



Department for
Business, Energy
& Industrial Strategy

IMPLEMENTING THE END OF UNABATED COAL BY 2025

Government response to unabated coal
closure consultation

January 2018

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1. Introduction

Context

1. In November 2015 the government announced its intention to consult on proposals to end unabated coal generation in Great Britain by 2025. In November 2016 the Department for Business, Energy and Industrial Strategy (BEIS) published a consultation on proposals¹ for how to put that into effect. The consultation ran from 9 November 2016 to 8 February 2017 and received 5,939 responses from individuals, businesses, trade bodies, Non-Governmental Organisations (NGOs) and other organisations. BEIS is grateful to all those who took the time to contribute. A summary of the responses received was published on 12 October 2017.
2. The Prime Minister confirmed on 18 September that 2017, following the consultation, the government will proceed with action to regulate the closure of unabated coal power generation units by 2025. This follows a review of the consultation responses and updated analysis, which provide assurance of the benefits of guaranteeing reductions in emissions of Carbon Dioxide and air pollution, the certainty regulation would give to the market for new, cleaner and more flexible capacity, and on security of supply. This document serves to:
 - provide the government's response to the consultation;
 - act as a statement of policy for how we intend to put the 2025 closure into effect, and
 - set out the government's intended next steps.
3. Published alongside this document is an updated Impact Assessment².

Success to date

4. The UK has been at the forefront of encouraging the world to move towards clean growth and is proud to have been one of the first countries to commit to ending unabated coal generation. The UK is already one of the most successful countries at growing its economy while reducing emissions. We have cut emissions by more than 40 per cent since 1990, while our economy has grown by two thirds.
5. Clean growth is one of the most significant and foreseeable global economic trends of our time, representing one of the greatest industrial opportunities. Since the consultation was

¹ *Coal Generation in Great Britain: The Pathway to a Low-Carbon Future, Consultation Document*, <https://www.gov.uk/government/consultations/coal-generation-in-great-britain-the-pathway-to-a-low-carbon-future>

² Also available at the link above.

held in November 2016, the government has published its Clean Growth Strategy³ and Industrial Strategy White Paper⁴, which set out our ambitious proposals for continuing this progress through the 2020s and beyond.

- The level of coal generation on the electricity system has continued to decline since the consultation was launched in November 2016. This comes as a result of a number of factors, but is largely driven by the UK’s carbon price support and the increase in low-carbon generation on the system. The level of coal generation in 2016 fell to 9%, down from 22% in 2015, and in the second quarter of 2017⁵ it fell to a record low of 2%. Over the same period low-carbon generation supplied more than 53% of electricity. The table below shows the success in reducing coal generation and the increased role of renewables. In addition to this, in April 2017 we had the first 24-hour period without coal on the system since the first coal power station opened in 1882.

