[redacted]

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Our ref: LJH/BAI2/2
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23 March 2022

Dear A38 Derby Junctions Team

Re A38 Derby Junctions
Re-Determination of the application by Highways England for an order granting development consent for the A38 Derby Junctions

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WRITTEN REPRESENTATIONS
ON BEHALF OF MAIR BAIN

Introduction

1. These representations respond to the Applicant's Response of 4 February 2022 ("**the Applicant's Response**") to the Secretary of State's ("**SoS**") Consultation letter of 7 January 2022 ("**the Consultation**") and should be read in conjunction with our client's previous representations dated 26 October 2021 ("**First Representations**"). Following the Applicant's Response, on 23 February 2022 the SoS invited comments from Interested Parties to sections 1 and 3 of the Applicant's Response, which requested:

    (i) Comments from the Applicant on other responses to the Statement of Matters;

    (ii) Additional information from the Applicant on the cumulative assessment of climate impacts.

2. These representations address specific points arising from the Applicant's Response and are accompanied by a further report from Dr Boswell ("**the Second Boswell Report**") addressing in more detail the Applicant's Response overall. The Second Boswell Report sets out overall concerns in the Applicant's approach and sets out further information that is required.

3. For the avoidance of doubt, where our client has chosen not to comment on matters in the Applicant's Response or earlier documents, it is not an indication that our client agrees with the point or comment raised or opinion expressed.

Transparency and public participation

4. Our client continues to be concerned about the lack of transparency regarding the information and data about the traffic models on which the operational carbon emissions assessment is based [see Second Boswell Report at para.14]. This undermines the current process following on from the Statement of Matters, through which the SoS is seeking to ensure that he is satisfied that the material provided by the Applicant is sufficient for him to reach a reasoned conclusion on the significant effects of the proposed development on the environment. This lack of information also limits the public's involvement in the EIA process which, as noted in our client's previous representations, is important not just to ensure compliance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ("**EIA Regs**"), which seek to ensure a process by which the public is given an opportunity to express their opinion on environmental matters,[1] but also the Aarhus Convention in respect of public participation.[2]

5. In short, the public can only participate and give a reasonable opinion on environmental matters if sufficient background data on projected environmental effects is provided. The Applicant in this case has not done this. In order to comply with the EIA Regs, the further information highlighted in the Second Boswell Report[3] is not only reasonably required in to facilitate meaningful public engagement but to ensure that the SoS is able to satisfy his duties under the EIA Regs.

Requirements of the EIA Regulations

6. The EIA Regs provide that when deciding whether to grant development consent the SoS must examine the environmental information and reach a reasoned conclusion on the significant effects of the proposed development on the

[1] (see Berkeley v SSE [2001] 2 AC 603 (section 8 of Lord Hoffmann's speech) and Commission of the European Communities v Federal Republic of Germany (Case C-431/92) at [35]).

[2] in particular Article 6 on public participation in decisions on specific activities, sub-paragraph (6) which requires public access to relevant information about a proposed project, including at least a "description of the significant effects of the proposed activity on the environment"

[3] In particular, at paragraphs: 25, 46, 67iii, 103, 105, 110, 111, 112, 116, 117 and 119.

environment, taking into account the examination and any supplementary examination considered necessary.[4]

7. The reasoned conclusion must be up to date at the time that the decision is taken and must address the likely significant effects of the proposed development.[5]

8. Environmental information means the environmental statement, including any further information and any other information, any representations duly made.[6]

9. "Any other information" means any other substantive information provided by the applicant in relation to the environmental statement or updated environmental statement.[7]

10. "Further information" means additional information which, in the view of SoS is directly relevant to reaching a reasoned conclusion on the significant effects of the development on the environment and which it is necessary to include in an environmental statement or updated environmental statement in order to satisfy the requirements of regulation 14(2).

11. The requirements of regulation 14(2) include the information set out in Schedule 4. Of particular relevance are the following provisions:

> ***1.*** *A description of the development, including in particular –*
>
> *[…]*
>
> *(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.*
>
> *[…]*
>
> ***3.*** *A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.*
>
> ***4.*** *A description of the factors specified in regulation 5(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.*

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[4] EIA Regs, regulation 21(1)(b)

[5] EIA Regs, regulation 21(2)

[6] EIA Regs, regulation 3(1)

[7] EIA Regs, regulation 3(1)

5. *A description of the likely significant effects of the development on the environment resulting from, inter alia—*

(a) the construction and existence of the development, including, where relevant, demolition works;

(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;

(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g) the technologies and the substances used.

*The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC(**1**) and Directive 2009/147/EC(**2**).*

6. *A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.*

7. *A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.*

12. The requirements of regulation 14(2) are important as they set out the information that will assist the SoS to be able to reach a reasoned conclusion (i.e. provided by way of the environmental statement and/or 'further information'). The Second Boswell Report sets out a number of areas of information which is currently lacking – much of which directly relates to the requirements of regulation 14(2), as set out in Schedule 4. For example, in relation to the assessment of carbon impact of the scheme we consider that the Applicant has not sufficiently or accurately described:

(i) the current state of the environment (i.e. baseline scenario)

(ii) the likely evolution thereof without implementation of the development

(iii) the cumulation of effects with other existing and/or approved projects

(iv) the impact of the project on climate (e.g. the nature and magnitude of greenhouse gas emissions)

(v) the forecasting methods or evidence used to identify and assess the significant effects on the environment

13. Our client considers that this information must be provided (as set out in the Second Boswell Report, para. 67iii) for the decision of the SoS to be compliant with the EIA Regs.

Case law

14. The Applicant raises the cases of (Khan) v London Borough of Sutton [2014] EWHC 3663 (Admin) and Preston New Road Action Group v Secretary of State for Communities and Local Government [2018] Env. L.R. in support of the principle that an environmental statement should only include such information as is reasonably required to describe the environmental effects of the development and, in particular, which the applicant can reasonably be required to compile having regard to current knowledge.[8]

15. The Secretary of State should note that the Applicant is not here being asked to perform an assessment based on anything that is beyond current knowledge, as demonstrated in the Second Boswell Report. The information needed [Second Boswell Report, Tables 1, 2 and 3] to perform a proper cumulative carbon assessment is available to the Applicant.

16. In any event, the present case is unlike *Khan* and *Preston New Road*, both of which featured free-standing development projects. In the present case, unlike *Khan* and *Preston New Road*, the Applicant is not asked to speculate as to the content or timing of some other future project which might never happen. To illustrate the point, the question raised in those cases should be read alongside *R (Brown) v Carlisle City Council* [2011] Env. L.R. 71, (confirmed in *Pearce v Secretary of State for Business, Energy and Industrial Strategy* [2021] EWHC 326 (Admin)) in which the Court of Appeal held that where the acceptability in planning terms of a proposal for a freight distribution centre was contingent upon the provision of improvement to the runway and terminal at Carlisle Airport, the airport improvements formed part of the overall project comprising the distribution centre. Consequently, the EIA was required to assess the cumulative environmental effects of that overall project and not just the distribution centre.

17. Again, the simple point is that unlike those cases the question here is not whether the evaluation of significant environmental effects may be deferred on the basis

[8] Applicant's Response, pages 15 & 56

that information is not available to the applicant at the time. In fact, the information needed for the assessment here is already before the Applicant.[9]

18. What those cases do touch on, though, is the approach to solus and cumulative impacts in the context of EIA assessment. This is clarified in *Pearce v Secretary of State for Business, Energy and Industrial Strategy* [2021] EWHC 326 (Admin), a case concerning the cumulative assessment of impacts arising from the Norfolk Vanguard offshore windfarm project. The question there was whether consideration of the cumulative effects of the development, taken together with the neighbouring proposed Boreas offshore windfarm project, which was undergoing a parallel DCO planning application, could be deferred in circumstances where there was sufficiently detailed information about the environmental effects of the Boreas project available at the time. Mr Justice Holgate found that the evaluation of (onshore) environmental impacts was required both for the windfarm in question (under DCO planning application) in isolation (i.e. solus) and, as the information available about the environmental effects of the Boreas project was available at that time, also the in combination with that other windfarm (i.e. cumulative).

Further information

19. The Applicant suggests that the additional material requested by the Secretary of State amounts to a request for "any other information" within the meaning of regulation 3(1) of the 2017 Regulations. However, the Applicant and the Secretary of State will be aware of the background to this matter. In particular, the basis upon which the Secretary of State consented to have the DCO quashed:

> *…he failed to provide a reasoned conclusion as required by Regulation 21 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 on the significant effects of the proposed development on the environment, taking into account his examination of the environmental information, and/or failed to include a reasoned conclusion in his decision notice when making the A38 Derby Junctions Development Consent Order 2021.*

20. The Secretary of State's concession related to his non-compliance with the EIA Regs procedure – specifically, the absence of reasoning he gave in relation to his assessment of environmental impacts. This was in light of the Examining Authority's conclusions in its Report that the Applicant had not provided sufficient information to allow the Examining Authority ("**ExA**") to form its own view, for example on the cumulative effects of carbon emissions. The ExA Report concluded:

> *4.15.116 We agree with Derby Climate Coalition, FoED and others that the emissions from the Proposed Development should not be*

[9] See *Pearce v Secretary of State for Business, Energy and Industrial Strategy* [2021] EWHC 326 (Admin) [118]

seen in isolation. The Applicant was not able to provide an assessment of cumulative impacts of the Proposed Development with other highways developments, particularly given its approach of assessing the proposal against UK carbon budgets.

4.15.117 *The Applicant's approach of assessing emissions from the Proposed Development as a proportion of national budgets does not appear to conflict with current policy or guidance. The contribution of the Proposed Development may be relatively small at up to 0.01% but we are not convinced that the Applicant's approach sufficiently considers cumulative effects with other projects or programmes. In our view an appropriate assessment should, as is normal practice for the assessment of cumulative effects for other matters, adopt a reasonably consistent geographical scale. An example of this would be to consider the RIS1 or RIS2 programmes, of which the Proposed Development is a part, against the UK carbon budgets. The Applicant suggested that such an exercise had been undertaken but was unable to provide any details of it. Based on the above, we are not able to reach a conclusion on cumulative climate change effects.*

4.15.118 *Therefore, the SoST will need to satisfy themself regarding the cumulative effects of carbon emissions from the Proposed Development with those from other developments on a consistent geographical scale, for example by assessing the cumulative RIS1 or RIS2 programmes (of which the Proposed Development is part) against the UK carbon budget.*

21. These matters were left to the Secretary of State to assess and form a view on. In the absence of sufficient information from the Applicant, he was not able to do so and so was not able to provide a reasoned conclusion, leading to the quashing of his decision to grant the DCO.

22. The information requested in the Statement of Matters seeks to remedy this by giving the Applicant the opportunity to provide further information that is directly relevant to the Secretary of State reaching a reasoned conclusion on the significant effects of the development on the environment and which it is necessary to include in an environmental statement or updated environmental statement in order for it to satisfy the requirements of regulation 14(2).

23. Our client considers that the information requested by the Secretary of State and so far provided in the Applicant's Responses clearly does fall within the definition of "further information". The Applicant should therefore issue a notice that it is treating all of the information it has provided in response to the Statement of Matters dated 2 August 2021 as if it were 'further information' as defined by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as it did on 24 February 2022 for the A303 Stonehenge scheme. Failing that, the Secretary of State is asked to confirm that the information requested by him and provided by the Applicant is 'further information', as contemplated by him in the Statement of Matters at bullet 5 of paragraph 5.

24. We highlight in particular the following:

    (i) The Applicant itself notes that the information it provides is "*additional information for the purposes of the EIA Regulations and is provided in response to the Secretary of State's request to assist him in discharging his duty under regulation 21 of the EIA Regulations to reach a reasoned conclusion which is up to date on the significant effects of the Scheme on the environment*" (Response at 3.2.25).

    (ii) Clearly, in substance, the information provided by the Applicant is directly relevant to the SoS's consideration of the significant effects of the Scheme on the environment, i.e. it includes information that was necessary to include in an environmental statement, or updated environmental statement, in order to satisfy the requirements of reg 14(2). This is particularly obvious in a context where the previously-made DCO was quashed on grounds that the SoS had failed to provide a reasoned conclusion in line with the EIA Regs.

25. Should the Secretary of State determine that the information in the Applicant's Responses was not "further information", there is a real risk that any such determination would be irrational (i.e. unlawful).

Changes to relevant policy

26. The Statement of Matters asked for further representations on any change in whether the Development would be consistent with the requirements and provisions of relevant local or national policies, given the length of time since the examination closed. Our client highlighted several guidance documents and policies that had been updated since the end of the examination, including:

    (i) HM treasury Green Book,

    (ii) Valuation of greenhouse gas emissions

    (iii) DfT's WebTAG guidance

    (iv) DMRB Volume 11, Section 3, Part 1, HA 207/07 - This was withdrawn in November 2019

    (v) Highways England Carbon Reporting Tool

27. The Applicant's response[10] here focusses on the impact that these documents have on BCR and value for money of the scheme and says that those will be recalculated later, but does not address whether, and the extent to which, the scheme is consistent with the requirements and provisions of those guidance and policy documents. The SoS will need to consider the extent to which the Development would be consistent with policy and so the Applicant should assist by providing further detail regarding the scheme's compliance with these documents.

Net Zero Strategy ("NZS")

28. The most significant change to relevant policy is the Net Zero Strategy ("**NZS**"), which was published on 19 October 2021, one week before our client's last set of representations. The NZS was published pursuant to section 14 of the Climate Change Act 2008, which sets out the duty to report on proposals and policies for meeting carbon budgets and requires the publication of a report setting out proposals and policies for meeting the carbon budgets.

