Permit Application Representation

COMMENTS ON THE DRAFT DECISION DOCUMENT

Proposed activity:

S5.1 A(1)(b) The incineration of non-hazardous waste in a waste incineration plant with a capacity of 3 tonnes per day or more.

Facility Location:

Doncaster Energy Recovery Facility, Sandall Stones Road, Kirk Sandall, DN24SF

Applicant:

BH EnergyGap (Doncaster) Limited

Permit Number:

EPR/SP3904SR/A001

AUGUST 2021

UKWIN
United Kingdom Without Incineration Network

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COMMENTS ON THE DRAFT PERMIT DECISION DOCUMENT

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5.2.1 Assessment of Air Dispersion Modelling Outputs

"For these emissions, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances." (p. 29)

5.1.2 Use of Air Dispersion Modelling

"Where an emission is screened out in this way, we would normally consider that the Applicant's proposals for the prevention and control of the emission to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant." (p. 23)

5.2.2 Consideration of key pollutants

"...the health of the public would not be put at risk by such emissions, as explained in section 5.3.3." (p. 30 & p. 31)

5.2.4 Consideration of Local Factors

"The Applicant is required to prevent, minimise and control emissions using the best available techniques; this is considered further in Section 6." (p. 34)

5.3.3 Particulates smaller than 2.5 microns

"In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that "a policy which aims to reduce the annual average concentration of PM2.5 by 1 µg/m3 would result in an increase in life expectancy of 20 days for people born in 2008."" (p. 42)

6.1.1 Consideration of Furnace Type

"Overall, any of the furnace technologies listed below would be considered as BAT provided the Applicant has justified it in terms of:
- nature/physical state of the waste and its variability- proposed plant throughput which may affect the number of incineration lines
- preference and experience of chosen technology including plant availability
- nature and quantity/quality of residues produced.
- emissions to air – usually NOx as the furnace choice could have an effect on the amount of unabated NOx produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs" (p. 51)

6.6.1 Translating BAT into Permit conditions

"The use of BAT AELs and IED Chapter IV emission limits for air dispersion modelling sets the worst case scenario. If this shows emissions are insignificant then we have accepted that the Applicant's proposals are BAT, and that there is no justification to reduce ELVs below the BAT AELs and Chapter IV limits." (p. 75)

7.2 National primary legislation

"(vii) Section 81 (National Air Quality Strategy)

We have had regard to the National Air Quality Strategy and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit.

We have also had regard to the clean air strategy 2019 and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit." (p. 82)

Given that the term 'best available technique' can be confusing if used for a purpose that is contrary to the plain and ordinary meaning of the words (which would imply that only those techniques which result in the lowest achievable level of pollution would be allowed) it is necessary for the Decision Document to be more careful with respect to how it explains and uses the term or else readers could be misled as to the process that the Environment Agency has followed and/or is required to follow.

Page 29 is the first time that the concept of Best Available Technique (BAT) is being introduced within the Decision Document, and it is being advertised as something which would 'minimise emissions', i.e. that emissions will be 'reduced to the smallest possible amount'. That would be a usage consistent with the ordinary meaning of the words, that there is a requirement for best available technique (rather than the 'best affordable technique' or a 'barely adequate technique').

However, it is stated on page 51 that cost is one of the considerations alongside others such as energy usage (and operator 'preference') - this means that emissions might not be reduced to the smallest possible amount that is technically achievable. As such, there is a discrepancy between how BAT is introduced and how it appears to be applied.

If the EA's approach is actually to ensure that the pollution is being minimised to the smallest possible amount then Page 51 needs to be changed to remove references to cost being a consideration, and the application needs to be assessed on the basis of what is claimed to be the BAT process on Page 29.

However, if the EA's position is that BAT simply means that the levels of pollution are 'justifiable based on the preference of the operator, the cost to the operator and other relevant considerations' (i.e. a justifiable compromise between minimising

pollution and other considerations) then this should be explicitly stated rather than it being claimed that the Environment Agency has 'ensured' that pollution has been 'minimised'.

We do not believe the approach that *"Where an emission is screened out in this way, we would normally consider that the Applicant's proposals for the prevention and control of the emission to be BAT"* is an acceptable position where the goal is to minimise emissions. If an incinerator is adding to the pollution of an area (or worsening climate change for everyone) then it is working against efforts to reduce emissions, and multiple sources doing this could result in a significant in-combination impacts. This is especially relevant for incinerators as they could be operational and emitting pollution constantly for decades. As efforts to reduce emissions from other sources are successful, incineration can be expected to increasingly become a larger relative source of pollution within the geographical areas they operate.

Defra, Public Health England and Local Government Association have stated: [1]

> *"...the latest epidemiology demonstrates that harm occurs at pollution levels below EU limit values, so if your area doesn't have an AQMA it doesn't mean there isn't a public health issue to consider…*
>
> *There is no safe level for particulate matter (PM10, PM2.5), while NO2 is associated with adverse health effects at concentrations at and below the legal limits".*

The European Parliament (Directorate General for Internal Policies) have stated: [2]

> *"Although WHO AQGs [World Health Orgnisation Air Quality Guidelines] are based on health considerations, exposure even below the guideline values may constitute health risks that cannot be excluded. This is especially true for pollutants such as PM [Particulate Matter] for which it has been found that there is no threshold level below which adverse effects can be excluded. Also, mixtures of pollutants might have additive effects; highly sensitive groups might also be affected when exposed to levels at or below the WHO AQG."*

[1] Source: Air Quality: A Briefing for Directors of Public Health (Pages 41 and 61). Defra, March 2017. Available from: https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf

[2] EU Air Quality Policy and WHO Guideline Values for Health. Study for the ENVI Committee.. European Parliament, October 2014. Available from: http://www.europarl.europa.eu/RegData/etudes/STUD/2014/536285/IPOL_STU(2014)536285_EN.pdf

The World Health Organization have stated:[3]

> *"The current WHO Air quality guidelines (AQG) provide exposure-response relationships describing the relation between ambient PM and various health endpoints. No specific guideline value was proposed as it was felt that a threshold could not be identified below which no adverse effects on health occurred. In recent years, a large body of new scientific evidence has emerged that has strengthened the link between ambient PM exposure and health effects (especially cardiovascular effects), justifying reconsideration of the current WHO PM Air quality guidelines and the underlying exposure-response relationships... Epidemiological studies on large populations have been unable to identify a threshold concentration below which ambient PM has no effect on health. It is likely that within any large human population, there is such a wide range in susceptibility that some subjects are at risk even at the lowest end of the concentration range."*

The Public Health England consultation response quoted in Annex 4(a)(1) states:

> *"We support approaches which minimise or mitigate public exposure to non-threshold air pollutants" (p. 101)*

The UK Government's Clean Air Strategy states:[4]

> *"Air pollution comes from many sources. Pollutants can travel long distances and combine with each other to create different pollutants. Emissions from distant and local sources can build up into high local concentrations of pollution. The UK has set stringent targets to cut emissions by 2020 and 2030**. The goal is to reduce the harm to human health from air pollution by half**." (p. 7)*
>
> *"Air quality is the largest environmental health risk in the UK. It shortens lives and contributes to chronic illness. **Health can be affected both by short-term, high-pollution episodes and by long-term exposure to lower levels of pollution.**" (p. 7)*
>
> *"We will progressively **cut public exposure** to particulate matter pollution as suggested by the World Health Organization." (p. 7)*

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[3] : Health Aspects of Air Pollution with Particulate Matter, Ozone and Nitrogen Dioxide - Report on a WHO Working Group. Bonn, Germany, 13–15 January 2003 . World Health Organization, January 2003. Available from: https://ec.europa.eu/environment/archives/cafe/activities/pdf/1st_report.pdf

[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

*"Emissions from abroad, across the UK and local sources all contribute to the pollution that people and the environment are exposed to. Effective action is needed at **all levels** to clean up our air." (p. 12)*

*"Larger industrial facilities undertaking specific types of activity are required to use Best Available Techniques (BAT) to reduce emissions to air, water and land. BAT means the available techniques which are the best for preventing or **minimising emissions and impacts on the environment**.." [**emphasis added**] (p. 75)*

*"…industrial emissions are still responsible for a significant proportion of total UK emissions - 35% of nitrogen oxides, 65% of sulphur dioxides, 27% of particulate matter and 53% of volatile organic compounds in 2016. Estimates of projected emissions to 2030 suggest **further action is required from the industrial sector if we are to meet our emission reduction targets**" [**emphasis added**] (p. 76)*

"The Industrial Emissions Directive is mainly focused on the most polluting activities. Emissions from smaller plants used by industry, as well as from officers, larger buildings, schools and hospitals also need to be controlled, if we are to make further progress in cutting air pollution. That is why we introduced legislation in January 2018 to reduce emissions from a significant and previously unregulated source of air pollution: medium-sized combustion plants and generators and we will keep this sector" (p.76)

"We will maintain our longstanding policy of continuous improvement in relation to industrial emissions…" (p. 78)

Based on these statements, it appears that the Environment Agency's decision to screen out known sources of pollution from incineration and to consider a facility to be BAT when lower environmental and human health impacts can be achieved is a choice that goes against the ambitions set out within the Air Strategy 2019, and is not an approach which we would endorse.

As the Greenpeace International Science Unit noted:[5]

"There's really strong evidence that even small increases in particulate pollution can have a measurable impact on health...Anything that is going to produce more air pollution in places where people are going to breathe it, there will be a

[5] Source Material in conjunction with The Telegraph, 4 February 2021. Available from: https://www.source-material.org/blog/dirty-white-elephants

health impact. It's effectively a political decision of how big you're willing that impact to be."

Since no safe level of particulates exist and small increases in other key pollutants can make a big difference, it is incorrect and misleading to claim that the public will not be put at risk by such emissions. The impact of facilities with higher emissions may be more significant than the impact of facilities with lower emissions but all such facilities should be seen as having a non-trivial impact and the potential to reduce emissions further should be considered even where emissions would fall below an arbitrary threshold of significance.

5.3.4 Assessment of Health Effects from the Installation

"We are satisfied that compliance with these conditions will ensure protection of the environment and human health"

This statement is misleading. To protect something suggests something is being kept safe from harm or injury. The EA's permitting process does not ensure this. It is recognised that there is no safe level for pollutants such as particulates. Greenhouse gases are damaging to the environment. The EA allows issues permits for facilities that would increase particulate pollution and increase greenhouse gas emissions. These facilities harm health and damage the environment. The EA may consider that it limits the harm to public health and the environment, but it is incorrect and misleading for the EA to claim that it ensures protection of the environment and human health.

2. CONFIDENCE INTERVALS APPEAR TO BE IGNORED

5.2.1 Assessment of Air Dispersion Modelling Outputs

"Second, they assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate" (p. 25)

5.2.2 Consideration of key pollutants:

"The above assessment is considered to represent a worst case assessment in that: ...It assumes that the plant emits particulates continuously at the IED Annex VI limit for total dust, whereas actual emissions from similar plant are normally lower" (p. 30)

5.5 Impact of abnormal operations

"We have not assessed the impact of abnormal operations against long term ESs for the reasons set out above" (p. 49)

6.1 Scope of Consideration:

"Chapter IV of the IED specifies a set of maximum emission limit values." (p. 50)

"Assessments based on, say, Chapter IV limits are therefore "worst-case" scenarios" (p. 50)

6.6.1 Translating BAT into Permit conditions:

"The use of BAT AELs and IED Chapter IV emission limits for air dispersion modelling sets the worst case scenario." (p. 75)

It should be made clearer that plants are allowed to exceed the ELVs even outside of the 'abnormal operations' mentioned on page 47 because measurement uncertainties are subtracted rather than added to the assumed level of emissions.

For example, the Environment Agency currently allows for a Confidence Interval for total dust of 30%, but this isn't mentioned anywhere in the decision document despite it being relevant to the issue of the extent to which the assumptions do or do not represent a 'worst case' scenario.

As noted in the Environment Agency's Data Verification Tool Guidance V1:

> *"The final step in data validation is to take account of the measurement uncertainty, also referred to as the Confidence Interval. Taking account of the Confidence Interval will ensure compliance with the relevant ELV can be determined.*
>
> *The uncertainty in the form of the Confidence Interval can be viewed as an "allowable margin of error" in the measurement.*
>
> *The Industrial Emissions Directive specifies the Confidence Intervals for each measurement parameter to account for this measurement uncertainty.*
>
> - *Carbon monoxide 10%*
> - *Sulphur dioxide 20%*
> - *Nitrogen dioxide 20%*
> - *Total dust 30%*
> - *Total organic carbon 30%*
> - *Hydrogen chloride 40%*
> - *Hydrogen fluoride 40%*
> - *Ammonia 40% (This is something we have agreed and is not actually specified in the IED.)"*

If the Environment Agency has a rationale for not assuming that emissions are double the Confidence Interval for the purpose of 'worst case' scenarios then this should be explained (e.g. the extent to which such considerations are already covered by the assessment of abnormal operations even though that is only intended to assess the impacts of short-term exceedances). Furthermore, we ask that at the very least sensitivity analysis is provided to show what the impact would be of assuming that the emissions are double the Confidence Interval.

There should also be an explanation of what measures, if any, are being taken to reduce the Confidence Intervals and make the measurements more accurate (including with respect to any relevant permit improvement conditions).

This issue is compounded with an issue noted elsewhere, which is that in relation to Planning Appeal ref 3218965 it was noted by the consultants for the incinerator applicant that *"Dispersion models typically have an accepted uncertainty of up to +/-25%"* and that it could be as high as ±30% for annual mean predictions.[6]

It is unclear whether or how this has been taken into account in the dispersion modelling and determination of the process contributions, e.g. sensitivity analysis assuming 25-30% higher emissions/impacts.

5.3.4 Assessment of Health Effects from the Installation

"In carrying out air dispersion modelling as part of the Environmental Impact assessment and comparing the predicted environmental concentrations with European and national air quality standards, the Applicant has effectively made a health risk assessment for many pollutants. These air quality standards have been developed primarily in order to protect human health."(p. 43)

Considerable research has been undertaken in recent years that shows the very harmful effects of air pollution on human health. The evidence is growing all the time. National Air Quality Standards have not kept up with this growing evidence base. If use of European and national air quality standards "effectively" means that the applicant has "made a health risk assessment for many pollutants" then, at best, this "risk assessment" is based on out of date information. It is extraordinary that the EA would consider such a "risk assessment" to be a reasonable assessment thereby effectively ignoring the huge quantity of recent evidence about the damaging impacts of air pollution.

To repeat an earlier quote, Defra, Public Health England and Local Government Association have stated: [7]

> *"...the latest epidemiology demonstrates that harm occurs at pollution levels below EU limit values, so if your area doesn't have an AQMA it doesn't mean there isn't a public health issue to consider…There is no safe level for particulate matter (PM10, PM2.5), while NO2 is associated with adverse health effects at concentrations at and below the legal limits".*

There is no indication that this advice has been taken into account by the Environment Agency, and the above quote from section 5.3.4 appears to indicate that it was not taken into account within either the applicant's modelling or the Environment Agency's assessment of that modelling.

