

An independent assessment of the Clean Growth Strategy

Technical annex – Industry

Under the Climate Change Act, the government is required to publish a set of policies and proposals that will enable the legally-binding carbon budgets, on track to the 2050 target, to be met. The Clean Growth Strategy, published in October 2017, presents the Government's plans.

Our report, *An independent assessment of the Clean Growth Strategy: From ambition to action*, sets out our overall assessment of the Strategy. This technical annex sets out the analysis for the industry sector underpinning that report, in three sections:

- i) Emissions from the Industry sector today
- ii) Ambition in the Clean Growth Strategy
- iii) Policy development required to deliver ambition in the Clean Growth Strategy

i) Emissions from the Industry sector today

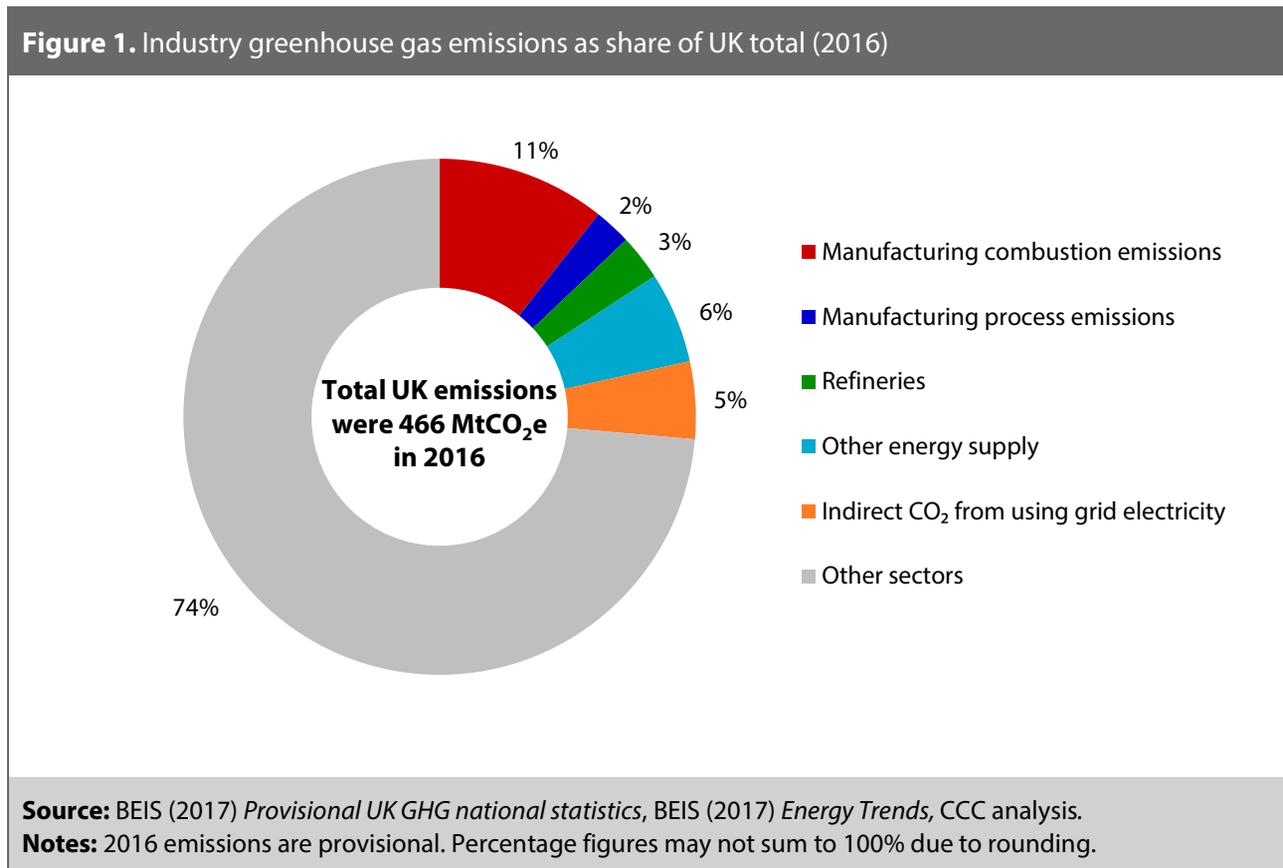
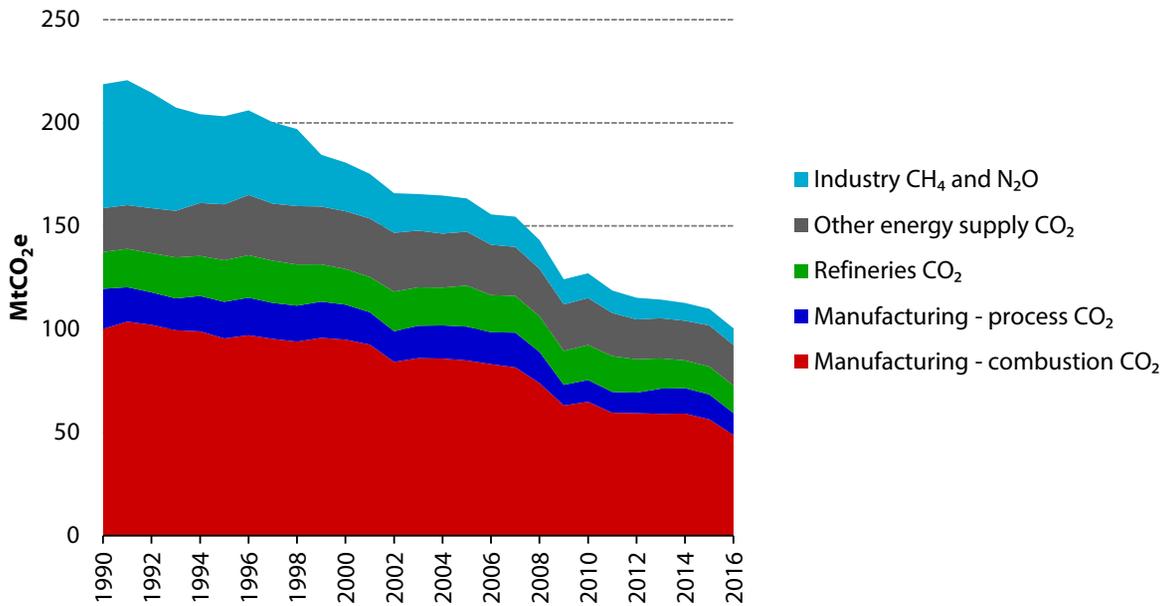


