

Author Details	
Name	Dr Andrew Boswell
Position	Independent Scientist & Consultant
NZT Registration	20029943
Organisation	Climate Emergency Policy and Planning (CEPP)
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POST EXAMINATION CONSULTATION – 19th JANUARY 2024

I am a retired scientist and environmental consultant, working at the intersection of science, policy, and law, particularly relating to ecology and climate change. I work at a consultancy called Climate Emergency Policy and Planning (CEPP).

In so far as the facts in this statement are within my knowledge, they are true. In so far as the facts in this statement are not within my direct knowledge, they are true to the best of my knowledge and belief.

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1 INTRODUCTION

1.1 Post Examination Consultation – December 20th 2023 letter

- 1 I am responding to the letter from John Wheadon, Head of Energy Infrastructure Planning Delivery (Department of Energy Security and Net Zero, DESNZ) of December 20th 2023.
- 2 I am responding to paragraph 5 of Mr Wheadon’s letter which notes that “*the Applicants’ revised residual operational emissions figures and comments regarding a double counting error*”. I address the double counting issue (again), and also provide comment on the emissions from third party emitters and the scope of the EIA assessment relevant to the Applicant’s December 13th letter. I also provide more information on the residual emissions, and especially how the upstream, indirect emissions have been underestimated.
- 3 As above, I return to the matter of the upstream, indirect GHG emissions from the NZT Project. The applicant has explained how it derives its WTT (“Well to Tank emissions from upstream supply of natural gas”). My further research explained below suggests that the emissions factor used are untrustworthy and do not provide a reasonable worst case estimate for the WTT emissions. The EIA assessment of GHG emissions is compromised, and the applicant must answer the issues which I lay out on this matter.
- 4 Further, I note that the NZT Project has never been properly assessed against alternatives which power the proposed third-party emitters CCUS network in Teesside without using a gas fired power station. I show that not only can a small amount of renewable energy, with energy storage, supply the necessary power for pumping CO2 from the third-party emitters to the offshore elements. A huge benefit which has not been recognised by the Applicant, nor apparently DESNZ, is that this would also use the Endurance CO2 storage field much more efficiently, making it last longer into the future, and reducing future costs of CCUS storage with related future economic benefits. I submit the Secretary of State must consider the benefits of basing the proposed Teesside third party emitter CCUS network around a renewable supply of electricity. A full alternatives assessment should be carried out before considering whether to approve the NZT project.

2 EMISSIONS FROM THIRD PARTY EMITTERS AND THE SCOPE OF EIA ASSESSMENT

5 In its latest letter of December 13th which I refer to here by its PINS document reference [EN010103-002891¹], the applicant has provided data (rough estimates) of the emissions from third party emitters. Although this data has previously been reported, it has not previously been used as part of the EIA Assessment. In the December 13th letter, the applicant departs from this and proposes using the third-party emitter data as part of the assessment. As the applicant has previously scoped out emissions from third party emitters, I submit that this departure is erroneous and breaches the applicant’s own EIA Scoping assessment for the scheme. To explain this, the history of treatment of emissions from third party emitters through the EIA process is now described.

2.1 History of treatment of emissions from third party emitters

6 In response to a question from the ExA, the applicant stated [REP6-121², PDF page 29, CC.2.11]:

“This report has been submitted at Deadline 6 (Document Ref. 9.29) and includes an updated assessment of the significance of overall GHG impact of the Proposed Development which applies the amended IEMA guidance published in February 2022.”

7 The report referred to is “9.29 Cumulative Onshore and Offshore GHG assessment “ [REP6-123³] and is the applicant’s GHG assessment under the EIA Regulations. This report makes clear at 1.3.3 that the scope of the assessment is:

“To frame this information, this document provides the cumulative Greenhouse Gas (GHG) assessment for the Proposed Development and the offshore works being developed under separate consents by the Northern Endurance Partnership (hereafter referred to in this document as ‘Proposed NEP Offshore Development’).”