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[6] Dispersion models typically have an accepted uncertainty of up to +/-25%APP/P3800/W/18/3218965

[7] Source: Air Quality: A Briefing for Directors of Public Health (Pages 41 and 61). Defra, March 2017. Available from: https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf

"Overall, taking into account the conservative nature of the impact assessment…" (p. 43)

For the reasons set out above, it appears there are a number of respects in which the impact assessment was not conservative. For example, it does not take into account:

- emissions above the ELV are allowed even outside of normal operations,
- there can be +30% uncertainty in dispersion modelling,
- there can be exposure response coefficient effects that have not been considered, and
- a significant proportion of particulate emissions could be smaller particles resulting in a higher level of ultrafine particles and a higher total number of particles than have been assessed or assumed.

For the prediction to truly be conservative, an assessment should be carried out on the possible margin of error. Without this, the impact assessment is not "conservative" as claimed.

3. THE ENVIRONMENT AGENCY'S EXPLANATION OF ITS ACTIVITIES AS A STATUTORY CONSULTEE REGARDING ENERGY UTILISATION IS MISLEADING

4.3.7 Energy efficiency:

"The location of the Installation largely determines the extent to which waste heat can be utilised, and this is a matter for the planning authority...In our role as a statutory consultee on the planning application, we ensured that the issue of energy utilisation was brought to the planning authority's attention" (p. 18)

ANNEX 4: Consultation Reponses

"Issue raised: Concern over the location of the plant. Summary of action taken: Location is primarily a land use planning issue."

It would be helpful if the Environment Agency could be more clear about what was said signpost to where this could be found. Presumably the statement in 4.3.7 is a reference to planning application 20/01774/TIPA and the EA's letter of 27 August 2020 which stated:

> *"We will as a minimum require the proposed development to be built CHP ready by imposing specific permit conditions. For example, conditions requiring the operator to provide and maintain steam and/or hot water pass-outs such that opportunities for the further use of waste heat may be capitalised upon should they become practicable, and a condition that requires the operator to review and report on the practicability of CHP implementation at least every 2 years. The applicant is advised to refer to the latest Environment Agency guidance on 'CHP Ready' at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296450/LIT_7978_e06fa0.pdf*

Additional to this the Environment Agency is able to offer guidance on undertaking cost-benefit assessments for installations under Article 14 of the Energy Efficiency Directive"

Rather than making it clear that *"The location of the Installation largely determines the extent to which waste heat can be utilised, and this is a matter for the planning authority"* as the EA claimed in their draft decision document, the letter of 27 August 2020 from the Environment Agency seems to be entirely focussed on the EA's role of requiring a plant is CHP ready and not at all on the Council's role of determining the appropriateness of the location taking into account whether or not its location is appropriate for heat use and could give the Waste Planning Authority the impression that CHP is entirely a permitting matter.

As such, the current draft permit decision document might be misleading as to the sort of advice given to the planning authority (and flag the need for improvements in what is expressed to Waste Planning Authorities).

4. INSUFFICIENT CONSIDERATION OF IMPACTS OF DIFFERENT SIZED PARTICULATES

5.2.2 Consideration of key pollutants

"The above assessment also shows that the predicted process contribution for emissions of $PM_{2.5}$ is also below 1% of the ES. Therefore the Environment Agency concludes that particulate emissions from the installation, including emissions of PM_{10} or $PM_{2.}5$, will not give rise to significant pollution." (p. 30)

"The above assessment is considered to represent a worst case assessment in that: … It assumes all particulates emitted are below either 10 microns (PM_{10}) or 2.5 microns ($PM_{2.5}$), when some are expected to be larger." (p. 30)

"There is currently no emission limit prescribed nor any continuous emissions monitor for particulate matter specifically in the PM_{10} or $PM_{2.5}$ fraction." (p. 30)

"…the health of the public would not be put at risk by such emissions, as explained in section 5.3.3" (p. 30 & p. 31)

5.3.3 Particulates smaller than 2.5 microns

"the HPA statement (referenced below) says that due to the small effects of incinerators on local concentration of particles, it is highly unlikely that there will be detectable effects of any particular incinerator on local infant mortality" (p. 42)

The logic here does not necessarily follow. It is possible to have very significant ultrafine particulate pollution whilst having PM10 and PM2.5 levels below 1% of the ES.

More generally, there is insufficient acknowledgment that a gram of PM10s might have a different human health impact to a gram of $PM_{2.5}$s, PM_1s or $PM_{0.1}$s.

As noted at https://uk-air.defra.gov.uk/networks/network-info?view=particle:

> *"Exposure to airborne PM is associated with a range of adverse effects on human health including effects on the respiratory and cardiovascular systems, leading to hospital admissions and mortality. There is increasing evidence that fine ($PM_{2.5}$) and ultrafine particulate matter (<100nm) plays a more significant role than previously thought, although as yet the precise toxicological mechanisms are not clearly understood. There is also evidence to suggest that particle number concentrations and chemical composition are of greater significance than mass concentrations in the determination of certain health effects. Particle number concentration is the total number of particles per unit volume of air (for example cm-3), whereas particle mass concentration is the total mass of particles per unit volume (for example µg m-3). Mass concentrations are typically dominated by larger particles."*

While ultrafines are mentioned within Section 5.3.3 of the Decision Document, there is no sensitivity analysis showing what the impact would be if a significant proportion of the emissions were PM_1s or $PM_{0.1}$s rather than $PM_{2.5}$s. It is not enough to say that PM $<_{2.5}$s are captured in $PM_{2.5}$, because having a larger proportion of smaller particles can result in different health impacts for the same mass of particles.

Given the age of the HPA statement, it is unclear about the extent to which they took into account how incineration could have a significant impact on the local number of particles even at low levels of total particulate mass if a large proportion of particles are smaller in size, resulting in higher numbers of ultrafine particles. A lot of the HPA's statement and assessments appear to relate to PM10 and PM2.5 emissions, and does not specifically appear to address the impacts of a large number of ultrafine particles being released.

A lot of the consideration by the Environment Agency seems to relate to infant morality, but many issues relating to pollution relate to the lifetime accumulation of pollutants and the impact on quality of life or in deaths brought forward. It is unclear about the extent to which many potential health outcomes have been considered with respect to incineration.

5.3.3 Particulates smaller than 2.5 microns

"The Operator will be required to monitor particulate emissions using the method set out in Table S3.1 of Schedule 3 of the Permit. This method requires that the filter efficiency must be at least 99.5 % on a test aerosol with a mean particle diameter of 0.3 µm, at the maximum flow rate anticipated. The filter efficiency for larger particles will be at least as high as this.

This means that particulate monitoring data effectively captures everything above 0.3 µm and much of what is smaller. It is not expected that particles smaller than 0.3 µm will contribute significantly to the mass release rate / concentration of particulates because of their very small mass, even if present. This means that emissions monitoring data can be relied upon to measure the true mass emission rate of particulates." (p. 41 & p. 42)

If a large proportion of emissions are sub-0.3 µm particles, then this might mean that emissions monitoring captures a large proportion of the *mass* but it also means it misses a large proportion of the *particles* and that a significant proportion of the emissions are smaller particles that could result in a significantly higher health impacts per unit of weight and/or per particle.

"PHE note that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP." (p. 42)

It is unclear when the PHE noted this and what work has been carried out on this topic since. It appears to acknowledge that their could be coefficients and does not rule out the prospect that those impacts could be likely or significant, it only states that we don't know with sufficient details what the precise impacts are. Given this, it appears that there is not yet scientific evidence available to *rule out* that there could be a significant adverse impact from the release of ultrafine particles from waste incinerators, and the Environment Agency do not state that this could be ruled out as a possibility. In light of the significant potential impacts of this, we think the precautionary approach should be used and efforts should be made to establish the possible upper bounds of those limits. If the EA is not willing to do this, then there should be a detailed explanation for why they are not applying the precautionary principle which is a cornerstone of good practice and acknowledge that this could result in human health impacts being significantly worse than predicted using the current modelling approach.

5.3.3 Particulates smaller than 2.5 microns

"PHE also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM10 levels compared with 18% for road traffic and 22% for industry in general… The 2016 data also shows that road traffic contributed to 5.35% of PM10 and 4.96% of PM2.5 and that domestic wood burning contributed 22.4% to PM10 and 34.3% of PM2.5 levels."

This statement is misleading for a number of reasons that mean that if the statement is retained then it should be accompanied by a significant amount of context to explain it.

Firstly, if this figure relates to the national inventory then it does not show what the impact of an incinerator might be on a local population or a sensitive local receptor. In terms of national impacts, there was significantly less incineration in 2007 than there is today. In 2006/7 only 3.2 million tonnes of English Local Authority Collected Waste was sent for incineration, whereas in 2019/20 that figure had increased to 11.6 million tonnes.

Secondly, there have been significant efforts to reduce emissions from road traffic and domestic wood burning since 2007 and more improvements are anticipated, meaning that the figure for alternative sources could be expected to reduce going forwards which would make incineration a larger contributor.

Thirdly, nearly all particles released by incinerators are PM2.5s and a significant proportion of them are smaller, meaning comparison with other sources of PM10 by weight is misleading as it does not reflect the relative number of particles and potentially harmfulness of those particles. Incinerators might make a small contributions to PM10 but that does not necessarily mean they make a small contribution to PM2.5 of PM0.1. Whilst PM10 includes PM2.5 which include PM0.1, the levels of each of these are very different so the statement is unhelpful in assessing the contributions on incinerators to adverse health impacts.

"A 2016 a paper by Jones and Harrison concluded that 'ultrafine particles (<100nm) in flue gases from incinerators are broadly similar to those in urban air and that after dispersion with ambient air ultrafine particle concentrations are typically indistinguishable from those that would occur in the absence of the incinerator." (p. 43)

The 2006 paper by Jones and Harrison is quoted, but the quoted statement says very little. The concentration of almost any emissions after dispersion with enough ambient air will be indistinguishable from those that would occur in the absence of an incinerator. It just means that these emissions are dispersed. It does not mean that they are not harmful nor does the quoted statement say how much ambient air is needed to make the concentration indistinguishable.

The EA says nothing about:

1. Whether UK incinerators are identical to the incinerators in Italy and Scandinavia considered by Jones and Harrison.

2. Why Jones and Harrison did not find any data on ultrafine emissions from UK MSW incinerators.

3. The Jones and Harrison recognition that differences in operational practices and in the waste processed affects emissions. The EA does not say that "operational

practices" and the waste processed by UK incinerators are identical to that considered by Jones and Harrison.

4. The poorer performance of fabric filters identified by Jones and Harrison at particle diameters around 0.04 µm.

The EA also does not say why it considers it reasonable to trust the health of UK residents to a 2006 study that may not be representative of UK incinerators.

5.3.4 Assessment of Health Effects from the Installation

"Taking into account all of the expert opinion available, we agree with the conclusion reached by PHE that "While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable."" (p. 43)

The EA quotes this sentence out of context. The following PHE statement says:

> *"This view is based on detailed assessments of the effects of air pollutants on health and on the fact that these incinerators make only a very small contribution to local concentrations of air pollutants."*

It is unclear about the extent to which this considered the issue of incinerators contributing a large proportion of smaller particles in light of the fact that ultrafine been acknowledged as a larger issue than previously thought and Jones and Harrison identified poor filter efficiency at particle diameters around 0.04 µm. The issue does not seem to have been adequately considered by the Environment Agency.

Furthermore, as noted above, as other sources of particulate matter such as from traffic and domestic wood burners are reduced incineration could become an increasingly large proportion of contributing pollution within a local area, and there is no indication that this has been taken into account by the Environment Agency.

5. NO EXPLANATION OF WHETHER OR NOT (AND HOW) THE ENVIRONMENT AGENCY HAS EXPLAINED ITS ROLE IN RELATION TO TRAFFIC AND NEW HOUSING TO THE PLANNING AUTHORITY AS PART OF THE PLANNING PROCESS

ANNEX 4: Consultation Reponses - Response Received from Doncaster Council

"Movement of traffic to and from the Installation is outside of our remit but will normally be an issue for the planning authority to consider." (p. 102)

"If new housing or schools are proposed in the future they would require planning permission and the incinerator should be taken into account in assessing those proposals." (p. 142)

The Environment Agency does not make it clear whether or not this was communicated to the Waste Planning Authority. From our look at the three consultation submissions from the EA (27 August 2020, 18 January 2021 and 3 March 2021 for planning application 20/01774/TIPA) we do not see any reference to traffic or the implications for now housing and schools.

An explanation should be given as to why the EA has not informed the Waste Planning Authority that the EA is relying on the Planning Authority to address this matter. If an explanation has been given, then it should be made clear in the Decision Document when this was communicated to the Waste Planning Authority and where this can found.

6. INSUFFICIENT EXPLANATION PROVIDED REGARDING EPR 5.01

4.3.7 Energy efficiency:

"The BREF says that 0.4 – 0.8 MWh of electricity can be generated per tonne of waste. Our technical guidance note, SGN EPR S5.01, states that where electricity only is generated, 5-9 MW of electricity should be recoverable per 100,000 tonnes/annum of waste (which equates to 0.4 – 0.72 MWh/tonne of waste)." (p. 17)

6.1.1 Consideration of Furnace Type

"The table below has been extracted from the BREF tables. This table is also in line with the Guidance Note "The Incineration of Waste (EPR 5.01))." (p. 51)

"In accordance with BAT 30 of the BAT C and our Technical Guidance Note, EPR 5.01, the Applicant has confirmed that the boiler design will include the following features to minimise the potential for reformation of dioxins within the de-novo synthesis range:…" (p. 56)

Given that Technical Guidance Note 5.09 is used as part of the evidence base relied upon to inform the Decision Document, the EA should provide a clear explanation including where this document can be found alongside an explanation of the current status and role of the document.

For example, is the document the one listed at https://www.gov.uk/government/publications/incineration-of-waste-epr501-additional-guidance dated 1st February 2009 on the webpage but March 2009 within the document, or is it an unpublished updated draft version to that document? If it is the version at https://www.gov.uk/government/publications/incineration-of-waste-epr501-additional-guidance then it might want to repeat the disclaimers from that page, e.g. that *"Some of the documents referred to in this guidance have been withdrawn and replaced with new versions"* but *"This guidance document is still current and how the Environment Agency regulates you [i.e. industry] and your [i.e. their] legal requirements have not changed."*

7. INSUFFICIENT EXPLANATION OF HOW COMPETENCE AND CONTROL IS ASSESSED

4.3.1 Administrative issues

"We are satisfied that the Applicant is the person who will have control over the operation of the Installation after the granting of the Permit; and that the Applicant will be able to operate the Installation so as to comply with the conditions included in the Permit."

ANNEX 1A: APPLICATION OF CHAPTER IV OF THE INDUSTRIAL EMISSIONS DIRECTIVE

"IED Article: 50(7)

Requirement: Management of the Installation to be in the hands of a natural person who is competent to manage it.

Delivered by: Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit. " (p.89) (emphasis added)

The Environment Agency does not explain how they satisfied themselves that *"the Applicant is the person who will have control over the operation of the Installation after the granting of the Permit"* or that *"the Applicant will be able to operate the Installation so as to comply with the conditions included in the Permit"*. For example, does this relate to Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit?

Those conditions are mentioned in a different section of the document within the context of implementing Article 50(7) of the Industrial Emissions Directive (IED).

Article 50(7) of the IED actually states: *"Member States shall ensure that the waste incineration plant or waste co-incineration plant is operated and controlled by a natural person who is competent to manage the plant." (emphasis added)*

Being 'in the hands' a competent natural person could arguably have a slightly different natural connotation in the Decision Document which refers to a facility being 'operated and controlled' by a competent natural person, but perhaps it more accurately conveys how the requirement is applied.

