REA Response:
Developing the UK Emissions Trading Scheme (UK ETS)

Contents

About the REA

The Association for Renewable Energy & Clean Technology (REA) is pleased to submit this response to the above consultation. The REA represents a wide variety of organisations, including generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

Of further relevance to this consultation, the REA has the largest number of bioenergy industry stakeholders as part of its membership in the UK, with member forums directly involved in biomass heat, biomass power, energy from waste, green gasses, advanced conversion technologies, hydrogen and renewable transport fuels. As such, our response focuses especially on the UK ETS proposals concerning these areas in chapters 6, 7 and 8.

CHAPTER 1: Net Zero Consistent Cap

1) Do you agree with the Authority's proposed range for the net zero consistent cap?

Yes. REA support the tightening of the cap to ensure the scheme is aligned to net-zero targets.

However, this will need to be carefully considered depending on the outcome of other proposals, including the inclusion of EfW into the scheme and the application of biomass sustainability

criteria. These new sectors will need to be included in the calculation when setting a net-zero consistent cap.

CHAPTER 2: Free Allocation Review

4. Do you agree with the Authority's minded to position to reset the industry cap, as set out in the consultation document?

The REA support the use of free allowances being used in a way that is aligned with the net-zero ambitions and supports the move to a percentage-based approach.

The use of free allowances should also be considered in relation to how they may be used to help new sectors, like energy from waste, transition into the scheme and avoid carbon leakage lower down the waste hierarchy.

They may also be used to provide some support to innovative technologies within obligated sectors, for example, Advanced conversion technologies, as discussed in chapter 7.

10. Are there alternative areas you think we should consider making changes to, or alternative methodologies for the provision of free allocations which you would like us to consider? Please set these out and explain your rationale

See Chapter 7 for a discussion on the use of free allowances to help transition the energy from waste sector into the scheme and support Advanced Conversion Technologies.

CHAPTER 2: Free Allocation proposal six: Combined Heat and Power (CHP) plants and electricity generator definition.

24. Should the current rules be maintained?

No

The rules should be reviewed to ensure they are incentivising investment in CHP from low carbon sources, including biomass, hydrogen and energy from waste. This should take into consideration how the energy mix in the electricity grid is expected to change and further decarbonise, including the greater prevalence of variable renewable generation such as wind and solar. This will make the role of firm low carbon dispatchable power and heat yet more important as part of a decentralised flexible energy system.

25. Should an amendment to the electricity generator classification be made to exclude installations that produced electricity for sale to third parties, if that electricity was produced by means of a CHPQA-certified plant, operating as part of an operator's industrial activity?

Yes

It is wrong that current rules exclude CHP installations that exports even a small amount of power from receiving any allocation of free allowances.

26. Should a cap be set on the maximum amount of electricity that can be exported as a condition to this exclusion?

No

This is best regulated through the CHPQA.

27. Do you believe that the Option 2 proposal will support investments in long-term decarbonisation solutions?

Yes.

It will improve the economics of investment in CHP compared the existing rules.

28. How can operators provide robust evidence that their CHPQA certified CHP plant operates as part of their industrial process, and does not operate independently for the sole purpose of generating electricity for sale?

CHPQA certification requires applicants to demonstrate that the "useful heat" is not rejected to the environment without beneficial use and must declare what the heat is used for. CHPQA carry out regular site audits.

CHAPTER 6 – CCUS and Transportation

93) Do you agree with the Proposal that the UK ETS be expanded to allow for the transportation of CO2 through other forms of non-pipeline transport (i.e. shipping, rail and road)? (Y/N) Please explain your answer.

The REA strongly support expansion to allow for the transportation of CO2 through other forms of non-pipeline transport. This will be essential to the development of Green Gas Removal (GGR) sites outside of main industrial clusters, including the retrofit of carbon, capture, and storage (CCS) systems on a substantial number of existing biomass power, biomass heat and energy from waste sites that will not realistically be able to connect to planned CO2 pipelines.

94) Do you have any evidence to suggest how expanding the UK ETS to include other forms of CO2 transport may impact the wider UK ETS or other policy areas of the Governments of the UK, either positively or adversely?

The CCC has made clear that by the 2030s all biomass power and energy from waste facilities will need to consider CCS options to be aligned to the UK's net zero ambitions [1]. Currently there are over 50 operational EfW facilities [2] and over 50 biomass plants operational across the UK [3]. These represent significant levels of low carbon dispatchable generation capacity in the UK that will need to be maintained to meet UK low carbon energy demands. To both maintain this generation capacity and realise the CCC targets on CCS, enabling non-pipeline transportation is essential.

[1] CCC (2018) Biomass in a low carbon economy. https://www.theccc.org.uk/publication/biomass-in-a-low-carbon-economy/
[2] Tolvik (2022) UK Energy from Waste Statistics – 2021. https://www.tolvik.com/published-reports/view/uk-energy-from-waste-statistics-2021/
[3] Tolvik (2019) UK Dedicated Biomass Statistics – 2019 https://www.tolvik.com/published-reports/view/uk-dedicated-biomass-statistics-2019/

95) What mitigation strategies, if any, do you believe should be applied in relation to CO2 emissions associated with all forms of CO2 transport for CCUS (eg. emissions produced by a cargo ship or those associated with the operation of pipelines)? For example, a mitigation strategy might include the requirement for a chosen means of transport to adhere to emissions standards, net proportion of emissions delivered criteria (after deduction of emissions from transportation) or similar sustainability criteria.

Life cycle emission studies of GGR units, including consideration of transportation emissions, should be included as part of the monitoring, reporting and verifications protocols applied to GGR technologies. It should be noted that transport emissions are also likely to reduce as both renewable transport fuels and electrification of transport drives further decarbonisation. Recognition of reduced transport emissions within the GGR unit, with this being appropriately rewarded, will therefore also help increase deployment of low carbon, non-pipeline, CCS transportation.

CHAPTER 6 – Biomass Sustainability Governance

96) Do you agree with the proposal that we implement sustainability criteria for solid, liquid and gaseous biomass for installations? (Y/N) Please explain your answer.

Yes

The REA is the largest UK trade association representing the bioenergy sector, with members involved in all forms of bioenergy production across power, heat and transport. The REA's 2019 Bioenergy Strategy set out how biomass feedstocks can sustainably provide up to 16% of the UK's energy by 2030 [1]. As has been identified by the Climate Change Committee (CCC), such growth will play an essential role in helping to affordably decarbonise the UK in line with our net zero targets [2].

Crucial to realising this is having stringent biomass sustainability governance. Today, the UK's bioenergy sustainability criteria are regarded as one of the most comprehensive frameworks in the world. All government support schemes have associated bioenergy regulations and reporting requirements that must be fulfilled and are appropriate to the sector they are designed to regulate. These are aligned to IPCC approved carbon accounting methodologies, which provide robust life cycle analysis of supply chain emissions, as well as considering land use change and social issues. In addition, much of the industry use independent voluntary certification schemes, such as the Sustainable Biomass Program [3], to audit and assess supply chain practices. Certification requirements go beyond national legislation and create a gold standard for global sustainability practices. The industry remains committed to ensuring the same levels of stringent and transparent sustainability governance remain in place as the sector continues to grow.

As direct government support mechanisms for the sector fall away, so will the existing points of obligation for sustainability governance. The industry is keen to see this potential gap addressed and want to avoid any period in which it may appear that sustainability governance is not applied. The REA is therefore supportive of the introduction of sustainability governance into the UK ETS to create an appropriate and manageable point of obligation that is not reliant on direct government support mechanisms. It is noted that the ETS market itself will also likely play an

important role in the further growth of the sector, especially when considered in conjunction with proposals for Green Gas Removal units, as discussed in Chapter 8 of this call for evidence.

However, while supportive, the introduction of sustainability governance into the ETS needs to be carefully designed. It needs to recognise different supply chains, biogenic feedstocks and out puts across the bioenergy sector and for requirements to be appropriately reflective of these different industries. They also need to be introduced in line with when different support mechanisms come to an end, in order to avoid duplications of obligations or the introduction of any discrepancies between monitoring approaches. For example, the first few biomass power sites will start to come to the end of their Renewable Obligation accreditation, and existing sustainability obligations, in 2027 but many other site contracts will go on into the 2030s. As such, this proposal will need further industry consultation as plans for governance arrangements are further considered.

[1] REA (2019) REA Bioenergy Strategy, https://www.r-e-a.net/resources/bioenergy-strategy-phase-3/
[2] CCC (2019) Net Zero – The UK's contribution to stopping global warming, https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/
[3] SBP (2021) About Us https://sbp-cert.org/about-us/

97) Which sustainability criteria should the UK ETS apply to solid, liquid and gaseous biomass (RO, CfD etc.), and would there be any value in developing UK ETS specific criteria? Please explain your reasoning.

