Planning Application Representation

OBJECTION AND COMMENTS ON CLIMATE CHANGE ISSUES

Proposal:

Demolition of existing buildings and structures and construction and operation of an energy recovery facility and a waste sorting and transfer facility for treatment of municipal, commercial and industrial wastes, including ancillary buildings, structures, parking, hardstanding, and landscape works

Location:

Ford Circular Technology Park, Ford Road, BN18 0XL

Applicant:

Ford Energy From Waste, Grundon Waste Management, Viridor Energy

West Sussex County Council Planning Reference:

WSCC/011/21

APRIL 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 West Sussex Council to **refuse** the planning application on the grounds of its adverse climate change impacts and any other grounds justified by the circumstances.
3. This submission focuses on a number of significant matters arising from:
    a) Chapter 7 of the Environmental Statement ('Climate Change');
    b) ES Technical Appendix D1 ('Climate Change'); and
    c) The Planning Supporting Statement.
4. The issues that provide the focus for this objection are the applicant's:
    a) Characterisation of the position of the Committee on Climate Change;
    b) Characterisation of the energy as 'low carbon';
    c) Failure to account for differences in the quantity of biogenic CO_2 that would be released through incineration compared to landfill;
    d) Use of 'sending waste untreated to landfill' as the only waste treatment counterfactual;
    e) Use of CCGT as the central energy generation counterfactual; and
    f) Failure to consider BEIS gird displacement factors.
5. Underlining used in quotes within this submission is added for emphasis.

THE FOSSIL CARBON INTENSITY OF THE FORD ERF PROPOSAL

6. The anticipated fossil carbon intensity associated with the Ford incinerator confirms the proposed ERF facility would be a high carbon development.

7. To determine the fossil carbon intensity of the electricity that would be exported by the proposed ERF facility one can divide the applicant's figures for total fossil CO_2e by their claimed figure for electricity export:

FOSSIL CARBON INTENSITY BASED ON APPLICANT FIGURES

	Source	Figure
(a) Fossil emissions from facility	Table 7.1 of ES Chapter 7 Carbon Assessment	136,874 tonnes CO_2e
(b) Electricity exported	Table 7.7 of ES Chapter 7 Carbon Assessment	238,614 MWh
(c) Fossil carbon intensity	a ÷ b	**0.574** tonnes CO_2e per MWh

8. This indicates that the electricity that would be exported by the proposed facility would have a fossil carbon intensity of 0.574 tonnes CO2e per MWh, which equates to 574g CO_2e per kWh.

9. 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).

10. As shown below and overleaf, the figure of 574g CO2e per kWh (which is based on the applicant's planning application data) 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 371g of CO_2 per kWh in ES Section 7.91 and Table 14 of ES Technical Appendix D1 (which is currently used as the applicant's central assumption for the applicant's grid displacement factor);

    b) The applicant's grid displacement factor sensitivity figure of 280g CO_2 per KWh as noted in ES Technical Appendix D1 Table 14;

    c) The BEIS Long-run Generation-based marginal grid displacement factors for 2025 (205g CO_2 / KWh)[1]; and

    d) Genuinely low carbon sources such as solar and wind which have very low emissions even when construction impacts are taken into account.[2]

