Comments on any further information and submissions received by Deadline 6

UKWIN'S D7 COMMENTS ON REP6-025, REP6-029 & REP6-030

REP6-025: 15.3 SUMMARY OF APPLICANT'S ISH7 ORAL SUBMISSIONS
REP6-029: 15.6B APPLICANT'S COMMENTS ON THE DEADLINE 5 SUBMISSIONS: PART 2 OTHER INTERESTED PARTIES
REP6-030: 15.7 APPLICANT'S RESPONSE TO ISH4 ACTION POINT 7 TECHNICAL NOTE: CLIMATE ADDITIONAL SENSITIVITY ASSESSMENT

Proposed Development:

Medworth EfW CHP

Proposed Location:

Land on the Algores Way Industrial Estate to the west of Algores Way in Wisbech, Fenland, Cambridge

Applicant:

Medworth CHP Limited

Planning Inspectorate Ref:

EN010110

Registration Identification Ref:

20032985

JULY 2023

UKWIN
United Kingdom Without Incineration Network

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REP6-025: 15.3 WRITTEN SUMMARY OF THE APPLICANT'S ORAL SUBMISSIONS AT ISH7

ISH 7 Action Point 1 [EV-082] – National Waste Fuel Suitability

1. ISH7 Action 1 [EV-082] is framed as follows: "[The] Applicant limits itself to certain waste types for its local analysis in recognition that some of the household and commercial waste material will not represent suitable fuel for the current proposal. Can the Applicant confirm if it has applied this approach to the National analysis and, if not, justify why?"
2. The Applicant's response discusses considerations with respect to Tolvik's 2017 future waste arisings predictions but not with respect to the analysis set out in the Applicant's D5 WFAA [REP5-020] in relation to meeting the UK Government's residual waste reduction targets for 2027 and 2042.
3. The Applicant does not respond to the criticism that they do not appear to take into account the fact that not all waste is suitable for incineration when they calculate residual waste at 5.2.26 of their D5 WFAA, where they state: "Current Office for National Statistics (ONS) population predictions are that in 2043, there will be approximately 61,744,098 people in England – and at 287kg of residual waste per head, this equates to 17.7 million tonnes of residual waste" and then go on to compare this 17.7 million tonne total residual waste figure (excluding major mineral waste) directly with the figure of 17.9Mtpa of EfW capacity as if all residual waste could be incinerated.
4. As such, the Applicant has not defended the robustness of their D5 WFAA conclusion on paragraph 5.3.1 that: "By 2028, even if the Government's ambitious interim residual waste reduction targets set out in their 2023 Environmental Improvement Plan are achieved there is anticipated to be 21.4 million tonnes of residual HIC waste in England requiring management. Based on operational capacity available by 2027, there would remain a minimum shortfall of 3.5 million tonnes of residual HIC capacity".
5. Similarly, the Applicant has not defended the robustness of their conclusion at paragraph 5.2.26 of their D5 WFAA that: "Current Office for National Statistics (ONS) population predictions are that in 2043, there will be approximately 61,744,098 people in England – and at 287kg of residual waste per head, this equates to 17.7 million tonnes of residual waste. Whilst current operational and 'in construction' EfW capacity in England equates to 17.9 million tonnes (as predicted by Tolvik in 2023), inevitably by 2042, a large proportion of the existing capacity will be aging and may have been decommissioned…With this in mind, it is considered that even in the unlikely event of the EIP stretch target of halving residual waste by 2042 being achieved, there remains a clear need for the modern, CHP enabled, and decarbonisation ready capacity offered by the Proposed Development".

6. Leaving aside UKWIN's established and outstanding concerns that the Applicant is using an outdated population forecast and that their methodology and approach for trying to reduce the 17.9Mpta EfW capacity figure is flawed, UKWIN's key WFAA criticism that is relevant to the Applicant's response to ISH7 Action Point 1 is that the Applicant is comparing the total residual waste (excluding major mineral waste) figure directly with their expectations of future EfW capacity, and as such are mistakenly assuming that all of that 17.7Mt of residual waste would be suitable for incineration.

7. The Applicant's lack of a response to this historic criticism, about which they were expected to comment as part of responding to ISH7 Action Point 1, could be indicative of the notion that providing a meaningful response would require the Applicant to either defend the indefensible by arguing that all residual waste would somehow be suitable for incineration when they have already admitted that this is not the case, or to concede that the amount of residual waste suitable for incineration in the event that waste fell in line with the 2027 and 2042 targets would be far lower than the levels of available feedstock that they are relying on for their WFAA to justify their proposed new incineration capacity.

8. Whatever the Applicant's reasons for failing to address the issue, UKWIN asks that the Examining Authority and Secretary of State give this issue the full attention it deserves.

9. Reviewing the transcript of ISH7 [EV-074], it is crystal clear that Action Point 1 arose out of UKWIN's concerns specifically with the way that the Applicant's national analysis of waste versus capacity with respect to meeting the residual waste reduction targets appeared to assume that all of this residual waste would be suitable for incineration, despite elsewhere making it clear that not all residual waste is suitable for incineration.

10. This is set out in the transcript to ISH7 Part 1 [EV-074] as follows:

> **Shlomo Dowen, UKWIN:**
>
> Next, we wanted to raise an issue relating to the combustibility of national feedstock.
>
> The applicant limits itself to certain waste types for its local analysis in recognition of the fact that some household industrial and commercial or HIC material "will not be suitable for use as a fuel source at the proposed development, for example, rubble and soils", and to "avoid an overestimation of available fuel".
>
> It appears, however, that the applicant has failed to apply this local logic to the national analysis with respect to the impact of meeting the residual waste reduction targets. Is this the case and if so, why?

And just to be clear, when we were talking earlier about the 3.5 million tonnes, et cetera, that related to all waste, [and] not [just] to waste that was suitable for use as fuel.

