

Lord Adonis
National Infrastructure Commission
5th Floor
11 Philpot Lane
London EC3M 8UD

28 March 2017

The infrastructure needs of a low-carbon economy prepared for climate change

Dear Lord Adonis,

For the National Infrastructure Assessment to be a success it must reflect the twin challenges of deeply reducing the UK's greenhouse gas emissions and of preparing the UK for a changing climate.

The Climate Change Act requires that UK greenhouse gas emissions are cut by at least 80% from 1990 to 2050, and that the Government produce a plan to prepare the UK for a changing climate.

Given the long lifetime of many infrastructure investments, decisions made now must avoid locking-in high-carbon infrastructure. They must also keep open options for reducing emissions close to zero, which may be required in electricity generation, heat and transport to meet the overall 2050 target.

Infrastructure strategies should also take into account the interactions between sectors and across the economy as a whole system. For example, reducing demand through energy efficiency measures may allow for significant savings by reducing the need for large-scale infrastructure investment.

We have identified the key areas where investment in infrastructure is critical to meeting the objectives set under the Climate Change Act (summarised in Table 1 and set out in more detail in the accompanying briefing note):

- **Reducing emissions** must cover smart grids with low-carbon electricity generation, electric vehicle charging networks, low-carbon heat, and carbon capture and storage to enable these sectors to achieve emissions close to zero by 2050.
- **Preparing for climate change** must cover flood risk management and drainage, and water resource management and supply, to ensure that the UK is resilient to future changes in climate.

We estimate the public costs of these investments to be around 0.1% of GDP in 2030, and therefore well within your remit for annual gross public investment to be 1.0-1.2% of GDP.

Investments in these low-carbon and resilient infrastructure projects are needed to achieve our domestic climate change obligations at the lowest cost, to support world-leading industries of the future, and to unlock a range of co-benefits - lower air pollution, better health - that improve the quality of life across the UK.

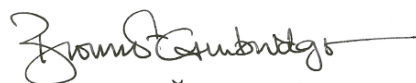
We would be very happy to discuss these issues with you in person if that would be useful.

We have copied this letter to Nick Hurd MP, Minister for Climate Change and Industry at the Department for Business, Energy and Industrial Strategy.

Yours sincerely,



Lord Deben
Chairman, Committee on Climate Change



The Baroness Brown of Cambridge
Chair, Adaptation Sub-Committee

cc.

Nick Hurd MP, Minister of State for Climate Change and Industry, BEIS
Clive Maxwell, Director General Energy Transformation, BEIS
Gareth Davies, Director General Business and Science, BEIS

Table 1: Infrastructure requirements and costs of meeting carbon budgets and preparing for climate change

Sector	Infrastructure requirements	Costs (£bn)*	Requires public funding
Electricity generation & CCS to 2030	<ul style="list-style-type: none"> • Low-carbon generation: additional 150 TWh new generation in the 2020s 	2.5	✗
	<ul style="list-style-type: none"> • Transmission and distribution networks to accommodate increased electrification of heat and transport; and interconnection to other markets 	<1	✗
	<ul style="list-style-type: none"> • Smart grid infrastructure and storage to enable flexible balancing of low-carbon generation with demand 	<1	**
	<ul style="list-style-type: none"> • Carbon capture and storage (CCS) for up to 3 strategic clusters, including transport and storage infrastructure elements (e.g. CO₂ pipelines) 	<1	✓
Heat to 2030	<ul style="list-style-type: none"> • Low-carbon heat meeting over 20% of heat demand by 2030, largely for new buildings and buildings off the gas grid 	1	✓
Transport to 2030	<ul style="list-style-type: none"> • A national network of charge points for electric vehicles covering home and rapid chargers, further electrification of the rail network, and spending on public and active transport infrastructure such that car-kms are around 5% below the baseline trajectory 	1	Mix of public & private
Beyond 2030	<ul style="list-style-type: none"> • Heat: widespread use of low-carbon hydrogen or deployment of heat pumps in place of natural gas. Infrastructure to enable both scenarios should be kept in play given uncertainties over cost and feasibility (e.g. whether CCS can produce enough low-carbon hydrogen at low cost) • Transport: keep open options to enable all HGVs to be low-carbon, including hydrogen infrastructure or electric road charging • Power: further deployment of low-carbon generation and storage - towards near-full decarbonisation (e.g. a carbon intensity of around 10 g/kWh in 2050) - supported by additional network reinforcement as required • CCS: wider roll-out to heavy industry and potential use with bioenergy for emissions removal 		
Flood management	<ul style="list-style-type: none"> • Increased investment in defences to prevent growing flood damages, from at least £750-850 million per year currently to £850-900 million in around a decade (in 2014 prices) • Upgrade and improve drainage infrastructure, including through retrofitting sustainable drainage systems 		
Water	<ul style="list-style-type: none"> • New water supply infrastructure to manage projected reductions in the amount of water in the environment that can be sustainably withdrawn 		
Digital comms	<ul style="list-style-type: none"> • Further work to understand the implications of a changing climate, including an assessment of vulnerabilities of networks and systems and interdependencies with other sectors 		

*Average annual investment costs (£bn to 2030), figures indicative and based on CCC evidence and analysis (see: <https://www.theccc.org.uk/publication/meeting-carbon-budgets-2016-progress-report-to-parliament> and <https://www.theccc.org.uk/publication/the-fifth-carbon-budget-the-next-step-towards-a-low-carbon-economy>)

** We are currently undertaking work to assess the need for public funding

Note: The majority of the investment costs set out in this table are expected to be funded by the private sector, and many will have offsetting savings in reduced running/fuel costs.