Response to Defra’s consultation on the Clean Air Strategy
14 August 2018

About Energy UK

Energy UK is the trade association for the GB energy industry with a membership of over 100 suppliers, generators, and stakeholders with a business interest in the production and supply of electricity and gas for domestic and business consumers. Our membership covers over 90% of both UK power generation and the energy supply market for UK homes. We represent the diverse nature of the UK’s energy industry – from established FTSE 100 companies right through to new, growing suppliers and generators, which now make up over half of our membership.

Our members turn renewable energy sources as well as nuclear, gas and coal into electricity for over 27 million homes and every business in Britain. Over 730,000 people in every corner of the country rely on the sector for their jobs, with many of our members providing long-term employment as well as quality apprenticeships and training for those starting their careers. The energy industry invests £12bn annually, delivers £88bn in economic activity through its supply chain and interaction with other sectors, and pays £6bn in tax to HM Treasury.

We welcome the opportunity to respond to Defra’s consultation on its Clean Air Strategy. Our responses to selected questions are set out below.

Response to Consultation Questions

Chapter 6 Actions to reduce emissions at home

Q13. What do you think of the package of actions put forward to reduce the impact of domestic combustion?

Energy UK agrees with Defra’s assessment of the risk posed by small biomass units which have relatively little regulatory oversight, particularly in urban areas. We believe that a switch away from combustion units as sources of domestic and SME heat will help to significantly reduce the air quality impact of this sector, particularly in urban areas. Furthermore, the electrification of heat will also help to reduce the CO₂ emissions of this sector as the UK Grid’s CO₂ emission intensity¹ continues to fall from c.265g.kWh⁻¹ and approaches that of the best new fossil fuelled boilers² at c.210 – 230g.kWh⁻¹.

Electric heating solutions such as heat pumps have zero local emissions and have a CO₂ intensity of roughly one third of that of the national grid (as for every unit of electricity consumed, they move c.3 units of heat), meaning as well as being low carbon heating solutions, in urban areas they do not contribute to air quality problems. We therefore support Defra’s proposals to review the role of biomass in the future policy for low carbon electricity and heat, as small biomass-fuelled CHP plants and boilers typically produce significant NOₓ and PM emissions through relatively low stacks, which can contribute to poor local air quality. Furthermore, we believe that a cross-departmental review should consider the difficulties in accurately assessing and assuring the sustainability of supply chains for biomass used in small boilers, as well as the challenges in assessing the lifecycle carbon emissions of biomass in such applications.

Chapter 8 Industry

Q19. What do you think of the package of actions put forward in the industry chapter?

Energy UK strongly supports the aims of the Clean Air Strategy and we welcome the opportunity to collaborate with Government on a Road Map for the power sector.

In our view, the overall focus of the Strategy in relation to industrial emissions is appropriate. We welcome the explicit recognition of the strength of the existing regulatory framework and the investments already made by the power industry to deliver substantial reductions in emissions, in particular sulphur dioxide, oxides of nitrogen and particulates. For our sector, the UK implementation of the Industrial Emissions Directive (IED) and its embedded requirement to apply Best Available Techniques (BAT) provides an effective framework for driving continuous improvement, particularly noting that there is an enduring requirement to periodically review and update BAT requirements.

This regulatory framework, together with decarbonisation policies, has ensured that large reductions have been made in emissions from our sector. For example, emissions of NOₓ in our sector have reduced by 85% between 1990 and 2016 and by 72% between 2006 and 2016. Looking ahead, this general trend is set to continue.

We also welcome the explicit recognition that policy stability is important - our answer to Question 20 discusses this further in relation to the particular challenges for our sector.

Q20. We have committed to applying Best Available Techniques to drive continuous improvement in reducing emissions from industrial sites. What other actions would be effective in promoting industrial emission reductions?

Defra has provided, for sector comment, a list of technical measures for the abatement of NOₓ which has been compiled for potential use in emissions modelling out to 2030. We consider that Defra must distinguish clearly between:

1. Emission reduction measures at a site level, by abatement and other site actions
2. Structural changes in the industry that lead to emission reductions
Under the former (Item 1), and as noted in our response to Question 19, the application of BAT is an embedded requirement within the existing regulatory framework and this has proved to be an effective mechanism for driving emission reductions for our sector. The profitability of a power station is closely linked to the efficiency of the generation process, which ensures a keen focus by the operator on efficiency and reducing fuel usage. This driver also reduces emissions per unit of electricity generated.

