Dear netzeroteessideproject@planninginspectorate.gov.uk

Application by Net Zero Teesside Power Limited and Net Zero North Sea Storage Limited ("the Applicants") for an Order granting Development Consent for the proposed Net Zero Teesside project ("the Proposed Development")

Author Details	
Name	**Dr Andrew Boswell**
Position	**Independent Scientist & Consultant**
NZT Registration	**20029943**
Organisation	**Climate Emergency Policy and Planning (CEPP)**

Following my response to John Wheadon's (DESNZ) letter of August 7th 2023 on Sept 6th, I have found some errors in my submitted document.

Please find Clean and Tracked copies of an Errata version of the response. I request that you make these Errata versions available to other parties ASAP.

Please confirm receipt.

Yours sincerely

Dr Andrew Boswell

Author Details	
Name	**Dr Andrew Boswell**
Position	**Independent Scientist & Consultant**
NZT Registration	**20029943**
Organisation	**Climate Emergency Policy and Planning (CEPP)**
Examination Principle Issues	• **Full lifecycle Greenhouse Gas (GHG) emissions** • **Cumulative assessment of GHG emissions** • **Air Quality** • **Scope of Development and Environmental Impact Assessment**

POST EXAMINATION CONSULTATION – 6th SEPT 2023

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.

Contents

1 INTRODUCTION

1.1 Post Examination Consultation – August 7th 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 August 7th 2023.

1.2 Climate Change

2 In this response, I rebut 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_53**[1], and "Appendix 6: Contextualization against Carbon Budget Delivery Plan and Draft Revised NPS Response" referred to here as **DOC_AP6**[2].

3 I note that the applicant previously submitted document "9.29 Cumulative Onshore and Offshore GHG assessment " [**REP6-123**[3]]. I genuinely did not locate this document during the examination as it had been promised for deadline 5 but delivered at a subsequent deadline. In preparing my closing statement at the end of the examination, I made a search for the document in the examination library, but unfortunately did not locate it at that time. I acknowledge that I then concluded that no assessment of the upstream emissions has been made where following reading DOC_9_53, I realise that it was. In responding to DOC_9_53, it is therefore necessary for me to also comment on the details of REP6-123 in this submission.

4 DOC_9_53 was the applicant's response to my submission to responding to the letter from David Wagstaff OBE, Deputy Director, Energy Infrastructure Planning Delivery (Department of Energy Security and Net Zero, DESNZ) of May 16th 2023. The applicant refers to this document as "CEPP's Post Examination Submission", and I abbreviate that here to **CEPP_PES**[4].

---

[1] "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

[2] "Response to the Secretary of States Request for further information dated 16 May 2023 - 6.6 - Appendix 6 Contexualisation against CBDP and Draft Revised NPS response", https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002814-NZT%20DCO%206.6%20-%20Appendix%206%20Contexualisation%20against%20CBDP%20and%20Draft%20Revised%20NPS%20response.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

[4] "Response to the Secretary of State's consultation letter of 16 May 2023", Climate Emergency Policy and Planning (CEPP), https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002795-CEPP%20BOSWELL.pdf

1.3 New Air Quality legislation

5 Since the close of the DCO examination for the NZT project, new legislation has introduced new targets for PM2.5 particulate matter for 2040 with interim targets for 2028.

6 The SoS must grapple with the implications of the new legislation for the NZT project under section 104(5) of the Planning Act 2008. However, the application and environmental statement have not been suitable updated against the new legislation and targets to enable the SoS to do this.

7 Therefore, I submit that the Secretary of State must now require that the applicant updates the Environmental Statement against the new legislation, via further consultation processes.

8 More detail is given in the relevant section below.

1.4 Availability of material to Secretary of State

9 This submission contains many statements relating to how the SoS may reach a reasoned conclusion on the environmental impacts of the NZT project. **I respectfully request that this submission is placed in full before the Secretary of State her/himself to consider.**

2 INITIAL COMMENTS ON DOC_9_53

2.1 Mischaracterisation of CEPP_PES

10 The applicant makes the comment that sections 2.3, 3 and 4 of CEPP_PES "*comprises a generalised commentary of recent Government policy papers, namely the draft Energy NPS and the 'Powering Up Britain' (PUB) document and the CBDP*" and states that CEPP seeks to challenge the lawfulness of the NZS, and it is not a proper forum to make submissions of that nature [DOC_9_53/1.1.4]. Similar comments are made at DOC_AP6/4.1.6 and 4.1.7.

11 Before describing the mischaracterisation, I note that the CBDP is a statutory document under the Climate Change Act 2008 ("**the 2008 Climate Act**"). The document is the plan required to fulfil section 13 of the 2008 Climate Act "*Duty to prepare proposals and policies for meeting carbon budgets*" and section 14 "*Duty to report on proposals and policies for meeting carbon budgets*". The applicant does not appear to recognised the significance of the CBDP as a statutory plan under the 2008 Climate Act in describing it as a mere "policy paper".

12 The applicant's mischaracterisation of CEPP_PES is to consider that the information in CEPP_PES was provided outside of the scope of the Secretary of State's decision making on the Net Zero Teesside Project (NZT) under the Planning Act 2008 ("**the 2008 Planning Act**"). Quite the contrary, the information was provided to directly address and inform the SoS decision making process. The purpose of providing the information on the CBDP and other documents was that it is vital information relating to whether there can be confidence that the NZT project is consistent with the CBDP, and therefore the delivery of "*this critical climate strategy under the Climate Change Act 2008*" as I referred to it as CEPP_PES/38.

13 I made this clear at CEPP_PES/39 "*As well as taking this into account, at the time of his/her decision, the SoS should consider the latest evidence on the revised NZS, the status of any on-going legal challenge to it, and my submissions here (by which I respectfully mean that this submission should be made available to the SoS to consider personally).*" CEPP_PES aimed to place the latest relevant evidence in front of the SoS to assist her/his decision making. This is expanded further below, and especially in the penultimate section on significance assessment.

14 The wider context here is that reasoned consideration of the GHGs from the NZT project and how they comply with the risk-assessed delivery of the CBDP (and the NDC and sixth carbon budget) is very much a live issue for the SoS in her/his decision-making, under section 104 of the 2008 Planning Act. The SoS must reach conclusions as to whether approving the scheme would lead to the UK being in breach of its international obligations (s104(4)); in breach of any statutory duty (s104(5)); or be unlawful (s104(6)). The latest evidence is required to be able to make a reasoned conclusion on these matters, and the material submitted in CEPP_PES was provided to assist the SoS in reaching those conclusions.

15 As matters have progressed further (for example a second Net Zero Strategy legal challenge against the CBDP, on risk assessment grounds, has recently received permission for a full High Court hearing), further information is provided in this document. Again, this new material is not some general commentary on the CBDP, or some vague challenge to the CBDP: it is provided as very specific information which the SoS should consider when making a reasoned conclusion relating to s104(4), s104(5) and s104(6).

3 RECENT UPDATES: POLICY AND LEGAL FRAMEWORK

16 This section is provided as vital information which the SoS should consider when making a reasoned conclusion relating to s104(4), s104(5) and s104(6) of the 2008 Planning Act. It is not provided as a generalised commentary, or as a challenge to Government policy.

3.1 The Scale and Logistical Impact of Net-Zero

17 Before discussing the Carbon Budget Delivery Plan (CBDP) in detail, I wish to submit as a prelude, evidence on the scale of the logistical impact of the legislative and policy changes between the pre-net-zero world and the net-zero world, following the Climate Change Act 2008 (2050 Target Amendment) Order 2019[5]. This is to provide high-level context which the SoS should consider when making a reasoned conclusion relating to s104(4), s104(5) and s104(6) of the 2008 Planning Act.

18 The "Net Zero" statutory instrument has one simple statement of substance at clause 2:

> *2.—(1) Section 1 of the Climate Change Act 2008 is amended as follows.*
>
> *(2) In subsection (1), for "80%" substitute "100%".*

19 The ramifications of the last four words 'for "80%" substitute "100%"' words have not yet been fully grasped and understood by many, including ministers making decisions on infrastructure.

20 As background, the original end target for 2008 Act was for an 80% reduction of greenhouse gas ("**GHG**") emissions[6] by 2050 from 1990 baseline and was based on outdated science. The new end target is for 100% reduction by 2050: this makes small step toward congruence with the science[7].

21 I use "Emissions space" ("**EmSp**") to mean that the available carbon emissions which may be legitimately emitted each year under the Climate Change Act 2008 (the "2008 Act") and the 100% target.

22 I provide the chart below for illustration and to explain three key effects of the legislative change in terms of how the numbers add up, or critically how they may not add up. The chart

[5] The Climate Change Act 2008 (2050 Target Amendment) Order 2019, Statutory instrument at https://www.legislation.gov.uk/ukdsi/2019/9780111187654

[6] The 2008 Act and 2019 "2050 Target Amendment" cover a number of GHGs. However, for this examination, carbon dioxide (CO_2e), or "carbon" is the only gas of interest.

[7] Please see my later point, which I place on record, that the legislative targets, based on CCC, are not science-based. Science-based budgets are more rigorous and demanding, and are needed to comply with Paris Agreement

does **not** purport to be precisely accurate in terms of trajectories[8], but is provided to illustrate the principles discussed.

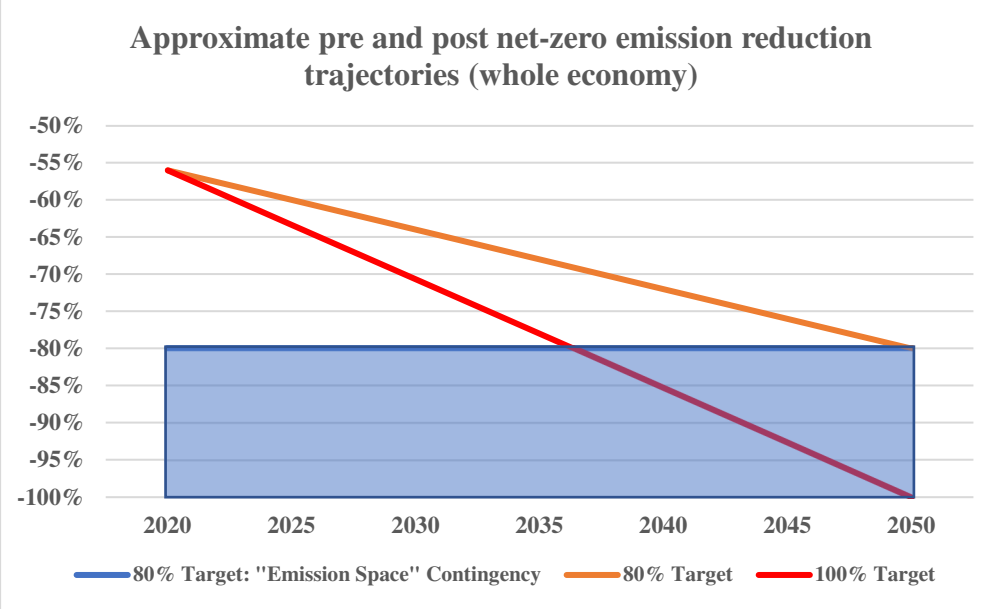


Figure 1: Approximate pre and post net-zero emission reduction trajectories (whole economy)

23 The keys effects of the legislative change can be seen in the graph as follows:

(A) *The UK economy EmSp rapidly contracts each year until 2050* at an average year-on-year rate of c.16.6 million tonnes of CO2e[9] from 2020 under the 100% target. Based on 2020 level, the rate of decarbonisation is approximately 3-4% a year. All existing economic activity must be contained within this rapid contraction of the EmSp. Each sector of the economy must contract emissions, via sectoral decarbonisation. New activity, eg additional emissions from new power infrastructure, competes for emissions sustaining existing activity either within its own sector(s), or from other sectors.

[8] The graph is based on approximate numbers from Figure 1 of the CCC 6th Carbon Budget Report "The Sixth Carbon Budget, The UK's path to Net Zero", December 2020, https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf . This includes emissions from international aviation and shipping (IAS) and shows 2020 levels at approximately 500MtCO2e (and approx. 56% of 1990 levels).

[9] Approximately equivalent carbon footprint to 16,000,000 return flights from London to New York

(B) *The legislated emissions contraction rate via 5-year carbon budgets is extraordinary.* The contraction rate (3-4% a year from 2020) for the 100% target (red line) is an approximate doubling of the contraction rate for the 80% target (orange line). The Government's objective is to decarbonise the electricity supply sector by 2035: in 2022, the sector generated 48 MtCO2e, 11% of UK emissions (CCC analysis[10])

(C) *The removal of any on-going background EmSp from 2020*. This is most critical effect and the one not usually discussed. It is very relevant to the question of whether there is enough EmSp for the NZT to be developed.

A 20% background level of emissions were legally permitted under 2008 Act until 2050 equating to around c.180 million tonnes of CO2e a year, as indicated by the blue block on the figure. This allowed considerable policy and delivery flexibility **that is simply and starkly no longer available**: for example, additional emissions from new fossil fuel based electricity generation could possibly have been contained within the 80% at 2050 target if other sectors had rapidly decarbonised, but this is no longer clearly possible.

24 In short, the approximate doubling of the rate of emissions contraction from 2020, ***and*** removing the legally permitted contingency of c.180 million tonnes CO2e a year in the economy, introduces immense delivery risks to:

- (A) the NDC international obligation for 2030, and
- (B) carbon budgets going forward, especially the 6CB and following budgets after 2033, and
- (C) the net-zero 2050 target (itself dependent on robust delivery of (A) and (B) first).

25 This logistical impact of the recent legislation requires a paradigm shift in policy and planning for the whole economy, which we simply are not seeing yet. Where plans existing like the CBDP, they are under legal challenge for what proposals and policies do exist, and as not being adequately risk assessed.

26 Please note that speculative technology like negative emissions has been built into Government policy to attempt to deal with the loss of the background contingency EmSp. However, negative emissions technologies (NETs) are widely criticised, and are not expected to deliver[11]. The delivery risks involved exert further pressure on the very limited EmSp.

[10] Page 199/200, "Progress in reducing Emissions - 2023 Report to Parliament", Climate Change Committee (CCC), June 2023, https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-UK-emissions-2023-Report-to-Parliament.pdf

[11] This is again a complex subject which may be expanded, if required. For the moment, and in short, greenhouse gas removals (GGR) and negative emissions technologies may provide extremely costly, speculative, and unproven at scale methods which proxy for an "overdraft facility" on carbon emissions. Even if these work, they would be like paying back a loan at a huge interest rate. See Kevin Anderson , John F. Broderick & Isak Stoddard

27 Further, I place on record that the legislative targets[12], based on CCC, are not science-based. Science-based budgets are more rigorous and demanding and are needed to comply with Paris Agreement[13]. The point is that even meeting the CCC targets is actually not enough to have any chance of keeping global average temperature to well under 2ºC (the 1.5ºC Paris Agreement target is now almost certainly breached[14]).

3.2 The Revised Net Zero Strategy

28 The Government laid the original Net Zero Strategy (NZS) before Parliament on 19 October 2021 as a report under section 14 of the Climate Change Act (CCA) 2008. The strategy was intended to fulfil the duty, at section 13 of CCA 2008, to "prepare such proposals and policies" that will enable the carbon budgets under the CCA 2008 to be met, now extended by the 2019 amendment to the 2008 Act. That is proposals and policies that would secure delivery of the UK climate targets including the legislated carbon budgets.

29 The NZS was subsequently found to be unlawful in July 2022 ("**first NZS legal case**"), and the Government were ordered to lay before Parliament a fresh report under section 14 before the end of March 2023.

30 On March 31st 2023, the Government subsequently published a revised Net Zero Strategy (NZS) with the overarching title "Powering Up Britain" (PUB), and the Carbon Budget Delivery Plan (CBDP) within it, as well as many other related documents comprising nearly 3000 pages in total.

31 On July 7th 2023, Friends of the Earth, ClientEarth and Good Law Project, the same claimants as in the first NZS legal case, announced that they are taking the Government to court for the second time in under two years ("**the second NZS legal case**") because of "*the Government's*

(2020): A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways, Climate Policy, DOI: 10.1080/14693062.2020.1728209, Appendix A "*However, there is wide recognition that the efficacy and global rollout of such technologies are highly speculative, with a non-trivial risk of failing to deliver at, or even approaching, the scales typically assumed in the models. … Whilst the authors of this paper are supportive of funding further research, development and, potentially, deployment of NETs, the assumption that they will significantly extend the carbon budgets is a serious moral hazard (Anderson & Peters, 2016).*"

[12] under the Climate Change Act 2008

[13] A key issue is the "area under the curve" in the emissions trajectories. The near flat line trajectories in Figure 1 of the CCC 6th Carbon Budget Report "The Sixth Carbon Budget, The UK's path to Net Zero", December 2020, https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf are inadequate and are based on policy targets like "Net Zero 2050". Science-based carbon budgets such as those from the Tyndall Centre (research that the UK Department of Business, Energy and Industrial Strategy supported) demonstrate that the area under their curve of their emissions trajectories is consistent with the global carbon budgets from the Intergovernmental Panel on Climate Change (IPCC) where the CCC do not. The Tyndall budgets are consistent with IPCC global carbon budgets of 1.7ºC degrees of global heating. This is not 1.5oC because, essentially, there are not enough degrees of freedom in the system to produce budgets consistent with 1.5ºC, the lowest end of the Paris target. See more in Tyndall's "Factor of Two" research paper, Kevin Anderson, John F. Broderick & Isak Stoddard (2020) A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways, Climate Policy, 20:10, 1290-1304, DOI: 10.1080/14693062.2020.1728209.

[14] "*Many climate experts believe that outcome is inevitable. Global temperatures will climb higher than 1.5 degrees compared with 150 years ago, they say, though often only in private.*", from article Scientific American, Chelsea Harvey, "The World Will Likely Miss 1.5 Degrees C—Why Isn't Anyone Saying So?", https://www.scientificamerican.com/article/the-world-will-likely-miss-1-5-degrees-c-why-isnt-anyone-saying-so/

failure to include a proper assessment of the delivery risks associated with the policies and proposals in the Carbon Budget Delivery Plan"[15].

32 On September 1st 2023, these claimants announced that they have been given permission to go to a full Judicial Review hearing in the High Court[16].

3.3 Delivery risk and policy gap in securing delivery of net zero, and the undisclosed Risk Tables

33 In relation to securing the NZS, I highlight here what the Court said in the first NZS legal case judgment[17] on delivery risk and policy gap. Holgate J. recorded the NZS's acknowledgement that the delivery pathways to achieve the 6th Carbon Budget are highly ambitious and face considerable delivery challenges and recorded that achievement was subject to a wide uncertainty range. The judge noted at paragraphs 204 and 211 that in approving the Net Zero Strategy, "*one obviously material consideration which the Secretary of State must take into account is risk to the delivery of individual proposals and policies and to the achievement of the carbon budgets and the 2050 net zero target.*" In finding the NZS unlawful, the judge described risk to delivery as the critical issue when concluding that the information provided to the Minister when reporting on the NZS was insufficient to enable him to discharge his reporting obligations under section 14 of the Climate Change Act 2008.

34 Critically at paragraph 249 the judge says:

> *"… the ability to meet the statutory targets depends upon the contributions made by a multiplicity of proposals and policies adopted by the Secretary of State. This is obviously material to the risk of delivery. It is critical to any assessment by Parliament, and by the public, of how the statutory targets are likely to be met, by what means and with what implications."*

35 With the new PUB and CBDP, a number of issues arise which are likely[18] to be taken before the Court, these include:

(A) Delivery risks have not been assessed in the CBDP for each policy and proposal as they should have been;

(B) The CBDP (at paragraph 26) is based on the assumption that all quantified policies and proposals will be delivered in full;

---

[15] Good Law Project press release, July 2023, "The Government is still failing on net zero, so we are taking them back to court", https://actions.goodlawproject.org/net_zero_2

[16] 'Not fit for purpose': Green groups secure High Court hearing over government's net zero plans, Business Green, Sept 1st 2023, https://www.businessgreen.com/news/4123909/fit-purpose-green-secure-court-hearing-governments-net-zero-plans

[17] R (Friends of the Earth) v Secretary of State for Business Energy and Industrial Strategy [2022] EWHC 1841 (Admin)

[18] Based on Good Law Project press release, July 2023, "The Government is still failing on net zero, so we are taking them back to court", and the Pre-Action Protocol (PAP) letter embedded within it at https://actions.goodlawproject.org/net_zero_2

(C) The Statements of Facts and Grounds (SFG)[19] from one of the claimants in the second NZS case describes that '*in pre-action correspondence, the Secretary of State for Energy Security and Net Zero ("SSESNZ") has revealed that he was, in fact, provided with analysis that set out in tables information about the delivery risk associated with each policy or proposal contained in the CBDP ("**the Risk Tables**")*'. These have not been published by SSESNZ to date.

36 Points (B) and (C) is important in consideration of the NZT project and any subsequent decision on it. The recent practice of ministers has been to approve projects (for example recent roads DCO projects) based on the assumption that all quantified policies and proposals under the NZS will be delivered in full. That is, there has been an assumption in recent DCO decisions that the delivery of NZS is fully secured when quite plainly it is not. As far as the SoS decision making process for the NZT project, she/he must reach a reasoned conclusion based on the known risks to delivery of the NZS and CBDP, based on the Risk Tables held by her/his own department.

37 It should be noted that the applicant in DOC_AP6 only contextualises the NZT project against the CBDP sectoral residual emissions: the applicant does not consider the risks to whether those residual emission may actually be delivered. It is acknowledged that the (Climate Change Act 2008) section 14 CBDP Risk Tables have not been disclosed by the Government (itself considered unlawful by a claimant in the second NZS legal case, now going to full High Court hearing) so may not be available to the applicant. The issue remains that the SoS must consider risk to policy delivery, with the assistance of her/his own Risk Tables, in order to reach a reasoned conclusion about the GHG emissions from the NZT project.

38 The risk assessment from the CCC in its 2023 Progress Report (see later) was available to the Applicant well before it submitted DOC_AP6 on August 4th but has been ignored by the Applicant despite the advice of the CCC being considered as having material weight by the judge in the first NZS legal judgement. (And I submit in this document the CCC advice has material weight for the SoS in reaching her/his reasoned conclusion).