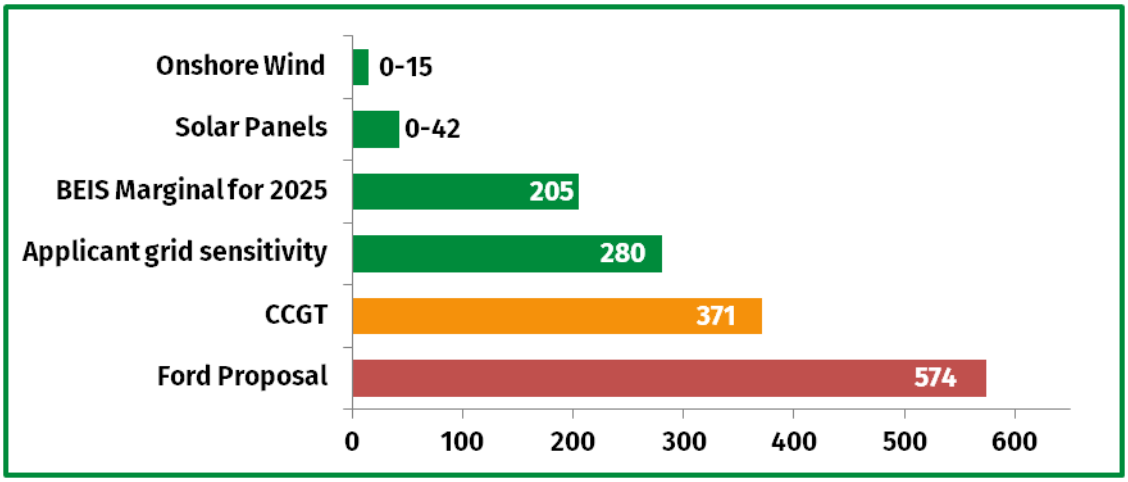
[1] Taken from the Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal, available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/793632/data-tables-1-19.xlsx used in line with Government guidance, as per https://ukwin.org.uk/files/pdf/UKWIN-2018-Incineration-Climate-Change-Report.pdf

[2] Technical Annex III of Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPPC), available from: 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	Lower carbon
Application's lower grid displacement sensitivity	280	Applicant (Table 14 of ES Technical Appendix D1)	Lower carbon
CCGT (2021 Central)	371	Defra (Table 14 of ES Technical Appendix D1)	Same
Ford CTP incinerator	574	Applicant (calculated above)	Higher carbon

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



11. As mentioned above, according to the Government's National Planning Policy Framework (February 2019):

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

12. Based on the NPPF definition, not only is the development proposed for Ford 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

13. 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 proposed development, the adverse impacts of greenhouse gas emissions from that development 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"*.[3]

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

CHARACTERISATION OF THE POSITION OF THE COMMITTEE ON CLIMATE CHANGE (CCC) CLAIMS THAT THE ENERGY SHOULD BE CONSIDERED AS BEING LOW CARBON

14. 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 for this proposed development.

15. Section 5.13 of the Planning Supporting Statement states:

    ...the Committee on Climate Change has recommended [in its 2019 Progress Report to Parliament] that a more ambitious target should be adopted, for an end to the landfill of biodegradable waste by 2025; a decade sooner than the Resources and Waste Strategy previously outlined and modelled towards.

16. Section 7.29 of the Environmental Statement states:

    As referred to previously, the CCC published a progress report in 2019 which sets out recommendations to the UK on how to achieve the target of net zero carbon emissions by 2050. The CC Report [sic] sets out how key biodegradable waste streams should be diverted from landfill within the UK alongside increase in recycling. To achieve this and deliver substantial emissions reduction in the waste sector, the report advises that key investment is required in alternative waste treatment facilities (such as anaerobic digestion, mechanical-biological treatment and EfW). The report acknowledges that a lack of investment in these areas may encourage the export of waste.

CCC's position on the general undesirability of incineration

17. However one interprets the comments from the CCC in 2019, the CCC has subsequently made numerous of statements that are highly critical of the proliferation of waste incineration and of the construction of incinerators that do not include carbon capture. The CCC has also made it clear that they believe incineration without abatement is high-carbon rather than low-carbon.

18. 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.

19. On 25th June 2020 the CCC produced their report 'Reducing UK emissions: Progress Report to Parliament'.[4]

20. 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, <u>moving away from landfill and incineration</u> (and the associated methane and fossil CO_2 emissions), and

[4] https://www.theccc.org.uk/publication/reducing-uk-emissions-2020-progress-report-to-parliament/

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.

