

E3G

# Emissions Performance Standard

## Briefing for House of Commons consideration of Energy Bill, Amendment 105

### Recommendation

**Existing coal plants should be included under the Emissions Performance Standard (EPS) if they seek to extend their operating life, as proposed by Amendment 105. This would close a loophole in the original EPS proposals and provide a timetable for phased reductions in emissions from the oldest and most inefficient coal power plants over the next decade.**

### Summary

There is a significantly increased risk that existing coal plants will upgrade to meet the air pollution requirements of the Industrial Emissions Directive (IED). This would enable plants to operate at high load factors beyond 2016 and throughout the 2020s.

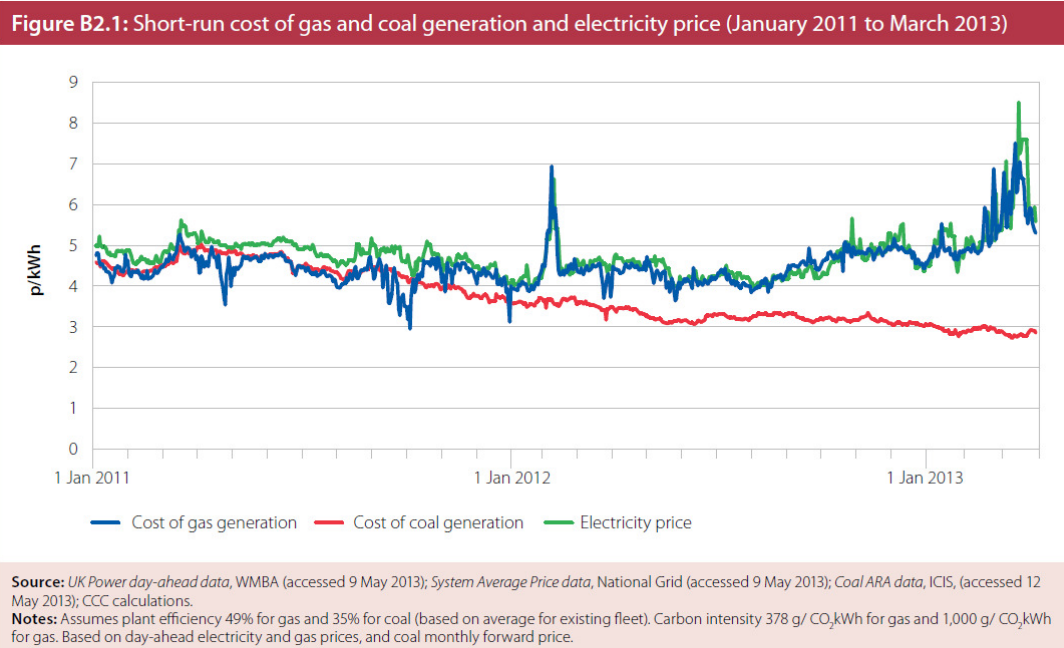
The investment case for the life extension of existing coal plants is being encouraged by current government policy: it proposes that these plants would be exempt from the proposed Emissions Performance Standard (EPS) and able to lock-in three years of receipts from the capacity mechanism.

In addition to its negative impact on power sector decarbonisation, this will also result in adverse outcomes for security of supply and affordability, by:

- > Disincentivising investment in new gas plant and continued mothballing of existing gas generation assets, with increased dependence on old coal plant.
- > Requiring higher capacity payments to support gas generation, without any positive impact on wholesale prices, which currently provide high returns to coal plant operators.

The government already accepts that any existing coal plant that undertakes major technology upgrades to improve operating efficiencies and extend plant lifetimes should be included under the EPS. This same principle should be consistently applied to any plant that upgrades pollution control equipment in order to meet the IED, which also extends its working life.

## Affordability<sup>1</sup>



The wholesale electricity price is set by the costs of gas generation. The lower cost of coal generation results in increased returns for coal plant operators, but no positive impact on consumer prices. If little or no coal capacity were to opt in to the IED, it can be expected that the foregone additional coal generation will be replaced by additional generation from more efficient (probably new) gas plant and therefore the marginal gas plant and electricity prices will remain essentially unchanged.

