variety of future climate scenarios is of significant interest to shareholders and other stakeholders. Describing how our portfolio is resilient would be useful. This paper could also help explain the purpose of exploration in a world of abundance – i.e. responding to queries from stakeholders regarding why BP choses to continue to invest in exploration even in a carbon constrained world |
| Waste plastics | S&OR / Petchems | Oral presentation | Awareness and concern about the disposal of plastics, primarily into the marine environment, is escalating quickly. This is raising questions about the way in which plastics are used. There is growing pressure on large users of plastics to act and attention could turn towards the role of manufacturers. |
| | | June IMWG | |
| The role of gas | Group strategic planning | Revision | Since the original position was agreed, BP has deepened its commitment to gas. A revised position is needed to reflect the evolution of our strategy relating to gas, as well as recent activity looking at gas in Upstream, Midstream and Downstream. It will also expand to consider the role of hydrogen and biogas. |
| Methane emissions | S&OR/ Group policy | Revision | Methane remains a significant issue for BP and the oil and gas sector and BP is now positioning itself as a leader in methane management. The position should reflect that aspiration and consider related supporting messaging on methane. |
| Environmental Performance Standards (EPS) | Group policy | Information note | EPS in power have been proposed in both the EU and US. While they offer potential benefits in supporting natural gas, there are risks. These include the possibility that tightening standards could quickly exclude natural gas, and that the principle of standards could be extended to other sectors, including fuels. |

| Issue | Lead | Type | Notes |
|---|---|---|---|
| Role of oil | Group economics | Information note | BP, and many of our peers, has focused on the future role of gas in a carbon constrained world. The view for the role of oil in the long term is less clear, with projections for peak oil demand tending to dominate much external commentary. Articulating the role for oil in the global economy – and within BP's portfolio – could be helpful. |
| | | September IMWG | |
| Electrification and automation of transport | Downstream | Revision | Recent commitments by auto-manufacturers and states/cities have prompted significant coverage of electric vehicles. The position should reflect activity by the downstream taskforce and any changes in BP's outlook for future mobility as a result of that activity and the evolving external environment. |
| Strategic resilience | Group strategic planning / Group policy | New position | In an uncertain and changing world, all companies – including those in the energy sector – must ensure that they are able to adapt. Investors and other stakeholders are pressing companies to articulate and demonstrate this ability, including through the disclosure of evaluations against a range of future scenarios. It is important that we can succinctly describe how we ensure our business is, and will remain, 'resilient'. |
| Sensitive and protected areas | S&OR / Group policy | Revision | External stakeholders, including investors, have continued to raise concerns with BP about the issues of operating in sensitive and protected areas. Extraction companies continue to be pressured to declare specific "no go" commitments. A review of this position is proposed to reflect external changes, as well as any internal developments. |
| Air quality | S&OR / Downstream / Group policy | Revision | Since the position was agreed in 2015, air quality has continued to grow as an issue. The use of diesel cars in cities is particularly relevant for BP and engagement with stakeholders, primarily in Europe. A revised position should reflect this changing focus. An alternative option would be to develop a position on diesel itself. |
| | | December IMWG | |
| Energy access | Group policy | Information note | The importance of providing access to energy for the world's poor is a significant focus of policy at the international level through initiatives such as the UN Sustainable Energy for All initiative. The role of enabling greater access to energy also forms parts of our (and our industry's) narrative when advocating for the continued need for fossil fuels. It may be helpful to have a position to respond to any challenges/questions on this. |

| Issue | Lead | Type | Notes |
|---|---|---|---|
| Waste plastics and the circular economy | S&OR / Group policy | New position | Awareness and concern about the disposal of plastics, primarily into the marine environment, is escalating rapidly. There is growing pressure on large users of plastics to act and attention could turn towards the role of manufacturers. This is further raising questions about the way in which plastics are used and the broader implications and opportunities from the circular economy. |
| Climate change adaptation | S&OR / Group policy | Revision | Adaptation has attracted a lot more attention since the position was last agreed in 2014. A more 'on the front foot' position, with more specifics on what we are doing operationally and how important this is would be helpful to respond to this interest. |
| Net positive approach (NPA) | S&OR/Group policy | Information note | NPA - where businesses are expected to demonstrate positive environmental or societal impacts in key areas of their operations – is starting to gain some momentum amongst NGOs and may become an issue in the future. |