We believe it will be difficult, and likely detrimental, to try and take only one set of existing sustainability governance arrangements in order establish a universal set of criteria to be applied across all bioenergy sectors. The current set of sustainability governance requirements have evolved in relation to the sectors being supported by specific government policies. These governance arrangements, while different, have developed for specific reasons and rational decisions that recognise sustainability issues concerning supply chains, processes, feedstocks, and outcomes of different bioenergy technologies. For example, the sustainability requirements needed in relation to an anaerobic digestion plant largely using farm waste to produce biomethane for heat are going to be very different to a biomass power plant, mainly using imported virgin biomass material or a renewable transport fuels producer using used cooking oil.

However, we believe there could well be a set of high-level sustainability principles established around which sector specific requirements could be set within the ETS, these could well use existing Renewable Energy Directive II sustainability criteria as a starting point. This could describe and drive for desired outcomes across a range sustainability issues, considering issues such as land use, life cycle analysis of GHG emissions, indirect land use change, transportation, biodiversity and ecosystem services and social impacts. These principles could ensure all separate sector sustainability governance arrangements are achieving the right set of outcomes appropriate to the technologies involved. Such principles should be consulted on and developed as part of the Governments Biomass Strategy workstream.

As part of this process, there will likely need to be sector specific consultations to develop appropriate sustainability governance requirements under the ETS, taking existing criteria as

their starting point. These consultations will be helpful in addressing any existing sector specific discrepancies between support mechanism, to establish at least one set of requirements per sector. As an illustrative example, it would be useful to establish a single approach to being allowed to average consignment for AD, which is currently allowed in the RO and Green Gas Support Scheme but not allowed in the RHI or RTFO.

In designing these sectors specific arrangements, it will also be important to recognise the role of independent voluntary certification schemes, which typically go beyond national governance arrangements. It is likely that many participants will aim to use such scheme certifications to demonstrate their compliance to UK ETS requirements. This should be welcomed and the ETS sustainability requirements designed around what is already demonstrable and enforceable through these standards.

98) What are your views on the proposal that for installations and combustion units which only burn biomass to be exempt from the UK ETS, operators must only use sustainable biomass?

The REA are supportive of this proposal, however, note further clarification will be needed in relation to specific sectors as the required governance arrangements are designed. This includes:

- Clarity will need to be provided specifically in relation to waste wood bioenergy sites. Sustainability criteria for the sector recognises the role such sites have in diverting such material from landfill, while utilising waste biomass to produce energy. The sector, however, frequently falls between requirements for energy from waste sector and the biomass sector. How the proposals here, to only be able to use sustainable biomass, relates to these installations will need to be made clear.

- The application of this proposal will need to be considered in relation to the proposals for bringing energy from waste into the ETS (Chapter 7) and the MRV requirements that will determine what proportion of carbon emissions are biogenic and what proportion are fossil. Requirements determined as part of that proposal could have direct implications for how the application of biomass sustainability governance arrangements are introduced.

99) What are your views on the suggestion that from the start of the second allocation period in the HSE scheme, sustainability criteria will be applied to biomass for the purpose of assessing eligibility, when calculating an emissions target for the installation and when determining whether an installation's reportable emissions exceed the emissions target?

We are supportive of seeing sustainability criteria also applied to the HSE scheme for the purpose of determining eligibility and emission targets. However, we suggest that introduction of different biomass sectors will need to align to when a sites existing support mechanism, and existing points of sustainability obligation, fall away. For biomass power sites this will likely start in 2027 when the first few sites come to the end of their Renewable Obligation accreditation but recognise that some site contracts will go on into the 2030s. Equally non-domestic RHI sites, will be subject to that scheme's sustainability governance arrangements for the duration of their 20-year contract, with the last sites coming to the end of the scheme in 2041.

Introduction of a small site into the HSE requirements, while still having to meet existing obligations, could create an unfair administrative burden that delivers no additional benefit in

terms of sustainability. As such, HSE scheme requirements should be set up to kick in at the point that existing obligations fall away. By comparison, all new sites will automatically start as part of HSE scheme as the obvious place for the point of sustainability obligation to lie.

100) Do you have any evidence regarding how applying sustainability criteria for solid and gaseous biomass in the UK as proposed may impact the UK ETS and/or other policy areas? (Y/N) If so, please provide this in as much detail as possible.

Yes

How the sustainability criteria are designed, and when they are brought in, will have an impact on the market. The most obvious will be if there are any discrepancies between sustainability criteria within the UK ETS and any, still applicable, requirement of existing support mechanisms. As such it will be important to consider how this transition is achieved and map out where any difficulties lie.

The REA would be happy to help facilitate appropriate roundtables between relevant bioenergy sectors and government to discuss specific changes and how the transition could be best facilitated. This will provide direct and specific evidence, rather than speculating impacts within this high-level call for evidence.

101) Going forward, is there anything else you think we should consider regarding biomass in the UK ETS?

We note that considerations around biomass in the UK ETS must also be considered in relation to several other policy proposals considered in this call for evidence, which will also have implications for the sector. As such these proposals must be considered in the round, with their implementation being carefully planned. These proposals include:

- Chapter 8: Introducing a Green Gas Removal Credit into the UK ETS, given biomass will be a primary route for delivering bioenergy carbon capture and storage
- Chapter 7: Introduction of Energy from Waste into the UK ETS. Roughly 50% of energy from waste feedstock is biogenic. Similarly, sites which use waste wood must have clear guidance on how UK ETS decisions apply to them.
- Chapter 6: consideration of how revision to 20MWth threshold and 3MW aggregation threshold could impact smaller biomass sites, and how the HSE scheme applies to such sites.

In addition, we would also particularly highlight this further area of UK ETS adaption to support the green gas market:

Recognition of GoOs under the UK ETS

Green gas could help decarbonise fossil gas consumption at industrial installations covered within the UK ETS. When viable, co-locating a green gas production plant at an industrial facility to decarbonise its gas supplies should be the preferred route, however co-location will not always be possible or cost effective.

In many cases, the most cost-effective way to decarbonise these schemes is to source renewable gas supplies from the gas grid ('grid delivery of green gas', tracked by Guarantees of Origin). This can deliver GHG savings without requiring significant changes to plant or their maintenance

schedules (in the case of biomethane; for fuel switching to hydrogen more changes may be required).

Grid delivery of biomethane is already well established under the Renewable Transport Fuel Obligation (RTFO), where tracking must be completed according to a mass balance methodology. Several schemes are already in use to evidence mass balance under the RTFO e.g. ISCC, RED Certification. Guarantees of Origin (GoO) can also be used to evidence grid delivery according to a book and claim or mass balance methodology. The Green Gas Certification Scheme (GGCS) is already working with over 80 biomethane plants to issue GoO.

Industrial CHP plants or other industrial applications using fossil gas should be able to report under the UK emissions trading scheme that the relevant proportion of their gas use was green gas, backed by GoO, and therefore zero emissions.

The same principle should also apply to clean hydrogen sourced from the grid (when this becomes possible in the future) and evidenced by H2 Guarantees of Origin. The Green Gas Certification Scheme is in the process of undertaking a number of pilot schemes on H2GoO and they would be happy to share the results of the pilot to BEIS when these become available

CHAPTER 6 - 20MWth threshold and 3MW aggregation threshold call for evidence

102) Do you have data on the number, scale and/or emissions level of installations that are currently not monitored under the UK ETS because of the two thresholds? (Y/N) If so, please provide this where possible.

No

104) Do you have data regarding the compliance costs of installations and likely compliance costs of those outside of the UK ETS (i.e., exempt, USE, HSE)? (Y/N) If so, please provide this where possible.

No

However, review of the impact of this change will also need to be considered in relation to other proposals being put forward in this call for evidence. In particular, consideration will need to be given to a number of energy from waste and biomass sites currently in operation that may now be introduced to the ETS and may also be impacted by any changes to these thresholds. As such the existing thresholds could be beneficial in helping to transition new sectors into the ETS.

We note that the threshold could prove helpful in mitigating the impact of additional carbon costs being placed on smaller sites, many of which will be of strategic importance to delivering decarbonisation. This includes Advanced Conversion Technologies that use biomass or wastes to produce hydrogen, green chemicals or renewable transport fuels. While appropriate that such sites do still have carbon emissions monitored and targets in place, this is likely best achieved through the HSE or Ultra Low Emitter Schemes, rather than full involvement in the ETS.

To understand the number of such sites already built, government could review these sources of information as a starting point to consider how these thresholds might be applied to these sectors:

[1] Renewable Energy Planning Database: quarterly extract: https://www.gov.uk/government/publications/renewable-energy-planning-database-monthly-extract

[2] UK Energy from Waste Statistics – 2021 https://www.tolvik.com/published-reports/view/uk-energy-from-waste-statistics-2021/

[3] UK Dedicated Biomass Statistics – 2019 https://www.tolvik.com/published-reports/view/uk-dedicated-biomass-statistics-2019/

105) Do you have evidence of distortion in relevant markets caused by the 20MWth threshold (e.g., in the form of smaller installations coming on to the market at an increasing rate)? (Y/N) If so, please provide this where possible.

