Veolia's contribution to the call for evidence on the Sixth Carbon Budget, Committee on Climate Change

February 2020

Question and answer form

A. Climate science and international circumstances

Question 1: The climate science considered in the CCC's 2019 Net Zero report, based on the IPCC Special Report on Global Warming of 1.5°C, will form the basis of this advice. What additional evidence on climate science, aside from the most recent IPCC Special Reports on Land and the Oceans and Cryosphere, should the CCC consider in setting the level of the sixth carbon budget?

ANSWER: No comment

Question 2: How relevant are estimates of the remaining global cumulative CO_2 budgets (consistent with the Paris Agreement long-term temperature goal) for constraining UK cumulative emissions on the pathway to reaching net-zero GHGs by 2050?

ANSWER: No comment

Question 3: How should emerging updated international commitments to reduce emissions by 2030 impact on the level of the sixth carbon budget for the UK? Are there other actions the UK should be taking alongside setting the sixth carbon budget, and taking the actions necessary to meet it, to support the global effort to implement the Paris Agreement?

ANSWER:

With the recent UK commitment to achieve net zero GHG emissions by 2050, it is important that key milestones, such as emissions reduction by 2030, are in place nationally in order to evaluate and measure UK's progress. We suggest that some degree of alignment should be put in place between the 6th carbon budget emissions reductions and emerging international commitments. This will ensure that the UK follows a coherent trajectory domestically and internationally while demonstrating global leadership.

Alongside international commitments and climate policy, which are essential and provide impetus, it is also important that the UK has a clear direction and action plan. The key is that any targets must have integrity, a clear path and available funding mechanisms to achieve them.

Industry and business communities will play a huge role in delivering the economic, social and technological transformation leading to net-zero. In this regard, businesses need to fully understand how to prepare for a net-zero world and reap the benefits of it. For

example, there is currently a lack of unified framework around GHG emissions reporting. Companies calculating and reporting their carbon emissions are not expected to follow a particular framework on GHG reporting. This induces a lack of clarity and benchmarking on the method used to report. This also leads to additional difficulties to verify and hold accountable the results from the companies who report on GHG. So there is no level playing field held and the 'best' cannot cannot gain the appropriate reputational benefits.

Question 4: What is the international signalling value of a revised and strengthened UK NDC (for the period around 2030) as part of a package of action which includes setting the level of the sixth carbon budget?

ANSWER: No comment

B. The path to the 2050 target

Question 5: How big a role can consumer, individual or household behaviour play in delivering emissions reductions? How can this be credibly assessed and incentivised?

ANSWER: No comment

Question 6: What are the most important uncertainties that policy needs to take into account in thinking about achieving Net Zero? How can government develop a strategy that helps to retain robustness to those uncertainties, for example low-regrets options and approaches that maintain optionality?

ANSWER:

In our view, the key elements of the journey to net zero are planning, financing and delivering - all under an umbrella of credibility and accountability.

In planning net zero, we recommend developing a credible and crucially actionable plan for the Government but also for businesses and public sector organisations. While 65% of councils have declared a climate emergency, 43% don't measure all energy use in council-owned buildings and 47% of English local authorities admit they have no plan in place to reduce emissions.

In financing net zero, we recommend to ensure that the existing finance models are still fit for purpose. Net zero will be a phased achievement for many businesses and financing models should take this into account. Strategic decisions involving payback considerations and the economic and bankable viability of projects/technologies are likely to be phased out in the investment cycle. Veolia's market research[1] has shown that the biggest challenge faced by businesses to deliver their energy and carbon targets is the cost, with many unwilling to proceed with energy efficiency projects if the payback is more than two

[1] Veolia UK (2019) Tackling Energy Efficiency in Buildings
https://www.veolia.co.uk/insight/energy-efficiency-white-paper

years. In addition, the limited budget available for energy related projects is the biggest barrier to senior managers for energy project approval.

In delivering net zero, we recommend moving from aspirations and plans to concrete and sustainable action. This is particularly true as there is currently a delivery gap. Although significant funding is readily available and innovative projects and solutions (that have been trialled) have emerged, there is a disconnect between money and projects. Industry, commerce and the public sector need to take bigger steps in implementing energy management. From our experience, energy management has proved that decentralised energy systems and energy efficiency make major changes to carbon emissions and deliver both energy security and energy cost savings for the long term.