21. On 9th December 2020 the CCC published their Sixth Carbon Budget alongside a policy report, sector summaries and supporting research.[5]

22. 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)

    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)

23. 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

[5] https://www.theccc.org.uk/publication/sixth-carbon-budget/

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)

24. 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.

25. 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)

26. As such, contrary to the impression that might be gained from the planning application for the Ford ERF, 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.

27. The applicant stated in Section 7.21 of their ES that *"…it is expected for there to always be a level of residual waste which will require disposal."*

28. However, this fails to appreciate that as of December 2019 the UK already had 18.50 million tonnes of headline incineration capacity (consisting of 14.60 million tonnes which is operational; 0.80 million tonnes in late stage commissioning; and 3.10 million tonnes under construction), and that this figure can be expected to be even higher by the time this planning application is determined.

29. This 18.50+ mtpa 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.

The status of the energy and development as low carbon

30. The applicant makes a number of references to their ERF facility as 'low carbon'.

31. For example, in the Planning Supporting Statement:

    a) Section 4.61 claims that: *"The facility will generate...a relatively low carbon energy source";* and

    b) Section 5.62 claims that: "...*the energy produced by the ERF can be classed as low carbon energy because part of the feedstock is biodegradable and therefore renewable"*; and

    c) Section 7.183 claims that *"...the recovery of energy from residual waste is recognised in current national policy guidance as a form of low carbon energy generation".*

32. As noted in the previous section of this objection, an actual assessment of the claimed levels of fossil CO_2 emissions and claimed level of electricity outputs shows that the proposal would have a higher fossil carbon intensity than the conventional use of fossil fuels and would therefore clearly run contrary to the NPPF definition of low carbon.

33. The applicant does not state when and where the Government supposedly recognise energy from residual waste as a form of low carbon energy generation in national policy guidance. However, this might be a reference to the following statement referred to on Page 123 of the Planning Supporting Statement:

    The Defra publication "Energy from Waste - a Guide to the Debate" says that energy from residual waste is "a partially renewable energy source, sometimes referred to as a low carbon energy source".

34. Not only is the cited document not a policy guidance document, but it was last updated in 2014 (back when the grid intensity was much higher and when the use of coal was more prevalent) and only states that energy from waste incineration is 'referred to' as 'low carbon', not that energy from waste incineration actually constituted low carbon energy. Indeed, arguably this only refers to the renewable fraction of the energy which would imply that the fossil fraction was high carbon.

35. Since 2014, a number of 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.

36. Table 1.2 - Phase-out dates of high-carbon activities under the Balanced Pathway on page 30 of the aforementioned 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.

37. 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".*

38. A conclusion that incineration is not low carbon is in line with recent reporting for an article published in conjunction with The Telegraph:[6]

    "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."

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

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."

39. 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.

FAILURE TO ACCOUNT FOR DIFFERENCES IN THE AMOUNT OF BIOGENIC CO_2 THAT WOULD BE RELEASED THROUGH INCINERATION COMPARED TO LANDFILL

40. 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).

41. Section 2.5 of the assessment carried out by Adams Hendry on behalf of No Wey Incinerator to Hampshire County Council dated August 2020 stated:

    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.

42. 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.

43. 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. [7]

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

Calculating the impacts of the differential emissions of biogenic CO_2

44. 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.[8]

RELATIVE NET GHG IMPACT OF SEQUESTERING BIOGENIC CARBON IN LANDFILL

	Source	Figures
(a) Biogenic Carbon	ES Technical Annex D1 Table 1	39,918 tonnes p.a.
(b) Total DDOC Content (*"biogenic carbon not sequestered - degradable"*)	ES Technical Annex D1 Table 1	19,959 tonnes p.a.
(c) Sequestered biogenic carbon	[a] – [b] = [c]	19,959 tonnes p.a.
(d) avoided biogenic CO_2 due to biogenic carbon sequestration in landfill compared to emissions from Ford ERF	**[c] x 44/12**	**73,183 tonnes p.a.**

45. 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 ERF of 73,183 tonnes of CO_2 per year.