[19] See https://goodlawproject.org/crowdfunder/net-zero-2 and link within to SFG at https://glplive.org/NZ2-SFG

3.4 Climate Change Committee (CCC) 2023 Progress Report

39 On 28th June 2023, the Climate Change Committee (CCC) submitted its "Progress in reducing Emissions - 2023 Report to Parliament" [20] (referred to as "**CCC_2023_PROG**") under Section 36 (1) of the Climate Change Act 2008.

40 It should be noted that Holgate, J stated in the first Net Zero Strategy judgment:

> *[188] "… It is apparent that the CCC as an expert body scrutinises the work of the Secretary of State and his Department with great care and in depth. The CCA 2008 proceeds on the basis that the reports of the CCC will provide much assistance to Parliament."*
>
> *[215] "The role of the CCC is to give advice as an expert body rather than to opine on questions of law. But nonetheless the court should give considerable weight to their advice in December 2020 on the setting of CB6 that the Government's net zero plans should include a "quantified set of policy proposals" and their criticism in October 2021 of the NZS for failing to quantify the effect of each policy and proposal on emissions reductions ([65]-[67] and [152] above)."*

41 Whilst this is a planning decision, significant material weight should be given to the CCC and their 2023 Progress Report by the SoS in reaching a reasoned conclusion with respect to section 104 of the 2008 Planning Act. It would be wrong, and challengeable, for the SoS to dismiss the CCC's advice in its report as less than significant material weight.

42 A key matter is that CCC_2023_PROG notes that, in the CBDP, there is a shortfall on the emissions reductions[21] required to meet the UK 6th carbon budget (6CB) and UK's Nationally Determined Contribution (NDC) for 2030, our international obligation under the Paris agreement.

43 I now look at the impact and risks on near-term climate targets (ie 2030 NDC; and 6th carbon budget (average year 2035)) for the power/electricity supply and the fuel supply sectors, as being the relevant sectors to the NZT scheme: the upstream Well to Tank emissions come under the fuel supply sector, and the other emissions related to the NZT project mostly[22] come under electricity supply, or power sector (in CBDP).

---

[20] "Progress in reducing Emissions - 2023 Report to Parliament", Climate Change Committee (CCC), June 2023, https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-UK-emissions-2023-Report-to-Parliament.pdf

[21] CCC _2023_PROG/page 93

[22] My analysis here does not consider emissions in the Industry, Waste and F-gases, and Domestic Transport sectors for brevity, and because over 95% of the GHGs from the project are attributable to the Fuel supply and Power supply sectors [DOC_AP6/2.1.7]

3.5 Impact on UK international obligation(s) (2030 NDC)

44 Figure 4b on page 24 of CCC_2023_PROG, reproduced below, shows that the electricity supply sector has large emission reductions[23] to make for the 2030 NDC. Electricity supply is required to reduce from a baseline of 53.8 MtCO2e/yr to 6.7 MtCO2e/yr (the "CBDP pathway") in 2030. The CCC assess that credible plans only exist for 41% of this (19.3 MtCO2e/yr – green on the Figure). There are risks for 27.7 MtCO2e/yr (yellow on the Figure) of electricity supply emission reductions for the NDC.

45 Note that the Fuel Supply sector is not illustrated on Figure 4b: however, the data is provided in the accompanying spreadsheet[24]. The Fuel Supply sector is required to reduce from a baseline of 23.9 MtCO2e/yr to 20.0 MtCO2e/yr (the "CBDP pathway") in 2030. The CCC assess that credible plans only exist for 25.5% of this (1 MtCO2e/yr – equivalent to green on the Figure). There are risks for the remaining 2.9 MtCO2e/yr of fuel supply emission reductions for the NDC.

[23] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

[24] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

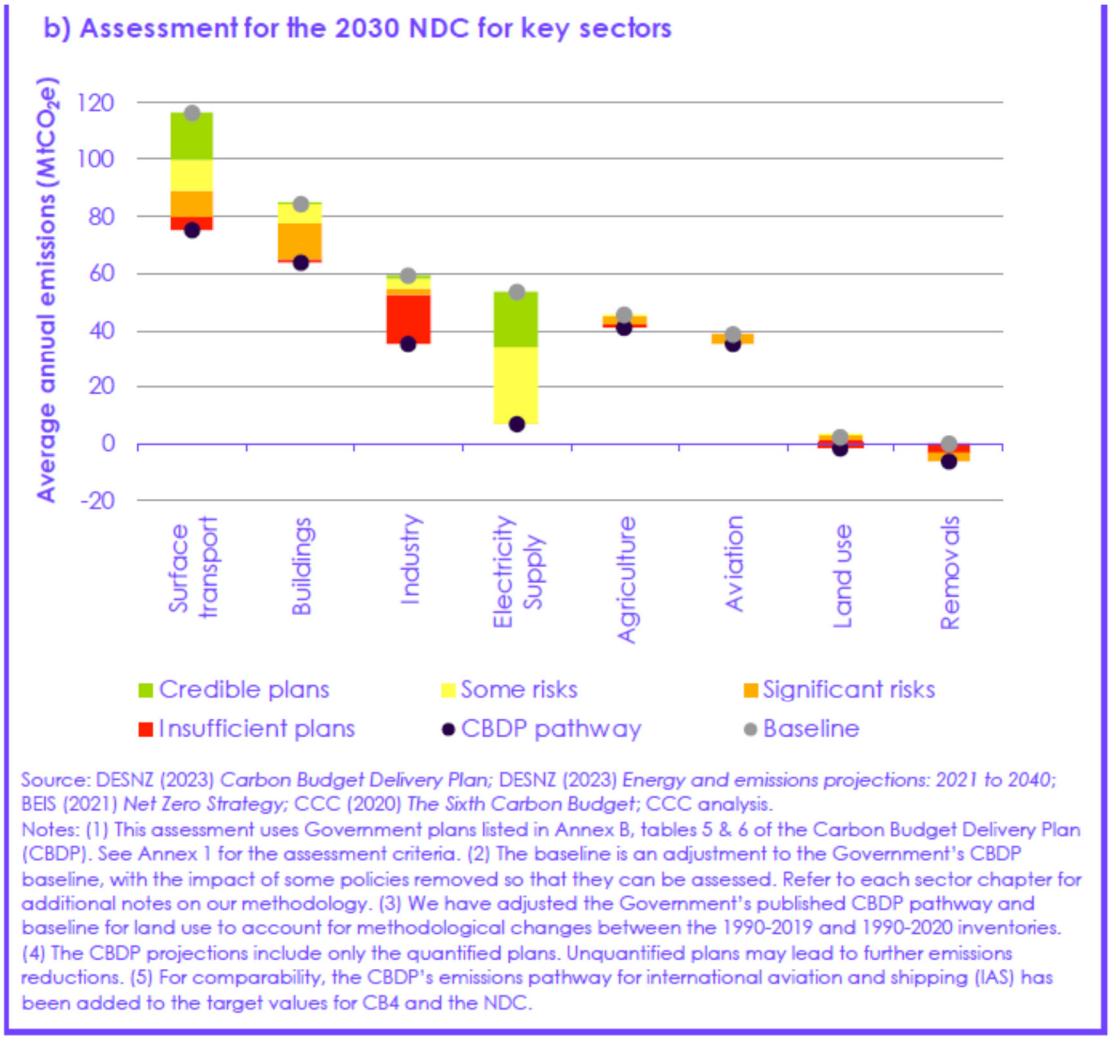


Figure 2:CCC Progress Report 2023, Fig 4b reproduced

3.6 Electricity Supply - Impact on 6th carbon budget

46 Figure 7.7 on page 211 of CCC_2023_PROG, reproduced below, shows the assessment of policies and plans for electricity supply across the 4th, 5th and 6th carbon budgets.

47 For the 6CB, electricity supply is required to reduce[25] from a baseline of 66.5 MtCO2e/yr to 3.5 MtCO2e/yr ("Government Pathway"). The CCC assess credible plans only existing for

[25] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

30% of this (19.3 MtCO2e/yr – green on the Figure). A remaining 43.8 MtCO2e/yr of electricity supply emissions reductions require to be fully secured in the 6CB.

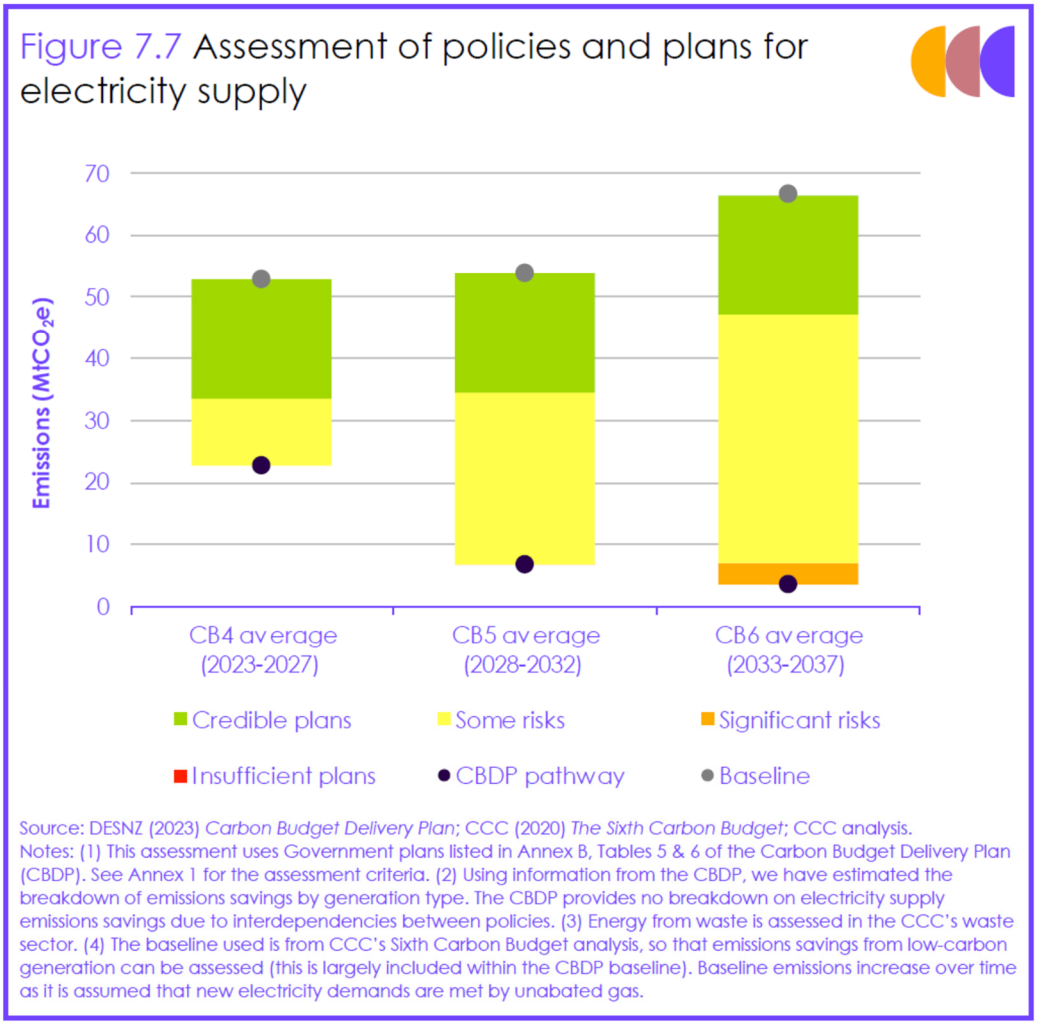


Figure 3: CCC Progress Report 2023, Fig 7.7 reproduced

3.7 Fuel Supply - Impact on 6th carbon budget

48 Figure 8.7 on page 230 of CCC_2023_PROG, reproduced below, shows the assessment of policies and plans for fuel supply across the 4th, 5th and 6th carbon budgets.

49 For the 6CB, fuel supply is required to reduce[26] from a baseline of 17.3 MtCO2e/yr to 12.0 MtCO2e/yr ("Government Pathway"). The CCC assess credible plans only existing for 17% of this (0.9 MtCO2e/yr – green on the Figure). A remaining 4.4 MtCO2e/yr of fuel supply emissions reductions require to be fully secured in the 6CB.

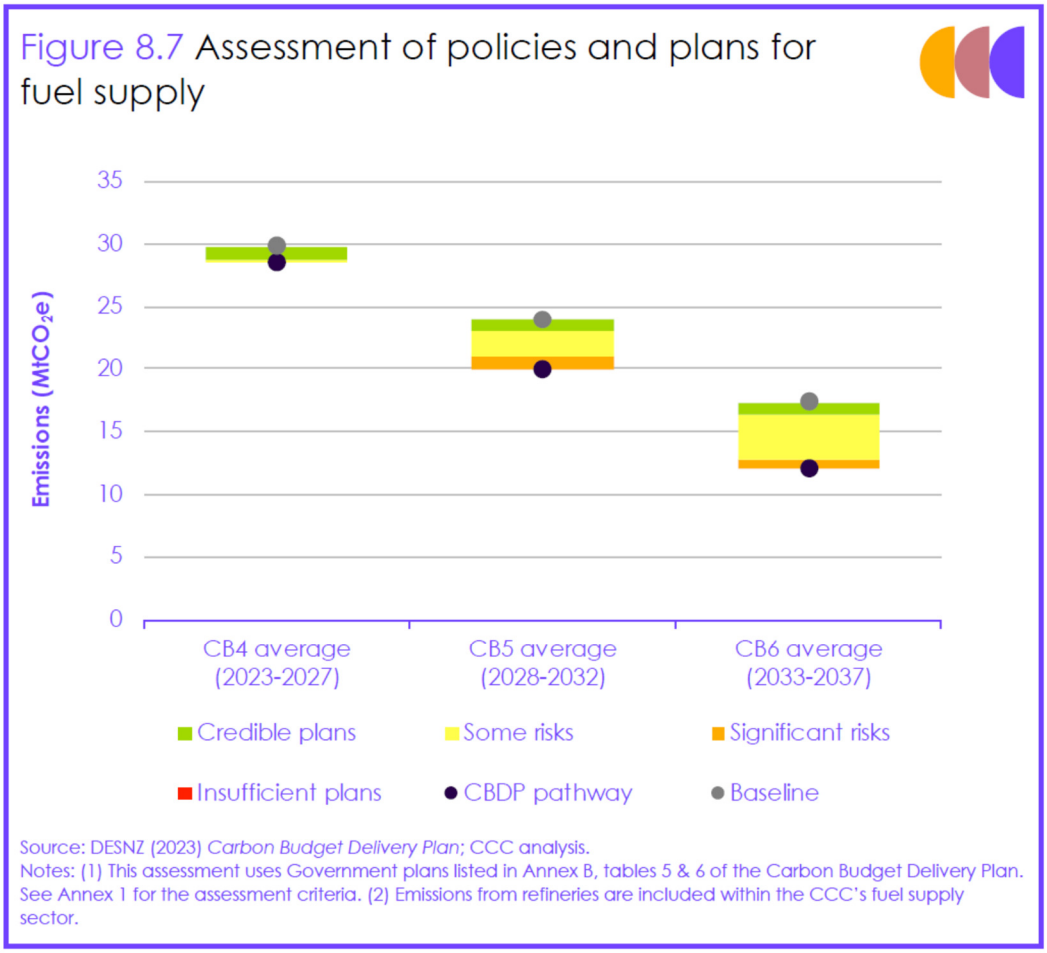


Figure 4: CCC Progress Report 2023, Fig 8.7 reproduced

50 The above reveals the true extent of the "delivery gap" in power/electricity supply, and fuel supply, decarbonisation policy as advised to the Government by their own advisors, the CCC.

[26] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

4 COMMENTS ON REP6-123: CARBON CALCULATIONS

51 REP6-123 provides the applicant's "Cumulative Onshore and Offshore GHG assessment". This section looks at the calculation section, and flawed assumptions and errors within it. A subsequent section looks at the significance assessment itself.

4.1 The assessment diverges from the application description (definition) of the project

52 For the assessment, the applicant changes the definition of the project from that which is used throughout the application to a different definition designed to suit its purposes of deriving an overly optimistic, and actually false, quantification of the cumulative carbon emissions from the scheme.

53 A description of the project is given in REP6-123 at section 1.2.1. This gives an outline definition which is used widely in many other documents in the Application: this can be considered the standard definition of the project. It describes ten works of which Work No 1 is the key element.

54 *"Work Number ('Work No.') 1"* describes the *"Low Carbon Electricity Generating Station"*. Critically, it is defined atomically as a single entity as follows: "*a Combined Cycle Gas Turbine electricity generating station with an electrical output of up to 860 megawatts and post-combustion carbon capture plant*". It is indisputable that the electricity generating station and the carbon capture plant are part of one work which, for the purpose of the environmental statement for the application, is indivisible into separate elements.

55 Nine other works No. 2 to No. 10 are also described: these essentially are necessary connections and services for the Low Carbon Electricity Generating Station itself to operate.

56 As Work No.1 is described atomically, it is clear that the future baseline of the project - the baseline in which the NZT project is not implemented – is one in which Work No. 1 is not implemented (along with the other nine works). In other words, the baseline of the project for environmental assessment is one in which the project is not implemented. This corresponds to the standard "Do Minimum" (or "Do Nothing") and "Do Something" approach. The future baseline is "Do Minimum" or the scenario in which the project is not implemented, and "Do Something" is the scenario in which the project is implemented.

57 However, at REP6-123/2.2.3, the applicant states the following:

> *"The future baseline scenario, i.e. a counterfactual in which the Proposed NZT Development does not take place, assumes the continued operation of a similar CCGT power station that is not fitted with carbon capture and storage technology."*

58 The applicant's "counterfactual" scenario formulates the environmental assessment incorrectly as follows. This then result in the miscalculation of carbon emissions for the environmental assessment which will be explained below.

A. It is a fabricated scenario which purports to provide a "Do Minimum" case for the project but does nothing of the sort. Instead it invents a completely different scenario which is not part of the application.

B. Effectively, the atomic description of Works No.1 is broken into two sub-elements. In doing so, it reduces Works No. 1 to the "*post-combustion carbon capture plant"* sub-element and derives a <u>false</u> future baseline from the "*CCGT power station*" sub-element.

C. The wording of 2.2.3 is extremely misleading with the use of the word "continued" which suggests falsely that the "CCGT power station" already exists when it does not. There is no evidence, anywhere, that the CCGT power station would be built anyway. In fact, the CCGT power station <u>is only delivered by delivering the application for the NZT project</u>.

4.2 Arbitrary choice of counterfactual

59 There would be no good reason for choosing such an arbitrary counterfactual even if this choice of counterfactual was lawful, which it is not as it changes the nature of the project seeking planning approval and therefore is not valid as part of the environmental statement for that project.

60 For example, an equally valid counterfactual would be an offshore wind development which delivered the same electrical power output as Works No. 1 and the additional electricity necessary for powering the wider carbon capture and storage facilities of the Proposed NEP Offshore Development (ie in place of where parts of the CCUS network would be powered by Works No. 1 in the current application).

61 This offshore wind counterfactual actually provides a more preferable alternative to the scheme which does not rely on a fossil fuel plant at its centre, and therefore assists the UK to decarbonise power and industry more rapidly. It would provide a CCUS network facility for 3rd party emitters but would be based around renewable energy infrastructure for its core operation. In such a counterfactual scenario, industrial operations such as cement and steel production could be decarbonised with the powering of the CCUS network coming from renewables and being almost zero carbon footprint. It is a far more preferable option, but <u>such an alternative has never been tested by the Applicant</u>.

62 Many other alternatives, or counterfactuals, could be chosen. For example, include onshore wind, or solar PV above, energy storage, and combinations of all of these with offshore wind above. In other words, an alternative counterfactual can be readily conceived which source

power from a combination of offshore and onshore wind[27], solar PV and energy storage to provide security of supply. I made this point that alternatives to a gas fired power station have not been considered in the Application in my original WR [REP2-061/22]:

> *"It is important to note that whilst reductions in methane leakage provide a relative benefit compared to not reducing methane leakage,* ***not*** *extracting and combusting gas in the first place would remove the methane emissions associated with the NZT project completely (and the abated or unabated CO2 emissions from gas combustion), provides much greater benefit and is a much more credible scientific approach. I acknowledge that UK Government policy, on which the Applicant relies, has not yet caught up with the massive technological advances and cost reductions in renewables and energy storage that provide an opportunity* ***now*** *to do much better than developing a gas power station which produces a significant net increase in GHG emissions in a climate emergency. These technologies have the potential to provide dispatchable carbon free power generation on the same timeframe as the NZT project (ie: starting to supply power in 2027)."*

63 The applicant seeks to justify its choice of counterfactual at REP6-123/3.6.9-10 on the basis that "*the transition to a net-zero future explicitly requires the replacement of existing high-carbon emissions sources with lower emissions sources that deliver a similar function in terms of dispatchable electricity generation that can provide security of supply … that will be part of a wider move to replace existing, unabated high-carbon electricity generation installations*". A renewable energy alternative counterfactual also meets this description at an overall much lower carbon footprint, and as stated in my WR with the new technology in renewables and storage can provide security of supply.

64 The fact is that the applicant choose just a single counterfactual, fabricated to maximise, falsely, the supposed benefits of the scheme, and ignored many other possible counterfactuals.

[27] As of Sept 5th 2023 with less planning restrictions

4.3 Unlawful counterfactual case

65 The Applicant repeats the false counterfactual narrative in DOC_9_53, 3.1.10 as follows:

> *"The net lifetime emissions impact of the Proposed Development and the proposed NEP development is therefore a net emissions reduction of over 32 MtCO2e, relative to a without-project baseline, which is reasonably assumed to be an unabated Combined Cycle Gas Turbine of similar size and running hours."*

66 This is not a reasonable assumption. It is not the "without-project baseline" used in all other aspects of the Environmental Statement as explained above. It is also an unlawful estimate of emissions as it creates false baseline by artificially breaking down the core part of the project, Works No. 1.

67 Note the 32MtCO2e "reduction" over 25-years is also false, due to the double counting of 53.3 MtCO2e carbon capture emissions, as explained below. The correct value using the applicant's assumptions is 20.8 MtCO2e of emissions to the atmosphere over 25 years, as shown in the corrected version of REP6-121/Table 3-4 below.