We also understand that carbon emission reductions and carbon pricing are necessary measures which could be delivered in a balanced approach. We support a tax of £30 to £40 per tonne for net emitters of carbon. Although carbon taxation can be a helpful mechanism, the Government should keep in mind that the existing discrepancy of tax regimes applicable to the different energy sources undermines the actual behavioural change. When it comes to carbon taxation a smart tax regime is required. Simple taxing a myriad of products is too complex, whereas a blanket tax is also counterproductive, for example a carbon tax of £70/t would add only 15 pence per litre to the price of petrol, this would not deter people from buying petrol only raise the costs for the low income population. Adding a £70 carbon tax to some products would not deter its use but only raise taxes without a solution.

We believe policy measures are required in addition to a general carbon tax, with offsets for those on low income who may be impacted during the change. Policy measures may include, electrification of the transport network, incentives and investment in the heat network to replace gas (in light of the fact that hydrogen is too far away to make significant inroads in the next 15 years), and policy measures similar to the landfill tax escalator for fossil energy use. The smoking gun of climate change is the 70% of gas based energy we are using for industry and home consumption, as well as supply chain imported carbon. These are the 3 key elements to address. A granular plan for the different sectors, taking into account 3rd party, scope 3 supply chain emissions is needed.

The resource sector and similar carbon reducing industries which contribute towards the UK achieving its carbon budgets should not be penalised, either by being omitted from any such taxation scheme or being given a credit for its carbon reducing activities that can be offset against its emissions. As an example, a recycling facility saves approximately 10 times as much carbon as it consumes and therefore this type of infrastructure should be exempt otherwise it will deter this activity.

Question 7: The fourth and fifth carbon budgets (covering the periods of 2023-27 and 2028-32 respectively) have been set on the basis of the previous long-term target (at least 80% reduction in GHGs by 2050, relative to 1990 levels). Should the CCC revisit the level of these budgets in light of the net-zero target?

ANSWER: No comment

Question 8: What evidence do you have of the co-benefits of acting on climate change compatible with achieving Net Zero by 2050? What do these co-benefits mean for which emissions abatement should be prioritised and why?

ANSWER:

Efficiency represents the perfect example to fight climate and the biggest opportunity in reducing carbon emissions. Indeed, measures such as investing in the technology of battery storage to support the Grid at peak time or switching off power during peak time are judged essential to allow currently unreliable but clean energy sources such as solar and wind to expand further. This can ultimately lead to a reduction in fossil fuels in the energy mix and therefore a reduction of GHG emissions and improved air quality.

Energy recovery has a role to play in the transition to a circular and net zero economy, as it has the potential, through smart district heating networks, to help scaling up a sustainable deployment of low-carbon heat. It has the benefit of diverting substantial quantities of residual waste from landfill, where methane would have been produced (with methane being more than 25 times more potent than CO2). It contributes minimising reliance on fossil fuels for electricity generation, which have to be mined, transported and then burnt. 50% of an Energy Recovery Facility's (ERF) fuel is biomass, a carbon neutral source that reduces emissions.

As an example, Veolia operates 10 ERFs across the country, treating a total of 2.4m tonnes of waste per year. By diverting this waste from landfill, we saved over 252,000 tonnes of CO2 and exported over 1.2TWh of electricity to the Grid and 0.15TWh of heat to district heating networks. 10m tonnes of waste in the UK is still landfilled every year, the majority of which is suitable for energy recovery. If all of this waste was diverted from landfill to energy recovery, this would save in the region of 880,000 tonnes of CO2 per year.

From our perspective, all our facilities, whether sorting or recycling materials, recovering energy from non-recyclable waste or generating biogas from food waste, are designed to reduce carbon emissions and save natural resources. It would be sensible to differentiate the applicability of carbon reduction measures to industry-led projects which inherently save carbon, greenhouse gas emissions and reduce climate change by investing in bespoke waste management, renewable energy and water treatment solutions, but also to include the savings created when assessing the carbon impact of the facilities.

