Rt Hon Chris Huhne
Secretary of State
Department for Energy and Climate Change
3 Whitehall Place
London
SW1A 2AW

9th September 2010

Dear Chris,

The level of renewable energy ambition to 2020

Thank you for your letter of 29th July in which you requested that we write to you in September on the level of renewable energy ambition to 2020, as part of our broader renewable energy review.

This response does two main things:

- It summarises our analysis to date of renewable energy ambition in the period to 2020.
- It sets out our proposed approach to the renewable energy review.

It also highlights the need for the energy national policy statements to set the direction of travel for power sector development, phasing out investment in unabated gas generation in favour of investment in renewable and other forms of low-carbon generation, in order to support delivery of the renewable energy target.

Key messages on ambition to 2020

Analysis published in our previous advice to Government and Parliament suggests that the current renewable energy target is broadly desirable but has significant delivery risks. It should neither be reduced (which would increase risks for meeting future carbon budgets) nor increased (which could involve rapidly escalating costs or go beyond the limits of what is likely to be feasible). Rather, the focus should be on implementation, with a number of key risks that should now be addressed by the Government in order that the share of renewable energy can be increased rapidly.

- The current renewable energy target for 2020, and the share of ambition across the sectors (electricity, heat and transport) is broadly desirable in that it makes an appropriate contribution to meeting carbon budgets to 2020 and beyond:

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

- The envisaged contribution from renewable electricity (to account for around 30% of total generation by 2020, compared with 6.6% in 2009) is appropriate in the context of the need to substantially decarbonise the power sector by 2030, on the path to meeting the economy-wide target to reduce 2050 emissions by 80% relative to 1990 levels. Investment now in a broad range of renewable technologies, but predominantly onshore and offshore wind, will directly contribute to required decarbonisation, and in driving down costs due to learning will provide an additional option for cost-effective investment in the 2020s. It could also provide economic opportunities for UK-based firms.

- A significant increase in the share of renewable heat from current very low levels (around 1.6% in 2009) is necessary to meet future carbon budgets. We have suggested, however, that the costs of achieving the proposed 12% share by 2020 could be very expensive at the margin (for example, replacing gas water heating with solar thermal), and that a slightly lower level of ambition for heat may be appropriate.

- The Gallagher Review suggested that a target of around 8% biofuels in 2020 is sustainable. This ambition is desirable, both in terms of the cost-effective contribution it will make to meeting the first three carbon budgets, and given the need to develop sustainable biofuels for use through the 2020s and beyond (e.g. for plug-in hybrid vehicles, HGVs, aviation). However, the current transport target in the 2009 Renewable Energy Strategy is to achieve 10% of energy from renewable sources by 2020, which is likely to be met primarily through the use of biofuels. This target should be lowered unless new evidence shows that it can be achieved sustainably.

- Meeting the 2020 renewable energy target requires a step change in the rate of progress and entails significant delivery risks, which should be addressed as a matter of urgency:

  - Our forward indicators for renewable electricity generation set out key actions that would deliver the 2020 target. A ramping-up in the pace of investment is required (around 1 GW of wind generation was added to the system in 2009, compared to over 3 GW required annually by the end of the decade). Failure to address the following key risks would limit scope for investment and imply a reduced share of renewable electricity in 2020:

    - Finalise regulatory arrangements for offshore transmission,

    - Agree investment to upgrade the onshore transmission network,

    - Reduce the planning application period for new renewable projects and increase the planning approval rate,

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

        - Address uncertainties around financial support mechanisms (e.g. banding of the Renewables Obligation), and ensure that new electricity market arrangements provide appropriate support to renewable generation,

        - Consider whether there is a role for public sector financial intermediation, for example, through a Green Investment Bank to provide support for investment in offshore wind.

    - Whilst technologies exist for increased renewable heat penetration, and there is potential for supply chain growth, the current level of renewable heat penetration is very low and investments will only be viable with financial support. In order to ensure viability, current uncertainties over the Renewable Heat Incentive (RHI) should be resolved, and complementary instruments introduced to address non-financial barriers (e.g. training and certification for installers, advice and technical support for consumers).

