

Large Combustion Plant Directive (LCPD): Running hours during winter 2014/15 and capacity for 2015/16

This article updates the September 2014 article *Running hours during winter 2014/15 for plants opted-out of the Large Combustion Plant Directive (LCPD)*¹ and provides analysis of the capacity available for winter 2015/16 as the LCPD enters its final year (ending 31st December 2015) and is replaced by the Industrial Emission Directive (IED, starting 1st January 2016). The article looks solely at capacity in Great Britain.

LCPD

The Large Combustion Plant Directive (LCPD) is a European directive aimed at controlling emissions of sulphur dioxide, nitrogen oxides and dust from large combustion plants. The directive imposes emissions limits on new plants (those licensed after 1st July 1987). Plants licensed before this date have three options:

- 1) Meet new emission limits which will require retrofitting of flue gas treatment equipment (i.e. opt-in).
- 2) Opt out limited life derogation – 20,000 hours of operation between 1st Jan 2008 and 31st Dec 2015.
- 3) Close before 1st Jan 2008.

Data on the running hours of plants opted-out of the LCPD can be downloaded from the following website www.bmreports.com/bsp/bes.php?prefix=LCPD.

Of the 17 coal fired power stations operating in Great Britain at the beginning of 2012, six opted out, along with the three oil fired stations. A list of these plants and a summary of their current operational status is given in table 1. The total capacity of the coal plants originally opted-out totalled 8 GW and comprised just over one-quarter of the coal capacity in Great Britain at that time. Two of the coal plants that opted-out (Tilbury and Ironbridge) have since converted to run on biomass. Tilbury closed in August 2013 but Ironbridge must still close once it's hours have been run.

¹ www.gov.uk/government/statistics/energy-trends-september-2014-special-feature-articles

Table 1: Capacity and current operating status of plants opted-out of LCPD

Plant	Capacity ² (MW)	Current Status
Cockenzie units 1 & 2	1,152	Closed March 2013
Cockenzie units 3 & 4		
Didcot A	1,958	Closed March 2013
Ferrybridge (1&2)	980 ³	Closed April 2014
Ironbridge	940 ⁴	Unit 1 closed February 2014 Unit 2 open
Kingsnorth	1,940	Closed December 2012
Tilbury (7 & 8)	750	Closed August 2013
Tilbury (9 &10)		
Total (coal)	7,720	
Fawley*	1,036	Closed March 2013
Grain*	1,300	Closed December 2012
Littlebrook*	1,370	Closed March 2015
Total (oil)	3,706	

* These plants are oil fired and have taken the option of limiting running hours to 10,000. Under this option plants only need to provide sample measurements of SO₂ rather than continuous measurements.

Winter 2014/15

Table 2 shows the hours run during winter 2014/15 by the remaining plants which chose to opt-out of the LCPD (winter is defined as beginning October 2014 – end March 2015). The data are also shown in chart 1. Of the plants that opted out of the LCPD, only Ironbridge (Unit 2) and Littlebrook were operational during winter 2014/15.

Table 2: Hours run during winter 2013/14 and winter 2014/15 by plants opted-out of LCPD

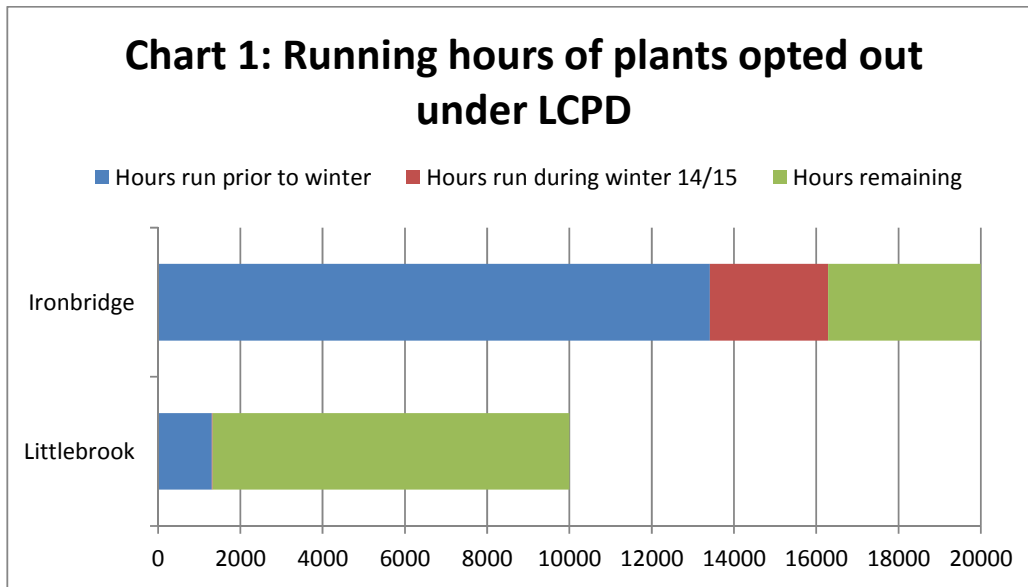
Plant	Hours run during winter 13/14	Hours run during winter 14/15	Hours remaining (as at end of winter 14/15)	Hours remaining (as at end of June 2015)	Hours remaining (as at end of June 2015 - %)
Ferrybridge (1&2)	2,292	0	0	0	0%
Ironbridge	1,242	2,879	3,707	2,234	11%
Total (coal)⁵	3,229	2,879	3,707	2,234	11%
Littlebrook*	2	18	CLOSED (8,675)	CLOSED (8,675)	87%
Total (oil)	2	18	CLOSED (8,675)	CLOSED (8,675)	87%
Total (coal and oil)	3,231	2,897	3,707	2,234	11%

