Planning Application Representation

OBJECTION AND COMMENTS ON CLIMATE CHANGE ISSUES

Proposal:
Riverside Optimisation Project

Facility:
Riverside Resource Recovery Facility

Location:
Norman Road, Belvedere

Applicant:
Riverside Resource Recovery Ltd

Reference:
Variation to GDBC/003/00001C-06

JUNE 2021

INTRODUCTION

1. The United Kingdom Without Incineration Network (UKWIN) was founded in March 2007 to promote sustainable waste management.
2. **UKWIN objects to this proposal** and calls upon the Secretary of State to **refuse** the planning application on the grounds of its adverse climate change impacts and any other grounds justified by the circumstances.
3. Underlining used in quotes within this submission is added for emphasis.

CARBON INTENSITY FLOOR CALCULATIONS

4. As noted at Paragraph 7.2.21 of the EIA Report Volume 1, Policy SI 8 E 3 of the London Plan (published in March 2021) states that *"all facilities generating energy from waste will need to meet, or demonstrate that steps are in place to meet, a minimum performance of 400g of CO2 equivalent per kilowatt hour of electricity produced"*.
5. The applicant's submissions on London's Carbon Intensity Floor calculations can be found at sections 7.7.12 - 7.7.20 of their Carbon Report (Technical Appendix D1). These are referred to in sections 5.1.14 and 5.1.15 of the applicant's Planning Statement.
6. Given that the London's Carbon Intensity Floor is set at 400g of CO_2 equivalent emitted per kilowatt hour (kWh) of electricity generated, and given that the applicant is claiming that the additional capacity only just meets this threshold (at 397g of CO_2/kWh), it is necessary to ensure that the basis and justification for this claim is robust.

Parasitic load

7. According to the EPS Ready Reckoner Guidance Carbon Intensity Floor (CIF), when evaluating carbon impacts it is necessary for calculations to take proper account of *"emissions associated with energy use at the incinerator (the 'parasitic load')".*[1]
8. According to Cory's Annual Performance Report, as submitted to the Environment Agency, in 2020 the Riverside Resource Recovery Facility used 65,980 kWh of energy on site and imported 1,273 kWh energy (which equates to 90 and 2 kWh per tonne respectively) and had a parasitic load of 11.8%.[2]
9. According to the Annual Performance Report submitted by Cory to the Environment Agency, in 2019 the Riverside incinerator had an even higher parasitic load of 15.5% for the year.[3]

[1] https://www.eunomia.co.uk/reports-tools/eps-ready-reckoner-greenhouse-gas-guidance/
[2] https://ukwin.org.uk/library/49-AnnualPerformanceReport-2020.xlsm
[3] https://ukwin.org.uk/library/49-AnnualPerformanceReport-2019.pdf

10. However, Table 7.7 ('Carbon intensity floor calculations') does not appear to include any explanation of how, or whether, the emissions associated with the parasitic load were taken into account.

11. The applicant should be asked to explain and if necessary correct this omission.

Power generation

12. According to Table 7.7 ('Carbon intensity floor calculations') the applicant assumes that the facility in its current configuration generates 722,973 MWh when processing 745,605 tpa. This means it is assumed in the application that the plant currently generates 970 kWh of electricity per tonne processed (970 = 722,973 ÷ 745,605 × 1,000).

13. However, this assumption is higher than the actual recorded level of power generation according to the facility's Annual Performance Report submitted to the Environment Agency.

14. According to the relevant Annual Performance Report, in 2020 the Riverside Resource Recovery Facility generated 566,848 MWh of energy from incinerating 731,225 tonnes of waste, resulting in a generation performance of 775 kWh per tonne of waste incinerated.[4]

15. In 2019, the Riverside incinerator performed even worse, with only 452 kWh/tonne generated by the plant.[5]

16. The applicant should be asked to explain the discrepancy between assumed and real world energy generation performance, and to justify (or correct) their assumption for assumed future electricity generation in light of historic performance.

Feedstock composition and fossil CO_2 emitted per tonne of waste

17. According to Table 7.7 ('Carbon intensity floor calculations') the applicant assumes that in the current configuration 745,605 tonnes of waste are processed per annum and that this results in 328,458 tonnes of fossil CO_2 emissions. This equates to an assumption of 441 kg of fossil CO_2 being released per tonne of waste incinerated (441 = 328,458 ÷ 745,605 × 1,000). The same assumption of 441 kg of fossil CO_2 emitted per tonne of waste incinerated is applied to the future emissions anticipated from incinerating the additional capacity.

18. However, this assumption is lower than a figure previously used by Cory Riverside Energy to quantify the fossil CO_2 emitted per tonne of waste incinerated at the Riverside incinerator.

19. According to the report 'Cory Riverside Energy: A Carbon Case' published by Cory Riverside Energy in 2017[6], Cory modelled the carbon content of the waste based on compositional analysis of actual feedstock from 2015.

