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Aviation and shipping privileged – again? UK delays decision to act on emissions

The ongoing exclusion of aviation and shipping emissions from UK carbon budgets further tests the veracity of the coalition's claim to be the "greenest government ever" claim the authors of this Tyndall Centre Briefing Note.

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1. Introduction:

The Climate Change Act 2008 sets short-term budgets for reducing the UK's greenhouse gas emissions, and has enshrined in law a target of reducing emissions by 80% by 2050. The Act notes that emissions from international aviation and shipping should be included in this 2050 target by the end of 2012, or that if the Government of the day decides not to include them, it must explain its decision to Parliament [1]. The Act also required the Committee on Climate Change (CCC) to publish its advice on the inclusion of emissions from international aviation and shipping in the spring of 2012. The CCC concluded that not only should they be brought into the 2050 target, but also into the UK's short-term emission budgets [2].

The UK Government has now taken the decision to exclude these emissions for the time being, deferring a decision on inclusion until the setting of the 5th budget in 2016. Uncertainty on the inclusion of aviation within the EU's Emissions Trading Scheme is given as the reason for delay, a reason supported by the CCC. This briefing note presents arguments supporting the CCC's *original* advice and opposing the recent Government decision.

2. Inclusive policy:

Underlying the Climate Change Act is the goal of reducing the UK's greenhouse gas emissions to a level that is commensurate with a given probability of avoiding a 2°C temperature rise above pre-industrial levels. Emissions from all sectors must be included in order for this goal to be meaningful [3]. After all, anthropogenic greenhouse gases in the atmosphere are driving global warming, with no distinction as to their source. However, if there was to be a global initiative to cap and control the greenhouse gases from international aviation and shipping, then assuming the cap was in line with the 2°C threshold, inclusion of these 'international' emissions in UK budgets and targets would not be necessary. Unfortunately, there are two major problems with reliance on such a global initiative:

i: The United Nations Framework Convention on Climate Change (UNFCCC) negotiations are yet to yield any binding global target on emission reductions, let alone

one aiming to avoid 2°C of warming. Consequently, leaving control of emissions from aviation and shipping to the international community is likely to see emissions rise in line with business as usual. Given this, if the UK is not to renege on its commitment to 2°C, aviation and shipping emissions must be included in the UK national emission targets.

ii: The bodies charged with regulating aviation and shipping, the International Civil Aviation Organisation (ICAO) and the International Maritime Organisation (IMO) respectively, are both required to apply the same rules to all nations (through the Chicago Convention for aviation and the maritime principle of "no more favourable treatment" for shipping). However, under the Kyoto Protocol [4], both ICAO and the IMO are tasked with controlling emissions from the respective industries related to Annex 1 nations only. This conflict between the fundamental framing of ICAO and IMO – as bodies that treat all nations equally – and the demands placed on them by Kyoto to differentiate between Annex 1 and non-Annex 1 nations, has proved a major obstacle to delivering any meaningful mitigation from these two important sectors [7]. Given this impasse, if the UK is not to renege on its commitment to 2°C, aviation and shipping emissions must be included in the UK national emission targets.

3. Different treatment for shipping and aviation?

Having established why the UK's portion of aviation and shipping emissions should be included in the UK's budgets and targets, it is necessary to both devise an acceptable approach for apportioning international emissions to nations and, using this, quantify their values for the UK. However, whilst aviation and shipping emissions are often considered together, in practice apportionment poses different and more difficult challenges for shipping than for aviation, principally because shipping voyages have multiple legs.

According to the Climate Change Act, the UK's international aviation and shipping emissions are those that *"relate to the transport of passengers or goods to or from the United Kingdom."* In the case of air transport, the emissions are generally straightforward to estimate. On a return flight from Madrid to London, emissions are associated with the transport of passengers and goods from Madrid to the UK and back again, with the UK's 'fair' share typically considered to be 50% of the total. For ease of accounting, the UK reports to the UNFCCC just the emissions from all departing flights to estimate its 'fair share' and avoid double counting; in 2010 this amounted to 31.5 Mt of CO_2, compared to 502.4 Mt from all sectors (excluding international aviation and shipping) [5]. While there are instances where journeys are more complicated, containing more legs and including transit passengers, this method is considered to be an acceptable way of apportioning international aviation emissions to nations [3, 6]. Importantly, clear policy options, such as constraining airport capacity [15], are available to nations to mitigate these emissions.