² DUKES 2015, table 5.10, at: www.gov.uk/government/publications/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

³ Ferrybridge units 3 and 4 (which also have a combined capacity of 980 MW) are opted in to the LCPD and will continue to run after 2015.

⁴ Converted from coal to dedicated biomass in 2013 (at 900 MW), before reducing to 360 MW in April 2014 following the fire which closed unit 1 in February.

⁵ Coal total includes Ironbridge, which converted from coal to biomass during 2013 and continued to be opted-out. Although biomass produces almost no CO₂ emissions, the plant will not be exempt from closure at the end of 2015 as the LCPD relates to particulate matter and sulphur dioxide/nitrogen oxide emissions.



In total the plants opted-out of the LCPD ran for 2,897 hours during winter 2014/15. This compares to 3,231 hours during the winter of 2013/14.

Ironbridge is now the only coal fired station that opted out of the LCPD still operational, with 19 per cent of its allowance remaining. However, this will have to close by the end of 2015, whether it has used its allowance or not.

Industrial Emissions Directive

The Industrial Emission Directive supersedes the LCPD from 1st January 2016. This places more stringent emissions requirements on power plants between 1st January 2016 and 31st December 2020, and affects all coal and oil plants (including those that opted in to the LCPD), as well as other combustion plants, such as gas and biomass. Again, plants have three options:

- 1) Opt in to the IED and meet the emissions requirements from 1 January 2016.
- 2) Opt in via the Transitional National Plan (TNP), which allows a gradual adjustment to the new emission requirements. Plants will be subject to an emissions allocation between 2016 and 2020. At the end of the transitional period, plants can decide to opt in to the IED or to cap their operating hours to 1,500 hours a year (i.e. 17% annual load factor).
- 3) Opt out from the IED, which means that these plants will be subject to a Limited Lifetime Derogation (LLD) of 17,500 running hours between 2016 and 2023 and must close when the hours are exhausted or by the end of 2023, whichever is reached first.

Operators wishing to opt-out under the Directive were required to give notice of their intentions by 1 January 2014. However, plants can withdraw their opt-out decision until 1 January 2016. Plants that did not make an opt-out declaration cannot now change their decision. More information on the IED can be found on the European Commission's website at

<http://ec.europa.eu/environment/industry/stationary/ied/legislation.htm>.

Of the 12 coal fired power stations due to be operating in Great Britain at the beginning of 2016, seven have opted out of the IED, although the current situation is not clear as they are able to withdraw their opt-out decision until 1 January 2016. A list of these plants is given in table 3. The total capacity of the coal plants originally opted-out totalled 9 GW, just under half of the expected coal capacity in Great Britain from January 2016. There were also three large scale CCGT gas plants, with a combined capacity of 2.5 GW, that have chosen to opt out of the IED. Around 10 GW of coal capacity and 12 GW of gas capacity have opted in via the TNP. More information on the plants that have opted in and opted in via the TNP is available in the Excel file at:

<https://circabc.europa.eu/webdav/CircaBC/env/ied/Library/TNPs/UK/NEW%20TNP>.

