

Introduction

This response is submitted by Unite the Union, the UK's largest trade union with 1.4 million members across the private and public sectors. The union's members work in a range of industries including manufacturing, financial services, print, media, construction, transport, local government, education, health and not for profit sectors.

The subject matter is of special relevance to Unite given its significant membership in not just carbon intensive industries but in the economy as a whole and the impacts of climate change on its members.

Question and response form

Part 1: Climate Science

Question 1 (Climate Science): The IPCC's Fifth Assessment Report and the Special Report on 1.5°C will form an important part of the Committee's assessment of climate risks and global emissions pathways consistent with climate objectives. What further evidence should the Committee consider in this area?

Although such an assessment is important Unite believes that there needs to be further work on recording and monitoring emissions. Differing modes of transport have different and particular patterns of emissions but there has been only partial assessments in particular sectors.

For example at airports there is only a statutory requirement to measure emissions at and outside the perimeter boundary of an airport. Unite as such has had to commission monitoring within airports.

Similarly studies have had to be carried out in cities - for example, by Kings College in London - which look at exposure levels and emissions within particular modes of transport.

Such should be fully considered at a wider level, as without a comprehensive approach to monitoring, the remedial and proactive action that is needed to achieve emissions neutral growth cannot be identified or acted on.

Currently the UK imports £5 billion worth of fresh fruit and vegetables each year much of which could be sourced from UK producers. Employing at least 3.8 million workers the food and drink sector acts as an economic hub bringing together produce from packaging, printing, retail, the media and, of course, transport and logistics.

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According to the UN's Scientific and Technical Advisory Panel (STAP) report in June 2018 "food production will need to increase by more than 50% to feed a global population of more than 9 billion people by 2050, and to meet the increased demand for protein, driven by rising incomes. The challenge is to achieve this in a sustainable way without compromising the natural capital and ecosystem services which support food production."

The sector emits 22% of global anthropogenic greenhouse gasses (GHG) and changing land use from forests and peatlands to agriculture contributes a further 10 to 15% of total emissions. Unite represents workers in Food Drink and Agriculture who support sustainable production, and action to protect livelihoods through a "just transition".

Question 2 (CO₂ and GHGs): Carbon dioxide and other greenhouse gas gases have different effects and lifetimes in the atmosphere, which may become more important as emissions approach net-zero. In setting a net-zero target, how should the different gases be treated?

Unite is of the belief that if a gas has a longer existence in the atmosphere than other gasses then it should be given a higher priority despite the lower levels of gas release. Whilst this move is vital, the eye should not be taken from the ball in respect to the reduction of more prolific GHG like carbon dioxide (CO₂) and methane (CH₄). Some of these gasses can have very long term effects disproportionate to their respective volume. Unite feels therefore that regulation on the use of these gasses should be tightened further.

Part 2: International Action

Question 3 (Effort share): What evidence should be considered in assessing the UK's appropriate contribution to global temperature goals? Within this, how should this contribution reflect the UK's broader carbon footprint (i.e. 'consumption' emissions accounting, including emissions embodied in imports to the UK) alongside 'territorial' emissions arising in the UK?

The UK is a significant contributor to global emissions and pollution with a greater footprint than many of our global neighbours. This government has been complicit in not mitigating carbon intensive and ecologically destructive projects - such as its support for fracking - while at the same time cutting support for renewables.

Government support, for example, to encourage the creation of a network of a Carbon Capture Storage and Utilisation pipeline could drastically reduce the release of GHGs not just from the generation of energy but also from high volume energy users that produce many millions of tonnes of CO2.

Unite believes that urgent action needs to be taken to introduce such a network, that will provide this nation's engineers with the foundations for this technology. Such a network

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could provide the feedstock needed to produce yet more energy and products that would offset the need for fracking and reduce the potential environmental impact.

Unite does not support the creation of biofuels on land that can be utilised for food production nor the shipment of these fuels over vast distances. There are local solutions that will reduce waste and cut the need for landfill. These solutions need to be employed.