68 As above, the counterfactual (or "without project baseline") is unlawful as it changes the nature of the project seeking planning approval and fabricates a false future baseline which is not part of the application.

4.4 Double counting error

69 Irrespective of the unlawful counterfactual, the assessment contains a double counting error. This is as follows with context of the source figures from APP-103:

A. Table 21-10 of APP-103 "ES Chapter 21: Climate Change" gives the "Hourly unabated GHG emissions from power plant (kg CO2e)" as 281,547 kg CO2e.

B. At 8,424 operating hours per year, the annual unabated emissions (Direct Scope 1 emissions) are 2,371,752 tCO2e. For 25 years, this is 59,293,798 tCO2e.

C. On the 90% carbon capture assumption, 53,364,420 tCO2e are captured over 25 years, leaving 5,929,380 tCO2e as "Uncaptured direct emissions from combustion of natural gas". This is the data carried forward to REP6-123/Table 3-1 and is agreed on the basis of the assumptions given.

D. REP6-123/Table 3-1 generates a total onshore figure based on construction emissions, the "Uncaptured direct emissions from combustion of natural gas" and other operation emissions, giving a total of 16,858,196 tCO2e.

E. Note, for the purposes (only) of demonstrating the double counting error, I accept the Well to Tank emissions from the upstream supply of natural gas as given at

10,101,668 tCO2e. This should not be taken as meaning that I agree this figure: I do, however, accept how the Applicant has explained in DOC_9_53 how it has derived this figure from the 2022 DEFRA/BEIS.

F. The 25-year total of 16,858,196 tCO2e is then carried forward to REP6-121/Table 3-4 as "Total Onshore" GHG emissions. Note from the above, that this figure has already had 90% of the Scope 1 Direct combustion emissions subtracted from it due to the "post-combustion carbon capture plant" within Works No. 1, as explained above.

G. The applicant then subtracts the carbon captured by Work No 1 **a second time** at the line "Carbon Captured" in REP6-121/Table 3-4.

H. This error:

(i) is a very large calculation error of over 50MtCO2e.

(ii) infects the subsequent significance assessment within REP6-123 which is based upon REP6-121/Table 3-4.

4.5 Correcting the double counting error

70 A corrected version of REP6-121/Table 3-4 using the applicant's assumptions (not agreed but used for this purpose) is given below:

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	
Carbon capture (NZT only)	Carbon captured	**Already accounted above**	
	T&S unavailability adjustment	3,592,523	
	Adjusted for T&S unavailability	3,592,523	
Whole life GHG emissions		20,808,127	

Table 1: Corrected version of REP6-121/Table 3-4

4.6 Emissions from the scheme

71 Despite the fabricated and false "counterfactual", and the double counting error above, the Applicant states at REP6-123/2.2.4:

> *"In absolute terms, however, the direct emissions from the combustion of natural gas at the power station, and the indirect emissions from the supply of this gas, continue to represent emissions to the atmosphere. The carbon capture system within the Proposed NZT Development avoids the emission of a substantial mass of carbon dioxide that would otherwise be released, but considering the boundaries explained in 2.2.2 above i.e. excluding third-party emitters, it does not remove carbon dioxide from the atmosphere."*

72 The statement that the NZT project "does not remove carbon dioxide from the atmosphere" is correct, and it is the only correct way to consider the project. It is deplorable that the applicant fabricated a false counterfactual, and made a double counting error, to try to claim otherwise.

73 Table 1 above shows that the absolute emissions from the project over 25-years is 20,808,127 tCO2e. This figure assumes the Applicant's other assumptions: including the boundaries explained in REP6-123/2.2.2, the 90% carbon capture rate, the 93.5% T&S system availability, the applicants Well to Tank emissions estimate. As explained above, I accept these assumptions for the purposes of highlighting calculation and assessment errors, but I do not necessarily agree them. 20,808,127 tCO2e is not just a lack of removal of CO2 from the atmosphere, it is a very large addition of CO2 to the atmosphere over the years 2026 to 2051.

74 The SoS must make a reasoned conclusion about such a large quantum of additional GHG emissions being released to the atmosphere. To do so requires consider contextualisation which is explained in the rest of this submission.

5 WELL TO TANK EMISSIONS

75 DOC_9_53 responded to the recent scientific paper published in the Royal Society of Chemistry journal and which I submitted in my letter of 30th May 2023. For the moment, I park further discussions of that paper: that is to say, I do not necessarily agree with the Applicant's comments on that paper, but I do not seek to rebut them here either. It is more important here to concentrate on other issues relating to methane emissions from upstream oil and gas activities, as below.

5.1 Applicant's quantification of Well to Tank emissions

76 The applicant has laid out how it estimated the Well to Tank emissions. I make these points.

77 The applicant estimates Well to Tank emissions for its 25-year assessment on "*using the appropriate WTT factor for natural gas provided in the 2022 dataset of emissions factors published by DEFRA/BEIS. 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*". [DOC_9_53/3.1.4]

78 The problem here is that a 25-year projection is based upon one year of data, and there is potentially large variability in the Well to Tank emissions depending on market forces and geopolitical events. I raised some initial concerns on this in my Written Representation at REP2-061/2.4 "*gas supply chains are not stable*". I now provide further, updated, concerns.

5.2 Variability of Well to Tank emissions

79 The key factors at play here are, and (1) variations in carbon intensity of upstream methane leakage between different source locations, and (2) variations in the geographical sources in methane supply, and how these factors combine.

80 Factor (1) was recently highlighted by a methane (natural gas) carbon footprint analysis by the North Sea Transition Authority (NSTA) which showed gas extracted from the United Kingdom Continental Shelf (UKCS) has an average emission intensity of 21 kgCO2e/boe; whereas imported LNG has a significantly higher average intensity of 79 kgCO2e/boe (ie: on average 4 time greater). The NSTA fact sheet is reproduced in Appendix A with a diagram illustrating the point above, reproduced below.

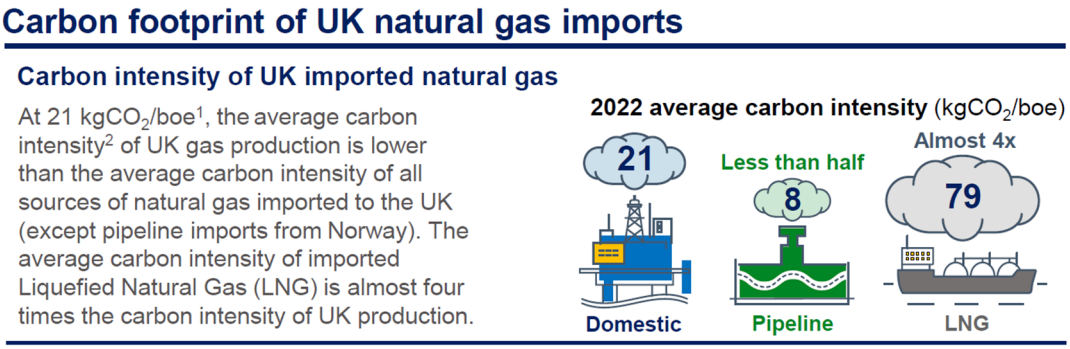


Figure 5: Carbon footprint of UK natural gas imports (reproduced from NSTA)

81 Consider with Factor (2), the fuel source location, the NSTA analysis shows that in 2022 the UK used 38% of methane from UK sources, and 14% from the US. However, when the CO2e emissions were estimated from these sources, the US LNG supplies generated 35% of upstream emissions compared to 24% for the UK supply (see "2022 UK gas supply and emissions" in Appendix A). In other words, the upstream emissions were dominated by high methane leakage in supplies from a relatively small total of the gas used in the UK.

82 Conversely, Norway as a pipeline supplier has provided the "cleanest" methane supplying 34% of UK supply in 2022 and only 7% of the 2022 emissions.

83 The July 2023 "Quarterly Gas Review: Gas Markets in 2023 Tracking Key Metrics" from the Oxford Institute of Energy Studies[28] describes that in Q2 2023, the flow of Norwegian gas to Europe (including the UK) showed a significant year-on-year decline due to maintenance activities in field production capacity; processing plant capacity; and receiving terminal capacity. It is likely for 2023 that Norwegian supply will be considerable curtailed as a result, and will be made up with imported LNG, including from the US. Page 10 of the review is reproduced at Appendix B in which Figure 1.8 shows that Norwegian pipeline supply to UK dropped by 80% between April and June 2023.

84 At DOC_9_53, the applicant notes that the June 2023 WTT factor from DEFRA/BEIS was 3% lower than the factor for 2022. However, the applicant does not note that the factor can also increase and is very likely to do so. The figure at June 2024 (taking in to account the decline in Norwegian supply in 2023 noted above) is likely to be greater than the 2022 factor. Given considerable loss of the cleanest methane supply (ie from Norway) in 2023, and its most likely substitution with the dirtiest methane produced via LNG, the increase in the factor is likely to be considerably more than 3%.

85 The Applicant presents its REP6-123 assessment as a worst case, but the Applicant has no justification for claiming that the Well to Tank estimates are a worst case. The Applicant has not addressed the issue of methane gas supply chain instabilities despite this being raised by me from my WR onwards.

86 The SoS must consider the impact that gas supply instability on the NZT GHG emissions in reaching a reasoned conclusion on the emissions.

6 COMMENTS ON DOC_AP6: CBDP CONTEXTUALISATION

87 First, I examine the residual emissions calculations. This supersedes my submission at CEPP_PES. CEPP_PES is extended to consider the two main CBDP sectors involved in NZT: fuel supply and power supply.

6.1 Contribution of the Well to Tank emissions in the CBDP fuel supply sector residual emissions

88 I use the Applicant's estimate of 0.4 MtCO2e/yr of upstream Well to Tank emissions as stated at DOC_9_53/3.1.4 "*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*" to assess the impact on the 6CB Fuel supply residual emissions.

89 As noted above, the Well to Tank emissions figure is in fact subject to variations (a small downward change in 2022, and most likely a much larger upward change in 2023).

[28] "Quarterly Gas Review: Gas Markets in 2023 Tracking Key Metrics", Oxford Institute of Energy Studies, July 2023 , https://www.oxfordenergy.org/wpcms/wp-content/uploads/2023/07/OIES-Quarterly-Gas-Review-Issue-22.pdf

90 The CBDP 6th carbon budget (6CB) average annual residual emissions for the Fuel supply sector[29] (9.6MtCO2e). The Applicant's 0.4MtCO2e/yr figure is therefore 4.21% of the annual residual emissions. The applicant is in agreement at DOC_AP6/Table 3.

6.2 Contribution of the remaining emissions in the CBDP power supply sector residual emissions

91 The CBDP 6th carbon budget (6CB) average annual residual emissions for the Power supply sector[30] (8.4MtCO2e). If only the Direct emissions from the combustion in the NZT power plant are considered, with the assumption of 90% CCS, then the annual emissions are 237,175 tCO2e which gives 2.82%. The applicant is in agreement[31] at DOC_AP6/Table 3.

92 However, the calculation ignores (1) the offshore emissions as estimated at REP6-121/3.2, and (2) the loss of combustion emissions capture through T&S unavailability as estimated at REP6-121/Table 3-3. The T&S unavailability emissions are 3,592,523 tCO2e over 25 years, or 143,700 tCO2e per year[32]. This is 1.71% of the Power supply residual emissions. When the combustion only 2.82% is added to the T&S unavailability 1.71%, the estimate is 4.53%. The estimate as low as it does not include the offshore emissions attributable to the Power supply sector[33]. The applicant's analysis in DOC_AP6 is in error in not considering the offshore emissions and T&S unavailability emissions and is inconsistent with REP6-123 in that respect.

93 The 25-year whole life GHGs emissions for the project are 20,808,127 tCO2e (832,325 tCO2e/yr) including offshore and T&S unavailability emissions as presented at Table 1. When annualised for a year in the 6CB, these consume 4.21% of the fuel supply annual residual emissions, and 4.53% (underestimate as explained) of the power supply annual residual emissions. The applicant has also identified emissions in the Industry, Waste and F-gases, and Domestic Transport sectors which I do not consider here.

6.3 Lack of deeper assessment based on delivery risk analysis

94 The assessment made by the applicant in DOC_AP6 assumes that each sector residual emission for the 6CB will be 100% delivered: that is, it is assumed that the policies and proposals in the CBDP for each sector will be delivered in full. No evidence has been provided by the applicant that this assumption is true. It is, in fact, very unlikely to be true.

---

[29] Table 2 of the CBDP (page 13) gives the Fuel sector residual emissions at 48 MtCO2e for the 6th carbon budget, or an average of 9.6 MtCO2e per year between 2033 and 2037.

[30] Table 2 of the CBDP (page 13) gives the Power sector residual emissions at 42 MtCO2e for the 6th carbon budget, or an average of 8.4 MtCO2e per year between 2033 and 2037.

[31] The applicant states 2.83% due to inconsequential differences in rounding.

[32] This gives a total of 380,876 tCO2e/yr – 237,175 tCO2e/yr from uncaptured direct emissions from combustion of methane and 143,700 tCO2e/yr from T&S unavailability.

[33] The offshore emissions are estimated by the applicant as 357,408 tCO2e: 324,699 tCO2e for construction over 3 years, 30,988 tCO2e for operation over 25 years, and 1,721 tCO2e for decommissioning [REP6-123/Table 3-2]. It is not clear exactly which parts of these emissions should be attributed to the Power supply sector.

For example, as one of the claimants in the second Net Zero strategy case[34] has written to the High Court:

> *"The Defendant, as the SSBEIS had done in the NZS, based his overall s.13 conclusion – that the CBDP policies would enable the carbon budgets to be met – firmly on the assumption that all 191 of the quantified CBDP policies would be delivered in full. On any view, that is a very optimistic assumption, given the huge number of policies, the fact that they would take effect across a period of over 15 years, and the significant technological, political and regulatory challenges involved in delivering them. Indeed, the CCC's Progress Report published on 28 June 2023 raises particular concerns about delivery risks and gaps, including, among other things, the reliance on technological solutions that have not been deployed at scale. It also noted a lack of coherent plans to mitigate those delivery risks [page 76, CB/537]."*

95 The assumption by the applicant in DOC_AP6 is the same – very optimistic. Further, by making this assumption and not engaging in the risk to delivery of CBDP proposals and policies, the applicant has not provided the SoS with the vital and necessary background information for reaching a reasoned conclusion on the impacts of the GHGs from the NZT.

96 It is acknowledged that the Climate Change Act section 14 CBDP Risk Tables have not been disclosed by the Government so may not be available to the applicant. The issue remains that the SoS must consider the risk to policy delivery, with the assistance of her/his own Risk Tables, in order to reach a reasoned conclusion about the GHG emissions from the NZT project.

97 The risk assessment from the CCC in its 2023 Progress Report (see later) was available to the Applicant well before it submitted DOC_AP6 on August 4th but has been ignored by the Applicant despite the advice of the CCC being considered as having material weight by the judge in the first NZS legal judgement. And I submit in this document the CCC advice has material weight for the SoS in reaching her/his reasoned conclusion.

98 The key flaw of DOC_AP6 is that it does not go beyond a superficial comparison of the un-risked residual emissions and the GHGs from the NZT project.

99 When risk is considered, the context for the GHG assessment changes considerably, and the significance of the emissions may also change.

100 For example, the 4.53% (only calculated as 2.82% by the applicant in error, and a severe underestimate) power supply annual residual emissions must be contextualised by the CCC's finding that the electricity supply sector is required to reduce[35] from a baseline of 66.5

[34] See https://goodlawproject.org/crowdfunder/net-zero-2 and link within to SFG at https://glplive.org/NZ2-SFG

[35] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

MtCO2e/yr to 3.5 MtCO2e/yr ("Government Pathway") in the 6CB, and the CCC assess credible plans only existing for 30% of this with a remaining 43.8 MtCO2e/yr of electricity supply emissions reductions requiring to be fully secured.

101 The deeper issue here is that 4.53% of the residual emissions for one power project is a very significant quantity when 43.8 MtCO2e/yr of electricity supply emissions reductions still need to be found for each year in that carbon budget. There is no evidence at all from the applicant that the NZT emissions can be accommodated by the risk-assessed emission space for the residual emissions in the power supply sector. There cannot be any clear evidence because the applicant has not considered any risk assessment of the CBDP sector residual emissions.

102 This is the issue that must be in the SoS's mind in reaching a reasoned conclusion on the significance of the NZT GHG emissions and is expanded upon in the penultimate section below on significance assessment.

103 The IEMA guidance is relevant to this, and important to understand, and is now discussed.

7 IEMA

104 The applicant purports to follow the IEMA guidance ("**IEMA**")[36]. At REP6-123/3.6, the applicant describes the IEMA approach to significance and the threshold criteria for significance assessment at Table 3-5 in IEMA. The SoS has also purported to use and follow the IEMA guidance, and make IEMA significance assessments, in other recent DCO decisions.

7.1 Incorrect claims for the counterfactual

105 The applicant seeks to just its counterfactual scenario on the basis of the IEMA guidance at REP6-123/3.6.4.

> *"The overall assessment of significance of a development may be affected by whether it is viewed in isolation, or relative to a counterfactual scenario in which the development does not go ahead."*

106 However, this is a false interpretation of what IEMA says about "Future baselines" and "Alternative baselines".

> *"Alternative baselines can be used to supplement the analysis and address uncertainty. For example, it may be unclear what baseline to adopt and compare a proposed project against if the site is 'empty' (i.e. the project is not replacing an existing development). For example: different locations, designs or layouts for*

[36] "Assessing Greenhouse Gas Emissions and Evaluating their Significance", IEMA, February 2022.

building developments; or alternative energy generation options in the instance of a wind or solar farm proposal. However, a realistic worse-case baseline should still be used for assigning significance."

107 First of all, IEMA refers to baseline**s** plural, indicating that a single alternative should not be cherry picked for its enabling of a desired outcome, in this case to create the illusion that the NZT project is net-negative for GHGs, as the application has done with its counterfactual. The guidance instead points to the use of genuine alternatives and supports my point above that a suitable counterfactual would be a renewable energy plant to generate electricity and operate the carbon capture facility for third party emitters. Further, an alternative baseline should be realistic: the stand-alone unabated CCGT power station is not a realistic, genuine alternative when Government policy is that there should be no further unabated fossil-fuel electricity generation.

108 Realistic baselines are a genuine "do nothing" ie the current baseline without the project, or a genuine alternative counterfactual such as renewable energy plant.

109 With regard to REP6-123/3.6.4, it should be also noted that the supposed net-negative carbon emissions on the scheme do not arise from the choice of the counterfactual, but from the applicant's double counting error.

7.2 IEMA Contextualisation: sectoral reduction strategies

110 IEMA places weight on "Contextualising a project's carbon footprint" – a substantive sub-section (section 6.4) is given in the IEMA chapter on Significance on this.

111 On IEMA page 26, it is stated:

"The starting point for context is therefore the percentage contribution to the national or devolved administration carbon budget as advised by the CCC. However, the contribution of most individual projects to national-level budgets will be small and so this context will have limited value."

112 IEMA goes on at Table 1 on page 28 to provide "*Sources of contextual information against which projects can be evaluated*".

113 One context in the table is "Sectoral budgets or reduction strategies". I acknowledge the quote of CBDP 19 at DOC_9_53/4.1.3 that referring to projected residual emissions, "*These are only projections and should not be interpreted as hard sectoral policy targets.*", but this mischaracterises what I was presenting in CEPP_PES.

114 IEMA is advising strongly that contextualisation should be done with sectoral reduction strategies, and this is exactly what the residual emissions (and the proposals and policies to meet them) are in the CBDP. They are not hard targets, but they do provide a sectoral reduction strategy which provides a fertile and valuable source of contextualisation.

115 Estimates were provided above for the 6CB that the 4.21% of the Fuel sector annual residual emissions are used for the project's Well to Tank emissions, and the 4.53% of the Power supply residual emissions for the electricity generation for the project. These calculations are **not** presented as evidence that a hard sectoral target may be breached. They are presented as important data in considering whether the scheme is consistent with the CBDP sectoral reduction strategy for the Fuel supply and Power supply sectors. Essentially, the data has to be considered in the context of whether there is enough emissions space in the residual emissions for these sectors to allow a single project to take around 5% of the national residual emissions in **both** these sectors.

116 The point was made at CEPP_PES/31 that this issue must be considered cumulatively with other schemes coming forward in the UK. The same issue applies to every other power CCUS station and also every other blue hydrogen facility[37] planned, and also the Drax BECCS project. Already, a very similar facility, the Keadby 3 Carbon Capture Power Station was granted development consent on 7th December 2022 – this will also consume of the order 5% of the national residual emissions for each of the Fuel supply and Power supply sectors. Another similar plant is planned in Scotland[38], also taking a similar amount. Further blue hydrogen projects also based on methane fuel supply and processing, and Drax BECCS are being planned. It is quite evident that the slices of the residual emissions pies for Fuel supply and Power supply are being "given out" and nobody is keeping track on when the pies might be fully consumed, or when emission reductions from the pies of other sectors will need to be substantially used to enable the fuel supply and power supply sectors to breach their residual emissions. The SoS must consider this cumulation of similar projects across the UK, and in the context of the extremely risk burdensome fuel supply and power supply sectors, in considering and reaching a reasoned conclusion on the GHG emissions from the NZT project.

[37] See the Bauer "On the climate impacts of blue hydrogen production" provided as Appendix B of my WR [REP2-061]

[38] Peterhead Carbon Capture Power Station

7.3 IEMA Contextualisation: Existing and emerging national and local policy or regulation

117 IEMA goes on at Table 1 on page 28 to provide another context "*Existing and emerging national and local policy or regulation*" and states an advantage of such contextualisation is that "*Policy should be compatible with the UK's national GHG commitments and actions to achieve those*".

118 The CBDP provides policy which the SoS has presented to parliament as "compatible with the UK's national GHG commitments and actions to achieve those", notwithstanding the identified shortfalls for the NDC and sixth carbon budget also presented to parliament in the CBDP, and the current legal case against the CBDP. And, the CCC Progress report provides the latest detailed analysis of progress, or lack of it, towards those sectoral reduction strategies. The judge in the first NZS legal case fully endorses, and legally approves, the critical expert role of the CCC by stating that their advice must be given "considerable weight".