Figure 2. Direct GHG emissions from industry (1990-2016)



Source: BEIS (2017) *Final UK GHG national statistics 1990-2015*, BEIS (2017) *Provisional UK GHG national statistics 2016*, National Atmospheric Emissions Inventory, CCC analysis.

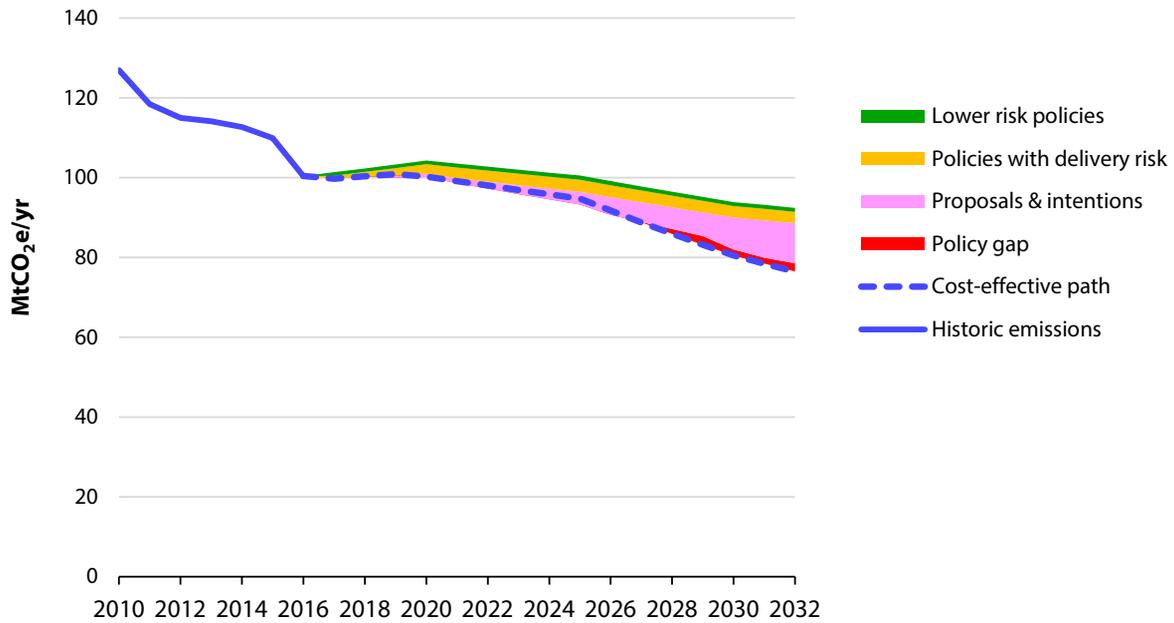
Notes: 2016 emissions are provisional. The 2016 provisional estimate for non-CO₂ emissions assumes no change from final 2015 emissions.