[4] https://ukwin.org.uk/library/49-AnnualPerformanceReport-2020.xlsm
[5] https://ukwin.org.uk/library/49-AnnualPerformanceReport-2019.pdf
[6] https://www.ice.org.uk/ICEDevelopmentWebPortal/media/Events/Conferences/Cory-Carbon-Report.pdf

20. On page 17 of this report Cory stated that 454 kg of fossil CO_2 was emitted per tonne of waste incinerated at the facility.

21. The applicant should be asked to explain the discrepancy between the historic 454 kg of CO_2 figure and current claims regarding the quantity of fossil CO_2 that would be emitted per tonne of waste, and they should be asked to justify (or correct) their assumption for emissions of fossil CO_2 in light of their historic claims.

THE FOSSIL CARBON INTENSITY OF THE ELECTRICITY EXPORTED

22. The anticipated fossil carbon intensity associated with the incinerator confirms that the proposed additional capacity constitutes a high-carbon proposal.

23. To determine the fossil carbon intensity of the electricity that would be exported one can divide the applicant's figures for total fossil CO_2e by their claimed figure for electricity export, as follows:

FOSSIL CARBON INTENSITY OF ELECTRICITY EXPORTED FOR FUTURE EMISSIONS BASED ON APPLICANT FIGURES

	Source	Figure
(a) Fossil emissions from facility	Table 5 of Carbon Assessment	352,923 tonnes CO_2e
(b) Electricity exported	Table 5 of Carbon Assessment	627,643MWh
(c) Fossil carbon intensity	(a ÷ b) × 1,000	**562** gCO_2e per kWh

24. This indicates that the electricity that would be exported by the facility would have a fossil carbon intensity of 562 gCO2e per KWh.

25. According to the Government's National Planning Policy Framework (2019):

Low carbon technologies are those that can help reduce emissions (compared to conventional use of fossil fuels).

26. As shown below and overleaf, the figure of 562 gCO2/kWh would mean that the development would have a significantly higher carbon intensity than:

a) The conventional use of fossil fuels (CCGT), which the applicant assumes is 371 gCO2/kWh (as per page 9 of the Carbon Assessment);

b) The applicant's grid displacement factor sensitivity figures of 258 and 205 gCO2/kWH based on the BEIS Long-run Generation-based marginal grid displacement factors for 2021 and 2025 as noted in Table 15 of the Carbon Assessment; and

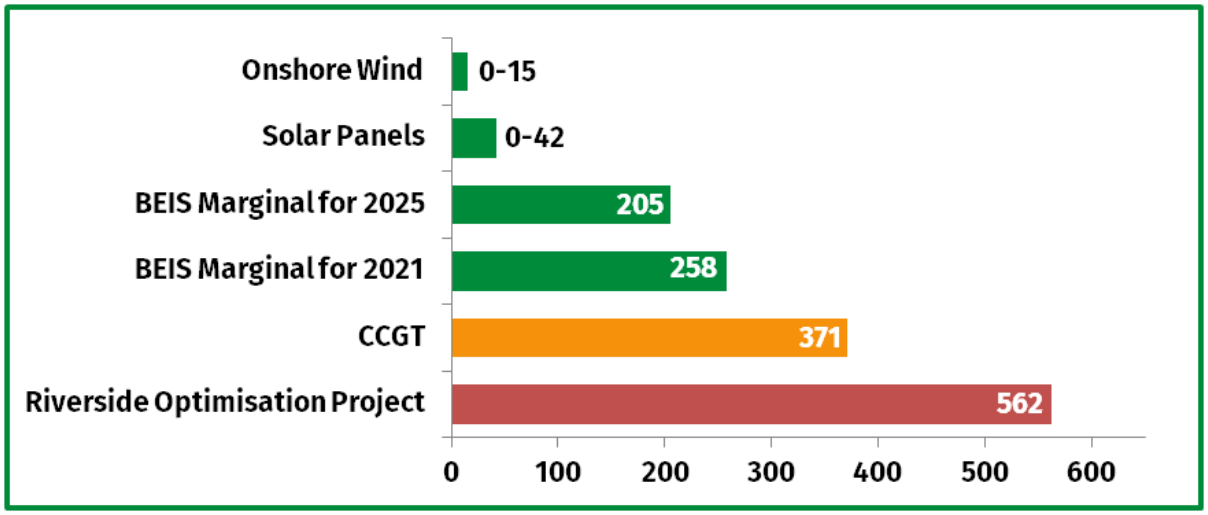
c) Genuinely low carbon energy sources such as solar and wind which have very low emissions even when construction impacts are taken into account.[7]

[7] https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_annexiii.pdf

SUMMARY OF THE FOSSIL CARBON INTENSITY OF THE PROPOSED DEVELOPMENT COMPARED TO ALTERNATIVE ENERGY GENERATION METHODS

Type	Fossil carbon intensity (gCO_2e/kWh)	Source	Comparison to conventional use of fossil fuels
Onshore Wind	0-15	IPCC (upper value shows construction emissions)	Lower carbon
Solar Panels	0-42	IPCC (upper value shows construction emissions)	Lower carbon
BEIS Marginal for 2025	205	BEIS (used by applicant as sensitivity)	Lower carbon
BEIS Marginal for 2021	258	BEIS (used by applicant as sensitivity)	Lower carbon
CCGT (Central Grid Displacement Factor)	371	Applicant (based on Fuel Mix Disclosure data table)	Same
Riverside Optimisation Project	562	Applicant (calculated above)	Higher carbon