46. 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 73,183 from the figures provided by in Table 14 of the applicant's Technical Annex D1 Carbon Assessment.

SUMMARY OF ADJUSTING THE APPLICANT'S 'NET BENEFIT' FIGURES AT 60-75% LANDFILL GAS CAPTURE RATE TO TAKE ACCOUNT BIOGENIC CARBON SEQUESTRATION

Grid Displacement Factor	Landfill Gas Capture Rate		
	75%	68% (Applicant Central)	60%
	Tonnes CO_2/year of net benefit		
0.371	-43,268	-25,081	3,704
0.350	-54,273	-29,180	-503
0.320	-59,996	-35,036	-6,512
0.280	-67,625	-42,845	-14,524

47. This shows that if the applicant's central claim of 48,102 tonnes of CO_2 per annum benefit is reduced by 73,183 to take account of biogenic carbon sequestration in landfill then this results in the proposed Ford ERF facility being calculated to have a net disbenefit of 25,081 tonnes of CO_2 per annum.

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

48. As can be seen from the Table above, this disbenefit figure of 25,081 tonnes of CO_2 per annum is even higher if one assumes a lower grid displacement factor and/or a higher landfill gas capture rate.

49. If the grid displacement factor of 350g is used, as per the withdrawn 2020 planning application, then even assuming only a 60% landfill capture rate, this would result in the proposed incinerator being calculated to have an adverse impact once biogenic carbon sequestration is taken into account.

50. As set out in this objection, in addition to including the benefit of biogenic carbon sequestration, it would be reasonable to assume that there would be:

    a) A landfill gas (LFG) capture rate closer to 75% to reflect anticipated improvements in landfill gas capture;

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

    c) A greater 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 reduce its decomposability).

51. Applying these assumptions would result in a greater disbenefit for the proposed ERF when compared to landfill than using the applicant's baseline assumptions.

Rationale for considering the benefits of sequestered biogenic carbon

52. 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.

53. Biogenic and fossil CO_2 are both the same molecule that behaves the same way in the atmosphere in terms of global warming potential. 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.

54. As noted by the environmental consultancy Eunomia, failing to take account of the different levels of biogenic CO_2 release is not methodologically valid:[9]

    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

[9] 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

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?)

55. Similar views have also been expressed in the academic literature. As noted in a paper by published in the Journal of Industrial Ecology:[10]

    ...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.

56. Section 3.2.1 of applicant's ES Technical Annex D1 states that the applicant considers the use of a 50% sequestration rate in accordance with Defra's EfW Guide (2014) is a *"conservative assumption"* and a *"high sequestration"* rate combined with a *"high landfill gas capture"* rate of 68%, and that these *"conservative"* assumptions mean that *"Therefore, it is not considered appropriate to give additional credit for sequestered carbon as this would result in an overly conservative assessment".*

57. It should not be accepted that the use of two allegedly 'conservative' assumptions justifies a serious and significant methodological flaw, especially when the applicant has not demonstrated that the impact of adopting these so-called 'conservative' assumptions over a theoretically 'less conservative' alternative would result in relative net greenhouse gas impacts of a similar magnitude to the figures produced through the applciant's failure to take account of the net differential in the release of biogenic CO_2.

58. The correct approach would be for the applicant to provide what they consider to be the most likely set of key assumptions, and then to apply a consistent approach to biogenic carbon to both landfill and incienration, and provide sensitivity analysis to show the impact of using alternative reasonable assumptions.

59. The net differential in the release of biogenic CO_2 is a material planning consideration that does not constitute a matter that can be dismissed as *de minimus.*

60. As shown above, the applicant's failure to take account of the impact of biogenic carbon sequestration in landfill resulted in the overstatement of the supposed benefits of the proposed ERF development.

[10] *'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

61. Section 3.2.1 of ES Technical Annex D1 states that:

    50% of the degraded carbon is released and converted into LFG [landfill gas]. The release carbon is known as the degradable 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 DEFRA's '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.