When it comes to shipping, the case is much more complicated. The CO_2 figure reported for international shipping to the UNFCCC is based on the sales of bunker fuels at UK ports, which amounted to 9 Mt in 2010 [5]. However, bunker sales are a poor reflection of "the transport of goods to and from the UK", as voyages by ship tend not to be simple A to B return trips [7, 8-10]. A ship transporting cargo across the

Atlantic may travel from New York to Liverpool, where it unloads a proportion of its cargo, it then moves on to Antwerp and Hamburg, unloading as well as loading cargo in both ports. It returns to the US, stopping *en route* in Liverpool to load further cargo. Establishing a nation's 'fair share' of emissions associated with such complicated journeys is clearly open to interpretation and argument. Simply using bunker fuel sales is a poor reflection of the "transport of goods to and from" different nations - as ships often purchase fuel from where it is relatively cheap. For example, sales of fuel at the port of Rotterdam would suggest the Netherlands is responsible for 43.2 $MtCO_2$ of shipping emissions [5], almost a factor of five higher than for the UK despite having only a quarter of the population.

Determining the most appropriate of the various apportionment regimes is fraught with difficulty [7]. However, even if it were possible to agree on a method for apportioning shipping emissions suitable for their inclusion within targets and budgets, the quantity of fuel burnt by individual ships is not publically available, undermining the opportunities for developing and deploying policy measures to control emissions. Moreover, the international nature of shipping means that whatever the chosen regime, it risks giving rise to perverse incentives that could be subject to gaming or leakage.

Despite such complications, avoiding 2°C of warming still requires urgent and immediate mitigation measures to be implemented by *all* sectors [11]. For aviation, the situation is clear-cut; it should be included immediately and based on the 50% apportionment regime. For shipping, there are significant advantages to treating the industry as its own 'sovereign nation' [12], thereby avoiding apportionment altogether. However, given there is no prospect of such a global approach yielding near-term mitigation it is incumbent on nations to intervene – at least until the IMO has a functioning and effective global framework in place.

Building on the IMO's explicit commitment that shipping *"will make its fair and proportionate contribution towards realizing the objectives that this Conference [Durban 2011] and the global community pursue"* [12]; a high-level framework for guiding national efforts to mitigate shipping emissions can be derived. Given the IMO is currently unable to deliver policies in line with the *global community's pursuance* of limiting warming to 2°C, the UK would be at one with the IMO's commitments if it sought measures to mitigate emissions from shipping in line with 2°C. So what measures exist for national mitigation to support the IMOs climate change commitments?

4. A practical approach to mitigating shipping emissions

Before considering measures for controlling emissions, it is worth briefly revisiting the issue of apportionment. The Committee on Climate Change acknowledge that their bunker fuel method is an interim approach to be used only while a more robust method is developed. They go on to note that the difference between 'true' UK shipping emissions and that based on fuel sales is "unlikely to be material" – though they later suggest the 'true' value is 20% to 60% higher than the bunker fuel estimate [2,13] (some methods suggest it could be much higher still) [7]. However, even if the current bunker sales value is not too unreasonable, and that it is a very poor indicator of trade, undermines efforts to improve data collection and transparency

and to develop alternative modelling approaches. Furthermore, refining and supporting one of the new trade-based methods being developed [2,13] would demonstrate important UK leadership in addressing this complex, but nevertheless, crucial aspect of global (and national) emissions.

Despite the methodological and data uncertainties in apportioning shipping emissions to the UK (or any nation), the order of magnitude of emissions is known and is sufficient to at least provide a guide to the scope and scale of necessary mitigation from shipping, as well as other sectors. In 2012 it is evident that any reasonable chance of not exceeding the 2°C threshold demands that the UK (and similarly wealthy nations) significantly mitigate emissions from all sectors – including shipping. To this end, it will need to reconsider options previously thought to be too radical or draconian – at least if it is not to renege on its 2°C commitments (reiterated in the 2012 G8 Camp David Declaration).

As it stands the UK's influence over shipping is certainly constrained, but demand for types, levels and sources of traded goods are amenable to national influence (for example, UK energy decarbonisation will significantly influence future imports of fuel [14]), as is the operation of shipping in UK waters and ports. For the former the UK could consider legislative frameworks to operate a stringent low-carbon procurement policy that extended to goods ordered and imported through any arm of the state. Such controls may encounter a range of trade objections, but the UK and EU also have express climate change commitments that arguably are incompatible with current trade rules. Certainly this an area that needs to be clarified; whether trade ultimately trumps climate change remains to be seen, but the process of testing this out will itself send a signal to shippers regarding the UK's (and perhaps EU's) commitments to mitigate emissions. Setting emissions or efficiency standards for ships operating in its waters may again raise legal issues and trigger perverse incentives, but a process of learning-by-doing could alleviate these and may also help catalyse an extension of controls to wider EU waters. Other options that could be considered relate to issues of congestion at and around ports, cold ironing, port-based renewables etc [7]. However, whatever the suites of measures, the reductions necessary for 2°C will require them to deliver significant and early mitigation.