The continued operation of existing coal plant will also have an impact on costs to consumers. Analysis by Simon Skillings (formerly Director of Policy and Strategy for E.ON UK) finds that “new gas-fired generators will demand a higher price from the capacity auctions to proceed with new build projects if significant proportions of coal plant opt-in and, given the market-wide nature of the capacity mechanism, this could significantly increase costs to consumers in delivering the required reliability standard.”<sup>2</sup>

## Security of Supply

The IED incorporates long lead times and flexibility mechanisms in order to provide sufficient time for new investment and avoid impacts to security of supply. The inclusion of existing coal plants under the UK’s EPS would use the same timetables that are already in place and there is no immediate ‘cliff edge’ threat to security of supply.

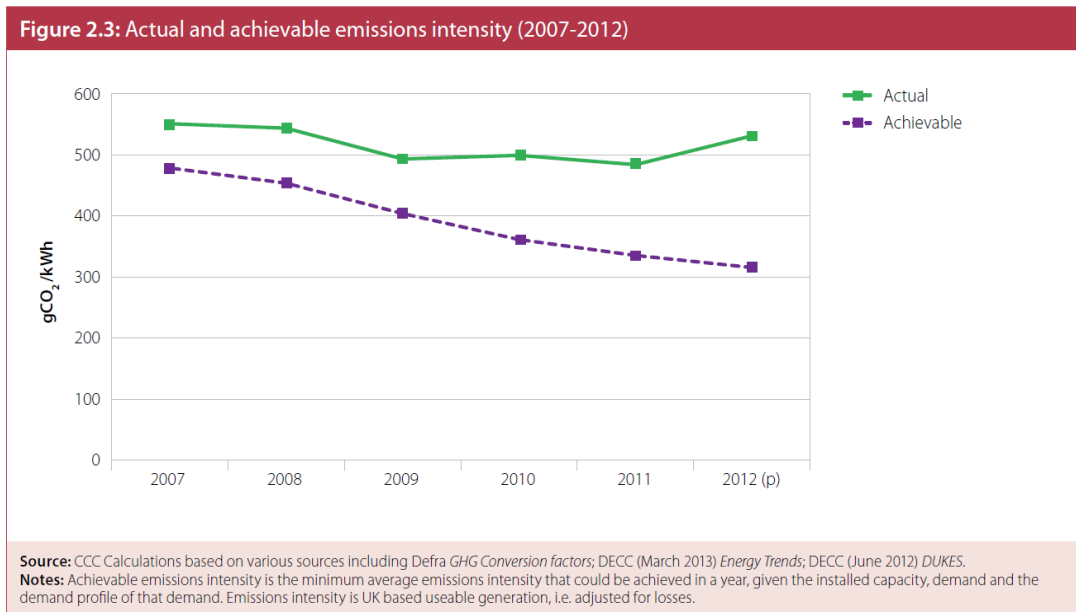
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<sup>1</sup> Source: Committee on Climate Change, 2013 Progress Report to Parliament

<sup>2</sup> [The future of existing coal plant in GB and implications for security of supply and affordability](#), Trilemma UK, October 2013

In the event that plant operators decide not to upgrade (and therefore not fall under the EPS) the IED will permit 'opted out' plant to undertake 17,500 hours of operations between 01/01/2016 and 31/12/2023. Simon Skillings' analysis states that "system security in the UK is likely to be increased rather than reduced if existing coal plant opts out of the provisions of the IED, as the operating potential for new and existing gas plant would be improved, while sufficient coal plant would remain available for winter peak operations beyond 2020."

### Achievability<sup>3</sup>



*Achievable emissions intensity is the carbon intensity of electricity supply that would be achievable if power plants were dispatched in order of least emission rather than least cost, while still maintaining security of supply to keep the lights on. This indicator shows that there is scope to reduce current emissions intensity by over 200gCO<sub>2</sub>/kWh (41%) within existing capacity through fuel-switching, primarily from coal to gas. This is achievable while maintaining security of supply at minimal cost to the consumer, being available today without any requirement for new investment, and given that the market electricity price continues to be set largely by gas plant.*

### Rationale for amendment to the Bill

Schedule 4 of the Energy Bill includes provisions that would apply the EPS to existing plants that upgrade boilers to improve plant efficiencies and extend plant life.

This same principle should also be applied to plants seeking to extend operating lifetimes via the installation of other pollution control equipment, for example to meet the Industrial Emissions Directive beyond 2023. Such investments are being actively considered by

<sup>3</sup> Source: Committee on Climate Change, 2013 Progress Report to Parliament

operators, and are currently attractive options due to low prices of coal and carbon that have made coal plants more profitable over recent years.