COMPARISON OF FOSSIL CARBON INTENSITY OF ENERGY EXPORTED TO THE GRID FROM DIFFERENT ELECTRICITY GENERATION METHODS (GCO_2E /KWH)



27. Based on the NPPF definition noted above, not only is the proposed Riverside Optimisation Project is not 'low carbon' in the normal meaning of the term, but it constitutes a high-carbon technology that falls outside of the NPPF definition of 'low carbon technologies'.

Planning implications

28. It was recently ruled by the Court of Appeal in ClientEarth, R (on the application of) v Secretary of State for BEIS & Anor [2021] EWCA Civ 43 (21 January 2021) that, when considering a development proposal, the adverse impacts of greenhouse gas (GHG) emissions from that proposal can be given *"significant, or even decisive"* weight in the planning balance and are even capable of being *"treated as a freestanding reason for refusal"*.[8]

[8] https://www.bailii.org/ew/cases/EWCA/Civ/2021/43.html

CHARACTERISATION OF THE POSITION OF THE COMMITTEE ON CLIMATE CHANGE (CCC)

29. UKWIN disagrees with the application's characterisation of the Committee on Climate Change's (CCC's) position with respect to waste incineration and its implications set out in the applicant's Planning Statement (e.g. sections 4.2.30-4.2.34).

CCC's position on the general undesirability of incineration

30. The CCC has consistently advocated for increased waste reduction and recycling, which reduces the 'need' for new waste incineration capacity, such as the application currently under consideration.

31. On 25th June 2020 the CCC produced their report 'Reducing UK emissions: Progress Report to Parliament'.[9]

32. This report includes the following statements that promote recycling rather than incineration as key for both emissions reduction and as a means of reducing waste exports:

    Achieving significant emission reductions in the waste sector requires a step-change towards a circular economy, moving away from landfill and incineration (and the associated methane and fossil CO_2 emissions), and towards a reduction in waste arisings and collection of separated valuable resources for re-use and recycling. This applies at local, regional and national levels…Fossil emissions from energy from waste plants are growing rapidly (currently at 6.8 $MtCO_2e/yr$), and will continue to do so in the near term… (Page 183)

    Achieving a 70% recycling rate at the latest by 2030 in England (with this target to be included in the Environment Bill)…will be key to phasing out waste exports and limiting fossil emissions from energy from waste plants.

33. On 9th December 2020 the CCC published their Sixth Carbon Budget alongside a policy report, sector summaries and supporting research.[10]

34. The Policies for the Sixth Carbon Budget report, published as one of the three primary documents in the Sixth Carbon Budget, includes the following CCC statements:

    Many new energy-from-waste (EfW) plants are under construction and have been granted planning permission, which if built without CCS [Carbon Capture and Storage] will likely significantly increase sector emissions. (Page 180)

    Banning biodegradable waste from landfill from 2025 is a priority, and should be achieved via prevention, reuse and recycling, not via more energy-from-waste. (Page 185)

[9] https://www.theccc.org.uk/publication/reducing-uk-emissions-2020-progress-report-to-parliament/
[10] https://www.theccc.org.uk/publication/sixth-carbon-budget/

An expansion in Scottish EfW capacity occurred ahead of their original 2021 biodegradable municipal waste ban date, and a repeat of this should be avoided (across the UK), due to the risk of locking-in increased EfW fossil emissions (Page 185)

England should target 68% recycling by 2030 – household, commercial and industrial shares of this are achievable.

Energy-from-waste emissions continue to grow, but need to be constrained by waste prevention, re-use and recycling, and over time further mitigated via carbon capture and storage. EfW fossil GHG emissions in 2018 were 5.3 $MtCO_2e$/year. Achieving the Balanced Pathway will require waste prevention, re-use and recycling efforts to keep EfW emissions approximately flat over time (between 5-6 MtCO2e/year) before CCS starts being retrofitted to plants…– For those plants not yet under construction, new energy-from-waste plants (and plant expansions) should only be constructed in areas confirmed to soon have CO_2 infrastructure available, and should be built 'CCS ready' or with CCS. (Pages 187-188)

35. The report 'Local Authorities and the Sixth Carbon Budget' published alongside the Sixth Carbon Budget includes the following CCC statements:

More local authority waste is now incinerated for energy than recycled or composted in England. In 2018 there were 6.8 $MtCO_2e$/year of emissions arising from the use of waste for power and heat (mostly energy from waste incineration plants), a doubling in emissions since 2013. Plants under construction and those granted planning permission could add a further 10 $MtCO_2e$/year. (Page 89)

What needs to happen to deliver the sixth carbon budget and be on track for Net Zero? The CCC's recommended Sixth Carbon Budget pathway sees a reduction in waste due to improvements in recycling, a phase-out of biogenic waste going to landfill and carbon capture and storage installed on both new and existing energy-from-waste facilities.