Question 4 (International collaboration): Beyond setting and meeting its own targets, how can the UK best support efforts to cut emissions elsewhere in the world through international collaboration (e.g. emissions trading schemes and other initiatives with partner countries, technology transfer, capacity building, climate finance)? What efforts are effective currently?

Unite supports UK governments and industrial efforts to meet the UK obligations under the Paris Climate Agreement; however, rushing to name unilateral ban dates is not the solution. Unite would oppose attempts to bring forward a ban to 2030 and believes that setting such a date must be secondary to the proper strategy needed to achieve it.

New research from German trade union IG Metall and automotive manufacturers reveals the stark risks to future employment within the automotive sector in both Germany and the UK – if a just transition strategy from oil and petroleum is not in place.

A just transition strategy – for both Internal Combustion Engines (ICE) and diesel production – must be based on new investment to develop the UK's manufacturing capabilities; the building of significant charging infrastructure; increased support for hybrid-vehicles, support long-term incentives and grants for consumers; and support the upskilling and reskilling of the existing workforce. This is particularly important for the supply chain not just in the automotive sector but throughout manufacturing and the generation of energy.

Whilst Unite supports the work of Sustainable Aviation which has demonstrated the aviation industry's efforts over the last five years opportunities have been missed by national and international governments to support the work. Technological solutions and even chances to reuse waste materials to produce more sustainable fuels, averting the need for landfill, have been idle for years due to lack of governmental support and the industry's preference for financially cheaper alternatives.

If the global shipping industry had been a nation, its carbon footprint would rank it 6th worst polluting nation after Germany but before Japan. Solutions which have been shown to reduce fuel burn on shipping could therefore not just pave the way to emission cuts, way beyond the slower sailing initiative, but also cut the production of acid rain. Shipping could deploy large power kites that have been shown to cut fuel burn and emissions yet despite the technology being a proven success over ten years ago, just two ships had taken up the technology by 2015. Over 90 percent of UK goods arrives by sea often from the Far East in vessels which include the largest moving man-made objects on earth. The wind is free and the use of sail is nothing new, but power kite technology has been shown to be far more efficient.

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Unite is firmly of the belief that there are technological solutions that could help avert the 1.5 degree increase in global temperature, but that technology is sitting gathering dust on a shelf somewhere. International collaboration the likes of which have not been seen since the second world war could offer these solutions. What is there to lose?

Question 5 (Carbon credits): Is an effective global market in carbon credits likely to develop that can support action in developing countries? Subject to these developments, should credit purchase be required/expected/allowed in the UK's long-term targets?

Unite is of the belief that Carbon Credits are only effective if they are linked to a market where the cost of each credit is representative and provides the impetus to bring about change. At present the volume of credits available has not stimulated a true carbon price nor one where those companies and organisations who have invested in carbon reduction activities are rewarded by being in a position to recoup the cost of their investment by selling off spare credits.

Whilst significant savings can be made in less developed countries, the scope for change in the developed world could have a greater long term impacts but are more expensive to implement. Additionally without policing of the schemes in receipt of credits, the long term impact can be fleeting and not lock away change. It matters not where carbon is released into the atmosphere but that is not the case for all GHG's. Research carried out by scientists at Manchester University discovered that Ozone produced at ground level from the interaction between sunlight and NO_X can reduce the volumes of methane and are therefore carbon negative even if it has toxic medical effects on humans. Ozone produced at around 35,000 feet up has the opposite effect. Consequently the application and accreditation of such credits may not be as easy to calculate.

The real environmental impact and embedded carbon is rarely reflected in the trade price of goods. Unite believe that the level of environmental dumping and the suppliers environmental standards to be factored into price.

Part 3: Reducing emissions

Question 6 (Hard-to-reduce sectors): Previous CCC analysis has identified aviation, agriculture and industry as sectors where it will be particularly hard to reduce emissions to close to zero, potentially alongside some hard-to-treat buildings. Through both low-carbon technologies and behaviour change, how can emissions be reduced to close to zero in these sectors? What risks are there that broader technological developments or social trends act to increase emissions that are hard to eliminate?