C. Delivering carbon budgets

Question 9: Carbon targets are only credible if they are accompanied by policy action. We set out a range of delivery challenges/priorities for the 2050 net-zero target in our Net Zero advice. What else is important for the period out to 2030/2035?

ANSWER:

For the period out to 2030-2035, we recognise that emerging technologies may have a place but the reality in many cases is that the technology and economics are not quite there yet. Therefore, it is a sensible strategy to rely on already existing, available, viable and proven technologies such as district heating, batteries, heat pumps, biogas CHPs and renewable energy. From our perspective, harnessing the full potential of these technologies will give a "breathing space" (10 to 15 year period) to companies to start their emissions reductions. Waiting for the next innovation simply delays action whilst there are solutions to achieving large and immediate reductions today.

Question 10: How should the Committee take into account targets/ambitions of UK local areas, cities, etc. in its advice on the sixth carbon budget?

ANSWER: No comment

Question 11: Can impacts on competitiveness, the fiscal balance, fuel poverty and security of supply be managed regardless of the level of a budget, depending on how policy is designed and funded? What are the critical elements of policy design (including funding and delivery) which can help to manage these impacts?

ANSWER: No comment

Question 12: How can a just transition to Net Zero be delivered that fairly shares the costs and benefits between different income groups, industries and parts of the UK, and protects vulnerable workers and consumers?

ANSWER: No comment

D. Scotland, Wales and Northern Ireland

Question 13: What specific circumstances need to be considered when recommending an emissions pathway or emissions reduction targets for Scotland, Wales and/or Northern Ireland, and how could these be reflected in our advice on the UK-wide sixth carbon budget?

ANSWER: No comment

Question 14: The Environment (Wales) Act 2016 includes a requirement that its targets and carbon budgets are set with regard to:

- The most recent report under section 8 on the State of Natural Resources in relation to Wales;
- The most recent Future Trends report under section 11 of the Well-Being of Future Generations (Wales) Act 2015;

- The most recent report (if any) under section 23 of that Act (Future Generations report).

a) What evidence should the Committee draw on in assessing impacts on sustainable management of natural resources, as assessed in the state of natural resources report?

b) What evidence do you have of the impact of acting on climate change on well-being? What are the opportunities to improve people's well-being, or potential risks, associated with activities to reduce emissions in Wales?

c) What evidence regarding future trends as identified and analysed in the future trends report should the Committee draw on in assessing the impacts of the targets?

d) Question 12 asks how a just transition to Net Zero can be achieved across the UK. Do you have any evidence on how delivery mechanisms to help meet the UK and Welsh targets may affect workers and consumers in Wales, and how to ensure the costs and benefits of this transition are fairly distributed?

ANSWER: No comment

Question 15: Do you have any further evidence on the appropriate level of Wales' third carbon budget (2026-30) and interim targets for 2030 and 2040, on the path to a reduction of at least 95% by 2050?

ANSWER: No comment

Question 16: Do you have any evidence on the appropriate level of Scotland's interim emissions reduction targets in 2030 and 2040?

ANSWER: No comment

Question 17: In what particular respects do devolved and UK decision making need to be coordinated? How can devolved and UK decision making be coordinated effectively to achieve the best outcomes for the UK as a whole?

ANSWER: No comment

E. Sector-specific questions

Question 18 (Surface transport): As laid out in Chapter 5 of the Net Zero Technical Report (see page 149), the CCC's Further Ambition scenario for transport assumed 10% of car miles could be shifted to walking, cycling and public transport by 2050 (corresponding to over 30% of trips in total):

a) What percentage of trips nationwide could be avoided (e.g. through car sharing, working from home etc.) or shifted to walking, cycling (including e-bikes) and public transport by 2030/35 and by 2050? What proportion of total UK car mileage does this correspond to?

b) What policies, measures or investment could incentivise this transition?

ANSWER: No comment

Question 19 (Surface transport): What could the potential impact of autonomous vehicles be on transport demand?