No

106. Do you have evidence of adverse interactions of the current threshold level with other UK Government or Devolved Administration policies (e.g., with Carbon Price Support)? (Y/N)

No

107) Do you believe there is other evidence that should be taken into account when considering lowering the 20MWth threshold? (Y/N) If so, please provide this.

Yes,

It should be recognised that the development of smaller low carbon generation sites is influenced by a significant number of market dynamics, of which the 20MWth UK ETS threshold is only one aspect. While these thresholds have an impact, it unlikely to be the primary driving force for market distortion suggested by this question. Other market factors that are driving the development of smaller scale generation include:

- The general move to more decentralised energy generation within local areas, providing flexibility and local energy solutions.
- Developing Combined heat and power projects to feed into localised district heating systems, necessitating smaller sizes.
- Distribution level grid capacity constraints making it difficult to get a grid connection much larger then the UK ETS thresholds. Members report that the maximum connection which any of the Distribution Network Owners (DNOs) can offer them on the 11kV network is typically a 8MW electrical output. This influences the size of plant they can plan to build when aiming to join the distribution network.
- Distribution level connections providing the greatest opportunity, and system value, for providing balancing and flexibility services to DNO's given current market arrangements.
- Effective development size for competing and clearing capacity market competitions.
- More modular and smaller designs of Advanced Conversion Technologies to firstly demonstrate commercial viability and secondly to treat specific localised waste streams or off taker markets.
- In addition, we note that moves towards more nodal pricing arrangements, currently being explored by BEIS, the ESO and Ofgem, could also drive developments of smaller localised generation.

Furthermore, the call for evidence also does not address the impacts that changing the thresholds could have on the broader energy market:

- Changes to the thresholds could increase costs of projects currently operating with support of existing CfD or Capacity Market contracts, making the clearing prices agreed in these arrangements less valuable and possibly undermining such project business models.
- Whether getting rid of the threshold in the UK would put UK projects at a disadvantage to EU renewable competitors who will still benefit from the thresholds being in place in the EU ETS. In tern this may also make the import of energy from similar projects in Europe, across interconnectors, cheaper then UK based generation at a time when British energy security remains a pressing issue.

As such, consideration of revisions to the thresholds, should include examination of full energy market dynamics, understanding what benefits or disadvantages maybe caused by the thresholds. As it stands, we suggest that the thresholds remain in place for low carbon generation sites that may now be brought into the UK ETS (such as biomass and energy from waste). While it is essential that such sites do have appropriate carbon emission monitoring in place and carbon targets, with sustainability criteria applied, the 20 MWth threshold could also help ensure such sites are encouraged and commercially viable without the additional administrative burden of being fully within the UK ETS.

108) Do you believe that there is a case for lowering the 20MWth threshold to bring more operators of combustion units under the scope of the UK ETS? (Y/N) If so, please state why?

No

While we recognise it is appropriate to consider the thresholds and ensure large polluters are included, we suggest that this consideration must now be done in relation to the wider set of proposals put forward by this call for evidence. As outlined in question 107, there are a wide set of market dynamics influencing generation size, the impact of this change therefore needs to be carefully considered while taking a whole market view and considering the full range of outcomes that the government wishes to achieve.

In addition, it should also be noted that, for facilities that fall under the waste permitting regime, there is already a high financial burden and strict emissions control under the regulatory controls of an environmental permit. The addition of further costs relating to the UK ETS will add to this and be disproportionate to the possibility of any further benefit in terms of carbon emissions reduction.

109) Do you have evidence of distortion in relevant markets caused by the 3MWth threshold for calculating total thermal input? (Y/N) If so, please provide this where possible.

No

110. Do you believe that there is a case for removing the 3MWth threshold to bring more operators of combustion units under the scope of the UK ETS? (Y/N) If so, please state why

No – as expressed in question 107, there are multiple market influences that are driving the size of generators beyond the UK ETS thresholds and that such thresholds provide a useful transition tool as new sectors are introduced to the ETS.

111) Do you believe the UK ETS is an appropriate policy to ensure the decarbonisation of small power generators in alignment with Net Zero? (Y/N)

Yes, however only in the long term. As the UK ETS evolves further and the ETS is expanded to further markets it is likely that revisions to the threshold in the immediate term may cause more difficulties then benefits, especially if such sites can be dealt with via the HSE and Ultra Smaller emit schemes. As these markets become more established it may then be beneficial to reconsider these thresholds later and ensure the UK ETS, and current thresholds, are delivering the carbon emission reductions that are being aimed for. As such the existing thresholds should be maintained for the time being as being useful to helping the transition of new sectors into the UK ETS.

In addition, in reviewing thresholds in the future, we suggest the opportunity should also be taken to switch the focus from input capacity to outputs, to better align the focus of the thresholds with UK targets for carbon reductions.

CHAPTER 7 - Reducing emissions from waste – a call for evidence on expanding the UK ETS to include waste incineration and energy from waste

124) Do you agree with the proposed timing for when waste incineration and EfW could be introduced into the UK ETS? (Y/N)

No

While the REA agree with the broad suggestion of the mid-late 2020s, we believe government should be aiming for its introduction to align with other waste policy implementation, such as the proposals for a ban on biodegradable material to landfill by 2028.

The introduction of EfW into the UK ETS should be considered in the context of wider waste management policy and implementation. As such, a late 2020's date (2028 – 2030) should be considered and committed to, providing a strong target date for the industry to prepare for. This will allow time for early investments to take place, taking advantage of lower costs now, with the expectations that such investments will deliver future savings when the UK ETS comes into force.

Other waste policies that will need to come before, or accompany, the introduction of the EfW into the UK ETS include:

- Effective implementation of the ban on biogenic material going to landfill
- Review of landfill tax and waste export tariff (or even ban) to ensure non-recyclable material is not just pushed further down the waste hierarchy
- Business model support for carbon capture technologies, available to existing bioenergy plants of all sizes and located across the country, not just in specific clusters.

- Development of carbon capture, storage and transportation infrastructure, including carbon pipelines outside of identified industrial clusters.
- Establishment of MRV criteria for the EfW sector in the UK ETS, including growing capacity of lab and testing infrastructure
- Wider implementation of waste and resource strategy policies. This includes waste prevention, new recycling targets, landfill bans, enhanced producer responsibility and deposit return schemes, to name a few

If government are keen to bring energy from waste into the UK ETS earlier, then it will be important for some form of transition arrangement be put in place to allow for the sector to make appropriate investments, manage new costs and get used to new administrative processes such as MRV testing. This could be done with the use of free allocations in the first few years of EfW joining the UK ETS, with a clear declining trajectory of available free allowances until the end of the decade, so that the sector can be transitioned into the scheme. This could also be important for not seeing carbon leakage into lower level of the waste hierarchy, if additional ETS costs result in wastes being directed to landfill or export in the first few years of implementation.

126) Do you agree that the UK ETS should be expanded to include waste incineration and EfW? (Y/N) Please outline your reasoning, including alternative options for decarbonisation of the sector outside of the UK ETS.

Yes.

The REA recognise that inclusion of energy from waste (EfW) in the UK ETS will help to drive sector decarbonisation by incentivising plant efficiency and helping encourage investment in lower carbon treatments of waste, including advance conversion technologies and carbon capture and storage. However, as a longer-term principle, government should be looking to apply carbon pricing across the whole waste management process, rather then just applying it to one specific stage, to achieve full decarbonisation of the waste system and mitigate unintended market consequences of applying additional costs to one stage of the waste hierarchy.

Inclusion EfW in the UK ETS needs to be targeted at ensuring that all EfW decarbonisation opportunities are being actively pursued. This means ensuring such activities are rewarded, or at least not discouraged by the addition of a carbon price. Such activities include, but are not limited to:

- Providing firm and dispatchable generation that compliments the deployment of other variable renewable generation.
- The use of innovative ACT technologies, already available, that deliver power at higher efficiencies providing environmental and economic benefits.
- Opportunity to capture, store and utilise heat and steam offtake to decarbonise domestic and industrial processes.
- Use of advanced conversion technologies (ACT) to produce further low carbon products, such as aviation fuels, that are of strategic importance for decarbonising hard to treat sectors.
- Sanitation services in treating waste and diverting it from landfill.
- Production of hydrogen, either via ACT using waste feedstocks or through electrolysis utilising power generated from EfW facilities
- Recovery of biproducts, such as metals or biochar, for use in other industries.

- Delivery of negative emissions using carbon capture technologies.
- recycling of incinerator bottom ash and air pollution control residues for construction materials

It must also be noted that this proposal will also need to happen in conjunction with reconsidering the level of the landfill tax, to ensure it remains above the cost of EfW, and the application of an export tariff on wastes leaving the country (or even ultimately an export ban) to equate for the difference of costs of sending waste to be treated abroad, rather than domestically.