Examining Authority:

Thank you, Mr. Dowen. If I could ask the applicant to respond, please.

Claire Brown for the Applicant:

Claire Brown for the applicant. Um, two points, actually. First of all, I would like to go away and check that, if I may. But secondly, I am aware that the data set out in the Environmental Improvement Plan does exclude non-combustible waste such as mineral waste and rubble. But I would welcome the opportunity to go back and double check that and come back with a more robust answer if that's okay.

Examining Authority

Definitely. So if I could get an action for the applicant to carry out that check and then come back to the examination panel on that, please. Thank you.

11. UKWIN's reading of the Applicant's ISH6 submissions suggests either that the Applicant failed to carry out that check or failed to share the results with the Examination.
12. While the Applicant, in their national analysis, has not attempted to limit their estimates of future residual waste to that which would be suitable for incineration, UKWIN has done so in its analysis set out in REP6-042.
13. UKWIN's more thorough analysis concluded that there simply would not be enough waste to justify the additional incineration capacity proposed for Medworth were the Government's targets to be met.
14. Put another way, the proposed Medworth capacity would be incompatible with the achievement of the Government's residual waste reduction targets and could therefore be expected to hamper the management of waste at the higher tiers of the waste management hierarchy.
15. Worryingly, the Applicant has not only failed to correct the assessment in their D5 WFAA, but they have repeated the misleading 17.7Mt figure in their comments on the responses to the ExA's second set of Written Questions.
16. As REP6-027 records, on electronic pages 60-61, Wisbech Town Council argued in REP5-024 that it is essential that the overall conclusions included at Section 6 appropriately consider the implications of the EIP targets.

17. In REP6-027 the Applicant responded to Wisbech Town Council by claiming that: "…Looking ahead to 2042 – it is concluded that should Government residual waste reduction targets be achieved; it is anticipated that there will be around 17.7 million tonnes of residual waste in England that requires management. Current predictions are that there are 17.9 million tonnes of available capacity in England…"
18. The Applicant appears to be continuing to compare apples and oranges by using the 17.7 million tonne figure for total residual waste to try to justify a need for incineration capacity, including the additional new capacity proposed for Medworth, that would only be capable of treating a portion of that residual waste.
19. This D6 response from the Applicant highlights how reliant they appear to be on using faulty assumptions to prop up their flimsy need case.

Comments on Applicant's REP6-025 Appendix A - Technical Note: Reduction in Energy Inputs

20. Table 3.1 of the Applicant's REP6-025 Appendix A ('Technical Note: Reduction in Energy Inputs') confirms that power output could be significantly lower than the nominal figure advertised within the NSIP application for the proposed development.
21. This is relevant to consideration of this NSIP proposal within the planning balance, alongside the fact that some of that energy would be needed to operate the plant itself (known as 'the parasitic load') and the fact that if the plant operates with a Carbon Capture and Storage (CCS) scheme this would increase the parasitic load further reducing electricity output, thereby reducing the benefits of the scheme and the weight to be given to those benefits.
22. The Applicant's REP6-025 Appendix A Table 3.1 only sets out the impact of reduced load and hours of operation on gross power output, but the discussion at ISH7 that led to Action Point 2 [EV-082] related not just to gross power generation but to how much was exported to the grid (i.e. generation net of the parasitic load).
23. ISH7 Action Point 2 states: "Applicant to produce a technical note focusing on the effects that a reduction in the predicted calorific content of waste and/or overall available fuel can have, particularly in relation to the operability of the CHP and **electricity components** of the Proposed Development". (**emphasis added**)
24. It should have been clear to the Applicant that the reference to 'electricity components' in ISH7 Action Point 2 included net electrical output to the grid in line with Mr. Carey's ISH7 comments, not just gross power generation.

25. As noted in the Part 2 transcript for ISH7 [EV-075], the discussion included the following statement from Mr. Carey for the Applicant: “So if anything was to be reduced, it would be electricity going into the grid rather than heat going to customers”.

26. This statement from Mr. Carey about reduced output to the grid appears to have been part of the ‘issue’ that formed the request from the Examining Authority at ISH7 which shortly followed Mr. Carey’s statement.

27. That is to say, the Examining Authority’s statement that: “[Mr] Carey, if you accept an action for this issue to be further investigated in terms of what the consequences of the different of a reduction in the outputs is going to be, particularly for those two components in terms of the electricity and CHP” appears to have included Mr. Carey’s comments about the export of electricity to the grid as part of the ‘issue’ expected to be adressed by the Applicant.

28. Operating the facility with just one line would halve the amount of gross power generated but would more than halve the amount of net electricity exported to the grid.

29. This is because a plant operating only one of its lines still needs to meet the electricity requirements (the parasitic load) of the same buildings and much of the same equipment as a facility operating two lines.

30. As such, the fact that the Applicant’s REP6-025 Appendix A Table 3.1 focuses on gross power output rather than electricity exported to the grid means that it fails to quantify the impact of reduced waste throughput, or reduced calorific value of the feedstock, on electricity going to the grid.

31. It is clear that the electricity exported to the grid would significantly reduce because the gross power output would reduce, but looking at just the drop in gross power generation understates the impact on reductions in power going to the grid.

32. Uncertainties regarding the amount of electricity that would be exported to the grid should reduce the weight given to this claimed benefit.

Comments on Applicant's REP6-025 Appendix D – WDI Guide

33. The Applicant's REP6-025 Appendix D WDI (Waste Data Interrogator) Guide was created in response to ISH7 Action Point 3 [EV-082] which asked the Applicant to clarify: "…the sources used for the waste data information included in the last version of the WFAA".

34. The Applicant's WDI Guide raises concerns that the HIC Waste Figures used by the Applicant in their D5 WFAA's local analysis appear to be overestimated due to double counting and that a notable quantity of the material relied upon by the Applicant for their local WFAA analysis would not be suitable for incineration or where there is a high degree of uncertainty regarding its suitability or availability for use as incinerator feedstock.