ii) Ambition in the Clean Growth Strategy

Table 1. Ambition in key low-carbon technologies and behaviours in industry

Key technology / behaviour	CCC scenarios	Clean Growth Strategy ambition	What we have assumed for quantification
Energy efficiency	5 MtCO ₂ abatement by 2030	Aims to improving energy efficiency by at least 20 per cent by 2030.	A 20% reduction in energy use per unit GVA in industry
Electrification, bioenergy and other fuel switching	4 MtCO ₂ abatement from bioenergy and 1 MtCO ₂ abatement from electrification by 2030	To phase out the installation of high carbon fossil fuel heating in new and existing buildings off the gas grid during the 2020s.	No new installations of oil- or coal-based space heating in industry from 2022.
Carbon Capture and Storage	3 MtCO ₂ abatement by 2030	To deploy CCUS at scale during the 2030s, subject to costs coming down sufficiently.	One or two small, but scalable, industrial CCS clusters coming online from 2026 and increasing their capacity in 2030.

Figure 3. Industry emissions and impact of Clean Growth Strategy (2010-2032)



Source: BEIS (2017) *Updated Energy and Emission Projections 2016*, BEIS (2017) *2016 UK Greenhouse Gas Emissions, provisional figures*, CCC analysis.

Notes: Chart is for actual (i.e. 'gross') emissions and is on the basis of Government emission projections used in the Clean Growth Strategy. Emission reductions from existing policies that we judge to have significant delivery risks (e.g. insufficient funding) are coloured amber. We have assessed emission reductions from proposals and intentions that were included in the Clean Growth Strategy. These are coloured pink. The remaining gap to the cost-effective path is coloured red.

iii) Policy development required to deliver ambition in the Clean Growth Strategy

Table 2. Progress against the Committee's recommendations on industry in the 2017 Progress Report

Recommendation in 2017 Progress Report	Clean Growth Strategy proposal	Assessment	Commentary
<p>An overall approach to long-term industrial decarbonisation, developing existing 'Roadmaps' into specific actions and milestones and extending coverage to other industrial sectors. The opportunities identified in the action plans should be taken into account in the Industrial Strategy white paper and any sector deals.</p>	<p>The Government published joint industrial decarbonisation and energy efficiency action plans. These action plans identify steps by industry and Government that can be taken now to support long-term low-carbon growth, energy efficiency and emissions reductions on a sector-by-sector basis. These include the sharing of best practice and innovation opportunities, including through a new online portal, facilitating dialogue to improve access to finance and cross-sector consideration of the best uses of biomass across industry.</p> <p>The government also committed to develop a framework to support the long-term low-carbon development of energy intensive industrial processes, such as carbon capture usage and storage and electrification.</p>	<p>Partially met</p>	<p>The commitment to develop a framework to support industrial decarbonisation is welcome, but the level of action previously set out by the Roadmaps has been lost and not replaced by the Action Plans.</p>