- Future ambition in the Renewable Transport Fuel Obligation should reflect the level of sustainable biofuels as set out in the Gallagher Review, unless there is new evidence suggesting increased availability of sustainable biofuels in the period to 2020.

- Energy efficiency improvement has an important role in supporting deployment of renewable heat technologies and delivering the renewable energy target (which is defined as a proportion of total energy demand). There is currently a high degree of uncertainty relating to energy efficiency policy across all sectors, and this should be resolved in order that potential can be unlocked.

- There is a question over whether an overall 15% renewable energy share could be achieved with a slightly lower level of renewable heat penetration than envisaged in the 2009 Renewable Energy Strategy, and with the slightly lower level of sustainable biofuels as set out in the Gallagher Review. The overall target could still be achievable, depending on the level of energy efficiency improvement and any ongoing impacts of the recession (see Table 1).

We provide a more detailed summary of our renewable energy analysis in the attachment to this letter.

The Committee's renewable energy review

Going forward, and in carrying out the broader review that you have requested, we will assess the scope for renewable energy in meeting carbon budgets and the 2050 emissions target.

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

Specifically, we will focus on six key areas:

- We will consider the economics of renewable technologies – current and future, including scope for cost reduction, and possible changes in costs due to changes in factor prices - and compare these with other low-carbon technologies (e.g. nuclear and CCS power generation).
- We will consider the extent to which technologies and infrastructure add to system flexibility (e.g. smart grids, interconnection, storage) and provide scope for addressing intermittency of renewable power generation.
- We will assess the scope for renewable energy uptake, given supply chain and stock turnover constraints.
- We will develop scenarios, with a range of renewable penetration across all sectors at different points in time (e.g. for 2030 and 2050), highlighting circumstances when higher levels of investment in renewable energy may be appropriate, and key decision points.
- We will build on our existing analysis of the path to 2020, drawing out any implications from the longer-term analysis for actions and ambition over the next ten years.
- We will undertake high level analysis of risks to delivering the 2020 target, and possible means for mitigating them (e.g. support under the Renewables Obligation, Feed-in Tariffs, and the Renewable Heat Incentive and new electricity market design to support investment in wind generation).

In addition, later in 2011 we will complement our review of renewable energy with a separate review of bioenergy availability, sustainability and economics. This bioenergy review will also feed into our broader advice on the approach to aviation and shipping required under the Climate Change Act and due in 2012.

The draft national policy statements on energy infrastructure

The wider context for the renewable energy target includes the publication of the draft national policy statements for energy, which will guide planning decisions relating to power sector investments, and for which we are a statutory consultee.

The national policy statements provide an opportunity to address the risk that continuing investment in unabated gas generation will displace investment in renewable and other forms of low-carbon generation:

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

- There is already a large amount of unabated gas generation that has received planning approval,

- A significant number of further approvals and investments would leave limited scope for investment in renewable and other forms of low-carbon generation through the 2020s, therefore putting at risk required sector decarbonisation,

- This risk would be mitigated through the inclusion of a clear direction of travel for power sector development in the Statements, moving away from near-term investment in unabated fossil fuel generation to investment predominantly in renewable and other forms of low-carbon generation.

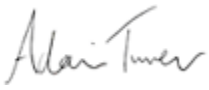
We therefore recommend that the statements should clearly highlight the need for early sector decarbonisation, and the implications for investment. Investment in unabated gas should be very limited beyond 2020, with almost all investment flowing to renewable and other low-carbon forms of generation.

This would complement other levers to support power sector decarbonisation, including a possible Emissions Performance Standard, and market reforms to encourage investment in low-carbon generation, as discussed in our previous advice on gas CCS demonstration.

***

We will report on the renewable energy review in spring 2011. In the meantime, I would be happy to discuss this letter with you, the scope of work for the review, and our emerging analysis.