127) Do you agree that all types of waste incinerators should be included in the UK ETS? (Y/N) If you believe certain incineration activities should be exempt, e.g. incineration of hazardous or certain healthcare waste, please provide details and specify which waste stream.

Yes.

As a design principal government should be trying to ensure a universal playing field across the whole waste system to help drive decarbonisation as part of a circular economy approach. As such, it is appropriate that all forms of energy from waste are introduced into the UK ETS, rather than trying to divide up the sector, which could lead to unintended market consequences.

As proposals currently stand, there will be specific questions that need to be considered in relation to where the boundary of energy from waste production lies, with different sites having varying levels of pre-treatment on site. Some sites might well find themselves disadvantaged by doing greater amount of sorting on site, despite this helping to increase recycling rates. This will need to be considered in greater detail in future consultations as the pathway for EfW inclusions is further considered.

However, while all technologies should be included within the ETS, there are strategic reasons why Advanced Thermal Technologies, particularly those providing waste to molecule solutions, should be provided some early protections using free allowances to ensure their pathway to commercialisation is not undermined. This is further discussed in answer to question 128.

A similar approach, utilising free allowances, may also be an appropriate solution to dealing with hazardous or medical waste where few other treatment options exist. Without such allowances such waste could possibly be exported for treatment, perhaps with lower environmental standards, leading to carbon leakage.

Finally, we also make clear that our understanding of this proposal is that the application of the UK ETS to EfW would not include combustion of landfill gas or sewage gas, which is typically considered lower down the waste hierarchy. The wider application of ETS onto the whole waste management sector should focus on the reducing methane emissions from landfill by ensuring biodegradable material does not end up in the ground in the first place. In addition, it would seem to create perverse outcome if the UK ETS imposes a cost on landfill sites to capture and use their gas to produce power where it does not impose such a cost if the gas is flared (or even leaks to atmosphere). As such, careful consideration of how the UK ETS is applied to waste management as a whole will need to be done before being applied more broadly.

128) Do you believe ATT should be included in the UK ETS? (Y/N) What challenges could arise as a result of including ATT, if any, that are different to conventional waste incineration plants?

Yes, but free allowances should be used while the technology becomes commercially established, given that such technologies deliver waste to molecule solutions that are of specific strategic importance for realising net-zero**.**

In the medium to long term, ATTs and Advanced Conversion Technologies (ACTs), should have a competitive advantage within the UK ETS having lower carbon emission profiles to traditional energy from waste units. Such systems are also seen as strategically important for the delivery of waste to molecule products that are needed to decarbonise hard-to-treat sectors. This includes the production of renewable transport fuels, sustainable aviation fuels, hydrogen and green chemicals. Other government policies are seeking to support their commercialisation through mechanisms such as the Renewable Transport Fuel Obligation, a mandate and possible Contracts for Difference for aviation fuels, Hydrogen Business Model, and other Net Zero Innovation Portfolio competitions. It would create a contradictory policy environment to both be supporting their delivery and, at the same time, making them subject to a restrictive carbon price, with an additional administrative testing burden on their operation, in the next few years.

In addition, consideration should be given to the fact that applying costs when using waste feedstocks could drive ATT/ACT systems to focus on the use of virgin biomass materials. While this would not be detrimental to UK carbon aims, recognising there is strong role for sustainable bioenergy in the energy transition, it could lead to the less effective use of our domestic waste resources and put further pressure on considerations of where biomass is best used within the bioeconomy.

Rather than exclude ATTs/ACTs from the UK ETS, the use of free allowances over a transition period - up until the sector is commercially established - should be used to ensure its inclusion does not slow the development of strategically important waste to molecule generation. The availability of such allowances, and the time over which they should be available, will need to be considered in line with broader, cross -Whitehall, policy aims in relation to these technologies.

129) Do you agree that the point of MRV obligation for the UK ETS should be placed on the operators of waste incinerators and EfW plants? (Y/N)

Yes.

It will be administratively difficult for the point of MRV obligation to lie outside of the operators of waste incineration and energy from waste plants. However, it will be important for government to provide appropriate guidance that sets out expected contractual responsibilities of waste companies/operators. This should include how costs associated with the UK ETS and MRV may well be passed on from the EfW plant to customers.

130) If the point of MRV obligation is placed on operators of waste plants, should waste companies/operators or customers (either LAs or commercial and industrial customers) be responsible for meeting compliance obligations? (Y/N)

Yes.

Given that meeting the required MRV standards, and the associated costs of meeting these requirements will to some extent be dependent on the composition of the waste being received from waste companies/operators some form of compliance obligation on ensuring a certain composition of waste may be appropriate and worth further consideration.

131) Do you believe that the Small and Ultra Small Emitter schemes that are currently available to eligible UK ETS participants should also be available to waste incinerators and EfW plants? (Y/N)

Yes.

Such plants that fall below this threshold are likely to be smaller more modular scale ATT or ACT projects, with the potential to deliver waste to molecule solutions. A lighter touch approach by applying the HSE and Ultra Small Emitter Schemes to the sector, which still requires emission monitoring and targets to be met, could reduce the ETS burden on innovative technology sites that are also being supported by other government policies (For further discussion on this see answer to question 128 and questions 102-109, Chapter 6). However, as ATT/ACT sector becomes more commercially established it may be appropriate to see this exemption reviewed and it brought into the full UK ETS in the longer term.

In addition, it should also be noted that, for facilities that fall under the waste permitting regime, there is already a high financial burden and strict emissions control under the regulatory controls of an environmental permit. The addition of further costs relating to the UK ETS will add to this and be disproportionate to the possibility of any further benefit in terms of carbon emissions. As such the Small and Ultra Small Emitter schemes remain appropriate approaches for such sites.

132) Which MRV proposal do you believe should be implemented to determine the UK ETS obligation for waste incinerators and EfW plants?

i) If Option A, please provide your views on which methods could be used, along with any information on the practicality of their implementation and likely costs.

ii) If Option B, please provide your views on how these emissions factors should be calculated, along with any information on the practicality of implementation and likely costs.

In your answer, please outline how frequently fossil emissions should be monitored under both options and consider whether there are other suitable MRV options that we have not identified.

We believe it is appropriate to aim for the method that provides the most accuracy in relation to carbon emissions. As such, we are supportive of seeing Individual Plant Monitoring (Option A) being the primary approach to MRV applied to energy from waste within the UK ETS. We suggest that emission factor approach (option B) can be inaccurate and places the ownership on the governing body to check and balance this approach across the industry, also increasing the overall cost burden to participants.

However, we do not believe the two options to be mutually exclusive. It should be recognised that the additional testing burden and costs implied by option A may not be suitable for all sites, especially smaller EfW applications. Where this is the case, we believe there should be an option

to also allow for an Emission Factor Approach (Option B), recognising that it would not be appropriate to see sites locked out of the market due to the UK ETS testing burden. In such a hybrid approach, it may be worth considering how the emission factor could be set at a higher-than-average carbon level. Given it is likely that costs will be passed on to the local authority or commercial customer, an elevated emission factor will incentivise them to consider the costs of the Individual Plant Monitoring process in order to ensure their obligation better reflects the actual carbon content of their waste stream and, overall, more accurate results are achieved.

In terms of considering both the practicalities and costs of applying option A, we would encourage government to examine the evidence they reviewed when considering the introduction of efficiency testing regimes for ACT projects in receipt of a Contract for Difference, which was consulted on in 2018 [1]. This included considerations of requiring C14 testing to determine biogenic content of feedstock, considering both the associated costs, appropriate frequency, and lab availability for running such tests. The data and conclusions reached during that consultation process could form a strong starting point for considering the appropriateness of testing regimes for EfW within the UK ETS today. However, we stress that the market has moved on since then and any data points will need to be further consulted on and sense tested with the industry to get realistic picture of today's market.

In addition, when designing the MRV protocols it will be essential for government to consider whether appropriate testing facilities are available if this is to become a requirement for all EfW installations across the UK. The lab availability, increased demand, and overall practicalities of running the tests could have a material cost implication for sites. This will need a separate consultation, and time provided for industry to gather realistic data to inform government decisions, which is not reasonable to expect provided in this form of high-level call for evidence.

The REA would be happy to work with government to help coordinate the collection of relevant industry data so that a suitable individual plant testing regime, and frequency, can be arrived at for the purposes of the UK ETS.

[1] BEIS (2018) Contracts for Difference Scheme for Renewable Electricity Generation - Government response to consultation on proposed amendments to the scheme - Part B https://www.gov.uk/government/consultations/contracts-for-difference-cfd-proposed-amendments-to-the-scheme

133) Do you believe that one of the MRV options proposed is more likely to lead to perverse incentives (e.g. more waste diverted to landfill) or to unintended consequences as a result of applying the UK ETS to waste incineration and EfW? Please consider different scenarios and provide evidence to support your views where possible.