ANSWER: No comment

Question 20 (Surface transport): The CCC recommended in our Net Zero advice that the phase out of conventional car sales should occur by 2035 at the latest. What are the barriers to phasing out sales of conventional vehicles by 2030? How could these be addressed? Are the supply chains well placed to scale up? What might be the adverse consequences of a phase-out of conventional vehicles by 2030 and how could these be mitigated?

ANSWER: No comment

Question 21 (Surface transport): In our Net Zero advice, the CCC identified three potential options to switch to zero emission HGVs – hydrogen, electrification with very fast chargers and electrification with overhead wires on motorways. What evidence and steps would be required to enable an operator to switch their fleets to one of these options? How could this transition be facilitated?

ANSWER: No comment

Question 22 (Industry): What policy mechanisms should be implemented to support decarbonisation of the sectors below? Please provide evidence to support this over alternative mechanisms.

a) Manufacturing sectors at risk of carbon leakage

b) Manufacturing sectors not at risk of carbon leakage

c) Fossil fuel production sectors

d) Off-road mobile machinery

ANSWER: No comment

Question 23 (Industry): What would you highlight as international examples of good policy/practice on decarbonisation of manufacturing and fossil fuel supply emissions? Is there evidence to suggest that these policies or practices created economic opportunities (e.g. increased market shares, job creation) for the manufacturing and fossil fuel supply sectors?

ANSWER: No comment

Question 24 (Industry): How can the UK achieve a just transition in the fossil fuel supply sectors?

ANSWER: No comment

Question 25 (Industry): In our Net Zero advice, the CCC identified a range of resource efficiency measures that can reduce emissions (see Chapter 4 of the Net Zero Technical Report, page 115), but found little evidence relating to the costs/savings of these measures. What evidence is there on the costs/savings of these and other resource efficiency measures (ideally on a £/tCO2e basis)?

ANSWER: No comment

Question 26 (Buildings): For the majority of the housing stock in the CCC's Net Zero Further Ambition scenario, 2050 is assumed to be a realistic timeframe for full roll-out of energy efficiency and low-carbon heating.

a) What evidence can you point to about the potential for decarbonising heat in buildings more quickly?

b) What evidence do you have about the role behaviour change could play in driving forward more extensive decarbonisation of the building stock more quickly? What are the costs/levels of abatement that might be associated with a behaviour-led transition?

ANSWER:

a) As the Association for Decentralised Energy (ADE) has rightly pointed out, heat networks will play a crucial, strategic role in decarbonising heat in the UK. The Government's Clean Growth Strategy, forecasts the need for 17% or more of non-domestic and domestic heating demand to be met by heat networks by 2050. In meeting this demand for low carbon heating in 2050, heat networks will also play a strategic role in supporting the greater use of waste heat, i.e Energy from Waste facilities.
b) The installation of metering devices could result in energy savings due to behaviour change by final consumers (reduction in heating and cooling use by final consumers). It is however worth mentioning that behaviour change happens over time and ongoing effective communication and education is necessary (which is an additional cost).

Question 27 (Buildings): Do we currently have the right skills in place to enable widespread retrofit and build of low-carbon buildings? If not, where are skills lacking and what are the gaps in the current training framework? To what extent are existing skill sets readily transferable to low-carbon skills requirements?

ANSWER:

It is essential that the Government supports the wider skills and retraining agenda. Robotics and the rise of artificial intelligence will replace many low skill and repetitive job roles even in the low carbon and renewable energy sectors. The wider industry impact will see human workforces reskilling and upskilling for the workplace - these changes are important to keep in mind when designing the future climate policy to achieve net zero.

The latest Office for National Statistics (ONS) estimates indicated that Britain's green economy has shrunk since 2014 with the number of people employed declining by more than 11,000 between 2014 and 2018. We recommend the Government to consider a forward-looking approach to ensure that green jobs remain attractive to a wide range of high and low skilled people.