For example, the information in Gent Fairhead & Co Limited's application for the Rivenhall IMWF permit they stated:

> *"As defined in the Regulation 7 of the Environmental Permitting Regulations, the operator is 'the person who has control over the operation of a regulated facility'.*
>
> *Gent Fairhead expect that the day-to-day operation of the different waste treatment processes will be subcontracted to third party organisations through operation and maintenance (O&M) contracts.*

Gent Fairhead will ensure that under the O&M contract Gent Fairhead retain control of the Installation and it is operated to the exact instruction of Gent Fairhead.

Gent Fairhead will require the O&M contractors to implement environmental management systems in accordance with BS EN ISO 14001:2004 Environmental Management System Standard and with the operating and maintenance instructions of the designer of the plant."

Similar language is used in BH EnergyGap (Walsall) Limited's proposed for the 3R Facility Walsall incinerator variation (EPR/AP3832WS/V002).

Given that the language used does not naturally seem to lend itself to outsourcing day-to-day operations to a third party, it seems like there should be a clearer explanation of how competence is assured and what it means for it to be 'in the hands' of a competent person, either within the decision document or in a document to which the decision document refers.

There is no explanation about whether or not any checks have already been carried out into the competence of the operators, or whether that is being left entirely to the condition. It is unclear how the conditions named will be enforced, i.e. how the Environment Agency will ensure continued compliance with the condition.

https://consult.defra.gov.uk/waste/crime-and-poor-performance-in-the-waste-sector/user_uploads/part-a-1.pdf states:

"The previous 'fit and proper person' test, as set out in past legislation, was replaced with a more light touch approach. Paragraph 13 of Schedule 5 to the EPRs sets out that a regulator must refuse an application for the grant of an environmental permit if the applicant cannot satisfy the regulator that they will:

- *be the operator of the regulated facility; and*
- *operate the regulated facility in accordance with the environmental permit.*

The Environmental Permitting Core Guidance explains how the EPRs should be applied in practice and Chapter 9 of the guidance sets out the scope and application of operator competence."

If this is relevant to the permits for municipal waste incinerators, then the Decision Document should include an explanation of how the Environment Agency has been satisfied that the applicant will be the operator of the regulated facility and that they will operate regulated facility in accordance with the environmental permit.

The Environmental Permitting Core Guidance available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/935917/environmental-permitting-core-guidance.pdf states:

> *"Following an application for the grant or transfer of an environmental permit, there is also a specific duty on the regulator not to grant or transfer the permit if it considers that the operator/new operator will not operate the facility in accordance with the permit (see paragraph 13 of Part 1 of Schedule 559). In making this decision the regulator should consider whether the operator cannot or is unlikely to operate the facility in accordance with the permit. The regulator might doubt whether the operator could or is likely to comply with the*
>
> *permit conditions if for example, the operator:*
>
> *• has an inadequate management system;*
>
> *• demonstrates inadequate technical competence;*
>
> *• has a record of poor behaviour or non-compliance with previous regulatory requirements; or*
>
> *• has inadequate financial competence."*

If this is the procedure to be followed, the this should also be explained within the Decision Document.

8. INSUFFICIENT EXPLANATION OF WHICH DEPARTMENTS HAVE BEEN CONSULTED AT DONCASTER COUNCIL AND WHETHER ALL CONSULTEES RESPONDED

ANNEX 4: Consultation Reponses

"The following statutory and non-statutory bodies were consulted: …Doncaster Council…" (p. 101)

It is not clear who at Doncaster Council was consulted.

If only a single contact was consulted and it was expected that the Council would discuss the matter internally to produce a single response, then it is not clear what (if any) advice was given as to which officers/specialities/departments should be consulted within the Council (e.g. Environmental Health Officer, Biodiversity Officer).

5.3.4 Assessment of Health Effects from the Installation

"The Food Standards Agency and local director of public health were also consulted during the permit determination process and did not raise any concerns." (p. 43)

It is stated that they did not raise concerns, but it does not specify whether or not they actually stated that they had no concerns of if they simply failed to respond to the consultation (e.g. for resource reasons).

The summary table ' 1) Consultation Responses from Statutory and Non-Statutory Bodies' on pages 101-103 does not list any consultation responses from those two consultees.

It would be helpful to have the actual consultation responses from all of the statutory bodies and a list of any which did not respond and an explanation of what measures the Environment Agency took to prompt them to respond.

9. WHEN DOCUMENTS ARE REFERRED TO, THEIR STATUS SHOULD BE EXPLAINED AND IT SHOULD BE MADE CLEAR WHERE/HOW THEY CAN BE OBTAINED

We carried out consultation on the Application in accordance with the EPR, our statutory PPS and our own internal guidance RGS Note 6 for Determinations involving Sites of High Public Interest.

RGN Note 6 is referred to, and as such information should be provided as to where this document should be obtained. For example, if this is the document listed at https://www.gov.uk/government/publications/rgn-6-determinations-involving-sites-of-high-public-interest then that should be stated. However, if that version is *"out of date"* as the document on that page states then it should be explained how the document can be obtained (e.g. a request under the Environmental Information Regulations).

10. INSUFFICIENT CONSIDERATION OF ENERGY GENERATION BEING SIGNIFICANTLY LESS THAN THE HEADLINE FIGURE

4.3.7 Energy efficiency

"The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Application shows 38.9 MW of electricity produced for an annual burn of 301,000 tonnes, which represents 12.5 MW per 100,000 tonnes/yr of waste burned (1.03x MWh/tonne of waste). The Installation is therefore above the indicative BAT range." (p. p18)

As noted in UKWIN's July 2021 Good Practice Guidance for Assessing the Greenhouse Gas Impacts of Waste Incineration[8], electricity generated by UK incinerators was on average 15% lower than implied by the claimed headline megawatt (MW) generation figure and significantly below this in a number of cases.

[8] https://ukwin.org.uk/files/pdf/UKWIN-2021-Incinerator-GHG-Guide.pdf

The potential for such 'underperformance' should be acknowledged, and it should be explained whether or not permit conditions will help ensure that the plant would not be able to operate for long periods without the turbine/generator being operational.

Extracts from the Good Practice Guidance:

COMPARISON BETWEEN HEADLINE GENERATION CAPACITY AND ACTUAL MEGAWATTS (MW) OF ENERGY GENERATED AND EXPORTED FOR ELECTRICITY-ONLY INCINERATORS IN ENGLAND IN 2020

Incineration Plant (Operator)	Gross headline MW	Gross MW generated in 2020	Net MW exported in 2020	Percentage gross generated higher than headline	Percentage net exported higher than gross headline
Milton Keynes (Amey)	7	5.4	4.0	-23%	-43%
Exeter (Cyclerval)	4	3.8	3.0	-6%	-25%
Hartlebury (EnviRecover)	22	20.1	18	-9%	-20%
Lincolnshire (FCC)	13.1	13.1	11.6	0%	-12%
Greatmoor (FCC)	32	27.5	24.7	-14%	-23%
Allington (FCC)	43	35.2	26.1	-18%	-39%
Lakeside (Grundon & Viridor)	37	37.1	33.3	0%	-10%
Stoke (MES)	14	6.8	5	-52%	-66%
Dudley (MES)	7	5.8	5	-18%	-32%
Ferrybridge Multifuel 1 (enfinium)	80	54.3	48	-32%	-41%
Ferrybridge Multifuel 2 (enfinium)	80	72.9	66	-9%	-18%
Suffolk EfW (Suez)	25.25	24.2	21.3	-4%	-16%
Haverton Hill (Suez)	55	53.7	46.6	-2%	-15%
Cornwall (Suez)	24	20.1	17.7	-16%	-26%
Severnside (Suez)	40	39.5	36	-1%	-10%
Kirklees (Suez)	10	2.1	1	-79%	-94%
Wilton 11 (Suez)	49	27.4	22	-44%	-55%
Javelin Park (Urbaser)	17.4	17.8	15.5	+2%	-12%
Integra South East, Portsmouth (Veolia)	14	12.2	10.2	-13%	-27%
Newhaven (Veolia)	19	18.5	16.1	-2%	-15%
Integra North, Chineham (Veolia)	9	7.4	6.4	-17%	-28%
Integra South West, Marchwood (Veolia)	17	12.6	10.9	-26%	-36%
Battlefield, Shropshire (Veolia)	8	7.6	7	-5%	-11%

Incineration Plant (Operator)	Gross headline MW	Gross MW generated in 2020	Net MW exported in 2020	Percentage gross generated higher than headline	Percentage net exported higher than gross headline
Staffordshire (Veolia)	29	26.8	24	-7%	-17%
Tyseley (Veolia)	27	25.9	22	-4%	-17%
Leeds (Veolia)	15	13.3	11	-11%	-24%
Runcorn (Viridor)	86	76.2	10	-11%	-23%
Avonmouth (Viridor)	37.2	39.9	33	+7%	-12%
Peterborough (Viridor)	9	7.5	6	-17%	-34%
Average				-15%	-28%

TOLVIK OBSERVATIONS ON TURBINE AND GENERATOR NON-AVAILABILITY

Year being observed	Observation by Tolvik
2018	*"Poor turbine reliability - The stand out operational issue for 2018 was that total power export was unchanged on 2017 despite increased inputs. This was due to at least 6 EfWs experiencing significant turbine difficulties during the year. The key question is whether this poor reliability was a 'blip' or part of a longer term trend."*
2019	"*Power export reliability - For the second successive year total power export from UK EfWs, when measured in terms of kWh generated per tonne of waste processed, fell as the result of major turbine/generator failures."*
2020	*"There was a significant increase in the number of facilities reporting average Turbine Operations availability in excess of 95% during 2020 – up from seven in 2019 to 14. However six EfWs reported a figure below 75% including Bolton and Kirklees…, two ACTs…plus Hanford and Ferrybridge FM1"*

EXAMPLES OF THE IMPACT OF POWER EXPORT UNRELIABILITY AT UK INCINERATORS BASED ON DATA PROVIDED IN ANNUAL PERFORMANCE REPORTS

Facility and Year	Power Import (MWh)	Power Export (MWh)	Net Power Exported (MWh)	Net Power Exported (KWh/t)	Hours of waste comb-ustion	Hours of turbine operation	Turbine availability during combustion (percentage of hours of waste combustion)
Ardley (2019)	22,248	16,142	-6,106	-22	7,857	624	8%
Bolton (2020)	7,830	0	-7,830	-148	5,252	0	0%
Kirklees (2020)	8,700	13,416	4,716	38	7,583	1,567	21%
FM1 (2020)	12,619	408,497	395,878	660	8,325	6,113	73%
Stoke (2020)	6,423	43,649	37,226	197	7,788	4,610	59%

EXPLANATIONS GIVEN FOR POWER EXPORT UNRELIABILITY

Facility (Year)	Explanation of unreliability in Annual Performance Report
Ardley (2019)	*"On 27 January 2019, a generator stator earth occurred at Ardley, resulting in the loss of generation capability. The generator was removed from Ardley on the 8th March 2019 for repairs within the UK. On 18th October 2019 the generator was removed from the UK to the Original Equipment Manufacturer in Austria to complete the repairs. The generator returned to Ardley on 23 January 2020 and began export 6 February 2020."*
Bolton (2020)	*"...since September 2017 when a major fire destroyed the turbine and associated equipment, the steam provided by the boiler is bypassed to a water cooled condenser where it is condensed back into water and fed back to the boiler. As such, the site has not generated any electricity throughout 2019."*
Kirklees (2020)	*"498 hours of unplanned downtime. Main Issues were: 2 X boiler tube leaks. Bottom ash extractor failure. Turbine remedial works…"*
FM1 (2020)	*"Annual boiler outages boilers 1 & 2 included refractory replacement, grate element inspection and replacement as necessary and pass 2/3 middle and bottom header replacements. Turbine initial outage inspection found axial clearances out of tolerance and subsequent inspections revealed significant damage to the shaft glands. The rotor and inner casings required removal to workshops in the UK and Germany respectively for machining."*
Stoke (2020)	*"During the outage, it was identified that the turbine required essential maintenance and repairs. This resulted in the turbine being removed from the site and sent to a specialist company to complete the works. For this reason, the plant did not generate as much electricity during 2020 when compared to previous years."*

ESTIMATE OF UK TURBINE AVAILABILITY IN 2019

Waste Combustion Hours (Simple Average from Tolvik EfW Statistics Report)	Turbine Operation Hours (Simple Average from Tolvik EfW Statistics Report)	Turbine availability during combustion (Turbine hrs ÷ Waste Combustion hrs)
89.5%	81.9%	**91.5%**

11. THE CREATION OF INCINERATOR BOTTOM ASH AGGREGATE SHOULD NOT BE DESCRIBED AS 'RECYCLING' OR 'RE-USE'

4.3.9 Avoidance, recovery or disposal with minimal environmental impact of wastes produced by the activities

"The Application also proposes that, where possible, bottom ash will be transported to a suitable recycling facility, from where it could be re-used in the construction industry as an aggregate." (p. 21) [Emphasis added]

Unless the source feedstock being incinerated was incinerator bottom ash, a facility to create IBA Aggregate is not 'recycling' or 're-use' in the common usage of the term as it has been removed from the original material cycle of the source material (e.g. it is not being converted back into plastic).

More neutral terminology should be used, e.g. that: "The Application also proposes that, where possible, bottom ash will be transported to a suitable processing facility, from where it could be used in the construction industry as an aggregate"

12. A LINK SHOULD BE PROVIDED TO RELEVANT GUIDANCE

5.1.1 Application of Environment Agency guidance 'risk assessments for your environmental permit'

"A methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits, is set out in our guidance 'Air emissions risk assessment for your environmental permit'" (p. 22)

A link should be provided as to where this guidance can be found, e.g. https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

5.2.3 Assessment of Emission of Metal

"For As, Cr(VI) and Ni the Applicant Used representative emissions data from other municipal waste incinerators using our guidance note Please refer to "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4"." (p. 33)

It should be noted that this document is available from: https://www.gov.uk/government/publications/waste-incinerators-guidance-on-impact-assessment-for-group-3-metals-stack

7.4.1 Duty to Involve

In addition to meeting our consultation responsibilities, we have also taken account of our guidance in Environment Agency Guidance Note RGS6 and the Environment Agency's Building Trust with Communities toolkit.

Links to both of these documents should be provided. It is unclear if RSG6 is the same as RGN6.

13. PERMIT CONDITIONS DO NOT 'ENSURE' COMPLIANCE

4.3.2 Management

"We are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions." (p. 13)

5.2.4 Consideration of Local Factors

"Specific conditions have been introduced to specifically ensure compliance with the requirements of Chapter IV." (p. 34)

5.3.1 Our role in preventing harm to human health

"We therefore ensure that permits contain conditions which require the installation to be well-run and regulate the installation to ensure compliance with such permit conditions." (p. 38)

6.8 Reporting

"We have specified the reporting requirements in Schedule 5 of the Permit either to meet the reporting requirements set out in the IED, or to ensure data is reported to enable timely review by the Environment Agency to ensure compliance with permit conditions and to monitor the efficiency of material use and energy recovery at the installation." (p. 77)

ANNEX 1A: APPLICATION OF CHAPTER IV OF THE IED

"Various permit conditions address this and when taken as a whole they ensure compliance with this requirement." (p. 87)

It is not unusual for incinerators to breach their permit conditions from time to time (e.g. ELV breaches), and this does not usually result in permit conditions being modified to tighten them as presumably a certain level of non-compliance is seemed acceptable. As such, it is misleading to state that permit conditions 'ensure' compliance (as opposed to 'help ensure an appropriate level of compliance') with Permit conditions as 'ensure' has the normal meaning of *"make certain that (something) will occur or be the case".*

There should be greater acknowledgement in the Decision Document that occasional permit breaches are something which the Environment Agency generally anticipates and often 'allows', i.e. a permit breach does not usually result in the revocation of the permit.