62. The applicant has not shown that these rates are particularly conservative, let alone sufficiently conservative to justify their approach to neglecting biogenic carbon sequestration.

63. If waste were to be sent to a landfill, it would not be sent to a historic landfill but rather to a modern landfill. According to Section 4.2 of ES Technical Annex D1:

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

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

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

66. 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.

67. Indeed, a recent report by Fichtner (the same consultancy who wrote the Carbon Assessment for the Ford proposal), states that:[11]

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

68. Despite this, the same consultancy cites, as one of their primary justifications for ignoring biogenic carbon sequestration, a claim that 68% is a conservative assumption for landfill gas capture.

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

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

70. Moving to a consideration of the degree of biogenic carbon sequestration, whilst the applicant claims that a 50% rate of biogenic carbon sequestration is conservatively high, there are actually reasons to expect the level of biogenic carbon sequestration for the material anticipated as feedstock for the proposed Ford ERF would be far higher than 50% were this material to be landfilled.

71. In relation to anticipated feedstock composition, while ES Section 7.72 states that the impacts of the Government's emphasis on reduced food waste collection and reduced plastic collection would *"to some extent cancel each other out"*, this does not take account the impact of reduced food waste in the residual stream on the biodegradability of the biowaste fraction.

72. Changes to the proportion of feedstock which is plastic might affect elements such as calorific value and fossil carbon content, but reductions in plastic cannot 'cancel out' the decrease to the biodegradability of the biowaste fraction as a result of increased separate collection of food waste (or indeed increased separate collection of garden waste, which the applicant has also not modelled).

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

74. 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.

75. Table 6 of that Defra report is reproduced below:

	Proportion of waste that is biogenic C	Proportion of waste that is decomposable C	Proportion of waste in 1t	Mass of biogenic C in 1t	Mass of decomposable C in 1 t
Mixed Paper and Card	0.32	0.158	0.15	0.049	0.024
Plastics		0	0.13	0.000	0.000
Textiles (and footwear)	0.2	0.0667	0.04	0.009	0.003
Miscellaneous combustibles	0.19	0.0889	0.06	0.012	0.006
Miscellaneous non-combustibles	0.035	0	0.09	0.003	0.000
Food	0.14	0.0849	0.31	0.043	0.026
Garden	0.17	0.0872	0.03	0.005	0.003
Soil and other organic waste	0.07	0.0025	0.03	0.002	0.000
Glass		0	0.05	0.000	0.000
Metals, White Goods and Other Non-biodeg Products		0	0.02	0.000	0.000
Non-organic fines		0	0.01	0.000	0.000
Wood	0.44	0.1253	0.03	0.012	0.003
Sanitary / disposable nappies	0.15	0.043	0.04	0.007	0.002
Total			1.00	0.142	0.067

76. One can derive the assumed level of decomposability (biodegradability) of the biogenic carbon of different types of waste in the Defra report by dividing the 'Mass of decomposable C in 1t' column by the 'Mass of biogenic C in 1t' column (as decomposable biogenic carbon can be determined as a proportion of total biogenic carbon per one tonne of waste).

DECOMPOSABILITY OF BIOGENIC CARBON
BASED ON TABLE 6 OF 'CARBON BASED MODELLING APPROACH' (DEFRA)

	Mass of biogenic carbon in 1 tonne of waste (a)	Mass of decomposable carbon in 1 tonne of waste (b)	Decomposability of biogenic carbon ([b] ÷ [a])
Food	0.043	0.026	60%
Garden	0.005	0.003	60%
Misc Combustibles	0.012	0.006	50%
Mixed Paper and Card	0.049	0.024	49%
Textiles (and footwear)	0.009	0.003	33%
Sanitary / nappies	0.007	0.002	29%
Wood	0.012	0.003	25%
Plastics	0	0	0%
Soil and other organics	0.002	0	0%
Glass	0	0	0%
Metals, etc.	0	0	0%
Non-organic fines	0	0	0%

77. 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 Ford incinerator could possibly be operational there will be significant diversion of food and garden waste away from the residual waste stream.