29. The Applicant states that neither Parliament nor Government has identified any sectoral targets for carbon reductions related to transport. However, this is not correct because, as Dr Boswell explains, the NZS does provide a sector specific target for surface transport. The Applicant seeks to rely on the case of *R (Transport Action Network) v Secretary of State for Transport [2021] EWHC 2095 (Admin)*. That case was, however, decided before publication of the NZS.

30. As explained in the Second Boswell Report, the NZS represents a change in policy since the end of the examination and one that the Secretary of State is required to consider, especially due to its status under the Climate Change Act 2008, which is made clear in paragraphs 5.16-5.18 of the NPS NN. The fact that the NZS provides sector specific targets for carbon emission reductions in transport means it is especially important in the context of the Secretary of State being able to provide a reasoned conclusion. The Applicant should therefore explain how and to what extent the scheme is consistent with the NZS, particularly in respect of the sectoral targets identified in it.

Adequacy of environmental information

31. We refer to paragraph 129 of our client's representations of 26 October 2021. Since the close of the DCO examination the Applicant says that a range of pre-construction surveys and assessments have been undertaken, including surveys to identify changes in the presence and/or distribution of protected and notable species. A summary of these was provided by the Applicant in Table 1 of its Response but no detail was provided, despite notable changes being included. This information forms part of the Environmental Information upon which the Secretary of State must base his decision whether or not to grant Development Consent, it is therefore important that sufficient detail is provided to allow him to understand the likely significant effects. It is also important for this information to

[10] Applicant's Response, page 59

be provided to allow interested parties to properly participate and provide comments.

Veteran oak tree

32. We refer to paragraphs 135-138 of our client's representations of 26 October 2021. We note the Applicant's response does not address the conflict with the policies of the NPPF in relation to the veteran oak tree (NPPF 180(c)), which is an important and relevant consideration in decisions on NSIPs under the NPS NN [paragraph 1.18] and should be applied to the extent that it is relevant to the project. In this case it is extremely relevant to the project because, as the ExA noted, the potential loss of the veteran oak tree weighs significantly against the DCO being made [ExA Report, 6.5.9]. In the absence of a response from the Applicant on this point, the application of paragraph 180(c) of the NPPF is something that the Secretary of State will have to grapple with without the benefit of the Applicant's view.

Conclusion

33. Overall, the SoS cannot be satisfied that he has sufficient information upon which he could reach a reasoned conclusion. Further information is required from the Applicant, as requested in the Second Boswell Report. There remain significant gaps in information which are required to be provided to understand the Applicant's assessment so far and to ensued that the public can properly participate in the process.

Yours faithfully
[Redacted]

Richard Buxton Solicitors
Environmental, Planning & Public Law

Enc.

- Dr Boswell's second report

Author Details	
Name	**Dr Andrew Boswell**
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Organisation	**Climate Emergency Policy and Planning (CEPP) on behalf of Mair Bain/Derby Climate Coalition**

EXPERT WITNESS STATEMENT: CLIMATE CHANGE

Contents

1 INTRODUCTION

1 I, Dr Andrew Boswell, have been asked by Mair Bain and Derby Climate Coalition to provide this expert witness statement on the technical issues relating to climate change in response to the applicant's Response (of February 2022) to the Secretary of State's Consultation letter issued 7th January 2022.

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

3 I submitted a brief resume in my first Expert Report on October 26th 2021. Since then, I have been awarded a Fellowship from the Foundation for Integrated Transport for research and study entitled "Exposing the flaws in carbon assessment and transport modelling for road schemes".

4 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.

1.1 Scope

5 I refer to these documents from the PINS website for the A38 Derby Junction scheme, and relevant guidance:

Reference in document	
BAIN-LETTER-1	Letter submitted by lawyers for Mair Bain in response to RESP-8.121 on October 26th 2021
EXP-REPORT-1	My expert report submitted in response to RESP-8.121 on October 26th 2021
RESP-8.122	Applicant's Response to the Secretary of State's Consultation letter issued 7th January 2022
APP-040	Environmental Statement (ES), Chapter 2 – The Scheme
Referenced in first expert report	
APP-042	Environmental Statement (ES), Chapter 4 – EIA Methodology
APP-052	ES, Chapter 14, Climate
APP-053	ES, Chapter 15, Assessment of Cumulative Effects
APP-166	ES, Scoping opinion
APP-167	Scoping Option Response Tables
APP-254	Application, Volume 7.3, Transport Assessment Report
REP3-026	Actions Arising from ISH2
RR	ExA's Recommendation Report

SoM	Statement Of Matters
RESP-8.121	Applicant's Response to SoM
DMRB	Design Manual for Roads and Bridges[1], selected parts reproduced in text LA 103 "Scoping projects for environmental assessment" LA 104 "Environmental assessment and monitoring"
EIA Regs	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017-SI 2017 No 572[2], selected parts reproduced at Appendix B and in text

1.2 Acronyms

AST	Appraisal Summary Table
NDC	Nationally Determined Contribution
NZS	Net Zero Strategy
TDP	Transport Decarbonisation Plan

1.3 Definitions

6 I refer you to EXPERT-REP-1 for discussion on definition and usage of "cumulative" and my definitions of "absolute emissions" and "differential emissions", as applied to carbon emissions.

1.4 Overview of witness statement

7 There is a lack of transparency of the data and computer modelling for the new data, and new methodology, published in RESP-8.122. This is addressed through the document with specific information being requested in places. Section 2 provides an overview of this issue.

8 Section 3 gives background on the further quantification of the economic cost of carbon required by the scheme specific objectives.

9 Section 4 provide background on the Net Zero Strategy (NZS) which is the most up-to-date delivery mechanism, and policy, for the Climate Change Act (CCA) and a legally binding document, but which has been ignored by the applicant.

10 Sections 5 to 9 respond directly to RESP-8.122.

[redacted]

[redacted]

2 LACK OF TRANSPARENCY OF DATA AND COMPUTER MODELLING

11 RESP-8.122 contains new data including **two** new sets of data for operational carbon emissions: a first new set from changes due to changing the DEFRA Emission Factor Toolkit versions and BEIS carbon factors; and a second new set from applying a nationally conglomerated "rate of improvement" based on TDP, Figure 2 (referred to by the applicant as "the TDP Sensitivity test"). This is on top of two previous sets of data for operational emissions from the Environmental Statement, and from RESP-8.121.

12 New values for construction emissions are also provided updating the Environmental Statement.

13 In all cases, the full details of the assumptions, data and computer modelling leading to these data changes has not been provided. Further, the modelling behind TDP, Figure 2 has not been published. Consequently, the nationally conglomerated "rate of improvement" based on it, and as applied to the data figures in RESP-8.122 Table 1, have been applied as a black-box calculation. (More details on this are explained in later sections).

14 The lack of transparent information and data about the traffic models from which operational carbon emissions are calculated **places severe limitations on any independent review and scrutiny** of the high-level figures published in the Environmental Statement, and in RESP-8.121 and RESP-8.122. It is, therefore, not possible to fully respond to the current consultation, without publication of the full details of the assumptions, data and computer modelling involved. **The applicant must provide the additional information required so that the SoS can, then, hold a further consultation round.**

15 The Government recently announced an "Algorithmic Transparency Standard" at [redacted] under the Central Digital and Data Office in the Cabinet Office. Under the new approach, government departments and public sector bodies will be required to explain where an algorithm was used, why it was used and whether it achieved its aim. There will also be an obligation to reveal the architecture behind the algorithm. Although, currently being piloted, it indicates the direction of travel for transparency on data, algorithms and modelling architectures. The current presentation of material falls far short of any standard of transparency. More details are provided at Appendix B.

3 OUTSTANDING ISSUE - CARBON PRICING – MEETING THE SCHEME-SPECIFIC OBJECTIVE OF HIGH VALUE FOR MONEY UNDER DfT APPRAISAL CRITERIA

3.1 Background to carbon pricing for appraisal

16 The letter from Richard Buxton solicitors on behalf of Mair Bain (26th October 2021) noted a significant number of changes to national policy and guidance including new

carbon pricing policy for appraisal, including transport appraisal [BAIN-LETTER-1, 125].

17 This should have prompted the applicant to revise the calculation of the BCR and the economic case for the scheme. The case made for the scheme in the DCO application is affected by changes to the BCR and economic case for the scheme. The applicant appears to have ignored this new policy guidance from the Government.

18 [APP-040], ES chapter 2 "The Scheme" states at 2.2.2 that a Scheme-specific objective for the A38 Derby scheme is:

> *"To be affordable and represent High Value for Money according to Department for Transport (DfT) appraisal criteria."*

The new carbon price data has changed the application of the DfT's WebTAG guidance and required a re-issuing of TAG Data Book now at v1.17 released in November 2021 with the new carbon price data[3]. In order to demonstrate value for money, and to meet the scheme objective in the ES, the revised DfT criteria should be tested with new calculations of the BCR as described in a later section. The SoS cannot consider the case for the scheme to be legitimate for determining the DCO, or consistent with its own objectives, until this has been done.

3.2 Background to new carbon pricing guidance

19 This section gives a very brief overview of the relevant methodology. The new guidance and carbon pricing values for appraisal were published by the Government in September and October 2021, followed by an update of the DfT WebTAG guidance and TAG data book. The BEIS Carbon Pricing Policy Paper "Valuation of greenhouse gas emissions: for policy appraisal and evaluation" (published 2 September 2021) is given **in Appendix A**.

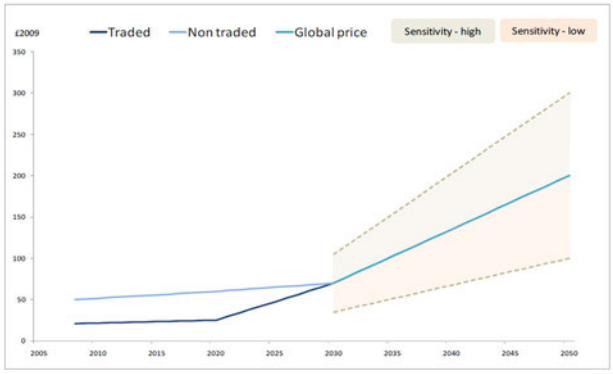
20 In 2011, the previous approach (before the policy changes outlined above and reflected in the Application) of working towards a fully working carbon market was outlined by BEIS' predecessor department DECC[4].

> *"In the short term (up to 2030), different targets in the Traded (ETS) and Non-Traded (non–ETS) sectors imply that emissions in the two sectors are essentially different commodities and the approach to valuing carbon needs to reflect this reality. Therefore, traded and non-traded carbon values will be used over the 2008-2030 period (Chart 1). Beyond 2030, a fully working global carbon market is assumed implying a single carbon value for economic appraisal over the 2031-2050 period ...*

[3] [redacted]

[4] DECC publication, 2011, "*Guidance on estimating carbon values beyond 2050: an interim approach*", [redacted]

Chart 1: Traded and Non Traded carbon values (2008-2050)



"

21 The latest Green Book supplement updates the method to recent Government policy on climate change, and the UK Emissions Trading Scheme, and "to give equal weight to emissions from the traded and non-traded sectors"[5]. This means that from 2020 traded and non-traded emissions are equally valued, as shown in the graph below, in the latest carbon pricing figures are shown below graphically as clipped from the policy paper guidance (reproduced in Appendix A).

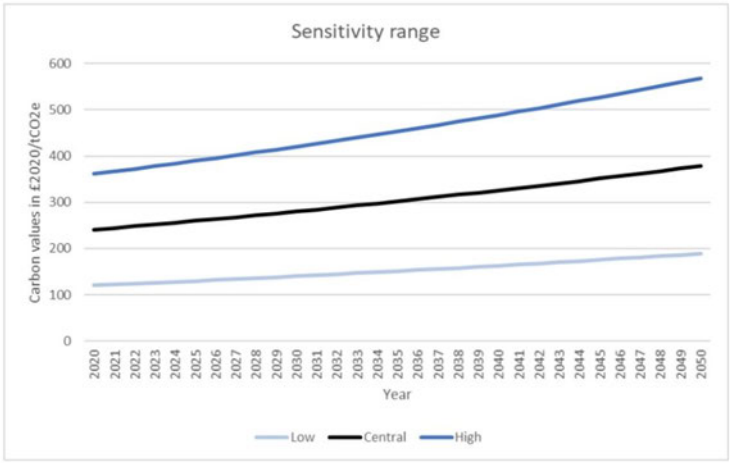


Figure 3: Sensitivity range of the updated carbon values.

22 Note that previously 60-year appraisals of road schemes have split the carbon emissions into the traded and non-traded sectors, with fossil fuel vehicles being non-traded and electric vehicles being traded. The fossil fuel vehicle / non-traded sector has been the numerically predominant sector in the appraisal data.

[5] See "*Traded and non-traded carbon*" under "*Valuation of greenhouse gas emissions: for policy appraisal and evaluation*", September 2nd 2021 at

23 It can be seen that the new carbon prices are significantly greater than the previous ones. For example, for the predominant non-traded sector, the 2020 carbon price in the new policy data is c. £240/tCO_2e compared to of c. £60/tCO_2e on the previous data (ie 4 times greater).