35. In their D5 WFAA the Applicant states on REP5-020 Paragraph 4.1.7: "This data shows that within the spatial scope of this WFAA, a total of approximately (~) 9.7 million tonnes of local authority collected waste, industrial and commercial waste, which is suitable for processing at the Proposed Development was generated in 2021".

36. This ~9.7Mt figure relates to the result of 9,706,427 in REP5-020 Table 4.2.

37. However, an assessment of the HIC listed in the D5 WFAA in Table 4.2 of REP5-020 using the WDI Guide to help understand the approach adopted by the Applicant indicates that a vast majority (at least around 75%) of this 9.7Mtpa does not in fact represent HIC waste within the spatial scope of the WFAA that would be "suitable for processing at the Proposed Development".

38. While the detailed assessment is set out later in this submission (including in the Technical Annex at the end), the results are summarised below.

UNSUITABLE WASTE IN APPLICANT REP5-020 TABLE 4.2 HIC 2021 ARISINGS TABLE

Method	East of England (Tonnes)	East of England (% of Table 4.2)	'In Scope' East Midlands (Tonnes)	'In Scope' East Midlands (% of Table 4.2)	Total 'In Scope' (Tonnes)	Total 'In Scopes (% of Table 4.2)
Unsuitable due to double counting (transfer)	2,586,837	39%	1,162,925	38%	3,749,762	39%
Unsuitable due to treatment option	1,938,069	29%	1,095,976	36%	3,034,046	31%
Tolvik 30% assumed non-combustible fraction of 19 12 12	370,453	6%	122,503	4%	492,956	5%
TOTAL CLEARLY UNSUITABLE	**4,895,359**	**74%**	**2,381,404**	**78%**	**7,276,764**	**75%**
Out of total listed in REP5-020 Table 4.2	6,643,864	100%	3,062,562	100%	9,706,426	100%

39. This indicates that at least around 75% of the Applicant's 9.7Mt HIC waste figure identified by the Applicant in REP5-020 Table 4.2 is waste that is clearly unsuitable for inclusion as potential incinerator feedstock.

40. That of course does not mean that it would be appropriate to send all of the remaining c.25% of waste to incineration or that all of this material would necessarily be available for such a purpose in any case, now or in the future.

41. As previously noted, much of the remaining combustible waste could be reduced, reused, recycled and/or composted, and some of it could be expected to be treated through other means such as co-incineration at cement kilns.

42. And indeed, as noted by others, much of it is waste that arises in Essex, and it can be expected that much of the suitable combustible waste arising there would go to the Rivenhall incinerator in the future.

43. A second conclusion from the Applicant is also undermined by a consideration of the approach set out in the Applicant's WDI Guide; specifically the statement in REP5-020 Paragraph 4.1.16 that: "The data in Table 4.4 HIC waste disposed to non-hazardous landfill (tonnes) demonstrates that of the ~9.7 million tonnes of HIC arisings (as set out in Table 4.2 HIC arisings for the defined LoW codes 2021 (tonnes), almost 2.4 million tonnes of suitable HIC waste generated within the WPAs within the spatial scope were sent to non-hazardous landfill in 2021…"

44. As set out later in this submission, one of the waste codes that is used by the Applicant for Table 4.4 and that contributes a significant proportion of the 2.4Mt figure cited by the Applicant is landfilled 19 12 12.

45. As this landfilled 19 12 12 is comprised of sorting residues, as set out below, it stands to reason that a vast majority of it would be waste deliberately not sent to incineration due to low combustibility or to the waste being otherwise unsuitable, for example due to being too fine to go through a moving grate.

46. For the analysis above we use Tolvik's estimate that around 30% of landfilled 19 12 12 is non-combustible, and this can be considered likely to understate the level of non-combustible waste in the Applicant's ~2.4Mt figure.

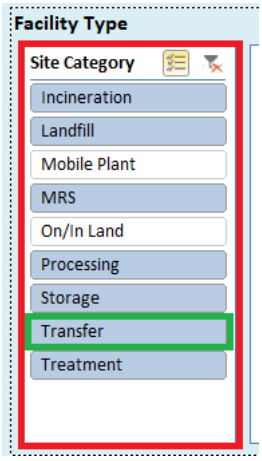
47. Furthermore, as noted above, just because some of the remainder might be combustible does not mean it is not material that could in the future be reduced, re-used, recycled or composted instead and/or material that might end up going to a different combustion route such as cement kilns.

48. More detailed analysis set out later in this submission expands upon the issue with respect to the non-combustibility of landfilled 19 12 12.

DOUBLE COUNTING, E.G. AT TRANSFER STATIONS

49. The Applicant does not appear to have followed any methodology to address the issue of double counting associated with the WDI in instances where waste goes through multiple waste management sites (e.g. where the waste is moved through one or more waste transfer or bulking stations en route to a next destination) and is therefore received at multiple sites and thus would be counted multiple times under the Applicant's methodology.

50. The Applicant's REP6-025 WDI guide shows the Facility Types that the Applicant excludes, and those that are included:



51. The issue of double counting is most clearly egregious in the Applicant's decision to include 'Transfer' (which we have highlighted in green above) within their D5 WFAA [REP5-020] Table 4.2 HIC figures.

52. Including transfer stations within the Applicant's WDI analysis means that every time waste goes through a transfer station it is counted again within the WDI's figures, and as a result the amount of waste counted is likely to far exceed the actual amount of waste arising.

53. For example, if one looks at the East of England results for the waste codes used by the Applicant (19 12 10, 19 12 12, 20 03 01, and 20 03 07) the results are as follows:

    - Waste received at transfer stations in 2021 was 2,405,313 tonnes
    - Waste received at landfill or incineration in 2021 was 2,343,559 tonnes

54. Counting both 'waste received at transfer stations' and 'waste received at landfill or incineration' results in a figure of 4,748,872 tonnes of waste, which indicates a high degree of double counting that could more than double the HIC figure.