8 That is, the cumulative assessment provided in [REP6-123] covers **ONLY** “the Proposed Development and the offshore works”. The document also makes clear that emissions from

¹ Applicant’s December 13th letter, “SoS Consultation 8 - Responses to letter dated 30 November 2023 - Applicant” <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002891-EN010103%20-%20NZT%20DCO%20-%20Letter%20in%20response%20to%20SoS%20RFI%20dated%2030.11.23.pdf>

² “9.27 Applicants’ Response to the ExA’s Second Written Questions - August 2022”, [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002078-NZT%20DCO%20-%209.27%20Applicants%E2%80%99%20Response%20to%20the%20ExA's%20Second%20Written%20Questions%20-%20August%202022%20\(D6\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002078-NZT%20DCO%20-%209.27%20Applicants%E2%80%99%20Response%20to%20the%20ExA's%20Second%20Written%20Questions%20-%20August%202022%20(D6).pdf)

³ “Deadline 6 Submission - 9.29 - Cumulative GHG Onshore and Offshore Assessment August 2022”, [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002075-NZT%20DCO%209.29%20-%20Cumulative%20GHG%20Onshore%20and%20Offshore%20Assessment%20August%202022%20\(D6\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002075-NZT%20DCO%209.29%20-%20Cumulative%20GHG%20Onshore%20and%20Offshore%20Assessment%20August%202022%20(D6).pdf)

the third-party emitters are not scoped as being part of the Proposed Development. Section 3.4 of the document is entitled “*Emissions from 3rd Party Emitters*” and section 3.4.2 states:

“These data do not form part of this cumulative assessment as they are outside the scope of the Proposed NZT Development. They do represent additional potential carbon storage figures, when these 3rd party emitters connect to the T&S system.”

9 It is clear, then, in [REP6-123] that emissions from third-party emitters are not included in the EIA assessment because they are outside the scope of the proposed development. In any case, the document notes at 2.2.2 (under “2.2 Assumptions and Limitations”) that there is uncertainty about the number of connecting sites and their emissions. In other words, there is no reliable estimate available of the emissions from third party emitters.

10 For consistency with my previous submission of September 12th 2023, I refer to the applicant’s August 2023 document “9.53 Applicants’ Response to Climate Emergency Policy and Planning Letter dated 30 May 2023” as [DOC_9_53⁴]. Referring to [REP6-123], footnote 4 of [DOC_9_53] confirms that third party emitter emissions are not within the cumulative assessment:

“The cumulative assessment did not consider the emissions avoided through the connection of other 3rd party emitters to the Proposed NEP Transport and Storage system.”

11 On October 6th, the applicant submitted a letter, which I refer to here by its PINS document reference [EN010103-002868⁵] – this document made no change on the matter of 3rd party emitters.

12 In its latest letter of December 13th which I refer to here by its PINS document reference [EN010103-002891⁶], the applicant notes at 2.1.5:

“The presentation of data in this submission also differs from that in [REP6-123] in two other ways. Firstly, it includes data relating to all estimated carbon stored via the NEP Project, whether from the NZT Power Station or from third party emitters within the Teesside cluster. The Applicants note that data relating to storage from third party emitters is subject to a greater degree of uncertainty compared to

⁴ “Response to the Secretary of States Request for further information dated 16 May 2023 - 9.53 - Applicants Response to CEPP Letter Dated 30 May 2023 - SoS RFI 4 Aug 2023”, <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002834-NZT%20DCO%209.53%20-%20Applicants%20Response%20to%20CEPP%20Letter%20Dated%2030%20May%202023%20-%20SoS%20RFI%204%20Aug%202023%20v3.pdf>

⁵ Applicant’s October 6th letter, “SoS Consultation 6 - Responses to letter dated the 22 September 2023 - Applicant” <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002868-Net%20Zero%20Teesside%20Power%20Limited%20and%20Net%20Zero%20North%20Sea%20Storage%20Limited%20-%20Cover%20Letter%20-%20Response%20to%20the%20SoS%20Consultation%20letter%20dated%2022%20September%202023.pdf>

⁶ Applicant’s December 13th letter, “SoS Consultation 8 - Responses to letter dated 30 November 2023 - Applicant” <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002891-EN010103%20-%20NZT%20DCO%20-%20Letter%20in%20response%20to%20SoS%20RFI%20dated%2030.11.23.pdf>

corresponding storage from the NZT Power Station, but it is all included here for completeness.”

13 The Applicant’s December 12th submission makes changes which go beyond presentation. Having established in the [REP6-123] document that emissions from 3rd party emitters are not included in the assessment because they are outside the scope of the proposed development, the applicant has added estimates relating to the emissions from the third-party emitters in at two places, and then taken that data forward into its assessment narrative, as discussed next.