Table 3: Capacity and current operating status of plants opted-out of IED

Plant	Capacity ⁶ (MW)
Aberthaw	1,586
Cottam	2,008
Eggborough	1,960
Ferrybridge C (one unit)	487
Lynemouth	420
Uskmouth*	363
West Burton A	2,012
Total (coal)	8,836
Didcot B	1,470
Corby	401
Peterhead Block 2**	660
Total (gas)	2,531
Total (coal and gas)	11,367

* Not currently operational

** Currently mothballed, due to close on or before 31st December 2015

⁶ DUKES 2015, table 5.10, at: www.gov.uk/government/publications/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

Forward look to winter 2015/16

After the closure of Littlebrook in March 2015 Ironbridge remains the only operational plant in Great Britain that opted out of the LCPD directive, but will have to close at the end of 2015. If it runs at hours similar to 2014 Ironbridge would be expected to close in early December 2015.

Table 4 shows total installed capacity (IC) connected to the High Voltage (HV) transmission network and interconnector capacity in Great Britain as at the year-end for 2012 to 2014. Also included is maximum demand in each year to for the winter periods to 14/15.

Table 4: Total installed capacity and maximum demand in Great Britain, 2012 to 2014

	MW		
	2012	2013	end December 2014
Installed capacity of GB transmission network ⁷	79,514	73,998	72,213
<i>Of which:</i>			
Combustion (coal, gas, oil, biomass)	62,040	55,150	52,496
Nuclear	9,231	9,373	9,408
Renewables	5,415	6,647	7,480
- Renewables – de-rated for intermittency	2,250	2,779	3,137
Pumped Storage	2,828	2,828	2,828
Interconnector capacity:			
England - France	2,000	2,000	2,000
England - Netherlands	1,000	1,000	1,000
Scotland - Northern Ireland	500	500	500
Wales - Irish Republic	500	500	500
Maximum demand ⁸ (for winter ending March)	55,765	51,811	52,516
Maximum demand as a percentage of de-rated GB capacity	73.0%	73.9%	77.4%

The IC in GB as at the end of December 2014 was 72,213 MW, while maximum demand for 2014 was 52,516 MW. At 72.7 per cent of installed capacity, maximum demand was slightly higher than in previous years.

When looking forward to potential maximum demand for winter 15/16, “firm” capacity should be considered, i.e. taking into account total combustion, nuclear and pumped storage capacity and de-rating renewables capacity to account for intermittency.

Combustion capacity was 52,496 at the end of December 2014 – with the closures of Littlebrook and Ironbridge this will fall to 50,766 MW in 2015.

⁷ Table 5.12 of the Digest of United Kingdom Energy Statistics (DUKES), available at: www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes.

⁸ Table 5.9 of the Digest of United Kingdom Energy Statistics (DUKES), available from the same link as above.

Special feature – Large Combustion Plant Directive

Most renewables technology is run intermittently due to the required conditions for generation and so capacity must be de-rated to take this into account. Biomass, which is non-intermittent, is classed as full capacity, while wind capacity is multiplied by a factor of 0.43, small scale hydro by 0.365 and solar by 0.17⁹. Taking this into account, along with the closures of Littlebrook and Ironbridge but excluding any new HV capacity (e.g. from offshore wind), “firm” capacity at the end of December 2015 may be around 66,140 MW.

Assuming a similar maximum demand figure as that in winter 14/15, maximum demand as a percentage of “firm” capacity in 2015 would be around 79.4 per cent, a margin of 26 per cent (or 13.6 GW). This compares to the 2012 margin of 37 per cent (20.6 GW). Although this represents a drop in margin, this is still significantly above maximum demand.

In addition to this, GB now has access to around 4 GW of interconnector capacity with continental Europe and Ireland, which may be available depending on relative market conditions.

While table 4 looks at supply to the transmission network, there is also increasing generation capacity on the Low Voltage (LV) distribution networks, particularly from renewables, which will reduce demand on the transmission network during their generation period. Solar capacity, which made up 29 per cent of overall renewables capacity as of the end of June 2015, has increased by over 300 times since the end of 2009 but is typically connected to the LV network, and would not be expected to reduce demand on the HV network at peak demand time as this usually occurs on winter evenings when solar flux is low.

User feedback

We welcome all feedback from users; therefore, if you have any comments or queries regarding this analysis, please contact either Sophie Brough or Stephen Ashcroft using the contact details below.

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⁹ Paragraph 5.80 of the Digest of United Kingdom Energy Statistics (DUKES), available from the same link as above.