The government has previously argued that the incorporation of existing plants under the EPS is not required due to the existence of price incentives that would result in a switch from coal- to gas-fired generation. However the collapse of carbon prices under the EU ETS and the perceived political instability of the UK's unilateral carbon price support mechanism mean that this is currently not taking place.

As a consequence, the International Energy Agency has recommended that EU member states should actively look to non-price measures to ensure the retirement of old coal plant.<sup>4</sup> Existing processes require decisions by operators as to whether they intend to invest in plant upgrades to meet the Industrial Emissions Directive. These timetables provide the opportunity for existing plants to be incorporated into the scope of the UK EPS in a coherent manner without requiring retrospective regulatory measures.

The approach taken by the proposed amendment is therefore in line with the original intent of government policy and consistent with currently proposed measures. It would allow existing coal plants to operate for peaking or during the winter months, for at least the next 10 years, thereby providing a backstop regulation in support of the carbon price support mechanism. If plants seek to upgrade to operate at higher load factors into the 2020s it is appropriate that this is in line with emissions reduction requirements that already apply to investors in new coal plants, requiring the use of carbon capture and storage technology.

## Operational and investment impacts

If the EPS is confirmed as proposed by the House of Lords, existing coal plant operators would have two options:

Existing coal plant that upgrades to 'opt-in' to the IED would fall under the EPS, but would still be able to run at around 40-45% load factor. This is in line with previous government analyses that predicted higher carbon prices would reduce running hours.

Existing coal plant that decides to 'opt-out' and not upgrade would not fall under the EPS, but would instead be limited to running 17,500 hours through until 2023. This plant would likely operate mainly during winter to reduce costs and maximise earnings and would thereby contribute to maintaining security of supply for the next 10 years.

Importantly, the investment case for new gas plant (and the use of existing mothballed assets) centres on operators being confident that they will be able to secure significant load factors during the first 5 to 10 years of plant operation. This investment case would best be assisted by limiting the use of old coal plants as described above. The continued base load operation of existing coal plant is currently the biggest barrier to investment in new gas plant.

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<sup>4</sup> <http://www.businessweek.com/news/2013-06-10/eu-should-move-beyond-carbon-market-to-shut-coal-power-iaea-says> / <http://www.iea.org/newsroomandevents/pressreleases/2013/june/name,38773,en.html>

## International EPS developments

Emissions Performance Standards (EPS) have been successfully used worldwide for decades to secure improvements in air quality by requiring reductions of pollutants from power plants. More recently, the concept of EPS has been extended to address emissions of CO<sub>2</sub>.

EPS regulations for CO<sub>2</sub> have been in place in California and other US states since 2006.<sup>5</sup> Canada put in place a Federal EPS policy in 2012 that covers both new and existing power plants.<sup>6</sup> In June 2013, President Obama announced that the US EPA would bring forward new source standards for power plants this year, to be followed by regulations on existing plant during 2014.<sup>7</sup> The World Bank and European Investment Bank now apply EPS requirements in their assessment of financing for new power plants, while the European Commission has recently consulted on policy options that could incentivise carbon capture and storage (CCS), including via the use of EPS regulations. The UK's proposed EPS could therefore form part of a worldwide effort to reduce emissions of CO<sub>2</sub> from fossil fuel power plants, including via the accelerated deployment of CCS.

## Questions and answers

### Why is the EPS needed?

The government claims that the EPS is not needed as carbon pricing will provide a sufficient means of limiting coal use over the coming decade. This view is not shared by the International Energy Agency, which has recommended that European governments should use non-price measures to ensure the prompt retirement of existing coal power stations.

The fact that existing coal plants are currently considering upgrades that would enable them to operate through until the late 2020s demonstrates that the signal to investors of potential future high carbon prices is not sufficient. This situation runs contrary to previous advice from the Committee on Climate Change, which has repeatedly highlighted that there should be no unabated coal generation in the UK from the early 2020s.

Even in the case that carbon prices do prove to be sufficient in future, the inclusion of existing coal plants under the EPS now provides an appropriate backstop measure that confirms the intention of policy and guards against further lock-in to high carbon electricity generation assets. The inclusion of existing coal plants under the EPS will therefore send a valuable signal of the UK's commitment to pursue power sector decarbonisation, enabling cost-effective investment in low-carbon technologies including a combination of unabated gas and carbon capture and storage.