The applied costs of the final testing regime will need to be carefully considered, along the with the overall costs that EfW sites will now need to bear to meet their UK ETS obligations. If these costs prove prohibitive in comparison to landfill or export, we can expect to see greater volumes of waste pushed in these directions. To account for this, the inclusion of EfW in the UK ETS must be carefully designed and considered across the whole waste stream and be delivered in line with other waste management policies coming into force.

This will likely need to include reconsidering the level of the landfill tax, to ensure it remains above the cost of EfW, and the application of an export tariff on wastes leaving the country (or

even ultimately an export ban) to equate the difference of costs of sending waste to be treated abroad, rather than domestically.

Ultimately, the final testing regime will need to be set out before the industry is able to accurately consider this question. It is also worth noting that many possible perverse incentives or unintended consequences would be avoided if the long-term aim was to apply carbon pricing across the whole waste system, creating a universal cost basis to drive decarbonisation.

134) Do you believe any additional greenhouse gases, other than CO2, that are emitted by EfW plants or incinerators, should be covered by the UK ETS? (Y/N) If so, please provide details on which gases and how it could work in practice.

No.

For consistency across the UK ETS, and in consideration of how all obligated parties are treated, EfW sites should be subject to the same greenhouse gasses as other sectors. The addition of other greenhouse gases, which aren't covered elsewhere, could lead to unintended consequences for how allowances are applied across the ETS market.

The UK ETS Authority should be aware of the significant levels of existing environmental regulation controlling the levels of emissions coming from EfW plants aligned with BREF permitting requirements, regulated by either local authorities or relevant national environmental agencies. These requirements should also be considered when considering expansion of GHG requirements relating to EfW sites within the UK ETS.

135) How would the application of an ETS to waste incineration and EfW impact stakeholders (including operators of waste incinerators, operators of EfW plants, LAs, consumers, customers)?

Impacts relating to specific stakeholders are addressed in response to other questions. However, overall, it should be expected that the inclusion of EfW within the UK ETS will see costs passed on from operators to local authorities as gate fees, and ultimately to consumers in the form of council tax requirements. These costs will be factored into how local authorities consider their waste management needs, and if done correctly, will help to see waste pushed higher up the waste hierarchy and efficiencies realised in the EfW sector. However, if not considered in line with broader waste system dynamics, there is the risk that waste will be further pushed towards landfill or export, which could also cause difficulties for local authorities, especially where they are trying to meet tighter recycling targets.

It should also be recognised that the inclusion of EfW into the ETS will be happening at the same time as a range of other waste policy changes are being implemented. This will put pressure on waste management companies, EfW plants and local authorities to manage all these changes within their own processes. As such, the inclusion of EfW into the UKETS should not be considered and designed in silo, it must be done as part of broader coordinated approach to how UK waste management systems are changing to meet our future waste decarbonisation needs, otherwise it risks negatively impacting all stakeholders involved and ultimately increasing costs

136) Could the introduction of a carbon price incentivise waste operators and/or LAs to improve their operations or processes to reduce fossil waste being incinerated? (Y/N)

Please outline your reasoning in as much detail as possible and provide evidence to support your views.

Yes, if done correctly and in coordination with other waste management policies then the introduction of carbon price should help the LA economic case for reducing fossil waste being incinerated and deliver greater amounts of waste being directed to recycling. This, however, will need to be accompanied by additional policy support to see recycling capacity increased, and for landfill and waste export policy to be reviewed, to ensure fossil wastes are not just pushed further down the waste hierarchy.

However, in addition to this dynamic, it is equally important to recognise that an alternative route for fossil waste is to be dealt with through advanced conversion technologies as waste to molecule applications. This could be either as recycled fossil fuels within the renewable transport fuel obligation or for chemical recycling to be used in plastic to plastic or plastic to oil applications. While such forms of conversion should still be considered EfW, and subject to the ETS, it is important that the early commercialisation of these conversion routes are not slowed by their introduction into the scheme. As discussed in question 128, free allowances could be used to mitigate the impact of their inclusion in the ETS in the first few years of their inclusion, enabling their development. Ultimately such sites will have low carbon emissions anyway and, as such, will see comparative advantages in the ETS once the sector is well established.

137) Could the introduction of a carbon price incentivise LAs to support households to improve recycling practices? (Y/N) Please outline your reasoning in as much detail as possible and provide evidence to support your views.

Yes, if also appropriately supported by further waste management policy to support the development of new recycling facilities. The addition of carbon costs within EfW should help the economic case for increasing LA recycling capacity, however this policy will not do it by itself. A broader approach to seeing the waste management system directed to the circular economy will be required beyond just the addition of EfW into the ETS.

This will also need to include consideration around the role of chemical recycling, utilising advanced conversion technologies, which will also fall under the ETS in current proposals as discussed in question 128.

The longer-term policy aim should also be to bring in the full waste management system into the ETS so that carbon reduction drivers are being felt across the waste hierarchy, which should further advantage waste minimisation and efficient, low carbon, recycling processes.

138) Is there opportunity (in the medium-long term) for the carbon price to incentivise waste operators and/or LAs to invest in carbon capture and storage infrastructure, to reduce fossil carbon emissions? (Y/N) Please outline your reasoning in as much detail as possible and provide evidence to support your views.

Yes, the inclusion of EfW in the UK ETS should help drive interest in carbon capture to avoid emissions costs. However, this must only be considered one part of the needed policy environment to see CCS EfW deployed. It also further reiterates the case for having an appropriate transition period, providing time for investment in new CCS technologies to be made in advance of higher costs being introduced.

More immediate, and wider, support mechanisms are going to be needed to enable the growth of the CCS market. The Government's current development of the Industrial Carbon Contract has been a welcome step in hopefully seeing the first few carbons capture projects in the EfW sector. However, this business model will need to be made available beyond just the cluster sequencing process, for a wide range of sites of different sizes, if it is going to substantially increase deployment of CCS EfW technologies.

In addition, this question needs to be considered in relation to the proposals in Chapter 8 of this call for evidence on rewarding Green Gas Removals within the ETS, which the REA has provided a response on. With MRV protocols for EfW sites requiring accurate measurements for biogenic waste, it will also be able to provide a foundation for MRV measurements on the delivery of captured biogenic emissions. This will create an additional dynamic for EfW plants in the ETS, both meeting their obligation and able to benefit from GGR units, which in the longer term might well further help drive sector investment in CCS technologies.

Combined, a broader ICC Business model and the development of a viable and liquid market for GGRs, will create a strong underpinning for the deployment of CCS on EfW sites. However, both a viable route to market for the technology and the market for GGRs must be established first.

139) In the event of the carbon price being applied to waste operators, will waste operators be able to pass through their costs to customers (including LAs)? (Y/N) Please explain in as much detail as possible why, how, and to what extent this may or may not occur.

The ability to pass on costs will be dependent on the individual contracts between waste operator and customer. These are not universal, and while many may have a 'change of law' clause, many are complex and there is still likely to be a significant amount of negotiation to be had to consider how costs are appropriately passed on.

As part of the transition to implementing this change, government should look to issue specific guidance for both Local Authorities and waste operators outlining the policy intent and how this should relate to expected changes in contractual arrangements, making it clear where the passing on of costs are considered appropriate.

141) Do you believe that government should consider phasing in ETS obligations to the sector over time? (Y/N) If yes, please outline why, how, and to what extent phasing options could be provided.

Yes.

As discussed in question 124, a transitional phasing in of ETS obligations is going to be necessary to appropraitly allow the sector to both adjust to the new obligation and avoid carbon leakage across the waste hierarchy, if increased EfW cost sees larger volumes of waste being directed at landfill or export.

In addition, we believe government should be aiming for EfW ETS introduction to align with other waste policy implementations such as the proposals for a ban on biogenic material to landfill by 2028. Taking a comprehensive view of all waste policy objectives is going to be crucial for avoiding unintended consequences, undermining policy aims or simply overloading local

authorities or waste management companies with an unmanageable level of new obligations and requirements.

As raised in question 128, a phasing in of ETS obligation on waste to molecule ACT sites may also be required given the strategic importance they are to play in helping to decarbonise hard to treat sectors, including in the production of hydrogen, sustainable aviation fuels and green chemicals. It is important that the ETS obligation does not undermine the commercialisation of this sector, especially when government polices elsewhere are supporting their deployment.

If government are keen to bring energy from waste into the UK ETS as soon as possible then transition arrangement could still be provided by through the administration of free allowances in the first few years of EfW joining the UK ETS, with a clear declining trajectory until the end of the decade, so that the sector can be transitioned into the scheme.

142) Would operators of incineration/EfW plants be exposed to competitiveness impacts abroad and carbon leakage risk, in the event of being exposed to the carbon price? (Y/N) Please explain in as much detail as possible and provide evidence to support your views.