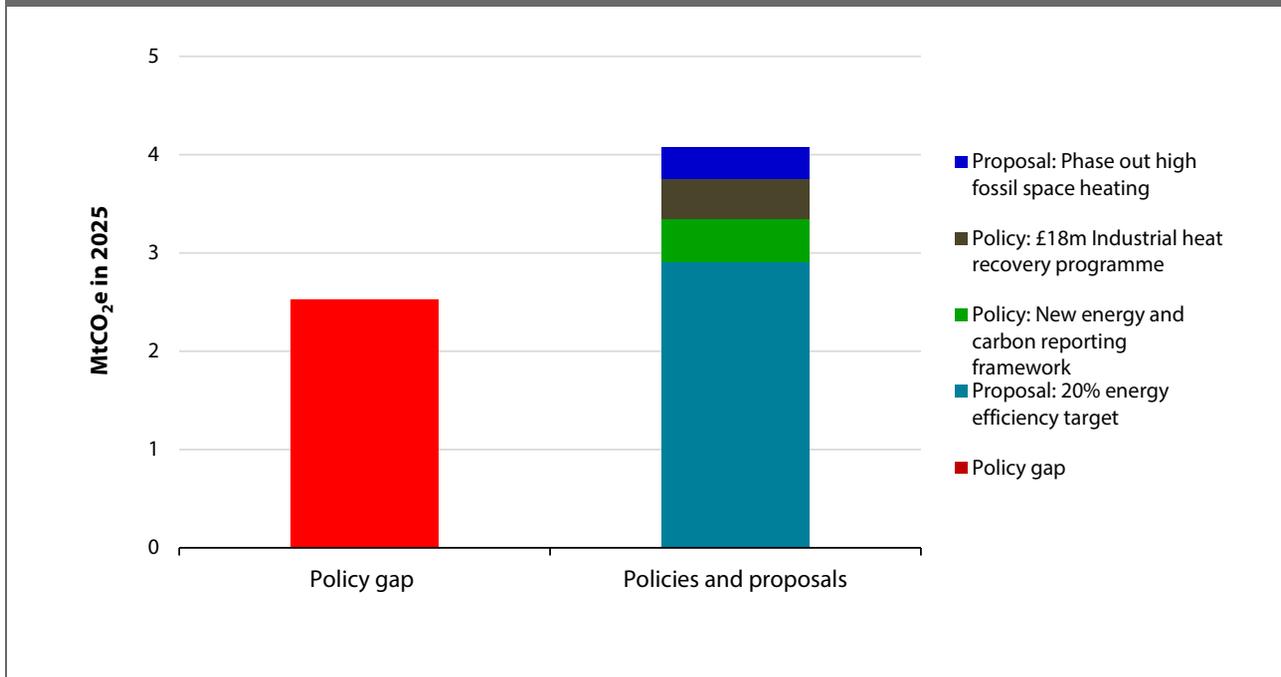
Table 2. Progress against the Committee's recommendations on industry in the 2017 Progress Report

Recommendation in 2017 Progress Report	Clean Growth Strategy proposal	Assessment	Commentary
<p>A strategic funded approach to industrial carbon capture and storage based around clusters alongside power installations and shared infrastructure, with a new funding mechanism for industry.</p>	<p>The Government committed to:</p> <ul style="list-style-type: none"> - publish a deployment pathway for CCUS in 2018, setting out the steps needed to meet our ambition of deploying CCUS at scale during the 2030s, subject to costs coming down sufficiently. - develop a framework to support the long-term low-carbon development of energy-intensive industrial processes, such as CCUS. - work with the ongoing initiatives in Teesside, Merseyside, South Wales and Grangemouth to test the potential for development of CCUS industrial decarbonisation clusters. - review the delivery and investment models for CCUS - spend up to £100m on Industry and CCUS innovation and deployment. 	<p>Partially met</p>	<p>These plans are very high level and early stage. The funding commitment is small. The statement of 'costs coming down sufficiently' that underpins the overall commitment, needs to be clearer given that significant cost reduction is already available through scale-up.</p>
<p>An effective approach to drive sustained uptake of low-carbon heat in industrial processes and buildings.</p>	<p>The Government committed to phase out the installation of high carbon fossil fuel heating in new and existing business buildings off the gas grid during the 2020s. It also committed to develop a framework to support the long term low carbon development of energy intensive industrial processes, such as carbon capture usage and storage and electrification, by mid-2022.</p>	<p>Partially met</p>	<p>The phase-out only covers buildings. Policy on decarbonising industrial processes is required. This may be covered by the proposed framework, but further detail is required on this, including pre-2022 milestones.</p>

Table 2. Progress against the Committee's recommendations on industry in the 2017 Progress Report

Recommendation in 2017 Progress Report	Clean Growth Strategy proposal	Assessment	Commentary
<p>The EU ETS and EU product efficiency standards and policy to be preserved after leaving the EU, or equivalent mechanisms put in place that achieve at least as much emissions reduction.</p>	<p>The Government stated that it remains committed to using carbon pricing as an emissions reduction tool and will ensure that a clear price signal continues to incentivise industrial emissions reduction.</p> <p>The Government stated in its response to our progress report that it continues to support EU products policy, which cut energy bills, increase energy security, reduce emissions and help customers make informed choices, and will keep step with equivalent standards wherever possible and appropriate, or even exceed them where it is in the UK's interest to do so.</p>	<p>Partially met</p>	<p>We expect more specific commitments during the process of the UK leaving the EU.</p>
<p>A stronger policy framework for industrial energy efficiency, including an effective reporting mechanism.</p>	<p>The Government committed to develop a package of measures to support businesses to improve how productively they use energy and will consult on this in 2018, with the aim of improving energy efficiency by at least 20 per cent by 2030. This included a commitment to an Industrial Energy Efficiency scheme to help large companies install measures to cut their energy use and their bills.</p> <p>The government also consulted on a new and streamlined energy and carbon reporting framework and the design of a new £18 million industrial heat recovery programme.</p>	<p>Partially met</p>	<p>The Government's commitments are stronger in this area than other areas of industrial decarbonisation, but further detail is required about the industrial energy efficiency scheme and policies to meet the broader 20 per cent energy efficiency improvement target.</p>