2.2 December 13th letter: Table 1: Summary of estimated cumulative net whole-life emissions to the atmosphere

14 The applicant introduces a new data item: an estimate of “T&S unavailability” for “Teesside 3rd party industrial emitters” into Table 1. This is more than a presentational matter as claimed by the applicant because having introduced this estimate for these emissions to Table 1, the applicant proceeds at Table 3 to use the data in a comparison against the 4th, 5th and 6th carbon budgets (ie an assessment step).

15 [EN010103-002891] states at 2.1.8:

*“The total atmospheric emissions figure summarised in **Table 1** is consistent with the whole life GHG emissions figure of 20,808,127 tCO₂e in Table 1 on page 22 of the CEPP response, with the sole exception that the CEPP total emissions figure does not include T&S unavailability from third party emitters of 2,632,500 tCO₂e and the figure presented in **Table 1** does.”* {emphasis as in original}

However, the point here is that Table 1 of the CEPP response (my September 12th submission) was a “corrected version of REP6-123/Table 3-4”, and Table 3-4 of [REP6-123] did not include any entry for the third party emitters because, as above, [REP6-123] made it clear that emissions from 3rd party emitters are not included in the EIA assessment because they are outside the scope of the proposed development.

Therefore the issue referred to at 2.1.8 does not reflect an omission by CEPP in my September 12th Table 1. To the contrary, the issue at 2.18 constitutes an error on the applicant’s part as it is adding in new data which is outside the scope of the EIA for the development in its December 13th Table 1.

[EN010103-002891]/Table 1 may therefore be corrected by yet another incantation of the table which started off as Table 3-4 of [REP6-123] by simply removing the erroneous and out of scope T&S unavailability emissions from third party emitters, as follows :

Development	Phase	GHG Emissions (tCO2e)	Note
Onshore Construction and Operation	Construction (4 years)	76,012	
	Operation (25 years)	16,782,184	← 90% carbon capture at NZT project accounted in this figure
	Total Onshore	16,858,196	
Offshore Construction and Operation	Construction (3 years)	324,699	
	Operation (25 years)	30,988	
	Decommissioning	1,721	
	Total Offshore	357,408	
T&S Unavailability	NZT Power Station	3,592,523	
	Total T&S unavailability	3,592,523	
Whole life GHG emissions		20,808,127	

Table 1: Corrected version of [EN010103-002891]/Table 1
Corrected title: Summary of estimated cumulative net whole-life emissions to the atmosphere (Proposed Development and the offshore works)

16 I maintain my annotation (from my September 12th Table 1) against the Onshore “Operation (25 years)” item of 16,782,184 tCO2e that the “90% carbon capture at NZT project accounted in this figure” (now in red bold). The annotation points out that the post combustion carbon capture emissions associated with the NZT Power Station are already included in this figure. This is the correct logical positioning of the Post combustion carbon capture emissions associated with the NZT Power Station. Any further instantiation of this data generates a double counting error, and I will return to this data and the double counting error later.

17 I note that Table 3-1, 3-2 and 3-3 of [REP6-123] have each been reproduced in [EN010103-002891] section 4.0, Appendix A. However [REP6-123] Table 3-4 which did instantiate a second instantiation of the post combustion carbon capture emissions, and so implemented a double counting error in the EIA assessment has not been reproduced. The reasons why Table 3-4 has been dropped from the narrative are obvious.

2.3 December 13th letter: Table 2: Summary of estimated net carbon storage

18 The same third-party emitter issue applies to [EN010103-002891]/Table 2. The Table includes data for “Teesside 3rd party industrial emitters” even though [REP6-123] emissions from 3rd party emitters are not included in the EIA assessment because they are outside the scope of the proposed development. Later, the output of Table 2 is used in narrative about assessment at [EN010103-002891]/3.1.15. As far as EIA Assessment purposes are concerned for the scoped-in emissions, the correct version of Table 2 is then:

Development	Phase	GHG Emissions (tCO ₂ e)	Note
NZT Power Station	Carbon captured	53,364,418	Figure already implicit in “Operation (25 years)” 16,782,184 tCO ₂ e in Table 1 above
	T&S unavailability	3,592,523	Figure already accounted in Table 1 above
	Net carbon storage	49,771,895	
Cumulative net carbon storage		49,771,895	

Table 2: Corrected version of [EN010103-002891]/Table 2
Corrected title: Summary of estimated net carbon storage (Proposed Development and the offshore works)

19 As all the source data items in Table 2 are already included (implicitly for “Carbon captured” and explicitly for “T&S unavailability”) in Table 1, as noted above, [EN010103-002891]/Table 2 is redundant in adding any further in scope information for the EIA Assessment.