Yours ever



Adair Turner,

Chair, Committee on Climate Change

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

Table 1. Renewable energy consumption as a percentage of total final consumption, outturn 2009 and forecast in 2020

	Outturn final consumption (TWh)	of which is renewable energy (TWh)	Outturn share of renewable	DECC forecast final consumption (TWh)	of which is renewable energy (TWh)	DECC % renewable energy	Adjusted ambition – illustrative (TWh)[g]
	2009	**2009**	**2009**	**2020**	**2020**	**2020**	**2020**
Heating and cooling in end-use sectors (excluding transport)[a]	640	10	1.6%	599	72	12.0%	66 (11%)
Electricity[b]	375	24	6.5%[e]	377	117	31.0%	117 (31%)
Transport (Road, rail, shipping)[c]	470	12	2.5%	511	49	9.7% [f]	41 (8%)
Total[d]	**1,578**	**47**	**3.0%**	**1,590**	**238**	**15.0%**	**224[#]**

Source: DUKES (2010), Renewable Energy Strategy (June 2009), National Renewable Energy Action Plan for the United Kingdom (July 2010), CCC calculations. **Notes:** [a] Excludes electricity. [b] excluding electricity demand for rail. [c] includes electricity for rail. [d] total final consumption is greater than sum of parts as they exclude aviation, which is included in the total (at 6.18% of total final energy consumption). [e] 6.6% if including renewable electricity in rail. [f] 10% if as a proportion of surface (road + rail) [g] Illustrative lower level of renewable energy (TWh) as proportion of forecast final consumption (shown in parenthesis). [#] Would deliver a renewable energy share of around 14%. A slightly lower amount of renewable consumption in heat and transport could deliver 15% of total final consumption with further reductions in (non-renewable) energy demand due to additional (but uncertain) energy efficiency improvement or the recession. For example, if total final consumption in 2020 (1,590 TWh) were to fall by 7% (i.e. to around 1,485 TWh), adjusted total renewable consumption (224 TWh) would make up 15% of the total.

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

Attachment: Summary of Committee analysis on renewable energy ambition to 2020

We now set out in more detail the analysis that underpins the key messages above, and our scope of work in completing the renewable energy review. Specifically, for 2020 we consider:

(i) The share of renewable electricity

(ii) The share of renewable heat

(iii) The share of renewable energy in transport

(i) Renewable electricity in 2020

Desirability of investment in renewable electricity

In considering the appropriate level of ambition for renewable electricity in the period to 2020, our particular concern has been the contribution that this could make to UK carbon budgets and the 2050 emissions target.

Early decarbonisation of the power sector is required on the path to meeting the 2050 target to reduce emissions by 80% relative to 1990 levels in the Climate Change Act. Specifically, a reduction in the carbon intensity of power generation from current levels of around 500gCO_2 / kWh to around 300 gCO_2 / kWh by 2020 and below 100 gCO_2 / kWh by 2030 is part of the least cost path to meeting the 2050 target.

The 2009 Renewable Energy Strategy (RES) envisages an important role for renewable electricity in early power sector decarbonisation, with significant investments in both onshore and offshore wind generation over the next decade (such that renewables would account for around 30% of electricity generation in 2020). Mirroring the approach in the 2009 RES, our focus to date has been on these two technologies, although we will also consider other technologies (wave, tidal, biomass, etc) in our renewable energy review.

Whether an ambitious contribution from electricity is appropriate depends on at least three factors:

- The cost of renewable electricity versus other low-carbon alternatives, and versus unabated fossil fuel subject to a carbon price,
- The deployability of renewable electricity versus low-carbon alternatives (e.g. wind generation can be deployed now, whereas there is limited scope for adding nuclear and CCS to the system before 2020),

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

- The scope for technology development (e.g. driving down costs) and industrial advantage (e.g. securing high-value jobs in the wind industry supply chain) that may ensue.

Onshore wind is currently the lowest cost source of renewable electricity development, is cost-effective in the context of a rising carbon price, and can be deployed in the near-term.