Unite believes that there are a significant number of actions that the UK aviation sector could introduce on the issue of emissions and air quality. This is especially true at airports, where a host of mitigating action could be implemented - for example, single engine taxiing, electric vehicles and operational changes can reduce the industry footprint but also improve the airport's workers' health.

Unite is of the belief that the path to net zero will, however, be missed unless there is action by not just the UK but governments internationally, to require industrial change. Many airlines and shipping companies appear to believe that they can buy their way out of the problem by providing carbon offsets and emissions trading schemes at some point in the distant future. But by that point, it may be too little, too late.

Unite is of the belief that many sectors are only interested in environmental measures if they can save them money or provide security of supply. The reason for this can easily be demonstrated for example by the number of airlines that have gone into liquidation, chapter 11 or bankruptcy in recent years and the cut throat competition between airlines for customers.

The UK airlines' commitment to the subject of sustainability can easily be demonstrated by their membership of Sustainable Aviation (SA), the organisation that was supposed to bring together the manufacturers, the airline industry, the CCC, the trade unions and academia to find, implement and publicise solutions.

None the less, the air framers, and engine manufacturers in the aerospace industry are racing to meet the potential of, amongst other things, electric aircraft, which could be a game changer.

Unite supports sustainability in the agriculture industry in combating the release of methane and other greenhouse gasses. Unite recognises, the efforts that this sector has invested in to achieve a net zero industry especially with respect to methods to provide woodland and other carbon sinks. But Unite believes yet more could be done.

Unite also supports the creation of a Carbon Capture, Storage and Utilisation (CCSU) network to aid not just the electricity generation industry but also manufacturing that currently produces large volumes of carbon and heat. This includes the glass, ceramics, metals, paper and concrete industries.

Unite campaigns to combat fuel poverty and a just transition so that workers displaced from closed carbon intensive industry to carriers that transform the economy, and housing in particular, into a carbon neutral or even carbon negative footprints by improving energy retention.

Question 7 (Greenhouse gas removals): Not all sources of emissions can be reduced to zero. How far can greenhouse gas removal from the atmosphere, in the UK or internationally, be used to offset any remaining emissions, both prior to 2050 and beyond?

Unite is of the belief that given the relatively low concentration of CO₂ and other greenhouse gasses in the atmosphere that a substantial volume of air needs to be processed to extract greenhouse gasses that have been released.

Unite believe that whilst it is technically possible to process the air the better option would be to prevent the release of these gasses in the first place. This is demonstrated by Unite's support of CCSU as stated earlier. Unite supports the call for government recognition of workplace environmental trade union representatives, who have the tools to advise and guide employers and their staff toward a more sustainable method of working.

Unite is concerned that one of the largest sinks for CO_2 is the world's oceans that are becoming increasingly acidic. This increased acidity and global temperatures is already affecting the world's food chain as it is leading to widespread coral bleaching, destroying the reefs and the habitats it provides. Additionally the increased acidity will cause these now dead reefs to dissolve releasing even more CO_2 unless something is done.

Whilst widespread forestry increases will help, it is critical that these new woodlands are managed and the wood produced is utilised as a long term carbon sink as opposed to being used as a fuel. Responsibly sourced wood is the only renewable building material available. Wood products store the carbon that the growing trees have removed from the air (about 50% of the dry weight of wood is carbon).

The production and processing of wood uses much less embodied energy than most other building materials, giving wood products a significantly lower carbon footprint. Wood can be used to substitute for materials that require larger amounts of fossil fuels to be produced and can provide a more desirable aesthetic.

Cellulose derived from plant materials can be fashioned into more sustainable and a selection of biodegradable plastic substitute products.