55. The impact of including waste at transfer stations can result in a significant degree of double counting, and this is why established Defra methodology is to exclude waste from transfer stations.

56. The 'Reconcile' methodology established by Jacobs for Defra in 2014 notes how: "Data sources and methods were chosen to minimise double-counting and exclude out of scope waste streams. Specific measures included: excluding transfer stations from EA Waste [Data] Interrogator records [used for the analysis]…"[1]

57. This advice is widely followed by those using the Waste Data Interrogator tool to conduct waste needs assessments.

58. The West Yorkshire Combined Authority's Waste Needs Assessment (WNA) Gap Methdology from 2017 noted that: "In accordance with the DEFRA methodology, waste passing through a waste transfer station was removed from the estimate in order not to double count such arisings, which would be eventually managed at other treatment or disposal facilities".

59. Similarly, Nottinghamshire and Nottingham's September 2021 WNA explains that: "C&I waste arisings have been calculated by adapting the Defra 'Reconcile' methodology…The following wastes are excluded: …Waste received by transfer station facilities (in order to avoid the double counting of waste)".[2]

60. The Appendix to this Nottinghamshire WNA notes: "To avoid double counting the waste arising at transfer stations and the waste arising at end treatment/disposal destinations, the waste received by transfer stations has been excluded by filtering the data to exclude Site Category: Transfer".

61. Explaining this, the Nottinghamshire WNA states: "The main role of a transfer station is to temporarily store waste, bulking it into more efficient loads before it is moved on to a final destination. Waste received by transfer stations has been excluded to avoid double counting as the waste will be reported twice (once when it is received by the transfer station and once when it arrives at its final destination)".

62. The Medworth Applicant's only attempt to avoid double counting appears to be with respect to the Treatment category, with internal page 42 of their D5 WFAA stating: "19 12 10, 19 12 11 & 19 12 12 removed from included Treatment sites, with fate 'Landfill', 'Incineration' or 'Recovery' to avoid double counting" – but this approach does not eliminate the double counting associated with the inclusion of transfer stations.

[1] New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England (Defra, August 2014)

[2] Nottinghamshire and Nottingham Waste Needs Assessment (Nottinghamshire County Council and Nottingham City Council, September 2021)

APPLICANT'S FAILURE TO ADEQUATELY ACCOUNT FOR HOW SOME WASTE PROCESSING FACILITY TYPES INDICATE THAT THE WASTE THEY PROCESS IS UNLIKELY TO BE SUITABLE FOR INCINERATION

63. Whilst the Applicant excludes Mobile Plants and On/In Land sites from their D5 WFAA [REP5-020] Table 4.2 HIC figures, the fact that they include all other facility types means that their HIC figures include significant quantities of residual waste whose unsuitability for incineration is made clear by how that waste is currently being processed.

64. To assess this and its potential impact we look at how much waste from the Applicant's aforementioned 'In scope' waste codes are treated in the East of England under the facility types that are the focus of our concerns.

65. The facility types relied upon by the Applicant indicate that for a significant proportion of the Applicant's HIC waste in the East of England region the waste appears to either already have an appropriate treatment route or it appears not to be material suitable for incineration.

66. Similar issues arise when one expands the scope of exploration into other areas within the Applicant's WFAA study area.

67. It is unclear the extent to which material in the Treatment category was removed as part of the Applicant's aforementioned approach to avoiding double counting from that category.

FAILURE TO ACCOUNT FOR HOW THE 19 12 12 WASTE TYPE INCLUDES SIGNIFICANT QUANTITIES OF WASTE GOING TO LANDFILL BECAUSE THAT WASTE IS UNSUITABLE FOR INCINERATION

68. The Applicant's WFAA targets all 19 12 12 currently going to landfill as if all of this material could be suitable for use as incinerator feedstock.

69. However, as has been previously stated, the waste code 19 12 12 is used for "other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11" and the portion of this which goes to landfill is often sent to landfill because it has specifically been assessed as being unsuitable for waste incineration.

70. This was set out by UKWIN in our comments on the Applicant's D5 WFAA (i.e. from paragraphs 49-55 of REP6-042 and in the REP6-042 Technical Annex from paragraphs 194-207) where we cite evidence from Defra, Tolvik and the Scottish Incineration Review to conclude that: "…a large quantity of 19 12 12, which is generally categorised as part of the municipal waste stream, is material that is deemed unsuitable for incineration either due to its low calorific value or to it being so fine as to not being compatible with use at a moving grate incinerator".

71. The November 2017 Tolvik analysis, used by the Applicant to assess future arisings at a national level (but not for their local analysis), assumes that only 70% of the waste landfilled under the code 19 12 12 is combustible.

72. More recent analysis, e.g. that undertaken for the Kent WNA, indicates that an even lower proportion of the 19 12 12 waste currently going to landfill is combustible.

73. Despite this evidence, the Applicant's D5 WFAA Table 4.2 ('HIC arisings for the defined LoW codes [list of wastes, i.e. European Waste Codes (EWC)] 2021 (tonnes)'), and Table 4.4 ('HIC waste from Study Area disposed to non-hazardous waste (tonnes)') assume 100% of 19 12 12 is combustible.

74. The Applicant's D5 WFAA Table 4.4 provides a total 'in scope' HIC waste figure for the study area of 2,374,212 tonnes (2.37Mt) sent to non-hazardous landfill in 2021.