14. LACK OF CLARITY REGARDING ELECTROSTATIC PRECIPITATORS (ESP)

6.2.1 Particulate Matter

"Technique: Electrostatic precipitators (ESP) Defined as BAT in BREF or TGN for: When used with other particulate abatement plant" (p. 59)

"The Applicant proposes to use fabric filters for the abatement of particulate matter" (p. 59)

While it is stated that the Applicant proposed to use fabric filters, it is not stated whether or not they are also proposing Electrostatic precipitators (ESP) which according to the table can be used alongside other particulate abatement plant.

According to Defra: *"There is no safe level for particulate matter (PM_{10}, $PM_{2.5}$), while NO_2 is associated with adverse health effects at concentrations at and below the legal limits".*[9]

15. LACK OF CLARITY AS TO REASON FOR NOT REQUIRING CATALYTIC FILTER BAGS

6.2.2 Oxides of Nitrogen

"The Applicant stated that catalytic filter bags react at a higher temperature than will be used for the proposed lime injection system and bag filters and so would not be efficient." (p. 69)

6.2.5 Dioxins and furans (and Other POPs)

"Technique: Catalytic filter bags Advantages: High destruction efficiency"

The EA has not stated why catalytic filter bags would not be a better choice for the facility. If catalytic filter bags would reduce levels of pollutants for which there is no safe level then the EA should explain its reasons for permitting technology when alternative technology is available that would lower health risks.

Whilst Section 6.2.2 considers catalytic filter bags stating that a higher temperature is needed the Decision Document does not say why this higher temperature cannot be achieved, especially if a different abatement system than the proposed lime injection system were to be used.

There is no explanation in the Decision Document, for example, of whether the use of the proposed abatement system as a whole results in lower environmental impacts than using a system that would allow catalytic filter bags to increase destruction efficiency. If the proposed system does not result in the lowest impacts then it is unclear why it is being allowed as BAT, e.g. is it on the basis of lower operator costs or merely an unexplained operator preference?

16. LACK OF CLARITY FOR NOT REQUIRING FLUE GAS RECIRCULATION (FGR)

6.2.2 Oxides of Nitrogen

"Flue gas recirculation is not proposed. The Applicant stated that where furnaces have been designed to operate without FGR optimised (design focussed on primary and secondary air control) FGR gives little benefit. We agree with that assessment and in addition FGR can result in corrosion issues and reduced energy efficiency."

The BREF considers Flue Gas Recirculation (FGR) to be BAT. This is a new plant, with a new furnace, and the applicant has said it will carry out computational fluid dynamic (CFD) modelling. As such, the furnace could be designed to operate with FGR.

[9] https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf

The EA has not provided adequate justification for why they consider that a new plant without FGR is considered BAT. For example, the EA fails to address the following questions:

- Does the EA consider that having FGR can be BAT, or do they disagree with the BREF in this regard (and if so on what basis)?
- How much does the EA consider energy efficiency to be reduced, and how relevant is this within the context of an increasingly decarbonised electricity supply?
- It is stated that using FGR 'can' result in corrosion issues, but are there ways for this to be avoided and what impacts would these issues have?

17. ELECTRICITY FROM INCINERATION WOULD NOT NECESSARILY DISPLACE FOSSIL FUELS

6.3 BAT and global warming potential

"The electricity that is generated by the Installation will displace emissions of CO_2 elsewhere in the UK, as virgin fossil fuels will not be burnt to create the same electricity." (p. 69)

"On the credit side - CO_2 saved from the export of electricity to the public supply by displacement of burning of virgin fuels;"(p. 70)

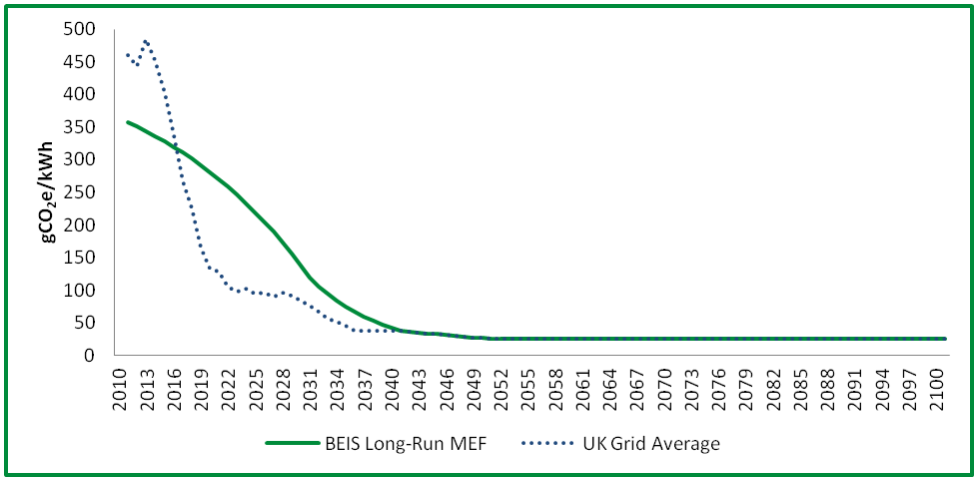
This could be seen as implying that the only electricity an incinerator might displace is fossil fuels. However, the UK is increasingly decarbonising the electricity supply with other forms of electricity generation. Incineration might be displacing renewable or nuclear rather than gas or coal.

Evidence on this topic is contained within UKWIN's Good Practice Guidance for Assessing the Greenhouse Gas Impacts of Waste Incineration. This guidance recommends that:

> *"When considering the carbon intensity of displaced energy it is necessary to take account of the progressive decarbonisation of the energy supply rather than simply assuming that a new energy source would displace fossil fuels. The carbon intensity of electricity displaced by a new incinerator can be estimated using the average BEIS Long-Run Marginal Emissions Factor (MEF) over the lifetime of the plant".*

Extracts from the Good Practice Guidance:

GRAPH BASED ON BEIS DATA TABLE 1: 'ELECTRICITY EMISSIONS FACTORS TO 2100' FIGURES FOR GENERATION-BASED ELECTRICITY GENERATION



EXTRACT FROM BEIS DATA TABLE 1: 'ELECTRICITY EMISSIONS FACTORS TO 2100'

Year (Column B)	Generation-based Long-run Marginal Emissions Factor (Column F)	Generation-based Grid average (Column J)
2010	357 gCO_2e/kWh	460 gCO_2e/kWh
2011	350 gCO_2e/kWh	443 gCO_2e/kWh
2012	343 gCO_2e/kWh	485 gCO_2e/kWh
2013	336 gCO_2e/kWh	452 gCO_2e/kWh
2014	328 gCO_2e/kWh	402 gCO_2e/kWh
2015	320 gCO_2e/kWh	337 gCO_2e/kWh
2016	311 gCO_2e/kWh	266 gCO_2e/kWh
2017	301 gCO_2e/kWh	226 gCO_2e/kWh
2018	291 gCO_2e/kWh	165 gCO_2e/kWh
2019	281 gCO_2e/kWh	133 gCO_2e/kWh
2020	270 gCO_2e/kWh	128 gCO_2e/kWh
2021	258 gCO_2e/kWh	105 gCO_2e/kWh
2022	246 gCO_2e/kWh	98 gCO_2e/kWh
2023	233 gCO_2e/kWh	102 gCO_2e/kWh
2024	219 gCO_2e/kWh	95 gCO_2e/kWh
2025	205 gCO_2e/kWh	96 gCO_2e/kWh
2026	189 gCO_2e/kWh	90 gCO_2e/kWh
2027	173 gCO_2e/kWh	96 gCO_2e/kWh
2028	156 gCO_2e/kWh	91 gCO_2e/kWh
2029	138 gCO_2e/kWh	84 gCO_2e/kWh
2030	118 gCO_2e/kWh	76 gCO_2e/kWh
2031	105 gCO_2e/kWh	67 gCO_2e/kWh
2032	94 gCO_2e/kWh	56 gCO_2e/kWh

2033	84 gCO_2e/kWh	52 gCO_2e/kWh
2034	75 gCO_2e/kWh	45 gCO_2e/kWh
2035	66 gCO_2e/kWh	37 gCO_2e/kWh
2036	59 gCO_2e/kWh	37 gCO_2e/kWh
2040	37 gCO_2e/kWh	37 gCO_2e/kWh
2045	31 gCO_2e/kWh	31 gCO_2e/kWh
2050-2100	25 gCO_2e/kWh	25 gCO_2e/kWh

The decision document should be updated to reflect the progressive decarbonisation of the electricity supply and how it is increasingly likely that incinerators would be displacing renewable and/or nuclear rather than CCGT or coal. The incinerator would be a barrier to the decarbonisation of the electricity supply, which should be considered a significant disbenefit of the facility.

18. MISCHARACTERISATION OF LANDFILL IMPACTS ON CLIMATE CHANGE

6.3 BAT and global warming potential

"Note: avoidance of methane which would be formed if the waste was landfilled has not been included in this assessment. If it were included due to its avoidance it would be included on the credit side." (p. 70)

This statement fails to acknowledge that:

(a) not all methane is released, and some is instead captured and used to generate energy, and

(b) a significant proportion of landfilled biogenic material is sequestered which is a carbon sink (and so would be on the debit side).

Depending on the level of bio-stabilisation, the amount of CO_2e avoided through landfill could be greater than the CO_2e from the methane that is not captured.[10]

If the issue of methane in landfill is not relevant then it should not be mentioned. If it is listed, then it should be explained in more detail so as not to be misleading.

19. EXPLANATION OF HANDLING UNCERTAINTY IN DISPERSION MODELLING

5.1.2 Use of Air Dispersion Modelling

"For incineration applications, we normally require the Applicant to submit a full air dispersion model as part of their application. Air dispersion modelling enables the process contribution to be predicted at any environmental receptor that might be impacted by the plant." (p. 22)

[10] https://ukwin.org.uk/files/pdf/UKWIN-2021-Incinerator-GHG-Guide.pdf

It has been stated in relation to Planning Appeal Ref 3218965 that *"Dispersion models typically have an accepted uncertainty of up to +/-25%"* and that it could be as high as ±30% for annual mean predictions.

It is unclear whether or how this has been taken into account in the dispersion modelling and determination of the process contributions, e.g. sensitivity analysis assuming 25-30% higher emissions/impacts.

Going into detail on the comments, the application's technical response to the Inspector's Queries regarding this claim began as follows:

Uncertainty

While the ADMS model has been formally validated and is widely used in the UK and internationally for regulatory purposes, the predictive ability of even the best model is limited by how well the turbulent nature of the atmosphere can be represented. On its website, CERC lists 20 papers on model validation[1], but none of these 20 papers attempts to numerically quantify the magnitude of uncertainty in the annual mean concentration. Where annual-mean concentrations are mentioned, the papers all state that *"Comparisons between modelled and observed annual average concentrations are not presented in this report due to the issues with monitor detection limits and background data."* This demonstrates the practical difficulty with validation studies for any point source model.

The ±25% model uncertainty quoted in the report is based on custom and professional judgement. There is no specific document that can be referenced; however, it is worthy of note that *Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air for Europe* sets an objective for modelling of ±30% for annual mean predictions.

Section 5.2 (and subsections) do not provide any consideration of the possible range of error in the modelling results, what their impacts could be, and how these were addressed within the permitting process. This is especially relevant within the context of this permit application, as it was acknowledged on page 103 that there were errors in air quality tables for HF, HCl and metals. The accuracy of the model results depends on both the applicant's model and the modelling system.

20. MEASURES TO CONTROL AND MONITOR CO_2E EMISSIONS FROM FEEDSTOCK

2.3 Requests for Further Information

"We consider that, if we grant the Permit, it will ensure that… a high level of protection will be delivered for the environment…" (p. 9)

5.1.2 Use of Air Dispersion Modelling

"If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions would cause significant pollution, we would refuse the Application" (p. 24)

5.3.1 Our role in preventing harm to human health

"The Environment Agency has a statutory role to protect the environment…from all processes and activities it regulates." (p. 34)

6.3 BAT and global warming potential

"Taking all these factors into account, the Operator's assessment shows their preferred option is best in terms of GWP." (p. 69)

"The Installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2012 therefore it is a requirement of IED to investigate how emissions of greenhouse gases emitted from the installation might be prevented or minimised" (p. 69)

6.6.1 Translating BAT into Permit conditions

"CO2 is an inevitable product of the combustion of waste. The amount of CO2 emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit." (p. 76)

"We have therefore considered setting equivalent parameters or technical measures for CO_2. However, provided energy is recovered efficiently (see section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the destruction of waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO_2 emissions." (p. 76)

6.8 Reporting

"We have specified the reporting requirements in Schedule 5 of the Permit either to meet the reporting requirements set out in the IED, or to ensure data is reported to enable timely review by the Environment Agency to ensure compliance with permit conditions and to monitor the efficiency of material use and energy recovery at the installation."

The operator has not shown that their option is 'best' in terms of global warming potential (GWP) when compared to options higher in the waste hierarchy (which is where is where some of the material could have been treated) or when compared to sending biostabilised waste to landfill (which as is noted in UKWIN's Good Practice Guidance, and in Defra's Economics of Waste and Waste Policy document, can have significantly lower GHG impacts than incineration).

Indeed, the operator has not even shown that their proposal would be better than alternative incineration options that include Combined Heat and Power (CHP) and/or Carbon Capture and Storage. As such, the EA should remove or clarify the misleading statement that: *"…the Operator's assessment shows their preferred option is best in terms of GWP"*.

The obvious way to minimise CO_2 being released from an incinerator is to deny the permit. If that option is not open to the Environment Agency then this should be clearly explained, e.g. current legislation does not allow the EA to refuse a permit based on a facility's overall adverse climate change impact.

If the permit application cannot be refused, there are still numerous potential ways that a permit might be able to reduce the overall adverse impact by regulating the conduct of the operator or requiring changes to the design of the plant, and these should either be required or an explanation should be given for why they have not been required.

No explanation is given about why measures such as requiring the carbon capture and storage or the removal of plastics prior to incineration have not been imposed within the permit to reduce fossil CO_2 emissions, or how a granting permit which allows for the incineration of a significant quantity of high-carbon and potentially recyclable materials (see UKWIN's July 2021 Good Practice Guidance for Assessing the Greenhouse Gas Impacts of Waste Incineration[11]) could be considered to be delivering a high level of environmental protection.

Furthermore, no explanation is given for why there is not a requirement for waste composition analysis to be conducted on an annual basis to identify what recyclable and high-carbon materials are being incinerated that could be minimised through upstream measures. The feedstock could be seen as one of the most significant materials used by the plant, and yet very little is being expected of applicants/operators in terms of monitoring beyond the recording of the total tonnage incinerated - this is not consistent with an approach that seeks to ensure the effective use of materials.

