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Parliamentary Briefing

Is there really a coal renaissance in the EU?

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This briefing covers how the share of electricity coming from coal has evolved in the EU in recent years and examines whether there is indeed a "coal renaissance" in the EU. This note also contains an appendix with more detailed information about the UK and Germany.

1. Despite recent claims to the contrary, there is no new wave of coal plans being built in the EU. Whilst the EU and some key member states could certainly do more to tackle the carbon emissions of coal plants and reduce the share of electricity being generated from coal plants, talk of a coal "renaissance" in the EU caused by the EU's energy policies is ill founded.

2. It is correct that the consumption of coal has been increasing in the EU since 2009, primarily in 5 key countries: the UK, Germany, Spain, Italy and the Netherlands. However, this recent increase must be situated within a long-term trend in which the proportion of the EU's electricity coming from coal is in gradual but absolute decline, having decreased from 39% in 1990 to less than 24.7% in 2010[1].

3. In terms of absolute capacity, the installed amount of coal power stations in the EU has gone down by 10GW between 1990 and 2011, whilst over the same period the installed amount of gas plants (+116GW), wind (+83GW) and solar PV (+47GW) have all increased substantially[2]. In addition, out of the 112 new coal plant projects that were announced in the EU in 2008, only 3 have reached construction stage, with the rest of the projects having either been abandoned (73), not progressed at all (14) or having not yet reached an investment decision[3].

4. The decline in the share of coal in the electricity mix also applies to Germany. Whilst some 9.6GW of new coal plant will arrive on the German electricity system by 2015, all of these projects result from investment decisions taken between 2005 and 2008 (prior to the introduction of the EU's climate and energy package in 2009)[4]. There are no plans for new coal plants in Germany beyond these projects and some 24 proposals have been abandoned since

[1] EU Energy in Figures, Statistical Handbook 2012, Market Observatory, page 83: http://ec.europa.eu/energy/publications/doc/2012_energy_figures.pdf
[2] See EWEA, Wind in Power 2011 (February 2012): European Power Statistics, European Wind Energy Association: http://www.ewea.org/statistics/
[3] Data collected by the European Climate Foundation. Some of these findings were reproduced in a recent Huffington Post article, 'Europe's 'Coal Renaissance' Masks Industry Downfall', 24 January 2013: http://www.huffingtonpost.com/justin-guay/europes-coal-renaissance-industry_b_2535187.html See also Financial Times, 'Shale gas boom sparks EU coal revival', 4 February 2013: http://www.ft.com/cms/s/0/d41c2e8a-6c8d-11e2-953f-00144feab49a.html
[4] See latest figures from the German Bundestnetzagentur (December 2012): http://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetGas/Sonderthemen/Kraftwerksliste/VeroeffKraftwerksliste_node.html

then. In fact, even among the new coal plants that are being built, those running on hard coal are unlikely to be economic to run (SKM's plant at Mannheim is a good example).

5. The lack of appetite for building new coal plants in the EU is due to the fact that hard coal plants are not particularly economic to operate in the EU and also face significant risks both in terms of future policy changes on coal (with the possibility of the EU and more countries tightening up legislation on coal plant emissions) and political / public opposition (5 coal projects are currently held in courts)[5].

6. The recent increase in coal consumption in the EU has only little to do with the export of "cheaper" US coal caused by the shale gas revolution in the US. The most important reasons behind the increase in coal consumption in the EU are to do with:

- the EU's economic recovery since 2009, which has resulted in an increase in EU electricity consumption and therefore an increase in the amount of electricity being produced from the EU's existing fleet of power plants[6] which includes a lot of old coal plants;
- country-specific issues, such as political issues (e.g. the desire in countries like Poland to reduce dependence on Russian gas), national resource issues (the presence of large amounts of lignite in Germany and Bulgaria), short-term policy issues (e.g. the upcoming introduction of the carbon floor price in the UK has incentivised UK coal plants to use up many of their remaining operating hours under the Large Combustion Plant Directive (LCPD) before the running of their plant becomes less profitable).

7. Other reasons behind the recent increase in coal use include:

- the fall in the carbon price: this primarily explains the increased running of lignite-fired plants in Germany. Lignite is much cheaper than hard coal[7] but is also much more carbon intensive and therefore the economics of lignite-fired plants is heavily reliant on the price of carbon; and
- the higher gas price in the EU: this is only relevant for gas-heavy power sectors such as the UK and the Netherlands. The drop in the relative cost of hard coal compared to gas caused by shale gas developments in the US has only had a limited impact on EU coal consumption in countries like Italy, which has very little domestic coal resources and is locked into expensive long-term gas contracts.

8. While there is no new renaissance of coal in the EU, it is clear that tougher rules targeting the carbon emissions of unabated coal plants in the EU and some of its key member states are required to help reduce the amount of electricity coming from these plants as soon as possible. This is an issue that WWF is particularly focused on in its climate and energy work across Europe.

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[5] Data collected by European Climate Foundation. Also see report on cases of political opposition to new coal plants by Sierra Club, Move Beyond Coal Now Report (September 2012): http://www.sierraclub.org/international/beyondcoalvictories/

[6] See Eurostat page on electricity consumption showing an increase in electricity demand in 2010 compared to 2009: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Electricity_production,_consumption_and_market_overview

[7] The price of lignite was at around €15/tonne in 2012 according to Bloomberg New Energy Finance.

Spotlight on the UK and Germany

Situation in Germany, 2013

9. Whilst some 9.6GW of new coal plants will arrive on the German electricity system between 2012 and 2015[8], these plants were built on the basis of decisions taken between 2005 and 2008 (preceding the EU's 20-20-20 climate and energy package). The economic rationale for these plants was mainly based on the free allocation of emission certificates. 6.7GW of these plants are hard coal plants and 2.9GW are lignite plants (a more carbon intensive form of coal).