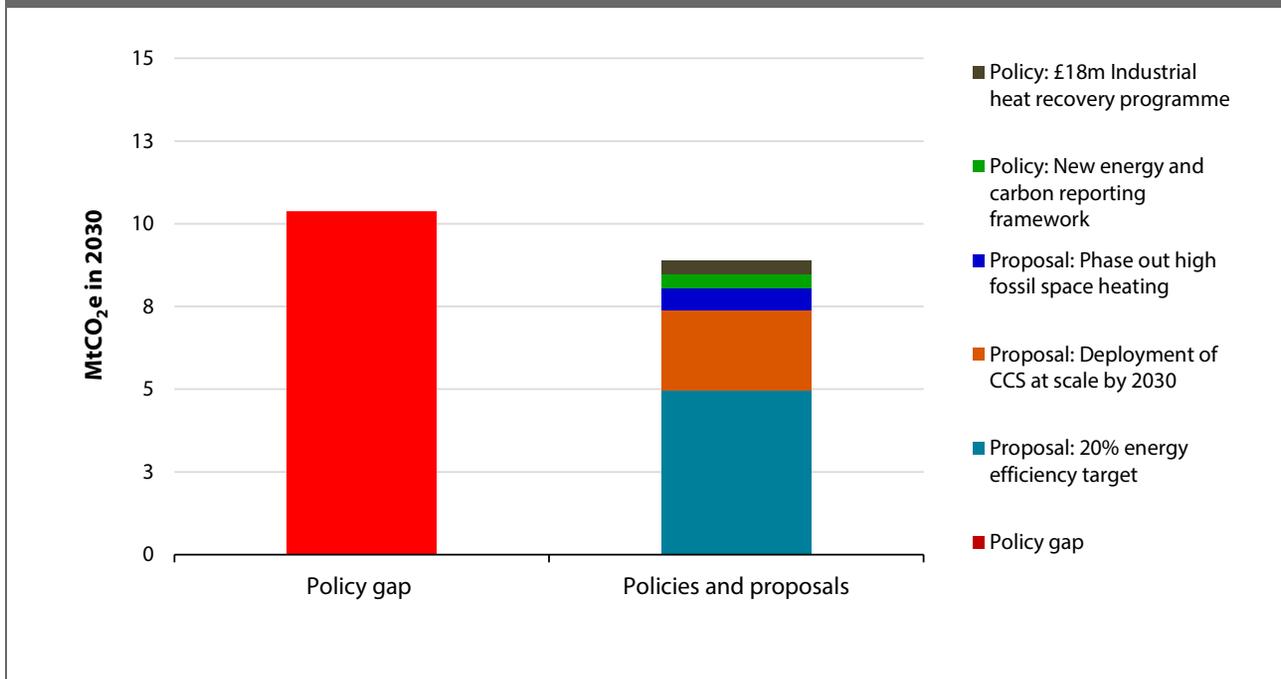
Figure 4. How policies and proposals in the Clean Growth Strategy could close the 2025 industry policy gap



Source: CCC analysis.

Note: Policy gap assessment in our 2017 Progress Report to Parliament; represents the gap to the cost-effective path, rather than to carbon budgets.