In particular: …Carbon Capture and Storage is needed to ensure that Energy from Waste facilities are close to zero carbon by 2050, starting with those in industrial clusters, and over time reaching smaller facilities further from CO2 storage locations. Incineration and other forms of power/heat generation from waste will increasingly become the final step on the waste hierarchy, only used after materials have been recycled several times. In the CCC's scenarios, by 2050 all EFW plants have fitted with CCS starting from the 2030s. (Page 89)

Energy from Waste (EfW). Local authorities should carefully consider the fossil emissions from EfW plants [Footnote: Heat produced by unabated EfW plants (i.e. without CCS) is not particularly low-carbon – burning Municipal Solid Waste releases ~335gCO2/kWh of input (of which ~163gCO2/kWh is fossil CO2), compared to burning natural gas at ~184gCO2/kWh of input (all fossil CO2), so

EfW can be worse in terms of fossil emissions once lower EfW generation efficiencies are accounted for compared to a gas boiler (although there are also upstream gas emissions as well). This will already be the case for EfW electricity generation compared to gas-fired generation. Source: CCC analysis].

In a Net Zero world EfW facilities are likely to be significantly higher carbon than other forms of energy production. Many facilities will need to reduce their emissions to continue to operate. Local councils will need to consider how current and new EfW plants will fit carbon capture and storage (CCS) equipment in the future, plus the impact of waste reductions and improved recycling (which will remove high calorific value materials from the feedstock)... (Page 91)

36. The applicant does not include Carbon Capture and Storage (CCS) within their proposed development, nor are they proposing a planning condition requiring the use of CCS within a specified timeframe.

37. A report published by the CCC on the economic impact of the Sixth Carbon Budget stated that:

For the sixth carbon budget (6CB) scenario we modelled a series of policies put forward by the CCC as indicative measures required to meet the sixth carbon budget pathway. (Page 8)

Waste - Scenario Story: ...Behaviour changes reduce the amount of waste arisings, and disposal shifts away from landfill and incineration, with a major increase in recycling. Policy: Increases in landfill tax. Greater funds for waste collection, which is spent on universal collection of separated waste streams. Stronger producer responsibility rules drive the move towards a circular economy. Approvals are not issued for new waste incinerators and existing facilities are supported, then required, to fit CCS. (Page 25)

38. As such, contrary to the impression that might be gained from the planning application, the CCC considered that a situation where no new incinerators were approved and where material is moved away from both landfill and incineration towards recycling is indicative of the sort of measures required to meet the Sixth Carbon Budget pathway.

39. The current 20.2 million tonnes per annum of existing capacity should be more than enough to deal with future genuinely residual waste arisings, especially if the CCC's recommendation of an *"achievable"* target of 68% recycling by 2030 in England were to be achieved.[11]

40. At section 4.2.42 of the applicant's Planning Statement they appear to claim that their proposal would deliver low carbon energy.

[11] https://www.tolvik.com/wp-content/uploads/2021/05/Tolvik-UK-EfW-Statistics-2020-Report_Published-May-2021.pdf

41. It should be noted that a number of public bodies such as the Committee on Climate Change and Zero Waste Scotland have made clear statements that incineration is not low carbon and/or that it is high carbon.

42. Table 1.2 - Phase-out dates of high-carbon activities under the Balanced Pathway on page 30 of the Policies for the Sixth Carbon Budget Report document from the CCC published in December 2020 lists 'Energy-from-waste plants (unabated)' as a form of high-carbon activity.

43. As noted above, a number of recent statements from the CCC have made it clear that incineration is not low carbon, stating for example that *"In a Net Zero world EfW facilities are likely to be significantly higher carbon than other forms of energy production"*, and making it clear that even with heat export: *"EfW can be worse in terms of fossil emissions once lower EfW generation efficiencies are accounted for compared to a gas boiler".*

44. A conclusion that incineration is not low carbon is in line with recent reporting for an article published in conjunction with The Telegraph:[12]

    "It's misleading" to call the electricity low-carbon, says Ann Ballinger of Eunomia, a sustainability consultancy whose clients include the government. "You are still burning a lot of plastic to get your energy in an incinerator, so that is pretty similar to burning oil."...

    "Energy-from-waste is not low-carbon," says Piers Forster, an atmospheric physicist at University of Leeds who sits on the UK Committee on Climate Change. "In recent years the amount of biogenic waste sent to landfill has declined and many landfill sites are introducing methane capture, so claims of low-carbon energy are looking less and less supportable."

    The method incinerator operators use to count their own emissions is "wrong", says Pedro Faria at CDP, a consultancy that helps many of the world's largest companies assess their climate impact:

    "From the point of view of the Greenhouse Gas Protocol, the mix of avoided emissions with actual emissions is not allowed. You cannot mix those two things, they are two different ways of looking at reality."

