

DECC Science Advisory Group meeting – October 31st 2013

Discussion of the 4th Carbon Budget part of the Carbon Plan

Summary of key comments and recommendations

1. **The Carbon Plan was welcomed** as a robust, coherent and useful piece of work that has given considerable clarity to short-term, medium-term, and long-term policy.¹
2. It was recognised that the **carbon-budget accounting methodology**, in which the legally mandated emissions are the sum of the traded sector *cap* and the non-traded sector actual territorial emissions may cause potential perverse consequences, and there is a need to consider whether this approach is satisfactory. It is recognised that Government reports on both traded and non-traded emissions, but that a consistent approach should be adopted:

If the current legal definition is the true objective for policy (i.e. the traded sector caps are viewed as fixed) then although this ensures environmental integrity (by ensuring traded sector emissions avoided in the UK are not emitted elsewhere in the EU), it unfortunately implies that all the UK's efforts to reduce traded sector emissions (e.g. by decarbonising electricity) are not helping. It thus means that reducing emissions in the traded sector has no value, except for the cash value of the ETS allowances liberated. Under this approach therefore it would be rational to drive non-traded sector emissions down even in ways that significantly *increase* actual traded sector emissions (e.g. electrification of building heating or transport, regardless of whether electricity is decarbonized). This can be environmentally justified (as those emissions will need to be avoided elsewhere in the EU), but it will neither encourage UK leadership, nor ensure the most cost effective approach. Under this approach extra marginal electricity used can be deemed as "zero carbon" and it should be considered whether this is appropriate and should be reflected elsewhere in DECC's policy portfolio.

Alternatively, policy could be focussed on the objective of reducing actual territorial emissions, or even the objective of reducing full-life-cycle emissions, taking into account off-shoring. There might be a strong argument for using actual territorial emissions as the objective, especially if (as seems likely) reducing emissions in the traded sector is cheaper than reducing emissions in the non-traded sector. Under this approach, however, to ensure that environmental integrity was maintained, a clear policy position on retiring or cancelling ETS allowances rather than selling them to another country must be developed. Such retired allowances could perhaps be very usefully banked as a form of carbon insurance for CO₂ stored in CCS projects.

3. In **preparing for the 5th Carbon Budget** DECC should pay attention to, and be explicit about the scale of the engineering challenges faced. It was emphasised that as a matter of priority

¹ It was however noted that there was some confusion in the document in the use of 2030 or the 4th Carbon Budget period. A more consistent approach in future would be welcomed.

Government needs to move beyond scenarios and to **develop roadmaps**, which set out the timetable for delivery of key assets, including a timetable of key decision points, and availability of finance. There should also be a detailed infrastructure plan for key items of infrastructure (or aggregated items, which together form a significant piece of infrastructure.) It must be ensured that the approach to infrastructure investments adopted for 2027 is **consistent with the roadmap to 2050** (a more relevant time-frame) and is not leading to perverse effects. **Adaptation** to climate change should be considered at the same time as actions to reduce emissions.

4. **The importance of whole system modelling** was emphasised and DECC's planned work on this, as outlined by the CSA was welcomed.
 - a. It is important that, well in advance of the 4CB period, there should be a good understanding of issues such as the interaction of intermittent wind and solar electricity generation with other assets -notably inflexible nuclear generation - and the potential impact of electric vehicles and heat pumps on the electricity system, especially if adoption of those technologies turns out to be strongly clustered. Demand-side response of EV chargers has considerable potential value for several stakeholders (for example, the system operator, the EV-owner's electricity supplier, and the local distribution network owner) The question of how this competition for the benefit of controlling the EV's charger is going to be resolved needs to be considered. DECC's cross-cutting activity on whole-system modelling is essential.
 - b. The modelling of the energy system should include a strong understanding of the actors in that system. For example, heating controls are used by humans: there is enormous potential for more energy saving through **better heating control design**.
5. It is important to **understand where UK policy** could make a difference to the global situation, and where we will be takers of global technological developments. This should be realistically reflected to ensure a technologically and financially optimal path.
 - a. It was felt that on both **electric vehicles, and to a lesser extent heat pumps, that the UK would be a taker of global developments** and would not drive the market. Consequently a better way to meet the 4CB might be to delay *mass*-rollout of electric vehicles to the 2030s (unless battery prices drop more rapidly than expected) on the grounds that battery prices are projected to fall until the 2030s then level out. To meet the 4CB, additional effort should therefore be focussed on less-costly sectors. There should nevertheless be some rollout of electric vehicles to ensure learning and to guide the mass-rollout policy.
 - b. The crucial requirement however is to **deliver and demonstrate decarbonisation of the electricity supply**, and to ensure that incentives are in place to promote this. Early availability of decarbonised electricity is crucial for appropriate developments in other sectors (including domestic heating). For example incentivisation of CCS for gas-fired plant may be more effective than encouraging take-up of electric vehicles.

- c. However, SAG members believed that there may also be **significant potential for industrial carbon capture** (for example at steel and cement facilities). The 2004 paper on “stabilization wedges” identified two wedges of global potential in this sector, so investment in industrial carbon capture in the UK might yield significant benefits in other countries in due course.
6. SAG members predicted that the **“4CB gap” will prove to be bigger** than that identified in the Carbon Plan (215 Mt). There is a significant risk that extra effort will be required. **Incentives should be designed to impact those who have actual decision-making powers** and targeted at the factors that they care about. SAG have not attempted to provide a complete analysis of what is needed to fill the gap, but offer the following observations on the shortfall and some potential actions:
- a. Industry is made up of a highly diverse set of energy users, and SAG members expressed scepticism about the projected use of “renewable heat” in industry.
 - b. New build homes all get certified as meeting building standards, but there is strong evidence that many of them actually fall short in energy efficiency terms. There is a pressing need to **ensure actual compliance with existing building regulations**. (There has never been a single prosecution for failure to meet building regulations.)
 - c. **Building regulations should be tightened.** House prices are driven far more by location and other factors; the additional cost of better insulation in new-build is small and pays for itself within a few years. Of course (see above) the tightened regulations would need to be better policed than at present.
 - d. To **ensure that the potential of retrofit measures** will approach that currently projected, the modelling of the benefits of solid wall insulation should be checked very carefully against reality, and ventilation losses should be fully considered and addressed.
 - e. Given that emissions savings in road transport are proportional to miles driven, it would be prudent to target the policies such that **electric vehicles were incentivised for high mileage journeys**, and to consider the infrastructure needed to make this possible. For example, users who drive 70 miles every day could have guaranteed access to charging when the vehicle is parked (etc.).
 - f. There is no reason to promote competition between CCS, nuclear & renewables: we shall need all of them and should seek to incentivise orderly parallel development of them all.