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<sup>5</sup> [http://www.raonline.org%2Fdocs%2FRAP\\_ResearchBrief\\_Simpson\\_EPS\\_Updated\\_2010\\_08\\_12\(2\).pdf](http://www.raonline.org%2Fdocs%2FRAP_ResearchBrief_Simpson_EPS_Updated_2010_08_12(2).pdf)

<sup>6</sup> <http://www.globalccsinstitute.com/insights/authors/davidhanly/2012/12/04/emission-performance-standards-old-option-new-incentive-ccs>

<sup>7</sup> <http://www.whitehouse.gov/the-press-office/2013/06/25/fact-sheet-president-obama-s-climate-action-plan>

**Will the inclusion of existing coal plants under the EPS require them to close in the next few years? Will this impact on security of supply before 2020?**

No. If a coal plant decides not to upgrade, then it would be able to run for a maximum of 17,500 hours out to the end of 2023 – a full decade from now. Even if operators chose to use this allowance quickly by running at ~55% load factor, plants would still be operational until 2020. Given the introduction of the capacity mechanism, it is likely to be beneficial for plant operators to phase availability of plant over the period to 2023.

**What happens if a plant upgrades to meet pollution controls?**

At present, any plant upgrading to meet the air pollution requirements of the IED would be able to run at high load factors. Over time the government believes that this will be reduced due to the increasing impact of carbon pricing. However the current combination of the EU ETS and the UK's Carbon Price Support are not sufficient to trigger fuel switching from coal to gas. Under the EPS, a plant would still be able to upgrade to take advantage of greater operational flexibility, however it would be limited to a load factor of around 40-45%. This would position it in line with the emissions permitted for new coal plant under the EPS, improving the business case for investment in new low-carbon generation assets.

**Is this retrospective regulation?**

No. Decisions are still to be taken as to whether coal plant operators will chose to opt in to the Industrial Emissions Directive. An initial indication is required by 31/12/2013, but does not need to be confirmed until 31/12/2015. Operators are currently waiting to see what support will be offered under the capacity mechanism before confirming their intentions. It is therefore clear that government decisions on the EPS and provision of financial support are the key determinants for whether plants will seek to upgrade. One plant (Ratcliffe, E.ON) has already invested to meet IED pollution control requirements. If necessary, the detailed secondary regulations for the EPS could confirm whether this plant is excluded or included under the EPS.

**What about CCS?**

It is unlikely that existing coal power stations will retrofit CCS given underlying plant inefficiencies. However a number of plants are ideally located for the rapid deployment of CCS in the early 2020s, assisted by the development of CO<sub>2</sub> transport infrastructure under the UK CCS Commercialisation Programme:

- > **Drax** is host to the White Rose Oxyfuel CCS project, which is participating in the Commercialisation Programme. This will provide a CO<sub>2</sub> transport and storage infrastructure that can subsequently be utilised by additional units of CCS on the same site.
- > **Eggborough** and **Ferrybridge** sites have both been identified as potential candidates for future deployment of CCS as part of a Yorkshire and Humber CCS network. Such a network would also likely include the proposed new coal-fired CCS power station at **Don Valley**.

- > **Longannet** already has a CO<sub>2</sub> transport solution available, and both the plant location and the CO<sub>2</sub> pipeline have been identified as National Developments in the Scottish Government's National Planning Framework. A CO<sub>2</sub> network in Scotland would also include the proposed new CCS power station at **Grangemouth**, and could also incorporate the existing **Cockenzie** site.

An additional CCS project is proposed for **Teesside**, which would provide additional opportunities for CO<sub>2</sub> network development in the North East of England.

The deployment of CCS in the early 2020s on these sites is achievable as part of the UK's CCS strategy, and would provide a sustainable long-term future for power generation in these locations. A proactive strategy would use the next 5 years to prepare firm plans for investment via Contracts for Difference and associated infrastructure support, enabling the construction of new CCS power stations at these locations by 2023.

#### **What would happen if the UK doesn't extend the EPS to include existing power stations?**

The immediate impact would be to further incentivise investment in upgrades to enable extended operation. This would negatively impact on the investment case for new gas plant, and increase costs under the capacity mechanism. Beyond the policy framework, global campaigns against coal power stations are likely to continue over the coming years. The UK has already seen direct action opposition to new and existing coal-fired power stations. There would therefore be an increased risk of direct action opposition in the event that multiple coal plants seek to upgrade to extend operating lifetimes.