119 Further, the risk to delivery of the CBDP was so great that in July 2023 campaigners took the strategy to Court for a second time (the second NZS legal case), particular on the issue the risk to policy delivery not being satisfactorily assessed in the CBDP, and this case now has permission for a full High Court hearing. It has emerged in the pre-action protocol correspondence that the Government have produced Risk Tables for the proposals and policies in the CBDP but failed to publish them under section 14 of the Climate Change Act[39].

120 The point again, is that this is not general background material, but is vital information which the SoS must consider in reaching a reasoned conclusion on the NZT project. In this case, it is not just a matter of considering if there is sufficient emissions space to meet the residual emissions for the Fuel supply and Power supply sectors as they are published in the CBDP. The SoS must first take into account the risk to delivering the residual emissions, which may be determined from her/his own CBDP Risk Tables, and the even more restricted emissions space that it imposes for any project coming forward. Second, the SoS must consider if the risk-assessed residual emissions provide, or do not provide, emissions capacity to construct the NZT plant with its approximately 5% additional emissions in each sector against the un-risk-assessed residual emissions.

121 To put this another way:

A. The residual emissions for the Fuel supply sector in the 6CB are 9.6 MtCO2e/yr: a reduction from 20 MtCO2e per year in 2021[40], and

[39] See https://glplive.org/NZ2-SFG

[40] Table 2 of the CBDP (page 13) gives the Fuel supply sector residual emissions at 48 MtCO2e (over 5 years) for the 6th carbon budget, or an average of 9.6 MtCO2e per year between 2033 and 2037, and the current 2021 emissions as 20 MtCO2e/yr.

(i) according to the CCC[41], a remaining 4.4 MtCO2e of fuel supply emissions reductions are required to fully secure the sector in the 6CB (see "Fuel Supply - Impact on 6th carbon budget" section above).

B. The residual emissions for the Power supply sector in the 6CB are 8.4MtCO2e/yr: a reduction from 54 MtCO2e per year in 2021[42], and

(i) according to the CCC[43], a remaining 43.8 MtCO2e of power/electricity supply emissions reductions are required to fully secure the sector in the 6CB (see "Electricity Supply - Impact on 6th carbon budget" section above).

The 832,325 tCO2e/yr emissions from the scheme (as per Table 1 above) need to be understood in the context of the CCC risk assessment and also in terms of the Government's own Risk Tables for the CBDP. Only then, it is possible to make a reasoned conclusion as to whether adding a further 832,325 tCO2e/yr to the atmosphere from the NZT project is compatible with the UK climate targets and budgets, and legislation.

7.4 IEMA summary

122 The applicant has adopted the IEMA guidance for significance assessment, as discussed further in the next section where I review their assessment. However, they have incorrectly and unlawfully applied the counterfactual, and failed to apply the guidance with respect to contextualising the GHG emissions from the project. Currently, it is not possible to reach a reasoned conclusion on the significance assessment because the applicant has not provided the contextualisation of genuinely considering if the large, additional GHG emissions can fit within the CBDP sectoral residual emissions, when it is properly risk assessed. Whilst the sectoral residual emissions are not considered a hard target, if the GHG emissions do not fit, then other sectors must make up the shortfall and there must also be a reasoned conclusion of why this could possibly be acceptable in the wider context of delivering the whole CBDP.

123 In short, where large additional emissions are proposed for a project, the Secretary of State must address both the current failures to deliver on sectoral reduction strategies as identified in the CCC Progress report, the shortfalls in delivering existing national policy identified in the CBDP (ie the shortfalls for the NDC and the 6CB), and the risk to proposals and policies in the CBDP (her/his own Risk Tables), in making her/his significance assessment. These each form vital contextualisation for the 832,325 tonnes of CO2e from the project each year.

[41] This analysis includes an increase to overall fuel supply required (due to greater power generation).

[42] Table 2 of the CBDP (page 13) gives the Power supply sector residual emissions at 42 MtCO2e (over 5 years) for the 6th carbon budget, or an average of 8.4 MtCO2e per year between 2033 and 2037, and the current 2021 emissions as 54 MtCO2e/yr.

[43] This analysis includes an increase to overall electricity generation.

8 COMMENTS ON REP6-123: SIGNIFICANCE ASSESSMENT

124 In Section 3.6 of REP6-123 the applicant purports to deal with "Assessment of Significance".

125 The applicant presents two scenarios for assessment [REP6-123/3.6.4]:

A. The project itself, as estimated in REP6-123, and "which will result in an increase in carbon dioxide in the atmosphere" [REP6-123/3.6.5]; and

B. "An alternative counterfactual scenario in which a similar CCGT operates without carbon capture and storage" [REP6-123/3.6.7].

126 I consider these in reverse as it is first necessary to show that Applicant's counterfactual is unlawful and unviable as an assessment scenario.

8.1 The counterfactual scenario

127 A number of claims are made for the counterfactual scenario which are false.

128 Under the applicant's counterfactual scenario, it is claimed that "*the project causes a reduction in atmospheric concentration*" of GHGs [REP6-123/3.6.7]. However, it has been shown that the claimed reduction in GHGs only arises from a double counting error in REP6-123/Table 3-4.

129 In any case, the counterfactual scenario is an arbitrary choice, and other alternative counterfactuals have not been considered, including the obvious one of a renewable energy alternative to the power plant and powering the CCUS network.

130 Further, the counterfactual is unlawful as it changes the nature of the project seeking planning approval and fabricates a false future baseline which is not relatable to the application.

131 The counterfactual scenario cannot be considered reasonable for all the above reasons.

132 It is of note that the Applicant's false and wrong calculation of this scenario claims a GHG reduction of 32MtCO2e over 25 years (1.3 MtCO2e/yr), and the applicant assesses this as "Beneficial and Significant" [REP6-123/3.6.11]. The applicant does not explain what it considers the threshold quantity of GHGs to be significant is: however, it is evident that applicant does consider this order of GHGs (ie of the order of 1MtCO2e/yr) to be significant.

8.2 The project itself

133 The applicant does not provide an estimate for the quantity of GHGs for this in REP6-123, although it does proceed, without a quantified estimate, to make a significance assessment at

REP6-123/3.6.6. The applicant has not justified, as it cannot, jumping to making the significance assessment without previously having calculated an estimate of the emissions associated with the project.

134 Table 1 above fills that gap above where there is a corrected version of REP6-121/Table 3-4. Using the applicant's assumptions, the whole life GHG emissions from the project itself are 20,808,127 MtCO2e over 25 years (0.83 MtCO2e/yr).

135 The applicant claims that the project itself "could be assessed as Minor Adverse, which would not be significant" [REP6-123/3.6.6]. The applicant appears not to be certain with this assessment (use of word "could").

136 In any case, the applicant gives no reasoning why it considers additional atmospheric emissions of 0.83 MtCO2e/yr to be not significant when it considers saving emissions by a similar megatonne order of magnitude to be significant.

137 Despite this inconsistency, there is further contextualisation information which the applicant has ignored completely, and which was available to it when DOC_9_53 was written in August 2023. The applicant purports to use the IEMA guidance but has not attempted to contextualise the GHG emissions against sectoral reduction strategies, or existing and emerging national and local policy or regulation. This is explained in the IEMA section above.

138 The NZT project, based on the applicant's REP6-123 estimates, consumes 4.21% of the CBDP Fuel sector annual residual emissions, and the 4.53% of the CBDP Power supply residual emissions for the electricity generation for the project.

139 I submit that the Secretary of State must reach a reasoned conclusion of whether these additional emissions in these sectors are consistent with delivering the UK climate targets and budgets, and international obligations, under section 104 of the 2008 Planning Act. I have also made clear that the SoS must bring into that reasoning:

A. The estimated quantum of the emissions (as above, 4.21% of the CBDP Fuel sector annual residual emissions and 4.53% of the CBDP Power supply residual emissions in the 6CB); and

B. The risks to the delivery of the proposals and policies in the CBDP designed to deliver the NDC, budgets and targets. This requires taking into account the delivery risks identified by (1) the CCC in it 2023 Progress Report (and giving material weight to the CCC advice), and (2) examining her/his own CBDP Risk Tables.

140 I have also submitted that the process at A above of considering the sector annual residual emissions is not treating them as hard sectoral targets (as the Applicant has mischaracterised it in CEPP_PES). Instead, it is treating the information on the sector annual residual emissions,

and the risks to their delivery, as vital contextual information for reaching a reasoned conclusion on the significance of the GHG emission for the project itself under regulation 21 of the EIA Regulations. The contextualisation here is considering information relating to "sectoral reduction strategies" as described by the IEMA guidance.

141 Similarly the contextualisation of using the risk assessment information (ie the CCC report and the Risk Tables) is considering information relating to "existing and emerging national and local policy or regulation" as described by the IEMA guidance. Reasoning of whether the project complies with national policy in the CBDP can only realistically be concluded if the risks to delivery of that policy are fully weighed.

8.3 Summary on significance assessment

142 The applicant's counterfactual scenario is riddled with problems, including unlawfulness, and cannot be considered as a viable scenario for the SoS to employ for reaching a reasoned under regulation 21 of the EIA Regulations.

143 The applicant provided no quantified estimate for the GHGs from the project itself, although it went on to make a significance assessment. Despite purporting to follow the IEMA guidance, the applicant then failed to undertake any contextualisation of the GHG emissions from the project, despite the IEMA guidance directing EIA professionals that contextualisation is substantive part of the significance assessment process.

144 Having corrected the applicant's whole life GHG emissions from the project itself (Table 1), I have emphasised above the matters that the SoS must consider in making a reasoned conclusion on the significance.

145 I submit that the GHG emissions (0.83 MtCO2e/yr) from the project itself are significant in the context of being around 5% of each of the Fuel supply and Power supply CBDP residual emissions in the 6CB. The emissions are at the megatonne annual scale, also making them significant. This corresponds to "Significant Adverse" in the IEMA based Table provided by the applicant at REP6-123/Table 3-5.

146 I then submit that the GHG emissions are "Major Adverse", and have a material impact on meeting the sixth carbon budget, because they consume:

A. around 5% of the Fuel supply residual emissions (as 0.4 MtCO2e/yr of upstream Well to Tank emissions) when that sector has to find 4.4 MtCO2e/yr of reductions to be fully secure the 6CB; and

B. around 5% of the Power supply residual emissions (380,876 tCO2e/yr from uncaptured direct emissions from combustion of methane and from T&S unavailability) when that sector has to find 43.8 MtCO2e/yr of electricity supply emissions reductions require to be fully secured in the 6CB.

147 Further, the GHGs from the project are "Major Adverse", and have a material impact on meeting the UK NDC under the Paris agreement as they consume:

A. 0.4 MtCO2e/yr of upstream Well to Tank emissions when the Fuel supply sector has to find 2.9 MtCO2e/yr of fuel supply emission reductions to meet the NDC; and

B. 380,876 tCO2e/yr from uncaptured direct emissions from combustion of methane and from T&S unavailability when the Power supply sector has to find 27.7 MtCO2e/yr of electricity supply emission reductions for the NDC.

148 The NZT project is therefore "Significant Adverse" and "Major Adverse". I submit that the project cannot be approved in these circumstances because it poses serious risks, that are unmitigated, to the delivery of both the UK NDC under the Paris agreement and the sixth carbon budget. In that situation, the SoS has to reasonably conclude, under section 104 of the 2008 Planning Act that approving the scheme would lead to the UK being in breach of its international obligations (s104(4)); in breach of any statutory duty (s104(5)); and/or be unlawful (s104(6)).

9 PARTICULATE MATTER

149 Recent legislation has introduced new targets for PM2.5 particulate matter for 2040 with interim targets for 2028.

150 According to 2021 analysis from the European Environment Agency (EEA)[44], in 2019 fine particulate matter (PM2.5) was responsible for more than 33,000 deaths annually in the UK, and nitrogen dioxide (NO2) for 5,750. Half of the UK's deaths from PM2.5 could have been avoided if the UK had followed the latest recommendations by the World Health Organization (WHO). A 2021 scientific study in Nature[45] confirmed fossil fuel combustion as a major source of PM2.5 health related issues. The study found that globally, 1.05 million deaths would have been avoidable in 2017 by eliminating fossil-fuel combustion.

151 The impact of PM2.5s from a new fossil fuel burning plant in the Teesside area must not be ignored: the PM2.5 effects must be estimated, and the impacts assessed against current UK legislation.

[44] "*Thousands of needless air pollution deaths as UK government ignores health experts – ClientEarth reaction*", ClientEarth media release 15th November 2021, https://www.clientearth.org/latest/press-office/press/thousands-of-needless-air-pollution-deaths-as-uk-government-ignores-health-experts-clientearth-reaction

[45] "*Source sector and fuel contributions to ambient PM2.5 and attributable mortality across multiple spatial scales*", McDuffie et al, Nature, June 2021, https://www.nature.com/articles/s41467-021-23853-y

152 The SoS must grapple with the implications of the new legislation for the NZT project. However, the application and environmental statement have not been suitable updated against the new legislation and targets.

9.1 Recent legislative changes

153 Sections 1 and 2 of the Environment Act 2021 ("**the 2021 Act**") require the Secretary of State for Environment, Food and Rural Affairs to set environmental targets for air quality, while section 8 requires an Environmental Improvement Plan ("**EIP**") to be prepared.

154 In January 2023, 2040 targets were set via the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 ("**the 2023 Regulations**") and, separately, interim targets for 2028 via the EIP ("**the 2028 interim targets**"), which replaced the 25-year environment plan [of 2018].

155 The 2023 Regulations 2023 were made on 30 January 2023 and came into effect on 31 January 2023, and introduced an annual mean concentration target for PM2.5 of 10µg/m³ and a Population Exposure Reduction Target ("**PERT**") to reduce population exposure to PM2.5 by 35% by the end of 2040 compared to 2018 levels.

156 The 2028 interim targets introduced:

A. an Annual Mean Concentration Target ("**AMCT**") which is that the highest annual mean concentration in the most recent full calendar year must not exceed 12 µg/m3 of PM2.5; and

B. an interim legal PERT target to reduce population exposure to PM2.5 by 22% by the end of January 2028

9.2 Issues with the application and environmental statement

157 APP-090 provides Chapter 8 of the Environmental Statement "Air Quality".

158 APP-090 section 8.2 is titled "Legislation and planning policy" and has not been updated for the new legislation. At Table 8-1, a previous EU air quality target value for PM2.5 of 25 µg/m³ (Annual Mean) is listed. However, the new UK targets are not listed.

159 Under APP-090 section 8.6 "Likely Impacts and Effects", no estimation or assessment is given for the PM2.5 effects from construction or operation of the NZT project.

160 The human health impacts of PM2.5 are very serious as evidenced by the EEA (quote above) and many other studies. Under APP-090 Table 8-10 "Results of Operational Impact Assessment for Human Health Impacts", no estimate or assessment is given for PM2.5.

161 "Appendix 8A: Air Quality – Construction Assessment" [APP-247] appears to provide some estimation of PM2.5 from construction traffic in the construction phase.

162 "Appendix 8B: Air Quality – Operational Assessment" [APP-248] makes no estimation or assessment of PM2.5 in the operation phase.

9.3 Issues for the Secretary of State

163 It is acknowledged that the new legislation and targets were enacted after the DCO examination period. However, the SoS cannot brush aside the new targets. Under section104 of the 2008 Planning Act, she/he must decide the application in accordance with any relevant national policy statement, except to the extent that she/he is satisfied that deciding the application in accordance with any national policy statement would lead to her/him to being in breach of any duty imposed by or under an enactment (section 104(5)). That includes the new legally binding targets, and interim targets, for PM2.5.

164 As outlined above, the Applicant's Air Quality assessment does not address the new targets, including the interim targets, nor provide estimates and assessments against them, nor consider the relevant potential health impacts in the Teesside area.

165 The Secretary of State must now require that the applicant updates the Environmental Statement against the new legislation, via further consultation processes.

10 SIGNED

Dr Andrew Boswell,
Climate Emergency Policy and Planning, September 6th, 2023

11 APPENDIX A: Carbon footprint of UK natural gas imports (reproduced from NSTA)

166 One page fact sheet, as from: https://www.nstauthority.co.uk/the-move-to-net-zero/net-zero-benchmarking-and-analysis/natural-gas-carbon-footprint-analysis/ , July 2023

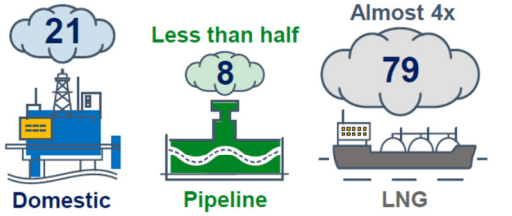
North Sea Transition Authority

Carbon footprint of UK natural gas imports

Carbon intensity of UK imported natural gas

At 21 $kgCO_2/boe$[1], the average carbon intensity[2] of UK gas production is lower than the average carbon intensity of all sources of natural gas imported to the UK (except pipeline imports from Norway). The average carbon intensity of imported Liquefied Natural Gas (LNG) is almost four times the carbon intensity of UK production.

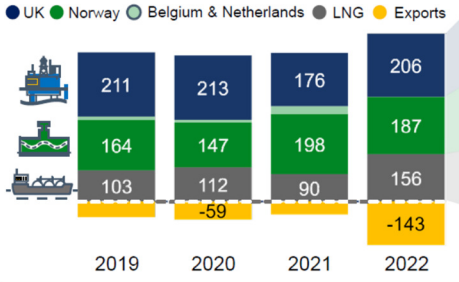
2022 average carbon intensity ($kgCO_2/boe$)



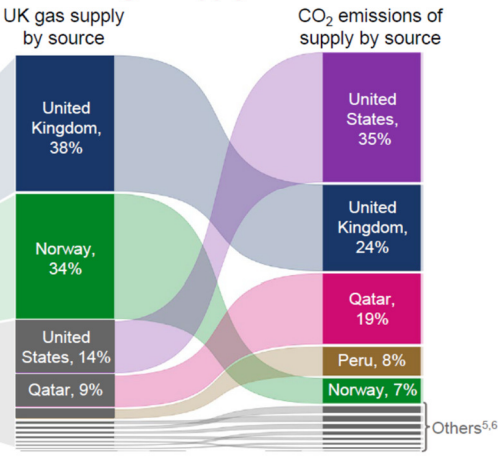
UK gas supply mix and carbon dioxide emissions

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).

UK 2019 – 2022 gas supply (mmboe)[3,4]



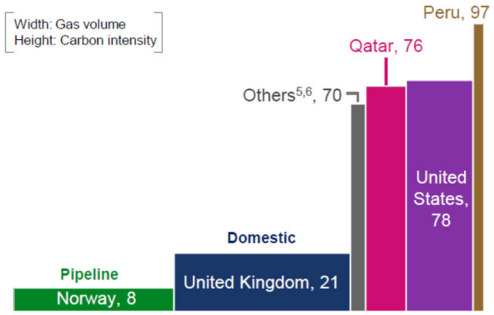
2022 UK gas supply and emissions



Others: Angola, Algeria, Nigeria, Russia, Trinidad & Tobago (T&T), Norway LNG & Egypt

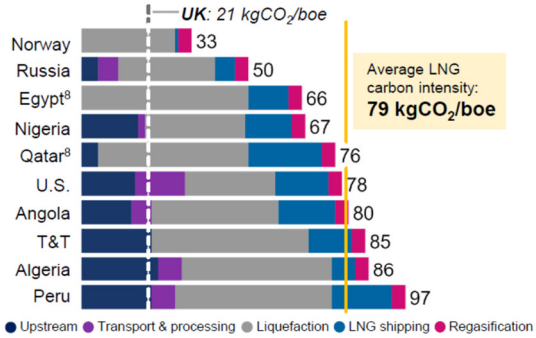
2022 UK gas supply carbon intensities

2022 carbon intensity ($kgCO_2/boe$) by gas volume and by country



Others: Angola, Algeria, Nigeria, Russia, T&T, Norway LNG & Egypt

2022 UK LNG import carbon intensity ($kgCO_2/boe$) profile[7] by country



- This factsheet summarises a comparison of carbon intensity of the UK's domestic production to that of imported LNG and pipelined gas.
- Given the lack of standardised monitoring, measurement and reporting of emissions across natural gas lifecycle stages and global sources, as well as uncertainties, all import emissions values are best estimates.

[1] All estimates of carbon dioxide emissions and carbon intensities are sourced from Rystad Energy's Gas and LNG trade emission analysis dashboard (July 2023).
[2] Carbon intensity = Carbon dioxide (CO_2) emissions per barrel of oil equivalent (boe) produced.
[3] Gross supply. The UK is a net gas importer but seasonally exports significant gas volumes to the Republic of Ireland, Belgium and The Netherlands.
[4] Source: Department for Energy Security and Net Zero (DESNZ) Energy Trends: UK Gas https://www.gov.uk/government/statistics/gas-section-4-energy-trends. Assuming 1 boe = 5800 standard cubic feet of natural gas.
[5] Others: Countries with import volumes less than five million boe in 2022. [6] Average intensity of grouped countries = Sum of emissions divided by sum of import volumes.
[7] The LNG value chain stages: Upstream, Transport & processing, Liquefaction, LNG shipping & Regasification.
[8] Egypt and Qatar's data is not disaggregated for all five LNG value chain stages.

- Natural gas imported via Belgium and Netherlands is a mix of gas from Norway, Russia, Germany & France. In 2022, imports from Belgium and Netherlands made up only 1% of pipelined gas imports as the pipelines from Belgium and Netherlands were almost exclusively used to export gas to Europe between April and December.
- No LNG imports were received from Russia between April and December 2022. During Q1 2022, Russian LNG originated from the relatively new arctic Yamal LNG plant.