75. Using WDI it can be ascertained that the Applicant's 2.37Mt figure breaks down into the following waste types:

APPLICANT'S IN-SCOPE 2021 LANDFILLED WASTE FROM STUDY AREA FIGURE BROKEN DOWN BY EWC/LOW CODE USING WASTE DATA INTERREGATOR

EWC/LoW code	Tonnes	Percentage
19 12 10	1,119	0.05%
19 12 12	1,643,187	69.21%
20 03 01	687,079	28.94%
20 03 07	42,827	1.80%
Total	**2,374,212**	**100%**

76. This means that the vast majority of the Applicant's 'in-scope' waste sent to landfill in 2021 comprised 19 12 12.

77. If 70% of this 19 12 12 were considered combustible, rather than 100%, then this would reduce the 1,643,187 tonne figure by 30%, i.e. by 492,956 tonnes, which in turn would reduce the total figure to around 1.88Mt.

78. This means that, if it is found that Tolvik were right that only 70% of 19 12 12 was combustible, then this would imply that the Applicant's approach of assuming that 100% of landfilled 19 12 12 is combustible inflates the overall 'in scope' waste figure for the D5 WFAA Study Area by more than 26.2% because their methodology produced a result of 2.37Mt when the actual value would have been around 1.88Mt.

79. As noted above, while Tolvik estimated that 70% of 19 12 12 landfilled in 2016 was combustible, some more recent estimates show how a lower proportion than 70% of landfilled 19 12 12 is combustible.

80. If lower figures of combustibility are assumed this would result in lower 'In Scope' waste being identified.

REP6-029: 15.6B APPLICANT'S COMMENTS ON THE DEADLINE 5 SUBMISSIONS: PART 2 OTHER INTERESTED PARTIES

Application of correction value to scope-in stages omitted by the Applicant

81. UKWIN appreciates the Applicant's acknowledgement, in their REP6-029 comments at UK06-UK09 (starting on electronic page 6), that the benefits of their proposal were overstated in the Applicant's APP-088 Table 14C.2 due to the narrowness of their focus on operational emissions rather than total emissions.

82. The Applicant does not dispute UKWIN's estimate of this overstatement as amounting to around 9,683 tonnes of CO_2e per annum.

Electricity generation emission factors

83. UKWIN does not agree with the Applicant's assertion, made at REP6-029 UK13, starting on electronic page 8, that "Existing guidance from DEFRA considers that electricity generated by gas-fired power stations (CCGT) is a reasonable substitute for energy generated by EfW plants".

84. UKWIN's reading of Defra's 2014 to 'Energy from waste. A guide to the debate' ('Defra's EfW Guide') document is that whilst CCGT was considered a reasonable comparator in 2014 for non-detailed analysis, due to the progressive decarbonisation of the electricity grid in the intervening years CCGT is no longer a suitable counterfactual for use in any form of analysis.

85. As UKWIN has already pointed out (e.g. in REP1-096 electronic pages 138-149; REP2-066 paragraphs 44-57; and REP4-037 paragraphs 78-83), Footnote 29 of Defra's EfW Guide reads as follows: "…When conducting more detailed assessments the energy offset should be calculated in line with DECC guidance using the appropriate marginal energy factor".

86. As noted in UKWIN's REP2-066 and REP4-037 submissions it was pointed out that even if CCGT is used as a comparator, it should be abated CCGT and not unabated CCGT that should be used as the Electricity generation counterfactual.

Waste composition cases

87. In REP6-029 UK15, starting on electronic page 9, the Applicant offers a critique of UKWIN's decision to consider a 40% Biogenic content sensitivity.

88. The Applicant's critique of UKWIN's decision is based on an assumption that the Applicant's current waste composition accurately reflects the current composition of the relevant waste arising, e.g. the residual waste arising within the Applicant's WFAA Study Area.

89. However, as noted at ISH7 and in UKWIN's post Hearing submission [REP6-043] at paragraphs 54-64, the Applicant's assumed 'current' waste composition appears to overestimate the proportion of food waste currently in the residual waste stream.

90. UKWIN's analysis of the impact of 40.2% biogenic carbon content is intended to look at the potential impact of the uncertainty in the Applicant's 'current waste' waste composition and not just potential future changes in waste composition.

91. The Applicant's Climate Appendices [APP-088] state that their 'Current (Core Case)' waste stream has a biogenic carbon content of 57.2%, and their APP-088 14C assessment looks at the impact of increasing biogenic carbon content to either 58.85% or to 74.58%.

92. As noted by UKWIN, a rationale for looking at lower biogenic carbon percentages was to mirror the impact of the Applicant's assumed 17% increase in biogenic content.

93. According to a report published by the UK Government in October 2021: "Approximately 40-60% of the CO_2 generated from current EfW plants in the UK is of biogenic origin…"[3]

94. This means that in terms of current waste composition, the Applicant's 57.2% assumption is towards upper end of the Government's range and while UKWIN's 40.2% sensitivity would be towards the lower end of the range, the Applicant's 74.58% sensitivity is well outside the range.

95. In terms of the Applicant's D6 Additional Climate Sensitivity Assessment [REP6-030] the lowest additional sensitivity that the Applicant considers assumes 50.26% biogenic content, which represents the midpoint of the Government's range.

96. In REP6-030 Table 3.1 the Applicant acknowledges that at 50.26% biogenic content (i.e. the Applicant's Scenario 6) the lifetime net GHG emissions of the Medworth EfW plant would be higher than the emissions associated with the landfill baseline.

97. While the Applicant, in REP6-030 Table 4.2, attempts to downplay the likelihood of this eventuality, given that 50.26% biogenic content is roughly the midpoint in the Government's range, it is not reasonable to dismiss the prospect of biogenic content being around 40-50%.

[3] Greenhouse gas removal methods and their potential UK deployment

98. This means that, by only considering biogenic content as low as 50.26%, the Applicant's analysis falls well short of fully considering the sensitivity of their climate assessment to the biogenic content of the feedstock being towards the lower end of the Government's current range during the facility's operational lifetime.

99. If – as the Applicant argues – reductions in plastic balance reductions in food waste then the range would remain as 40-60% even in the future, meaning that the biogenic content of the feedstock could end up towards the lower end of that range, e.g. around 40%.