Unite is of the belief that the biggest solution to GHG removals is to not release the GHG's in the first place and to work in harmony with employers to achieve a more sustainable future. For this reason Unite has been calling for years for the recognition of Environmental Workplace Representatives who, we believe, should have the same rights to release from their day to day duties in order to assist employers in this endeavour whilst by encouraging worker involvement in change.

Question 8 (Technology and Innovation): How will global deployment of low-carbon technologies drive innovation and cost reduction? Could a tighter long-term emissions target for the UK, supported by targeted innovation policies, drive significantly increased innovation in technologies to reduce or remove emissions?

Unite welcomes innovation in the area of fuel efficiency, carbon neutral and carbon negative technology. Unite is concerned, however, in the provision of long term project funding and international co-operation following Brexit.

Unite's transport strategy supports technology which minimises the polluting effects of transport and endorses cleaner fuels and electric vehicles. Unite has been working with our members in the taxi sector for example to identify sustainable, affordable and cleaner

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taxis. Last year Unite held a taxi conference which included a visit to the LEVC taxi factory which has now switched production away from diesel to a range extended hybrid electric design for all future black cabs.

The Department for Transport 'Road to Zero' strategy has failed to provide for a just transition which protects and sustains employment in the automotive industry. The Government's unilateral announcement of a 2040 ban on the sale of Internal Combustion Engine (ICE) and diesel-powered vehicles had an immediate commercial and industrial impact on the automotive sector. Unite echoes the concerns raised by IndustriAll Europe, the Society of Motor Manufacturers and Traders (SMMT) and the European Automobile Manufacturers' Association (ACEA) that emission reduction targets are unachievable without a serious transition strategy. The market alone will not overcome the barriers to mass consumer take up of electric vehicles or deliver the infrastructure investment needed. Intervention is therefore needed.

Air framers and engine manufacturers are in competition currently to produce a hybrid electric passenger aircraft and eventually an all-electric aircraft for use initially on domestic short haul routes. Whilst the civil aerospace industry can still do more on the ground to improve air quality, the issue of fuel use whilst flying has always been a major hurdle. The only major hurdles lie in battery technology and the issue of refuelling during the short aircraft turnaround period.

Innovations in battery technology could have dramatic benefits to not just transport but also the design and construction of the world's energy network. No more would there be a need to follow demand with generation if a base load was augmented with energy generated by carbon neutral generation, with the excess stored for times of shortage. Losses caused by the conversion from Alternating Current (AC) to Direct Current (DC) and back again would be negated if there were sufficient volumes of supply. Excess grid supply could be transformed into DC and then through the process of electrolysis of water into hydrogen that could be transformed back through hydrogen fuel cells to feed the grid for example.

The worlds shipping is a major contributor to GHG's and unlike other forms of transport, it is far more difficult to have a fully electric commercial container or general cargo vessel, for example. Currently transporting goods via the world's sea's and waterways is the most efficient way of moving goods and people from A to B per tonne of CO₂. Unite believes that more less time critical cargos should utilise the network of waterways around the UK that are sitting idle.

Question 9 (Behaviour change): How far can people's behaviours and decisions change over time in a way that will reduce emissions, within a supportive policy environment and sustained global effort to tackle climate change?

In 2016 the Unite Policy Conference gave its full support to the campaign for the expansion & development of public transport and for a conscious policy of encouraging people to transfer from private motor cars to buses, trams, taxis, and local heavy rail services in our towns and cities. Unite rejects the approach of the EU Commission whose neo-liberal dogma directing Europe towards even more competition and free markets in a failed ideological bid to achieve improved public transport.

Unite applauds the 1 million Climate Jobs Campaign, that seeks to offer a positive alternative, public investment in sustainable growth, to create good jobs, and generate a skilled workforce to help mitigate and adapt to a low carbon economy.

The early closure of coal fired generation caused the selected 'shut downs' in British industry in early winter 2015. Since then, the UK has become more dependent upon gas production and interconnectors between the UK and other European countries. Given that the UK storage for gas drawn from UK fields is far less than production this resource is still sold in the summer to Europe, only for the UK consumer to buy it back at peak demand and cost.