12 APPENDIX B: Extract on 2023 Norwegian pipeline supply of methane to UK

Extract of page 10 from "Quarterly Gas Review: Gas Markets in 2023 Tracking Key Metrics", Oxford Institute of Energy Studies, July 2023 , https://www.oxfordenergy.org/wpcms/wp-content/uploads/2023/07/OIES-Quarterly-Gas-Review-Issue-22.pdf

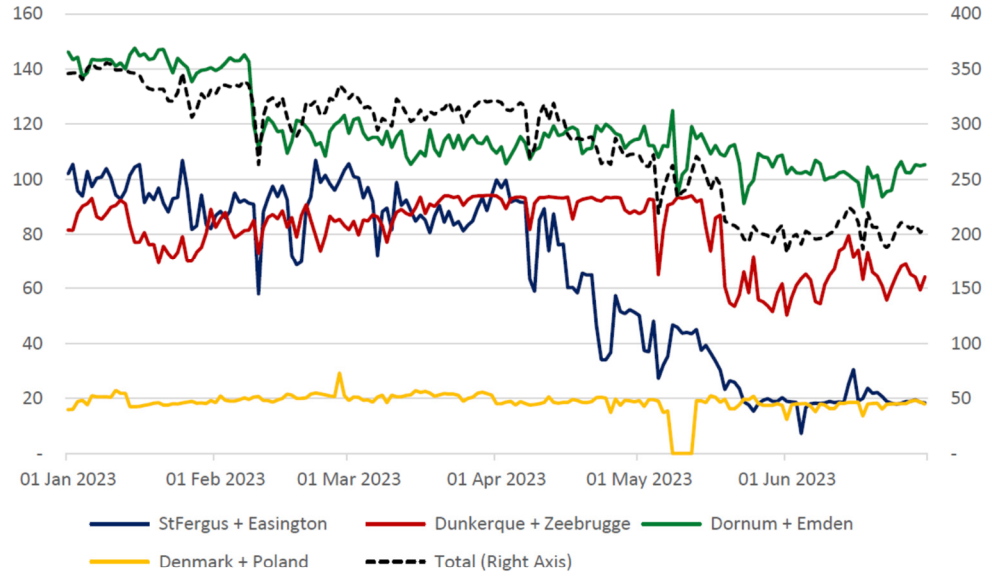
It was in Q2 2023, however, that the flow of Norwegian gas to Europe showed its most significant year-on-year decline, especially in May and June. That decline may be attributed to a significant extent to maintenance work that curtailed three key elements of Norwegian supply: field production capacity; processing plant capacity; and receiving terminal capacity.

According to Gassco, curtailments related to maintenance brought production capacity down from an average of 334-338 MMcm/d in January-March 2023 to 314 MMcm/d (April), 271 MMcm/d (May), and 232 MMcm/d (June). That capacity is set to recover to around 300-310 MMcm/d in July and August, then dipping again to 264 MMcm/d in September, before finally regaining its full potential of around 345-355 MMcm/d in October-December 2023.

Norwegian gas processing capacity at its three main plants (Nyhamna, Kollsnes, and Kårstø) is around 330 MMcm/d. But maintenance reduced this capacity in Q2 2023 to monthly averages of 310 MMcm/d (April), 245 MMcm/d (May), and 228 MMcm/d (June). That capacity is expected to remain at 270-300 MMcm/d in Q3 2023, 320 MMcm/d in October, and not return to its full 330 MMcm/d until November. In addition to gas processed at Nyhamna, Kollsnes, and Kårstø, some volumes are delivered directly to the UK at St Fergus for processing there, which is why the capacity at Nyhamna, Kollsnes, and Kårstø combined is less than total Norwegian production capacity.

The terminals that receive Norwegian pipeline gas in the UK (at St Fergus & Easington), France (Dunkerque), Belgium (Zeebrugge), Germany/Netherlands (Emden & Dornum), and Denmark/Poland (Nybro) have a combined capacity of 380 MMcm/d. According to Gassco, from late May to late August, and again from 11 September to 1 October, this capacity is planned to be reduced to 330-355 MMcm/d, with a deeper curtailment down to 300 MMcm/d from late August to 10 September, including two days down to 260 MMcm/d (due to annual Emergency Shut Down [ESD] tests at Emden on 29-30 August and Easington on 4-5 September). The impact of the maintenance that has already taken place this year on the daily flows of Norwegian pipeline gas to Europe are illustrated in the graph below.

Figure 1.8: Daily Norwegian pipeline gas exports to Europe since 1 January 2023 (MMcm/d)



Source: Data from ENTSOG Transparency Platform & UK Government

The Net Zero Teesside Project Planning Examination	Post Examination Consultation 3 (DESNZ letter – 7th August 2023), September 6th 2023

Author Details	
Name	**Dr Andrew Boswell**
Position	**Independent Scientist & Consultant**
NZT Registration	**20029943**
Organisation	**Climate Emergency Policy and Planning (CEPP)**
Examination Principle Issues	• **Full lifecycle Greenhouse Gas (GHG) emissions** • **Cumulative assessment of GHG emissions** • **Air Quality** • **Scope of Development and Environmental Impact Assessment**

POST EXAMINATION CONSULTATION – 6th SEPT 2023

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.

Contents

1 INTRODUCTION

1.1 Post Examination Consultation – August 7th 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 August 7th 2023.

1.2 Climate Change

2 In this response, I rebut 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_53**[1], and "Appendix 6: Contextualization against Carbon Budget Delivery Plan and Draft Revised NPS Response" referred to here as **DOC_AP6**[2].

3 I note that the applicant previously submitted document "9.29 Cumulative Onshore and Offshore GHG assessment " [**REP6-123**[3]]. I genuinely did not locate this document during the examination as it had been promised for deadline 5 but delivered at a subsequent deadline. In preparing my closing statement at the end of the examination, I made a search for the document in the examination library, but unfortunately did not locate it at that time. I acknowledge that I then concluded that no assessment of the upstream emissions has been made where following reading DOC_9_53, I realise that it was. In responding to DOC_9_53, it is therefore necessary for me to also comment on the details of REP6-123 in this submission.

4 DOC_9_53 was the applicant's response to my submission to responding to the letter from David Wagstaff OBE, Deputy Director, Energy Infrastructure Planning Delivery (Department of Energy Security and Net Zero, DESNZ) of May 16th 2023. The applicant refers to this document as "CEPP's Post Examination Submission", and I abbreviate that here to **CEPP_PES**[4].

[1] "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

[2] "Response to the Secretary of States Request for further information dated 16 May 2023 - 6.6 - Appendix 6 Contexualisation against CBDP and Draft Revised NPS response", https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002814-NZT%20DCO%206.6%20-%20Appendix%206%20Contexualisation%20against%20CBDP%20and%20Draft%20Revised%20NPS%20response.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

[4] "Response to the Secretary of State's consultation letter of 16 May 2023", Climate Emergency Policy and Planning (CEPP), https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010103/EN010103-002795-CEPP%20BOSWELL.pdf

1.3 New Air Quality legislation

5 Since the close of the DCO examination for the NZT project, new legislation has introduced new targets for PM2.5 particulate matter for 2040 with interim targets for 2028.

6 The SoS must grapple with the implications of the new legislation for the NZT project under section 104(5) of the Planning Act 2008. However, the application and environmental statement have not been suitable updated against the new legislation and targets to enable the SoS to do this.

7 Therefore, I submit that the Secretary of State must now require that the applicant updates the Environmental Statement against the new legislation, via further consultation processes.

8 More detail is given in the relevant section below.

1.4 Availability of material to Secretary of State

9 This submission contains many statements relating to how the SoS may reach a reasoned conclusion on the environmental impacts of the NZT project. **I respectfully request that this submission is placed in full before the Secretary of State her/himself to consider.**

2 INITIAL COMMENTS ON DOC_9_53

2.1 Mischaracterisation of CEPP_PES

10 The applicant makes the comment that sections 2.3, 3 and 4 of CEPP_PES "*comprises a generalised commentary of recent Government policy papers, namely the draft Energy NPS and the 'Powering Up Britain' (PUB) document and the CBDP*" and states that CEPP seeks to challenge the lawfulness of the NZS, and it is not a proper forum to make submissions of that nature [DOC_9_53/1.1.4]. Similar comments are made at DOC_AP6/4.1.6 and 4.1.7.

11 Before describing the mischaracterisation, I note that the CBDP is a statutory document under the Climate Change Act 2008 ("**the 2008 Climate Act**"). The document is the plan required to fulfil section 13 of the 2008 Climate Act "*Duty to prepare proposals and policies for meeting carbon budgets*" and section 14 "*Duty to report on proposals and policies for meeting carbon budgets*". The applicant does not appear to recognised the significance of the CBDP as a statutory plan under the 2008 Climate Act in describing it as a mere "policy paper".

12 The applicant's mischaracterisation of CEPP_PES is to consider that the information in CEPP_PES was provided outside of the scope of the Secretary of State's decision making on the Net Zero Teesside Project (NZT) under the Planning Act 2008 ("**the 2008 Planning Act**"). Quite the contrary, the information was provided to directly address and inform the SoS decision making process. The purpose of providing the information on the CBDP and other documents was that it is vital information relating to whether there can be confidence that the NZT project is consistent with the CBDP, and therefore the delivery of "*this critical climate strategy under the Climate Change Act 2008*" as I referred to it as CEPP_PES/38.

13 I made this clear at CEPP_PES/39 "*As well as taking this into account, at the time of his/her decision, the SoS should consider the latest evidence on the revised NZS, the status of any on-going legal challenge to it, and my submissions here (by which I respectfully mean that this submission should be made available to the SoS to consider personally).*" CEPP_PES aimed to place the latest relevant evidence in front of the SoS to assist her/his decision making. This is expanded further below, and especially in the penultimate section on significance assessment.

14 The wider context here is that reasoned consideration of the GHGs from the NZT project and how they comply with the risk-assessed delivery of the CBDP (and the NDC and sixth carbon budget) is very much a live issue for the SoS in her/his decision-making, under section 104 of the 2008 Planning Act. The SoS must reach conclusions as to whether approving the scheme would lead to the UK being in breach of its international obligations (s104(4)); in breach of any statutory duty (s104(5)); or be unlawful (s104(6)). The latest evidence is required to be able to make a reasoned conclusion on these matters, and the material submitted in CEPP_PES was provided to assist the SoS in reaching those conclusions.

15 As matters have progressed further (for example a second Net Zero Strategy legal challenge against the CBDP, on risk assessment grounds, has recently received permission for a full High Court hearing), further information is provided in this document. Again, this new material is not some general commentary on the CBDP, or some vague challenge to the CBDP: it is provided as very specific information which the SoS should consider when making a reasoned conclusion relating to s104(4), s104(5) and s104(6).

3 RECENT UPDATES: POLICY AND LEGAL FRAMEWORK

16 This section is provided as vital information which the SoS should consider when making a reasoned conclusion relating to s104(4), s104(5) and s104(6) of the 2008 Planning Act. It is not provided as a generalised commentary, or as a challenge to Government policy.

3.1 The Scale and Logistical Impact of Net-Zero

17 Before discussing the Carbon Budget Delivery Plan (CBDP) in detail, I wish to submit as a prelude, evidence on the scale of the logistical impact of the legislative and policy changes between the pre-net-zero world and the net-zero world, following the Climate Change Act 2008 (2050 Target Amendment) Order 2019[5]. This is to provide high-level context which the SoS should consider when making a reasoned conclusion relating to s104(4), s104(5) and s104(6) of the 2008 Planning Act.

18 The "Net Zero" statutory instrument has one simple statement of substance at clause 2:

> *2.—(1) Section 1 of the Climate Change Act 2008 is amended as follows.*
>
> *(2) In subsection (1), for "80%" substitute "100%".*

19 The ramifications of the last four words 'for "80%" substitute "100%"' words have not yet been fully grasped and understood by many, including ministers making decisions on infrastructure.

20 As background, the original end target for 2008 Act was for an 80% reduction of greenhouse gas ("**GHG**") emissions[6] by 2050 from 1990 baseline and was based on outdated science. The new end target is for 100% reduction by 2050: this makes small step toward congruence with the science[7].

21 I use "Emissions space" ("**EmSp**") to mean that the available carbon emissions which may be legitimately emitted each year under the Climate Change Act 2008 (the "2008 Act") and the 100% target.

22 I provide the chart below for illustration and to explain three key effects of the legislative change in terms of how the numbers add up, or critically how they may not add up. The chart

---

[5] The Climate Change Act 2008 (2050 Target Amendment) Order 2019, Statutory instrument at https://www.legislation.gov.uk/ukdsi/2019/9780111187654

[6] The 2008 Act and 2019 "2050 Target Amendment" cover a number of GHGs. However, for this examination, carbon dioxide (CO_2e), or "carbon" is the only gas of interest.

[7] Please see my later point, which I place on record, that the legislative targets, based on CCC, are not science-based. Science-based budgets are more rigorous and demanding, and are needed to comply with Paris Agreement

does **not** purport to be precisely accurate in terms of trajectories[8], but is provided to illustrate the principles discussed.

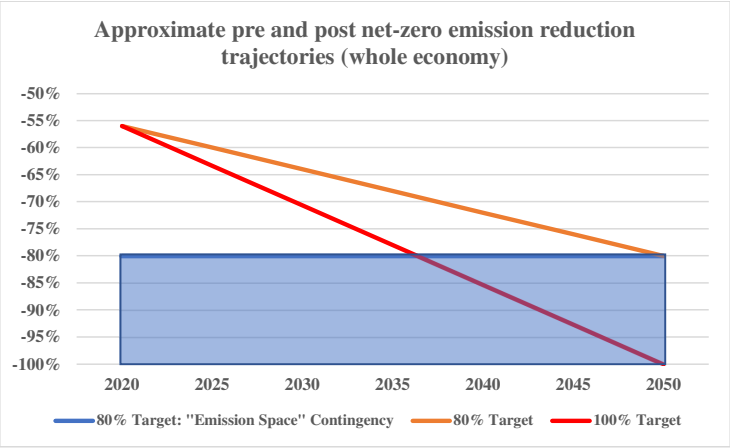


Figure 1: Approximate pre and post net-zero emission reduction trajectories (whole economy)

23 The keys effects of the legislative change can be seen in the graph as follows:

(A) *The UK economy EmSp rapidly contracts each year until 2050* at an average year-on-year rate of c.16.6 million tonnes of CO_2e[9] from 2020 under the 100% target. Based on 2020 level, the rate of decarbonisation is approximately 3-4% a year. All existing economic activity must be contained within this rapid contraction of the EmSp. Each sector of the economy must contract emissions, via sectoral decarbonisation. New activity, eg additional emissions from new power infrastructure, competes for emissions sustaining existing activity either within its own sector(s), or from other sectors.

[8] The graph is based on approximate numbers from Figure 1 of the CCC 6th Carbon Budget Report "The Sixth Carbon Budget, The UK's path to Net Zero", December 2020, https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf . This includes emissions from international aviation and shipping (IAS) and shows 2020 levels at approximately 500MtCO2e (and approx. 56% of 1990 levels).

[9] Approximately equivalent carbon footprint to 16,000,000 return flights from London to New York

(B) *The legislated emissions contraction rate via 5-year carbon budgets is extraordinary.* The contraction rate (3-4% a year from 2020) for the 100% target (red line) is an approximate doubling of the contraction rate for the 80% target (orange line). The Government's objective is to ~~reduce~~ decarbonise the electricity supply sector by 2035: in 2022, the sector generated 48 MtCO2e, 11% of UK emissions (CCC analysis[10])

(C) *The removal of any on-going background EmSp from 2020*. This is most critical effect and the one not usually discussed. It is very relevant to the question of whether there is enough EmSp for the NZT to be developed.

A 20% background level of emissions were legally permitted under 2008 Act until 2050 equating to around c.180 million tonnes of CO2e a year, as indicated by the blue block on the figure. This allowed considerable policy and delivery flexibility **that is simply and starkly no longer available**: for example, additional emissions from new fossil fuel based electricity generation could possibly have been contained within the 80% at 2050 target if other sectors had rapidly decarbonised, but this is no longer clearly possible.

24 In short, the approximate doubling of the rate of emissions contraction from 2020, ***and*** removing the legally permitted contingency of c.180 million tonnes CO2e a year in the economy, introduces immense delivery risks to:

- (A) the NDC international obligation for 2030, and
- (B) carbon budgets going forward, especially the 6CB and following budgets after 2033, and
- (C) the net-zero 2050 target (itself dependent on robust delivery of (A) and (B) first).

25 This logistical impact of the recent legislation requires a paradigm shift in policy and planning for the whole economy, which we simply are not seeing yet. Where plans existing like the CBDP, they are under legal challenge for what proposals and policies do exist, and as not being adequately risk assessed.

26 Please note that speculative technology like negative emissions has been built into Government policy to attempt to deal with the loss of the background contingency EmSp. However, negative emissions technologies (NETs) are widely criticised, and are not expected to deliver[11]. The delivery risks involved exert further pressure on the very limited EmSp.

[10] Page 199/200, "Progress in reducing Emissions - 2023 Report to Parliament", Climate Change Committee (CCC), June 2023, https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-UK-emissions-2023-Report-to-Parliament.pdf

[11] This is again a complex subject which may be expanded, if required. For the moment, and in short, greenhouse gas removals (GGR) and negative emissions technologies may provide extremely costly, speculative, and unproven at scale methods which proxy for an "overdraft facility" on carbon emissions. Even if these work, they would be like paying back a loan at a huge interest rate. See Kevin Anderson , John F. Broderick & Isak Stoddard

27 Further, I place on record that the legislative targets[12], based on CCC, are not science-based. Science-based budgets are more rigorous and demanding and are needed to comply with Paris Agreement[13]. The point is that even meeting the CCC targets is actually not enough to have any chance of keeping global average temperature to well under 2ºC (the 1.5ºC Paris Agreement target is now almost certainly breached[14]).

3.2 The Revised Net Zero Strategy

28 The Government laid the original Net Zero Strategy (NZS) before Parliament on 19 October 2021 as a report under section 14 of the Climate Change Act (CCA) 2008. The strategy was intended to fulfil the duty, at section 13 of CCA 2008, to "prepare such proposals and policies" that will enable the carbon budgets under the CCA 2008 to be met, now extended by the 2019 amendment to the 2008 Act. That is proposals and policies that would secure delivery of the UK climate targets including the legislated carbon budgets.

29 The NZS was subsequently found to be unlawful in July 2022 ("**first NZS legal case**"), and the Government were ordered to lay before Parliament a fresh report under section 14 before the end of March 2023.

30 On March 31st 2023, the Government subsequently published a revised Net Zero Strategy (NZS) with the overarching title "Powering Up Britain" (PUB), and the Carbon Budget Delivery Plan (CBDP) within it, as well as many other related documents comprising nearly 3000 pages in total.

31 On July 7th 2023, Friends of the Earth, ClientEarth and Good Law Project, the same claimants as in the first NZS legal case, announced that they are taking the Government to court for the second time in under two years ("**the second NZS legal case**") because of "*the Government's*

(2020): A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways, Climate Policy, DOI: 10.1080/14693062.2020.1728209, Appendix A "*However, there is wide recognition that the efficacy and global rollout of such technologies are highly speculative, with a non-trivial risk of failing to deliver at, or even approaching, the scales typically assumed in the models. … Whilst the authors of this paper are supportive of funding further research, development and, potentially, deployment of NETs, the assumption that they will significantly extend the carbon budgets is a serious moral hazard (Anderson & Peters, 2016).*"

[12] under the Climate Change Act 2008

[13] A key issue is the "area under the curve" in the emissions trajectories. The near flat line trajectories in Figure 1 of the CCC 6th Carbon Budget Report "The Sixth Carbon Budget, The UK's path to Net Zero", December 2020, https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf are inadequate and are based on policy targets like "Net Zero 2050". Science-based carbon budgets such as those from the Tyndall Centre (research that the UK Department of Business, Energy and Industrial Strategy supported) demonstrate that the area under their curve of their emissions trajectories is consistent with the global carbon budgets from the Intergovernmental Panel on Climate Change (IPCC) where the CCC do not. The Tyndall budgets are consistent with IPCC global carbon budgets of 1.7ºC degrees of global heating. This is not 1.5oC because, essentially, there are not enough degrees of freedom in the system to produce budgets consistent with 1.5ºC, the lowest end of the Paris target. See more in Tyndall's "Factor of Two" research paper, Kevin Anderson, John F. Broderick & Isak Stoddard (2020) A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways, Climate Policy, 20:10, 1290-1304, DOI: 10.1080/14693062.2020.1728209.

[14] "*Many climate experts believe that outcome is inevitable. Global temperatures will climb higher than 1.5 degrees compared with 150 years ago, they say, though often only in private.*", from article Scientific American, Chelsea Harvey, "The World Will Likely Miss 1.5 Degrees C—Why Isn't Anyone Saying So?", https://www.scientificamerican.com/article/the-world-will-likely-miss-1-5-degrees-c-why-isnt-anyone-saying-so/

failure to include a proper assessment of the delivery risks associated with the policies and proposals in the Carbon Budget Delivery Plan"[15].

32 On September 1st 2023, these claimants announced that they have been given permission to go to a full Judicial Review hearing in the High Court[16].

3.3 Delivery risk and policy gap in securing delivery of net zero, and the undisclosed Risk Tables

33 In relation to securing the NZS, I highlight here what the Court said in the first NZS legal case judgment[17] on delivery risk and policy gap. Holgate J. recorded the NZS's acknowledgement that the delivery pathways to achieve the 6th Carbon Budget are highly ambitious and face considerable delivery challenges and recorded that achievement was subject to a wide uncertainty range. The judge noted at paragraphs 204 and 211 that in approving the Net Zero Strategy, "*one obviously material consideration which the Secretary of State must take into account is risk to the delivery of individual proposals and policies and to the achievement of the carbon budgets and the 2050 net zero target.*" In finding the NZS unlawful, the judge described risk to delivery as the critical issue when concluding that the information provided to the Minister when reporting on the NZS was insufficient to enable him to discharge his reporting obligations under section 14 of the Climate Change Act 2008.