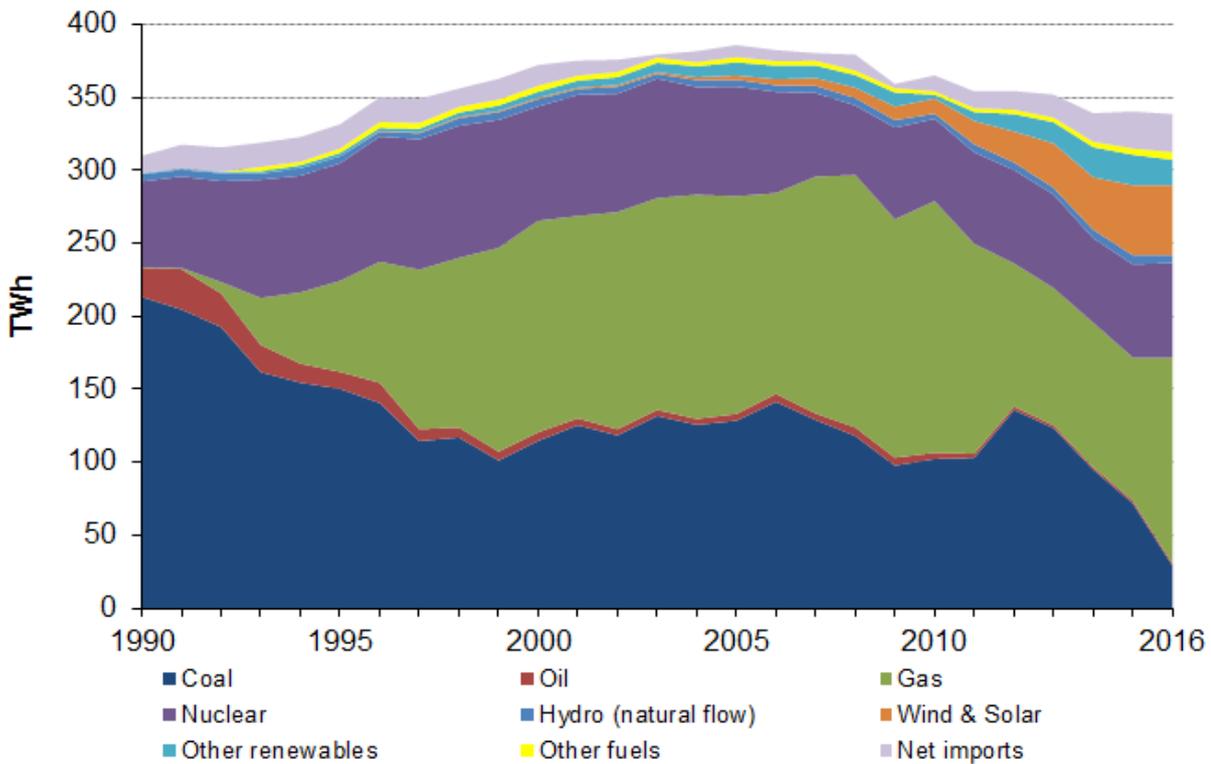


Table 1: Electricity supplied by fuel type, 1990-2016

Objectives

- As set out in the consultation document, the government’s objective is to ensure that the closure of remaining unabated coal-fired power stations in Great Britain takes place in a way that minimises the impact on the electricity system and provides certainty for investors

³ <https://www.gov.uk/government/publications/clean-growth-strategy> October 2017

⁴ <https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future> November 2017

⁵ BEIS Energy Trends www.gov.uk/government/uploads/system/uploads/attachment_data/file/647752/Energy_Trends_Sep_17.pdf

to enable them to invest in lower-carbon alternatives in good time to replace the lost capacity.

8. In doing so, we will be guaranteeing further reductions in emissions of carbon dioxide as well as harmful air pollution such as Sulphur Dioxide (SO₂), Nitrogen Oxides (NO_x) and particulate matter (PM).

Territorial extent

9. The policies outlined in this document relate to England, Wales and Scotland. Energy policy is a reserved matter in Scotland, a non-devolved matter in Wales, and a devolved matter in Northern Ireland.
10. Note that there are now no coal power stations in Scotland.

2. Government response to the consultation

Question 1: Putting closure of unabated coal into effect

This question sought views and evidence on the two options for putting the closure of unabated coal into effect, including on relative benefits and risks. These were:

- 1) To reflect the existing regime that applies to new coal power plants onto existing plant, namely to require Carbon Capture and Storage technology to be demonstrated and to apply the existing “mass based” Emissions Performance Standard; or,
- 2) To apply a concentration-based limit on Carbon Dioxide emissions to coal units, at 450gCO₂/kWh.

Finally, views were sought on the date in 2025 from which the proposed obligations should take effect.

Regulatory intervention

11. Following consideration of the consultation responses, we have ruled out mandating Carbon Capture and Storage (CCS) technology to be deployed on existing coal power stations. Our assessment concurs with many of the responses to the consultation that suggest the likely relative cost of retro-fitting full-chain CCS on relatively inefficient and in some cases aged power stations will be prohibitive without significant support. In addition, as noted by some stakeholders, the time that it would take for the relevant investment decisions, consents, construction and commissioning of full-chain CCS is likely to extend beyond 2025.
12. We consider that the appropriate means to guarantee the closure of unabated coal by 2025 will be to set a new emissions intensity limit to generating units, which provides coal generators with more flexible options of investing to reduce emissions to a level in line with our decarbonisation pathway. We consider that an emissions intensity limit of 450g CO₂ per kWh of electricity generated is an appropriate level. This is broadly the emissions intensity of an unabated gas generator and is in line with the existing Emissions Performance Standard⁶ that applies to new build fossil fuel plant. This limit shall be applied on a unit-by-unit basis, as proposed in the consultation. Units could meet this standard by investing to abate CO₂ emissions significantly.
13. As proposed in the consultation, to ensure that the emissions intensity limit is applied only to generating units that use coal and that there are no unintended consequences for other

⁶ Note that the 450gCO₂/kWh emissions intensity limit outlined here is an *instantaneous* limit. This contrasts with the existing Emissions Performance Standard, which sets an annual limit on CO₂ emissions from fossil fuel generators, based on their capacity and an assumed 85% annual load factor. Applying the existing Emissions Performance Standard on an annual basis could allow unabated coal units to run at relatively low load-factors and therefore would not achieve our objectives.

forms of generation, we will apply the limit to units burning any solid fossil fuel (i.e. coal, lignite, etc.), irrespective of site boundaries, and with a thermal capacity of over 300MWth. Compliance with the emissions intensity limit will be on a net CO₂ basis, in that emissions from other fuels co-fired with solid fossil fuel will be included in the calculations for emission intensity. The emissions intensity limit will not apply to units that convert fully to other fuels.