In contrast, **offshore wind** is currently relatively expensive, raising the question of how much to invest in this technology, and whether it would be appropriate to invest in gas-fired generation instead. Our analysis suggests that significant investment in offshore wind is justified, given the factors set out above (cost effectiveness, deployability, potential for cost reduction, etc):

- **Deployability and cost effectiveness**. Decarbonisation on the path to the 2050 target requires rapid deployment of low-carbon generating capacity up to 2050. Given build rate constraints for each of the low-carbon options and uncertainty over potential viability of CCS, there is potential value in deploying available low-carbon technologies (i.e. onshore and offshore wind) over the next decade, even if these do not appear to be cost-effective when compared to the pre-2020 carbon price.
  - For example, our modelling (using the Markal model) of a scenario where there are build rate constraints for nuclear and wind, and uncertainty over the future costs and performance of CCS, suggests that around 35% renewable share may be desirable by 2025 (suggesting a 30% share is appropriate by 2020, particularly where there are build rate constraints).
  - We note that since we carried out this analysis, there is new evidence about costs of power generation (e.g. the Mott McDonald study recently carried out for DECC, and the UKERC review of offshore wind costs), and we will consider this in the context of our review going forward, drawing out any implications for the level of ambition to 2020.
- **Technology innovation**. Even if this new evidence were to show a cost penalty with offshore wind (i.e. costs over and above a rising carbon price), investment could still be justified on the basis that it will develop the technology and reduce its costs. The Markal analysis referenced above does not include the learning benefits from UK deployment over the next ten years. Offshore wind is not a mature technology, and significant opportunities for learning and cost reduction remain. Therefore investment in offshore wind over the next decade is likely to lead to cost reductions (notwithstanding other cost factors such as commodity prices and exchange rates, which to date have exerted upward pressure on costs), and will yield an additional option for required power sector decarbonisation, and one that may be particularly useful given build rate constraints and cost uncertainties of other technologies.

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

- **Industrial opportunities**. Analysis of current capabilities in our review of low-carbon innovation suggested that there is an opportunity for firms based in the UK to drive development of offshore wind technology. Government analysis suggests this could make a significant contribution to building a green economy.

An ambitious contribution from renewable electricity in 2020, requiring large scale investments in onshore and offshore wind generation, is therefore justified on the grounds that this is part of the cost-effective path to meeting the 2050 target, that investment now will drive down costs for future deployment, and that an opportunity exists for the UK to develop and deploy offshore wind technologies.

Challenges in delivering renewable electricity investment

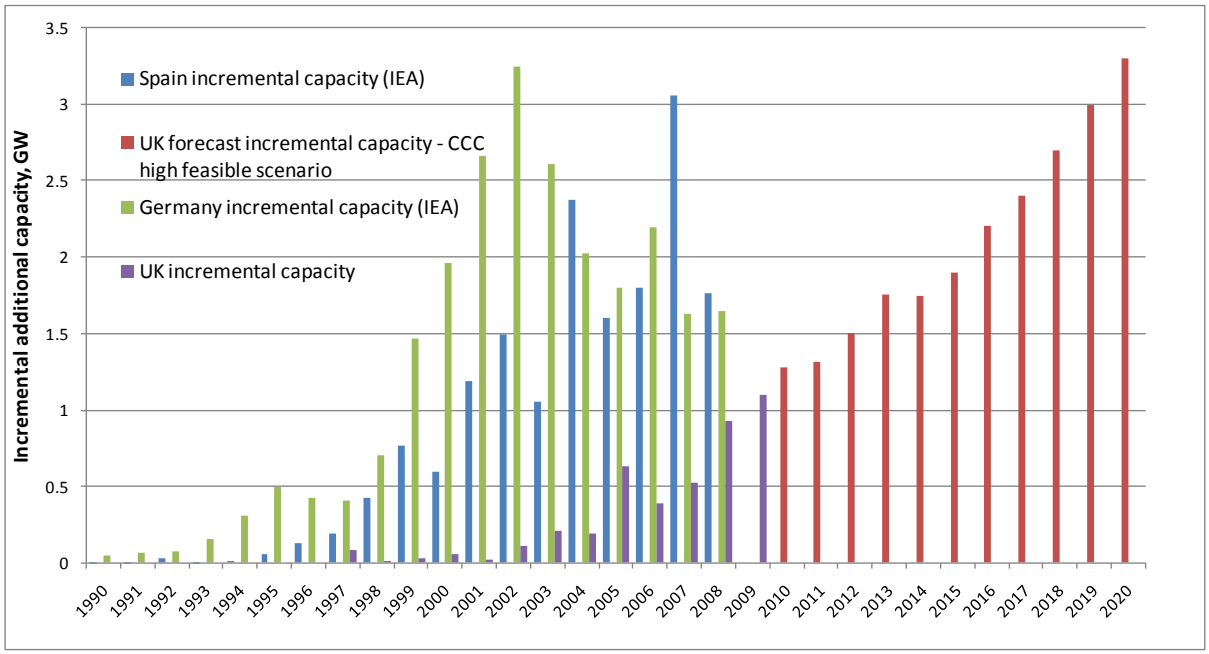
We set out feasible trajectories for investment in onshore and offshore wind in our first Progress Report to Parliament (2009).[1] These vary according to assumptions on planning approvals, investments in network infrastructure, availability of financing for investments, and supply chain expansion. In our high feasible scenario (which is consistent with the Government's 2020 ambition for electricity), there is investment in up to 23 GW of new wind capacity in the period to 2020 (Figure 1) (along with other renewable generation resulting in total renewable electricity generation capacity of around 34 GW in 2020).