    Using landfill for comparison is misleading because it falsely suggests dumping waste is the only alternative to burning it, according to Michael Lenaghan, a scientist at Zero Waste Scotland, a government-funded non-profit organisation.

    "Landfill is not the only alternative to waste-to-energy," he says. "There is potential for lower carbon options for treating residual waste, but we would always stress that increased recycling, reuse and waste prevention are much better."

[12] https://www.source-material.org/blog/dirty-white-elephants

45. Similarly, in October 2020 Zero Waste Scotland published the technical report entitled *'The climate change impacts of burning municipal waste in Scotland'* which found that:

    Decarbonisation of the grid has been so successful that EfW technologies can no longer be considered low carbon solutions. Decisions on future management must be based on the most current and accurate data possible to ensure climate change impacts are minimised.

APPLICANT'S CLAIMS OF GHG BENEFITS OVER LANDFILL

46. For the reasons set out below, the applicant should be requested to show what the impact of reduced biodegradability of the biogenic carbon in the feedstock would be for the reduced food waste case, giving full credit for the benefits of sequestered biogenic carbon acting as a carbon sink in landfill.

47. For the reasons set out below, due to the applicant's failure to take into account the impact of biogenic carbon sequestration in landfill, no weight should be given to their claimed benefit over landfill.

48. For the reasons set out below, significant weight should be given to UKWIN's evidence that when errors in the applicant's Carbon Assessment are corrected then the proposal would be assessed to perform worse or significantly worse than landfill (and that correcting for further errors would mean the proposal would be shown to have even greater adverse impacts).

Failure to account for differences in the amount of biogenic CO_2 that would be released through incineration compared to landfill

49. The carbon assessment by Fichtner appears to have repeated a methodological error that they were previously criticised for with respect for the Alton incinerator proposal (Hampshire County Council Planning Reference: 33619/007).

50. Section 2.5 of the assessment carried out by Air Quality Consultants Ltd. on behalf of No Wey Incinerator to Hampshire County Council dated August 2020 notes how:

    The assessment [by Fichtner for the Alton ERF proposal] 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

    [Footnote 2: Defra, 2014 "Energy recovery for residual waste A carbon-based modelling approach"] indicates that this "benefit" is not insignificant and would warrant further consideration.

    Recommendation 3: Landfill CO_{2e} assessment to consider impact of sequestering biogenic carbon.

51. The Atkins Review from October 2020 carried out for Hampshire County Council agrees with this recommendation, stating:

[Following Recommendation 3] 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.

52. This was subsequently confirmed by Eunomia in their March 2021 report 'Greenhouse Gas and Air Quality Impacts of Incineration and Landfill' produced for ClientEarth which states:

...if no adjustment is made [to take account of biogenic CO_2 released through incineration when carrying out comparative analysis], the exclusion of the biogenic CO_2 emissions will overestimate landfill impacts relative to other forms of treatment in which all the biogenic carbon is released as CO_2 into the atmosphere. [13]

Calculating the impacts of the differential emissions of biogenic CO_2

53. Whilst the applicant has not calculated the impacts of accounting for the benefit of sequestered biogenic carbon, the impact can be calculated based on the information provided by the applicant using one of the approaches noted by Defra.[14]

RELATIVE NET GHG IMPACT OF SEQUESTERING BIOGENIC CARBON IN LANDFILL RELATING TO 'ADDITIONAL WASTE LANDFILLED'

	Source	Figures
(a) Biogenic Carbon	Carbon Assessment Table 8	16,267 tonnes p.a.
(b) Total DDOC Content (*"biogenic carbon not sequestered - degradable"*)	[a] x 50%	8,133 tonnes p.a.
(c) Sequestered biogenic carbon	[a] – [b] = [c]	8,134 tonnes p.a.
(d) avoided biogenic CO_2 due to biogenic carbon sequestration in landfill compared to emissions from additional waste that would be incinerated at the Riverside plant	**[c] x 44/12**	**29,825 tonnes p.a.**

54. As such, based on the figures provided by the applicant, if the impact of biogenic carbon sequestration were taken into account then there would be a reduction in the benefits ascribed to the proposed additional capacity of 29,825 tonnes of CO_2 per year.

[13] https://www.eunomia.co.uk/reports-tools/greenhouse-gas-and-air-quality-impacts-of-incineration-and-landfill/

[14] http://randd.defra.gov.uk/Document.aspx?Document=11918_WR1910Energyrecoveryforresidualwaste-Acarbonbasedmodellingapporach.pdf

55. This difference in the rate of biogenic CO_2 release is not included in the figures provided by the applicant, but it is possible to show the impact of taking biogenic carbon sequestration into account by subtracting 29,825 from the figures provided by in Table 15 of the applicant's Carbon Assessment.