Furthermore, no detail is provided as to what measures will be required to ensure that accurate measurements are made and reported of the quantity of fossil and biogenic CO_2 and N_2O released by the facility that could be used to help determine if the above measures are successful in reducing emissions or if further measures are required.

If the Environment Agency is not imposing strict controls on feedstock to prevent recyclable or plastic material from being incinerated then the wording of the Decision Document should be changed to state explicitly that the EA's assessment only provides minimal protection to the environment from damaging greenhouse gas emissions.

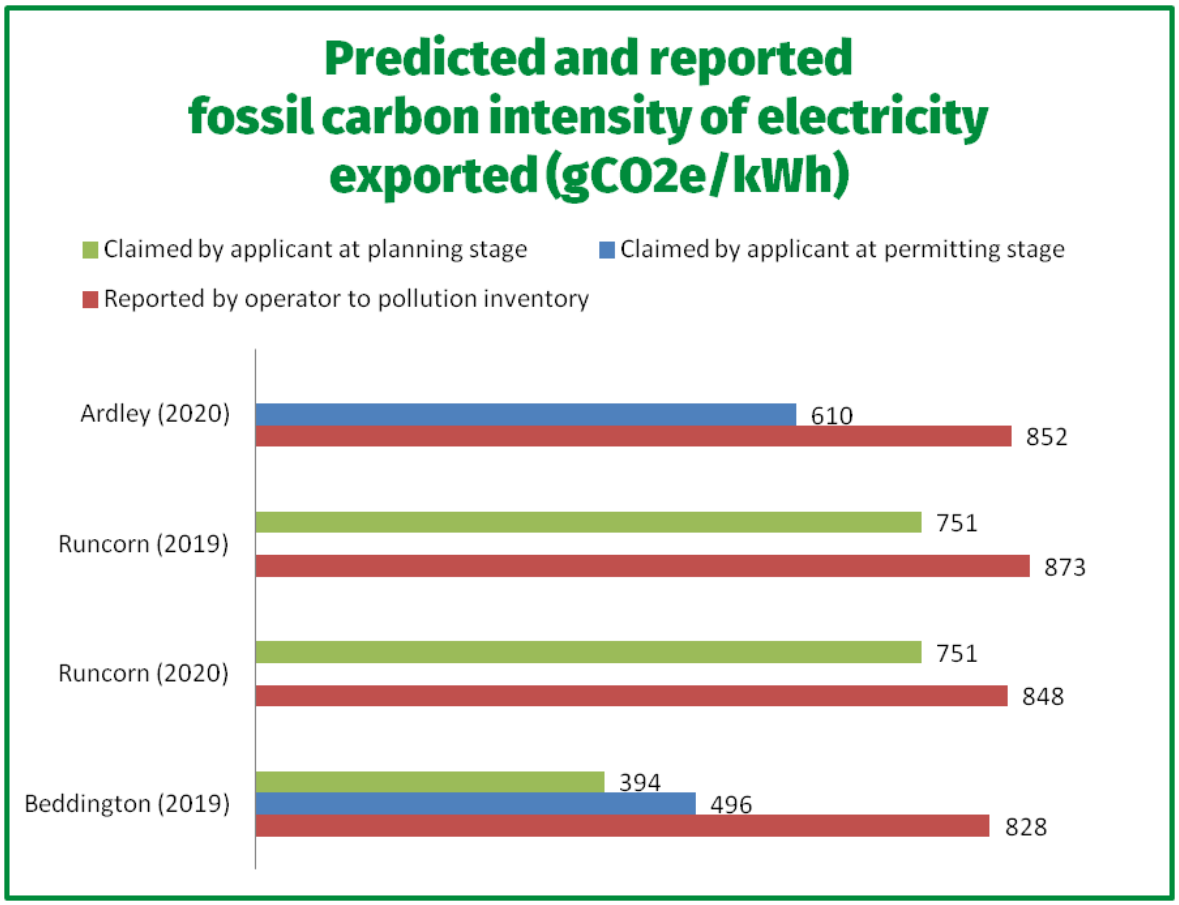
To the extent that controls are considered to constitute a planning rather than a permitting issue, the Environment Agency should inform the Waste Planning Authority of this determination.

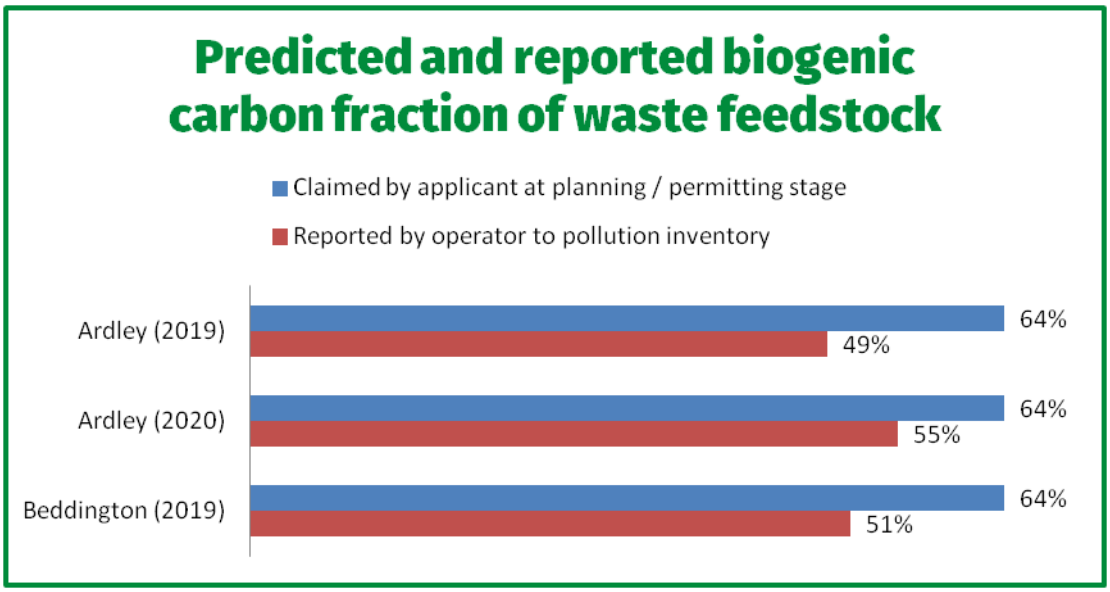
[11] https://ukwin.org.uk/files/pdf/UKWIN-2021-Incinerator-GHG-Guide.pdf

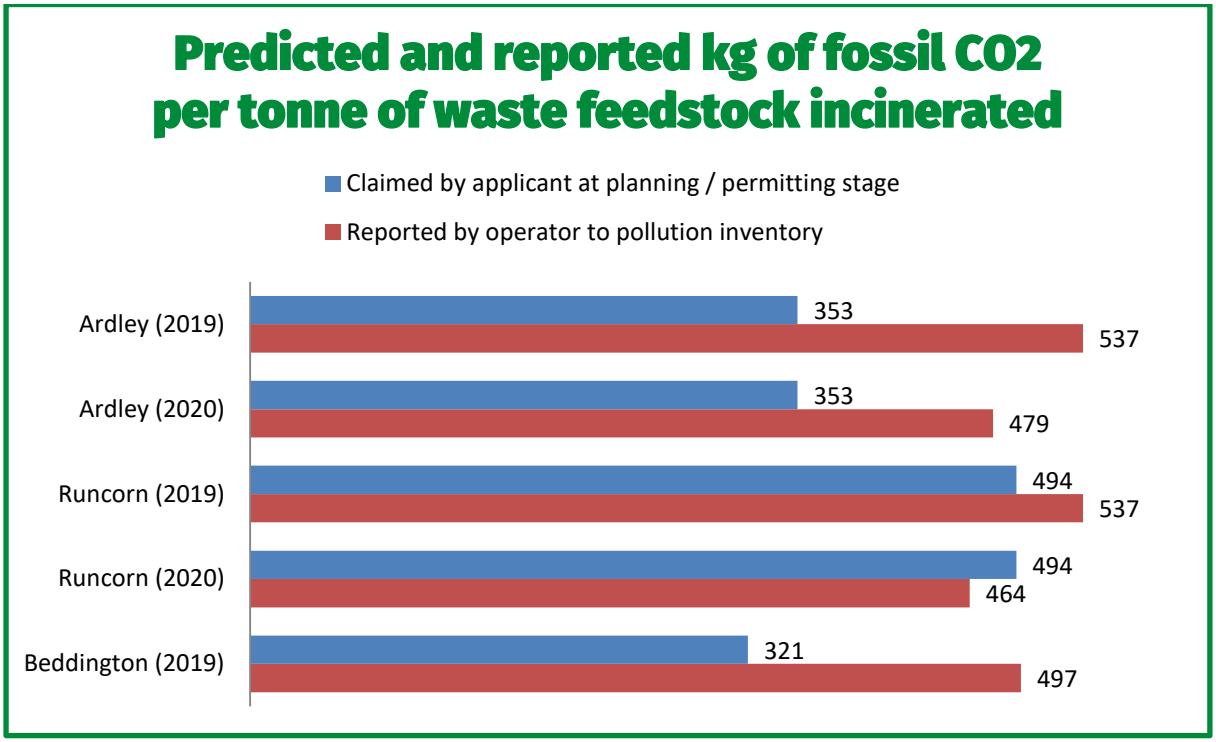
For example, it is not made explicitly clear that the Environment Agency's position of refusing in the event of significant pollution does not currently extend to the greenhouse gas emissions from the incinerator, and that this is seen as a planning matter (and whether or not that is conveyed to the Waste Planning Authority).

As matters stand, the Environment Agency's claim that they will refuse in the event of significant pollution could be considered inaccurate and misleading.

Extracts from the Good Practice Guidance:







CHARTS FROM DEFRA'S 2020 RESOURCES AND WASTE STRATEGY MONITORING REPORT SHOWING HOW MUCH RESIDUAL WASTE IS CONSIDERED AVOIDABLE

Chart 13. Avoidable residual waste from household sources, England, 2017, proportion of total residual waste, by category (WP2a)

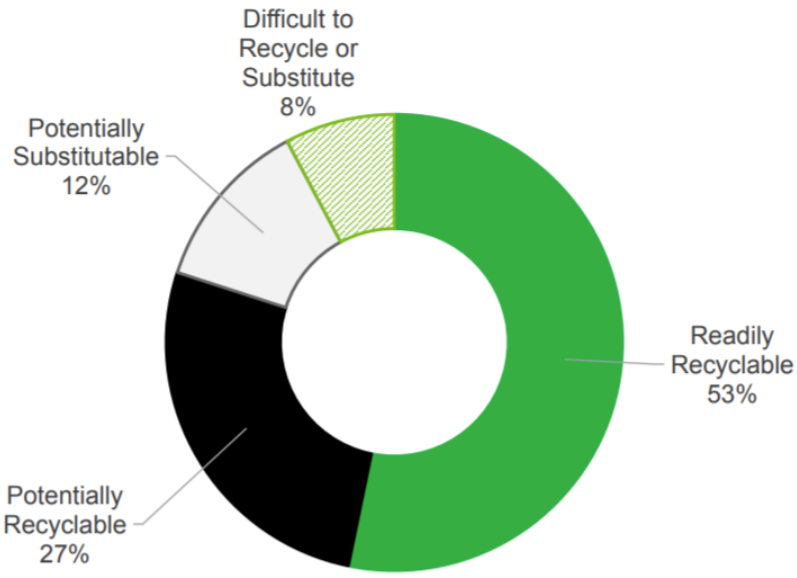
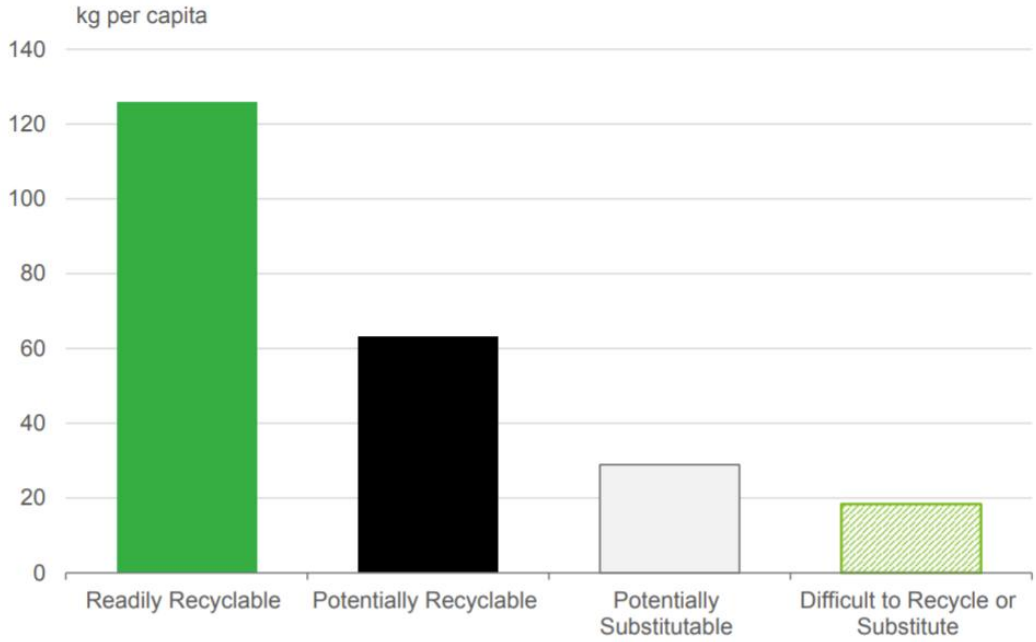


Chart 15. Avoidable residual waste from household sources, England, 2017, kg per Capita (WP2c)

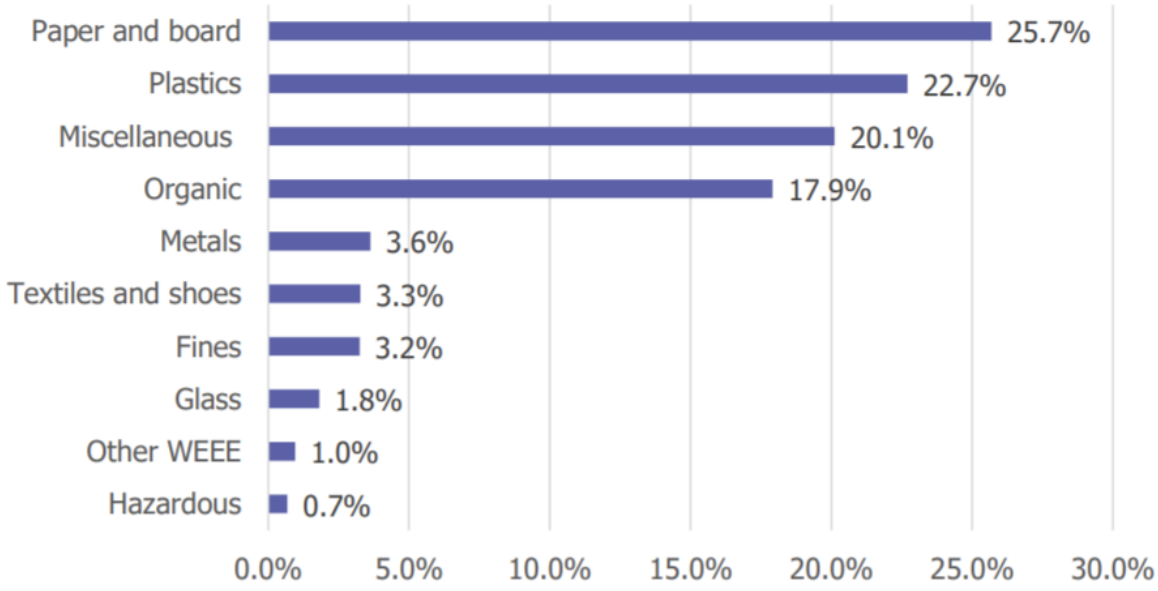


CHARTS FROM WRAP CYMRU WELSH COMMERCIAL & INDUSTRIAL WASTE STUDY

Table 3: Recyclability and biodegradability of commercial and industrial residual waste (EWC 19.12.12 & 20.02.01) in Wales

		Average	STDEV.S	C.I. 95%
Commercial	Recyclability	74.0%	13.8%	3.4%
	Biodegradability	60.5%	10.7%	2.6%
Industrial	Recyclability	80.5%	10.9%	8.7%
	Biodegradability	48.7%	11.0%	8.8%

Figure 1: Overall composition of C&I waste in Wales (main category level). N=108



"BAT for greenhouse gas emissions is to maximise energy recovery and efficiency"(p. 69)

If this is the case, then an adequate explanation should be given as to:

- Why maintaining R1 Recovery status is not a permit requirement;
- Why the plant is not required to shut down in the event that the turbine/generator may be offline for extended periods;
- Why the permit is being granted despite the lack of combined heat and power; and
- Why efficiency is not improved by requiring operators to make greater efforts to prevent reusable, recyclable, and/or compostable material from being permitted to be used as incinerator feedstock, despite incineration being an inefficient use of these resources.