Our assessment is that the high feasible scenario pushes the limits of what is likely to be feasible, and that a higher level of renewable generation is unlikely to be achievable. However, we also note that the pace of investment required (i.e. to over 3 GW incremental capacity per annum by 2020) is similar to that achieved by Spain and Germany over the last decade (Figure 1). Although the high feasible scenario remains within reach, delivering it will require a step change in investment (only around 1 GW was added to the system in 2009).

[1] CCC (2009), *Meeting Carbon Budgets - the need for a step change* http://www.theccc.org.uk/reports/1st-progress-report

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

Figure 1. Outturn and forecast incremental capacity in wind (onshore and offshore) Spain, Germany and UK



Source: IEA, CCC (2009), *Meeting Carbon Budgets - the need for a step change*

In our 2009 Report we identified a number of delivery risks, which remain and as we highlight in our more recent Progress Report (2010)[2] should be addressed as a matter of urgency:

- **Power transmission**: agreement on investments to reinforce the transmission network has been delayed from early 2010 to April 2011. Given current bottlenecks, it is very important that this agreement is not delayed further in order that investments become operational from 2015 to support increased levels of wind generation.

- **Planning**: the planning period in 2009 remained well above the statutory minimum, with the approval period for larger projects rising to 41 months. In addition, local planning approval rates fell from 68% in 2008 to 53% in 2009. Any changes to the planning framework should focus on reducing planning times in order that renewable electricity projects proceed as required to meet the target.

- **Financing**: current uncertainties over the Renewables Obligation (e.g. future banding levels) should be resolved to provide confidence that revenues will cover investment and operating costs. Notwithstanding any progress in this area, it may still be the case that there is insufficient finance available for investments in offshore wind (e.g.

[2] CCC (2010), *Meeting Carbon Budgets- ensuring a low-carbon recovery* http://www.theccc.org.uk/reports/2nd-progress-report

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

as suggested by the recent PricewaterhouseCoopers report)[3], suggesting a possible role for the Government in financing new projects (e.g. through introduction of new financial instruments, and the establishment of a Green Investment Bank).

(ii) Renewable heat in 2020

The role for renewable heat

Heat currently accounts for around 50% of UK energy use and CO_2 emissions, with only 1% currently from renewable sources. Decarbonising heat will require a combination of renewable heat deployment and energy efficiency. A range of renewable heat technologies exist and could be deployed in the UK, including biomass boilers and combined heat and power plants, air source and ground source heat pumps, biogas and solar thermal.

In our 2009 report to Parliament, we developed scenarios for renewable heat deployment in the period to 2020 based on a consideration of the economics of each technology, applicability in the UK context, scope for uptake given turnover of the boiler stock and building fabric, and supply chain capabilities.

Our analysis suggested that there is scope for significantly increased renewable heat penetration over the next decade broadly consistent with the overall target (e.g. to around 11% of total heat demand) at an average cost of around £120 / tCO_2 avoided, and a marginal cost up to around £175 / tCO_2 avoided. This level of penetration would provide a good basis for deep cuts that will be required in heat emissions through the 2020s, and could help reduce future deployment costs and develop UK supply chains.