The removal of subsidy for onshore wind and biomass, the lack of major investment and the lifespan of the current nuclear fleet, may result in major shortfalls of electricity post 2025. Unite welcomes the growth of renewable energy but feels more should be done to develop greater energy storage.

Unite recognises a strong correlation between climate change and economic inequality. Oxfam reported, in 2015, that around 50% of emissions are attributed to the richest 10% of the worlds populous. This 10% have average carbon footprints 11 times as high as the poorest half of the population. The average footprint of the richest 1% globally, may be as high as 175 times that of the poorest 10%. Within wealthy countries the responsibility is also highly unequal with wealthier people in the UK disproportionately responsible for emissions. There is an argument for a more rebalancing of society with more collective consumption and better, more efficient public services.

Unite recommends that the estimated £255 billion of the public sector procurement budget that is used to obtain goods and services from external suppliers, should be utilised as a driver for better environmental standards as part of its social value criteria (along with decent work, local employment etc.)

Question 10 (Policy): Including the role for government policy, how can the required changes be delivered to meet a net-zero target (or tightened 2050 targets) in the UK?

Unite welcomes the news that Avinor, the public operator of Norwegian airports, aim to be the first in the world to make the switch to electric air transport for all flights lasting up to 1.5 hours. They believe that such flights can be operated by entirely electric aircraft on all domestic and flights of this duration by 2040.

Air framers across the world are currently in competition to produce such aircraft which will

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only be limited in range by battery capacity or on-board electrical generation capacity. Unite believes that exploring a similar pledge by the UK would could improve the likelihood of such aircraft entering production in the near future. Such a change would be a step change in efforts to make aviation more sustainable, quieter and continue efforts to connect the UK to markets across the world.

This move to electric vehicles will create greater demands on the energy sector from all forms of transport, including aviation. In this respect Unite calls for a balanced energy policy which can draw upon the benefits of each source of power generation. Unite is of the belief that this mix should incorporate not just renewable generation sources but also nuclear and CCSU technology to allow in the continued operation of not just fossil fuels but also the utilisation of synthetic fuels derived from recycled materials, otherwise destined for landfill.

The manufacture of many everyday materials are created by energy intensive industry especially in regard to glass, ceramics, aluminium, steel, the oil & chemical industry and even paper making. Other materials like concrete and chemically derived hydrogen generation liberated from natural gas cause the release of large volumes of Carbon Dioxide (CO2). Such a CCSU network could therefore provide a lifeline for these industries to allow time for technology to innovate and smooth the transition to a carbon neutral economy.

Part 4: Costs, risks and opportunities

Question 11 (Costs, risks and opportunities): How would the costs, risks and economic opportunities associated with cutting emissions change should tighter UK targets be set, especially where these are set at the limits of known technological achievability?

Unite believes that tighter targets should be set in industries where there are real opportunities and prospects for change. Governmental support for major infrastructure is required, however, especially with respect to waste reduction and the coordinated collection storage and utilisation of GHG's. Unite believes a firm commitment to provide continued support for the creation of a CCSU network is required as highlighted elsewhere in this consultation response.

Unite also believes there are substantial opportunities that have yet to be realised from better worker engagement. All too often in an office environment, workers leave computers running in order to save valuable time in the mornings, waiting for the machines to become operational. In kitchens, various electrical devices remain connected to the mains while not in use, regardless of the fact that they continue to drain power while switched off. Lights are left burning in rooms even though they are not occupied or switched on even though there is enough ambient light.

Lessons learned in the workplace are frequently carried back to the home and hence could result in further energy savings from the domestic sector.

The provisions of greater volumes of induced electrical vehicle charging stations (that detect a vehicle moving over it, switch on and charge electric vehicles wirelessly) would significantly enhance the range of electric taxis and buses, in particular, given they can spend long periods stationary. Similarly ambulances and other emergency vehicles could

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recharge and go without the need to connect and disconnect leads. Such an innovation could ensure a faster transition to electric vehicles. Given that an electric vehicle has fewer moving parts there are less things to go wrong and they are less labour intensive to produce.