SUMMARY OF ADJUSTING THE APPLICANT'S 'NET BENEFIT' FIGURES TO TAKE ACCOUNT BIOGENIC CARBON SEQUESTRATION

Grid Displacement Factor	Landfill Gas Capture Rate			
	75%	68% (Applicant's Central Assumption)	60%	52%
	Tonnes CO_2/year of net benefit			
0.371 (Applicant's Central Assumption)	-10,993	**-679**	11,108	22,895
0.258	-18,715	-8,623	2,911	14,444
0.205	-22,337	-12,349	-934	10,481

56. This summary shows that, when the impact of biogenic carbon sequestration is taken into account, the proposed capacity would be expected to perform worse than landfill for a number of combinations of grid displacement factors and landfill gas capture rates (including the applicant's central assumptions).

57. For the reasons explained below, it would be reasonable to assume that there would be:

    a) A landfill gas (LFG) capture rate closer to 75% than 68% - to reflect current and anticipated improvements in landfill gas capture;

    b) A grid displacement factor of 205 gCO_2/kWh or lower - to reflect the decarbonisation of the electricity supply; and

    c) A higher level of biogenic carbon sequestration than 50% - to reflect changes in waste composition and the potential for pre-treatment of biowaste prior to landfill (which would stabilise the material and nearly eliminate its decomposability).

58. Applying these assumptions would result in a much greater disbenefit for the proposed facility than applying the applicant's central assumptions.

Rationale for considering the benefits of sequestered biogenic carbon

59. Despite acknowledging that incineration and landfill would result in the release of different quantities of biogenic CO_2, the applicant fails to take this difference into account in their comparative assessment of the two treatment options.

60. Biogenic and fossil CO_2 are both the same molecule that behaves the same way in the atmosphere in terms of global warming potential (GWP). The only difference is that biogenic CO_2 is derived from sources such as wood, paper, card, food and garden waste whereas fossil CO_2 is derived from oil/gas derived materials such as conventional plastics.

61. As noted by the environmental consultancy Eunomia, failing to take account of the different levels of biogenic CO_2 release is not methodologically valid:[15]

    In a comparative analysis of different waste treatment technologies, the assumption that emissions of CO_2 related to biogenic carbon should be ignored cannot be valid where the technologies deal with biogenic carbon in different ways. The atmosphere does not distinguish between those CO2 molecules which are from biogenic sources and those which are not. Consequently, if one type of technology 'sequesters' some carbon over time, then this function needs to be acknowledged (it effectively negates the basis for distinguishing between biogenic and fossil sources of carbon on the basis that the one is 'shortcycle' and the other is 'long-cycle' – after all, how long is 'short' and long is 'long', and when could one period said to become the other?)

62. Similar views have also been expressed in the academic literature. As noted in a paper by published in the Journal of Industrial Ecology:[16]

    …not considering biogenic CO_2 can lead to biased conclusions. If a fraction of the biogenic carbon is assumed to be sequestered permanently, as was the case for the carbon sequestered…then the amount of biogenic carbon entering the product system is not equal to the amount leaving the system, which means that biogenic CO_2 emissions cannot be considered neutral.

63. The applicant's Carbon Assessment states that the applicant considers the use of a 50% sequestration rate is in accordance with Defra's EfW Guide (2014) and that 50% is a *"high sequestration"* rate. The applicant also states that assuming a 68% landfill gas capture rate would be a *"high landfill gas capture rate*". They combine these two flawed assumptions to argue that: *"Therefore, it is not considered appropriate to give additional credit for sequestered carbon as this would result in an overly conservative assessment".*

64. It should not be accepted that the use of two allegedly 'conservative' assumptions justifies a serious and significant methodological flaw. In any case, as set out below, the values chosen by the applicant were far from 'conservative' given the context of the application.

[15] Quoted document available from https://www.foe.ie/assets/files/pdf/report_on_incineration_and_climate.pdf with further quotes from Eunomia and others to support their conclusions set out in https://ukwin.org.uk/files/pdf/UKWIN-2018-Incineration-Climate-Change-Report.pdf

[16] *'Biogenic Carbon and Temporary Storage Addressed with Dynamic Life Cycle Assessment'* by Levasseur, Annie & Lesage, Pascal & Margni, Manuele & Samson, Réjean (2012). A version of this paper is available from: https://publications.polymtl.ca/706/1/2011_AnnieLevasseur.pdf

Critique of applicant's claims that rates of landfill gas capture and sequestration are conservatively high

65. Section 3.2.1 of applicant's Carbon Assessment states that:

    50% of the degraded biogenic carbon is released and converted into LFG [landfill gas]. The released carbon is known as the degradable decomposable organic carbon (DDOC) content.

    a. This assumes a sequestration rate of 50%, which is considered to be a conservative assumption and is in accordance with DEFRAs 'Energy from Waste – A Guide to the Debate' (2014).

    b. There is considerable uncertainty in literature surrounding the amount of biogenic carbon that is sequestered in landfill. The high sequestration used in this assessment (i.e. 50%), combined with the use of high landfill gas capture rates (assumed 68% capture) is considered to be conservative. Therefore, it is not considered appropriate to give additional credit for sequestered carbon as this would result in an overly conservative assessment.