20 In paragraph 5 of her letter of December 20th, the Secretary of State notes “that she has a duty, under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 to come to reasoned conclusions on the significance of effects of the Proposed Development on the environment, which must be up to date at the time she makes a decision.”

21 As a result of the analysis above, based on the correct EIA Scoping of the proposed development as described by the applicant in [REP6-123], and noting the redundancy of Table 2, all the relevant information that needs to be considered by the Secretary of State is provided by the data items in the Table 1 above (ie my corrected version).

2.4 Double counting error

22 I described at section 4.4 of my September 12th submission how the 16,858,196 tCO₂e figure for “Total Onshore” emissions in [REP6-121]/Table 3-4 is generated. My Table 1 in the September 12th submission succeeds the previous Table 3-4 (apparently now also abandoned by the applicant) and annotated the fact that the post combustion carbon capture emissions were already included within the 16,858,196 tCO₂e figure (as highlighted again in red above).

23 Subsequently, the applicant suggested [EN010103-002891]/Table 1 as a further successor to my September 12th Table 1 but introduced emissions outside of the scope of the EIA assessment. I have corrected this above in Table 1 in this submission which for intents and purposes is the same table as my September 12th Table 1: it is numerically identical, and the only difference being minor labelling changes, which I have followed to reflect the changes made by the applicant in [EN010103-002891].

24 The Secretary of State is referred to bullets 69 A-D of my September 12th submissions which explains the simple arithmetic of how the 16,858,196 tCO₂e figure for “Total Onshore” emissions in [REP6-121]/Table 3-4 is derived. It is entirely clear that the post combustion carbon capture emissions for the onshore NZT project are implicitly included within the

“Operation (25 years)” 16,782,184 tCO₂e figure in Table 1 above (and also in the same figure in [EN010103-002891]/Table 1).

25 Any further instantiations of the post combustion carbon capture emissions for the onshore NZT project represent a double counting error. This is what the applicant did in [EN010103-002891]/Table 2. My annotations in my corrected version of Table 2 in this submission above indicate that both the “T&S unavailability” and “Carbon captured” data items are already included, respectively explicitly and implicitly, in Table which also makes the information presented in Table 2 redundant as already discussed.

26 All the applicant has done with Table 1 and Table 2 in [EN010103-002891] is rearrange the data slightly in presentational terms, but the double counting error remains within the data and within its narrative.

27 My corrected Table 1 above corrects the errors made. The related logical arguments having been already provided to the Secretary of State on September 12th.

2.5 December 13th letter: Narrative errors

28 I note the following errors in the applicant’s narrative relating to this.

29 Section 2.1.4:

“The individual data points presented in this submission and included in Table 1 and Table 2 below are taken directly from the Cumulative Onshore and Offshore GHG Assessment [REP6-123]. No new data relating to emissions sources or storage have been introduced in this submission, nor any omitted.”

As noted above, whilst no new “data points” have been introduced in the applicant’s December 13th submission, data points relating to the third-party emitters have been used as if they are within the scope of the EIA assessment when they were quite clearly identified as not being within the scope for EIA assessment, previously in [REP6-123].

This is a material and false change in the use of the data points. Essentially up to the December 13th letter, the data points on third party emitters were described in the Environmental Statement. In the December 13th letter, the data points are both described and then used as part of the assessment.

30 Section 2.1.10:

“Total emissions to the atmosphere, shown in Table 1, and total net carbon storage figures, shown in Table 2, are presented separately to avoid any perception of double counting. There is no overlap between the data presented in these tables, nor are any identified emissions sources omitted.”

The applicant implies here that they have functionally separated the data for carbon captured from data for emissions to the atmosphere. And that there should be no data items (describing physical emissions) represented in both Tables.

This is false, as I have shown above, because the post combustion carbon capture emissions are included implicitly in both the applicant's Table 1 and in Table 2. As explained above and has already been explained for [REP6-121]/Table 3-4 in my September 12th letter, Table 1 implicitly includes the post combustion carbon capture emissions for the onshore NZT project (as highlighted in red above). Therefore both Table 1 and Table 2 in [EN010103-002891] includes the post combustion carbon capture emissions for the onshore NZT project. Simply expressed, this is double counting and to see it as such it requires no perception other than correctly understanding the numbers.

31 Section 2.1.11:

“By presenting existing GHG data in such a way as to keep emissions to the atmosphere entirely separate from carbon in long term storage, the Applicants have sought to address the concerns of CEPP and respond directly to the request for clarification from the Secretary of State.”