Our analysis suggested that costs would increase steeply around a 12% share (e.g. as potential in heat pumps and biomass boilers is exhausted and solar thermal is required), suggesting that a slightly lower level of ambition in the heat sector may be appropriate.

Challenges deploying renewable heat

Arrangements to support renewable electricity have developed over a number of years, with investment incentives provided both by the carbon price in EU ETS, and the Renewables Obligation. In contrast, there is currently no support for renewable heat, which is also potentially more complex given the fragmented nature of the heat sector. Our analysis suggests that a targeted mechanism is required to cover the higher capital costs of renewable heat.

[3] PricewaterhouseCoopers (2010), *Meeting the 2020 renewable energy targets: Filling the offshore wind financing gap*
http://www.pwc.co.uk/eng/publications/meeting_the_2020_renewable_energy_targets.html

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

The draft Renewable Heat Incentive was published in February 2010 and was due to be introduced in April 2011. Our analysis suggested that the proposals covered the appropriate range of technologies, although we highlighted uncertainties around whether proposed support for specific technologies was adequate. The new Government has not yet set out a detailed position on the future of the Renewable Heat Incentive. Given this uncertainty, projects are currently not progressing, and time is being lost in implementing a very ambitious deployment schedule.

In developing instruments to support renewable heat deployment, we have highlighted three key areas for focus:

- Financial support for investment, ensuring that this is set at an appropriate level, that it is predictable, and structured in a way so as to support accessing of finance.
- Addressing non-financial barriers, for example, providing information about benefits and availability of financial support to address lack of awareness and/or confidence in renewable heat technologies (e.g. possibly as part of a broader whole house approach in the residential sector, or the Green Deal for the commercial sector), providing public sector access to finance, and training and certifying installers.
- Ensuring that the approach to renewable heat is well integrated with the approach to energy efficiency. For example, we have highlighted the lack of incentives for energy efficiency improvement under the draft Renewable Heat Incentive. An approach which incentivises renewable heat in tandem with improvements in energy efficiency would maximise benefits for consumers and emissions reductions.

Given the relative immaturity of policy in the sector and the need for a rapid scaling-up of renewable heat deployment, new policies should be quickly introduced to address each of these areas in order that required deployment can commence.

(iii) Renewable energy in transport

The role for biofuels in transport

The Gallagher Review (2008) considered biofuel ambition in the context of rising food prices, the contribution to deforestation, the future availability of land for cultivation of feedstocks and doubts about the net greenhouse gas impact of biofuels when land use change is considered.

The Review concluded that “the proposed EU biofuels target for 2020 of 10% by energy is unlikely to be met sustainably”, and suggested that a target in the range 5-8% would be more appropriate, of which 1-2% should come from advanced (second generation) biofuels.

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA

We accepted the 8% figure and used this in considering how the first three carbon budgets might best be achieved, both on the basis that biofuels are competitive with conventional fuel depending on assumptions about the oil price, and because deployment in the period to 2020 will support development of advanced biofuels for deployment beyond 2020. Going beyond the first three budgets, there is likely to be an important role for sustainable biofuels in cutting emissions from road transport (e.g. from plug-in hybrid vehicles, HGVs), aviation and shipping.

Delivering biofuels

The Renewable Transport Fuel Obligation (RTFO) requires that there is an increasing proportion of biofuel in total road fuel consumption. The current level of ambition in the RTFO is that there will be 3.25% (by volume) in 2009/10, rising to 5% by 2013/14, and with scope for further increases to levels recommended in the Gallagher Review.

However, the current transport ambition in the Renewable Energy Strategy requires around 10% renewable energy in surface transport by 2020. We recommend that it should be lowered unless new evidence is presented to suggest that the availability of sustainable biofuels is higher than that concluded by the Gallagher review (and we note that in 2014 the European Commission plans to review the feasibility of meeting EU targets sustainably).

The Committee on Climate Change
4th Floor, Manning House
22 Carlisle Place
London SW1P 1JA