



Department for
Business, Energy
& Industrial Strategy

INDUSTRIAL DECARBONISATION AND ENERGY EFFICIENCY ACTION PLANS

Summary Document

October 2017

With industry representing nearly a quarter of UK emissions, helping industrial sectors decarbonise and improve their energy efficiency is a crucial part of meeting our climate change commitments.

Publication of the 2050 Industrial Decarbonisation & Energy Efficiency Roadmap Action Plans¹ is an important landmark for Government and industry collaboration on decarbonisation and energy efficiency. Each sectoral Action Plan contains voluntary commitments by Government, industry and other parties to help the sector decarbonise and improve its energy efficiency while maintaining international competitiveness. They build on the publication of Industrial Decarbonisation and Energy Efficiency Roadmaps to 2050 that set out, for each individual industry sector, the opportunities and challenges to realising emissions reduction pathways in the UK².

This initiative forms part of the Clean Growth Strategy that sets out how Government will work with industry to achieve the most cost effective path to the decarbonisation required to meet our carbon budgets, while realising opportunities for growth, job creation and exports and improving our energy security. It is also aligned to the Industrial Strategy, particularly its pillar on delivering affordable energy and clean growth to secure the economic benefits of the transition to a low-carbon economy.

The annexed table sets out the potential decarbonisation projections for each sector under the business as usual (BAU) and “Max Tech” pathways that were identified in the Roadmaps. The Max Tech pathways – which outline the maximum technical potential for decarbonisation in each sector, setting aside economic and commercial considerations – identify that deep decarbonisation of energy intensive industries is achievable if a range of technologies are deployed. A number of barriers were identified as needing to be overcome to achieve this, however, including cost and competitiveness; economic, business and policy uncertainty; knowledge and skills; and access to finance³.

The Action Plans will therefore contribute to this objective by supporting the development, commercialisation and deployment of some of the key technologies, and bolstering industry capability to decarbonise and improve energy efficiency. Areas include:

- **Access to Finance:** The 2015 Roadmaps proposed looking at different finance sources and barriers to developing investible business cases for uptake of energy efficiency and decarbonisation technologies. Government will establish an industrial energy efficiency scheme to help large companies install measures to cut their energy use. BEIS will also facilitate dialogue between finance providers and industry to make access to finance easier.

¹ Thereafter “Action Plans”

² [Industrial Decarbonisation and Energy Efficiency Roadmaps to 2050](#):

³ Industrial Decarbonisation and Energy Efficiency Roadmaps to 2050, cross sector summary

- **Knowledge sharing & Innovation:** Parties have committed to support the research, development and demonstration (RD&D) of innovative technologies, and to collaborate and share knowledge within the constraints of competition law. Government is running a £9.2m Industrial Energy Efficiency Accelerator (IEEA) programme to demonstrate close-to-market-ready industrial energy efficiency technologies and launch a web portal to overcome information barriers through greater industry collaboration. In line with the launch of the Clean Growth Strategy, Government will invest up to £20m in a fuel switching innovation programme aimed at overcoming the barriers holding back deployment of alternative fuels. Industry has also made a number of commitments such as to map UK research expertise, develop innovation networks and to look to demonstrate innovative technologies.
- **Carbon Capture Usage & Storage (CCUS):** CCS is the extraction of CO₂ for permanent storage in geological formations or utilisation as a feedstock. The 2015 Roadmaps report identified CCS as an important technology for industrial decarbonisation, particularly for the cement, chemicals, oil refining and iron & steel sectors. CCS is also important for the power sector, and Government's overall approach to CCS has been set out in the Clean Growth Strategy. For the Action Plans, HMG has committed to commission reports on the potential to deploy CCS at industrial clusters and isolated sites, and on the applications for carbon capture and usage (CCU) and how CCU can be commercialised. Government also intends to launch an up to £20m CCU innovation programme to bring down the cost of carbon capture in industry.
- **Clustering:** Clustering is the integration between industrial sites to deliver energy savings. It could result in significant decarbonisation in the chemicals sector, for example. Clustering commitments include for Local Employment Partnerships to undertake feasibility studies on opportunities to strengthen clusters.
- **Biomass:** Replacing fossil fuel sources with biomass, which absorbs CO₂ during growth, in a sustainable manner is an important decarbonisation technology for several sectors including cement, pulp & paper, chemicals, glass, food and drink and ceramic industries⁴. Government will establish a cross-sector group that will develop a collective industry view of the best uses of bioenergy and provide greater clarity on the role of biomass and its availability, security of supply and costs. Several sectors have committed to demonstrating the viability of biomass technologies.