It is worthwhile noting that the heat networks industry will create around 16,000 direct jobs in construction, operation and maintenance by 2030, which will grow to around 35,000 new jobs by 2050. This is in addition to a further 33,000-65,000 jobs created in the wider supply chain. [2]

In addition, it is important to provide local governments with adequate support to ensure that enforcement and inspection by competent experts are delivered in due time and course. When it comes to energy efficiency in buildings, the EIC report "Improving Non-Domestic Energy Efficiency After Brexit: the challenge and the opportunity"[3] informs that inspections are currently performed by local Trading Standards officers which cover areas from energy efficiency to fair trading, to food standards, to health and safety, to fraud, to animal welfare. Interestingly, "Trading Standards offices around the country have been facing budget restrictions as a result of government austerity since 2010 – the National Audit Office found that the amount of Trading Standards officers had reduced by 56% since 2009, and that overall budgets for Trading Standards had reduced by 46% since 2011". It is therefore highly likely that enforcing energy efficiency policy at the local level has been a low priority - a consideration to bear in mind as it is at the local level that actions to reduce emissions matter the most.

Question 28 (Buildings): How can local/regional and national decision making be coordinated effectively to achieve the best outcomes for the UK as a whole? Can you point to any case studies which illustrate successful local or regional governance models for decision making in heat decarbonisation?

ANSWER: No comment

[2] Source: Heat Networks Industry Council - A Proposal to Government

[3] http://eic-uk.co.uk/wp-content/uploads/2018/08/Improving-non-domestic-energy-efficiency-after-Brexit-8.18.pdf

Question 29 (Power): Think of a possible future power system without Government backed Contracts-for-Difference. What business models and/or policy instruments could be used to continue to decarbonise UK power emissions to close to zero by 2050, whilst minimising costs?

ANSWER:

The key challenge in this Carbon Budget Period will be decarbonising heat, buildings and transport. We do not see a role for major Government subsidy of electricity generation types however if the UK is to successfully decarbonize heat it will be necessary to overcome three main challenges:

1. [NETWORKS] building network infrastructure (ie replacing steel pipes with plastic ones in order to transport hydrogen; upgrading electricity networks to cope with increased demand; connecting existing renewable heat sources like energy from waste into industrial "clusters");
2. [BASELOAD] ensuring that baseload renewable plant can continue to operate in a very low power price environment in light of the heat decarbonisation benefits it brings. This could be brought about through, for example, allowing all of the thermal capacity of heat networks connected to ERFs as well as the electricity generating capacity to participate in the GB Capacity Market. This would recognize that ERFs with district heating brings a double benefit to society.
3. [DEMAND ASSURANCE]: with no net cost to the government, a demand assurance scheme could unlock a significant number of low carbon heating schemes. A rolling fund would be used to pay developments that are not fully built out, and developments will repay into that fund once the network demand passes the point of profitability.

Question 30 (Power): In Chapter 2 of the Net Zero Technical Report we presented an illustrative power scenario for 2050 (see pages 40-41 in particular):

a) Which low-carbon technologies could play a greater/lesser role in the 2050 generation mix? What about in a generation mix in 2030/35?

b) Power from weather-dependent renewables is highly variable on both daily and seasonal scales. Modelling by Imperial College which informed the illustrative 2050 scenario suggested an important role for interconnection, battery storage and flexible demand in a future low-carbon power system:

   i. What other technologies could play a role here?

   ii. What evidence do you have for how much demand side flexibility might be realised?

ANSWER:

a) The Net Zero Technical Report estimates that renewables will contribute up to at least 59% of generation in 2050, including generation from energy-from-waste (equivalent to 2% of generation).

With the UK expected to miss its carbon targets between 2023 - 2032 (4th and 5th carbon budgets) by 180 million tonnes of carbon, Veolia commissioned a report[4] from Imperial College London looking into how the resources and waste sector can save emissions as we approach 2023. It revealed that through various circular innovations, the sector is predicted to save 23 million tonnes of carbon during this 10 year period - equating to a contribution of over 10% of the overall CO2 emission reduction shortfall.

From our perspective, the generation of energy at ERF is a low-carbon technology resulting in overall carbon savings compared to the only practical alternative of landfill: each tonne of waste diverted from landfill to an ERF saves 88kg of CO2 (electricity only) or 154kg of CO2 (electricity and heat).