Yes,

There is already an established waste export market, which in some cases provides a more affordable waste treatment option then landfill or domestic energy from waste treatment, but does represent a carbon leakage risk. If costs of domestic energy from waste are increased, then other international markets can be expected to become more competitive, dependent on tax regimes within the importing country.

In addition to the inclusion of EfW within the UK ETS then either the application of an export tariff, to equate for the cost difference, or an outright waste export ban may need to be considered to mitigate the likelihood of increasing waste export volumes.

Consideration must also be given to when waste is imported into the UK. For example, there is a quantity of waste wood imported for use in biomass power and heat plants in the UK. This waste should primarily be treated as biomass and, as such, continue to be zero-rated under the ETS, however this should be made clear within future arrangements to ensure such markets aren't undermined.

143) Have you identified any other distributional impacts (including wider environmental or social impacts) arising from this proposal? (Y/N) Do you have views on how government could address these concerns?

Yes.

Government should also consider how the inclusion of EfW in the UK ETS, and the additional costs this entails, could lead to increases in illegal waste activity such as fly tipping or illegal waste esports, where materials are sent for recycling but are then dumped in landfill by the receiving country. Consideration will need to be given to how these activities are monitored and further prevented, to ensure that the inclusion of EfW in the UK ETS does not have the unintended consequence of making these activities more attractive.

144) What additional policies would be needed to support the UK ETS in decarbonising waste incineration and EfW? How would this change over time?

There will be several more immediate policies needed to see the establishment of carbon capture technologies on energy from waste sites. As outlined in question 124, this includes:

Other waste policies that will need to come before, or accompany, the introduction of the EfW into the UK ETS include:

- Effective implementation of the ban on biogenic material going to landfill
- Review of landfill tax and waste export tariff (or even ban) to ensure non-recyclable material is not just pushed further down the waste hierarchy
- Business model support for carbon capture technologies, available to existing bioenergy plants of all sizes and located across the country, not just in specific clusters.
- Development of carbon capture, storage and transportation infrastructure, including carbon pipelines outside of identified industrial clusters.
- Establishment of MRV criteria for the EfW sector in the UK ETS, including growing capacity of lab and testing infrastructure
- Wider implementation of waste and resource strategy policies. This includes waste prevention, new recycling targets, landfill bans, enhanced producer responsibility and deposit return schemes, to name a few

Furthermore, it is noted that the Industrial Carbon Capture Contract is helpful in establishing an initial business model, however, this will need to be significantly expanded to apply to a range of sites outside of the initial cluster sequencing process. Government should aim for this to be widely available either before, or soon after, the full introduction of energy from waste into the UK ETS, providing a route to market for carbon capture projects and a clear investment opportunity for waste sites to reduce their carbon emissions.

Similarly, if government hopes to drive efficiencies in EfW by encouraging more sites to also provide heat, then government must urgently address the large policy gap created around commercial and industrial heat decarbonisation, left by the closure of the non-domestic RHI in March 2021. The delivery of either a heat CfD or dedicated fuel switching tariff could be beneficial in helping more energy from waste sites to become CHP. In relation to EfW sites, this will need to include the deployment of innovative thermal storage solutions which allow for the capturing of process heat to help decarbonise industrial processes.

Finally, further government focus on advanced conversion technologies, including clear strategic aims agreed across Whitehall, would be beneficial given the number of government policies being focused on by BEIS, DEFRA and DfT which consider the technology.

145) How would the expansion of the UK ETS to waste incineration and EfW interact with existing and planned policies in waste incineration, EfW, and waste management more broadly, as well as any other relevant non-decarbonisation policies?

Government should take the opportunity to consider the full range of new waste policies currently being implemented. This includes waste prevention, new recycling targets, landfill bans, enhanced producer responsibility and deposit return schemes, to name a few.

Government should aim to map out the implementation of these changes and how the inclusion of EfW in the ETS relates to them. It is important that the introduction of EfW into the ETS is appropraitly aligned with other policies also impacting the market.

146) Are there other parts of the waste management system that should be included in the scope of the UK ETS? For example, landfill or wastewater. (Y/N) Please explain in as much detail as possible and provide evidence to support your views.

As a principle, if government are looking to use the ETS to drive decarbonisation behaviours across the waste management system then they should be looking, overtime, to create a level playing field by applying the ETS to the whole waste management sector. This would be preferable to just focusing on one tier of the waste hierarchy, which could well lead to unintended market dynamics.

It is appreciated that such wholesale inclusion will require time and eventual transition, plus the evolution of the UK ETS itself, however it would be powerful to be stating this as an overall objective to provide a clear direction of travel for the whole industry.

CHAPTER 8 – Greenhouse Gas Removals: A call for evidence on the role the UK ETS could have as a potential future market

147) Do you believe the UK ETS could be an appropriate long-term market for GGRs? (Y/N) Please explain why, highlighting benefits and risks where possible.

Yes. GGR inclusion in the ETS is one of the tools required to successfully establish an emission removal market that is critical to reaching the UK's net zero ambitions.

The REA are supportive of seeing the UK ETS evolve so that it creates long-term market demand for both emission reductions and verified greenhouse gas removals (GGRs). The Climate Change Committee suggest GGRs will play a critical role, once emission reductions have been prioritised, in the UK meeting its net zero ambitions. Their central scenario suggests that around 23 Mt of CO2 removals will be needed by 2035 to remain in line with UK carbon budgets [1].

A market for both allowances and GGR credits will help to establish the interaction between both essential activities and help enable the deployment of commercial scale greenhouse gas removal technologies, both engineered and nature based. Their inclusion in the ETS, as the Governments critical policy for driving economy wide decarbonisation, will provide both appropriate rigour and credibility to how GGRs are accounted for in the establishment of this important market.

However, it should be recognised that inclusion in the ETS of GGRs will be focused on the creation of demand markets, it will not by itself spearhead the creation of supply. As recognised by the call for evidence, the creation of GGR unit in the ETS will need to be accompanied by several other supports polices and business models, many of which are already being developed by government, to help de-risk innovative technologies and see commercial deployment of a wide range of GGR technologies, both engineered and nature based. The UK ETS will compliment these polices and help create a long-term bankable market. In doing so it remains essential that a full portfolio of GGR technologies is delivered and all verifiable forms of GGRs are appropraitly rewarded by the UK ETS.

Key benefits will include:

- Build on an already well understood market mechanism that is well regulated and has existing governance arrangements.
- Inclusion of GGRs recognises that it is the obligated parties who will most likely need GGRs once they have prioritised emission reductions.
- Early inclusion of GGRs in the UK ETS would further establish the UK as a world leader in the delivery of GGRs at a commercial and rigorous scale.
- Inclusion in the UK ETS accords with the CCC pathway, and UK target, to realise net zero emissions by 2050.
- As a broad market, the UK ETS provides a suitably liquid market needed for effective GGR price discovery, setting the benchmark in which different GGR routes can compete and drive down costs.
- Inclusion accords with the broader 'polluter pays' principle which remains fundamental to ongoing decarbonisation policies.

It is, however, recognised that there is risk to including GGRs in the UK ETS, primarily concerning the quality of GGRs and ensuring that the credibility of the UK ETS is not undermined. We believe that this concern can be appropraitly addressed through two changes. Firstly, establishment of, a strong standards and methodologies regime for GGRs. Secondly, appropriate monitoring, reporting, and verification (MRV) processes to transparently demonstrate greenhouse gas removal.

[1] CCC (2021) Sixth Carbon Budget https://www.theccc.org.uk/publication/sixth-carbon-budget/

148) How could the design of the UK ETS be adapted to include GGRs while still maintaining the incentive to decarbonise for ETS participants?

It is firstly important to recognise that both reduction and removal activities are complementary and are themselves not opposing activities. This is well demonstrated by Bioenergy Carbon Capture and Storage technologies, whereby the ability for an industry to switch from a fossil fuel to bioenergy both reduces their emissions and enables the use of carbon capture to also deliver negative emissions.

However, it is also appreciated that reliance on removals must not be used by obligated parties to avoid emissions reductions in the first place. As such it is appropriate that in the introduction of a GGR credit into the UK ETS, emissions allowances continue to be seen as the primary method for driving down emissions and GGRs are used to support the removal of those emissions that can't be avoided in the first place.

The REA is supportive of seeing the creation of a separate GGR credit, equivalent to one tonne of CO2 removed, that is used in the market in conjunction with an Emission Allowances, thereby creating two tradable products. It is then up to the design of the market to make distinct how, and to what quantities, EA's and GGR's can be used by market participants to meet their obligation.

We believe further modelling is required to understand how the market design might best achieve maintaining the incentive to decarbonise. A good foundation for design consideration can be found in a report published by Oxera [1] in which they propose three models of greater or lesser integration of a GGR unit. However, they note that all require a reduction in the number

of emission allowances to apply pressure on market participants to continue to decarbonise rather than rely solely on removals. These designs include:

1. Separate Markets for EA's and GGR units, with Government acting as broker to control numbers of EAs and GGRs, effecting both their price and availability to drive market participant behaviours.
2. Separate markets, but with a price cap for GGR units, so that GGRs do not become more valuable than EA's.
3. Fully integrated markets whereby EAs and GGRs are auctioned together assuming the cost convergence of the two units within a mature market scenario.