34 Critically at paragraph 249 the judge says:

> *"… the ability to meet the statutory targets depends upon the contributions made by a multiplicity of proposals and policies adopted by the Secretary of State. This is obviously material to the risk of delivery. It is critical to any assessment by Parliament, and by the public, of how the statutory targets are likely to be met, by what means and with what implications."*

35 With the new PUB and CBDP, a number of issues arise which are likely[18] to be taken before the Court, these include:

(A) Delivery risks have not been assessed in the CBDP for each policy and proposal as they should have been;

(B) The CBDP (at paragraph 26) is based on the assumption that all quantified policies and proposals will be delivered in full;

---

[15] Good Law Project press release, July 2023, "The Government is still failing on net zero, so we are taking them back to court", https://actions.goodlawproject.org/net_zero_2

[16] 'Not fit for purpose': Green groups secure High Court hearing over government's net zero plans, Business Green, Sept 1st 2023, https://www.businessgreen.com/news/4123909/fit-purpose-green-secure-court-hearing-governments-net-zero-plans

[17] R (Friends of the Earth) v Secretary of State for Business Energy and Industrial Strategy [2022] EWHC 1841 (Admin)

[18] Based on Good Law Project press release, July 2023, "The Government is still failing on net zero, so we are taking them back to court", and the Pre-Action Protocol (PAP) letter embedded within it at https://actions.goodlawproject.org/net_zero_2

(C) The Statements of Facts and Grounds (SFG)[19] from one of the claimants in the second NZS case describes that '*in pre-action correspondence, the Secretary of State for Energy Security and Net Zero ("SSESNZ") has revealed that he was, in fact, provided with analysis that set out in tables information about the delivery risk associated with each policy or proposal contained in the CBDP ("**the Risk Tables**")*'. These have not been published by SSESNZ to date.

36 Points (B) and (C) is important in consideration of the NZT project and any subsequent decision on it. The recent practice of ministers has been to approve projects (for example recent roads DCO projects) based on the assumption that all quantified policies and proposals under the NZS will be delivered in full. That is, there has been an assumption in recent DCO decisions that the delivery of NZS is fully secured when quite plainly it is not. As far as the SoS decision making process for the NZT project, she/he must reach a reasoned conclusion based on the known risks to delivery of the NZS and CBDP, based on the Risk Tables held by her/his own department.

37 It should be noted that the applicant in DOC_AP6 only contextualises the NZT project against the CBDP sectoral residual emissions: the applicant does not consider the risks to whether those residual emission may actually be delivered. It is acknowledged that the (Climate Change Act 2008) section 14 CBDP Risk Tables have not been disclosed by the Government (itself considered unlawful by a claimant in the second NZS legal case, now going to full High Court hearing) so may not be available to the applicant. The issue remains that the SoS must consider risk to policy delivery, with the assistance of her/his own Risk Tables, in order to reach a reasoned conclusion about the GHG emissions from the NZT project.

38 The risk assessment from the CCC in its 2023 Progress Report (see later) was available to the Applicant well before it submitted DOC_AP6 on August 4th but has been ignored by the Applicant despite the advice of the CCC being considered as having material weight by the judge in the first NZS legal judgement. (And I submit in this document the CCC advice has material weight for the SoS in reaching her/his reasoned conclusion).

[19] See https://goodlawproject.org/crowdfunder/net-zero-2 and link within to SFG at https://glplive.org/NZ2-SFG

3.4 Climate Change Committee (CCC) 2023 Progress Report

39 On 28th June 2023, the Climate Change Committee (CCC) submitted its "Progress in reducing Emissions - 2023 Report to Parliament" [20] (referred to as "**CCC_2023_PROG**") under Section 36 (1) of the Climate Change Act 2008.

40 It should be noted that Holgate, J stated in the first Net Zero Strategy judgment:

> *[188] "… It is apparent that the CCC as an expert body scrutinises the work of the Secretary of State and his Department with great care and in depth. The CCA 2008 proceeds on the basis that the reports of the CCC will provide much assistance to Parliament."*
>
> *[215] "The role of the CCC is to give advice as an expert body rather than to opine on questions of law. But nonetheless the court should give considerable weight to their advice in December 2020 on the setting of CB6 that the Government's net zero plans should include a "quantified set of policy proposals" and their criticism in October 2021 of the NZS for failing to quantify the effect of each policy and proposal on emissions reductions ([65]-[67] and [152] above)."*

41 Whilst this is a planning decision, significant material weight should be given to the CCC and their 2023 Progress Report by the SoS in reaching a reasoned conclusion with respect to section 104 of the 2008 Planning Act. It would be wrong, and challengeable, for the SoS to dismiss the CCC's advice in its report as less than significant material weight.

42 A key matter is that CCC_2023_PROG notes that, in the CBDP, there is a shortfall on the emissions reductions[21] required to meet the UK 6th carbon budget (6CB) and UK's Nationally Determined Contribution (NDC) for 2030, our international obligation under the Paris agreement.

43 I now look at the impact and risks on near-term climate targets (ie 2030 NDC; and 6th carbon budget (average year 2035)) for the power/electricity supply and the fuel supply sectors, as being the relevant sectors to the NZT scheme: the upstream Well to Tank emissions come under the fuel supply sector, and the other emissions related to the NZT project mostly[22] come under electricity supply, or power sector (in CBDP).

---

[20] "Progress in reducing Emissions - 2023 Report to Parliament", Climate Change Committee (CCC), June 2023, https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-UK-emissions-2023-Report-to-Parliament.pdf

[21] CCC _2023_PROG/page 93

[22] My analysis here does not consider emissions in the Industry, Waste and F-gases, and Domestic Transport sectors for brevity, and because over 95% of the GHGs from the project are attributable to the Fuel supply and Power supply sectors [DOC_AP6/2.1.7].

3.5 Impact on UK international obligation(s) (2030 NDC)

44 Figure 4b on page 24 of CCC_2023_PROG, reproduced below, shows that the electricity supply sector has large emission reductions[23] to make for the 2030 NDC. Electricity supply is required to reduce from a baseline of 53.8 MtCO2e/yr to 6.7 MtCO2e/yr (the "CBDP pathway") in 2030. The CCC assess that credible plans only ~~existing~~ exist for 41% of this (19.3 MtCO2e/yr – green on the Figure). There are risks for 27.7 MtCO2e/yr (yellow on the Figure) of electricity supply emission reductions for the NDC.

45 Note that the Fuel Supply sector is not illustrated on Figure 4b: however, the data is provided in the accompanying spreadsheet[24]. The Fuel Supply sector is required to reduce from a baseline of 23.9 MtCO2e/yr to 20.0 MtCO2e/yr (the "CBDP pathway") in 2030. The CCC assess that credible plans only existi~~ng~~ for 25.5% of this (1 MtCO2e/yr – equivalent to green on the Figure). There are risks for the remaining 2.9 MtCO2e/yr of fuel supply emission reductions for the NDC.

[23] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

[24] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

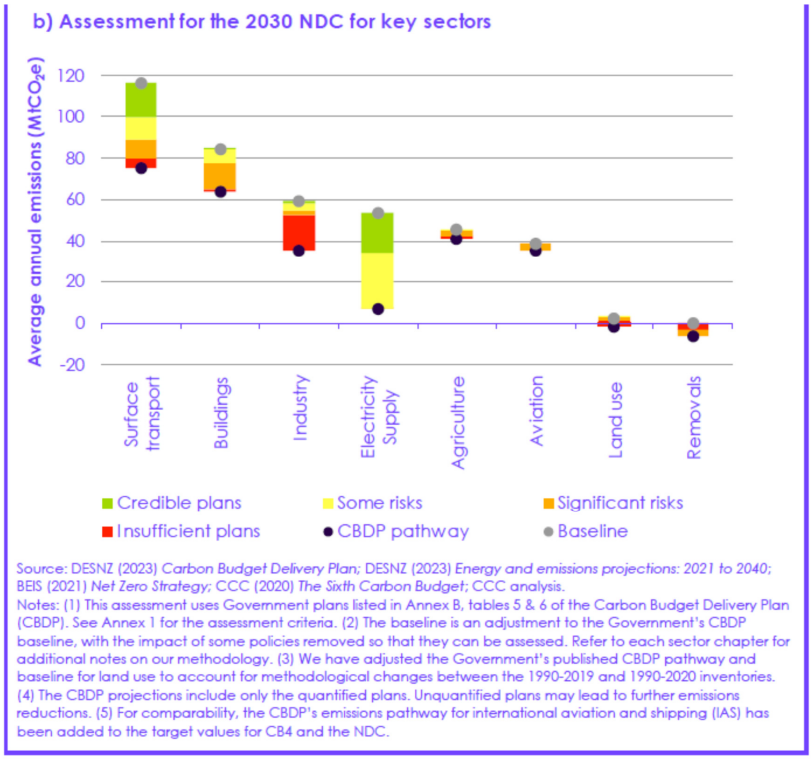


Figure 2:CCC Progress Report 2023, Fig 4b reproduced

3.6 Electricity Supply - Impact on 6th carbon budget

46 Figure 7.7 on page 211 of CCC_2023_PROG, reproduced below, shows the assessment of policies and plans for electricity supply across the 4th, 5th and 6th carbon budgets.

47 For the 6CB, electricity supply is required to reduce[25] from a baseline of 66.5 MtCO2e/yr to 3.5 MtCO2e/yr ("Government Pathway"). The CCC assess credible plans only existing for

[25] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

30% of this (19.3 MtCO2e/yr – green on the Figure). A remaining 43.8 MtCO2e/yr of electricity supply emissions reductions require to be fully secured in the 6CB.

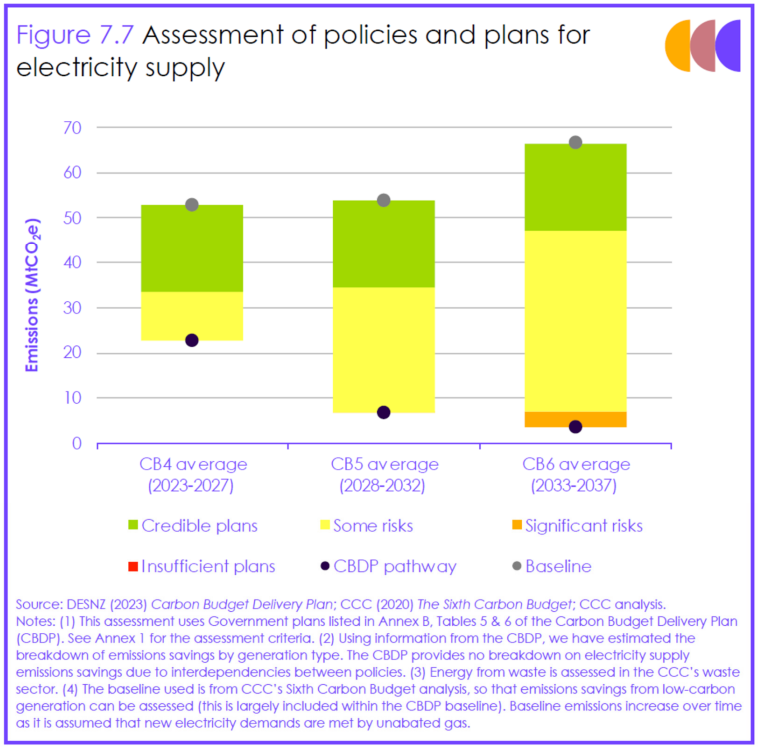


Figure 3: CCC Progress Report 2023, Fig 7.7 reproduced

3.7 Fuel Supply - Impact on 6th carbon budget

48 Figure 8.7 on page 230 of CCC_2023_PROG, reproduced below, shows the assessment of policies and plans for fuel supply across the 4th, 5th and 6th carbon budgets.

49 For the 6CB, fuel supply is required to reduce[26] from a baseline of 17.3 MtCO2e/yr to 12.0 MtCO2e/yr ("Government Pathway"). The CCC assess credible plans only existing for 17% of this (0.9 MtCO2e/yr – green on the Figure). A remaining 4.4 MtCO2e/yr of fuel supply emissions reductions require to be fully secured in the 6CB.

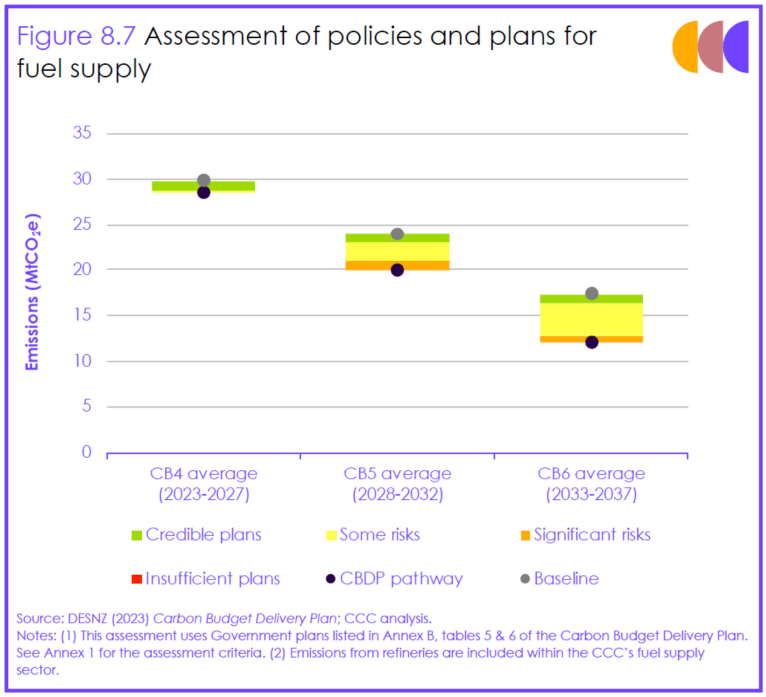


Figure 4: CCC Progress Report 2023, Fig 8.7 reproduced

50 The above reveals the true extent of the "delivery gap" in power/electricity supply, and fuel supply, decarbonisation policy as advised to the Government by their own advisors, the CCC.

[26] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

4 COMMENTS ON REP6-123: CARBON CALCULATIONS

51 REP6-123 provides the applicant's "Cumulative Onshore and Offshore GHG assessment". This section looks at the calculation section, and flawed assumptions and errors within it. A subsequent section looks at the significance assessment itself.

4.1 The assessment diverges from the application description (definition) of the project

52 For the assessment, the applicant changes the definition of the project from that which is used throughout the application to a different definition designed to suit its purposes of deriving an overly optimistic, and actually false, quantification of the cumulative carbon emissions from the scheme.

53 A description of the project is given in REP6-123 at section 1.2.1. This gives an outline definition which is used widely in many other documents in the Application: this can be considered the standard definition of the project. It describes ten works of which Work No 1 is the key element.

54 *"Work Number ('Work No.') 1"* describes the *"Low Carbon Electricity Generating Station"*. Critically, it is defined atomically as a single entity as follows: "*a Combined Cycle Gas Turbine electricity generating station with an electrical output of up to 860 megawatts and post-combustion carbon capture plant*". It is indisputable that the electricity generating station and the carbon capture plant are part of one work which, for the purpose of the environmental statement for the application, is indivisible into separate elements.

55 Nine other works No. 2 to No. 10 are also described: these essentially are necessary connections and services for the Low Carbon Electricity Generating Station itself to operate.

56 As Work No.1 is described atomically, it is clear that the future baseline of the project - the baseline in which the NZT project is not implemented – is one in which Work No. 1 is not implemented (along with the other nine works). In other words, the baseline of the project for environmental assessment is one in which the project is not implemented. This corresponds to the standard "Do Minimum" (or "Do Nothing") and "Do Something" approach. The future baseline is "Do Minimum" or the scenario in which the project is not implemented, and "Do Something" is the scenario in which the project is implemented.

57 However, at REP6-123/2.2.3, the applicant states the following:

> *"The future baseline scenario, i.e. a counterfactual in which the Proposed NZT Development does not take place, assumes the continued operation of a similar CCGT power station that is not fitted with carbon capture and storage technology."*

58 The applicant's "counterfactual" scenario formulates the environmental assessment incorrectly as follows. This then result in the miscalculation of carbon emissions for the environmental assessment which will be explained below.

A. It is a fabricated scenario which purports to provide a "Do Minimum" case for the project but does nothing of the sort. Instead it invents a completely different scenario which is not part of the application.

B. Effectively, the atomic description of Works No.1 is broken into two sub-elements. In doing so, it reduces Works No. 1 to the "*post-combustion carbon capture plant"* sub-element and derives a false future baseline from the "*CCGT power station*" sub-element.

C. The wording of 2.2.3 is extremely misleading with the use of the word "continued" which suggests falsely that the "CCGT power station" already exists when it does not. There is no evidence, anywhere, that the CCGT power station would be built anyway. In fact, the CCGT power station is only delivered by delivering the application for the NZT project.

4.2 Arbitrary choice of counterfactual

59 There would be no good reason for choosing such an arbitrary counterfactual even if this choice of counterfactual was lawful, which it is not as it changes the nature of the project seeking planning approval and therefore is not valid as part of the environmental statement for that project.

60 For example, an equally valid counterfactual would be an offshore wind development which delivered the same electrical power output as Works No. 1 and the additional electricity necessary for powering the wider carbon capture and storage facilities of the Proposed NEP Offshore Development (ie in place of where parts of the CCUS network would be powered by Works No. 1 in the current application).

61 This offshore wind counterfactual actually provides a more preferable alternative to the scheme which does not rely on a fossil fuel plant at its centre, and therefore assists the UK to decarbonise power and industry more rapidly. It would provide a CCUS network facility for 3rd party emitters but would be based around renewable energy infrastructure for its core operation. In such a counterfactual scenario, industrial operations such as cement and steel production could be decarbonised with the powering of the CCUS network coming from renewables and being almost zero carbon footprint. It is a far more preferable option, but such an alternative has never been tested by the Applicant.

62 Many other alternatives, or counterfactuals, could be chosen. For example, include onshore wind, or solar PV above, energy storage, and combinations of all of these with offshore wind above. In other words, an alternative counterfactual can be readily conceived which source

power from a combination of offshore and onshore wind[27], solar PV and energy storage to provide security of supply. I made this point that alternatives to a gas fired power station have not been considered in the Application in my original WR [REP2-061/22]:

> *"It is important to note that whilst reductions in methane leakage provide a relative benefit compared to not reducing methane leakage,* ***not*** *extracting and combusting gas in the first place would remove the methane emissions associated with the NZT project completely (and the abated or unabated CO2 emissions from gas combustion), provides much greater benefit and is a much more credible scientific approach. I acknowledge that UK Government policy, on which the Applicant relies, has not yet caught up with the massive technological advances and cost reductions in renewables and energy storage that provide an opportunity* ***now*** *to do much better than developing a gas power station which produces a significant net increase in GHG emissions in a climate emergency. These technologies have the potential to provide dispatchable carbon free power generation on the same timeframe as the NZT project (ie: starting to supply power in 2027)."*

63 The applicant seeks to justify its choice of counterfactual at REP6-123/3.6.9-10 on the basis that "*the transition to a net-zero future explicitly requires the replacement of existing high-carbon emissions sources with lower emissions sources that deliver a similar function in terms of dispatchable electricity generation that can provide security of supply … that will be part of a wider move to replace existing, unabated high-carbon electricity generation installations*". A renewable energy alternative counterfactual also meets this description at an overall much lower carbon footprint, and as stated in my WR with the new technology in renewables and storage can provide security of supply.

64 The fact is that the applicant choose just a single counterfactual, fabricated to maximise, falsely, the supposed benefits of the scheme, and ignored many other possible counterfactuals.

[27] As of Sept 5th 2023 with less planning restrictions

4.3 Unlawful counterfactual case

65 The Applicant repeats the false counterfactual narrative in DOC_9_53, 3.1.10 as follows:

> *"The net lifetime emissions impact of the Proposed Development and the proposed NEP development is therefore a net emissions reduction of over 32 MtCO2e, relative to a without-project baseline, which is reasonably assumed to be an unabated Combined Cycle Gas Turbine of similar size and running hours."*

66 This is not a reasonable assumption. It is not the "without-project baseline" used in all other aspects of the Environmental Statement as explained above. It is also an unlawful estimate of emissions as it creates false baseline by artificially breaking down the core part of the project, Works No. 1.

67 Note the 32MtCO2e "reduction" over 25-years is also false, due to the double counting of 53.3 MtCO2e carbon capture emissions, as explained below. The correct value using the applicant's assumptions is 20.8 MtCO2e of emissions to the atmosphere over 25 years, as shown in the corrected version of REP6-121/Table 3-4 below.

68 As above, the counterfactual (or "without project baseline") is unlawful as it changes the nature of the project seeking planning approval and fabricates a false future baseline which is not part of the application.

4.4 Double counting error

69 Irrespective of the unlawful counterfactual, the assessment contains a double counting error. This is as follows with context of the source figures from APP-103:

A. Table 21-10 of APP-103 "ES Chapter 21: Climate Change" gives the "Hourly unabated GHG emissions from power plant (kg CO2e)" as 281,547 kg CO2e.

B. At 8,424 operating hours per year, the annual unabated emissions (Direct Scope 1 emissions) are 2,371,752 tCO2e. For 25 years, this is 59,293,798 tCO2e.

C. On the 90% carbon capture assumption, 53,364,420 tCO2e are captured over 25 years, leaving 5,929,380 tCO2e as "Uncaptured direct emissions from combustion of natural gas". This is the data carried forward to REP6-123/Table 3-1 and is agreed on the basis of the assumptions given.

D. REP6-123/Table 3-1 generates a total onshore figure based on construction emissions, the "Uncaptured direct emissions from combustion of natural gas" and other operation emissions, giving a total of 16,858,196 tCO2e.

E. Note, for the purposes (only) of demonstrating the double counting error, I accept the Well to Tank emissions from the upstream supply of natural gas as given at

10,101,668 tCO2e. This should not be taken as meaning that I agree this figure: I do, however, accept how the Applicant has explained in DOC_9_53 how it has derived this figure from the 2022 DEFRA/BEIS.

F. The 25-year total of 16,858,196 tCO2e is then carried forward to REP6-121/Table 3-4 as "Total Onshore" GHG emissions. Note from the above, that this figure has already had 90% of the Scope 1 Direct combustion emissions subtracted from it due to the "post-combustion carbon capture plant" within Works No. 1, as explained above.

G. The applicant then subtracts the carbon captured by Work No 1 **a second time** at the line "Carbon Captured" in REP6-121/Table 3-4.

H. This error:

(i) is a very large calculation error of over 50MtCO2e.

(ii) infects the subsequent significance assessment within REP6-123 which is based upon REP6-121/Table 3-4.