5. Conclusions

The DECC decision to defer judgement on whether to include international aviation and shipping emissions in the UK's carbon budgets until 2016 demonstrates a cavalier disregard for climate change science.

Just a week on from the Prime Minister defending his election pledge to lead the *"greenest government ever"* [16], his Government has decided to ignore the more than 8% of UK emissions coming from aviation and shipping – whilst in the meantime it reviews further expansion of airport and seaport capacity. Even in isolation, ignoring these emissions would be a concern, but the decision is one amongst several that raise serious questions as to the UK's international leadership on climate change.

In the year that the Prime Minister publically declared his *"Government has the most incredibly green set of energy policies and I think we can be very, very proud"* he has overseen:

- a refusal to set a 2030 'decarbonisation' target for electricity generation
- a green-light given for shale gas exploitation - *a high carbon fossil fuel comprising ~75% carbon*
- the planned construction of up to 37GW of new gas-fired power stations
- the reversal of the decision to rule out a third runway at Heathrow

This is all set against the Prime Minister's promise, made as part of the May 2012 Camp David Declaration – for "*increased mitigation ambition in the period to 2020, with a view to doing our part to limit effectively the increase in global temperature below 2ºC above pre-industrial levels, consistent with science."*[17] However, the science already demonstrates that the *global* carbon budget underpinning the UK's *national* budget equates to a 63% chance of exceeding 2°C. Moreover, the UK's *national* budget is based on a very unfair proportion of the *global* budget - again in contradiction to UK commitments on climate change and equity.

The decision to ignore shipping and aviation emissions is further evidence of the coalition's profound departure from being the *"greenest government ever"*.

References

1. *Climate Change Act 2008*, 2008, The Stationery Office Ltd: London.
2. Committee on Climate Change, *Scope of carbon budgets: statutory advice on inclusion of international aviation and shipping*, 2012, The Stationery Office Ltd: London.
3. Anderson, K., A. Bows, and S. Mander, *From long-term targets to cumulative emission pathways: Reframing UK climate policy.* Energy Policy, 2008. **36**(10): p. 3714-3722.
4. United Nations Framework Convention on Climate Change, *The Kyoto Protocol*, 1997, United Nations Framework Convention on Climate Change.
5. UNFCCC, *GHG data from UNFCCC*, 2012, United Nations.
6. Pejovic, T., et al., *Estimaets of UK CO2 emissions from aviation using air traffic data.* Climatic Change, 2008. **88**: p. 367-384.
7. Gilbert, P. and A. Bows, *Exploring the scope for complementary sub-global policy to mitigate CO2 from shipping.* Energy Policy, 2012. **50**(0): p. 613-622.
8. Entec UK Ltd, *European Commission Directorate General Environment: Service contracts on ship emissions: Assignment, abatement and market-based instruments*, 2005, Entec UK Limited: Brussels.
9. UNFCCC, *Subsidiary body for scientific and technological advice. FCCC/SBSTA/1996/9/Add.1*, 1996b, United Nations. Framework Convention on Climate Change: Geneva.
10. UNFCCC, *Subsidiary body for scientific and technological advice. FCCC/SBSTA/1996/9/Add.2*, 1996a, United Nations. Framework Convention on Climate Change: Geneva.
11. Anderson, K. and A. Bows, *Beyond 'dangerous' climate change: emission scenarios for a new world.* Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2011. **369**(1934): p. 20-44.
12. Anderson, K., and A. Bows, *Executing a Scharnow turn: why, when and how the Shipping sector can be reconciled with international commitments on climate change.* Carbon Management, 2012, **3(**6), 615-628.
13. Walsh, C., et al. *A new method for estimating national-scale CO2 from shipping: preliminary results from a UK study*. in *Low Carbon Shipping*. 2012. Newcastle.
14. Mander, S., Walsh, C., Gilbert, P., Traut, M., and Bows, A., 2012, *The implications of a low carbon energy transition for the shipping sector*, Carbon Management, 3(6), 615-628.
15. Wood, R., Bows, A., and Anderson, K., *A one-way ticket to high carbon lock-in: the UK debate on aviation policy*, Carbon Management, 3, 6, 537-540.
16. Liaison Committee, 2012, Uncorrected transcript of oral evidence http://www.publications.parliament.uk/pa/cm201213/cmselect/cmliaisn/uc484-ii/uc48401.htm
17. G8, May 2012, Camp David Declaration. http://www.whitehouse.gov/the-press-office/2012/05/19/camp-david-declaration