10. Plants running on hard coal are increasingly uneconomic to run, with the new plant being built in Mannheim by SKM being a good example. This is due to the fact that the increased deployment of renewables in Germany (which accounted for 25% of Germany's electricity demand in the first 6 months of 2012)[9] has reduced the wholesale price of electricity and has therefore reduced the market for both coal (the sport price of hard coal was still high at $90/tonne in 2012) and gas plants (which face the added challenge of an increasing gas price). In addition to the lower average price of electricity, fossil fuel plants also run less frequently, which further erodes their profitability.

11. However, the situation is different for plants running on lignite, of which Germany has a lot (18.3GW of lignite-fired plants are on the system at the moment and 2.9GW will come online in the next 2 years)[10]. The price of lignite is completely independent of the price of hard coal: lignite cannot be traded as it loses its calorific value very quickly and therefore can only be consumed onsite. Therefore, lignite tends to be cheaper[11] than coal as its cost only reflects that of extracting it and burning it. As Germany has a lot of lignite, this has meant that despite the drop in the wholesale electricity price in Germany over the last few years, it has still been economic for lignite-fired plants to operate at fairly high load factors especially because of the fall in the carbon price. Increased electricity generation from lignite-fired plants – a consequence of a market price clearing mechanism based on marginal costs - has been the main reason behind the increase in "coal" consumption in Germany since 2009. However, it should be made clear that the increase of "coal" use in Germany relates to an increase in consumption, not an increase in new capacity.

12. Going forward, the trend for coal capacity in Germany is pointing firmly downwards. 24 coal projects have been abandoned in Germany alone since 2008 and it is widely expected that none of the remaining projects will be permitted. According to WWF Germany's climate model, the latest 9.6GW of coal plants that will be coming on to the system will not be a threat to Germany's climate change targets for 2050 nor the interim targets, as long as Germany meets its future commitments for the building of new renewable energy capacity. This is because renewable generation in Germany has priority access to the grid ahead of other forms of generation, which means that the more renewable energy there is on the system, the less of a market there will be for any type of fossil fuel plant to operate at high utilisation rates. The fact that coal plants will operate less and less in the future and increasingly act as a back-up to renewables is fully reflected in the official documents underpinning Germany's future electricity system planning[12].

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[8] See above note 4.
[9] Data from German Transmission System Operators. Also see detailed facts on the EnergieWende on www.energytransition.de/
[10] See above note 4.
[11] At around €15/tonne according to Bloomberg New Energy Finance report referred to above.
[12] See Germany's Power System Development Plan projections for 2022 and 2032, which envisages a clear drop in the contribution of both hard coal and lignite-fired plants: http://www.netzentwicklungsplan.de/sites/default/files/NEP_2012/Factsheet.pdf

Situation in the UK, 2013

13. The UK has seen a recent increase in coal consumption since 2009. This increase is likely to be a temporary blip (although see note of caution below) and is a result of the following factors:

- A large number of the UK's existing coal plants will have to close by the end of 2015 or earlier as a result of the pollution control requirements of the EU's Large Combustion Plant Directive (LCPD). These plants have a limit on the number of hours they can operate before they must close and they can choose when to use up those hours.
- The price of carbon is currently low but the UK Government will be introducing a gradually increasing minimum price for carbon (carbon floor price) in April 2013. This will result in an increase in the carbon price for UK fossil fuel plant generators, which will have a greater impact on the profitability of coal plants than gas plants, given that coal plants emit around twice the carbon emissions of gas plants.
- The price of gas in the UK has also been increasing for a number of years and the price of hard coal is therefore relatively cheap in comparison.

14. As a result of these factors, UK coal generators have had an incentive to make the most of using their remaining allowable operating hours under the LCPD prior to the carbon floor price kicking in in April 2013, which will undermine the economics of UK coal plants. As a result of using up these remaining hours, a number of UK coal plants are likely to be closing in 2013 rather than 2015.

15. There is a note of caution however. The LCPD was replaced in 2008 with the new Industrial Emissions Directive (IED)[13]. Whilst the IED imposes even stricter limits on nitrogen oxide emissions than the LCPD, it also allows coal plants (which are compliant with the old LCPD but not with the new IED) to continue operating until 2020 under a transitional national plan, following which they will have to meet the new emission restrictions under the IED. Power station operators have to decide in the coming months whether

> (i) not to comply with the IED and accept to only run for a limited number of operating hours before closing by 2023 at the latest; or
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> (ii) to carry on operating under this transitional national plan in the hope that they can find an economic way of complying with the IED from 2020 onwards[14].

As some cheaper forms of nitrogen oxide filters are currently being trialled in Poland, there is a possibility that some coal plant operators may decide to keep their plant running under the transitional national plan especially if they take the view that gas prices will stay high for a while longer, which would improve the economics of coal plants[15].

[13] See the very good summary prepared by law firm Norton Rose on the difference between the LCPD and the IED and what this means in practice for coal plants: http://www.nortonrose.com/knowledge/publications/32295/the-industrial-emissions-directive-large-combustion-plants

[14] As plants have until January 2014 to decide whether or not to comply with the IED, there is also a possibility that plants which are not compliant with the LCPD and which have limited operating hours left to use between now and 2015, may decide to retrofit cheap abatement technologies (if available) in late 2013 and therefore decide to comply with the terms of the IED from 1 January 2016.

[15] Industrial Emissions Directive: Game over for EU coal?, Bloomberg New Energy Finance, 18 October 2012, see graph on page 2 showing different routes for compliance under the IED.