It is possible these three models likely reflect transitional steps Government may wish to consider in the introduction of GGRs. Option one provides the most control, as the GGR market is established, and participant behaviours can be monitored. Whereas option three reflects a long term aim whereby the market is operating with limited government intervention.

Further possible market designs that could be considered, and could be built into the above to ensure decarbonisation behaviours, include:

- Introducing a percentage cap on the amount of GGRs that can be used by a market participant to meet their obligation, for example 10% - 30%. This would ensure most of their obligation continues to rely on EA's and pressure to decarbonise is maintained. However, the GGR percentage will need to be reviewed and have a clear trajectory for increasing over time as the successful decarbonisation of targeted industries naturally leads to GGRs being a bigger proportion of the market.
- In time, obligate the purchase of a GGR for each unit of EA, directly joining a tonne of emission to a tonne of carbon removal. This would likely need to be phased in later in ETS developments, once GGR technologies are well established and there is an appropriate level of GGR credits available.

In parallel to the above market design, the role of non-obligated parties, who may also be delivering GGR's, also needs to be considered. These may well be rewarded through the voluntary market, however there could be options for enabling them to be rewarded for the creation of a GGR credit in the UK ETS to create a further revenue stream for smaller scale GGR technologies to become established. It would also help accelerate price reduction and cost convergence between EAs and GGR units.

[1] Market design for negative emissions in the UK ETS, Oxera, April 2022. https://www.oxera.com/insights/reports/market-design-for-negative-emissions-in-the-uk-ets/

149) To what extent could the UK ETS price signal incentivise development of the full range of GGRs, including engineered and nature-based GGRs, given the expected differences in the project costs?

As a foundation principle, the UK ETS should be encouraging the development, and purchase, of a full portfolio of GGR technologies, recognising that we will likely need them all to see both substantial carbon removals realised and the delivery of a range of solutions to avoid dependence on one technology and encourage price competitiveness to help reduce costs.

It is, however, recognised that different GGR's do have varying characteristics. Nature based solutions, for the most part, could already be at a price point that could allow for quick deployment but there are clear issues around them being able to deliver permeance of storage

and providing additionality. By contrast engineering-based solutions are far more expensive, requiring additional support for deployment, but due to geological storage could see far greater levels of permanence.

The first step is therefore to ensure strong standards and methodologies for each form of GGR so that their quality can be assured from the outset through strict definitions. These can be designed around the Oxford Principle's for Net Zero Aligned Carbon Offsetting [1]. MRV can then be used to appropriately ensure continued compliance.

Once the nature of different GGRs is suitably defined and assured, then mechanisms within market design can be used to appropriately reward different forms of GGRs. A volume-based derating (or discounting) system based on the level of permeance achieved could be used. In such a system, those with lower levels of permeance could receive only a proportion of a single GGR unit. As a result, cheaper but less permeant solutions still receive a benefit, but not as much as the more expensive, but more permeant, geological storage solutions. This can also be expected to lead to market participants seeking a portfolio of GGRs in order to meet their obligation.

It is likely that a derating system is preferrable to a blunter permeance threshold which could ultimately exclude some GGR technologies from the market, while also creating a benchmark above which there is little advantage for longer permanence technologies to innovate or improve.

[1] Allen et al. (2020) The Oxford Principles for Net Zero Aligned Carbon Offsetting

150) What impacts or opportunities could arise for the UK voluntary carbon markets, if GGRs were included in a compliance market like the UK ETS? For example, what impacts, or opportunities could there be for voluntary carbon market schemes such as the Woodland Carbon Code?

Over the last few years, several standards have started to be developed for the verification of carbon removals within the voluntary carbon market. For the most part these are set by recognised and independent carbon credit standards setters such as the Gold Standard, CCS+ and Verra. This includes the development of MRV protocols for these markets. The establishment of the voluntary market is likely to be a crucial mechanism for the development of GGRs, especially for sites that may fall outside of obligated industries within the UK ETS, including smaller developments.

The development of these standards means that some of the work for the establishment of a standards, methodologies and MRV protocols has already been done – creating a strong basis with which to develop a suitable process for the UK ETS. However, given the UK ETS is a government backed mechanism, it is essential that GGR methodologies used are both rigorous and appropriate to the sector they are serving. In doing so it is likely that what is set out by Government will also influence and provide greater rigour to the voluntary market, becoming a recognised common standard in the UK and likely influencing the development of further GGR markets around the world. This is to be welcomed.

Given this interaction, and establishment of a recognised standard, it is appropriate for there to be opportunities for UK ETS market participants to also interact with the voluntary market, and for those sites developing GGRs outside of the UK ETS to also have the option to be able to

provide credits into the ETS. This of course will need careful accounting and likely require the establishment of suitable registers of credits to ensure that there is no double counting between markets. The design of GGRs within the UK ETS should set the expectation from the start that in the medium to long term it aims to interact with other GGR markets. Confirmation of those linkages can then be confirmed once robust processes are in place.

151) What impacts or opportunities could arise for the emerging markets for wider ecosystem services (e.g. biodiversity, flood management, water quality) if GGRs were included in a compliance market like the UK ETS?

There are many overlaps between the delivery of wider ecosystem services and GGRs both from engineered and nature-based solutions. The inclusion of GGRs within the UK ETS, backed by suitably robust standards, methodologies and MRV protocols, should lead to strong and positive environmental outcomes by categorising the co-benefits of different GGR technologies. This helps in two ways:

1) Helps to create strong offtake markets and sustainability standards for environmental products needed as feedstock for GGRs, for example wood pellets or perennial energy crops, enabling more landowners to enter that sector.
2) Potentially provides additional revenue streams to landowners and farmers rewarding them for the environmental benefits provided, especially in relation to nature based GGR technologies.

Such examples of this interaction between GGRs and Environmental benefits include:

- Bioenergy Carbon Capture and Storage creating a market for well managed healthy commercial forestry, leading to afforestation.
- Demand and strong offtake markets for sustainable energy crops, grown on marginal land, provides markets for growth of innovative crops like perennial energy crops. These can deliver environmental benefits in the form of soil carbon storage, biodiversity, pollination and even flood management.
- Creating a market for Biochar production which can be used to increase soil carbon storage and further land management benefits.

As such, the UK ETS itself could form part of the economic model that is essential for rewarding landowners and farmers for delivering environmental benefits. The development of UK ETS policy should also be done in conjunction with the further evolution of the Environmental Land Management Schemes (ELMs), with there being clear strategic objectives set out by both BEIS and DEFRA to reward farmers and create suitable offtake markets for their products.

152) Are there any impacts, constraints or unintended consequences that need to be managed if incorporating GGRs within an ETS?

The inclusion of GGRs within the ETS does need to be managed carefully, with consideration given to how the sector will evolve over time. Such areas for consideration include:

- Ensuring there is confidence in the quality of GRRs, by having a robust set of Standards and methodologies clearly defining GGR technologies and supported by a strong set of MRV's appropriate to the relevant sectors.
- Issues such as carbon leakage and price volatility will need to be modelled and considered carefully. The market for GGRs will need to remain consistent if it is to help

carbon capture projects to be bankable. Ensuring that available GGR units are appropraitly released in relation to demand will be crucial to ensuring a stable market.

- The inclusion of GGRs will also have to consider impacts on other government support mechanisms and government aims. There are many government work streams currently aimed at delivery of strategically important decarbonisation technologies including the CfD, RTFO, business models for hydrogen and government contracts for carbon capture. It is essential that these mechanisms and processes are complementary to the UK ETS to avoid the creation of unintended market barriers.
- The introduction of the GGRs will need to be done in consideration with the introduction of other policies proposed in this consultation. For example, proposals around the introduction of EfW into the ETS, the inclusion of biomass sustainability governance and revision of the 20 MW thermal threshold could all influence the demand and supply of GGRs when introduced. As such, proposals must be considered in the whole and the ETS market design done comprehensibly rather than in siloed proposals.
- Recognise how the interplay between Emission Allowances and GGRs may change over time as the ETS evolves. As we get closer to 2050, and realisation of the UKs net zero target, the level proportion of GGRs relative to EA's will increase. As such in the 2040s the focus of the ETS will likely need to be changed from aiming for net zero to aiming for net negative emissions so that the ETS can continue to provide long term support to the GGR market.

153) Do you think there are other eligibility requirements we should consider and what are these?

It is noted that the UK will likely be one of the first carbon markets to incorporate GGRs. While progress has been made under Article 6 of Paris Agreement to define rules for international cooperation towards national targets and carbon trading mechanisms, it is unlikely that carbon removals will be included in these arrangements in the near term. As such it may be appropriate to make eligibility limited to domestic projects only, with capture and storage of CO2 taking place in the UK.