Biomass co-firing

14. We recognise that co-firing with solid biomass at relatively high levels is one way that generators might be able to meet the emissions intensity limit.
15. Our unabated coal closure consultation document noted that any increase in co-firing levels by generators accredited under the Renewables Obligation (RO) scheme would give rise to additional pressure on the Levy Control Framework (LCF), with a consequent impact on consumers' bills. We recognised that it might be necessary to identify action to enable control of spend on biomass co-firing under the RO. In September 2017 the government consulted⁷ on proposals to ensure that the costs to consumers of new biomass co-firing or conversion under the RO are controlled. A response to that consultation will be published soon.
16. Under the RO scheme, arrangements are in place to ensure that only sustainable biomass is used, including by use of life-cycle assessments of net CO₂ emissions from biomass as set out in the EU's Renewable Energy Directive methodology, which is currently being re-cast. This, along with other methodologies, calculates the net CO₂ emissions that derive from biomass combustion, including, amongst other things, from the processing and transport of biomass.
17. We received a number of views in the consultation on the risks over the use of unsustainable biomass in units that co-fire. To avoid this, for the purposes of compliance with the emissions intensity limit, the net CO₂ emissions from coal units co-firing with biomass will be calculated as the sum of the emissions from the coal element of the fuel diet, *plus* net life-cycle CO₂ emissions attributable to the biomass element of the diet. It is recognised that this will have the incidental effect of increasing the relative proportion of biomass that would need to be combusted with coal in order to remain under the emissions intensity limit. This does not preclude any other biomass sustainability requirements that might be introduced in the future.

Date of intervention

18. We sought feedback in the consultation on the when in 2025 the intervention some come into force. The emissions intensity limit will apply on and from 1 October 2025, to align with the beginning of the 2025/26 Capacity Market delivery year. This will mean that unabated coal units will be unable to bid into the four- and one-year ahead Capacity Market auctions

⁷ Consultation on controlling the costs of biomass conversion and co-firing under the Renewables Obligation: <https://www.gov.uk/government/consultations/controlling-the-costs-of-biomass-conversion-and-co-firing-under-the-renewables-obligation> (closed 26th October 2017).

for 2025/26 delivery and beyond (which we anticipate will be held in late 2021/early 2022 and late 2024/early 2025 respectively). See below for more detail on the Capacity Market.

19. As set out in the summary of responses to the consultation, a number of stakeholders called for the date of intervention to be brought forward from 2025. We have considered this, but our assessment is that 2025 is the appropriate date for intervention, balancing the need to ensure security of our electricity supplies, maintaining affordability and the benefits of emissions reductions.

Question 2: Constraint in the years ahead of 2025 closure

This question sought views on the principle of establishing a constraint on coal generation in the years ahead of 2025, how such a constraint might be implemented, and the level and time from which it might apply.

20. As underlined in the consultation document, one of our objectives in setting an end date for unabated coal generation is to ensure an orderly transition towards cleaner forms of generation, avoiding the risk of a significant level of coal generation capacity closing at once.
21. The updated Impact Assessment accompanying this consultation sets out our refreshed analysis. This suggests that the majority of our remaining coal power stations will close (or invest to abate emissions) in the early 2020s, with around 1.5 GW of unabated coal capacity likely to remain until 2025. As many consultation responses noted, these closures are expected to be due to a combination of factors, including:
- The requirements under the Industrial Emissions Directive (IED). This will set a 1,500 hour per year limit on operations (i.e. 17% load factor constraint) on the majority of remaining coal units from July 2020. Under the IED one coal station, Eggborough, must close by 31 December 2023.
 - The effects of carbon pricing. Unabated coal emits around twice as much CO₂ per unit of electricity generated as gas, meaning that carbon prices impact the profitability of coal generation compared to gas and other forms of generation. As set out in the Clean Growth Strategy, the government remains committed to carbon pricing to help reduce emissions in the power sector. At Budget on 22 November 2017⁸, the Chancellor committed to keeping total carbon prices at around the same level as they are currently, until unabated coal is phased out.
 - Relatively poor economics for coal generation, related to coal stations' relative age, high coal commodity prices relative to gas, and the increasing flexibility of the electricity system to which coal is not well-placed to respond.