Therefore, for our sector, we do not think that any further policy actions would be effective. The application of BAT already ensures that appropriate measures are adopted, taking into account economic and technical viability as well as the overall environmental benefits. Updated BAT Conclusions for Large Combustion Plant (LCP) have only recently been published (in August 2017) and the sector is already working towards implementing these revised standards by 2021. Further actions and requirements beyond these very recently updated standards could be counter-productive in terms of the potential to jeopardise policy stability and investor confidence.

Policy stability is of particular importance for our sector, since there is an ongoing need for investment in energy infrastructure and these projects tend to be characterised by large investments with long payback times. A perceived lack of policy stability has the potential to jeopardise new investments. In the context of the Clean Air Strategy, additional mechanisms to reduce NOx beyond those already in place could impact adversely on investments in new Combined Cycle Gas Turbines (CCGTs), peaking plant or refurbishments to existing plant. It is important that the Clean Air Strategy takes full account of other Government policies that influence investment in these plants, in particular the Capacity Market, to ensure the security of supply of the UK electricity system and the delivery of decarbonisation policies. It remains the case that where individual, local circumstances dictate, “Beyond BAT” performance can be required of combustion plant. As such, there is already a mechanism available to regulators to control local air quality hot spots and the contribution to them of power plant regulated under the IED.

In Section 8.3, the Clean Air Strategy makes reference to “market-based measures” to reduce emissions. We would welcome the opportunity to discuss this approach further. Our initial assessment of market measures for industry (such as an emission trading scheme and the current Transitional National Plan (TNP) arrangements for Large Combustion Plant) is that the low levels of current total emissions mean that it is unlikely that there would be sufficient liquidity for an emissions market to function in practice. Again, this conclusion is supported by the relatively low levels of transfers seen in the TNP. Previous UK emission trading schemes (such as the National Emissions Reduction Plan for large combustion plants up to 2015) covered much larger quantities of emissions than any future scheme would, reflecting the effectiveness of previous measures in delivering substantial reductions.

In terms of structural changes (Item 2), the energy industry is already undergoing profound technological and structural change in response to the Climate Change Act and CO2 emission
targets, as most recently reiterated in the Clean Growth Strategy. This is driving the rapidly increasing development of renewable energy capacity, as well as the decline and eventual cessation of electricity generation using coal by 2025. Wind energy capacity is set to continue to increase over the next decade, displacing further fossil fuel-based energy generation, although at the same time requiring fossil plant to remain available in the important role of maintaining security of supply. Changes to rules governing the operation of the UK Electricity Market, including subsidies to encourage renewables, form the primary mechanisms whereby the pathway to decarbonisation of the power industry is being carved out. In addition, the strategic decision to invest in new nuclear power will contribute to the move away from fossil fuel combustion for power.

These structural changes in the industry also lead to significant emission reductions of air quality pollutants such as NO\textsubscript{x}, SO\textsubscript{2} and PM because they result in the displacement of combustion plant from the generation portfolio. They therefore represent an important but fundamentally different category of measures to reduce air pollution compared to site-level abatement.

How the portfolio of power generation plant types changes out to 2030 is the most important factor in determining the overall rate of reduction of air pollutant emissions. Therefore, in considering a Road Map for the sector, a scenario approach is most appropriate which considers the ability of structural changes to deliver a particular level of emission reduction. It is important to emphasise that the decision over which generation technology to build in a given circumstance is very unlikely to be driven primarily by the cost of abatement of air pollutant emissions.

Given this, one metric for defining progress out to 2030 might be to consider emission efficiency i.e. a mass emission per unit of power generated. NO\textsubscript{x} is the pollutant of greatest significance for the energy industry going forwards, and a suitable metric might be tonnes NO\textsubscript{x} emitted per Gigawatt hour of generation. To capture the structural-type measures which lead to more renewables in the portfolio, and which at the same time produce increasing problems of intermittency in the grid (particularly on a 2030 timescale), thereby ensuring the need for combustion plant to provide stability, it would be appropriate to consider a tNO\textsubscript{x}/GWh for the sector as a whole.

Many of the technical measures Defra has listed concern replacing one technology e.g. CCGT with another e.g. renewables. Although this represents a structural change measure, it fails to take into account the different roles the technologies have in the electricity market. In this example, renewables are intermittent in generation and CCGTs operate in a balancing role to smooth out the intermittency, making the two technologies not independent of each other. This highlights the need for a scenario approach which considers the underlying drivers and constraints which determine plausible changes to the generation portfolio over time.