100. An unbalanced change in waste composition could push incinerator feedstock above 60% biogenic content, but it could also push it below 40% biogenic content.

101. UKWIN's analysis shows that at 40% biogenic content the Medworth facility would perform even worse than the acknowledged adverse impact at 50.26% biogenic content and, given that 40% is within the range provided in the Government report for current EfW feedstock, the potential impact of 40% biogenic content should not be discounted from the Medworth Examination's considerations of potential GHG impacts of the facility.

102. It is these sorts of inherent uncertainties that resulted in the diminished weight afforded to claimed GHG benefits of incineration in the Wheelabrator Kemsley North refusal.

Analysis of biogenic carbon sequestration

103. In their REP6-029 UK24, starting on electronic page 13, the Applicant fails to demonstrate that it would be inappropriate to consider the climate benefits associated with the sequestration of biogenic carbon in landfill within either the central analysis or in the context of sensitivity analysis.

104. At Deadline 5 [REP5-053] UKWIN provided detailed evidence accompanied by a clear rationale justifying consideration of this benefit within the context of making comparisons between the relative net climate impacts of incineration and landfill.

105. The Applicant cites IPCC guidelines that were produced for the purpose of National Greenhouse Gas Inventory reporting and not for comparative analysis of residual waste treatment options.

106. There are many considerations that feed into decisions about how to approach National Greenhouse Gas Inventory reporting that are not relevant to comparative analysis of residual waste treatment options, such as the need to avoid double counting between different sectors and the desirability of reducing the administrative burden on the reporting nation.

107. As set out in UKWIN's Good Practice Guidance for Assessing the GHG Impacts of Waste Incineration (July 2021) – which was included as part of REP1-096 (see, in particular, electronic pages 119-127) – many climate professionals have identified the importance, when carrying out comparative analysis between incineration and landfill, of considering the sequestration of biogenic carbon in landfill, also known as 'carbon sink', and these experts would have been well aware of the IPCC guidance.

108. When the Defra 'Carbon-based modelling approach' document (referred to in REP1-096, on electronic pages 106, 113 and 120) identified giving credit for the climate benefits of the sequestration of biogenic carbon in landfill the document did not rule out such an approach but instead modelled the impact of applying such an approach, which is in line with the approach adopted by UKWIN for the purpose of sensitivity analysis.

109. Various other assessments of the relative impacts of incineration and landfill have similarly taken account of the benefits of biogenic carbon sequestration in landfill as part of either their central or their sensitivity analysis.

110. As set out in REP1-096 from electronic page 111, examples include reports, assessments, and models produced by or for the following:

- Environmental Groups: Evaluation of the climate change impacts of waste incineration in the UK (UKWIN, October 2018); The Potential Contribution of Waste Management to a Low Carbon Economy (Zero Waste Europe, October 2015); Greenhouse Gas and Air Quality Impacts of Incineration and Landfill (ClientEarth, March 2021)

- Governments: Development of a Modelling Tool on Waste Generation and Management (European Commission, February 2014); EPS Ready Reckoner Guidance (Greater London Authority, May 2019); Landfill Carbon Storage in US EPA's Waste Reduction Model (US Environmental Protection Agency, November 2020)

- Incineration Companies: East Midlands Energy ReGeneration (EMERGE) Centre Environmental Statement Appendix 8-4: Carbon Assessment and Sustainability (Uniper, June 2020); North Lincolnshire Green Energy Park (Solar 21, June 2021); Proof of Evidence on Energy, Renewable Energy, Combined Heat and Power and Effects on Climate Change for planning inquiry ref 3195373 (Veolia Environmental Services, May 2018)

- Academics: Technical University of Denmark's Environmental Assessment of Solid Waste Systems and Technologies (EASEWASTE) Model

111. Information regarding the importance of considering the climate benefits of biogenic carbon sequestration in landfill and the significance of the Medworth Applicant's failure to take this into account is set out by UKWIN in REP2-066 paragraphs 79-106, REP3-050 paragraphs 61-66, and REP4-037 paragraphs 85-90.

112. By way of illustration of the sorts of arguments advanced to support the consideration of biogenic carbon sequestration in landfill – arguments with which the Applicant has failed to grapple – we note the August 2020 Air Quality Consultants (AQC) study, produced for consideration as part of the planning process that resulted in the Waste Planning Authority's un-appealed decision to refuse Veolia's Alton EfW application.

113. As recorded on electronic page 119 of REP1-096, AQC noted: "The [Alton applicant's] assessment has also scoped out the potential benefit from sequestering biogenic carbon that is likely to be associated with waste treatment by landfill. Independent research by Defra indicates that this 'benefit' is not insignificant and would warrant further consideration".

114. AQC went on to recommended that the Alton applicant's "Landfill CO_2e assessment" should be required "to consider impact of sequestering biogenic carbon".

115. UKWIN's GHG Assessment Guidance document goes on to note how the 'Alton AAERF Atkins Review Report' produced by Atkins for Hampshire County Council in October 2020, agreed with Air Quality Consultants' recommendation, observing that following the recommendation: "…would provide a more complete picture of the baseline scenario against which the development is being compared. Currently, this element is missing, which potentially misrepresents the impact of landfill as being higher than would be the case were this mechanism addressed".

116. As noted in UKWIN's Good Practice Guidance [REP1-096], in addition to Air Quality Consultants and Atkins, other consultants such as Eunomia, ERM and Uniper have similarly provided assessments that credit landfill for its biogenic carbon sequestration when comparing residual waste management options that result in differing levels of biogenic CO_2 being released.

117. Or to put it another way, unlike the Applicant, many others have been prepared to follow industry good practice in line with the IEMA guidance which UKWIN set out in REP2-066 paragraphs 79-88. This includes the IEMA guidance that: "The ultimate goal of establishing a baseline is being able to assess and report the net GHG impact of the proposed project" and their highlighting of the importance of considering "sequestered GHG emissions".