However, given that the UK and EU continue to explore options for connecting the UK ETS and EU ETS, GGRs should also be part of these discussions and explored at the earliest opportunity so that trade of GGRs across these two markets are achieved as soon as possible. This will also help with addressing price and carbon leakage concerns.

154) What MRV criteria need considering for GGRs and what steps need to be taken to ensure a framework of criteria is robust, cost-effective, and scalable? a) For Nature-based GGRs b) For Engineered GGRs

The starting point for the development of the MRV is to ensure that strong standards and methodologies are established for each form of GGR technology, so that they are appropriately defined. These can be designed around the Oxford Principles for Net Zero Aligned Carbon Offsetting [1]. This will help establish baseline levels for capture and storage against which MRV protocols will be set. For example, where standards and methodologies are set for geological storage from the beginning, this will ensure projects are done correctly from the start and reduce what MRV protocols need to focus on.

In terms of the MRV's themselves crucial criteria include:

- Consideration of when CO2 Removal starts and finish

- Volume of CO2 removed
- The level of permanence achieved, and level of risk in this level of permanence not being met.
- Sources of carbon emissions resulting from GGR activities, for example feedstock growth or processing, level of emissions caused by transportation of carbon, or any additional energy inputs needed in the GGR process itself.
- Baseline emissions for the specific GGR technology to compare performance.
- Overall measurement and monitoring plans, including frequency and how they might change over time.

For the most part, engineered solutions can be expected to deliver high purity CO2 streams allowing for direct measurements. Nature based solutions may require proxy measurements, based on scientific studies to provide accurate results.

All MRV processes will need to be based on the best available data; build on existing environmental regulation; be rigorously tested; and be designed with appropriate review timescales to take note of new techniques or evidence.

We would be supportive of seeing a dedicated independent regulator established to have authority over MRVs, and coordinate appropriate input from academia, industry, and other stakeholders.

155) For GGRs that have a risk of carbon being re-released into the atmosphere, are there any potential solutions we should consider enabling market participation?

As stated in answer to question 149, a volume-based derating (or discounting) system based on the level of permeance achieved could be introduced. In such a system those with lower levels of permeance could receive only a proportion of a single GGR unit. As a result, cheaper but less permeant solutions still receive a benefit, but not as much as the more expensive, but more permeant, geological storage solutions. This can also be expected to lead to market participants seeking a portfolio of GGRs to meet their obligation.

It is likely that a derating system is preferable to a blunter permeance threshold which could ultimately exclude some GGR technologies from the market, while also creating a benchmark above which there is little advantage for longer permanence technologies to innovate or improve.

156) What are challenges of integrating non-permanent removals alongside permanent removals in the UK ETS and how can these be overcome?

Where credits with lower levels of permeance are allowed, their level of derating will need to be defined through robust and transparent MRV protocols. The role of these removals will also need to be clearly and transparently communicated to avoid accusations of poor quality or greenwashing that could devalue the effectiveness of the UK ETS. See responses to questions 149 and 155 for further information.

157) Who should own the rights of a possible GGR allowance or credit in a possible future market - the buyer, or the seller?

The full ownership of a GGR unit should be transferred at the point of sale, with initial ownership being the entity that captured the CO2 in the first place.

It is recognised that questions around liability are raised if ownership of the unit is divorced from the original originator of the credit. However, the ETS obligation itself could be used to provide insurance in cases where carbon leakage happens. For example:

- Where leakage occurs at a geological storage site, the site owner would be obligated to buy EA's, or further GGR Units, to offset this carbon loss.
- Where leakage occurs before storage, the capture site would need to be obligated to cover this loss by buying additional GGRs or EA's.

159) Should GGRs be incorporated into the UK ETS or would it be preferable to establish a separate, but linked, market for GGRs?

As expressed in answer to question 148, Government should be aiming for an incorporated market, however, it may take couple of steps to see this achieved.

A good foundation for consideration of this design can be found in a report published by Oxera [1] in which they propose three models of greater or lesser integration of a GGR unit. These designs include:

1. Separate Markets for EA's and GGR units, with Government acting as broker to control numbers of EAs and GGRs, effecting both their price and availability to drive market participant behaviours.
2. Separate markets, but with a price cap for GGR units, so that GGRs do not become more valuable than EA's.
3. Fully integrated markets whereby EAs and GGRs are auctioned together assuming the cost convergence of the two units within a mature market scenario.

It is possible these three models likely reflect possible transitional steps Government may wish to consider in the introduction of GGRs. Option one provides the most control, as the GGR market is established, and participant behaviours can be monitored. Whereas option three reflects a long term aim whereby the market is operating with limited government intervention.

In parallel to the above market design, the role of non-obligated parties, who may also be delivering GGR's, also needs to be considered. These may well be rewarded through the voluntary market, however there could be options for enabling them to be rewarded for the creation of a GGR credit in the UK ETS to create a further revenue stream for smaller scale GGR technologies to become established. It would also help accelerate price reduction and cost convergence between EAs and GGR units.

[1] Market design for negative emissions in the UK ETS, Oxera, April 2022. https://www.oxera.com/insights/reports/market-design-for-negative-emissions-in-the-uk-ets/

160) Are there other market designs or proposals we should consider for longer-term GGR deployment that would be preferable to inclusion in the UK ETS?

No. Other support market policies will be required to get specific GRR sectors established in the short term, but these will be complementary, rather than preferable, to GGR inclusion in the UK ETS.

In questions 147, 148 and 150 we explore possible UK ETS market designs and how these may also integrate with other policies or markets. This includes the possible integration with voluntary carbon markets, which are also expected to support the sector in parallel to the UK ETS.

161) How and when could eligible GGRs be phased into a market such as the UK ETS?

Government should aim for introduction of GGRs into the ETS at the earliest appropriate opportunity, to start to provide the strongest possible signal to market and get the sector moving. It is worth noting that with the current CCS cluster sequencing process, the first engineered GGR projects could be operational by the mid-2020's. This provides a useful timescale for GGR inclusion in the UK ETS.

With that said, the timing of GGR inclusion must also be considered in line with the timings of other proposals within this broader call for evidence. For example, inclusion of energy from waste into the ETS; establishment of biomass sustainability governance; reviews to the 20 MWth threshold; and changes to free allocations will all affect sectors where GGRs may well be delivered. The design and timing of ETS transformations therefore must be considered in the whole, and timings aligned accordingly.

162) Should any GGR approaches, or methods be considered for earlier inclusion in a market than others? Why should we consider these?

Those GGR technologies able to deliver at commercial scale first, while being underpinned by well-regulated MRV protocols, could be prioritised for early inclusion into the market. To facilitate early inclusion, government could consider prioritising the development of MRV protocols that can be based on pre-existing regulation, e.g. for GGR methods that make use of geological CO2 storage, or prioritise protocols for GGR methods that are operational or under development.

163) Should we trial eligible GGRs in a market or scheme before fully integrating to an existing market like the UK ETS? How and when could this happen?

Rather than trying to establish a separate 'trial' market outside of the UK ETS, Government should use the market designs options described by Oxera [1] as a phased stepped approach by which GGRs get increasingly integrated into the UK ETS, with clear end goal of full integration.

These design steps include:

1. Separate Markets for EA's and GGR units, with Government acting as broker to control numbers of EAs and GGRs, effecting both their price and availability to drive market participant behaviours.
2. Separate markets, but with a price cap for GGR units, so that GGRs do not become more valuable than EA's.
3. Fully integrated markets whereby EAs and GGRs are auctioned together assuming the cost convergence of the two units within a mature market scenario.

See responses to question 148 and 159 for further discussion on this.

[1] Market design for negative emissions in the UK ETS, Oxera, April 2022. https://www.oxera.com/insights/reports/market-design-for-negative-emissions-in-the-uk-ets/

164) Are there any relevant sources of evidence and expertise we should use to help inform our thinking?

The REA have a wide range of members focused on the development of GGR technologies across both engineered and nature-based solutions. This includes members involved in BECCS (both on biomass and EfW sites), Biochar developers, Hydrogen developers and organic recycling market participants. As government ideas and proposals develop, the REA would be happy to arrange suitable industry roundtables for further discussion on how best to include GGRs into the UK ETS.

The REA is also a member of the Coalition for Negative Emissions, which should also be considered a useful group of GGR industry developers with which to engage.

Also:

- Market design for negative emissions in the UK ETS, Oxera, April 2022. https://www.oxera.com/insights/reports/market-design-for-negative-emissions-in-the-uk-ets/
- Allen et al. (2020) The Oxford Principles for Net Zero Aligned Carbon Offsetting
- Coalition for Negative Emissions (2021) The Case for Negative Emissions report https://coalitionfornegativeemissions.org/wp-content/uploads/2021/06/The-Case-for-Negative-Emissions-Coalition-for-Negative-Emissions-report-FINAL-2021-06-30.pdf

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