Valuation of greenhouse gas emissions: for policy appraisal and evaluation

Department for Business, Energy and Industrial Strategy: 2 Sept 2021

Implications for Socio-economic impact assessment

By John Siraut on behalf of North Somerset Council

1. This note sets out the implications of this new policy paper from the Department for Business, Energy and Industrial Strategy (BEIS), on the socio-economic impact assessment and passenger forecasting.

2. As stated in the policy paper it "*sets out a revised approach to valuing greenhouse gas (GHG) emissions in policy appraisal*". This is to take into account the decision by Parliament to adopt a net zero target for 2050.

3. The paper explains that "*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 (ETS)).*"

4. Both carbon prices and carbon values are used in economic assessments informing decision making. This reflects the fact that the UK ETS does not cover all economic activities, being limited to energy intensive industries, the power generation sector and UK domestic aviation and flights to the European Economic Area (the 27 EU countries plus Iceland, Liechtenstein and Norway.) Hence in sectors not covered by the UK ETS, the non-traded value of carbon is used.

5. As the paper states "*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*."

6. That is, the value has been set at a level which puts the UK on a trajectory to achieve net zero by 2050. This is a change from the previous approach adopted by BEIS of using the social cost of carbon, which was an estimate of the economic damage that the emission of one tonne of CO2e causes.

7. The policy paper sets out, the new values of carbon to be used in economic and policy appraisals, and a change in approach with regards to the use of traded prices and non-traded values of carbon in those appraisals.

8. The present price of traded carbon in the UK ETS is just over £50 a tonne, compared to the previous non-traded value used by BEIS of £22. The BEIS paper provides new non-traded values which under its central series rise from

£241 in 2020 to £368 by 2050. That is, there is a considerable and an immediate increase in the values to be used in appraisals.

9. The paper states "*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*."

10. That means that, in policy and economic assessments, where there are traded and non-traded carbon emissions to be assessed, instead of using both traded carbon prices and non-traded carbon values, they should now use the single non-traded carbon value. As the paper states "*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*."

11. Thus, to act as an incentive to individuals and businesses, we can expect that the traded sector will be subject to further policy initiatives that over time will raise traded carbon prices so that they become more in line with the non-traded values that are required to achieve the outcome of net zero by 2050. If they did not do this then the decarbonisation required to meet the net zero target would not be delivered.

12. The paper goes on to state "*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*"

13. The expansion of Bristol Airport increases GHG emissions. These emissions are required to be quantified and monetised using the new BEIS non-traded carbon values. The cost of abatement reduces any economic benefits, that is, because the development will give rise to carbon emissions which will have to be abated in order to attain net zero.

14. In the socio-economic cost benefit analysis that York Aviation undertook, summarised in CD2.22, figure 4.1, they used the carbon prices set out in CD2.21 Appendix A to monetise all carbon emissions arising from the proposed development.

15. York Aviation has provided a revised version of CD2.22 figure 4.1 (that summarises the results of the socio-economic cost benefit analysis) in its note to the Inquiry regarding the BEIS revised carbon values. This takes into account the new September 2021 BEIS central series carbon values. The revised analysis shows a doubling of the carbon cost of the project from £305m to £623m.

16. The appellant in CD2.08 figure 6.1 pg 59 indicated that the NPV benefits of expansion were £1,565m at the time of the original planning application, this decreased to £820m in CD2.22 table 4.1 pg 36 at the beginning of this Inquiry and with the latest change in the price of carbon these benefits are now stated to be £502m. That is the economic benefits of the scheme, as calculated by the appellant, have declined by over two thirds since the original planning application was submitted.

17. The above assessment does not take into account any of the uncertainties relating to carbon emissions. For example, a different fleet mix may impact the level of emissions and hence their monetised value. A fleet with a larger proportion of older aircraft for example could have higher GHG emissions and hence a higher economic cost. Thus the NPV in this situation could be reduced still further.

18. The appellant argued in CD2.22 p35-36 that the cost of carbon should be excluded from the socio-economic "*cost benefit analysis on the grounds that it was highly questionable whether the emissions associated with the Proposed Development were likely in reality to be additional in a European or global context*".

19. There is a conflict here between the appellant arguing that the economic impacts of the scheme should be assessed on a regional basis, (recognising that at a UK level that there is a very low level of additionality) and the environmental disbenefits should be assessed on a European or even global level. Both impacts, when included in an economic assessment should be assessed on a consistent spatial basis to determine the net impact of the scheme.

20. In addition, the UK Government in including international aviation in the UK's sixth Carbon Budget makes it clear, that the level of emissions arising from UK based aviation need to be taken into account in its carbon targets and abatement policies.

21. The appellant also argued in this section that "*The modelling of future air fares includes an assumption that the cost of carbon associated with flights will have to be paid by passengers. In other words, the carbon costs of growth are internalised within the traffic forecasts and, hence, including the costs of carbon again as a cost in the socio-economic cost benefit analysis can be viewed as double counting*".