21. EMISSIONS MODELLING INFORMATION MISSING FROM THE CONSULTATION PORTAL

2.2 Consultation on the Application

"We advertised the Application by a notice placed on our website, which contained all the information required by the IED… Application documents were available to view on our consultation webpage." (p. 8)

"We consider that this process satisfies, and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the IED, which applies to the Installation and the Application. We have also taken into account our obligations under the Local Democracy Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements." (p. 7)

ANNEX 4: Consultation Reponses

"Application documents were available to view on our consultation webpage."

Documents may have been available but the applicant's air dispersion modelling files were not. It was therefore not possible for people to comment on all the permit application information submitted by the applicant.

Given the fundamental nature of emissions in the context of the consideration of the permit application, we believe that this failure undermines the compliance with the Aarhus Convention right to support public participation in environmental decision-making.

It is not sufficient to merely state that: *"Noise model and Air Dispersion model input files require specialist software to open so are not included but are available on request."*

The EA's 'Audit of air quality impact assessment and Human Health Risk Assessment' document from 1st April 2021 states that:

> *"Fichtner Consultant Engineers Limited (the consultant) conducted the air quality assessment (AQA) and the human health risk assessment on behalf of the applicant. Fichtner Consultant Engineers limited instructed Ecological Solutions to produce a technical note on the ecological interpretation of the Air Quality Assessment."*

We cannot see a copy of either the Air Quality Assessment or this technical note on the consultation webpage for the draft decision document[12] - it only seems to be available from the page for the original permit application[13].

22. IMPORTANT INFORMATION LEFT TO PRE-OPERATIONAL AND IMPROVEMENT CONDITIONS, WITHOUT JUSTIFICATION OR EXPLANATION OF HOW THERE WILL BE CONSULTATION ON THESE CONDITIONS

4.2.3 Closure and decommissioning

"Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the Installation. Pre-operational condition PO1 requires the Operator to have an Environmental Management System in place before the Installation is operational, and this will include a site closure plan.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into accounts both the baseline conditions and the site's current or approved future use. To do this, the Operator will apply to us for surrender of the permit, which we will not grant unless and until we are satisfied that these requirements have been met." (p. 12)

4.3.2 Management

"The Applicant has stated in the Application that they will implement an Environmental Management System (EMS). A pre-operational condition (PO1) is included requiring the Operator to provide a summary of the EMS prior to commissioning of the plant and to make available for inspection all EMS documentation. The Environment Agency recognises that certification of the EMS cannot take place until the Installation is operational. An improvement condition

[12] https://consult.environment-agency.gov.uk/psc/draft-dn2-4sf-bh-energygap-doncaster-limited/
[13] https://consult.environment-agency.gov.uk/psc/dn2-4sf-bh-energygap-doncaster-limited/

(IC1) is included requiring the Operator to report progress towards gaining accreditation of its EMS.

We are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions." (Page 13)

4.3.4 Accident management

"The Applicant has not submitted an Accident Management Plan. However, having considered the other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. An Accident Management Plan will form part of the Environmental Management System and must be in place prior to commissioning as required by a pre-operational condition (PO1).

The Applicant submitted a Fire Prevention Plan. We are satisfied that the plan will minimise the risk of a fire and limit the impact of a fire in the event that one occurred" (p.13)

2.2 Consultation on the Application

"We consider that this process satisfies, and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the IED, which applies to the Installation and the Application. We have also taken into account our obligations under the Local Democracy Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements."(p. 7)

It is unclear why only a summary of the Environmental Management System (EMS) is considered necessary prior to commissioning of the plant and why the EA consider a "summary" to be acceptable. Because an EMS is an important requirement, shouldn't a full draft EMS be available with the permit application so that the public can comment on whether the EMS is adequate?

The EA has not explained how it has satisfied itself *"that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions".*

If there are plans for the EMS, Accident Management Plan, etc. to be subject to consultation at a later point then this should be explained, and if not then there are questions as to the Environment Agency's compliance with the Aarhus convention as there will not be public participation in environmental decision-making.

Furthermore, it is possible that if matters can be considered at an earlier stage then this could allow for changes to the configuration of the plant and choice of plant in a way that would reduce the environmental impacts and accidents, but it is harder for this to happen if the details are not available until a later stage in the process.

23. UNCLEAR WHAT ACTION THE EA WILL TAKE IF EFFICIENCY IS POOR

4.3.7 Energy efficiency

"The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 4. The following parameters are required to be reported: total electrical energy generated; electrical energy exported; total energy usage and energy exported as heat (if any). Together with the total MSW burned per year, this will enable the Environment Agency to monitor energy recovery efficiency at the Installation and take action if at any stage the energy recovery efficiency is less than proposed."

It is not clear how efficiency would be calculated without compositional analysis to determine the calorific value of the waste feedstock.

It is stated that this condition would 'enable' the Environment Agency to monitor energy recovery efficiency, but the Decision Document does not explicitly state that the Environment Agency would actually do so.

Furthermore, it is not clear what actions the Environment Agency could take and what process it would follow to determine if action is warranted.

In UKWIN's Good Practice Guidance we note a number of examples where incinerators had poor electricity generation performance compared to the plated MW figure (see table extract above entitled 'Comparison between headline generation capacity and actual megawatts (MW) of energy generated and exported for electricity-only incinerators in England in 2020') but we have no indication that the Environment Agency have ever intervened in processes where the turbine or generator was offline for extended periods (e.g. to require that operations are stopped until the turbine or generator is fixed).

We are aware of a number of Annual Performance Reports for incinerators which contain incorrect information on MW generation capacity and/or operational hours, and so it seems that the Environment Agency is either not monitoring this information or it is not doing so consistently.

The Decision Document needs to make clear what action the EA would take were "*the energy recovery efficiency of any installation has ever been less than proposed*" and how many incinerators have not met the energy recovery efficiency stated in their permit applications and what actions have the EA taken. If little or no action is normally taken by the EA when issues occur (if they do not actually monitor to determine if issues occur), then the current statements within the Decision Document are misleading as to how the plant is likely to be regulated.

24. AN EXPLANATION IS NEEDED TO EXPLAIN WHY TOTAL ORGANIC CARBON IS CONTROLLED

4.3.9 Avoidance, recovery or disposal with minimal environmental impact of wastes produced by the activities

"Condition 3.1.3 and associated Table S3.5 specify limits for total organic carbon (TOC) of <3% or loss on ignition (LOI) of <5% in bottom ash." (p. 20)

We expect that the reason total organic carbon (TOC) in the bottom ash should generally be minimised is to help ensure that the bottom ash behaves as an inert material. However, unlike most pollutants this is not something which would be intuitive to members of the public reading the Decision Document. As such, an explanation should be provided setting out why full burn-out is desirable and why TOC in the bottom ash is being controlled.

25. NO EXPLANATION AS TO WHETHER ASSESSMENT OF CLIMATE ADAPTATION WAS FOUND TO BE ADEQUATE

4.3.10 Climate change adaptation

"We have assessed the climate change adaptation risk assessment. We have decided to include a condition in the permit requiring the operator to review and update their climate change risk assessment over the life of the permit." (p. 21)

No explanation is given as to whether or not the current climate change adaptation risk assessment was found to be adequate for present purposes (notwithstanding the need for it to be updated throughout the life of the permit).

26. FAILURE TO EXPLAIN THE EXTENT TO WHICH THE APPLICANT CONTROLS THE MODELLING PARAMETERS FOR AIR DISPERSION MODELLING

5.2 Assessment of Impact on Air Quality

"These assessments predict the potential effects on local air quality from the Installation's stack emissions using the ADMS 5.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling." (p. 24)

The explanation of ADMS is misleading because ADMS 5.2 is a dispersion modelling system for regulatory dispersion modelling and not an a "*computer model for regulatory dispersion modelling".*

This is an important distinction, because the applicant creates a model using the modelling system. The accuracy of the model results depends on both the applicant's model and the modelling system.

However, Section 5.2 (and subsections) do not consider possible range of error in the modelling results. The 'Audit of air quality impact assessment and Human Health Risk Assessment' (April 2021) is provided in draft form, but in many cases it only states that sensitivity analysis was carried out and does not go into detail on how the different assumptions would impact on the process contributions, etc.

27. FAILURE TO EXPLAIN ROBUSTNESS OF METALS ASSUMPTIONS

5.2.3 Assessment of Emission of Metals

"For As, Cr(VI) and Ni the Applicant Used representative emissions data from other municipal waste incinerators using our guidance note Please refer to "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4"." (p. 33)

More explanation should be given to describe the process followed for assessing these assumptions. The emissions data relied upon relates to guidance last updated in 2016 and relates to measurements between 2007 and 2015. Since then, many changes to feedstock could have been expected such as a reduction in food waste that could increase the proportion of metals in the feedstock.

No explanation is given to show that the data is sufficiently representative, and that it would not underestimate emissions over the lifetime of the plant. Furthermore, it is nor explained if the data used is the maximum, mean or minimum.

28. UNCLEAR IF HABITATS LEAD WAS CONSULTED ON HATFIELD MOOR AND HOW FUTURE IMPROVEMENTS WERE TAKEN INTO ACCOUNT

5.4.2 Habitats Assessment

"The Applicant's Habitats assessment was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services, who agreed with the assessment's conclusions, that there would be no likely significant effect on the interest features of the protected sites" (p. 44)

"The PC of 1.47% is a precautionary figure based operation of the plant operating continually for the entire year with emissions at the emission limit value. Plants of this type will typically operate for approximately 8,000 hours per year." (p.46)

5.4.3 Assessment of other conservation sites

"It is under the Environment Act that we assess other sites (such as local wildlife sites) which prevents us from permitting something that will result in significant pollution; and which offers levels of protection proportionate with other European and national legislation." (p. 46)

7.2.6 Natural Environment and Rural Communities Act 2006

"Section 40 of this Act requires us to have regard, so far as is consistent with the proper exercise of our functions, to the purpose of conserving biodiversity. We have done so and consider that no different or additional conditions in the Permit are required." (p. 83)

7.2.7 Countryside Act 1968

"Section 11 imposes a duty on the Environment Agency to exercise its functions relating to any land, having regard to the desirability of conserving the natural beauty and amenity of the countryside including wildlife. We have done so and consider that no different or additional conditions in the Permit are required." (p. 84)

The Environment Agency has not shown that they have actually ruled out significant pollution which would prevent them from issuing a permit, nor that they have identified whether or not there are potential impacts that would justify additional controls on emissions to minimise the impact on nature conservation interests.

The draft Audit of air quality impact assessment and Human Health Risk Assessment (1st April 2021) states:

> *"We recommend the permitting officer consults with a habitats lead on:*
>
> - *Potential exceedance of the acid deposition critical loads at the Hatfield Moor SPA/SAC*
> - *Appropriateness of the ecological interpretation presented in the appendix E of the air quality assessment." (p. 2)*
>
> *"3.33 Acid deposition PCs are above 1% as a function of the critical load for the Hatfield Moor SAC/SPA. We have conducted detailed modelling to assess the impact of acid deposition across the ecological site. This site has a number of ecological transects across the designation and we found that the PCs are above 1% for the whole designation. It is worth noting that the backgrounds already exceed the critical loads and therefore PEC exceed 100%. As a result of this, we cannot rule out adverse effects to the SAC/SPA. For the LWS's acid deposition" (p. 7)*

The Draft Permit Decision Document does not make it clear whether or not this consultation ever took place and whether or not the Air Quality Modelling & Assessment Unit (AQMAU) maintain their view that they "*cannot rule out adverse effects to the SAC/SPA*".

The Draft Decision Document fails to explain the concerns raised by the AQMAU and how they were addressed. The response document is marked as 'draft', and it is unclear if it was ever signed off as their 'final' position or if there is a more recent version of the document which was not shared with consultees.

Furthermore, while the average number of operational hours for incinerators might be around 8,000, we have assessed operator Annual Performance Reports and the majority (around 55%) operated for more than 8,000 hours (i.e. 16 of 29 surveyed). For those incinerators with >=8,000 operational hours, the average operational hours was 8,276 and the maximum was Veolia's Integra South East ERF (Portsmouth) with 8,671 operational hours (99% availability).

As such, it is not safe for the purpose of an Environmental Permit application to assume that a facility would only be releasing emissions for around 8,000 hours per year and an assumption of a potential 99% availability should be considered for the purpose of potential pollution impacts. If such an assessment is not carried out then it is necessary for the maximum number of operational hours to be limited to those used as the basis of the assessment.

EXAMPLES OF INCINERATORS WITH MORE THAN 8,000 OPERATIONAL HOURS IN ENGLAND IN 2020 (BASED ON ANNUAL PERFORMANCE REPORTS)

Permit reference	Facility	Average Operational Hours
BJ7107IJ	Integra South East ERF (Veolia)	**8,671**
GP3334CX	Leeds RERF (Veolia)	**8,406**
XP3239GF	Battlefield (Veolia)	**8,404**
HP3431HK	Staffordshire (Veolia)	**8,361**
SP3239FU	Ferrybridge Multifuel 1 (Multifuel Energy)	**8,325**
BJ7093IY	Integra South West ERF (Veolia)	**8,308**
AP3435SD	Dudley (MES)	**8,254**
WP3438HZ	Suffolk EfW (Suez)	**8,253**
XP3833DK	Ferrybridge Multifuel 2 (Multifuel Energy)	**8,180**
BT7116IW	Lakeside (Grundon & Viridor)	**8,147**
GP3433GH	Cornwall ERC (Suez)	**8,115**
FP3739FS	Lincolnshire EfW (FCC)	**8,111**
BV8067IL	Newhaven (Veolia)	**8,058**
XP3935TX	Hartlebury (EnviRecover)	**8,055**

Furthermore, as noted elsewhere in this submission the emissions limit values for NOx is not a maximum, as the 20% Confidence Interval is subtracted (rather than added) to the level of emissions assumed for the purpose of determining whether or not there has been a breach, meaning that the actual level of emissions could

potentially be around double the Confidence Interval higher than the maximum permitted level without a breach being detected.