4.5 Correcting the double counting error

70 A corrected version of REP6-121/Table 3-4 using the applicant's assumptions (not agreed but used for this purpose) is given below:

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	
Carbon capture (NZT only)	Carbon captured	**Already accounted above**	
	T&S unavailability adjustment	3,592,523	
	Adjusted for T&S unavailability	3,592,523	
Whole life GHG emissions		20,808,127	

Table 1: Corrected version of REP6-121/Table 3-4

4.6 Emissions from the scheme

71 Despite the fabricated and false "counterfactual", and the double counting error above, the Applicant states at REP6-123/2.2.4:

> *"In absolute terms, however, the direct emissions from the combustion of natural gas at the power station, and the indirect emissions from the supply of this gas, continue to represent emissions to the atmosphere. The carbon capture system within the Proposed NZT Development avoids the emission of a substantial mass of carbon dioxide that would otherwise be released, but considering the boundaries explained in 2.2.2 above i.e. excluding third-party emitters, it does not remove carbon dioxide from the atmosphere."*

72 The statement that the NZT project "does not remove carbon dioxide from the atmosphere" is correct, and it is the only correct way to consider the project. It is deplorable that the applicant fabricated a false counterfactual, and made a double counting error, to try to claim otherwise.

73 Table 1 above shows that the absolute emissions from the project over 25-years is 20,808,127 tCO2e. This figure assumes the Applicant's other assumptions: including the boundaries explained in REP6-123/2.2.2, the 90% carbon capture rate, the 93.5% T&S system availability, the applicants Well to Tank emissions estimate. As explained above, I accept these assumptions for the purposes of highlighting calculation and assessment errors, but I do not necessarily agree them. 20,808,127 tCO2e is not just a lack of removal of CO2 from the atmosphere, it is a very large addition of CO2 to the atmosphere over the years 2026 to 2051.

74 The SoS must make a reasoned conclusion about such a large quantum of additional GHG emissions being released to the atmosphere. To do so requires consider contextualisation which is explained in the rest of this submission.

5 WELL TO TANK EMISSIONS

75 DOC_9_53 responded to the recent scientific paper published in the Royal Society of Chemistry journal and which I submitted in my letter of 30th May 2023. For the moment, I park further discussions of that paper: that is to say, I do not necessarily agree with the Applicant's comments on that paper, but I do not seek to rebut them here either. It is more important here to concentrate on other issues relating to methane emissions from upstream oil and gas activities, as below.

5.1 Applicant's quantification of Well to Tank emissions

76 The applicant has laid out how it estimated the Well to Tank emissions. I make these points.

77 The applicant estimates Well to Tank emissions for its 25-year assessment on "*using the appropriate WTT factor for natural gas provided in the 2022 dataset of emissions factors published by DEFRA/BEIS. 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*". [DOC_9_53/3.1.4]

78 The problem here is that a 25-year projection is based upon one year of data, and there is potentially large variability in the Well to Tank emissions depending on market forces and geopolitical events. I raised some initial concerns on this in my Written Representation at REP2-061/2.4 "*gas supply chains are not stable*". I now provide further, updated, concerns.

5.2 Variability of Well to Tank emissions

79 The key factors at play here are, and (1) variations in carbon intensity of upstream methane leakage between different source locations, and (2) variations in the geographical sources in methane supply, and how these factors combine.

80 Factor (1) was recently highlighted by a methane (natural gas) carbon footprint analysis by the North Sea Transition Authority (NSTA) which showed gas extracted from the United Kingdom Continental Shelf (UKCS) has an average emission intensity of 21 kgCO2e/boe; whereas imported LNG has a significantly higher average intensity of 79 kgCO2e/boe (ie: on average 4 time greater). The NSTA fact sheet is reproduced in Appendix A with a diagram illustrating the point above, reproduced below.

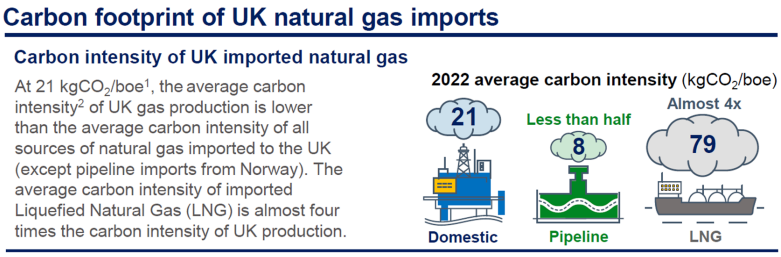


Figure 5: Carbon footprint of UK natural gas imports (reproduced from NSTA)

81 Consider with Factor (2), the fuel source location, the NSTA analysis shows that in 2022 the UK used 38% of methane from UK sources, and 14% from the US. However, when the CO2e emissions were estimated from these sources, the US LNG supplies generated 35% of upstream emissions compared to 24% for the UK supply (see "2022 UK gas supply and emissions" in Appendix A). In other words, the upstream emissions were dominated by high methane leakage in supplies from a relatively small total of the gas used in the UK.

82 Conversely, Norway as a pipeline supplier has provided the "cleanest" methane supplying 34% of UK supply in 2022 and only 7% of the 2022 emissions.

83 The July 2023 "Quarterly Gas Review: Gas Markets in 2023 Tracking Key Metrics" from the Oxford Institute of Energy Studies[28] describes that in Q2 2023, the flow of Norwegian gas to Europe (including the UK) showed a significant year-on-year decline due to maintenance activities in field production capacity; processing plant capacity; and receiving terminal capacity. It is likely for 2023 that Norwegian supply will be considerable curtailed as a result, and will be made up with imported LNG, including from the US. Page 10 of the review is reproduced at Appendix B in which Figure 1.8 shows that Norwegian pipeline supply to UK dropped by 80% between April and June 2023.

84 At DOC_9_53, the applicant notes that the June 2023 WTT factor from DEFRA/BEIS was 3% lower than the factor for 2022. However, the applicant does not note that the factor can also increase and is very likely to do so. The figure at June 2024 (taking in to account the decline in Norwegian supply in 2023 noted above) is likely to be greater than the 2022 factor. Given considerable loss of the cleanest methane supply (ie from Norway) in 2023, and its most likely substitution with the dirtiest methane produced via LNG, the increase in the factor is likely to be considerably more than 3%.

85 The Applicant presents its REP6-123 assessment as a worst case, but the Applicant has no justification for claiming that the Well to Tank estimates are a worst case. The Applicant has not addressed the issue of methane gas supply chain instabilities despite this being raised by me from my WR onwards.

86 The SoS must consider the impact that gas supply instability on the NZT GHG emissions in reaching a reasoned conclusion on the emissions.

6 COMMENTS ON DOC_AP6: CBDP CONTEXTUALISATION

87 First, I examine the residual emissions calculations. This supersedes my submission at CEPP_PES. CEPP_PES is extended to consider the two main CBDP sectors involved in NZT: fuel supply and power supply.

6.1 Contribution of the Well to Tank emissions in the CBDP fuel supply sector residual emissions

88 I use the Applicant's estimate of 0.4 MtCO2e/yr of upstream Well to Tank emissions as stated at DOC_9_53/3.1.4 "*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*" to assess the impact on the 6CB Fuel supply residual emissions.

89 As noted above, the Well to Tank emissions figure is in fact subject to variations (a small downward change in 2022, and most likely a much larger upward change in 2023).

[28] "Quarterly Gas Review: Gas Markets in 2023 Tracking Key Metrics", Oxford Institute of Energy Studies, July 2023 , https://www.oxfordenergy.org/wpcms/wp-content/uploads/2023/07/OIES-Quarterly-Gas-Review-Issue-22.pdf

90 The CBDP 6th carbon budget (6CB) average annual residual emissions for the Fuel supply sector[29] (9.6MtCO2e). The Applicant's 0.4MtCO2e/yr figure is therefore 4.21% of the annual residual emissions. The applicant is in agreement at DOC_AP6/Table 3.

6.2 Contribution of the remaining emissions in the CBDP power supply sector residual emissions

91 The CBDP 6th carbon budget (6CB) average annual residual emissions for the ~~Fuel~~ Power supply sector[30] (8.4MtCO2e). If only the Direct emissions from the combustion in the NZT power plant are considered, with the assumption of 90% CCS, then the annual emissions are 237,175 tCO2e which gives 2.82%. The applicant is in agreement[31] at DOC_AP6/Table 3.

92 However, the calculation ignores (1) the offshore emissions as estimated at REP6-121/3.2, and (2) the loss of combustion emissions capture through T&S unavailability as estimated at REP6-121/Table 3-3. The T&S unavailability emissions are 3,592,523 tCO2e over 25 years, or 143,700 tCO2e per year[32]. This is 1.71% of the Power supply residual emissions. When the combustion only 2.82% is added to the T&S unavailability 1.71%, the estimate is 4.53%. The estimate as low as it does not include the offshore emissions attributable to the Power supply sector[33]. The applicant's analysis in DOC_AP6 is in error in not considering the offshore emissions and T&S unavailability emissions and is inconsistent with REP6-123 in that respect.

93 The 25-year whole life GHGs emissions for the project are 20,808,127 tCO2e (832,325 tCO2e/yr) including offshore and T&S unavailability emissions as presented at Table 1. When annualised for a year in the 6CB, these consume 4.21% of the fuel supply annual residual emissions, and 4.53% (underestimate as explained) of the power supply annual residual emissions. The applicant has also identified emissions in the Industry, Waste and F-gases, and Domestic Transport sectors which I do not consider here.

6.3 Lack of deeper assessment based on delivery risk analysis

94 The assessment made by the applicant in DOC_AP6 assumes that each sector residual emission for the 6CB will be 100% delivered: that is, it is assumed that the policies and proposals in the CBDP for each sector will be delivered in full. No evidence has been provided by the applicant that this assumption is true. It is, in fact, very unlikely to be true.

---

[29] Table 2 of the CBDP (page 13) gives the ~~Power~~ Fuel sector residual emissions at 48 MtCO2e for the 6th carbon budget, or an average of 9.6 MtCO2e per year between 2033 and 2037.

[30] Table 2 of the CBDP (page 13) gives the Power sector residual emissions at 42 MtCO2e for the 6th carbon budget, or an average of 8.4 MtCO2e per year between 2033 and 2037.

[31] The applicant states 2.83% due to inconsequential differences in rounding.

[32] This gives a total of 380,876 tCO2e/yr – 237,175 tCO2e/yr from uncaptured direct emissions from combustion of methane and 143,700 tCO2e/yr from T&S unavailability.

[33] ~~This extra estimation for offshore emissions has not been included for brevity.~~ The offshore emissions are estimated by the applicant as 357,408 tCO2e: 324,699 tCO2e for construction over 3 years, 30,988 tCO2e for operation over 25 years, and 1,721 tCO2e for decommissioning [REP6-123/Table 3-2]. It is not clear exactly which parts of these emissions should be attributed to the Power supply sector.

For example, as one of the claimants in the second Net Zero strategy case[34] has written to the High Court:

> *"The Defendant, as the SSBEIS had done in the NZS, based his overall s.13 conclusion – that the CBDP policies would enable the carbon budgets to be met – firmly on the assumption that all 191 of the quantified CBDP policies would be delivered in full. On any view, that is a very optimistic assumption, given the huge number of policies, the fact that they would take effect across a period of over 15 years, and the significant technological, political and regulatory challenges involved in delivering them. Indeed, the CCC's Progress Report published on 28 June 2023 raises particular concerns about delivery risks and gaps, including, among other things, the reliance on technological solutions that have not been deployed at scale. It also noted a lack of coherent plans to mitigate those delivery risks [page 76, CB/537]."*

95 The assumption by the applicant in DOC_AP6 is the same – very optimistic. Further, by making this assumption and not engaging in the risk to delivery of CBDP proposals and policies, the applicant has not provided the SoS with the vital and necessary background information for reaching a reasoned conclusion on the impacts of the GHGs from the NZT.

96 It is acknowledged that the Climate Change Act section 14 CBDP Risk Tables have not been disclosed by the Government so may not be available to the applicant. The issue remains that the SoS must consider the risk to policy delivery, with the assistance of her/his own Risk Tables, in order to reach a reasoned conclusion about the GHG emissions from the NZT project.

97 The risk assessment from the CCC in its 2023 Progress Report (see later) was available to the Applicant well before it submitted DOC_AP6 on August 4th but has been ignored by the Applicant despite the advice of the CCC being considered as having material weight by the judge in the first NZS legal judgement. And I submit in this document the CCC advice has material weight for the SoS in reaching her/his reasoned conclusion.

98 The key flaw of DOC_AP6 is that it does not go beyond a superficial comparison of the un-risked residual emissions and the GHGs from the NZT project.

99 When risk is considered, the context for the GHG assessment changes considerably, and the significance of the emissions may also change.

100 For example, the 4.53% (only calculated as 2.82% by the applicant in error, and a severe underestimate) power supply annual residual emissions must be contextualised by the CCC's finding that the electricity supply sector is required to reduce[35] from a baseline of 66.5

[34] See https://goodlawproject.org/crowdfunder/net-zero-2 and link within to SFG at https://glplive.org/NZ2-SFG

[35] The figures quoted are derived from the supplementary "Progress in reducing emissions - 2023 Report to Parliament - Charts and data" at https://www.theccc.org.uk/wp-content/uploads/2023/06/Progress-in-reducing-emissions-2023-Report-to-Parliament-Charts-and-data.xlsx

MtCO2e/yr to 3.5 MtCO2e/yr ("Government Pathway") in the 6CB, and the CCC assess credible plans only existing for 30% of this with a remaining 43.8 MtCO2e/yr of electricity supply emissions reductions requiring to be fully secured.

101 The deeper issue here is that 4.53% of the residual emissions for one power project is a very significant quantity when 43.8 MtCO2e/yr of electricity supply emissions reductions still need to be found for each year in that carbon budget. There is no evidence at all from the applicant that the NZT emissions can be accommodated by the risk-assessed emission space for the residual emissions in the power supply sector. There cannot be any clear evidence because the applicant has not considered any risk assessment of the CBDP sector residual emissions.

102 This is the issue that must be in the SoS's mind in reaching a reasoned conclusion on the significance of the NZT GHG emissions and is expanded upon in the penultimate section below on significance assessment.

103 The IEMA guidance is relevant to this, and important to understand, and is now discussed.

7 IEMA

104 The applicant purports to follow the IEMA guidance ("**IEMA**")[36]. At REP6-123/3.6, the applicant describes the IEMA approach to significance and the threshold criteria for significance assessment at Table 3-5 in IEMA. The SoS has also purported to use and follow the IEMA guidance, and make IEMA significance assessments, in other recent DCO decisions.

7.1 Incorrect claims for the counterfactual

105 The applicant seeks to just its counterfactual scenario on the basis of the IEMA guidance at REP6-123/3.6.4.

> *"The overall assessment of significance of a development may be affected by whether it is viewed in isolation, or relative to a counterfactual scenario in which the development does not go ahead."*

106 However, this is a false interpretation of what IEMA says about "Future baseline**s**" and "Alternative baseline**s**".

> *"Alternative baselines can be used to supplement the analysis and address uncertainty. For example, it may be unclear what baseline to adopt and compare a proposed project against if the site is 'empty' (i.e. the project is not replacing an existing development). For example: different locations, designs or layouts for*

[36] "Assessing Greenhouse Gas Emissions and Evaluating their Significance", IEMA, February 2022.

building developments; or alternative energy generation options in the instance of a wind or solar farm proposal. However, a realistic worse-case baseline should still be used for assigning significance."

107 First of all, IEMA refers to baseline**s** plural, indicating that a single alternative should not be cherry picked for its enabling of a desired outcome, in this case to create the illusion that the NZT project is net-negative for GHGs, as the application has done with its counterfactual. The guidance instead points to the use of genuine alternatives and supports my point above that a suitable counterfactual would be a renewable energy plant to generate electricity and operate the carbon capture facility for third party emitters. Further, an alternative baseline should be realistic: the stand-alone unabated CCGT power station is not a realistic, genuine alternative when Government policy is that there should be no further unabated fossil-fuel electricity generation.

108 Realistic baselines are a genuine "do nothing" ie the current baseline without the project, or a genuine alternative counterfactual such as renewable energy plant.

109 With regard to REP6-123/3.6.4, it should be also noted that the supposed net-negative carbon emissions on the scheme do not arise from the choice of the counterfactual, but from the applicant's double counting error.

7.2 IEMA Contextualisation: sectoral reduction strategies

110 IEMA places weight on "Contextualising a project's carbon footprint" – a substantive sub-section (section 6.4) is given in the IEMA chapter on Significance on this.

111 On IEMA page 26, it is stated:

"The starting point for context is therefore the percentage contribution to the national or devolved administration carbon budget as advised by the CCC. However, the contribution of most individual projects to national-level budgets will be small and so this context will have limited value."

112 IEMA goes on at Table 1 on page 28 to provide "*Sources of contextual information against which projects can be evaluated*".

113 One context in the table is "Sectoral budgets or reduction strategies". I acknowledge the quote of CBDP 19 at DOC_9_53/4.1.3 that referring to projected residual emissions, "*These are only projections and should not be interpreted as hard sectoral policy targets.*", but this mischaracterises what I was presenting in CEPP_PES.

114 IEMA is advising strongly that contextualisation should be done with sectoral reduction strategies, and this is exactly what the residual emissions (and the proposals and policies to meet them) are in the CBDP. They are not hard targets, but they do provide a sectoral reduction strategy which provides a fertile and valuable source of contextualisation.

115 Estimates were provided above for the 6CB that the 4.21% of the Fuel sector annual residual emissions are used for the project's Well to Tank emissions, and the 4.53% of the Power supply residual emissions for the electricity generation for the project. These calculations are **not** presented as evidence that a hard sectoral target may be breached. They are presented as important data in considering whether the scheme is consistent with the CBDP sectoral reduction strategy for the Fuel supply and Power supply sectors. Essentially, the data has to be considered in the context of whether there is enough emissions space in the residual emissions for these sectors to allow a single project to take around 5% of the national residual emissions in **both** these sectors.

116 The point was made at CEPP_PES/31 that this issue must be considered cumulatively with other schemes coming forward in the UK. The same issue applies to every other power CCUS station and also every other blue hydrogen facility[37] planned, and also the Drax BECCS project. Already, a very similar facility, the Keadby 3 Carbon Capture Power Station was granted development consent on 7th December 2022 – this will also consume of the order 5% of the national residual emissions for each of the Fuel supply and Power supply sectors. Another similar plant is planned in Scotland[38], also taking a similar amount. Further blue hydrogen projects also based on methane fuel supply and processing, and Drax BECCS are being planned. It is quite evident that the slices of the residual emissions pies for Fuel supply and Power supply are being "given out" and nobody is keeping track on when the pies might be fully consumed, or when emission reductions from the pies of other sectors will need to be substantially used to enable the fuel supply and power supply sectors to breach their residual emissions. The SoS must consider this cumulation of similar projects across the UK, and in the context of the extremely risk burdensome fuel supply and power supply sectors, in considering and reaching a reasoned conclusion on the GHG emissions from the NZT project.

[37] See the Bauer "On the climate impacts of blue hydrogen production" provided as Appendix B of my WR [REP2-061]

[38] Peterhead Carbon Capture Power Station

7.3 IEMA Contextualisation: Existing and emerging national and local policy or regulation

117 IEMA goes on at Table 1 on page 28 to provide another context "*Existing and emerging national and local policy or regulation*" and states an advantage of such contextualisation is that "*Policy should be compatible with the UK's national GHG commitments and actions to achieve those*".

118 The CBDP provides policy which the SoS has presented to parliament as "compatible with the UK's national GHG commitments and actions to achieve those", notwithstanding the identified shortfalls for the NDC and sixth carbon budget also presented to parliament in the CBDP, and the current legal case against the CBDP. And, the CCC Progress report provides the latest detailed analysis of progress, or lack of it, towards those sectoral reduction strategies. The judge in the first NZS legal case fully endorses, and legally approves, the critical expert role of the CCC by stating that their advice must be given "considerable weight".

119 Further, the risk to delivery of the CBDP was so great that in July 2023 campaigners took the strategy to Court for a second time (the second NZS legal case), particular on the issue the risk to policy delivery not being satisfactorily assessed in the CBDP, and this case now has permission for a full High Court hearing. It has emerged in the pre-action protocol correspondence that the Government have produced Risk Tables for the proposals and policies in the CBDP but failed to publish them under section 14 of the Climate Change Act[39].

120 The point again, is that this is not general background material, but is vital information which the SoS must consider in reaching a reasoned conclusion on the NZT project. In this case, it is not just a matter of considering if there is sufficient emissions space to meet the residual emissions for the Fuel supply and Power supply sectors as they are published in the CBDP. The SoS must first take into account the risk to delivering the residual emissions, which may be determined from her/his own CBDP Risk Tables, and the even more restricted emissions space that it imposes for any project coming forward. Second, the SoS must consider if the risk-assessed residual emissions provide, or do not provide, emissions capacity to construct the NZT plant with its approximately 5% additional emissions in each sector against the un-risk-assessed residual emissions.

121 To put this another way:

A. The residual emissions for the Fuel supply sector in the 6CB are 9.6 MtCO2e/yr: a reduction from 20 MtCO2e per year in 2021[40], and

[39] See https://glplive.org/NZ2-SFG

[40] Table 2 of the CBDP (page 13) gives the Fuel supply sector residual emissions at 48 MtCO2e (over 5 years) for the 6th carbon budget, or an average of 9.6 MtCO2e per year between 2033 and 2037, and the current 2021 emissions as 20 MtCO2e/yr.

(i) according to the CCC[41], a remaining 4.4 MtCO2e of fuel supply emissions reductions are required to fully secure the sector in the 6CB (see "Fuel Supply - Impact on 6th carbon budget" section above).

B. The residual emissions for the Power supply sector in the 6CB are 8.4MtCO2e/yr: a reduction from ~~52~~ 54 MtCO2e per year in 2021[42], and

(i) according to the CCC[43], a remaining 43.8 MtCO2e of power/electricity supply emissions reductions are required to fully secure the sector in the 6CB (see "Electricity Supply - Impact on 6th carbon budget" section above).