24 The rationale for the change in carbon price is given in the policy paper, from Department of Business, Energy and Industrial Strategy (BEIS) "*Valuation of greenhouse gas emissions: for policy appraisal and evaluation*", published 2 September 2021 and provided **in Appendix A**. BEIS has conducted a review and update of the carbon values because several factors have changed since the last review, the most significant of which are the following:

i. Changes in international climate change targets, especially the Paris Agreement of 2015 and the new temperature target to limit global overheating to 1.5°C.

ii. Changes in national targets including the UK 2050 net-zero target.

iii. The introduction of a UK Emissions Trading Scheme (UK ETS) in January 2021 following Brexit.

3.3 Further issues with the economic valuation of carbon

25 The changes in carbon pricing outlined above require a revision of the BCR and the case for the Scheme. However, there are further issues which also need addressing in the required recalculation as follows.

26 The applicant's latest traffic model should be used with the updates enumerated including the Emission Factor Toolkit (EFT) (version 11).

27 **Construction emissions** should be included on the cost side of the BCR.

28 A **solus differential quantity of carbon emissions** should be calculated as specified by this document's Table 2, as shown in a later section, ie: based on the environmental impacts of adding the road to the existing environmental baseline.

29 A quantification of the [full] **cumulative carbon emissions** should be calculated as specified by this document's Table 3, later in this document.

30 For the full economic cost of the greenhouse gases associated with the road requires that the quantification of **cumulative carbon emissions** is also taken forward into the calculations. (ie the full **cumulative carbon emissions**).

31 In summary, the economic case for the road remains completely flawed, and unreliable for a safe determination of the Application, until it is updated for:

A. The new carbon pricing data
B. The new traffic model with EFT v11
C. Construction emissions (on cost side)
D. The full cumulative carbon emissions calculated in compliance with the EIA Regulations

4 CHANGES IN LOCAL AND NATIONAL POLICY (SOM, POINT 2, 4TH BULLET)

32 The NZS was published October 19th 2021 whilst my previous EXPERT-REP-1 was submitted only a week later. It included preliminary information on the NZS: this section adds some more context and background on the NZS required for later sections of this report.

4.1 Net Zero Strategy in context of the Planning System, and this DCO application

33 The NZS is the most up-to-date delivery mechanism for the Climate Change Act (CCA). As such it is a legally binding policy document. CCA Section 13 imposes a duty of the Secretary of State to prepare such a document, and the NZS is the document of proposals and policies that the Secretary of State has prepared, and laid before Parliament under CCA Section 14, to meet the UK carbon budgets and targets.

34 The relevant budgets and targets include:

A. The UK Nationally Determined Contribution under the Paris Agreement of 68% reduction of carbon emissions by 2030

B. The target of 78% carbon emissions reduction by 2035 under the 6th Carbon Budget

C. The 4th, 5th and 6th carbon budgets

D. The net-zero target of net-zero carbon emissions by 2050

35 The planning system is required to take account of the NZS, as the NPPF 152 states that the planning system should "*help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions*" whilst NPPF 153 states:

> *"Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal*

> *change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures* <footnote 53>*."*

Where footnote 53 says "*In line with the objectives and provisions of the Climate Change Act 2008.*"

36 The NZS is the most up-to-date policy document which provides Parliament's proposals and policies to meet the objectives and provisions of the Climate Change Act, and therefore, it is of material weight in planning decisions.

37 Further the NZS itself at page 252 says:

> *"19 We will make sure that the reformed planning system supports our efforts to combat climate change and help bring greenhouse gas emissions to net zero by 2050. For example, as part of our programme of planning reform we intend to review the National Planning Policy Framework to make sure it contributes to climate change mitigation and adaptation as fully as possible."*

38 This indicates that further strengthening of the NPPF can be expected on top of the already very clear alignment of the planning system to the Climate Change Act via the extant NPPF, and to the NZS as the delivery mechanism for the CCA.

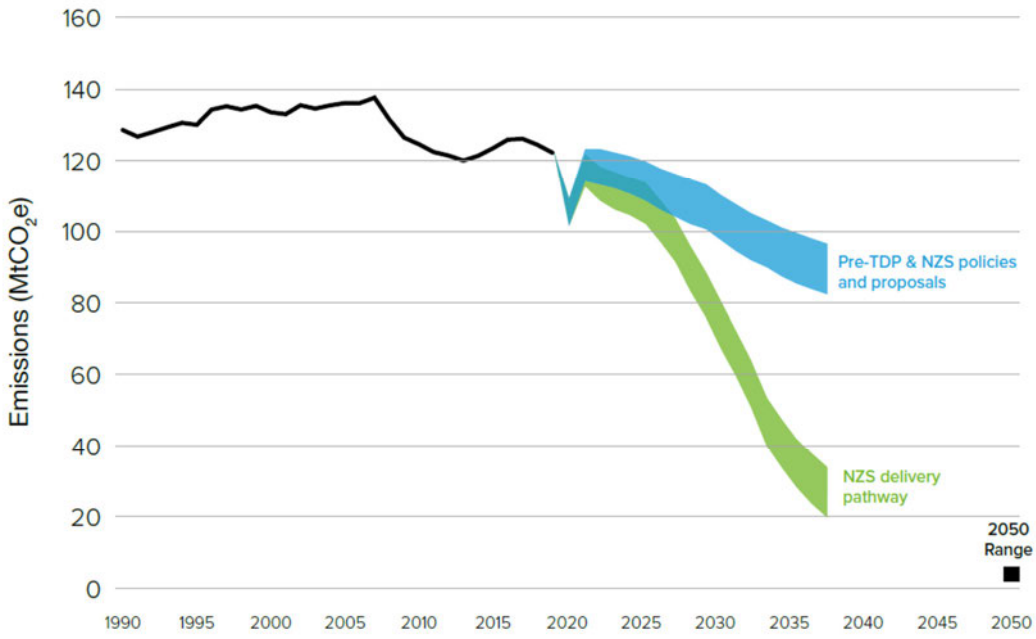
4.2 Net Zero Strategy in context of the NN NPS

39 The NN NPS 5.16- 5.18 provides guidance on carbon emissions, the legally binding framework under the Climate Change Act, the Applicant's assessment, and decision making. The document refers to the eleven-year-old Carbon Plan (2011), as the plan for meeting carbon budgets. Footnote 69 states that "successor documents" should be applied. The NZS is the most up-to-date successor document under section 13 of the Climate Change Act. Therefore the NZS and TDP are government policies to which the SoS must give weight in determining this DCO Application. Currently, the applicant's Environmental Statement, and responses to the SoS' consultations, are not aligned to the NZS or the TDP. I will explain this in later sections.

4.3 Surface transport decarbonisation targets in the Net Zero Strategy and the Transport Decarbonisation Plan

40 The applicant reproduces Figure 2 of the TDP. It should be noted that Figure 21 of the NZS, reproduced below, is a refined version of the same figure. The NZS also provides numerical lower and upper bounds for the emission reductions in the indicative domestic transport emissions pathway to 2037 in the narrative for Figure 21. These are a fall in residual emissions from domestic transport emissions (excluding aviation and shipping) by around 34-45% by 2030 and 65-76% by 2035, **relative to 2019 levels.**

Figure 21: Indicative domestic transport emissions pathway to 2037



Source: BEIS analysis

41 The applicant has not demonstrated that the scheme contributes to the required fall in residual emissions from domestic transport emissions (excluding aviation and shipping) by around 34-45% by 2030 and 65-76% by 2035, **relative to 2019 levels.**

5 RESP-8.122/SECTION 1 - REQUEST FOR COMMENTS FROM THE APPLICANT ON OTHER RESPONSES TO THE STATEMENT OF MATTERS

5.1 RESP-8.122/Section 1a - Any comments on the responses to the Statement of Matters

42 I note that "points raised by Mair Bain and Dr Boswell" that are not covered in the response provided to the Secretary of State are provided in Appendix A. I respond to Appendix A in section 9 below.

5.2 RESP-8.122/Section 1b(i) - the definition of the study areas

43 I note the response: the clarification and the map are helpful.

5.3 RESP-8.122/Section 1b(ii) - what assessments have been carried out in relation to different study areas

44 I note the response: the clarification is helpful.

5.4 RESP-8.122/Section 1b(iii) - explanation for this difference in the figures, including which set of figures the applicant considers that the Secretary of State should rely at the point of making his decision on the scheme

45 The applicant in the 1st paragraph of its response states that the **variation in data** (between the Environmental Statement and the SOM response [RESP-8.121]) has occurred for two reasons:

A. "a refinement in the assessment methodology"

B. an update to the Emissions Factor Toolkit (EFT) from EFTv8 to EFTv10

46 It is not clear what A above means, although the narrative suggests that it may mean that the Environmental Statement was based upon National Highways' Interim Advice Note (IAN) 185/13 whilst the SOM response was based upon DMRB LA 114 Climate, and the "refinement" relates to the change of guidance. Whilst it is clear that the change in the EFT version would impact the numerical values of the data, it is **not** clear how the change of guidance would impact the numerical values of the data, and this should be clarified by the applicant. **That is, further clarification is required as whether the change in guidance also had an impact on the numerical values of the data, and if so, how?**

47 I note that RESP-8.122 contains new data including **two** new sets of data for operational carbon emissions: a first new set from changes due to changing the DEFRA Emission Factor Toolkit versions and BEIS carbon factors; and a second new set from applying a nationally conglomerated "rate of improvement" based on TDP, Figure 2 (referred to by the applicant as "the TDP Sensitivity test"). This means so far 4 different sets of data have been provided.

6 RESP-8.122/SECTION 2 - COMMENTS FROM THE APPLICANT FOLLOWING THE ENVIRONMENT AGENCY'S RESPONSE

48 No comment

7 RESP-8.122/SECTION 3 - REQUEST FOR FURTHER INFORMATION FROM THE APPLICANT ON THE CUMULATIVE ASSESSMENT OF CLIMATE IMPACTS

49 The SoS in his letter of January 7th 2022:

> *"…* **invites** *the Applicant to update its response of 31 August 2021 to the Statement of Matters to provide (or, to the extent that it has already been provided, identify) its assessment of the cumulative effects of Greenhouse Gas emissions from the scheme with other existing and/or approved projects on a local, regional and national level on a consistent geographical scale (for example an assessment of the cumulative effects of the Road Investment Strategy ('RIS') 1 and RIS 2 at a national level)."*

50 The applicant has failed to respond to this invitation:

A. It has not **identified** how it has already provided an assessment of the cumulative effects of Greenhouse Gas emissions from the scheme. As explained below, it has only identified how a quantification and assessment of the solus effects of Greenhouse Gas emissions from the scheme has been provided. (Note, this is also wrong solus quantification and assessment, which as explained below is a severe underestimate of the real solus effects).

B. By way of **update(s)** to its response of 31 August 2021, it has not provided an assessment of the cumulative effects of Greenhouse Gas emissions from the scheme. The updates provided, as discussed above for RESP-8.122/Section 1b (iii) update the numerical CO_2e data in the context of the original quantification and assessment of the solus effects of Greenhouse Gas emissions from the scheme.

   The new data in RESP-8.122, Table 1 is actually **two** new sets of data for operational carbon emissions: a first new set from changes due to changing the DEFRA Emission Factor Toolkit versions and BEIS carbon factors; and a second new set from applying a nationally conglomerated "rate of improvement" based on TDP Figure 2 (referred to by the applicant as "the TDP Sensitivity test"). Both new sets of data are based on the same traffic modelling as the Environmental Statement and RESP-8.121, are solus only quantifications.

51 The applicant has, therefore, failed to provide the Secretary of State with the information requested. I now provide the evidence for this in detail. The applicant has broken their response down into six constituent parts which for clarity I refer to as i) to vi) below.

7.1 RESP-8.122/SECTION 3 (i)/page 11 - Assessment of Cumulative Effects of Greenhouse Gas Emissions from the Scheme with other Existing and/or Approved Projects

52 The applicant describes their traffic model as being "inherently cumulative" at the bottom of page 12, and going over to page 13, as it contains data about:

> *"1) The Proposed Development and adjoining Strategic Road Network and local road network;*
>
> *2) Other Proposed Developments promoted by National Highways in the near vicinity of the Proposed Development with high certainty that they are to be progressed i.e. progressed beyond preferred route announcement stage;*
>
> *3) Foreseeable developments promoted by third parties likely (based on discussions with the relevant planning authorities) to be developed in a similar timeline to the proposed National Highways' scheme. Knowing where the proposed third party development is to be sited, the extents and types of development, and the timescales of when it is to be constructed and completed are requirements to ensure that the third party developments can be reasonably described in the traffic model; and*
>
> *4) National government regional growth rates which include a representation of likely growth rates excluding known planning developments already included in the traffic model. This is represented by DfT's NTEM/TEMPRO growth factors for car usage, and growth in freight is derived from DfT's National Transport Model."*

53 I do not dispute that the applicant's traffic model contains all these elements.

54 The problem in the applicant's position is how it then quantifies and assesses the carbon for the scheme via its selection, and extraction, of data from the different possible configurations of the traffic model. The applicant essentially posits the following notion:

> **'If** the traffic model contains all known road and land developments in the study, **then** it follows that any combination of data, and any differentiation of that data (eg DS-DM), extracted from the traffic model must also be "inherently cumulative".'

This is a defective notion as the latter does not universally follow the former, as I will demonstrate below.

55 Having configured a traffic model for the scheme with all the elements listed above within it, the applicant then describes how they quantify the carbon for the scheme as follows:

> *"In terms of operational carbon, the Applicant has evaluated the changes in CO2e emissions of the proposed Scheme by comparing changes in the road traffic on the Strategic Road Network and local road network between the 'without scheme scenario' and the 'with scheme scenario'."*

56 The applicant, here, identifies a single calculation of "the changes in CO_2e emissions of the proposed Scheme" from the many possible calculations available. By the applicant's own advocacy, this is the only calculation which they perform in the Environmental Statement and subsequent document (eg: RESP-8.121 and RESP-8.122), and the only calculation which they are saying is required.