We believe that energy recovery represents a flexible and reliable source of power and heat in the generation mix in the years to come, fulfilling the renewable obligation. ERFs offer flexibility with thermal stores and Demand Response Solutions providing flexibility to local grids (e.g. peak demand shaving and demand turn-up), with the stores discharging or charging as necessary as heat demand rises and falls. By only using grid electricity to top up requirements, this also minimises the energy used from coal power stations and helps to reduce costs and carbon emissions. As a reliable source, ERFs continuously and predictably generate electricity and heat. Other major benefits include cost savings, independent electricity supply and less exposure to electricity price fluctuations. District Heating Networks have the potential to address, in the most optimal and sustainable way, energy discrepancies across the UK and regional energy poverty.

We wish to add that in the light of the present rate of investment in ERFs, there is a capacity gap with almost 6 million tonnes of residual waste with nowhere to go, even after factoring in a continuation of RDF exports. Closing this gap is estimated to lead to £4.5 billion capital investment; 1,500 permanent jobs in the waste sector and almost 7,500 jobs in the construction phase; and the additional ERFs would produce almost 0.5GW of electricity, capable of powering around 720,000 homes.

Question 31 (Hydrogen): The Committee has recommended the Government support the delivery of at least one large-scale low-carbon hydrogen production facility in the 2020s. Beyond this initial facility, what mechanisms can be used to efficiently incentivise the production and use of low-carbon hydrogen? What are the most likely early applications for hydrogen?

ANSWER: No comment

Question 32 (Aviation and Shipping): In September 2019 the Committee published advice to Government on international aviation and shipping and Net Zero. The Committee recognises that the primary policy approach for reducing emissions in these sectors should be set at the international level (e.g. through the International Civil Aviation Organisation and International Maritime Organisation). However, there is still a role for supplementary domestic policies to complement the international approach, provided these do not lead to concerns about competitiveness or carbon leakage. What are the

[4]The Circular Revolution, Imperial College London report commissioned by Veolia, available at: https://www.veolia.co.uk/sites/g/files/dvc1681/files/document/2015/07/LIVING_CIRCULAR_BROCHURE.pdf

domestic measures the UK could take to reduce aviation and shipping emissions over the period to 2030/35 and longer-term to 2050, which would not create significant competitiveness or carbon leakage risks? How much could these reduce emissions?

ANSWER: No comment

Question 33 (Agriculture and Land use): In Chapter 7 of the Net Zero Technical Report we presented our Further Ambition scenario for agriculture and land use (see page 199). The scenario requires measures to release land currently used for food production for other uses, whilst maintaining current per-capita food production. This is achieved through:

- A 20% reduction in consumption of red meat and dairy
- A 20% reduction in food waste by 2025
- Moving 10% of horticulture indoors
- An increase in agriculture productivity:
  - Crop yields rising from the current average of 8 tonnes/hectare for wheat (and equivalent rates for other crops) to 10 tonnes/hectare
  - Livestock stocking density increasing from just over 1 livestock unit (LU)/hectare to 1.5 LU/hectare

Can this increase in productivity be delivered in a sustainable manner?

Do you agree that these are the right measures and with the broad level of ambition indicated? Are there additional measures you would suggest?

ANSWER: No comment

Question 34 (Agriculture and Land use): Land spared through the measures set out in question 33 is used in our Further Ambition scenario for: afforestation (30,000 hectares/year), bioenergy crops (23,000 hectares/year), agro-forestry and hedgerows (~10% of agricultural land) and peatland restoration (50% of upland peat, 25% lowland peat). We also assume the take-up of low-carbon farming practices for soils and livestock. Do you agree that these are the key measures and with the broad level of ambition of each? Are there additional measures you would suggest?

ANSWER:

With regard to land use and particularly in relation to peatlands, we welcome the recent report from the Committee “Land use: Policies for a Net Zero UK” and supports its recommendation to the Government to consider a ban on the extraction and sale of peat for horticultural use to come into force before 2023.

Peatlands are effectively non-renewable natural assets with indisputable value to a healthy environment, fertile soils and a burgeoning wildlife. Most importantly, the role of peatlands as carbon sinks is essential in retaining carbon, stabilising the carbon cycle and mitigating climate change. The scale of the challenge is enormous - the UK’s peatlands store over 3 billion tonnes of carbon.