118. For the reasons outlined above, UKWIN maintains our position that credit for biogenic carbon sequestration should be considered, and that the Applicant's approach goes against good practice including IEMA guidance, and that concerns raised by Steve Barclay MP in REP1-094 electronic pages 6-7 that the "comparative assessment between landfill and incineration was flawed" and was "methodologically unsound" due to the Applicant's improper "treatment of non-fossil CO_2 emissions" remain valid.

Analysis of improved landfill performance

LANDFILL GAS RECOVERY RATES

119. In their REP6-029 response to UK35, the Applicant refers to the 80% landfill gas capture rate as 'aspirational', but the Climate Change Committee set out an 80% landfill gas capture rate within their central Balanced Net Zero Pathway for waste to Net Zero for the UK within the Sixth Carbon Budget.

120. The fact that the UK Government did not rely on improvements in methane capture rates in one of its pathway modelling assessments does not mean efforts will not be made over the next several decades to improve methane capture and it does not mean that those efforts would be ineffective.

121. It is perfectly valid to consider higher greenhouse gas capture rates as a possibility when considering the potential impact of the Medworth incinerator compared to a theoretical future landfill alternative.

122. The point of the sensitivity analysis is to consider uncertainties regarding future changes in circumstances where there are known unknowns.

123. In their 2023 Progress Report to Parliament the Climate Change Committee noted that "EfW emissions are already higher than the Government's Carbon Budget Delivery Plan (CBDP) anticipates and EfW capacity is set to increase in the coming years".

124. It is plausible that one response to this situation that will be made by the current or by a future Government would be to redouble or expand efforts to improve methane capture to help bring the waste sector back on track.

125. Another possibility is that the industry might unilaterally invest more in improving capture rates for environmental reasons, as part of their own contributions to net zero, or for commercial reasons to maximise energy outputs and thus profits.

126. Indeed, the landfill industry has already made commitments to improve landfill gas capture rates to 85% by 2030, which goes even further than 80%.

127. The Environmental Services Association (ESA) represents the waste industry, including landfill operators. In June 2021 the ESA announced that "ESA's members will: ...Invest £10bn of new money in recycling infrastructure to drive up recycling rates and cut down waste; and increasing capture of methane emissions…by 85% from landfill by 2030".

128. Even if landfill gas capture rates do not reach 80% or 85%, they could still be higher than the rates relied upon by the Applicant in their climate analysis.

129. In the Applicant's REP6-030 scenarios 18 and 19 the Applicant's analysis shows that at 85% landfill gas capture the Medworth plant would be between 3,611 and 5,642 tonnes of CO_2e per year worse than landfill.

130. Unfortunately, the Applicant does not provide 'tipping point analysis' to show the rate below 85% that would result in the Medworth plant having higher net GHG emissions than the assumed landfill baseline.

131. However, given the high level of adverse impact at 85% landfill gas capture it would be reasonable to expect the Medworth impacts to be adverse at lower than 85% landfill gas capture rates, especially when account is taken of grid decarbonisation.

132. It is noted that, as per REP5-053 electronic page 8, UKWIN showed how the Medworth plant would perform worse than landfill using a 75% landfill gas capture rate (which is less than halfway between the Applicant's central 68% and the Applicant's modelled 85% sensitivity) across a range of electricity generation factors and waste composition cases.

RATIO OF METHANE TO CARBON DIOXIDE

133. In REP6-029 UK37 the Applicant cites a Defra study of historic emissions from landfill sites in a UK context to support the Applicant's decision to adopt a 57:43% ratio of methane to CO_2 instead of using the conventional IPCC value of 50:50%.

134. However, even if this 57:43 ratio was correct for historic emissions that only tells us about the past, and not the future.

135. Over the lifetime of the proposed Medworth incinerator the UK Context for newly landfilled material could end up looking less like historic landfills and more like the IPCC defaults, e.g. due to changes in waste composition and/or landfill management.

IVC TO BIOSTABILISE WASTE PRIOR TO LANDFILL

136. Whilst the Applicant's REP6-029 comment on UK40 does no more than refer the reader to their UK34 and UK37 responses which themselves refer to the Applicant's existing sensitivity analysis, it should be noted that none of the sensitivity analysis carried out by the Applicant considers the potential for in-vessel composting (IVC).

137. IVC could reduce the amount of methane produced at landfill and this would affect the comparative analysis of incineration and landfill by reducing the landfill GHG emissions and therefore increasing the relative net adverse GHG impacts from the Medworth plant compared to a landfill baseline.

138. UKWIN has provided evidence on the impact of biostabilisation prior to landfill, e.g. in REP1-096 electronic pages 150-164.

Analysis of reduction in power generation

139. In REP6-029 UK41 the Applicant refers to an example of a facility which they claim is operating to plan, but that does nothing to show the impact of a facility that does not operate to plan.

140. As noted above, if the Medworth plant were to operate at reduced capacity, e.g. due to changes in the calorific value and/or shortfalls in the quantity of waste feedstock available, the overall impact on export to the grid could be far greater than the impact on gross electricity generation per tonne due to the parasitic load still largely needing to be serviced.

141. Furthermore, merely looking at a few years of operation of one EfW plant does not reflect the precedent established whereby some EfW plants have operated without a fully functioning generator turbine for extended periods.

142. UKWIN has provided real world operational data that addresses this point in REP1-096 electronic pages 133-137.

Further rationale for sensitivity analysis of the assumed proportion of methane in landfill gas

143. REP6-029 UK71 records how UKWIN noted that according to the official peer review at the start of the WR1908 document: "The peer review opinion was divided on the recommendation to amend the proportion of methane produced from IPCC default value of 50% (IPCC 2006) to 57% for modelling. The underlying question is whether the methane to carbon dioxide ratio observed during monitoring i.e. at point of release is reflective of the molar concentration rates assumed during landfill gas generation, and or whether there are any secondary processes that significantly change the ratio prior to landfill gas emissions monitoring".