57 However, this calculation produces a differential quantity of carbon emissions for the scheme which is the difference (DS-DM), **solely**, of the all the elements of the network [ie: 1) to 4) above] as the DS case, and all the elements of the network except the scheme as the DM case. This is a solus quantification. Notwithstanding that it is the wrong solus calculation, it is also not the only quantification required; the EIA Regulations also require a cumulative quantification, and the SoS has invited the applicant to provide it.

58 Below I have modified Table 2 submitted in my previous expert report [EXP-REPORT-1] so that it aligns with the broad elements 1) to 4) listed above, and illustrates the calculation made.

	Performance oriented (ie as in APP-254)	
Model configuration name	DM (Perf, baseline)	DS (Perf, all)
2015 Baseline Highway network (1)	✓	✓
A38 Derby Junctions scheme (1)	×	✓
Other schemes promoted by National Highways (2)	✓	✓
Foreseeable developments promoted by third parties (3)	✓	✓
National government regional growth rates (4)	✓	✓

Table 1

59 The red ellipse indicates the only change in the configuration between the DM and DS scenarios is the presence, or not, of the A38 Derby Junction scheme in the modelling, as the applicant identifies in the quoted statement above.

60 The important point is that although the DS and DM traffic models in this case may be described as "inherently cumulative", **the quantification produced by the differentiation (DS-DM) is "solus" in the sense described by Mr Justice Holgate in in Pearce v BEIS [2021] EWHC 326 (Admin)**. For the EIA Regulations, it is necessary to clearly distinguish solus and cumulative assessment, as Mr Justice Holgate does: solus[6] being the impacts of a scheme in isolation. In the Pearce case, Mr Justice Holgate ruled that the evaluation of (onshore) environmental impacts was required **both** for the windfarm in question (under DCO planning application) in isolation (**ie solus**), and also the windfarm in combination with another windfarm which was undergoing a parallel DCO planning application (**ie cumulative**).

[6] Solus means, here, "alone; separate" as in the first definition in the Collins on-line dictionary

61 The applicant continues:

> *"This takes into account the assessment of the Proposed Development and all other developments likely to have an influence on the Proposed Development and on the area the Proposed Development is likely to influence."*

62 It is a truism that the presence of all elements of data in the traffic model has an influence on its outputs, but it is not a particularly helpful truism in understanding the carbon impacts of the scheme and how to extract them from the model meaningfully. There are two key issues here:

A. Fundamentally, the "influence" of all other developments **is not the same** as **quantifying** their environmental impact, in this case on the EIA receptor of global GHG emissions, which is what the EIA Regulations require. The presence of their influence on the data output is not the same as quantifying their environmental impact, as measured in tCO_2e, and is no substitute for it.

B. The nature and quantification of the "influence" is not addressed. This can be understood by considering another possible **solus** quantification based also on a (DS-DM) differentiation but from different configurations of the traffic model. This is derived from EXP-REPORT-1, Table 2.

	EIA Regs compliance-oriented (eg: for impact assessment of GHGs)	
Model configuration name	*DM (GHG, baseline)*	*DS (GHG, scheme)*
2015 Baseline Highway network (1)	✓	✓
A38 Derby Junctions scheme (1)	×	✓
Other schemes promoted by National Highways (2)	×	×
Foreseeable developments promoted by third parties (3)	×	×
National government regional growth rates (4)	✓	✓

Table 2

63 Here, the quantification is made by considering the scheme when it is added, in isolation or solus, to the current environmental baseline. In this case, there is no influence from other developments which may follow after the scheme's implementation. This model provides a more accurate description of the journey trips which are attributable to the scheme itself as it quantifies the impact of building out the scheme into the current environmental baseline.

In the applicant's solus calculation (ie as specified by this document's Table 1 above) journey trips attributable to the scheme may actually be accounted for in the DM case. This raises the quantum of the DM, and reduces the DS-DM differential, making it an underestimate of the real solus impacts of the scheme. This shows how the effects of the other developments have an influence which distorts even the solus quantification. Further, the quantification of the tCO_2e associated with the other developments, required for the cumulative assessment, has not been made.

64 This shows that the by-far preferrable way to understand the carbon emissions of the scheme, in isolation, is to perform the solus quantification against the current environmental baseline (ie as specified by this document's Table 2 above), and then perform the applicant's version (ie as specified by this document's Table 1 above) as a sensitivity test on the "influence" that results from considering the other development.

65 Returning to the requirements of the EIA regulations, and the fundamental requirement, for **quantifying** the environmental impacts of the scheme with all other developments for cumulative carbon assessment. This may be done as I previously submitted in [EXP-REPORT-1], Table 2, reproduced below [as Table 3 in this document]. The required calculation is *DS (GHG, all) – DM (GHG, baseline)* in my nomenclature which has been fully explained in EXP-REPORT-1. Arrows have been added below this version of the Table to make the intended meaning of the two different solus carbon quantifications described above, and the cumulative carbon quantification, required by the EIA Regulations, entirely clear.

	Performance oriented (ie as in APP-254)		EIA Regs compliance oriented (for impact assessment of GHGs)		
Model configuration name	*DM (Perf, baseline)*	*DS (Perf, all)*	*DM (GHG, baseline)*	*DS (GHG, scheme)*	*DS (GHG, all)*
2015 Baseline Highway network (1)	✓	✓	✓	✓	✓
A38 Derby Junctions scheme (1)	×	✓	×	✓	✓
Other schemes promoted by National Highways (2)	✓	✓	×	×	✓
Foreseeable developments promoted by third parties (3)	✓	✓	×	×	✓
National government regional growth rates (4)	✓	✓	✓	✓	✓

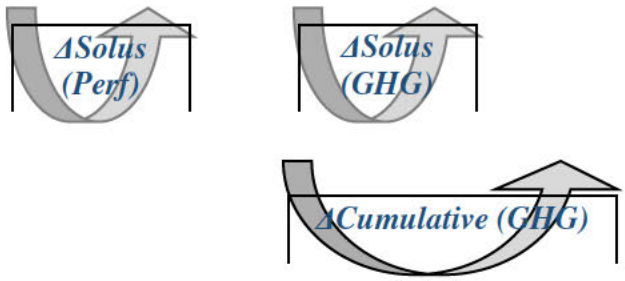


Table 3

66 I also refer you to EXP-REPORT-1, bullets 107-108 which demonstrates the issue with respect to the applicant's description of the traffic models in [APP-254].

67 In summary:

i. The applicant has identified that it has performed a single quantification of carbon. It is a solus quantification, and any assessment based on comparing it to benchmarks (such as the NZS and TDP delivery pathways, or carbon budgets) is consequently also only a solus assessment. This has already been explained in detail in EXP-REPORT-1.

ii. The solus quantification is the wrong solus quantification. The carbon emissions of the scheme against the existing environmental baseline needs to be quantified, assessed and understood first (DS-DM as specified by this document's Table 2 above). The applicant's DS-DM (ie as specified by this document's Table 1 above) could be an interesting sensitivity test, but it should not be considered as the primary solus quantification (and assessment).

iii. The SoS invited the applicant to identify its cumulative quantification and assessment of the carbon impacts of the schemes. The applicant has been unable to do so. Therefore, the Environmental Statement remains non-compliant with the EIA Regulations, and further work is still required by the applicant: a cumulative quantification of the carbon impacts of the scheme should be made, and an assessment based upon that. This would be based upon running the traffic model configurations, and calculating *DS (GHG, all) – DM (GHG, baseline)* as specified by this document's Table 3 above.

68 For absolute clarity, the narrative above applies to all four data sets that have been provided by the applicant for the operational road-user emissions: that is, the original Environmental Statement, RESP-8.121, and the two new data sets in RESP-8.122. Each of these use the same traffic model configuration for the DS-DM quantification ie as specified by this document's Table 1 above. The changes to the data are caused by changes the EFT versions (v8 to v10, and v10 to v11) and the application of the nationally conglomerated "rate of improvement" based on TDP, Figure 2. Each of the four data sets is a solus only quantification (the wrong solus quantification), and therefore only a solus assessment of the impacts of the scheme has been provided in each case.

7.2 RESP-8.122/SECTION 3 (i)/page 13 - Assessment of Cumulative Effects – PINS Advice Note 17

69 The applicant continues [RESP-8.122]:

> *'In essence, as both with and without scheme scenarios already include all likely developments and traffic growth factors, the assessment is inherently cumulative as regards operational carbon emissions. This is recognised in general terms in paragraph 3.4.4 of the Planning Inspectorate's Advice Note 17 ("Cumulative effects assessment relevant to nationally significant infrastructure projects"), the first two sentences of which state that:*
>
> > *"Certain assessments, such as transport and associated operational assessments of vehicular emissions (including air and noise) may inherently be cumulative assessments. This is because they may incorporate modelled traffic data growth for future traffic flows. Where these assessments are comprehensive and include a worst case within the defined assessment parameters, no additional cumulative assessment of these aspects is required (separate consideration may be required of the accumulation or inter-*

relationship of these effects on an individual set of receptors e.g. as part of a socio economic assessment).”’

70 The first sentence is false. As demonstrated above, the quantification and assessment made by the applicant of carbon emissions in the Environmental Statement is simply and purely **a solus one**. I have shown above that it is a defective notion that including all likely developments and traffic growth factors in the traffic model, necessarily generates a cumulative quantification and assessment of carbon impacts.

71 PINS Advice note 17 does not address cumulative carbon assessment. There is no reference to it in the quoted section, but furthermore there is no reference to cumulative carbon assessment in the entire document[7]. Whilst the PINS Advice note 17 is part of a suite of general, and often helpful, advice provided by the Planning Inspectorate, it has no statutory status as the website states.

72 The writers of PINS Advice Note 17 used the word “may” in the first sentence of paragraph 3.4.4 indicating that they understood that it was not universally true that assessments would be “inherently cumulative” just on the basis of the traffic model including traffic data growth for future traffic flows.

73 I have unambiguously shown that the distinguishing feature on the applicant’s approach is that it is based on calculating differential emissions, that is DS-DM where DS and DM are absolute carbon emission values output from the traffic model. The quantification and assessment are not inherently cumulative when differential emissions are calculated based on just “with scheme” and “without scheme” models (the inclusion of the scheme, or not, being the only element of difference). The reason is that even if planned changes to the highway network and foreseeable third-party developments are included in each model (input to the calculation), their effects (“influence”) on carbon emissions are cancelled out by the subtraction process. This is also clear by considering Tables 1, 2 and 3 above.

74 The applicant appears to have taken this PINS Advice note which does not consider the issue of cumulative carbon assessment, and holds no statutory status and tried to apply it to their case. In referring to its relevance “*in general terms”,* the reality is that the note offers no support for the applicant’s case.

75 I conclude that Planning Inspectorate’s Advice Note 17 gives no support to the applicant’s claims in RESP-8.122, and accordingly the Secretary of State should also inevitably conclude that no weight can be applied to the note in this context.

7.3 RESP-8.122/SECTION 3 (ii)/page 13 - The Appropriate Geographical Scale of Assessment of Greenhouse Gas Emissions

[7] [redacted] accessed 18th March 2022

76 The applicant fails to identify that the NZS now provides a sector specific target for surface transport under UK Climate Change legislation. It has also failed to withdraw its repeated assertion that there is no sector specific target for transport.

77 The applicant states:

> *"Neither Parliament nor Government has identified any sectoral targets for carbon reductions related to transport, or any other sector. There is no requirement in the CCA 2008, or in Government policy, for carbon emissions for all road transport to become net zero."*

and refers to *R(Transport Action Network) v Secretary of State for Transport [2021] EWHC 2095 (Admin)* ("the TAN case"). However, the TAN case judgement was in July 2021 whilst the Net Zero Strategy was published in October 2021. The Net Zero Strategy has been laid before Parliament under section 13 and 14 of the Climate Change Act, and provides the up-to-date legal and policy framework to be considered within the context of the NPS NN.

78 The Net Zero Strategy (NZS) and the Transport Decarbonisation Plan (TDP) update the policy framework since the TAN case. Both documents provide the same sector specific decarbonisation pathway, and implied targets, for the surface transport sector, and the NZS is legally binding policy under section 13 of the Climate Change Act 2008 (CCA).

79 The NZS delivery pathway, related to road transport, in the Figure below corresponds to a fall in residual emissions from domestic transport emissions (excluding aviation and shipping) by around 34-45% by 2030 and 65-76% by 2035, **relative to 2019 levels** (see Figure 21 from the NZS reproduced above).

80 Figure 21 of the NZS, reproduced in an earlier section, is a refined version of the Figure 2 of the TDP which is reproduced by the applicant in RESP-8.122, and shows the linkage between the TDP and the NZS. Essentially the same indicative delivery pathway for domestic transport has been carried forward from the TDP to the NZS.

81 The applicant has claimed that there is no sector specific target under UK Climate Change legislation. However, the NZS (and TDP) which is the delivery policy document for achieving the CCA targets and budgets has clearly laid out an indicative delivery pathway for surface transport as one of the 11 sectors under the Climate Change Act budgets. **This is a sector specific target for surface transport under UK Climate Change legislation.**

82 Despite the very clear material relevance of the NZS to appraisal of carbon in road schemes under the NN NPS, as outlined above, the applicant has failed to mention the NZS targets, indicative delivery pathways, for surface transport.