⁸https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661480/autumn_budget_2017_web.pdf

22. As noted in section 1, coal generation has already fallen to record lows and with periods of zero coal generation. On this basis, we do not currently consider it necessary to set an explicit constraint on coal generation ahead of the 2025 backstop as we assess the effect, if any, would be limited. This is in line with many responses to the consultation which noted that the existing interventions above are likely to reduce coal generation ahead of the backstop.

Question 3: Ensuring security of supply

This question sought comment on our proposals in terms of securing secure supplies of electricity, in particular on whether the Secretary of State should retain powers to suspend temporarily the backstop date on unabated coal if this were justified at the time.

The question also sought feedback and evidence on the impact of the proposals on the investment case for new capacity, and on the build rates of this capacity set out in the draft Impact Assessment that accompanied the consultation.

23. As set out above and in our updated Impact Assessment accompanying this document, our modelling projections suggest that there is likely to be around 1.5GW of unabated coal capacity remaining by the time the emissions intensity limit is introduced on 1 October 2025, with all other unabated coal power stations taking closure decisions in the years ahead of that.

24. The Capacity Market is our main tool for ensuring security of supply. It is a technology-neutral mechanism that is designed to work alongside the wholesale electricity market. It provides payments for reliable generation and other forms of capacity on top of wholesale revenues, though plants that are in receipt of support through other incentives are ineligible.

25. The Capacity Market is also designed to encourage the investment needed to bring forward new generation to replace retiring stations and provide back-up for more intermittent and inflexible generation sources. Capacity Market agreements are awarded principally through auctions held four-years ahead of the delivery year (which runs from 1 October each year). A further auction may take place one year ahead of the delivery year for one-year agreements only.

26. In December 2016 the auction for delivery for in 2020/21 was held: 6 GW of unabated coal capacity secured agreements, and 4GW did not. The next Capacity Market auction for delivery in 2021/22 will be held in February 2018.

27. Our assessment is that the Capacity Market will ensure that there is sufficient capacity in place to replace unabated coal units when they close. This will of course be monitored carefully and kept under review. Coal units will be unable to bid into auctions for delivery in 2025/26 and beyond, unless they can demonstrate that they will be able to meet the emission intensity limit of 450gCO₂/kWh. This should provide investors in new capacity with additional certainty around future load factors and revenues.

Emergency powers

28. We consulted on proposals to allow provision for the Secretary of State to have the power to suspend or amend the arrangements in case there were significant and imminent concerns about security of supply. While we are confident that it is considerably unlikely that such a provision would ever be invoked, we consider it prudent for the Secretary of State to retain provisions to act in *emergency* situations, as a last resort, where there might be a shortfall in electricity generation, or risk of one, and that suspension would wholly or partially mitigate that risk.
29. Such an emergency provision is in place for the Emissions Performance Standard (EPS) through the Energy Act 2013⁹. We consider it appropriate that the provisions for emergency suspension of the emissions intensity limit broadly follow this model; for instance that it could be applied only once all other reasonably viable measures available to the Secretary of State have already been taken, and be in place for a maximum of 90 days at a time. The arrangements could not be invoked any earlier than six months before 1 October 2025.
30. Such an arrangement, for use only in crisis situations and as a last resort, should not be seen to undermine the certainty for investors in new capacity that the end date for unabated coal generation aims to provide. Given the Capacity Market's role in ensuring there is sufficient capacity on the system, it is unlikely these powers would need to be invoked.

Question 4: Wider impacts of coal closure

This question sought views and supporting evidence on the wider impacts of regulating the closure of unabated coal by 2025, particularly where these are additional to what might be expected without this measure.

Leading a global transition

31. Coal is the most carbon intensive fossil fuel and the decline in coal generation over the last few years has led to a significant reduction in the carbon intensity of the power sector. Our assessment, as set out in the updated Impact Assessment, is that the closure of unabated coal will yield guaranteed reductions of 15MtCO₂. In addition to this, reductions of harmful air pollution such as Sulphur Dioxide (SO₂), Nitrogen Oxides (NO_x) and particulate matter (PM) will be guaranteed. This will contribute to the improvements in air quality that this government is actively pursuing to reduce impacts on human health and the environment. In 2017 we published an air quality plan to reduce roadside concentrations of Nitrogen Dioxide¹⁰ and in 2018 we will publish a Clean Air Strategy outlining our plans to reduce emissions of air pollutants from a wide range of sources.