144. REP6-029 UK72 notes UKWIN's argument was therefore that: "This implies that there was some uncertainty from experts in the field as to whether or not to deviate from the 'generally assumed' IPCC default value of 50:50%, making this an appropriate focus for sensitivity analysis".

145. In response to these points, in REP6-029 UK71 and UK72 the Applicant merely refers back to UK34, but UK34 cites the WR1908 document (about which was the focus of UKWIN's comment) without the Applicant adding any discussion about the element of that document that UKWIN is drawing upon to make their point.

146. As such, the Applicant's responses neither address nor dispute the point that is being made by UKWIN.

147. The Applicant's additional sensitivity analysis [REP6-030] shows that even if there are climate change benefits from the development compared to landfill those benefits could be very marginal, and it is possible that there would be adverse impacts across a range of potential scenarios.

148. We do not agree with the Applicant's conclusion that it is unlikely that scenarios where there would be adverse impacts could come about.

149. Not only are some of the sensitivity scenarios which show adverse impacts reasonably possible on their own, but there are a number of sensitivity parameters that could occur to some extent in combination with one another to produce relative net adverse impacts.

150. For example, as noted above, the Applicant considers 52% and 85% LFG capture rates and prefers 52% as more likely but the Applicant does not consider what potentially higher LFG rate (below 85%) would be needed to result in a tipping in the balance across a range of waste composition cases.

151. We also note that the Applicant's additional sensitivity analysis only goes as low as 50.26% biogenic carbon which is only the midpoint of the range provided by the UK Government.

152. This means the REP6-030 reduced organics scenario (Scenario 6) which results in adverse impacts should not be dismissed as unlikely because, even if organics do not halve in isolation, the associated results in terms of a 50% biogenic carbon content could reasonably occur even if plastics and food waste reductions balance one another to some extent in the event current waste composition is towards the lower end of the 40-60% range.

153. Furthermore, for the reasons set out in UKWIN's D6 sensitivity analysis [REP6-042], it appears that all of the Applicant's sensitivities overstate landfill emissions by not giving any additional credit for biogenic carbon sequestration.

154. Finally, the Applicant's further sensitivity analysis is entirely based on the premise that the plant would divert waste from being sent directly to landfill.

155. However, if even a small fraction of the waste is diverted from waste minimisation, recycling, or a more efficient EfW plant then this could be enough to flip the results across many of the cases considered.

156. As such, rather than showing that the development is likely to result in a relative net GHG benefit the Applicant's latest assessment merely serves to highlight the inherent uncertainty that ought to reduce the weight given to their claimed GHG benefits.

'IN SCOPE' WASTE THAT APPEARS CLEARLY UNSUITABLE DUE TO PROCESS

Facility Type	East of England	In Scope' East Midlands	Total 'In Scope'
Treatment			
Materials Recycling Facility	591,740	205,060	796,800
Hazardous Waste Transfer	492,726	248,798	741,524
Non Hazardous Waste Transfer / Treatment	229,429	153,337	382,766
Biological Treatment	143,306	39,506	182,811
Physical Treatment	105,767	212,092	317,859
Composting	50,171	89,460	139,631
Physical-Chemical Treatment	16,053	2,037	18,090
Hazardous Waste Transfer / Treatment	10,770	9,212	19,982
Anaerobic Digestion	1,435	9,259	10,694
Chemical Treatment	91	0	91
Inert Waste Transfer / Treatment	16	0	16
WEEE treatment facility	12	0	12
Sub-total	**1,641,516**	**968,761**	**2,610,276**
Landfill			
Inert landfill	158,172	32,634	190,806
Hazardous Merchant Landfill	4,180	0	4,180
Sub-total	**162,352**	32,634	194,986
Storage			
Temporary storage installation	**125,272**	**64,804**	**190,077**
Incineration			
Co-incineration (Hazardous)	**0**	**29,650**	**29,650**
MRS (Metal Recycling Sites)			
Metal Recycling	8,387	122	8,510
Car Breaker	542	5	547
Sub-total	**8,929**	**127**	**9,057**
TOTAL CLEARLY UNSUITABLE	**1,938,069**	**1,095,976**	**3,034,046**
Out of total listed in REP5-020 Table 4.2	6,643,864	3,062,562	9,706,426
Percentage of Table 4.2 total	**29.17%**	**35.79%**	**31.26%**

'IN SCOPE' WASTE THAT IS RECEIVED AT A TRANSFER STATION

Facility Type	East of England	In Scope' East Midlands	Total 'In Scope'
Transfer Station			
CA Site	230,085	100,163	330,248
Clinical Waste Transfer	161,208		161,208
Haz Waste Transfer	492,726	202,741	695,467
Inert Waste Transfer	6,460		6,460
Non-Haz Waste Transfer	1,696,357	860,022	2,556,379
TOTAL CLEARLY UNSUITABLE	**2,586,837**	**1,162,925**	**3,749,762**
Out of total listed in REP5-020 Table 4.2	6,643,864	3,062,562	9,706,426
Percentage of Table 4.2 total	**38.94%**	**37.97%**	**38.63%**

'IN SCOPE' 19 12 12 TO LANDFILL THAT TOLVIK ASSUMES IS NON-COMBUSTIBLE

Facility Type	East of England	In Scope' East Midlands	Total 'In Scope'
Landfill			
Non Haz (SNRHW) LF	82,194	72,042	154,237
Non Hazardous LF	288,259	50,461	338,720
TOTAL TOLVIK NON-COMBUSTIBLE	**370,453**	**122,503**	**492,956**
Out of total listed in REP5-020 Table 4.2	6,643,864	3,062,562	9,706,426
Percentage of Table 4.2 total	**5.58%**	**4.00%**	**5.08%**