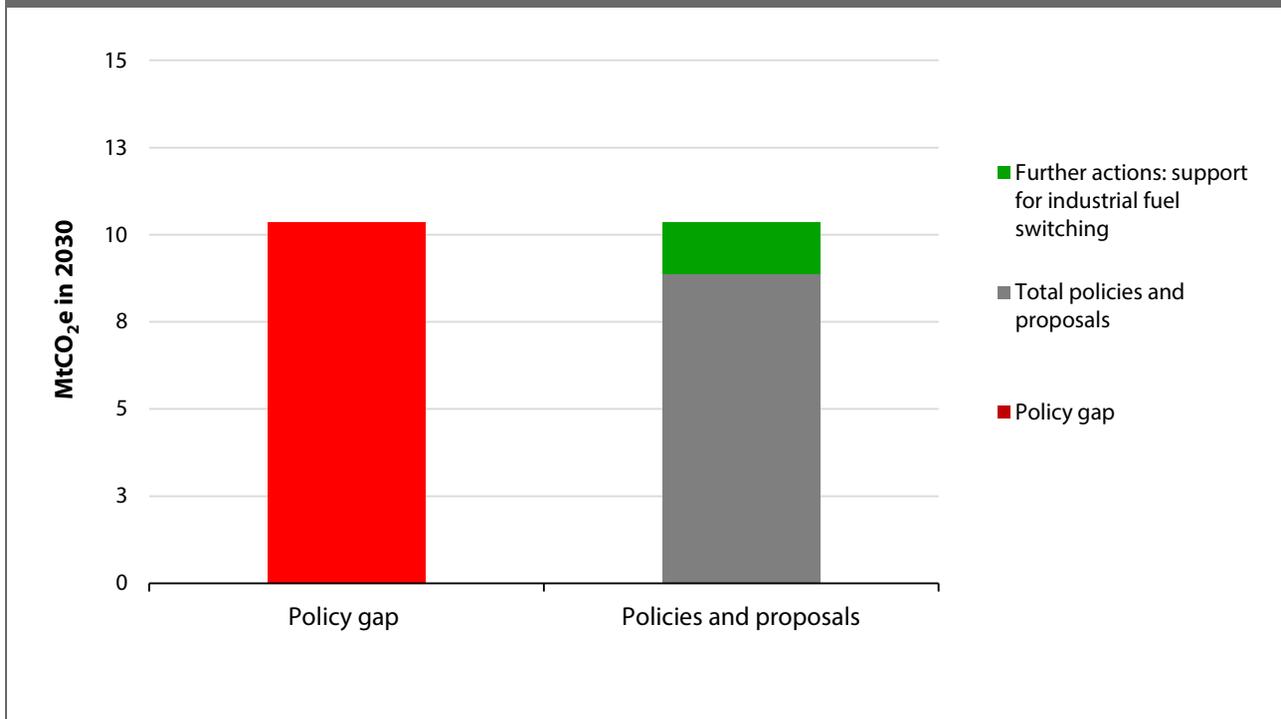
Figure 5. How policies and proposals in the Clean Growth Strategy could close the 2030 industry policy gap



Source: CCC analysis.

Note: Policy gap assessment in our 2017 Progress Report to Parliament; represents the gap to the cost-effective path, rather than to carbon budgets.

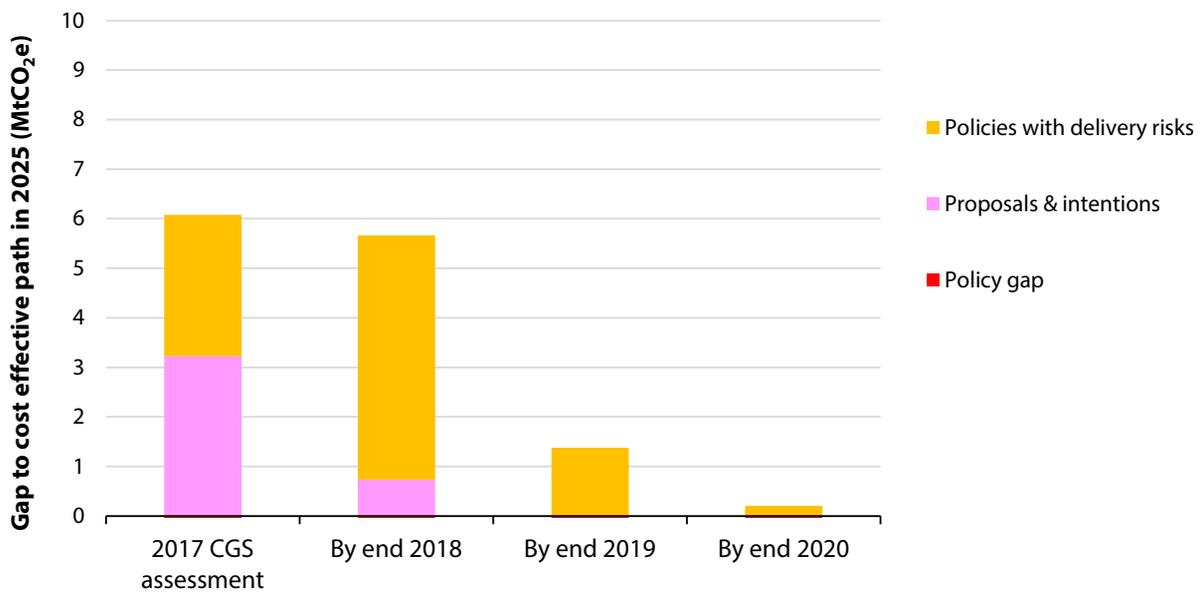
Figure 6. Additional actions required to close the 2030 policy gap in industry



Source: CCC analysis.