As such, it is inaccurate to say that it is assumed emissions would be released 'at the emission limit value' because it is being assumed to be released below the limit for emissions once the Confidence Interval has been taken into account. Additionally, as noted above, real world impacts can be 25-30% higher than modelled.

The Environment Agency should not allow for emissions to exceed the level for which an assessment was carried out, and as such the allowable level of NOx emissions should be reduced to reflect the limitations of the modelling that was carried out.

"At Hatfield Moor SAC the PC >1% of the critical load and the background exceeds the critical load. Dispersion modelling showed a maximum process contribution (PC) of 1.47% of the critical load for raised bogs. This maximum concentration is predicted to be on the western boundary of the habitat site. The habitat site is underlain by Hatfield Moor SSSI. The Natural England website shows that the western area is made up of standing open water, rivers and areas of lowland bogs. The areas of bogs are either unfavourable recovering or unfavourable unchanged. The reasons given for unfavourable are mainly due to drainage, weed or scrub control." (p. 45)

"We have concluded no adverse effect for the following reasons:

- **The predicted maximum PC of 1.4% is very small; when compared to existing deposition levels of up to 420% it can be considered negligible**
- **Current unfavourable status is mainly as a result of drainage, weed or scrub control.**
- ***Based on likely operating conditions the PC will be close to the 1% insignificance level." (p. 46)***

It is unclear how the information about the status of the site was taken into account and the baselines against which the proposal was considered. For example, was the fact that there is current unfavourable status seen as a reason why there should be no further burdens on the side? Was the impact of the plant compared against what the site will be once the drainage, weed or scrub control issues have been resolved? Will changes to traffic (increased electrification) reduce background levels, increasing the impacts of the facility as a proportion of the underlying background levels?

Overall, the logic given behind the EA's decision to rule out significant impact on nearby wildlife sites is inadequate to justify permitting a continuous source adding to the pollution of these wildlife sites. Given that the goal should be to improve and preserve these sites, inadequate consideration is given as to whether there are any improvements that could be made to reduce plant emissions (including reducing the maximum allowable level of materials that can be processed at the site).

29. FAILURE TO EXPLAIN THE UNCERTAINTIES, WARNINGS, STUDY LIMITATIONS AND CALLS FOR MORE RESEARCH IN CITED ASSESSMENTS INTO THE HEALTH IMPACTS OF INCINERATION

5.3.1 Our role in preventing harm to human health

"iii) Expert Scientific Opinion

We take account of the views of national and international expert bodies. The gathering of evidence is a continuing process. Although gathering evidence is not our role we keep the available evidence under review. The following is a summary of some of the publications which we have considered (in no particular order)." (p. 35)

In a number of cases the quotes from the documents appear to be highly selective, and does not convey relevant uncertainties, warnings, study limitations, and calls for further research contained within those studies or peer reviews of those studies. Examples are provided below.

Review of Environmental and Health Effects

Review of Waste Management: Municipal Solid Waste and Similar Wastes (Defra, 2004):[14]

"An independent review of evidence on the health effects of municipal waste incinerators was published by DEFRA in 2004. It concluded that there was no convincing link between the emissions from MSW incinerators and adverse effects on public health in terms of cancer, respiratory disease or birth defects. On air quality effects, the report concluded "Waste incinerators contribute to local air pollution. This contribution, however, is usually a small proportion of existing background levels which is not detectable through environmental monitoring (for example, by comparing upwind and downwind levels of airborne pollutants or substances deposited to land). In some cases, waste incinerator facilities may make a more detectable contribution to air pollution. Because current MSW incinerators are located predominantly in urban areas, effects on air quality are likely to be so small as to be undetectable in practice."" (p. 35)

The document fails to note the statements made within the November 2003 peer review by the Royal Society on the DEFRA-published report contained as Appendix 4 of the report:

> *"Caveats associated with the uncertainties in the results are not presented adequately, particularly in the quantification of the health effects, which could mislead the reader." (p. 2)*

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14 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69391/pb9052a-health-report-040325.pdf

"In view of the large uncertainties associated with some of the data examined, particularly in the epidemiological studies, it would have been more appropriate to adopt a cautious approach, rather than use inadequate data in a quantitative framework. The latter may give a misleading impression of the robustness of the results. Caveats associated with the uncertainties in the results are not presented adequately, particularly in the quantification of the health effects, which could mislead the reader." (p. 3)

*"**We are particularly concerned about how uncertainties have been expressed in the quantification of the health impacts.** The uncertainties in the data have been inadequately expressed in the results of the quantification and, more worryingly, data have been extrapolated to quantify the health impacts when the uncertainties demonstrate that this is inappropriate." [**emphasis added**] (p.3)*

*"Throughout our review we have stressed the need to clarify the uncertainties inherent in the data in this report and consider the implications this uncertainty has when evaluating the environmental and health effects of waste management. Although the uncertainties have been acknowledged in this report, **it is important that anyone using these data takes adequate consideration of its inherent uncertainty**." [**emphasis added**] (p. 6)*

While there were subsequently some changes made to the report in response to this Peer Review, the March 2004 statement notes that:

"Although the uncertainties have been acknowledged in this report, it is important that anyone using these data takes adequate consideration of its inherent uncertainty." (p. 2)

It is not clear from the decision document whether or not the EA recognise the uncertainties inherent in the data in the DEFRA 2004 report, and if so, whether or not the EA recognise that the uncertainties inherent in the data in the DEFRA 2004 report result in uncertainties in the conclusions that the DEFRA 2004 reaches.

Similarly, the EA do not quote the DEFRA 2014 report's statement that:

"The study was not able to investigate the effects of all emissions to air, or the potential effects of exposure to substances released to water or land. … We estimated the health effects that might arise in the general population due to emissions to air from municipal solid waste management facilities … these estimates are of moderate or poor quality" (p. 191)

Furthermore, the EA do not highlight how:

> *"…indirect exposures via the food chain were not considered in this work." (p. 193)*

HPA (2009)

"HPA (now PHE) in 2009 stated that "The Health Protection Agency has reviewed research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable" (p. 35)

It should be noted that HPA acknowledged in 2010 that their statement relied heavily on the 2004 Defra[15]. This means that the flaws and limitations regarding the DEFRA 2004 report are relevant to the HPA statement.

SAHSU Studies

"In 2012 the UK Small Area Health Statistics Unit (SAHSU) at Imperial College was commissioned by Public Heath England (PHE) to carry out a study to extend the evidence base and to provide further information to the public about any potential reproductive and infant health risks from municipal waste incineration (MWIs)." (p. 35)

No mention is made of the criticisms and limitations of the SAHSU studies.

For example, that on the 12th of October 2011 an individual from the General Toxicology Unit at the Health Protection Agency (now Public Health England) wrote to Dr Anna Hansell of the Small Area Health Statistics Unit (SAHSU), who was the lead on the HPA/PHE study, to say:

> *"… If the proposal is only looking at inhalation exposure and not via food, it begs the question of how it can examine the effects of dioxin emissions since the vast majority of dioxin exposure is via the diet, specifically fatty foods. Any inhalation exposure will be trivial in comparison. So individuals eating fatty diets would be at greatest risk, regardless of emissions received or not from the incinerator…"*

Other criticisms include the focus on PM10s rather than smaller particles and the inaccuracy of the emissions modelling due to the simplified nature of the modelling exercise combined with inherent uncertainties in such modelling exercises.

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15 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335090/RCE-13_for_web_with_security.pdf

Report on waste incineration and possible contamination of the food supply with dioxins (Food Safety Authority of Ireland, 2003)[16]

"The Food Safety Authority of Ireland (FSAI) (2003) investigated possible implications on health associated with food contamination from waste incineration and concluded: "In relation to the possible impact of introduction of waste incineration in Ireland, as part of a national waste management strategy, on this currently largely satisfactory situation, the FSAI considers that such incineration facilities, if properly managed, will not contribute to dioxin levels in the food supply to any significant extent. The risks to health and sustainable development presented by the continued dependency on landfill as a method of waste disposal far outweigh any possible effects on food safety and quality."" (p. 36 & p. 37)

Although this is not stated by the Environment Agency, the conclusions of the report appear to primarily relate the impact of incineration on the national (rather than local) food supply.

The preceding paragraph includes the statement that:

> *"The EPA estimates that waste incineration will contribute 1.8% of projected dioxin emissions to air, or 0.55g out of a total of 30.3g total air emissions estimated for the year 2010".*

This figure is from Table 4 of the report ('Summary of estimated dioxin emissions to air, land and water in Ireland for 2010') that relate to impacts on national. These figures are based on the national EPA Inventory of Dioxin and furan emissions to air, land and water in Ireland for 2000 and 2010, published 2002 and the anticipated rate of incineration from 2010.

On 20 November 2018, the European Food Safety Authority (EFSA) announced a new tolerable intake level for dioxins and dioxin-like PCBs14 of 2 picograms per kilogram of body weight per week.[17] The previous tolerable intake level was 2 picograms per kilogram of body weight per day so the new level is a seventh of the previous level. This announcement followed a comprehensive scientific review, initiated by the EFSA, on the risk to animal and human health related to the presence of dioxins and dioxin-like PCBs in feed and food. The report comprised 331 pages and 1151 references.

[16] https://www.lenus.ie/bitstream/handle/10147/44804/6364.pdf?sequence=1&isAllowed=y
[17] https://www.efsa.europa.eu/en/press/news/dioxins-and-related-pcbs-tolerable-intake-level-updated

The Food Safety Authority of Ireland 2003 report referred to the European Commission's dioxins and dioxin-like PCBs level as 14 picograms (pg) WHO-TEQ per kg bodyweight per week which confirms that the report and its conclusions used the old tolerable intake level for dioxin and dioxin-like PCBs – a level which is no longer considered safe by the European Food Safety Authority.

Furthermore, it is stated on page 39 of the Draft Permit Decision Document that: *"In the UK, the COT [Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment] has set a TDI for dioxins, furans and dioxin like PCB's of 2 picograms I-TEQ/Kg-body weight/day (N.B. a picogram is a millionth of a millionth (10-12) of a gram)."*

As such, the Food Safety Authority of Ireland 2003 assessment (and potentially other assessments relied upon directly or indirectly by the Environment Agency) appears to be out of date, and this needs to be made clear within the Decision Document.

30. PROBLEMS WITH DISCUSSION AND USE OF THE HUMAN HEALTH RISK ASSESSMENT PROTOCOL (HHRAP)

5.3.1 Our role in preventing harm to human health

"iv) Health Risk Models…

Models are available to predict the dioxin, furan and dioxin like PCBs intake for comparison with the Tolerable Daily Intake (TDI) recommended by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, known as COT. These include the HHRAP model." (p. 39)

This confuses modelling systems/protocols with models. HHRAP is "Human Health Risk Assessment Protocol". It defines how to create a model but it is not, in itself, a model. According to the Environment Agency's draft audit of air quality impact assessment and Human Health Risk Assessment from 1st April 2021 what the application actually does is use the 'industrial risk assessment program Human Health' Software (IRAP-h View – Version 5.0, IRAP) to create a model which implements the protocol. The most recent version of the IRAP-h software from Lakes Environmental Software is Version 5.1.

"In addition to an assessment of risk from dioxins, furans and dioxin like PCB's, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. In principle, the respective ES for these metals are protective of human health. It is not therefore necessary to model the human body intake." (p. 39)

The Decision Document provides no evidence for this statement. Heavy metals can accumulate in the environment and in the body.

5.3.2 Assessment of Intake of Dioxins, Furans and Dioxin like PCBs

The results of the Applicant's assessment of dioxin intake are detailed in the table below.

It is not clear whether, and on what basis, the Environment Agency considers applicant's assessment of dioxin intake to be correct.

The Environment Agency's draft audit of air quality impact assessment and Human Health Risk Assessment from 1st April 2021 states:

> *"Table 7 of the HHRA shows the consultant's assessment at the point of maximum impact. These are based on deposition velocities and assumptions presented in Table 5 which are considered conservative. We have conducted our own HHRA screening using the US EPA HHRAP with more representative dry deposition velocities."*

It is unclear whether by 'conservative' the Environment Agency meant that the value chosen by the applicant was likely to underestimate or overestimate the impacts of the proposal, and it is unclear what the result was of the 'more representative' screening approach. It is also unclear whether the EA ensured that worst case values of all the HHRAP parameters have been used and whether or not the applicant has considered all significant pathways.

31. LACK OF DETAIL REGARDING THE APPROPRIATENESS OF USING THE COMEAP METHODOLOGY

5.3.1 Our role in preventing harm to human health

"The use of the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations " (p. 40)

No logic is provided to explain the basis for the conclusion that the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations.

Furthermore, a detailed explanation would need to be given for why, if this is the case, the Environment Agency are relying on studies that directly or indirectly rely on using COMEAP methodology to assess human health impacts of waste incineration.

32. LACK OF CLARITY FOR THE BASIS OF TDI FIGURES AND ASSESSMENT OF SIGIFICANCE (AND MORE GENERALLY A LACK OF INFORMATION ON THE EXTENT TO WHICH THE MOST SENSITIVE AND VULRNABLE PEOPLE ARE CONSIDERED)

5.3.2 Assessment of Intake of Dioxins, Furans and Dioxin like PCBs

"The results of the Applicant's assessment of dioxin intake are detailed in the table below. (worst – case results for each category are shown). The results showed that the predicted daily intake of dioxins, furans and dioxin like PCBs at all receptors, resulting from emissions from the proposed facility, were significantly below the recommended TDI levels." (p. 41)

"Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (as % of TDI)" (p.41)

"In 2001, the average daily intake by adults in the UK from diet was 0.9 pg WHO-TEQ/kg bodyweight. The additional daily intake predicted by the modelling as shown in the table above is substantially below this figure." (p. 41)

It is unclear how the maximum daily intake figures were derived and what the basis is for the statement that they were *"significantly below the recommended TDI levels".*

The EA's draft audit of air quality impact assessment and Human Health Risk Assessment dated 1st April 2021 does state that:

> *"3.22 The consultant has considered abnormal emissions in their Abnormal Emissions Assessment, the PEC is not predicted to exceed the AQAL at the point of maximum impact . We have conducted our checks assuming emissions are 100 times higher than the IED ELV for 60 abnormal hours per year as a worst case scenario."*
>
> *3.23 The threshold level for toxicity is the Tolerable Daily Intake value published by the UK Committee on Toxicity (COT). The consultant has assessed against a Tolerable Daily Intake (TDI) of 2 pg WHO-TEQ/kg(BW)/day. Their predicted maximum contribution is 2.6% of the Committee on Toxicity (COT) Tolerable Daily Intake (TDI) of the 2 pg WHO-TEQ/kg(BW)/day which is below 10% insignificance criterion suggested by Public Health England (PHE)." (p. 6)*

It is unclear if the 2.6% is based on the operation during abnormal operations at 100 times higher than ELV levels, and it is unclear what level of modelling uncertainty was taken into account.

It is also unclear what the basis is for the 10% insignificance threshold. Is this just the 10% process contribution insignificance threshold re-used for a different purpose? If so, has Public Health England specifically recommended for the threshold to be used in this way, and if so where and on what basis?