The point is, as already explained, that the applicant has not kept emissions to the atmosphere entirely separate from carbon captured for long term storage. Both Table 1 and Table 2 in [EN010103-002891] include the post combustion carbon capture emissions for the onshore NZT project.

3 UNTRUSTWORTHY EMISSION FACTORS FOR UPSTREAM EMISSIONS

32 In [REP6-123], the applicant introduced an estimate for “Well to Tank emissions from upstream supply of natural gas” in Table 3-1: “Onshore Greenhouse Gas Emissions”. The estimate was calculated as 10,101,668 tCO₂e for the 25-year operation period of the NZT Power station. This value remains the applicant's estimate, describing the WTT emissions, in the reproduction of [REP6-123]Table 3-1 in Appendix 1 of the applicant's December 13th letter [EN010103-002891].

33 Various issues remain unresolved about the enumeration of the upstream indirect emissions from the NZT Power station which I now discuss. First, I explain how the applicant's estimate figure to be derived. It is necessary to understand this before I explain why the emissions factors used are unreliable and untrustworthy.

3.1 Derivation of WTT emissions figure

34 First, I confirm how the applicant calculates the Direct, Scope 1, emissions from the combustion of the gas as follows:

1. Table 21-10 of [APP-103] “Direct operational GHG Emissions from the Reference Case (90% Abated) power plant at (Scenarios 1 - 3)” gives “Hourly unabated GHG emissions from power plant (kg CO₂e)” as 281,547 kg CO₂e.
2. For 25 years at 8,424 hours a year, the total unabated 25-year figure (including conversion from kg to tonnes) is given by:

$$(281,547 * 8,424 * 25)/1000$$

which equates to 59,293,798 tCO₂e which is the established figure for the gas combustion in the NZT project over 25 years.

35 For every unit of gas (eg tonnes) combusted, or unit of energy produced (eg kWh) by the NZT Power station, there are:

- the direct, Scope 1 emissions (CO₂ from combustion) as calculated above; and
- indirect upstream Scope 3 emissions⁷.

36 In the Applicant’s submission of August 2023 entitled “Applicants’ response to Submission from Climate Emergency Policy and Planning (Document Ref. 9.53, Rev. 1.0)”, referred to here as [DOC_9_53⁸], the applicant describes at 3.1.4 that the Scope 3 emissions “*were estimated over the design life of the Proposed Development using the appropriate WTT factor for natural gas provided in the 2022 dataset of emissions factors published by DEFRA/BEIS <footnote 5>. The application of this factor results in WTT emissions of 0.4 MtCO₂e per annum over the 25 year design life of the Proposed Development.*”

⁷ As described by Applicant at [REP6-123]/3.1.2 as “emissions associated with the extraction, refining and transportation of the natural gas to be consumed in the power station over its operational lifetime. The WTT factors also account for fugitive upstream emissions of methane”.

⁸ for consistency with my previous submission of September 12th 2023

37 [DOC_9_53]/Footnote 5 refers to <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022> but does not specify the precise spreadsheet (from a number of spreadsheets at that webpage), nor details of the relevant spreadsheet tabs and cells. However, as shown below, I can exactly reproduce the applicant's numbers from the "Conversion factors 2022: full set (for advanced users)" spreadsheet⁹ ("the 2022/2021 spreadsheet") as follows:

1. The Tab "Fuels" in the 2022/2021 spreadsheet gives the Scope 1 emissions. At cell E41, the "Total kg CO2e per unit" for "kWh (Net CV)" is given for "Natural gas" – the value of the factor is 0.20.
2. The upstream Scope 3 emissions are given under Tab "WTT- fuels". At cell E40, the "Total kg CO2e per unit" for "kWh (Net CV)" is given for "Natural gas" – the value of the factor is 0.03446.
3. On the basis of the 25-year Scope 1 emissions of 59,293,800 tCO2e, the energy produced over 25-years is 293,141,840 kWh (Net CV) (calculated as 59,293,800 0.20).
4. The upstream Scope 3 emissions are therefore 293,141,840 * 0.03446. This computes to 10,101,668 tCO2e which is precisely the same as the applicant's estimate, which the applicant uses in [REP6-123]/Table 3-1 as Well to Tank emissions from upstream supply of natural gas.

38 The applicant also notes at [DOC_9_53]/3.1.5 that "the 2023 WTT factor for natural gas is almost 3% lower than the corresponding factor for 2022". I will refer to this later.