⁴ [Industrial Decarbonisation and Energy Efficiency Roadmaps to 2050](#), p.16":

Looking forward, Government and the sectors will continue to collaborate to deliver the agreed actions in the Plans, updating regularly on progress, whilst also reviewing the landscape for new industrial decarbonisation and energy efficiency opportunities that would benefit from joint work. This work helps achieve the HMG Industrial Strategy pillar to deliver affordable energy and clean growth, sitting alongside our innovation support over the next 4 years.

Annex – Sector Decarbonisation Pathways

Sector	Pathway ⁵	Base Year (2012) ⁶ Emissions (MtCO _{2e})	Relative emission reduction in 2050 (relative to 2012)	Absolute emission reduction in 2050 (MtCO _{2e})	Technology groups (in descending order of relative contribution)
Cement	BAU	7.5	12%	0.9	Others: Energy Efficiency
	Max Tech – With or without Carbon Capture		33-62%	2.5-4.7	(CCS), fuel switching to biomass, others and cementitious substitution
Ceramics	BAU	1.3	27%	0.3	Energy Efficiency Others; Material Efficiency; Fuel Switching ; Biomass
	Max Tech		60%	0.8	Electrification of Heat; CCS; Energy Efficiency; Biomass; Others; Material Efficiency; Fuel Switching
Chemicals	BAU	18.4	31%	5.8	Biomass; Energy Efficiency; CCS; Fuel switching; Clustering; others
	Max Tech: With and Without biomass		79-88%	14.6-16.1	CCS;(Biomass); Others; Energy Efficiency; Clustering; Fuel switching
Food & Drink	BAU	9.5	40%	3.8	Energy efficiency: Biomass; Electrification of Heat; Material Efficiency; CCS; other; Fuel switching
	Max Tech- with and Without electrification of heat		66-75%	6.2-7.2	(Electrification of Heat); Energy Efficiency; Biomass; Others; Material Efficiency; CCS; Fuel Switching
Glass	BAU	2.2	36%	0.8	Energy Efficiency: Material Efficiency: Others; Fuel Switching
	Max Tech- with and without carbon capture		90-92%	2.0-2.0	CCS (CCS pathway only): Electrification of Heat; Fuel Switching; Material Efficiency; Energy Efficiency; Others
Iron and Steel	BAU	23.1 ⁷	15%	3.4	Energy Efficiency; Material Efficiency; Fuel Switching
	Max Tech		60%	13.9	CCS; Energy Efficiency; Clustering; Material Efficiency; Fuel Switching
Oil Refining	BAU	16.3	44%	7.2	Energy Efficiency; Fuel Switching
	Max Tech		64%	10.4	Energy Efficiency; CCS; Fuel Switching
Pulp and Paper	BAU	3.3	32%	1.0	Energy Efficiency; Electrification of Heat
	Max Tech- Clustering and electrification		98%	3.2	Energy Efficiency; Clustering; Electrification of Heat
	Max Tech- biomass		98%	3.2	Biomass; Energy Efficiency: Electrification of Heat

⁵ Note that the scenarios include the decarbonisation of the electricity grid, relevant to sectors that currently import large quantities of electricity. In addition, Max Tech is the maximum technical potential for decarbonisation in each sector setting aside economic and commercial considerations.

⁶ Note that sectors also decarbonised considerably before the 2012 base-year.

⁷ For the iron and steel sector, the base year used is 2013. This was chosen due to the large production increase from the recommissioning of SSI Teesside steelworks in 2012.



© Crown copyright 2017

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit nationalarchives.gov.uk/doc/open-government-licence/version/3 or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk. Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

This publication is available from: www.gov.uk/beis

Contacts us if you have any enquiries about this publication, including requests for alternative formats, at: enquiries@beis.gov.uk