78. As such, it could reasonably be assumed that for typical waste sent to landfill or incineration in the 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.

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

80. As has been noted by Defra, using an MBT process can stabilise biowaste prior to landfill:[12]

    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.

81. As explained in 'Building a bridge strategy for residual waste: Material Recovery and Biological Treatment to manage residual waste within a circular economy'[13]:

    ...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...

82. 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.

83. 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.

84. 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'.

[12] '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

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

WASTE TREATMENT AND ENERGY COUNTERFACTUALS

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

85. 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[14]); and/or

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

86. The Ford 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

87. 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 Ford ERF plant would be displacing wind and solar energy rather than primarily CCGT.[15]

88. 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.

89. 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).

90. We note that BEIS grid displacement factors which are lower than 280g (the lowest grid displacement factor considered in the Ford ERF application) are regularly considered as part of the consideration of the impacts of waste incinerators, including in the following instances:

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

[15] https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035

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.[16]

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

CONCLUSION AND RECOMMENDATIONS

91. The net differential in the release of biogenic CO_2 as a result of biogenic carbon being sequestered in landfill is a material planning consideration that does not constitute a matter that can be dismissed as *de minimus* when comparing the relative greenhouse gas impacts of incineration and landfill.

92. Adopting lower carbon comparators than the applicant's chosen figure for CCGT would also have a significant impact on the results, especially when combined with higher landfill gas capture rates.

93. Waste treatment counterfactuals other than sending waste directly to landfill should be considered, and would result in the plant proposed for Ford being assessed as having even worse relative net GHG impacts.

94. The applicant's failure to account for differences in the quantity of biogenic CO_2 that would be released through incineration compared to landfill, combined with the applicant's problematic use of a very limited range of waste treatment and energy generation comparators, should weigh heavily against the proposal in the planning balance.

95. It is also noted that 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 specific timeframe, and that this too should weigh against the proposal in the planning balance.

96. Furthermore, it is noted that, based on the quantity of fossil CO_2e that can be anticipated to be released according to the applicant, the electricity that would be exported from the proposed development would have a high carbon intensity (even higher than the conventional use of fossil fuel) and would therefore hamper efforts to decarbonise the electricity supply whilst failing to meet the NPPF definition of 'low carbon'.

97. For the reasons set out above, West Sussex County Council should refuse this planning application on the grounds of the proposal's adverse climate change impacts alongside any other grounds for refusal that are justified by the circumstances.

98. Such a refusal would be entirely consistent with Government policy, recent legal rulings, and with statements made by the Committee on Climate Change, as outlined above.

99. If the Council is not yet minded to refuse planning consent based on the information provided to date, we would also recommend that the applicant be asked to provide a GHG assessment that:

    a) Considers both 68% and 75% landfill gas capture;

    b) Considers the impact of changing biowaste composition on the proportion of the biowaste that would degrade in landfill; and

    c) Takes full account of the different releases of biogenic CO_2 between landfill and incineration (either by including biogenic CO_2 for both landfill and incineration, by treating is a benefit for landfill, or by treating it as a disbenefit for incineration).

100. This GHG assessment should be required to include sensitivity analysis that considers the impacts (alone and in combination) of:

    a) Assuming a grid displacement factor of 205g CO_2 per kWh in line with the BEIS generation-based marginal emissions factor for the anticipated year that the site could become operational;

    b) Using stabilisation of waste (both with and without material recovery) prior to landfill as a waste treatment counterfactual; and

    c) Assuming changes in waste composition in line with the future waste composition adopted by Eunomia in their December 2020 'Greenhouse Gas and Air Quality Impacts of Incineration and Landfill' report to take account of the impact of Government policies and strategies on residual waste arisings.