⁹ <https://assets.publishing.service.gov.uk/media/62aed8f6d3bf7f0af9463486/ghg-conversion-factors-2022-full-set.xls>

3.2 Outstanding issues with WTT emissions reporting for the EIA

39 The previous section established how the upstream, indirect emissions for the methane combusted in the project have been calculated. This was necessary background for this section.

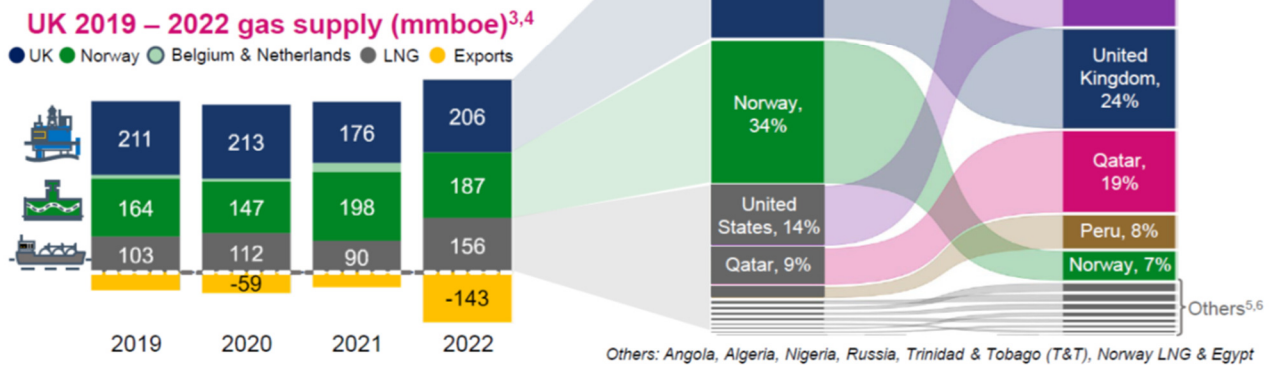
40 I have outstanding concerns about the reporting (or EIA description, enumeration) of the upstream, indirect emissions for the methane. These are at least three-fold:

- (1) Are the emission factors from the BEIS/DESNZ conversion factors, the best factors to be using? Are there better, more trusted data sources?
- (2) Is the “Natural gas” emission factor from the BEIS/DESNZ conversion factors, the correct factor to be using? The Tab “WTT- fuels” in the BEIS/DESNZ spreadsheet also has an entry for LNG. As the fuel supply for NZT will include a proportion of LNG, should the factor used for the upstream Scope 3 emissions calculations above use a factor that proportionally represents the LNG content of the fuel for the NZT. For example, in the 2023 spreadsheet, the “kWh (Net CV)” factor for “Natural Gas” as used by the applicant is 0.03347 whilst the factor for LNG is significantly higher at 0.07214. If the LNG factor should be included proportionately, then the WTT emissions would be considerably higher than reported.
- (3) If the “Natural Gas” factor is the correct one ie: it fully represents the methane that will be the fuel source for the NZT plant (including LNG imports), then the data does not make sense against recent information from the North Sea Transition Authority (NSTA). This data was reproduced in Appendix A of my September 12th submission as a one page fact sheet, also downloadable at <https://www.nstauthority.co.uk/the-move-to-net-zero/net-zero-benchmarking-and-analysis/natural-gas-carbon-footprint-analysis/> (July 2023).

41 I now discuss point (3) above further. First, I reproduce part of the factsheet:

UK gas supply mix and carbon dioxide emissions

In 2022, gas imports to the UK accounted for 63% of its natural gas supply. The UK helped to meet the surge in European LNG demand by increasing its LNG imports (by 74%) and then exporting the surplus supply to Europe through pipelines (240% increase from 2021).



42 The left of the picture gives gross supplies of UK gas supply by three overall categories: Domestic supply, pipeline import (largely Norway) and LNG (largely US and Qatar). From this is possible to simply calculate the percentage of UK methane (natural gas) supply between the years 2019 and 2022. This is shown in rows A, B and C at Table 3 below¹⁰.

43 Then it is possible to calculate an aggregated carbon intensity of the UK gas supply using the figures on the data sheet of 21 kgCO₂/boe for UK domestic supply, 8 kgCO₂/boe for pipeline imports, and 79 kgCO₂/boe for LNG – this is shown in row D. Then it is possible to work out its percentage against the 2020 data as 100%. 2020 has been chosen for this percentage as the data for 2019 appears to be out of kilter¹¹. This percentage is given at row E below.