83 As described in the NZS section above, with the NZS, the Climate Change Act is a material consideration for this scheme, and this is supported by NPPF 153, footnote 53, and NN NPS, footnote 69.

7.4 RESP-8.122/SECTION 3 (iii)/page 15 - How the Assessment Complies with Various Carbon Budgets and Wider Carbon Policies

84 The applicant fails to identify that the NZS now provides a sector specific target for surface transport under UK Climate Change legislation. It has also failed to withdraw its repeated assertion that there is no sector specific target for transport.

85 Despite the very clear material relevance of the NZS to appraisal of carbon in road schemes, as outlined above, the applicant has failed to mention the NZS (and TDP) targets, indicative delivery pathways, for surface transport. As described in the NZS section above, with the NZS, the Climate Change Act is a material consideration for this scheme, and this is supported by NPPF 153, footnote 53, and NN NPS footnote 69, as explained in previous sections.

7.5 RESP-8.122/SECTION 3 (iv)/page 16 - How an Assessment was Undertaken to Evaluate the Impacts of the Scheme Including Consideration of Likely Significance Effects

86 On page 18, the applicant states that they have been advised by the DfT that "a sensitivity test based on the impact of the policy measures set out in TDP can now be undertaken for schemes", and that "the DfT has approved a sensitivity test based on the rate of improvement shown in Figure 2 of the TDP which can be applied to CO_2e emissions calculated for the Scheme assessment".

87 Before commenting in detail on the data in the applicant's Table 1, I first raise two issues with the overall method which the applicant refers to as the "TDP Sensitivity test".

88 The **first** is that what has been performed - applying the TDP Figure 2 rate of improvement to CO_2e emissions calculated for the Scheme – is not what is normally understood as a sensitivity test. Sensitivity analysis is the study of how the uncertainty in the output of a mathematical or computer model can be understood and proportioned statistically to different sources of uncertainty in its inputs. In terms of traffic modelling, I have already described how the solus quantification of carbon emissions for the scheme, as specified by this document's Table 1 above (and that performed by the applicant), can be a sensitivity test of the preferrable, and more accurate, solus quantification of carbon emissions for the scheme, as specified by this document's Table 2 above (and that has not been performed by the applicant). This is an example of sensitivity analysis, in this case, testing the influence of adding other known developments to the traffic modelling on the differential carbon emissions associated with the scheme.

89 The method described in RESP-8.122, by contrast, applies a graph of some desirable, future outcome (ie the TDP Figure 2) to existing data. This makes **no** test of how the carbon emission outputs change depending on inputs to the modelling. Further, the "rate of improvement" represented by TDP, Figure 2 is conglomeration of national data, and therefore, takes no account of the specific, and local, conditions which determine the carbon emissions in the traffic model study area.

90 The method is falsely called a "TDP Sensitivity test". It would be more accurately described as applying a "<u>TDP policy factor</u>", and I will use that descriptor from now on.

91 The **<u>second</u>** is that even **<u>if</u>** applying a TDP Policy factor was technically sound and reliable, and I don't agree that it is without the full publication and scrutiny of the method, **then** it could only be justified where the case for the scheme fully aligned with the TDP, and NZS, policies.

92 However, the case for the A38 Derby scheme was developed many years in advance of the TDP and NZS, and did not even foresee these key policy documents of the current legal framework, let alone attempt to align with them.

93 [APP-040] is the Chapter 2 of the Environmental Statement "the Scheme". And section 2.2.2, it outlines specific scheme objectives including:

> *"Assist in bringing forward development and regeneration opportunities in the surrounding area and immediately adjacent to the Scheme.*
>
> *Facilitate regional development and growth in Derby City and its surrounding areas and **<u>increase capacity of the strategic road network</u>** to absorb growth."*

94 Both the above are not easily aligned with the policies in the NZS and TDP. For example, page 156 of the NZS states:

> *"We cannot simply rely on the electrification of road transport, or believe that zero emission cars and lorries will solve all our problems. **As we build back better from the pandemic, it will be essential to avoid a car-led recovery.** Alongside road vehicle decarbonisation, we must increase the share of trips taken by public transport, cycling and walking. We want to make these modes the natural first choice for all who can take them. As more journeys are cycled or walked, and taken by public transport, the carbon, air quality, noise and congestion benefits will be complemented by significant improvements in public health and wellbeing."*

95 Whilst page 6 of the TDP says:

> *"Road traffic, even on pre-pandemic trends, was predicted to grow by 22 percent from 2015 to 2035 much of it in cities, where new roadbuilding is physically difficult and disadvantages communities.–*
> *We cannot pile ever more cars, delivery vans and taxis on to the same congested urban roads. That would be difficult for the roads, let alone the planet, to tolerate. **As we build back better from the pandemic, it will be essential to avoid a car-led recovery.**"*

96 The scheme is predicated on increasing capacity of the strategic road network. Just at the policy level, the TDP and NZS do not support unbridled increase of capacity and provide policy support against a car-led recovery from the pandemic.

97 When this discrepancy is taken to the numerical level of quantifying carbon emissions, as it is in the applicant's Table 1, it is clear that the different data being applied is not internally consistent. First, there are the traffic models of the scheme which as enumerated contain the 2015 Baseline Highway network, the scheme itself, other schemes promoted by the applicant, foreseeable developments promoted by third parties, and national government regional growth rates (see section 7.1). And second, the TDP policies which require avoiding a car-led recovery, and a significant modal shift to non-motorised journeys, contracting the overall need for vehicle movements. The different elements within the traffic model expand vehicles using the network and with the express intent of expanding capacity, and model the effects of this to produce a carbon quantification. The TDP Policy factor applies numbers based on very different, and in some cases quite opposing, policy directions to the carbon quantification output from the models. The approach is simply incoherent.

98 The **genuine TDP Sensitivity test** would be to apply the individual TDP policies in the local context of the study area in the traffic models themselves. For example, the "foreseeable developments promoted by third parties" could be remodelled to align with the policies in the TDP for modal shift in new developments[8]. This would give a clear indication of the effect of remodelling land-based developments for TDP compliant modal shift against the approach incorporated in the traffic model which is based on unconstrained traffic growth, and car-based development, as conceived quite a few years ago. This has not been attempted by the applicant, despite the TDP, and NZS, now being part of the policy and legal framework.

99 In summary, "TDP Sensitivity test" is a misnomer for the data in the applicant's Table 1, and it is nothing more than a non-project specific TDP Policy factor that has actually been applied. However, the TDP policies - the basis for the TDP Policy factor - do not align with the assumptions in the existing traffic model. The result is an incoherent method which produces numbers to which no value, nor weight, can be given in determination of the DCO.

[8] See TDP, page 8 "We must also do better at joining up our transport, decarbonisation, and planning goals in both urban and rural areas. Too many new developments – not just by housebuilders, but by public-sector bodies – are difficult to reach without a car. But if we do development in a greener way, and if we join it to existing places, we can make it lower-carbon, lower-emission and lower-traffic – and more acceptable to local communities. We will also support local areas to decarbonise by linking local infrastructure funding to solutions that cut emissions – aligning billions of pounds of investment to our net zero mission.", and

TDP, page 156 "**We will embed transport decarbonisation principles in spatial planning and across transport policymaking**", and "The government wants walking, cycling or public transport to be the natural first choice for journeys. Where developments are located, how they are designed and how well public transport services are integrated has a huge impact on whether people's natural first choice for short journeys is on foot or by cycle, by public transport or by private car. The planning system has an important role to play in encouraging development that promotes a shift towards sustainable transport networks and the achievement of net zero transport systems. Traffic issues have often caused opposition to housebuilding. There is a legacy of developments that give people few alternatives to driving, are difficult to serve efficiently by public transport and are laid out in ways which discourage walking and cycling. Developments which are planned to minimise car use, promote sustainable transport choices, and are properly connected to existing public transport could help make new building more publicly acceptable."

7.6 RESP-8.122/SECTION 3 (iv)/page 16 – TDP Factor test – data issues in Table 1

100 The data does not compare like-with-like as the data row "Operation (d)" comprises both road-user emissions and non road-user emissions (footnote (d)) where the sensitivity test rows "TDP (upper bound)" and "TDP (lower bound)" are "road-user emissions only" footnote (g). Whilst it would be helpful for the applicant to clarify the quanta of the non road-user operation emissions for each carbon budget period. In the absence of this data, and from the applicant's evidence elsewhere, I assume that the non road-user emissions are a small proportion of the operation emissions (ie <1%), and are therefore not significant[9].

101 The applicant has now presented four different sets of data. Three overall changes (or steps) have been made to the data originally published in the Environmental Statement, these are:

A. EFT v8 to EFT v10

B. EFT v10 to EFT v11 (and BEIS emissions factors (2021))

C. applying a nationally conglomerated "rate of improvement" based on TDP, Figure 2 (referred to by the applicant as "the TDP Sensitivity test") to the data in B

102 There are two fundamental problems with the data in RESP-8.122, Table 1:

i. No explanation as to the assumptions and modelling used to generate TDP Figure 2 has been provided in RESP-8.122 or elsewhere since the TDP was published. The same is true for NZS Figure 21 which is a refinement of TDP Table 2. This is despite various Freedom of Information requests[10] and a parliamentary question[11] being raised. Therefore, Step C above, the application of a TDP Policy factor based on the rate of improvement shown in TDP Figure 2, is presented as a black-box calculation, and algorithmically untransparent. I present further questions on this below.

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[9] No project-specific data for energy use, or maintenance and refurbishment during the A38 Derby Scheme's operational life has been made available in the Environmental Statement or subsequent documents, so it is impossible to be certain whether the test **not** being "like with like" is significant or not. However, I note from my analysis elsewhere that non road-user operational emissions are less than 1% of operational emissions on three A47 schemes in Norfolk (see below), and that for the A57 Link Roads, Environmental Statement, chapter 14 (see below), the applicant states from a study of three schemes that '0.29% of road user emissions has been applied as a reasonable worst-case operation and maintenance figure'.

A47 Blofield to North Burlingham, [redacted], A47 North Tuddenham to Easton, [redacted] easton, and A47 - A11 Thickthorn Junction [redacted] A57 Link Roads, [REP1-019] in the TR010034 library, page 20, [redacted]

[10] For example, by the New Scientist "UK refuses to release document showing Net Zero Strategy CO2 savings", 1 December 2021, [redacted]

[11] Kerry McCarthy, MP, 18th October 2021 to Trudy Harrison, MP - [redacted]

ii. Despite the data in RESP-8.122, Table 1, **no assessment or conclusions have been made** from the data. The presentation therefore fails to achieve what it sets out to do which is to describe "how an assessment ..." was undertaken.

103 On point i, I draw attention to my statement above on "Lack of Transparency of Data and Computer Modelling" and the Algorithmic Transparency Standard (see Appendix B). The applicant has applied figures for a nationally conglomerated "rate of improvement" based on TDP, Figure 2 to figures derived directly from traffic modelling without explaining how the TDP figures are derived. **For data and algorithmic transparency, a full explanation of how these figures are derived is required.** Despite the introduction of this new material, and the lack of transparent information and data relating to it places severe limitations on the independent review which I have been asked by Mair Bain to provide.

7.7 RESP-8.122/SECTION 3 (iv)/page 18 – Data and algorithmic transparency issues

104 I have summarised the four data sets provided, and the stepwise changes applied to the data below. RESP-8.122, Table 1 misses the data from RESP-8.121: I have added this data in below (at row B) so the full picture may be seen.

105 The first three sets of data (rows A, B and C) are (wrong) solus quantifications derived from the traffic models as described in previous sections. The fourth set of data (rows D, E and F) result from the **application** of a nationally conglomerated "rate of improvement" based on TDP, Figure 2 to the most up-to-date traffic model run (in terms of EFT and BEIS carbon factor versions) at row C. **The applicant must define what "application" means in this context, and provide all the assumptions used in applying the TDP Policy factor.**

106 Rows G, H and J compare each of the three sets of data derived from traffic models with the fourth set based by applying the "TDP Sensitivity test" by comparing each set of operational emissions data with an **average** of the TDP (upper bound) and TDP (lower bound values).

CO_2e (Million tonnes)					
			4CB (2023-2027)	5CB (2028-2032)	6CB (2033-2037)
Environmental Statement	**Operation (EFT v8)**	A	0.012300	0.020600	-
RESP-8.121	**Operation (EFT v10)**	B	0.009900	0.019100	0.022300
RESP-8.122, page 8	**Operation (EFT v11) & BEIS emissions factors (2021)**	C	0.007200	0.011900	0.012200
RESP-8.122, page 18 "sensitivity test based on the rate of improvement shown in TDP Figure 2"✦	**TDP (upper bound)**	D	0.006500	0.007100	0.005100
	TDP (lower bound)	E	0.005000	0.004200	0.002400
	TDP (average)	F	0.005750	0.005650	0.003750
	(EFT v8)/TDP (average)	G=A/F	214%	365%	
	(EFT v10)/TDP (average)	H=B/F	172%	338%	595%
	(EFT v11)/TDP (average)	J=C/F	125%	211%	325%
	TDP (average)		100%	100%	100%

NB: All data in the above table is based upon, or derived from, traffic models which are configured for a **(wrong) solus only** quantification of carbon emissions, based on the solus quantification shown as specified by this document's Table 1 above.

✦referred to as TDP Policy factor in this report

Table 4

107 The applicant has **applied** a black box approach which it describes as "a sensitivity test based on the rate of improvement shown in Figure 2 of the TDP which can be applied to CO_2e emissions calculated for the Scheme assessment". All TDP policies are assumed to be working as a conglomerate mass, based on a model at the national level, the details of which have not been made public.