The 1st April 2021 audit states that:

> *"3.26 Our checks indicate the PCs at sensitive human receptors for most pollutants are likely to be insignificant. Where PCs are not insignificant the PECs are unlikely to exceed the relevant environmental standards." (p. 6)*

This is not very informative. For example, this statement could be technically correct even if it was 49% likely to be 99% of the relevant environmental standard. Without providing more details regarding the original analysis and the sensitivity analysis, it is impossible to assess the robustness of the conclusions reached.

It is also unclear why there is a focus on average daily intake as opposed to say the 95th Percentile. The incinerator will not only affect the 'average person', but also people with a variety of different lifestyles and vulnerabilities. It is unclear what, if any, impact assessment has been carried out against the most vulnerable and sensitive receptors in relation to TDI (including people who may primarily eat locally-grown produce).

While these issue are highlighted with respect to TDI, it is more generally a problem with the approach taken within the Decision Document and the Audit, with insufficient data and context being made available to truly appraise and verify the relevant risks and uncertainties that lie behind the Environment Agency's conclusions in relation to the whole population and in respect to the most vulnerable people who could be more sensitive than average to increases in pollution.

33. INSUFFICIENT INFORMATION REGARDING CONSIDERATION OF BROMINATED COMPOUNDS

5.3.2 Assessment of Intake of Dioxins, Furans and Dioxin like PCBs

"In 2010, FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in UK. It asked COT to consider the results and to advise on whether the measured levels of these PXDDs, PXDFs and PXBs indicated a health concern ('X' means a halogen). COT issued a statement in December 2010 and concluded that " The major contribution to the total dioxin toxic activity in the foods measured came from chlorinated compounds. Brominated compounds made a much smaller contribution, and mixed halogenated compounds contributed even less (1% or less of TDI). Measured levels of PXDDs, PXDFs and dioxin-like PXBs do not indicate a health concern". COT recognised the lack of quantified TEFs for these compounds but said that "even if the TEFs for PXDDs, PXDFs and dioxin-like PXBs were up to four fold higher than assumed, their contribution to the total TEQ in the diet would

still be small. Thus, further research on PXDDs, PXDFs and dioxin-like PXBs is not considered a priority."

In the light of this statement, we assess the impact of chlorinated compounds as representing the impact of all chlorinated, brominated and mixed dioxins / furans and dioxin like PCBs." (p. 41)

It is unclear how the issue of brominated compounds was considered within the context of the permit application and therefore how the particulars of the proposal were taken into account when applying the advice of the Food Standards Agency.

It seems like the logic behind the statement is only robust if:

1. it is known that the ratio of chlorinated dioxins to brominated dioxins from incinerators is the same as the environmental concentrations derived from other sources, and

2. brominated dioxins are the only other halogenated dioxins to be a health concern.

Without such information, brominated dioxins and other halogenated dioxins produced by incinerators could still be a health risk.

The EA should provide confirmation of the above or show how it is ensuring emissions of halogenated compounds other than chlorinated compounds are not a risk to health.

It is also unclear about the extent to which the conclusions from 2010 are relevant to this proposal given the significant increase in waste incineration since 2010 (with the amount of English Local Authority Collected Waste sent for incineration increasing from 3.6 million tonnes in 2009/10 to 11.6 million tonnes in 2019/20).

The Environment Agency should also provide an explanation of how it has taken into account the issues highlighted by ToxicoWatch in their case study 'Hidden emissions: A story from the Netherlands'[18] and whether or not the EA has taken advice from Public Health England and the Food Standards Agency regarding the relevance of, and lessons to be learned from, that case study.

[18] https://zerowasteeurope.eu/wp-content/uploads/2018/11/NetherlandsCS-FNL.pdf

34. THERE SHOULD BE MORE TRANSPARENCY IN CIRCUMSTANCES WHERE THE COST TO THE OPERATOR IS PROPRITISED OVER MINIMISING ENVIRONMENTAL IMPACTS, E.G. IN RELATION TO NOT USING A GAS MAIN

If the EA's only or primary justification for allowing a more environmentally harmful option to be selected is on costs grounds, then this should be explained and it should be made clear what the avoided costs to the operator are compared to the increased costs to society and what the Environment Agency has done to confirm that the costs figures provided are not overstated and that the potential impacts are not understated. Wherever an option is accepted by the EA as BAT despite not being the best available technique from the perspective of environmental protection then this should be explicitly acknowledged and appropriately justified within the decision document, with appropriate reference to where supporting evidence can be found.

"The Applicant proposes to use gasoil as support fuel for start-up, shut down and for the auxiliary burners. The choice of support fuel is based on lack of availability of a high pressure gas main. "

Section 2.1.3.3 ('Auxiliary fuel') of the Application Supporting Information appears to justify the decision not to use natural gas almost entirely on cost grounds, and appear to acknowledge that their chosen option does not have the lowest environmental impacts. The EA has not stated how far away the nearest high pressure gas main is nor what the cost of extending the high pressure gas main to the site would be. Nor has the EA explained why society should have to pay the price for the increased pollution of using gas oil rather than the additional cost that the applicant would have to pay for a high pressure gas main.

"Based on the figures above [i.e. £2,800/tonne of NO_x removal for SCR compared to £2,000/tonne of NO_x removal for SNCR] the Applicant considers that the additional cost of SCR over SNCR is not justified by the reduction in environmental impact. Thus SCR is not BAT in this case, and SNCR is BAT for the Installation. The Applicant has justified the use of ammonia as the reagent on the basis of lower nitrous oxide emissions. The Environment Agency agrees with this assessment." (p. 62)

It is unclear whether or not there is an SCR option which would not result in high levels of nitrous oxide emissions, and therefore whether cost is the only basis for the Environment Agency accepting SCR as BAT even when SNCR would result in lower levels of NO_x emissions.

The price of NO_x removal is expressed as £/tonne, but it is not made clear what the financial impact this would have on a lifetime basis between the two options. What financial value has been placed on the increased harm caused by allowing more NO_x to be released, including the harm to Hatfield Moor? Why does the Environment Agency not consider the increased cost to be worth it if it results in lower levels of NO_x?

35. INSUFFICIENT EXPLANATION AND JUSTIFICATION REGARDING POPS

6.4 BAT and POPs

"Our legal obligation, under regulation 4(b) of the POPs Regulations, is, when considering an application for an environmental permit, to comply with article 6(3) of the POPs Regulation" and then quotes a statement which includes "give priority consideration to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of substances listed in Annex III" (p. 71)

The EA has not explained what "*alternative processes, techniques of practices*" it has considered for waste management that may avoid the formation and release of substances listed in Annex III and why it considers those processes not to have a "similar usefulness".

Alternative processes that would reduce waste being incinerated could be improved waste sorting and recycling, waste reduction techniques, anaerobic digestion of biogenic waste, long-term storage of plastics that cannot yet be recycled (e.g. storage in landfill). These techniques do not have the formation and release of substances listed in Annex III so priority should be given to them. The EA should explain why it considers them to be less useful.

"We believe that the Permit ensures that the formation and release of POPs will be prevented or minimised" (p. 72)

How can the EA possibly consider that the Permit could prevent the formation and release of POPs? How can the EA consider that the Permit will minimise the formation of release of POPs? Are there not better techniques available that could reduce POPs still further, such as catalytic filter bags? Or better control of the waste materials being burnt? The statement appears misleading or needs further explanation.

36. INSUFFICIENT JUSTIFICATION OF CONCLUSIONS REGARDING ODOUR

6.5.4 Odour

"Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise odour and to prevent pollution from odour." (p. 74)

Given that odour is a significant concern for the public and that odour issues have plagued a number of incinerator sites despite having been granted a permit, this level of detail seems totally insufficient to explain why the Environment Agency is satisfied that odour issues have been minimised.

For example:

- How has the EA assessed the doors and are they fast enough in practice?
- How has the EA assessed the air flow required to keep the building under negative pressure?
- How has the EA assessed the monitoring of odours, and
- Where does the EA set out the actions that will be taken in the event of odours escaping the installation?

37. MISLEADING AND INADEQUATE STATEMENTS REGARDING NOISE

6.5.5 Noise and vibration

"Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site:"(p. 74)

Because it is always possible to reduce noise and vibration still further, it is incorrect for the EA to claim that the applicant has put measures put in place that will prevent or minimise noise and vibration. The EA should state what limits of noise or vibration it considers acceptable and/or what measures it does or does not require the applicant to put in place.

"Potentially noisy plant items at the Facility will be installed within the main building and equipped with noise insulation appropriate to the type of plant." (p. 74)

It is not true that *"potentially noisy plant items … will be installed within the main building"* because some potentially noisy aspects of the facility, e.g. the air cooled condensers, will not be within the main building.

The EA has not said how it will ensure that doors to the building will be kept closed when not in use, nor for how long the doors may be kept open.

"A sound attenuator will be fitted to the exhaust of the flue gas ID fan to minimise noise emissions." (p. 74)

The EA has said *"a sound attenuator will be fitted to the exhaust of the flue gas ID fan to minimise noise emissions",* but the EA has not said why the sound attenuator that will be fitted is the very best sound attenuator available or why multiple sound attenuators cannot be fitted to reduce the noise still further. Perhaps the EA should instead be saying that it considers the sound attenuator will reduce the noise to an acceptable level of xxx dB?

"In addition, vehicle movements at night will be limited, and regular maintenance of plant items will be undertaken" (p. 74)

"Any mobile plant will be operated and maintained in accordance with the manufacturer's instructions, whilst complying with the latest standards including those on noise emissions." (p.74 - p. 75)

The EA has not said how it will ensure that *"mobile movements at night will be limited"* nor has it said how it will ensure that "regular maintenance of plant items will be undertaken" nor has it said how it will ensure that *"mobile plant will be operated and maintained in accordance with the manufacturer's instructions, whilst complying with the latest standards including those on noise emissions"*.

If the EA is stating these things just because the applicant has stated them, is the EA prepared to stake its reputation on the applicant's compliance?

"Noise level checks will be carried out regularly in operational areas where high noise levels are present, with early warning of increasing noise levels resulting in a noise reduction or mitigation program." (p. 75)

The EA has not said how often noise level checks will be carried out. "Regularly" could mean every year.

"Based on the Applicant's assessment we agreed that noise will be a low risk from noise and unlikely to cause any significant impacts." (p. 75)

The EA has not said what will be done if the plant does cause significant impacts.

38. IT IS INCORRECT TO SAY THAT INCINERATION RESULTS IN THE DESTRUCTION OF WASTE

6.6.1 Translating BAT into Permit conditions

"… the primary purpose of the plant, which is the destruction of waste"

Strictly speaking, this statement is incorrect because matter cannot be created or destroyed. The facility does not 'destroy' waste, but instead changes the chemical nature of the waste (mainly through oxidation/combustion) with the resulting chemical elements largely ending up in the waste ash and the dispersed air emissions (such as in the form of CO_2).

39. ENVIRONMENT AGENCY HAVE NOT DEMONSTRATED THAT THE DEVELOPMENT WOULD CONTRIBUTE TO (RATHER THAN UNDERMINE) ACHIEVING SUSTAINABLE DEVELOPMENT

"We are required to contribute towards achieving sustainable development, as considered appropriate by Ministers and set out in guidance issued to us. The Secretary of State for Environment, Food and Rural Affairs has issued The Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002). This document:

> ***"provides guidance to the Agency on such matters as the formulation of approaches that the Agency should take to its work, decisions about***

priorities for the Agency and the allocation of resources. It is not directly applicable to individual regulatory decisions of the Agency"." (p. 81)

The Environment Agency refer to this document, and should therefore link to it: http://www.hwa.uk.com/site/wp-content/uploads/2017/12/Annex-11-EA-susdev-guidance-2002.pdf

The approach taken by the Environment Agency appears to run contrary to the goal of contributing to sustainable development in a number of key respects. For example:

- *"take into account any likely costs in achieving its principal aim, and to take account of the likely costs and benefits in exercising its powers. This includes both costs to people and organisations, and costs to the environment."* (section 1.3). The EA has not explained how its approach assesses the costs to people (in terms of the health costs) nor the costs to the environment (in terms of greenhouse gas emissions and other pollutants) in order to meet this requirement.
- *"Sustainable development is about achieving a better quality of life for everyone, now and for generations to come."* (section 3.2). Since the proposed facility will increase greenhouse gas emissions, the Environment Agency's current approach would result in the loss of materials from the circular economy, and so adopting an approach which would allow for the permit to be granted would go against this goal.
- *"effective protection of the environment"* (section 3.2). Since an approach that would allow for this permit to be granted would result in harm and not effectively protect the environment because of the damage that the CO_2 emissions (amongst others), the approach is not in accordance with this principle.
- *"prudent use of natural resources"* (section 3.2). Since the proposal can be expected to damage natural resources that are limited (e.g. plastics derived from fossil fuels and nutrients in biogenic materials), it is not in accordance with its objectives.
- *"maintenance of high and stable levels of economic growth and employment"* (section 3.2) and *"taking a long-term perspective"*. Since the proposal is based on a linear economic model (where materials are produced and disposed of) rather than a circular economic model, the facility is based on an economic model that is fundamentally unstable and unsustainable. Recycling and re-use results in significantly more jobs than incineration, but the EA are allowing material which might otherwise have been recycled or re-used to be incinerated.
- *"transparency, information, participation and access to justice"* (section 3.3). The EA should explain why its decision to not automatically disclose and reveal enhanced pre-application discussions with applicants (and all the information

given in those discussions) can be considered to be transparent and how this may impact access to information, participation and access to justice. Section 4.1 (d) of the same document requires “high standards” of transparency. The EA should explain why its decision to not disclose the applicants dispersion models which form part of the permit application can be considered compatible with its objective for transparency, information participation and access to justice.

- *"contribute to the reduction of greenhouse gas emissions"* (section 5.6). See above.
- *“including advising on regional planning guidance, development plans and planning applications. Its primary role … is to advise on those aspects of … planning applications … which relate to its operational functions and particular expertise, using information it already has”* Since the EA has expertise in the greenhouse gas emissions, the EA should explain how it has advised the planning authority in relation to this application of the greenhouse gas emissions and the impact of those emissions.

The approach adopted by the EA for this permit does not appear to be in line with the requirement to promote sustainable development, and instead appears to permit unsustainable development resulting in excess levels of pollution with insufficient monitoring.

40.PERMIT CONDITION INCONSISTENCY

ANNEX 1A: APPLICATION OF CHAPTER IV OF THE INDUSTRIAL EMISSIONS DIRECTIVE

"IED Article: 45(1)(f)

Requirement: The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values.

Delivered by: Conditions 2.3.11 and 2.3.12." (p. 86)

"IED Article: 46(6)

Requirement: Limits the maximum period of operation when an ELV is exceeded to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year. imits on dust (150 mg/m3), CO and TOC not to be exceeded during this period

Delivered by: Conditions 2.3.11 and 2.3.12" (p. 87 & p. 88)

Conditions 2.3.11 and 2.3.12 refer to record keeping and not to the maximum permissible period of unavoidable stoppages as written in the “Requirement” column of the table.

"IED Article: 46(5)

Requirement: Prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. Adequate storage capacity for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting

Delivered by: The application explains the measures to be in place for achieving the directive requirements. The permit requires that these measures are used. Various permit conditions address this and when taken as a whole they ensure compliance with this requirement." (p. 87)

The permit conditions should be specified.