#### **What international influence would this have?**

Acting now to prevent lock-in to unabated operation from existing coal power plants will provide a clear signal that the UK is acting domestically to limit the impacts of coal use, just as it is restricting international funding for coal power stations elsewhere. The inclusion of existing coal plants under the EPS would therefore send a valuable signal of support to efforts underway in the USA and Canada to also address CO<sub>2</sub> emissions from existing power stations. It would also increase the pressure on EU member states to address emissions from coal more proactively in their domestic climate policies. The review of the EU CCS directive in 2014-15 will also provide an opportunity for re-consideration of whether an EU EPS would be possible as a means of addressing emissions across the internal energy market.

### **About E3G**

E3G is an independent, non-profit European organisation operating in the public interest to accelerate the global transition to sustainable development. E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere.

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## Annex 1: Amendments introduced in the House of Lords

Since the Energy Bill was last considered in the House of Commons, the government has introduced amendments to the EPS to provide additional flexibility for new CCS power stations during an initial 3-year commissioning window. This addition is time-limited and provides greater clarity on the required operation of CCS, in line with power sector decarbonisation objectives.

At report stage in the House of Lords, peers voted in support of an amendment that incorporates existing coal plants into the EPS regime if they undertake pollution control upgrades as a means of extending operating lifetimes. This provides improved consistency, as the government already intended to include under the EPS any plant undertaking major improvements (such as boiler upgrades).

Schedule 4 of the Energy Bill now reads:

### Application and modification of emissions limit duty

Application of duty: changes to main boilers

- 1 (1) Regulations under section 57(6)(b) may provide for the emissions limit duty to apply (with or without modifications) in relation to fossil fuel plant in cases where—
  - (a) immediately before the day on which section 57(1) came into force, the electricity generating station in question was the subject of a relevant consent, and
  - (b) on or after that day—
    - (i) any main boiler of the generating station is replaced,
    - (ii) an additional main boiler is installed for the generating station, or
    - (iii) *substantial pollution abatement equipment dealing with oxides of sulphur, oxides of nitrogen, heavy metal emissions or particles is fitted to the generating station.*

The introduction of this amendment can therefore be seen to match the original intent of the government to include existing plant under the EPS when undertaking technical upgrades to extend operating life.

Upgrades to pollution control equipment to meet the IED have the same outcome of extending operating life, as they would enable plant to operate beyond the 2023 end date for opted-out plant. Additionally, such upgrades would enable plant to operate at much higher load factors prior to that date than possible under the 17,500 hours limitation of the IED.



## Annex 2: Status of coal-fired power plant in GB<sup>8</sup>

### Coal-fired power plant opted out under LCPD provisions

Station	Owner	Capacity (MW)	Status
Ironbridge	EON	972	Converted to biomass but will close by 2015
Kingsnorth	EON	2000	Closed
Didcot	RWE	1920	Closed
Tilbury	RWE	1050	Converted to biomass and recently decided not to re-license so will close by 2015
Cockenzie	Iberdrola	1200	Closed
Ferrybridge (units 1&2)	SSE	980	Due to close March 2014
<b>Total capacity</b>		<b>8122</b>	

### Coal-fired power plant opted in under LCPD provisions

Station	Owner	Capacity (MW)	Status
Eggborough	Eggborough Power Ltd	2000	Considering biomass conversion – no apparent plans to opt-in to IED
Uskmouth	SSE	360	120MW closed, future of remaining 240MW to be decided by early 2014 but unlikely to be opted in
Drax*	Drax Power	3960	3 units to convert to biomass and still to confirm future of remaining 3 units
Cottam*	EdF	1948	Yet to decide
West Burton*	EdF	1924	Yet to decide
Ferrybridge (units 3&4)*	SSE	980	Yet to decide
Ratcliffe*	EON	2000	Has already undertaken work to comply with IED
Rugeley	GdF	996	Considering biomass conversion
Aberthaw*	RWE	1386	Yet to decide
Longannet*	Iberdrola	2400	Yet to decide
Fiddlers Ferry*	SSE	2000	Has received planning permission for necessary works
<b>Total capacity</b>		<b>19954</b>	

\* Those stations most likely to consider opting in to the IED on the basis of public statements by the owners

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<sup>8</sup> Source: [The future of existing coal plant in GB and implications for security of supply and affordability](#), Trilemma UK, October 2013.

Note: There is also a small coal-fired power station in Northern Ireland that is expected to opt-out of the IED