108 The approach of applying a nationally conglomerated "rate of improvement" to carbon quantities which are derived from a specific traffic model for a specific study makes no account of:

A. **which** TDP policies are having an effect, and

B. **how, and by how much,** they are having an effect on the transport carbon emissions associated with the scheme in the study area

109 As such, applying the TDP Policy factor is a blunt tool which eliminates the gathering of useful information rather than generating it.

110 **The applicant must provide a complete breakdown of the calculations behind TDP Figure 2**, showing for each policy how it has been modelled and what its contribution towards the decarbonisation path in TDP Figure 2 is. The applicant must provide any

analysis, if there is any, on how each potential TDP policy may impact and apply **to the particular situation in the study area** of the scheme.

111 **The applicant must also make available a wide range of data involved in the traffic modelling.** For the study area, the highway and public transport matrices, changes in walking and cycling modelled, and automatic TUBA outputs for each of the three traffic models (rows A, B and C in Table 4 above). These will also be useful in analysing how each potential TDP policy, for example those on modal shift in new developments, impacts the study area. Further, the 60-year appraisal spreadsheets for GHGs should be provided for each of these traffic models. The Economics Table and new BCRs should also be calculated, including the new appraisal carbon pricing data from Government.

112 **If the applicant has produced a 60-year appraisal GHGs spreadsheets for its "TDP Sensitivity test"** set of data, then they should provide this.

7.8 RESP-8.122/SECTION 3 (iv)/page 18 – Potential double counting

113 Further, I have concerns that there may be **double counting** between emission reductions in the EFT v11 and the application of the TDP sensitivity test. Table 4, row C (the EFT v11 traffic model run) already has emissions outputs for the years 2031-2050 with updated fleet and engine efficiency adjustment factors. The DEFRA EFT webpage states "the 'Output CO2 Summary' sheet provides a summary of direct CO2 emissions from tailpipe and indirect CO_2e emissions associated with the charging of the batteries of electric and plug-in hybrid cars and LGVs, in tonnes/annum"[12].

114 As significant policies in the TDP relate to electric vehicle (eg "A zero emission fleet of cars, vans, motorcycles, and scooters", and "Zero emission buses and coaches" in the "Summary of commitments", TDP, Part 2a, for "Decarbonising all forms of transport"), decarbonisation from electric vehicles can be expected to be part of the nationally conglomerated "rate of improvement" implied by TDP Figure 2".

115 This risk of double counting may extend to other policies too, such as modal shift: electric vehicles is just the most obvious example.

116 **The Applicant must provide a breakdown of all the adjustments for carbon reduction values made in the EFT v11 and the TDP Figure 2, and demonstrate that there is a clear demarcation of which contribute to the EFT v11 and which to the emission reductions implied by the TDP Policy factor.** There should also be a clear demonstration that DEFRA and DfT are working to ensure that this demarcation and apportionment of emissions reduction effects between versions of the EFT and the TDP modelling is fully understood. The resolution of this issue may require work between DEFRA and the DfT.

[12] [redacted] "Emissions Factors Toolkit", accessed Mar 18th 2022,

117 I note that rows G, H and J of Table 4 above show the relative operational emissions in the different models presented, against the baseline of TDP (average). There is a significant quantum of reductions made by first introducing the EFT v11 and second by the application of the TDP Policy factor. **The applicant must provide a very clear explanation of, and demarcation between, the effects contributing to each of these substantive reduction effects on their data.**

118 I also note for the EFT v11 traffic model run, Table 4, row C, the 6th carbon budget operational emissions are greater than the 5th carbon budget operational emissions, indicating that even with the EFT v11, that electric vehicles are not contributing sufficiently to decarbonisation in the study area.

7.9 RESP-8.122/SECTION 3 (iv)/page 20 – Construction emissions

119 The construction emissions in the 4th carbon budget are approximately 9 times the TDP (average) figure [0.052 $MtCO_2e$ cf 0.005750 $MtCO_2e$], and 42% of the total construction emissions are in the 3rd carbon budget. **The applicant must explain how such a large emission from construction, in the period leading to 2030, can be reconciled with the TDP and the NZS, and the UK NDC target of 68% reduction in emissions by 2030, reflected in the NZS.**

7.10 RESP-8.122/SECTION 3 (iv)/page 20 – All the data is based on solus, not cumulative, quantification and assessment

120 Each of the 4 sets of data now presented: EFT v8 (Table 4, row A); EFT v10 (Table 4, row B); EFT v11 (Table 4, row C); and TDP Policy factor (Table 4, rows G, H, J) for operation emissions data are **only solus** quantifications, and the **wrong solus** quantifications, as described earlier.

121 I have summarised the four sets of operation emissions data which have now been presented by the applicant in Table 4. No assessment is possible of the cumulative carbon impacts of the scheme with other developments, as these cumulative impacts have not been quantified as explained earlier. **The applicant has still not made the application EIA compliant**.

7.11 RESP-8.122/SECTION 3 (iv) - How the Assessment Presented for the Scheme Complies with the Environmental Impact Assessment Regulations

122 I have shown in previous sections that the Applicant has not quantified, nor assessed, the cumulative impacts of the development proposed together with those from other "existing and/or approved projects".

123 The applicant claims that it "can only assess the change in CO_2e emissions from the Scheme in absolute terms". However, the quantifications that the applicant calculates are differential in nature, being differences (DS-DM) of configurations of the traffic model. The differential emission quantities do not reflect the scale of the absolute emissions in the study area with the scheme. The absolute emissions value is the realistic quantification of the transport emissions for the study area, as part of local, regional or national carbon budgets.

7.12 RESP-8.122/SECTION 3 (v) - The Assessment was Prepared by a Competent Experts

124 Noted.

8 RESP-8.122/SECTION 4 - FRAMEWORK AGREEMENT BETWEEN THE APPLICANT AND NETWORK RAIL

125 No comment

9 RESP-8.122/APPENDIX A

9.1 RESP-8.122/APPENDIX A – 12: Mair Bain (Derby Climate Coalition) and support document provided by Dr. Boswell – differential v absolute carbon emissions

126 The applicant responds to two bullet points under the title "Solus v absolute emissions reporting" on RESP-8.122, page 54. The title is incorrect and should read "Differential v absolute emissions". The point here is that there are two general quantifications of emissions: absolute and differential. Differential emissions derived by differences between two configurations of the traffic model may be solus or cumulative. Solus and cumulative are terms, describing the scope or range of the environmental impact assessment being made, and relate here to the scheme in isolation, or the scheme in cumulative with other developments in the study area. Table 1 and Table 2 in this document show two distinct <u>differential</u> <u>solus</u> quantifications. Whilst this document's Table 3 shows both of these, and also a <u>differential</u> <u>cumulative</u> quantification: all derived by DS-DM differences in traffic model configurations.

127 The reason why absolute emissions provide a more reliable quantification for assessment is illustrated by the example given in the applicant's response: "*For the SoM, GHG emissions arising during the 4th, 5th and 6th carbon budget periods for the Do Minimum Scenario are 101,189,344 tCO_2e. Emissions for the Do Something Scenario over the same time period are 101,240,659 tCO_2e.*" The applicant calculates a small solus

differential quantity (the wrong solus as specified by this document's Table 1 above) for the scheme in isolation. In so doing, the applicant ignores the massive >100MtCO_2e carbon emissions footprint across the traffic model for these few years[13].

However, to meet the targets in the NZS (and TDP), the emissions across the whole traffic network need to be radically reduced, and the applicant does not address how this can happen. It is only by looking at the whole study area in absolute emissions terms that such radical emissions reductions can be conceived, and perceived, in the traffic modelling required to delivered them. This would need to be traffic modelling that genuinely expressed the TDP policy objectives and targets as core assumptions: as already discussed, the current traffic models are based on assumption which reflect very different scheme specific objectives, and date from many years ago.

Looking at the carbon reduction challenge as small differences on a particular scheme is fiddling at the edges of the task required. This is what the differential emissions approach is doing. It is why the methodology in the Environmental Statement, and that for other DCO schemes, is destined to fail to deliver transport decarbonisation, as set out in the NZS.

128 The applicant has not even addressed the question, let alone demonstrated an answer, to how the carbon emissions in the traffic model study area can be reduced by around 34-45% by 2030 and 65-76% by 2035, **relative to 2019 levels,** which is the necessary reduction rates for the study area network to align with the NZS, and TDP. It is not realistic to consider the emissions for the scheme in isolation and assume that the rest of the study area network will decarbonise itself which is a key implicit failing assumption of the differential emissions approach.

Solus (and wrong solus) differential emissions is the defining feature of the scope of the carbon emissions assessment made in the Environmental Statement, and it fails to see the bigger picture that is needed to genuinely start to deliver on the NZS and the TDP. Absolute emissions give that bigger picture.

[13] The 13 years 2025 to 2037

9.2 RESP-8.122/APPENDIX A – 12: Mair Bain (Derby Climate Coalition) and support document provided by Dr. Boswell – the "inherently cumulative" notion

129 I have already refuted the points made under "bullet point 2" in previous sections. I have shown that the applicant's notion below is false:

> **'If** the traffic model contains all known road and land developments in the study, **then** it follows that any combination of data, and any differentiation of that data (eg DS-DM), extracted from the traffic model must also be "inherently cumulative".'

130 I have also shown that Planning Inspectorate's Advice Note 17 gives no support to the applicant's claims in RESP-8.122, and I strongly suggest the Secretary of State must also conclude that no weight can be applied to the note in this context.

131 Where I have not responded to other responses from the applicant under the applicant's Appendix A, does not mean that I agree with the responses given.

10 SIGNED

Dr Andrew Boswell,
Climate Emergency Policy and Planning, March 23rd, 2022

11 APPENDIX A: BEIS CARBON PRICING POLICY PAPER

Policy paper, Department of Business, Energy and Industrial Strategy (BEIS)
"Valuation of greenhouse gas emissions: for policy appraisal and evaluation"
Published 2 September 2021

GOV.UK

Coronavirus (COVID-19) (/coronavirus)
Latest updates and guidance

[redacted]

Policy paper

Valuation of greenhouse gas emissions: for policy appraisal and evaluation

Published 2 September 2021

Contents

Introduction

This document sets out a revised approach to valuing greenhouse gas (GHG) emissions in policy appraisal, following a cross-government review during 2020 and 2021. It replaces the [redacted]

What are carbon values?

Greenhouse gas emissions values ("carbon values") are used across government for valuing impacts on GHG emissions resulting from policy interventions. They represent a monetary value that society places on one tonne of carbon dioxide equivalent (£/tCO2e). They differ from carbon prices, which represent the observed price of carbon in a relevant market (such as the UK Emissions Trading Scheme).

The government uses these values to estimate a monetary value of the greenhouse gas impact of policy proposals during policy design, and also after delivery.

Why value GHG emissions in policy appraisal?

The fundamental purpose of assigning a value to the GHG emissions impacts that arise from potential government policies is to allow for an objective, consistent and evidence-based approach to determining whether such policies should be implemented. Carbon values are used in the framework of broader cost-benefit analysis to assess whether, taking into account all relevant costs and benefits (including impacts on climate change and the environment), a particular policy may be expected to improve or reduce the overall welfare of society.

To reach net zero in 2050 and meet our [redacted] a robust approach to valuing emissions is vital to ensure that government takes full account of climate change impacts in appraising and evaluating public policies and projects, whether those policies are intended to reduce emissions or are likely to have the effect of increasing emissions. Such policy decisions often involve making choices between competing policy objectives.

Assigning a value to carbon helps to ensure that such choices are made in a transparent fashion and in a way that seeks to be cost-effective for UK society as a whole.

Valuing emissions impacts explicitly when making policy decisions helps to:

- ensure the climate impacts of policies are fully accounted for
- ensure consistency in decision making across policies
- improve transparency and scrutiny of decision making

Valuing emissions impacts robustly is important, however it is often the case that some of the most strategically important benefits of climate policy cannot always be quantified. For example; strengthening of decarbonisation supply chains; or increases in the UK's resilience to deal with extreme climate events. As a result, quantified benefits of carbon saving policies can underestimate the true benefits. Therefore, policy makers and decision makers should consider all qualitative and quantitative evidence in the round as set out in the Green Book, even if a project has a low estimated benefit-cost ratio.

Greenhouse gas emissions should be valued for all policies that may have an impact on emissions, whether these impacts are positive or negative. This includes policies whose primary objective is not related to progressing the net zero target, but where there are indirect impacts on emissions.

It should be stressed that the carbon values discussed in this paper apply to all types of policy, providing there is some impact on emissions. It is not the aim of this document to discuss how these policies should be designed but rather to provide carbon values to be used in the economic appraisal or evaluation of these policies. Detailed practical guidance for analysts on how to apply the carbon values in appraising policies is available in the [redacted]

Rationale for reviewing and updating carbon values

BEIS's current approach to carbon valuation for appraisal purposes was set out in the 2009 publication [redacted]

Since 2009, a 'target consistent' approach has been used to estimate the values, where these are calculated as the marginal abatement cost of meeting targets.

BEIS has conducted a review and update of the carbon values because several factors have changed since the last review, the most significant of which are the following.

Changes in international targets

The UK signed the Paris Agreement in 2016, which sets out a more ambitious goal - to keep global temperature rise well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C.

Changes in domestic targets

[redacted]

In June 2019, the UK adopted in law the recommendations of the Climate Change Committee, to achieve net zero GHG emissions by 2050 (compared to the previous target of an 80% reduction by 2050 on 1990 levels).