⁹ See Annex B to the EPS Consultation Response, January 2015
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/395350/ImplementingEPSEPSGovtResponse.pdf

¹⁰ <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

32. As coal is the most carbon-intensive fossil fuel, a global transition away from unabated coal use is necessary if we are to achieve the ambition set out in the 2015 Paris Agreement. At the UN Climate Change conference in Bonn in November 2017, the UK and Canada and over twenty other national and regional governments jointly launched the *Powering Past Coal Alliance*, bringing together a range of governments, businesses and organisations that are united in taking action to accelerate clean growth and climate protection through the rapid phase out of traditional coal power. This has since expanded to 58 signatories¹¹. The measures set out in this document above, coupled with our existing framework to prevent new build coal power stations unless they meet an Emissions Performance Standard and invest in Carbon Capture and Storage, set a bold example to the world. This was a strong theme coming out of the responses received to the consultation last year.

Growth at home

33. As noted in the consultation document, it is clear that the continued transition away from coal generation, which has been underway for some years, will have an impact on jobs and communities given the number of people employed at a typical power station. In addition, jobs associated with supply chains, such as port and rail infrastructure will be affected, as will the coal mining industry, although there remain other markets for UK coal. These changes can have a secondary effect on local economies.

34. The analysis in the accompanying updated Impact Assessment suggests that the majority of coal plants are likely to close ahead of the intervention in 2025. However, regardless of whether the end of the coal generation sector is a result of direct intervention or the factors outlined under question 2 above, we recognise that there will be an effect on a number of people, largely in the Yorkshire/Humber region, and in South Wales.

35. A number of responses to the consultation reflected on this, but also on the opportunities that investment in clean growth will lead to, including new, skilled jobs in the clean energy sector.

36. The government is clear that we need to build an economy that delivers good, skilled, well-paid jobs and creates the conditions for competitive, world leading businesses to prosper and grow right across the UK. Since the consultation was held in November 2016, the government has published the Clean Growth Strategy¹² and the Industrial Strategy White Paper¹³

37. The move to cleaner growth, including through low carbon technologies, is one of the most significant and foreseeable global economic trends, and represents one of the greatest industrial opportunities of our time. The UK is well placed to benefit: according to one estimate, our clean economy could grow at four times the rate of GDP. We are determined to make the most of these opportunities. We are already seeing jobs, regional investment

¹¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/666736/Final_Declaration_PPCA_111217.pdf

¹² <https://www.gov.uk/government/publications/clean-growth-strategy>, October 2017

¹³ <https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future>, November 2017

and export sales flowing from UK supply chains for clean power technologies, as a result of the on-going transition to a cleaner, smarter power sector. In 2015, the low carbon electricity sector generated over £12 billion in turnover and directly supported 47,000 jobs, with more in supply chains¹⁴. We expect that the losses in activity associated with the closure of unabated coal generators will be compensated by increased activity in new, clean generation. There is a notable opportunity for the UK to become one of the most advanced economies for smart energy and related technologies. The Smart Systems and Flexibility Plan¹⁵ we launched in July aims to grow the markets for these technologies, and the new innovation challenge announced in our Industrial Strategy, '*Prospering from the energy revolution*', aims to accelerate innovation so that cutting edge technologies and systems are developed in the UK.

38. The development of the world's largest market for offshore wind in the UK has already created new job opportunities. Innovation in the sector has seen costs fall by half over the last two years. Provided costs continue to fall, this could result in at least 10GW of new capacity built in the 2020s, with the potential to support high value jobs and a sustainable UK industry exporting goods and services around the world. The government has recently committed up to £557 million for further Contracts for Difference, with the next auction planned for spring 2019.
39. We want all regions of the UK to benefit from the creation of new jobs in the clean economy. Our new Local Energy Programme will support local areas to develop their capability and capacity to unlock local clean energy and low carbon opportunities, making the most of their diverse clean energy resources and skills.

¹⁴ ONS (2016) Low Carbon Economy and Renewable Energy Economy Survey, final estimates: 2015

<https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/finalestimates/2015results>

¹⁵ <https://www.gov.uk/government/publications/upgrading-our-energy-system-smart-systems-and-flexibility-plan>
July 2017

3. Next steps

40. The government is considering the appropriate legislative vehicle for introducing the emissions intensity limit from 1 October 2025 and other measures required to implement it. As the introduction of the emissions intensity limit will prevent unabated coal units entering into the Capacity Market auctions held in late 2021/early 2022 for the 2025/26 delivery year, and subsequent auctions for delivery years beyond that, the government will prepare the required legislation in good time before these 2021/22 auctions. A final Impact Assessment will be published at that time.