Energy UK welcomes the opportunity to comment in detail on abatement options, and to work with Defra to identify ones not yet considered in the analysis.
Policy measures to reduce emissions are often assessed using a marginal cost approach to determine the lowest cost of achieving a particular reduction target. We understand that Defra is additionally considering the associated benefits (for human health and the environment), based on sector specific damage costs, as part of its approach to delivering the required reductions. We welcome this approach as it recognises that reductions from the power sector may deliver substantially lower benefits per tonne compared to reductions from other sectors due to the dispersion of emissions from tall stacks and the lack of proximity to urban conurbations. If Defra is taking such a cost benefit approach it does, nevertheless, need to also keep a view on marginal costs, and to consider implications across the range of sources covered by a particular sector, to make sure that an option is not incurring/accepting some excessive costs for individual sources, wrapped up in the total cost of a package.

Q22 What further action, if any, should Government take to tackle emissions from medium combustion plants and generators?

We agree that, looking forwards, the contribution from smaller plant will become increasingly important. However, the Government has very recently (January 2018) put in place legislation to reduce emissions from medium combustion plant and specified generators, following a full consultation and impact assessment. Therefore, as a point of principle, it is not appropriate to consider further measures for these plant, bearing in mind the principles of policy stability set out in the Clean Air Strategy. The recently-introduced measures will deliver substantial reductions in emissions in a cost-effective way.

Nonetheless, since these plants will contribute a significant fraction of the total emissions for the sector by the end of the next decade, it is important to better characterise the emissions baseline for this sub-group of generator plant. An effective way of improving knowledge on these emissions would be to collect data on the annual operating hours of these plant and their measured emission performance. Operators will be required to maintain records of this information so it would be straightforward to require this to be reported centrally. Government working with Regulators could ensure that this is implemented through the upcoming Medium Combustion Plant Directive and Specified Generator permit requirements.

Chapter 10 Progress towards our clear air goals

Q31 Do you have any specific suggestions for additional or alternative actions that you think should be considered to achieve our objectives?

Overall, the Strategy has adopted a comprehensive approach in terms of considering the range of sectors which have a role to play in contributing to reducing UK total emissions and in setting out a quantitative summary of the breakdown of historical emissions from the contributing sectors.

In Chapter 10, the Strategy quantifies the gap after existing policy measures are accounted for and the abatement potential at sector level to fill the gap. Presumably this has been derived from a “bottom up” analysis of possible measures and the associated emission reduction they could deliver, but no information is given as to what these measures are and the assumptions made. Without this information it is not possible to make any meaningful comment on the
actions proposed – particularly as the costs, benefits and feasibility are all relevant factors and these need to be considered alongside a cross-sector consideration of potential costs and benefits. Further engagement and consultation are therefore needed to ensure that the development of the National Air Pollution Control Programme has a sound basis.

An important consideration relating to the delivery of the 2030 UK emission targets is ensuring that adequate account is taken of the uncertainty in emission projections. This is particularly relevant for the energy sector and its contribution to NOx emissions. Thermal generation (predominantly gas-fired) has an important role to play throughout the next decade and beyond in providing reliable generation and security of supply to complement the growth of low carbon generation including renewables. However, inevitably, there is a very large uncertainty in the amount of gas-fired generation needed. This is because it depends on a wide range of other factors such as the pace of renewables growth, new nuclear build rate, the extent to which interconnectors are used and, in the longer term, the development of Carbon Capture Utilisation and Storage. This uncertainty needs to be fully accounted for in planning the UK approach to meeting the 2030 emission ceilings.

Finally, the assessment of the measures adopted to meet the 2030 targets should take into account the potential to maximise the health benefits, noting that emissions from different sectors can have very different impacts. In general, medium and large power stations tend to have a low air quality impact relative to that from other sectors, due to the tall stacks employed and their siting away from centres of population.

For further information contact:

**Andy Limbrick**  
Environment Consultant  
Energy UK  
26 Finsbury Square  
London EC2A 1DS  
Tel: +44 20 7747 2924  
andy.limbrick@energy-uk.org.uk  
www.energy-uk.org.uk

**India Redrup**  
Policy Executive  
Energy UK  
26 Finsbury Square  
London EC2A 1DS  
Tel: +44 20 7024 7635  
india.redrup@energy-uk.org.uk  
www.energy-uk.org.uk