Note: Policy gap assessment in our 2017 Progress Report to Parliament; represents the gap to the cost-effective path, rather than to carbon budgets.

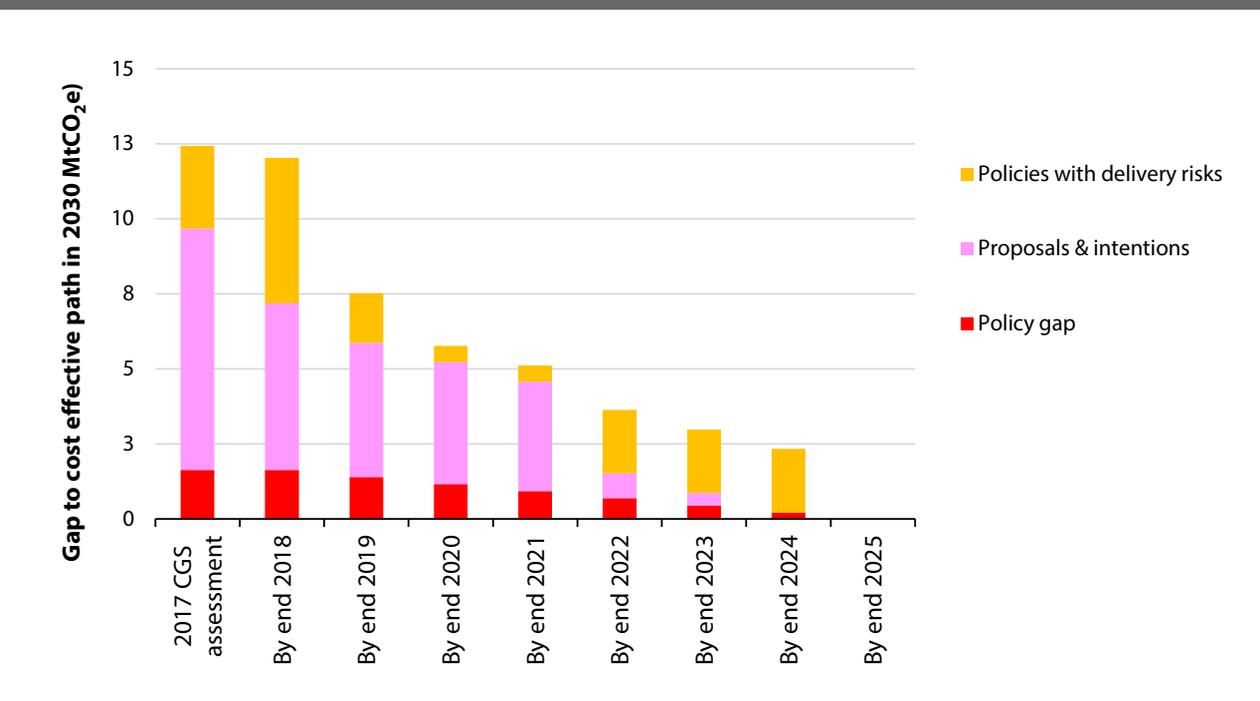
Figure 7. Fourth carbon budget: The industry policy gap in 2025 and how Government policies should develop over time to close this gap



Source: BEIS (2017) *Updated Energy and Emission Projections 2016*, CCC analysis.

Notes: This chart reflects the Committee's detailed assessment of how the remaining gap to the cost-effective path can be closed and how current policies, proposals and intentions are firmed up so that delivery risks are largely eliminated. This is based on an assessment of the current status of policies, proposals and intentions, and the potential to strengthen policy by 2020. The chart focuses on annual emissions in 2025, the middle year of the fourth carbon budget period, and the gap to meeting the cost-effective path. This assessment is based on the government emission projections used in the Clean Growth Strategy. New projections were published in January 2018.

Figure 8. Fifth carbon budget: The industry policy gap in 2030 and how Government policies should develop over time to close this gap



Source: BEIS (2017) *Updated Energy and Emission Projections 2016*, CCC analysis.