EU Exit

The UK has left the EU Emissions Trading System (EU ETS) and from January 2021 introduced a UK Emissions Trading Scheme (UK ETS).

New understanding of technology costs and availability

Some of the key technologies for decarbonisation such as renewable power generation and batteries have seen larger-than-predicted price reductions over the last 10 years which should reduce abatement costs in relevant sectors.

Previous reviews of the value of carbon

In 2009 the government conducted a review of the approach taken to developing carbon values. The conclusion of the review was to move to a "target-consistent" or "abatement cost" approach to carbon valuation rather than a "social cost of carbon" (SCC) approach. The main rationale for moving away from the SCC is further outlined in the 2009 publication of [redacted]

Under the target consistent approach, the appraisal of individual policies is based on target-consistent values of carbon. Previously these were be based on a "traded value of carbon" for appraising policies that affected emissions in sectors covered by the EU ETS and, in the short term, a "non-traded value of carbon" for appraising policies that affected emissions in sectors not covered by the EU ETS. In the long term (post-2030), *a single series of carbon values was used covering emissions across the economy based on global* abatement cost estimates.

Since 2009, the government has ensured that the values remain fit-for-purpose, by taking the following actions:

- the values were updated annually to update the real terms price base year and also reflect developments within the EU ETS
- policy analysis used high and low ranges as part of sensitivity analysis to account for uncertainties
- in 2011, BEIS produced guidance on valuing emissions post-2050. This ensured that policies with a longer time horizon correctly accounted for their emissions impact during the appraisal stage

Methodology

Aproach taken to updating the values

We have given due consideration to the following criteria while updating the current values:

- consistent: the new values must be consistent with the UK's national and international climate commitments
- simple and transparent: the series should be intuitive, resistant to modelling artefacts, easily understandable and replicable
- evidence-based: the values should be supported by the latest evidence available
- pragmatic: the series should be stable, and allow effective decision-making in its application, and represent a reasonable balance of the factors above

The new carbon values are based on a Marginal Abatement Cost (MAC) or "target-consistent" valuation approach. This involves setting the value of carbon at the level that is consistent with the level of marginal abatement costs required to reach the targets that the UK has adopted at a UK and international level. This is illustrated, in simplified form, below in Figure 1 which illustrates how a "target-consistent" carbon value would be set. From our understanding of emissions projections and abatement options, we can determine the effort level, A*, that is required in order to meet the UK's targets. Reading across from the abatement curve produces the corresponding carbon value level.

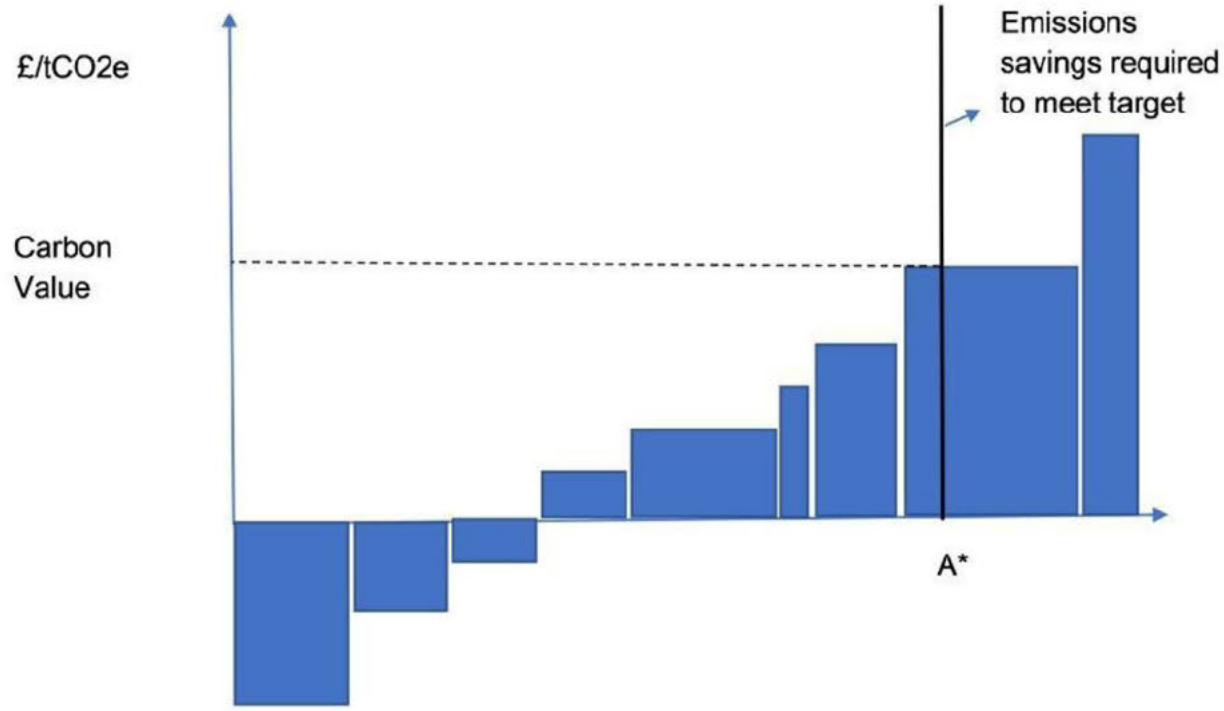

Figure 1: illustrative MAC curve

BEIS has consulted academics and commissioned a literature review, which confirmed that the SCC approach is not recommended for use and that the target-consistent approach remains the best option. The target-consistent approach is preferred in two main areas. First, it is more credible as the methodology is more transparent and relies less on unobserved factors and uncertain estimates about damages caused by GHG emissions. Second, the approach is well-aligned with the net zero target, which represents the UK's primary legal obligation.

BEIS has taken the following steps to produces the carbon value series:

- identifying appropriate targets
- selecting the modelling approach
- translating the range of modelling outputs into a single series
- defining an appropriate uncertainty range

Climate targets

The UK has both domestic and international climate targets. The updated carbon values presented in this publication are intended to be consistent with both targets.

Internationally, the UK has committed to climate targets under the Paris Agreement. The Paris Agreement provides for the international community to keep the increase in global average temperature to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C. The government has a clearly stated focus on 1.5°C, with well below 2°C being inconsistent with its climate leadership intentions.

Domestically, the UK government has legal targets committing us to reaching net zero emissions by 2050, along with a series of interim carbon budgets (each covering a 5-year period) paving the trajectory towards the net zero target. Recently, the UK announced the [redacted] equivalent to reducing emissions around 78% by 2035 compared with 1990 levels. This is consistent with a pathway through our 2030 Nationally Determined Contribution (NDC) under the Paris agreement (which is more ambitious than the legislated 5th Carbon Budget).

The domestic targets are the UK's chosen implementation of our international commitments and represent a more ambitious end point and more front-loaded pathway than previous targets.

Modelling approach

The carbon values review has taken a range of evidence on abatement costs into consideration. It has been informed by internal BEIS modelling as well as international evidence from the Intergovernmental Panel on Climate Change (IPCC). The evidence base has been used by both the government and the Climate Change Committee in its advice and decisions on carbon budgets and net zero.

Evidence base

Global carbon prices from IPCC Modelling

The scientific and economic modelling literature underpinning the IPCC assessment reports provides a broad consensus on the global technological and emission trajectory changes that are needed to maintain climate change below 2°C of warming, but there is no consensus on the carbon price signals needed to trigger such transformations, with the exception of prices increasing throughout the end of the century[footnote 1]. Consistent with the 2009 values, the revised carbon values are anchored on long-run global abatement costs rather than UK costs, but as discussed later the trajectory over time reflects the UK's relatively front-loaded domestic targets.

There is a significant range of uncertainty in the carbon price trajectories deriving from the application of Integrated Assessment Models (IAM)[footnote 2]. The differences in carbon price trajectories are often driven by either structural differences in modelling approaches (that is, optimisation models v. dynamic recursive models) or by differences in underlying scenario assumptions on the future evolution of socioeconomic factors (that is, population or GDP forecasts). This means that there is no true or unique carbon price trajectory that is perfectly aligned with a given global temperature target. The trajectory will depend on the future uncertain evolution of socioeconomic factors and implementation of mitigation actions[footnote 3].

IPCC values, produced by a suite of IAMs, are [redacted] In this case the modelled carbon prices and emissions projections were sourced from the 1.5°C low overshoot pathway class of modelling scenarios (including a constraint on Kyoto gas emissions in 2010 being sufficiently close to observed values) following the IPCC approach outlined in Chapter 2 of IPCC Special Report 1.5 and also followed by the CCC in their analyses. The median carbon price was calculated from the range of carbon prices and converted from USD2010 to GBP2020.

GloCaF – BEIS Global Carbon Finance Model

GloCaF models an idealised carbon market. A global emission trajectory is set and by means of 100% free trade with no friction, each region mitigates up to the same marginal cost to meet the global target. Trade is modelled across 25 specified regions, giving global coverage, including International Bunkers (International Aviation and Maritime sectors). Trade is allowed across all 24 sectors of the model, giving economy-wide coverage. The result is the most cost-effective carbon price, by which the abatement target equivalent to the emissions target, might be achieved.

In setting the emissions target for the modelling of necessary abatement we used the median value of the range of IPCC climate model outputs for the 1.5°C target to limit global temperature increase to 1.5°C by 2100, allowing for a temporary marginal exceedance (low overshoot) prior to 2100 ("1.5LowOS"). In modelling of 2030 and 2040 abatement necessary to achieve emissions that correspond to the median emissions projected for 1.5LowOS, GloCaF carbon prices are within the interquartile range of carbon prices included in the IPCC model set. The 2030 value is marginally lower than the IPCC median (£147 vs £163) and the 2040 value higher than the corresponding IPCC median (£575 vs £326), while still within the interquartile range of IPCC carbon values.

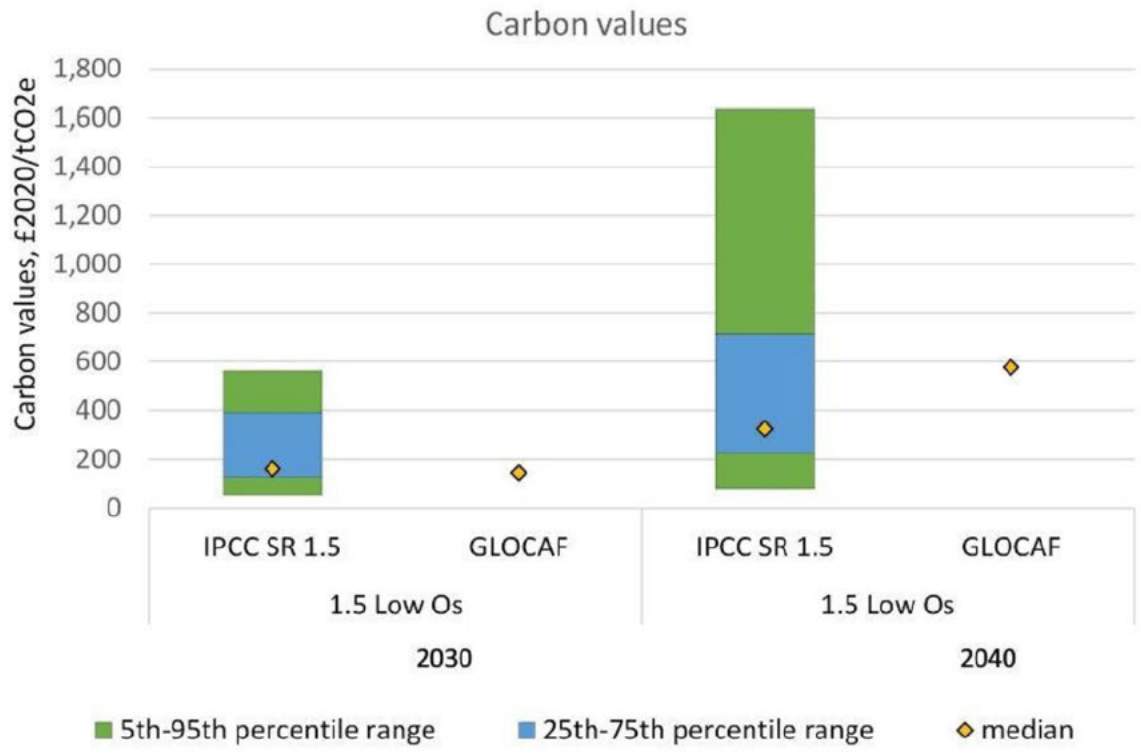

Figure 2: comparison of GloCaF modelled carbon values and IPCC median carbon value and carbon value range for 2030 and 2040, for IPCC 1.5 Low overshoot scenario

Each of the modelling approaches set out above has advantages and disadvantages. On the basis of the relative merits, BEIS has adopted the IPCC's evidence base as the starting point for constructing a series of values. The main advantages of the IPCC evidence is that it has been widely peer-reviewed and builds on a broad range of modelling and available evidence. Furthermore, it is a source independent to UK government and considered authoritative internationally.

Anchor points

Marginal abatement costs can be subject to large fluctuations between years modelled. This can be due to a number of factors, not least:

- assumptions about technology costs and availability
- emissions pathways within the modelling
- interdependency with modelling outcomes in other years

Therefore, the full series derived by models can have counterintuitive annual fluctuations, which are not practical for appraisal purposes. We therefore use a single point estimate in 2040 (anchor point) around which we apply a constant growth rate to derive annual values.