66. The applicant has not shown that these rates are particularly conservative, let alone sufficiently conservative to justify neglecting the carbon benefits associated with biogenic carbon sequestration.

67. If waste were to be sent to a landfill, it would not be sent to a historic landfill but rather to a modern landfill.

68. According to Section 4.2 of the applicant's Carbon Assessment:

    The Golders Associates report for DEFRA [from November 2014] states that collection efficiency for large, modern landfill sites was estimated to be 68%...

69. As such, rather than being 'conservative', the 68% landfill gas (LFG) capture figure is actually in line with a typical landfill in 2014.

70. However, the waste being considered would - if landfilled - not be treated at a 2014 landfill site but in a future landfill with associated improvements.

71. In terms of LFG capture rates, it can be anticipated that as we move towards Net Zero 2050 we will see investment in maximising LFG capture rates at landfill sites, and technology improvement to support this.

72. Indeed, a recent report by Fichtner (the same consultancy that wrote the Carbon Assessment for the Riverside Optimisation Project), states that:[17]

    Landfill gas capture rates are assumed to increase gradually from 68% in 2024 to 75% in 2045, as it is <u>likely</u> that landfill performance will improve.

[17] Page 27 of Technical Annex E for planning application WP/20/00692/DCC submitted by Powerfuel Portland Limited to Dorset County Council.

73. Indeed, the lifetime carbon benefit assessment from page 18 of the Carbon Assessment in the Riverside application itself notes that:

    LFG recovery rates may improve as older sites are closed. We have allowed for a 0.2% improvement per year, starting at 68% in 2021 and ending at 72% in 2040

74. Despite acknowledging how LFG capture is likely to improve, Fichtner, as one of their primary justifications for ignoring biogenic carbon sequestration at Riverside, inexplicably claims that 68% is somehow a conservative (i.e. optomistic) assumption for landfill gas capture.

75. We would consider a landfill gas capture rate that rises from 68% to 75% during the lifetime of the proposed Riverside Optimisation Project to be a reasonable assumption rather than a 'high', 'conservative' or 'overly-conservative' assumption.

76. Moving to a consideration of the degree of biogenic carbon sequestration in landfill, whilst the applicant claims that a 50% rate of biogenic carbon sequestration is conservatively high, there are sound reasons to expect the level of biogenic carbon sequestration for the material anticipated as feedstock for the proposed Riverside Optimisation Project to be far higher than 50% were this material to be landfilled.

77. The applicant's assumption that 50% of biowaste would biodegrade is based entirely on the biowaste fraction. Reduced food waste and/or reduced garden waste would decrease the proportion of the biowaste which can be expected to decompose without stabilisation.

78. According to 'Energy recovery for residual waste - a carbon based modelling approach' which was published by Defra:

    All of the carbon contained within the fossil portion of waste can be considered to be locked away in landfill, as fossil-based plastics take a very long time to degrade. As a result, it is assumed it does not result in release of greenhouse gases. Biological processes within the landfill will degrade the biogenic portion of the waste.

    However, not all of the carbon in this biogenic portion will degrade to form CO2 or methane and some, like the fossil carbon, will become locked away. The proportion of degradable carbon varies by material. This has been assessed for the development of the MelMod model. Values from MelMod have been used in this model and are summarised in Table 6 below.

79. Referring to the actual data from MelMod we see that food waste has the highest degree of degradability of all of the material streams considered:

BIODEGRADABILITY OF DIFFERENT MATERIAL STREAMS

Material stream	Fossil carbon content	Biogenic carbon content	Degradability of biogenic carbon (DDOC percentage)
Food		32.0%	67.5%
Garden		44.0%	51.3%
Mixed Paper and Card		14.0%	49.4%
Miscellaneous combustibles	19.0%	17.0%	44.5%
Textiles (and footwear)	20.0%	19.0%	33.4%
Sanitary / disposable nappies	4.0%	20.0%	28.7%
Wood		15.0%	28.5%
Soil and other organic waste		7.0%	3.6%
Miscellaneous non-combustibles	3.5%	3.5%	0.0%
Glass		0.3%	0.0%
Plastics	52.0%	0%	
Metals, White Goods and Other Non-biodegradable products		0%	
Non-organic fines	7.0%	0%	

Based on MELMod AR5 (2014) data set (provided by BEIS)

80. Given the Government's approach, as enshrined in the current Resources and Waste Strategy and in the Government's proposals in the Environment Bill, it can be anticipated that by the time the proposed additional capacity was on-stream there will be significant diversion of food and garden waste away from the residual waste stream.

81. As such, it could reasonably be assumed that for typical waste sent to landfill or incineration in the near future a significant proportion would be material such as wood, paper and card which is less likely than food and garden waste to decompose in landfill.

82. However, it is not clear how this reduction in the biodegradability of the biogenic waste is taken into account in the 'reduced food' scenario of the applicant's Waste Sensitivity analysis.

83. Furthermore, there is the potential for waste to be pre-treated prior to landfill which would significantly further reduce the proportion that would decompose.