Notes: This chart reflects the Committee's detailed assessment of how the remaining gap to the cost-effective path can be closed and how current policies, proposals and intentions are firmed up so that delivery risks are largely eliminated. This is based on an assessment of the current status of policies, proposals and intentions, and the potential to strengthen policy by 2025. The chart focuses on annual emissions in 2030, the middle year of the fifth carbon budget period, and the gap to meeting the cost-effective path. This assessment is based on the government emission projections used in the Clean Growth Strategy. New projections were published in January 2018.

Table 3. Timetable for closing the industry policy gap - energy efficiency policy milestones

Policy	2018 H1	2018 H2	2019 H1	2019 H2	2020	2021	2022	2023	2024	2025	2026-32
Framework to drive 20% energy efficiency improvement	Produce consultation, clarify metric and set baseline	Set out plans and proposals for meeting target									
Industrial energy efficiency scheme	Develop scheme		Implement scheme								
£18m Industrial heat recovery scheme	Open applications for funding	Fund heat recovery projects through a series of rounds									
New energy and emissions reporting framework	Decide on preferred option		Introduce framework								
Climate Change Agreements		Evaluate Climate Change agreements to inform any successor scheme from 2023									
Product efficiency standards			Preserve standards								
Buildings policies regulations	See commercial buildings table										

Source: Clean Growth Strategy and CCC analysis.

Legend: *Green* - Government commitment and timing in Clean Growth Strategy; *Blue* - Government commitment in Clean Growth Strategy with CCC timing; *Orange* - CCC recommendation.

Table 4. Timetable for closing the industry policy gap – CCS and CCU policy milestones

Policy	2018 H1	2018 H2	2019 H1	2019 H2	2020	2021	2022	2023-5	2026-29	2030-32
CCS strategy development	CCUS Cost Challenge Taskforce to deliver plan to reduce the cost of deploying CCS	Publish CCS deployment pathway								
Initial CCS project(s)	Test the potential for development of CCS industrial decarbonisation clusters via FEED studies		Financial support for initial industry project(s)				First project(s)/clusters constructed	First project(s) / clusters constructed		
	Commission reports into potential of clusters									
Mechanism for supporting CCS transport and storage infrastructure	Government to publish review of CCS delivery and investment models.		Put in place mechanism to support storage and transport infrastructure						Deploy CCUS at scale	
Funding mechanism for wide-scale CCS deployment	Develop of framework to support decarbonisation of heavy industry							Award support to industrial CCS projects		
CCU and CCS innovation	Set out further details on CCS and CCU innovation spend									

Source: Clean Growth Strategy and CCC analysis.

Legend: *Green* - Government commitment and timing in Clean Growth Strategy; *Blue* - Government commitment in Clean Growth Strategy with CCC timing;

Orange - CCC recommendation.

Table 5. Timetable for closing the industry policy gap – fuel switching policy milestones

Policy	2018 H1	2018 H2	2019	2020	2021	2022	2023	2024	2025-29	2030-32
Renewable heat incentive	Decide on successor/reformed scheme					RHI successor established and supporting industrial fuel switching, including biomethane-to-grid				
	RHI ongoing (retargeted towards heat pumps and biomethane)									
Phase-out of high-carbon fossil fuels from off-gas grid	Set out set out proposals for the phase out of high carbon fossil fuel heating, including a definition of 'high-carbon fossil fuel' heating			Framework of measures to phase out high-carbon fossil fuel heating						
Heat strategic options		Publish review								
<p>Source: Clean Growth Strategy and CCC analysis. Legend: <i>Green</i> - Government commitment and timing in Clean Growth Strategy; <i>Blue</i> - Government commitment in Clean Growth Strategy with CCC timing; <i>Orange</i> - CCC recommendation.</p>										

Table 6. Timetable for closing the industry policy gap – cross cutting policy milestones

Policy	2018 H1	2018 H2	2019 H1	2019 H2	2020	2021	2022	2023	2024	2025	2026-32
Framework to support decarbonisation of heavy industry	Develop framework										
EU ETS and Emissions trading	Set out plans for ensuring a continued carbon price in the UK		Potentially implement new carbon pricing in UK								
Action plans	Implementation										
<p>Source: Clean Growth Strategy and CCC analysis. Legend: <i>Green</i> - Government commitment and timing in Clean Growth Strategy; <i>Blue</i> - Government commitment in Clean Growth Strategy with CCC timing; <i>Orange</i> - CCC recommendation.</p>											