44 Then the “WTT Fuels” Scope 3 factor from the DESNZ emission factors for “Natural Gas” [“Total kg CO₂e per unit” for “kWh (Net CV)”] is given in row F. Finally, I work out its percentage against the 2020 data as 100% (given in row G below).

45 If the BEIS/DESNZ data reflected the proportions of UK domestic, pipeline import and LNG supply given by the NSTA factsheet, then the percentages in rows E and G would be expected to be relatively similar and follow the same trend. They are not and do not.

¹⁰ I do not present the “yellow” export data, as this data is not relevant to the point being made about the UK natural gas supply which comes from the 3 sources indicated by rows A, B and C.

¹¹ I am seeking an explanation for this from the DESNZ statisticians.

46 For example, the aggregated carbon intensity based on NSTA is 107.6% above its 2020 value whereas the BEIS/DESNZ “WTT Fuels” Scope 3 factor against 2020 is 96.3% of its 2020 value.

		NSTA Percentage of supply			
		2019	2020	2021	2022
A	UK domestic	44.1%	45.1%	37.9%	37.5%
B	Pipeline	34.3%	31.1%	42.7%	34.1%
C	LNG	21.5%	23.7%	19.4%	28.4%
D	Aggregated carbon intensity kgCO2/boe	29.04	30.71	26.70	33.05
E	Aggregated carbon intensity against 2020 level	94.5%	100.0%	86.9%	107.6%
F	“WTT Fuels” Scope 3 factor (BEIS/DESNZ data)	0.02649	0.03474	0.03446	0.03347
G	“WTT Fuels” Scope 3 factor against 2020 level	76.3%	100.0%	99.2%	96.3%

Table 3: Comparison of annual aggregated carbon intensity (from NSTA factsheet) against “WTT Fuels” Scope 3 factor (from DESNZ data)

47 From this, I conclude in response to my point (3) concern above that the BEIS/DESNZ “Natural Gas” “WTT Fuels” Scope 3 factors do not reflect reality on the ground as reported by NSTA over the years 2020-2022. And, in the case of the 2022 data (as reported in 2023), the DESNZ Scope 3 factor significantly under-represents the aggregated real-world carbon intensity. The 2023 WTT factor for natural gas is around 3% lower than the corresponding factor for 2022, (as above), whilst according the NSTA factsheet, the aggregated carbon intensity went up by 24% [(107.6%/86.9%) - 100% = 23.8%].

48 On this basis, I submit that the WTT Scope 3 emissions reported (enumerated) in the [REP6-123]/ Table 3-1 (ie 10,101,668 tCO2e for the 25-year operation period of the NZT Power station) is a significant underestimate and does not form a reliable reasonable worst-case for the upstream, indirect emissions.

49 I have reached this conclusion only in reference to point (3) of my three-fold concerns about the WTT reporting, and the EIA GHG assessment made on the basis of the BEIS/DESNZ Scope 3 “Natural gas” emission factors (which as shown is the applicant’s method for estimating WTT emissions).

50 Points (1) and (2) also need answering.

51 At this stage, I submit that I have shown that the applicant’s estimation of the WTT upstream, indirect emissions cannot be trusted, and the Secretary of State cannot make a reasoned EIA conclusion, relating to the significant impacts of climate change, on the basis of it.

52 The applicant must be required to explain the issues which I present above, and respond on each of issues (1), (2) and (3) above.

4 ALTERNATIVE OPTIONS NOT ASSESSED

4.1 *Avoid burning methane and – bingo - double the carbon storage capacity*

53 I have previously submitted, for example in my original WR at [REP2-061/22], that alternatives to constructing a methane burning gas fired power plant at the centre of the wider CCUS network in Teesside have never been properly considered.

54 It would be perfectly possible to support and power the wider CCUS network for third party emitters in Teesside with the pumping of CO₂ (as provided by the NZT facility in the current proposal) provided by renewable energy.

55 The Secretary of State should consider the following points in reaching a reasoned conclusion on the scheme. I submit that there has been a serious breach of considering alternatives to the NZT project and these have wide ranging repercussions for the economy and for the sustainability and longevity of existing carbon storage facilities such as the Endurance field.