Unite supports a just transition to a less carbon intensive economy, as stated elsewhere, and therefore repeats its call for greater efforts to be utilised to assist the UK's workforce into a carbon neutral future.

Unite also supports efforts to combat fuel poverty. No more should families need to make the choice between eating and heating. Unite believe that the displaced former workforce from carbon intensive industry, make a ready skilled body to improve housing stock to make them more fuel efficient and able to cope with extreme weather.

Question 12 (Avoided climate costs): What evidence is there of differences in climate impacts in the UK from holding the increase in global average temperature to well below 2°C or to 1.5°C?

From the production of food to the manufacturing of shipping, from the manufacture of micro/nano technology to the construction of new buildings, Unite believes there should be a root and branch approach to keeping the increase in global average temperature below the 1.5°C limit. Whilst this target is harder to achieve it is by far the safest option given the uncertainties of scientific evidence.

The impacts of climate change in reducing the flow of the transatlantic conveyer of warm salty waters from the Gulf of Mexico (due to dilution of these warm salty water with the fresh cold waters of ice melt from the glaciers or Greenland), has already resulted in a wildly meandering jet stream. These meanders have produced the successively long hot or wet cold summers, monsoon style rains and cold drifting snow conditions of recent years.

Unite is of the belief that due to the increasing frequency of these weather conditions more needs to be invested to accommodate and mitigate the potential to disruption to the UK economy and the public's daily lives. This would include greatly increasing the water storage capacity around the country; flood prevention, the provision of snow and ice clearing equipment both on the roads, rails and within our ports/airports and a more robust power grid.

Unite supports calls for a new maximum working temperature to prevent the number of heat related health issues faced by members in the workplace. This limit should include not just the workforce in offices and factories but also workers in the cabs and control rooms of the various transport modes.

Part 5: Devolved Administrations

Question 13 (Devolved Administrations): What differences in circumstances between England, Wales, Scotland and Northern Ireland should be reflected in the Committee's advice on long-term targets for the Devolved Administrations?

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Due to the geography of Scotland and Wales there is more scope for renewable generation from hydro and wind in particular. Similarly there is greater scope for investment in solar in the southern counties of England. Currently these nations have placed the fate of public transport, the water industry and electrical industry into the hands of the market, for it to decide its own direction with minimal input from successive governments. This light touch on the steering wheel approach has led these nations down a path to a market heavily dependent on gas supplies for electrical generation and soaring costs.

Unlike the rest of the UK, Northern Ireland has a far greater degree of public ownership. The electrical supply and generation industry, together with the supply treatment and distribution of water has not suffered this fate of investment strategies but it has shared its direction with the Republic of Ireland. In a similar fashion the rail and bus networks are also in public ownership and can therefore lead the way for investment strategies to encourage change.

Unite supports Labour policy to renationalise the energy sector, as well as the supply of water and a publically owned bus and rail network. Unite believe that this change could create savings both financially but also environmentally that could empower change.

The current spanner in the works is Brexit which could disrupt the relationship between the UK and Europe and the creation of a replacement to Euroatom in order to continue the development of low to zero carbon nuclear energy as an integral part of a balanced approach to energy generation.

Part 6: CCC Work Plan

Question 14 (Work plan): The areas of evidence the Committee intend to cover are included in the 'Background' section. Are there any other important aspects that should be covered in the Committee's work plan?

Unite welcomes the CCC involvement in Sustainable Aviation and other industry wide bodies to assist the industry towards change. It is important, however, that industry is actively engaged in the task at hand and does not utilise their membership of such bodies as an excuse for minimalistic, publicity grabbing, stunts that have little to no impact on the day to day activities of that industry.

Additionally, Unite believes that the CCC requires much greater power and resources to enforce change where the evolution of that industry is not happening naturally.

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