The 832,325 tCO2e/yr emissions from the scheme (as per Table 1 above) need to be understood in the context of the CCC risk assessment and also in terms of the Government's own Risk Tables for the CBDP. Only then, it is possible to make a reasoned conclusion as to whether adding a further 832,325 tCO2e/yr to the atmosphere from the NZT project is compatible with the UK climate targets and budgets, and legislation.

7.4 IEMA summary

122 The applicant has adopted the IEMA guidance for significance assessment, as discussed further in the next section where I review their assessment. However, they have incorrectly and unlawfully applied the counterfactual, and failed to apply the guidance with respect to contextualising the GHG emissions from the project. Currently, it is not possible to reach a reasoned conclusion on the significance assessment because the applicant has not provided the contextualisation of genuinely considering if the large, additional GHG emissions can fit within ~~a properly risk assessed~~ the CBDP sectoral residual emissions, ~~-~~when it is properly risk assessed~~as given by the CBDP strategy plan~~. Whilst the sectoral residual emissions are not considered a hard target, if the GHG emissions do not fit, then other sectors must make up the shortfall and there must also be a reasoned conclusion of why this could possibly be acceptable in the wider context of delivering the whole CBDP.

Formatted: Underline

~~123~~ In short, where large additional emissions are proposed for a project, the Secretary of State must address both the current failures to deliver on sectoral reduction strategies as identified in the CCC Progress report, the shortfalls in delivering existing national policy identified in the CBDP (ie the shortfalls for the NDC and the 6CB), and the risk to proposals and policies in the CBDP (her/his own Risk Tables), in making her/his significance assessment. These each form vital contextualisation for the 832,325 tonnes of CO2e from the project each year.
123

[41] This analysis includes an increase to overall fuel supply required (due to greater power generation).

[42] Table 2 of the CBDP (page 13) gives the Power supply sector residual emissions at 42 MtCO2e (over 5 years) for the 6th carbon budget, or an average of 8.4 MtCO2e per year between 2033 and 2037, and the current 2021 emissions as 54 MtCO2e/yr.

[43] This analysis includes an increase to overall electricity generation.

Formatted: Normal

Formatted: No bullets or numbering

8 COMMENTS ON REP6-123: SIGNIFICANCE ASSESSMENT

124 In Section 3.6 of REP6-123 the applicant purports to deal with "Assessment of Significance".

125 The applicant presents two scenarios for assessment [REP6-123/3.6.4]:

A. The project itself, as estimated in REP6-123, and "which will result in an increase in carbon dioxide in the atmosphere" [REP6-123/3.6.5]; and

B. "An alternative counterfactual scenario in which a similar CCGT operates without carbon capture and storage" [REP6-123/3.6.7].

126 I consider these in reverse as it is first necessary to show that Applicant's counterfactual is unlawful and unviable as an assessment scenario.

8.1 The counterfactual scenario

127 A number of claims are made for the counterfactual scenario which are false.

128 Under the applicant's counterfactual scenario, it is claimed that "*the project causes a reduction in atmospheric concentration*" of GHGs [REP6-123/3.6.7]. However, it has been shown that the claimed reduction in GHGs only arises from a double counting error in REP6-123/Table 3-4.

129 In any case, the counterfactual scenario is an arbitrary choice, and other alternative counterfactuals have not been considered, including the obvious one of a renewable energy alternative to the power plant and powering the CCUS network.

130 Further, the counterfactual is unlawful as it changes the nature of the project seeking planning approval and fabricates a false future baseline which is not relatable to the application.

131 The counterfactual scenario cannot be considered reasonable for all the above reasons.

132 It is of note that the Applicant's false and wrong calculation of this scenario claims a GHG reduction of 32MtCO2e over 25 years (1.3 MtCO2e/yr), and the applicant assesses this as "Beneficial and Significant" [REP6-123/3.6.11]. The applicant does not explain what it considers the threshold quantity of GHGs to be significant is: however, it is evident that applicant does consider this order of GHGs (ie of the order of 1MtCO2e/yr) to be significant.

8.2 The project itself

133 The applicant does not provide an estimate for the quantity of GHGs for this in REP6-123, although it does proceed, without a quantified estimate, to make a significance assessment at

REP6-123/3.6.6. The applicant has not justified, as it cannot, jumping to making the significance assessment without previously having calculated an estimate of the emissions associated with the project.

134 Table 1 above fills that gap above where there is a corrected version of REP6-121/Table 3-4. Using the applicant's assumptions, the whole life GHG emissions from the project itself are 20,808,127 MtCO2e over 25 years (0.83 MtCO2e/yr).

135 The applicant claims that the project itself "could be assessed as Minor Adverse, which would not be significant" [REP6-123/3.6.6]. The applicant appears not to be certain with this assessment (use of word "could").

136 In any case, the applicant gives no reasoning why it considers additional atmospheric emissions of 0.83 MtCO2e/yr to be not significant when it considers saving emissions by a similar megatonne order of magnitude to be significant.

137 Despite this inconsistency, there is further contextualisation information which the applicant has ignored completely, and which was available to it when DOC_9_53 was written in August 2023. The applicant purports to use the IEMA guidance but has not attempted to contextualise the GHG emissions against sectoral reduction strategies, or existing and emerging national and local policy or regulation. This is explained in the IEMA section above.

138 The NZT project, based on the applicant's REP6-123 estimates, consumes 4.21% of the CBDP Fuel sector annual residual emissions ~~are used for the project's Well to Tank emissions~~, and the 4.53% of the CBDP Power supply residual emissions for the electricity generation for the project.

139 I submit that the Secretary of State must reach a reasoned conclusion of whether these additional emissions in these sectors are consistent with delivering the UK climate targets and budgets, and international obligations, under section 104 of the 2008 Planning Act. I have also made clear that the SoS must bring into that reasoning:

A. The estimated quantum of the emissions (as above, 4.21% of the CBDP Fuel sector annual residual emissions and 4.53% of the CBDP Power supply residual emissions in the 6CB); and

B. The risks to the delivery of the proposals and policies in the CBDP designed to deliver the NDC, budgets and targets. This requires taking into account the delivery risks identified by (1) the CCC in it 2023 Progress Report (and giving material weight to the CCC advice), and (2) examining her/his own CBDP Risk Tables.

140 I have also submitted that the process at A above of considering the sector annual residual emissions is not treating them as hard sectoral targets (as the Applicant has mischaracterised it

in CEPP_PES). Instead, it is treating the information on the sector annual residual emissions, and the risks to their delivery, as vital contextual information for reaching a reasoned conclusion on the significance of the GHG emission for the project itself under regulation 21 of the EIA Regulations. The contextualisation here is considering information relating to "sectoral reduction strategies" as described by the IEMA guidance.

141 Similarly the contextualisation of using the risk assessment information (ie the CCC report and the Risk Tables) is considering information relating to "existing and emerging national and local policy or regulation" as described by the IEMA guidance. Reasoning of whether the project complies with national policy in the CBDP can only realistically be concluded if the risks to delivery of that policy are fully weighed.

8.3 Summary on significance assessment

142 The applicant's counterfactual scenario is riddled with problems, including unlawfulness, and cannot be considered as a viable scenario for the SoS to employ for reaching a reasoned under regulation 21 of the EIA Regulations.

143 The applicant provided no quantified estimate for the GHGs from the project itself, although it went on to make a significance assessment. Despite purporting to follow the IEMA guidance, the applicant then failed to undertake any contextualisation of the GHG emissions from the project, despite the IEMA guidance directing EIA professionals that contextualisation is substantive part of the significance assessment process.

144 Having corrected the applicant's whole life GHG emissions from the project itself (Table 1), I have emphasised above the matters that the SoS must consider in making a reasoned conclusion on the significance.

145 I submit that the GHG emissions (0.83 MtCO2e/yr) from the project itself are significant in the context of being around 5% of each of the Fuel supply and Power supply CBDP residual emissions in the 6CB. The emissions are at the megatonne annual scale, also making them significant. This corresponds to "Significant Adverse" in the IEMA based Table provided by the applicant at REP6-123/Table 3-5.

146 I then submit that the GHG emissions are "Major Adverse", and have a material impact on meeting the sixth carbon budget, because they consume:

A. around 5% of the Fuel supply residual emissions (as 0.4 MtCO2e/yr of upstream Well to Tank emissions) when that sector has to find 4.4 MtCO2e/yr of reductions to be fully secure the 6CB; and

B. around 5% of the Power supply residual emissions (380,876 tCO2e/yr from uncaptured direct emissions from combustion of methane and from T&S unavailability) when that sector has to find 43.8 MtCO2e/yr of electricity supply emissions reductions require to be fully secured in the 6CB.

147 Further, the GHGs from the project are "Major Adverse", and have a material impact on meeting the UK NDC under the Paris agreement as they consume:

A. 0.4 MtCO2e/yr of upstream Well to Tank emissions when the Fuel supply sector has to find 2.9 MtCO2e/yr of fuel supply emission reductions to meet the NDC; and

B. 380,876 tCO2e/yr from uncaptured direct emissions from combustion of methane and from T&S unavailability when the Power supply sector has to find 27.7 MtCO2e/yr of electricity supply emission reductions for the NDC.

148 The NZT project is therefore "Significant Adverse" and "Major Adverse". I submit that the project cannot be approved in these circumstances because it poses serious risks, that are unmitigated, to the delivery of both the UK NDC under the Paris agreement and the sixth carbon budget. In that situation, the SoS has to reasonably conclude, under section 104 of the 2008 Planning Act that approving the scheme would lead to the UK being in breach of its international obligations (s104(4)); in breach of any statutory duty (s104(5)); and/or be unlawful (s104(6)).

9 PARTICULATE MATTER

149 Recent legislation has introduced new targets for PM2.5 particulate matter for 2040 with interim targets for 2028.

150 According to 2021 analysis from the European Environment Agency (EEA)[44], in 2019 fine particulate matter (PM2.5) was responsible for more than 33,000 deaths annually in the UK, and nitrogen dioxide (NO2) for 5,750. Half of the UK's deaths from PM2.5 could have been avoided if the UK had followed the latest recommendations by the World Health Organization (WHO). A 2021 scientific study in Nature[45] confirmed fossil fuel combustion as a major source of PM2.5 health related issues. The study found that globally, 1.05 million deaths would have been avoidable in 2017 by eliminating fossil-fuel combustion.

151 The impact of PM2.5s from a new fossil fuel burning plant in the Teesside area must not be ignored: the PM2.5 effects must be estimated, and the impacts assessed against current UK legislation.

[44] "*Thousands of needless air pollution deaths as UK government ignores health experts – ClientEarth reaction*", ClientEarth media release 15th November 2021, https://www.clientearth.org/latest/press-office/press/thousands-of-needless-air-pollution-deaths-as-uk-government-ignores-health-experts-clientearth-reaction

[45] "*Source sector and fuel contributions to ambient PM2.5 and attributable mortality across multiple spatial scales*", McDuffie et al, Nature, June 2021, https://www.nature.com/articles/s41467-021-23853-y

152 The SoS must grapple with the implications of the new legislation for the NZT project. However, the application and environmental statement have not been suitable updated against the new legislation and targets.

9.1 Recent legislative changes

153 Sections 1 and 2 of the Environment Act 2021 ("**the 2021 Act**") require the Secretary of State for Environment, Food and Rural Affairs to set environmental targets for air quality, while section 8 requires an Environmental Improvement Plan ("**EIP**") to be prepared.

154 In January 2023, 2040 targets were set via the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 ("**the 2023 Regulations**") and, separately, interim targets for 2028 via the EIP ("**the 2028 interim targets**"), which replaced the 25-year environment plan [of 2018].

155 The 2023 Regulations 2023 were made on 30 January 2023 and came into effect on 31 January 2023, and introduced an annual mean concentration target for PM2.5 of 10µg/m³ and a Population Exposure Reduction Target ("**PERT**") to reduce population exposure to PM2.5 by 35% by the end of 2040 compared to 2018 levels.

156 The 2028 interim targets introduced:

A. an Annual Mean Concentration Target ("**AMCT**") which is that the highest annual mean concentration in the most recent full calendar year must not exceed 12 µg/m3 of PM2.5; and

B. an interim legal PERT target to reduce population exposure to PM2.5 by 22% by the end of January 2028

9.2 Issues with the application and environmental statement

157 APP-090 provides Chapter 8 of the Environmental Statement "Air Quality".

158 APP-090 section 8.2 is titled "Legislation and planning policy" and has not been updated for the new legislation. At Table 8-1, a previous EU air quality target value for PM2.5 of 25 µg/m³ (Annual Mean) is listed. However, the new UK targets are not listed.

159 Under APP-090 section 8.6 "Likely Impacts and Effects", no estimation or assessment is given for the PM2.5 effects from construction or operation of the NZT project.

160 The human health impacts of PM2.5 are very serious as evidenced by the EEA (quote above) and many other studies. Under APP-090 Table 8-10 "Results of Operational Impact Assessment for Human Health Impacts", no estimate or assessment is given for PM2.5.

161 "Appendix 8A: Air Quality – Construction Assessment" [APP-247] appears to provide some estimation of PM2.5 from construction traffic in the construction phase.

162 "Appendix 8B: Air Quality – Operational Assessment" [APP-248] makes no estimation or assessment of PM2.5 in the operation phase.

9.3 Issues for the Secretary of State

163 It is acknowledged that the new legislation and targets were enacted after the DCO examination period. However, the SoS cannot brush aside the new targets. Under section104 of the 2008 Planning Act, she/he must decide the application in accordance with any relevant national policy statement, except to the extent that she/he is satisfied that deciding the application in accordance with any national policy statement would lead to her/him to being in breach of any duty imposed by or under an enactment (section 104(5)). That includes the new legally binding targets, and interim targets, for PM2.5.

164 As outlined above, the Applicant's Air Quality assessment does not address the new targets, including the interim targets, nor provide estimates and assessments against them, nor consider the relevant potential health impacts in the Teesside area.

165 The Secretary of State must now require that the applicant updates the Environmental Statement against the new legislation, via further consultation processes.

10 SIGNED

Dr Andrew Boswell,
Climate Emergency Policy and Planning, September 6th, 2023

11 APPENDIX A: Carbon footprint of UK natural gas imports (reproduced from NSTA)

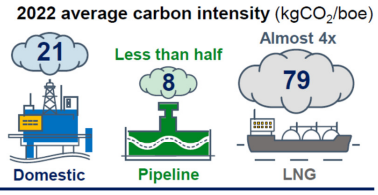
166 One page fact sheet, as from: https://www.nstauthority.co.uk/the-move-to-net-zero/net-zero-benchmarking-and-analysis/natural-gas-carbon-footprint-analysis/ , July 2023

North Sea Transition Authority

Carbon footprint of UK natural gas imports

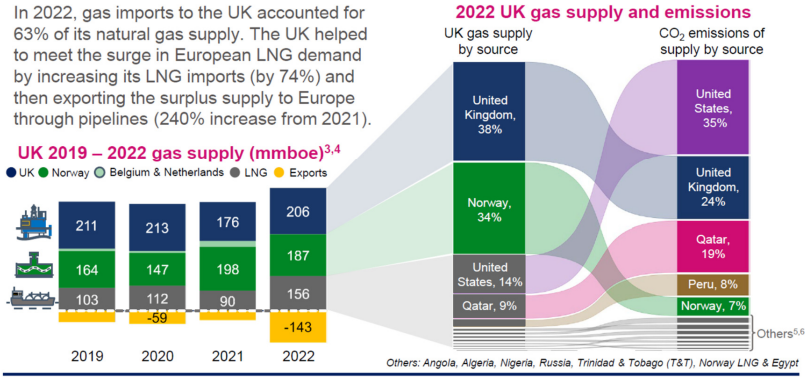
Carbon intensity of UK imported natural gas

At 21 $kgCO_2/boe$[1], the average carbon intensity[2] of UK gas production is lower than the average carbon intensity of all sources of natural gas imported to the UK (except pipeline imports from Norway). The average carbon intensity of imported Liquefied Natural Gas (LNG) is almost four times the carbon intensity of UK production.

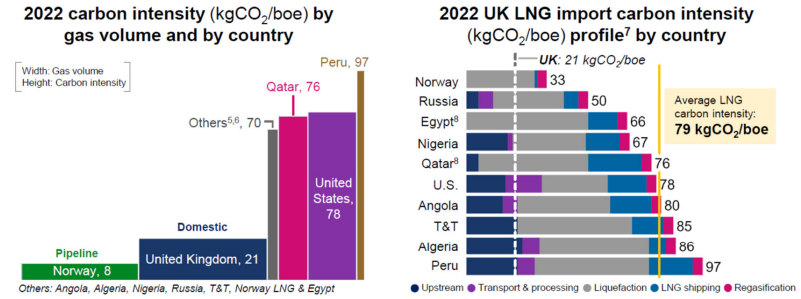


UK gas supply mix and carbon dioxide emissions

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).



2022 UK gas supply carbon intensities



- This factsheet summarises a comparison of carbon intensity of the UK's domestic production to that of imported LNG and pipelined gas.
- Given the lack of standardised monitoring, measurement and reporting of emissions across natural gas lifecycle stages and global sources, as well as uncertainties, all import emissions values are best estimates.

[1] All estimates of carbon dioxide emissions and carbon intensities are sourced from Rystad Energy's Gas and LNG trade emission analysis dashboard (July 2023).
[2] Carbon intensity = Carbon dioxide (CO_2) emissions per barrel of oil equivalent (boe) produced.
[3] Gross supply. The UK is a net gas importer but seasonally exports significant gas volumes to the Republic of Ireland, Belgium and The Netherlands.
[4] Source: Department for Energy Security and Net Zero (DESNZ) Energy Trends: UK Gas https://www.gov.uk/government/statistics/gas-section-4-energy-trends. Assuming 1 boe = 5800 standard cubic feet of natural gas.
[5] Others: Countries with import volumes less than five million boe in 2022. [6] Average intensity of grouped countries = Sum of emissions divided by sum of import volumes.
[7] The LNG value chain stages: Upstream, Transport & processing, Liquefaction, LNG shipping & Regasification.
[8] Egypt and Qatar's data is not disaggregated for all five LNG value chain stages.

- Natural gas imported via Belgium and Netherlands is a mix of gas from Norway, Russia, Germany & France. In 2022, imports from Belgium and Netherlands made up only 1% of pipelined gas imports as the pipelines from Belgium and Netherlands were almost exclusively used to export gas to Europe between April and December.
- No LNG imports were received from Russia between April and December 2022. During Q1 2022, Russian LNG originated from the relatively new arctic Yamal LNG plant.

12 APPENDIX B: Extract on 2023 Norwegian pipeline supply of methane to UK

Extract of page 10 from "Quarterly Gas Review: Gas Markets in 2023 Tracking Key Metrics", Oxford Institute of Energy Studies, July 2023 , https://www.oxfordenergy.org/wpcms/wp-content/uploads/2023/07/OIES-Quarterly-Gas-Review-Issue-22.pdf

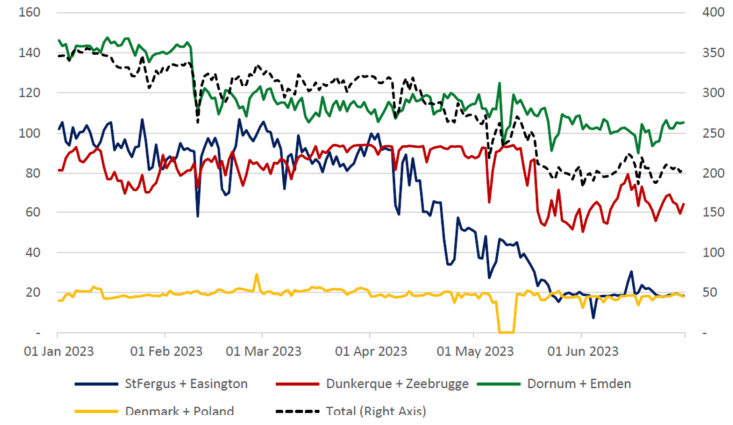
It was in Q2 2023, however, that the flow of Norwegian gas to Europe showed its most significant year-on-year decline, especially in May and June. That decline may be attributed to a significant extent to maintenance work that curtailed three key elements of Norwegian supply: field production capacity; processing plant capacity; and receiving terminal capacity.

According to Gassco, curtailments related to maintenance brought production capacity down from an average of 334-338 MMcm/d in January-March 2023 to 314 MMcm/d (April), 271 MMcm/d (May), and 232 MMcm/d (June). That capacity is set to recover to around 300-310 MMcm/d in July and August, then dipping again to 264 MMcm/d in September, before finally regaining its full potential of around 345-355 MMcm/d in October-December 2023.

Norwegian gas processing capacity at its three main plants (Nyhamna, Kollsnes, and Kårstø) is around 330 MMcm/d. But maintenance reduced this capacity in Q2 2023 to monthly averages of 310 MMcm/d (April), 245 MMcm/d (May), and 228 MMcm/d (June). That capacity is expected to remain at 270-300 MMcm/d in Q3 2023, 320 MMcm/d in October, and not return to its full 330 MMcm/d until November. In addition to gas processed at Nyhamna, Kollsnes, and Kårstø, some volumes are delivered directly to the UK at St Fergus for processing there, which is why the capacity at Nyhamna, Kollsnes, and Kårstø combined is less than total Norwegian production capacity.

The terminals that receive Norwegian pipeline gas in the UK (at St Fergus & Easington), France (Dunkerque), Belgium (Zeebrugge), Germany/Netherlands (Emden & Dornum), and Denmark/Poland (Nybro) have a combined capacity of 380 MMcm/d. According to Gassco, from late May to late August, and again from 11 September to 1 October, this capacity is planned to be reduced to 330-355 MMcm/d, with a deeper curtailment down to 300 MMcm/d from late August to 10 September, including two days down to 260 MMcm/d (due to annual Emergency Shut Down [ESD] tests at Emden on 29-30 August and Easington on 4-5 September). The impact of the maintenance that has already taken place this year on the daily flows of Norwegian pipeline gas to Europe are illustrated in the graph below.

Figure 1.8: Daily Norwegian pipeline gas exports to Europe since 1 January 2023 (MMcm/d)



Source: Data from ENTSOG Transparency Platform & UK Government