84. As has been noted by Defra, using an MBT process can stabilise biowaste prior to landfill:[18]

    MBT (mechanical biological treatment)-landfill provides the best emissions performance in terms of the treatment/disposal of residual waste. It essentially involves landfilling somewhat stabilised wastes with some material recovery. The magnitude of the environmental impact depends on the extent to which the waste is stabilised.

85. As explained in 'Building a bridge strategy for residual waste: Material Recovery and Biological Treatment to manage residual waste within a circular economy'[19]:

    ...a 'Material Recovery and Biological Treatment (MRBT)' system that combines biological treatment and sorting equipment allows us to 'stabilise' the organics that are included in residual waste, so as to minimise their impact once buried in a landfill...

86. Importantly, putting in place measures to ensure that bioactive waste is stabilised prior to landfill would completely overcome the applicant's already flimsy justifications for failing to account for the climate change benefits of biogenic carbon sequestration in landfill.

87. Not only would the level of degradability be more certain, but as the level of methane would be far less the impact of any uncertainties regarding the LFG that would be used for energy generation would be far less.

88. This provides yet another reason why the applicant's failure to adopt a consistent approach to the treatment of biogenic carbon is not methodologically sound and does not deserve to be treated as if the figures were somehow 'conservative'.

Use of 'sending waste untreated to landfill' as the waste treatment counterfactual

89. There are a number of relevant waste treatment counterfactuals that the applicant has not considered, including:

    a) The impacts of all biowaste being stabilised prior to landfill (as mentioned above);

    b) Increased recycling as an alternative (given that a significant proportion of the feedstock could potentially have been separated for recycling rather than being incinerated[20]); and/or

    c) Incineration plants with carbon capture (as noted above).

[18] 'The Economics of Waste and Waste Policy' (Defra, June 2011). Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69500/pb13548-economic-principles-wr110613.pdf

[19] https://zerowasteeurope.eu/wp-content/uploads/2020/06/zero_waste_europe_policy-briefing_MRBT_en_with-annex.pdf

[20] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/907029/resources-and-waste-strategy-monitoring-progress.pdf

90. The proposal could perform significantly worse when compared against these reasonable counterfactuals. As such, it is unfortunate that the applicant has not set assessed their proposal against any/all of these alternatives treatment options.

Use of CCGT as the energy generation counterfactual

91. Given the Government's recent announcement that the sixth carbon budget will enshrine in law a reduction of emissions of 78% by 2035 compared to 1990 levels, and taking account of the potential for significant increases in energy storage to allow for renewable energy to be utilised whenever it is required, it is increasingly likely that the proposed plant would be displacing wind and solar energy rather than primarily CCGT.[21]

92. Indeed, due to the increase in climate change ambition, the BEIS marginal emissions factor for 2025 of 205 gCO_2/kWh (published in March 2019) should be considered to be rather conservative in terms of the anticipated trajectory of the accelerating decarbonisation of the energy supply.

93. As such, we ask that the 205g sensitivity be adopted in preference to the 371g base assumptions for grid displacement factors, and that the 205g displacement factor be used in conjunction with the impacts of biogenic carbon sequestration and higher rates of landfill gas capture (as set out above).

94. We note that BEIS grid displacement factors which are lower than 280g (the lowest grid displacement factor considered in the application) are regularly considered as part of the consideration of the impacts of waste incinerators, including within the 'Lifetime carbon benefit and Grid displacement sensitivity analysis' of this application. Other examples include:

    a) The assessment carried out by Fichtner as part of Powerfuel Portland Limited's proposal submitted to Dorset County Council (ref WP/20/00692/DCC);

    b) The assessment carried out by Fichtner as part of Veolia's proposal for Alton submitted to Hampshire County Council (Hampshire County Council ref 33619/007); and

    c) Eunomia's 'Greenhouse Gas and Air Quality Impacts of Incineration and Landfill' report produced for ClientEarth.[22]

APPLICANT'S CLAIMS OF LIFETIME BENEFIT

95. The applicant's lifetime benefit claim fails to take account of the benefit of the biogenic carbon sink (as set out above) and it is not clear to what extent the claim takes into account the reducing biodegradability of the feedstock as the food waste is reduced (as set out above).

[21] https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035
[22] https://www.eunomia.co.uk/reports-tools/greenhouse-gas-and-air-quality-impacts-of-incineration-and-landfill/

96. As such, the applicant's lifetime estimate claim can be expected to significantly overestimate the benefit of incineration over landfill, and therefore their conclusions should be given no weight in the planning balance.

97. The applicant has assumed that their facility will continue to operate for another 20 years, but they are seeking permanent planning permission.

98. The applicant should be asked to assess the development's potential impacts if it were to continue to run to 2045 and 2050, taking into account the benefit of biogenic carbon sequestration in landfill as well as reduced biodegradability of biogenic carbon as food waste is removed.

99. Additionally, while plastic film is hard to recycle, food waste is compostable. As such, the applicant's revised assessment should also consider higher rates of food waste removal (e.g. up to 75%).