Veolia recommends to act on two fronts: discouraging peat use through a phased wholesale ban on peat-based compost while incentivising peat-free alternatives for consumers.

We recommend the following steps:

- Introducing a phased wholesale ban on peat before 2023 given there is a ready-made peat-free alternative from high-quality green waste.
- In the absence of a ban, we suggest addressing the price gap between peat-free and peat-based products by imposing a tax on peat-based products.
- Assuring the quality of peat-free product via a new certification scheme.
- Clearer consumer labelling so consumers can make the 'green and carbon choice'.
- Mandatory reporting for retailers so they are held accountable for sales of peat-based products.

Question 35 (Greenhouse gas removals): What relevant evidence exists regarding constraints on the rate at which the deployment of engineered GHG removals in the UK (such as bioenergy with carbon capture and storage or direct air capture) could scale-up by 2035?

ANSWER: No comment

Question 36 (Greenhouse gas removals): Is there evidence regarding near-term expected learning curves for the cost of engineered GHG removal through technologies such as bioenergy with carbon capture and storage or direct air capture of CO_2?

ANSWER: No comment

Question 37 (Infrastructure): What will be the key factors that will determine whether decarbonisation of heat in a particular area will require investment in the electricity distribution network, the gas distribution network or a heat network?

ANSWER:

We believe that to be successful in decarbonising its heat, the UK must build out city wide heat networks in all major cities. At the moment, new network development is constrained by competition with a very low cost of gas, supplied by an infrastructure that has already been fully amortized. The electricity infrastructure is similar in that the initial network is fully amortised and any reinforcement costs can be levied on millions of bill payers.

The heat network industry will never reach this size and therefore we believe that gas, electricity and heat networks should all be considered in a whole. If not, we can anticipate a race for remaining electrical capacities to fit heat pumps, which will leave no room for electric vehicle infrastructure given that petrol and diesel vehicles will be phased out by 2035.

City wide heat networks are deliverable today, with proven technologies and utilising waste heat which is present in vast quantities in every major city and will release increasing pressure on the electricity network.

Community-level energy infrastructure projects coupled with professional operations and maintenance tend to be more efficient and cost-effective decarbonisation solutions. Currently there is only 215 megawatt (MW) of district heating capacity in UK ERFs. If ERFs utilise their ability to deliver district heating to local businesses and residents it could generate 530MW of heat; cutting carbon emissions by 570,000 tonnes and saving the average homeowner £90 per year through lower heating bills.

One of the elements to consider is the carbon calculation methodology: the Standard Assessment Procedure (SAP) methodology for calculating the energy consumption and CO2 emissions of buildings should state that energy generated by CHP plants displaces the marginal CO2 emission factor (i.e. CCGT), rather than the grid average emission factor (which takes into account wind, solar and biomass). The marginal carbon intensity of the Grid is forecast to reach 118g CO2/kWh by 2030. Adding distributed generation helps to close down coal plants as the heat from CHP is deemed to be used during high carbon intensity periods and therefore does not displace renewable generation.

We also would like to highlight that whilst renewables incentives are progressively being removed, with the plans to further penalise embedded generators via additional Balancing Services Use of System (BSUoS) charges in the Targeted Charging Review, district heating development is being stalled by financial hurdles and lack of regulatory clarity. As a result private investors are reluctant to bear the high upfront investment district heating requires and are being put off installing or operating decentralised energy sources which are desperately needed to meet our energy demand.

To enable the decentralised grid and flexibility market to thrive in the coming years, policymakers and regulators (BEIS, Ogem) should consider incentivising decentralised energy in a new and competitive way.

The development and delivery of district heating projects would greatly benefit from a demand guarantee scheme which would help to offset the risk of securing long term offtakers of heat (for example if fewer properties are built under a development project than originally planned) given the large upfront capital investment necessary to install district heating systems.

To guarantee installation quality, we recommend to include a standard set of high quality technical specifications to ensure contractors comply with a minimum standard.

We also support a business rates reform that would see heat networks treated favourably to other utilities.

Question 38 (Infrastructure): What scale of carbon capture and storage development is needed and what does that mean for development of CO_2 transport and storage infrastructure over the period to 2030?

ANSWER: No comment