There is considerable uncertainty around technologies and corresponding abatement costs far into the future (beyond 2040) at these ambitious levels of domestic and global climate mitigation. Future technological advancements are most likely to happen at the higher cost end of current known technologies (reflecting that they are typically in earlier stages of development), on which marginal cost estimates depend. As a result, anchoring the value on 2050 is particularly uncertain as all models rely on indicative stopgap technologies, or extrapolated cost estimates that far in the future.

Choosing an anchor point in the very near future risks underestimating the cost of abatement as the level of action required in the future will place us further up the marginal abatement cost curve.

Growth rate

Marginal costs are not constant over time, and are influenced largely by 2 primary driving forces:

- increased emissions reductions ambitions, requiring more expensive technologies to be adopted
- reductions in technology costs through innovation and deployment

Currently, there is no academic consensus on how these two factors interplay, and consequently what the precise optimal trajectory for carbon values is – although there is general consensus that they should rise over time. For simplicity and pragmatic application, we have adopted a constant growth rate to construct the carbon value series around the 2040 IPCC anchor point.

Relative to global trajectories for emissions, our domestic emissions reduction targets are relatively front-loaded, which implies that a flatter trajectory for carbon values is more appropriate as additional UK efforts should be made in the near-term. In the 2020s and 2030s the evidence is clear that the UK needs to implement many policies and technologies that have relatively high upfront investment costs and long lead times. In this case, early action will contribute to innovation in the clean technology space and thus encourage future cost advantages. Based on our assessment of the evidence base, including the CCC's estimates of UK abatement costs in their advice on the 6th Carbon Budget, we have concluded that an indicative 1.5% annual real growth rate around the 2040 anchor point is appropriate.

Uncertainty range

There is a significant range of uncertainty in the carbon values derived from any modelling. The differences in carbon price trajectories are often driven by either structural differences in modelling approaches or by differences in underlying scenario assumptions on future evolution of socioeconomic factors (for example, population or GDP forecasts).

To capture the full range of uncertainty, a plus or minus 50% sensitivity range has been deemed appropriate around the central series. This is consistent with the previous range used.

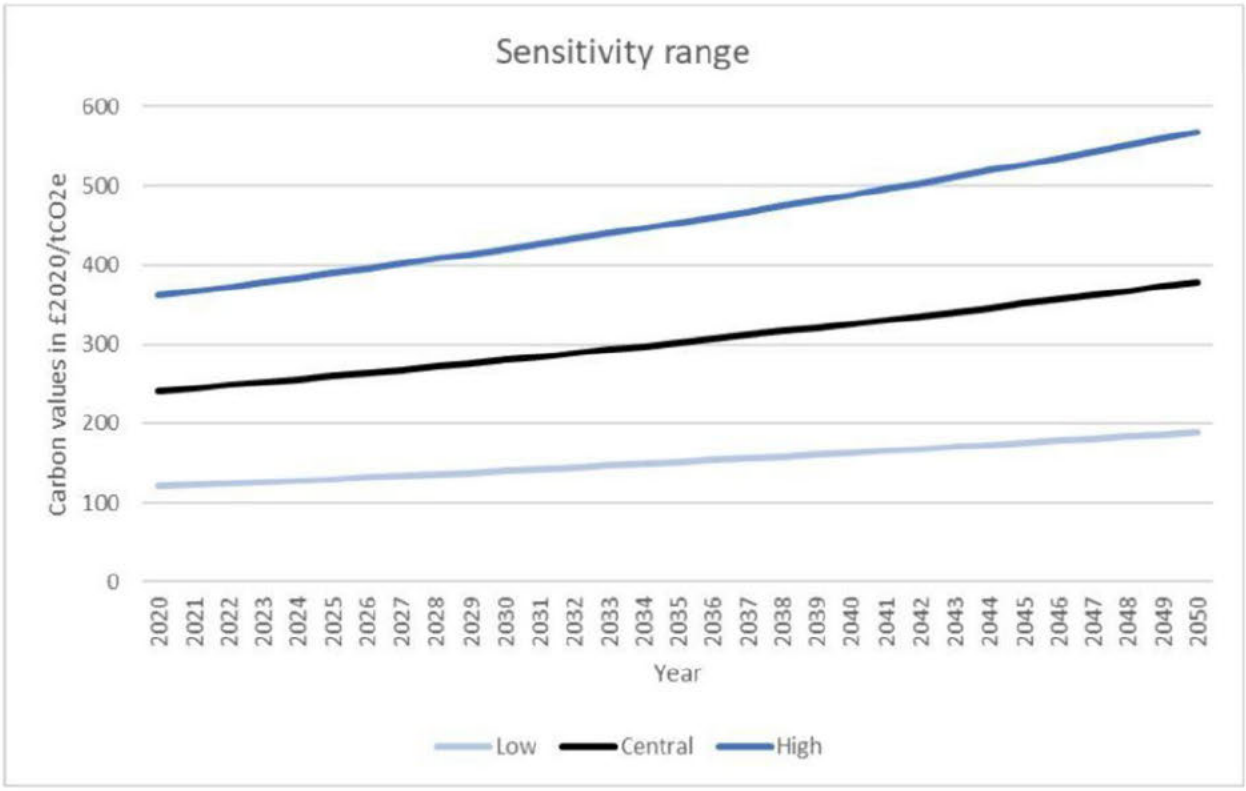

Figure 3: Sensitivity range of the updated carbon values.

Traded and non-traded carbon

Traded emissions capture those that come from installations covered by the [redacted] (ETS), whereas non-traded emissions are those which do not fall within scope of the UK ETS.

Currently, the UK ETS covers power generation, energy-intensive industries, and domestic aviation. To achieve the economy-wide decarbonisation required to meet our net zero goals in a cost-effective way, it is important that our decarbonisation strategy gives equal weight to emissions from the traded and non-traded sectors.

The UK ETS caps the total level of greenhouse gas emissions within the sectors in scope and allows firms with low emissions to sell their emissions allowances to higher emitters.

Previously this trade could occur between the UK and other countries in the EU ETS and this was reflected in accounting towards the UK's emissions targets.

The UK ETS is an important mechanism to achieve the UK's climate goals. However, it is likely that additional measures in the sectors covered by the UK ETS will need to be taken to reach net zero. Therefore, any emissions increases or savings resulting from policies (either traded or non-traded) should be considered and valued during appraisal. For emissions in the traded sector, appropriate adjustments should be made to account for any existing carbon pricing in the market prices of goods or services. For example, if a policy increases the production of a good where the price of that good already reflects a carbon price then this needs to be taken into account in order to avoid double counting some of the carbon costs.

Post-2050 values

The carbon series published in this report only extends to 2050. The main challenge in modelling carbon values beyond 2050 is that any analysis looking over such a long timescale is subject to significant uncertainty from a range of sources. Many of the input assumptions that are required to estimate future carbon prices – such as GDP growth and its sectoral composition, fossil and non-fossil fuel prices, and the costs and availability of different technologies – are extremely uncertain. Moreover, the way in which these variables interact over time in the complex, dynamic global climate, economic and social system is both uncertain and, in some areas, unknown. For these reasons, projections of future carbon prices based on modelling outputs can be highly sensitive to modelling methodology and assumptions and must therefore be seen and used in this context of uncertainty.

Nevertheless, some policy proposals will have long term impacts reaching beyond 2050. It is therefore necessary that any carbon impacts from such proposals are captured during policy appraisal. To obtain values post-2050, it is advisable to apply a real annual growth rate of 1.5% starting at the most recently published value for 2050.

Approach to future updates

The government is committed to using the best available evidence to inform the value placed on greenhouse gas emissions during appraisal. However, there is a trade-off to be struck between three factors:

- having the most up-to-date carbon valuation estimates
- avoiding spurious updates that do not reflect the high level of uncertainty
- ensuring stability in application to allow long-term policy decision-making to occur

A situation where the carbon values used in appraisal changed too often would be undesirable, as this would mean that policy options were being assessed against different criteria. Therefore, the carbon values will be reviewed every 5 years in line with setting the UK's carbon budgets. The review will take into account a broad evidence base. Under exceptional circumstances, reviews outside the 5-yearly cycle may be necessary if changes affecting the evidence or policy regime are significant enough in order to warrant a review.

Application

How to apply carbon values during policy appraisal

Incorporating a value of carbon into the appraisal of projects and policies ensures proper account of greenhouse gas emissions across government. By comprehensively and systematically using carbon valuation across appraisal in a consistent manner, it is intended that government should seek out cost-effective opportunities for reducing emissions across policies and projects – not only in areas such as energy and transport policies where emissions reductions are of primary or secondary importance, but also where this is not the case. Having consistent values across government also provides transparency and consistency for business.

A policy or project that increases or decreases GHG emissions domestically or internationally relative to a "business as usual" scenario is required to quantify the change in emissions, and then apply the carbon values. This calculation feeds into the overall cost benefit analysis to be considered alongside other quantitative and qualitative evidence in the overall policy appraisal. The values should be considered as a guide to the carbon cost-effectiveness of policies but account should be taken of the inherent uncertainty involved in estimating future abatement costs and unquantified costs and benefits.

Carbon valuation is not a policy instrument in itself. It is a £-value applied in appraisal in order to guide government decision-making, and further signal the level of ambition that should be factored into those policies. Unless it is translated into a tangible incentive (and the incentive may exceed the carbon value in order to overcome barriers), it will not act upon private economic agents, whether individuals or business.

Alongside setting the right carbon appraisal value, the selection of instruments to tap potential emissions reduction is key. A mix of carbon pricing (through taxes/trading), regulatory instruments, innovation support and information policies are likely to be required to address the multiple market failures and barriers which exist.

When carrying out a policy appraisal it is also necessary to take into account the impacts on the wider environment also known as natural capital. To help with this Defra has developed an online resource called [redacted] (ENCA) . This provides guidance on natural capital, economic values, references on reports and data sources along with over 70 case studies.

Presenting the monetised change in greenhouse gas emissions

To appropriately quantify greenhouse gas emissions, analysts should consider the key drivers of emissions affected by a policy proposal or intervention. All assessments should include a baseline or Business as Usual (BaU) emissions against which the policy is assessed. There is no standardised or straightforward methodology for measuring the baseline, so this must be done on a case-by-case basis. Historical trends and statistically supported projections are the most commonly used, but historical trends are not effective

at taking changing circumstances into consideration (i.e. non-linearity). The annually updated [redacted] published by BEIS provide projections of greenhouse gas and energy demand to 2040 by sector and are a useful starting point.

Policies or projects can impact emissions in a number of different ways, either directly or indirectly. Analysts should refer to the [redacted] for how to calculate cost effectiveness indicators, including NPVs and £/tCO2.

Annex 1: Carbon values in £2020 prices per tonne of CO2

Year	Low series	Central Series	High Series
2020	120	241	361
2021	122	245	367
2022	124	248	373
2023	126	252	378
2024	128	256	384
2025	130	260	390
2026	132	264	396
2027	134	268	402
2028	136	272	408
2029	138	276	414
2030	140	280	420
2031	142	285	427
2032	144	289	433
2033	147	293	440
2034	149	298	447
2035	151	302	453
2036	153	307	460
2037	156	312	467
2038	158	316	474
2039	161	321	482
2040	163	326	489
2041	165	331	496
2042	168	336	504
2043	170	341	511
2044	173	346	519
2045	176	351	527
2046	178	356	535
2047	181	362	543
2048	184	367	551

Year	Low series	Central Series	High Series
2049	186	373	559
2050	189	378	568

1. World Bank, Report of the High-Level Commission on Carbon Prices, May 2017.
2. IAMs are the most widespread tool for assessing long-term emission trajectories in the context of global warming scenarios and they are the underlying modelling tool used to derive the pathways presented by the IPCC.
3. To narrow the scope of our analysis we focused on the median IPCC scenario to inform our global emissions abatement targets. As part of the validation of our Business-as-Usual trajectory we concluded that it was more aligned with the SSP1 and SSP2 scenarios, representing respectively the Sustainable Development and Middle of the Road scenarios in the IPCC classification.

12 APPENDIX B: DATA AND ALGORITHMIC TRANSPARENCY

12.1 The Algorithmic Transparency Standard

132 The Government recently announced an "Algorithmic Transparency Standard" at [redacted] under the Central Digital and Data Office in the Cabinet Office. Under the new approach, government departments and public sector bodies will be required to explain where an algorithm was used, why it was used and whether it achieved its aim. There will also be an obligation to reveal the architecture behind the algorithm.

133 This follows from the debate on computing, AI and data in public bodies where decision may be made by computer or based on computer outputs. It also applies to decision making and one of the scopes is software that "has a potential legal, economic, or similar impact on individuals or populations" which includes transport models used for decision making of carbon in planning.

134 The need for such transparency was foreseen by Supreme Court judge Lord Sales in a 2019 speech[14] "Algorithms, Artificial Intelligence and the Law" which includes the key paragraph:

> "*The question then arises, how should we provide for ex ante review of code in the public interest? If, say, a government department is going to deploy an algorithmic program, it should conduct an impact assessment, much as it does now in relation to the environmental impacts and equality impacts in relation to the introduction of policy. …*
>
> *Therefore, t**here seems to be a strong argument that a new agency for scrutiny of programs in light of the public interest should be established, which would constitute a public resource for government, Parliament, the courts and the public generally**. It would be an expert commission staffed by coding technicians, with lawyers and ethicists to assist them."*

135 Whilst the Algorithmic Transparency Standard is at a pilot stage and being currently tested by several government departments and public sector bodies, it will be reviewed again and formally launched later in the year. It is a standard that the Applicant as a public body, or publicly owned company, will be required to comply with in the future.

[14] [redacted]