22. This is conflating the impact of financial prices and economic costs. The traded price of carbon has been included in the air fare leading to higher prices and hence a marginal reduction in demand. This marginal reduction in demand does not prevent the airport reaching 12MPPA. It should be noted that the socio-economic cost benefit analysis presents the economic impacts over a 60 year period. Over that 60 year period there is an annual economic cost associated with the carbon emissions of the additional flights arising from raising capacity from 10MPAA to 12 MPPA. As stated by Mr Siraut in cross

examination these economic costs of carbon need to be included in the assessment.

23. The situation is analogous to fuel duty being paid by motorists which leads to a reduced demand for road travel but the economic cost of additional carbon emissions is nevertheless still required to be and is captured in the economic appraisal of road schemes.

24. Hence in my view there has been no double counting of carbon in the assessment undertaken by the appellant.

Implications for passenger forecasts

25. As highlighted above, the government's position is that "*it is important that our decarbonisation strategy gives equal weight to emissions from the traded and non-traded sectors*". The value placed on non-traded carbon is that required to produce a trajectory that achieves net zero by 2050. The implication is that the number of carbon credits will be reduced in the ETS so that the traded price of carbon comes into line with the non-traded value. If this occurs then the cost of air travel will increase relative to the situation without an increase in the price of carbon.

26. CD2.5.44, table 17.9 provides a figure of 106.59ktCO2/yr as the net increase in aviation related emissions arising from the proposed development. In 2030 the new value of carbon is £280 a tonne compared to £78 a tonne used by the appellant (CD2.21 appendix A). Rebasing the latter figure from 2018 to 2020 prices so they are in a common price base with the BEIS values gives a figure of £84 a tonne. Hence the difference between the figure used by the appellant and the new value is £196 a tonne.

27. If by 2030 the non-traded value was equal to the traded price of carbon then the potential average impact on airline fares can be determined as follows.

28. Additional carbon emissions arising from the proposed expansion multiplied by the marginal increase in carbon values gives the additional cost to the airlines which they either have to absorb or pass on to their customers.

    106,590 tonnes CO2* £196 = £20.9m

29. This then needs to be divided by the extra 2m passengers that the planning application seeks to accommodate.

    £20.9m / 2m passengers = £10.45 per trip

30. So on average there may be an increase of £10.45 in air fares. This increase will vary by trip length and market segment. That is, airlines will price fares at the level the market will bear rather than applying a straight pass through of the additional cost to each trip/fare unlike the situation with Air Passenger Duty (APD) which is applied equally to all fares. In relation to APD, its

introduction and continued increases over the last twenty years has not adversely impacted the growth of passenger traffic at Bristol Airport.

31. Additionally, it is not certain that the full amount of any additional cost will be passed through to customers. Airlines may partially absorb the cost increase, as can be the case with any increase in operating costs or offset it by operating cost efficiencies over time. As such, there may not be a direct relationship between changes in specific cost items and the evolution of average fares. Therefore, the impact on fare levels in the long-run is unclear and the effect on the long-term passenger forecast indeterminate.

32. In general terms the price elasticity for business travel is significantly lower than for leisure passengers. Thus, an increase in fares in unlikely to deter business travel but could potentially lead to a reduction in leisure passenger travel. However, the extent to which it is likely to do so will depend upon the degree of impact upon total journey costs. For example a trip with a £50 fare each way to which £10 is added may be significantly affected but a holiday costing £500 to which £10 is added may not.

33. The Department for Transport, INQ 042 pg.6 para 4.6, notes in response to questions by North Somerset Council (INQ 009) on the Jet Zero consultation (INQ 041) that "*the high carbon price has a minimal impact on overall emissions reductions compared to the central carbon price. We can infer from this that applying a high carbon price to scenarios 1 and 2 would also have a minimal impact*." That is, its view is that the demand for flights is price inelastic. It is to be noted that the DfT Jet Zero consultation appraisals and illustrative trajectories are not based upon the use of these updated carbon values. To reflect the required Government approach as set out in the BEIS appraisal the Jet Zero appraisal will need to be undertaken again.

34. A further point to note is that, in response to increased costs, airlines may switch holiday destinations so as to reduce carbon costs, for example, from Greece and Turkey to Spain or Portugal, depending on the price point that customers are prepared to pay. These differing destinations will also exhibit varying elasticities and types of customer base, it is likely that airlines will redeploy seat capacity to various markets to ensure ongoing growth and so the headline forecast can be attained via a range of permutations, in terms of market composition.

35. It is therefore considered unlikely that **if** the traded price of carbon was to increase to the new non-traded values (and that in itself is an unknown) that there would be a material impact on total passenger demand at Bristol Airport, although there may be a change in the distribution of destinations served. Hence, in our view, there is no reason to revise the passenger forecasts.