4.2 *Feasibility of a renewable energy centric CCUS network in Teesside*

56 [APP-103]/21.3.56 states that a 30MW compressor can manage up to compressing 4 MtCO₂e/yr. With the captured emissions from gas fired power station being 2.1 MtCO₂e/yr, this would leave 1.9 MtCO₂/yr for third party emitters. The possibility of expanding to an 80MW / 10 MtCO₂e/yr compressor later is also discussed.

57 [APP-103]/Table 21-11 provides for 100MW (from the gas fired power station in the application) for compression and ancillary plant: this includes the 80MW compressor envisaged for later in the project lifecycle.

58 It is clear from this that that function of the current application which relates to gathering, compressing and pumping of CO₂ from the CCUS wider network around Teesside to the offshore facilities could be achieved by a fairly small supply of electricity. 30MW-50MW of electricity would provide support for up to 4 MtCO₂e/yr of CO₂ capture and storage from the third party CCUS Teesside network.

59 The electricity for this could be readily source from the UK's ever increasing rich supply of renewable energy combined with energy storage on-site for resilience.

4.3 *Greater efficiency of CO₂ storage sites*

60 A key advantage of utilising renewable energy and energy storage solutions for the wider CCUS network in Teesside, and deleting the NZT power station, is that the carbon storage

capacity of the Endurance carbon store in the southern North Sea would endure for a much longer period of time into the future.

61 This is clear from [EN010103-002891]/Table 2. Although this table is completely redundant in terms of the EIA assessment as already explained, it is helpful in showing the split of potential CO₂ for storage from the NZT Power Station itself and the Teesside 3rd party industrial emitters. It shows that a greater part of the carbon storage from Teesside is solely for the gas fired power station and a smaller proportion for the third-party emitters: over 25 years, 53.3MtCO₂e may be captured for NZT against 45MtCO₂e for the third parties.

62 It is clear that if the gas fired power station is eliminated from the Teesside part of the East Coast Cluster, then less than half of the currently planned carbon storage capacity is needed for third party emitters over 25 years.

63 Whilst the UK claims to have 78GtCO₂e storage capacity, most of this is speculative, and available carbon storage is actually an extremely high-value resource. As the UK goes forward, carbon storage will have a role to play for some industries (eg cement), and it is most cost effective to use the available storage, such as ready storage fields such as Endurance, as efficiently as possible. This will increase longevity of existing carbon storage facilities and massively reduce the need to develop new storage sites, possibly in more remote parts of the UK: both leading to very significant reductions in the costs of carbon storage in the long-term, with associated economic benefits to the UK.

64 It was clear at the Examination that North Sea “real estate” for carbon storage is already at a premium. This was played out at the examination with the territorial dispute between the Ørsted’s Hornsea 4 project and the NZT project which consumed considerable time at some of the hearings. As time goes on, the UK needs to make the most of North Sea resources for deploying renewable energy and some carbon capture of hard to decarbonise industrial processes like cement production.

65 It is frankly a waste of carbon storage resources to fill them unnecessarily, and profligately, with carbon captured from gas fired power stations like the proposed NZT project, and Keadby 3 in the Humber part of the East Coast cluster, when these gas power stations are simply not required for the CCUS networks. These gas power stations are not essential and their proposed function in the CCUS schemes can quite readily be provided by renewables.

66 This issue has apparently not been considered at all during the planning process for the NZT project, nor wider in BEIS/DESNZ in planning the Government’s CCUS deployment programme.

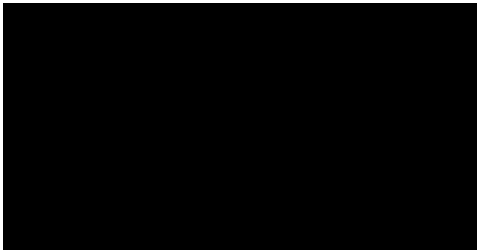
67 The Secretary of State should consider at this stage, if she really wants to consent the NZT project, which locks in burying over 50MtCO₂e of carbon completely unnecessarily, and wastes relatively near-shore, and developed, CCUS storage capacity (in the Endurance field) for the future.

5 NOTE

5.1 Correction noted

68 I note that the applicant accepts the error which I pointed out at bullet 92 of my September 12th submission – that is that the T&S unavailability emissions had not been included in DOC_AP6/Table 3 for the Power supply residual emissions. The applicant subsequently corrected this error at Table 1 and 1.5.3 of its October 6th letter [EN010103-002868] and reconfirms that correction at 1.1.4 of its December 13th letter [EN010103-002891].

6 SIGNED



Dr Andrew Boswell,
Climate Emergency Policy and Planning, January 19th, 2024