The GB 2014 capacity auction results

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The 2014 capacity auction closed on 18th December 2014 at 1630 GMT, with the results published the next day (National Grid, 2014b). A total of 64,969.341 MW entered the Auction, of which 75.82 % received Capacity Agreements for delivery in 2018/19. A total of 15,710.403 MW exited the auction above the clearing price. Tables 1 and 2 are reproduced from that report (with minor changes) and give the results by Capacity Market Unit (CMU). The amount procured of 49.3 GW makes allowance for deductions from the target amount of 53.3-*w*-*x*-*y*-*z*-0.4 GW but is almost 1 GW higher than the target amount as the price cleared at a significantly lower level (£19.40/kWyr) than the price at the target level of £49/kWyr, as figure 1 demonstrates.

Table 1: Breakdown of Awarded Capacity by CMU Classification and technology

	Capacity (MW)	Capacity (%)	Number of CMUs	Number of CMUs (%)
Existing CMUs	33,566.006	68.14%	185	60.46%
Refurbishing CMU	7,048.927	14.31%	17	5.56%
pre-refurbishment CMU	5,848.684	11.87%	12	3.92%
New Build Generating CMU	2,621.151	5.32%	77	25.16%
Unproven DSR CMU	165.945	0.34%	13	4.25%
Proven DSR CMU	8.225	0.02%	2	0.65%
Total	49,258.938	100.00%	306	100.00%
of which				
CCGT	22,258.65	45.19%	47	15.36%
CHP & autogeneration	4,235.07	8.60%	36	11.76%
Coal/Biomass	9,232.18	18.74%	29	9.48%
DSR	174.17	0.35%	15	4.90%
Hydro	682.162	1.38%	29	9.48%
Nuclear	7,876.11	15.99%	16	5.23%
OCGT & reciprocating engines	2,101.22	4.27%	121	39.54%
Storage	2,699.37	5.48%	13	4.25%

[1] The author (dmgn@cam.ac.uk) is a member of the DECC Panel of Technical Experts advising on the GB capacity auction but writes this in his academic capacity using only published material and the views expressed here cannot be taken as representing the views of either institutions. He is indebted to comments from colleagues but they cannot be held responsible for my interpretation.

Table 2. Capacity exited by CMU Classification and technology

	Capacity (MW)	Capacity (%)	Number of CMUs	Number of CMUs (%)
Existing Generating CMUs	5,900.76	37.56%	17	16.35%
Refurbishing CMUs	2,585.51	16.46%	8	7.69%
New Build Generating CMU	6,794.88	43.25%	63	60.58%
Unproven DSR CMU	429.25	2.73%	16	15.38%
Proven DSR CMU	0	0.00%	0	0.00%
Total	15,710.40	100.00%	104	100.00%
of which				
CCGT	8,846.95	56.31%	16	15.38%
CHP & autogeneration	541.71	3.45%	7	6.73%
Coal/Biomass	4,499.19	28.64%	7	6.73%
DSR	429.25	2.73%	16	15.38%
OCGT/reciprocating engines	1,344.71	8.56%	57	54.81%
Storage	48.59	0.31%	1	0.96%

The auction produced several surprises. First, National Grid (2014a) as advisor on the auction, set the target volume to procure at the intersection of the demand schedule with the cost of new entry (CONE), estimated at £49/kWyr, whereas the auction cleared at £(2012) 19.40/kWyr, less than 40% of the predicted value.

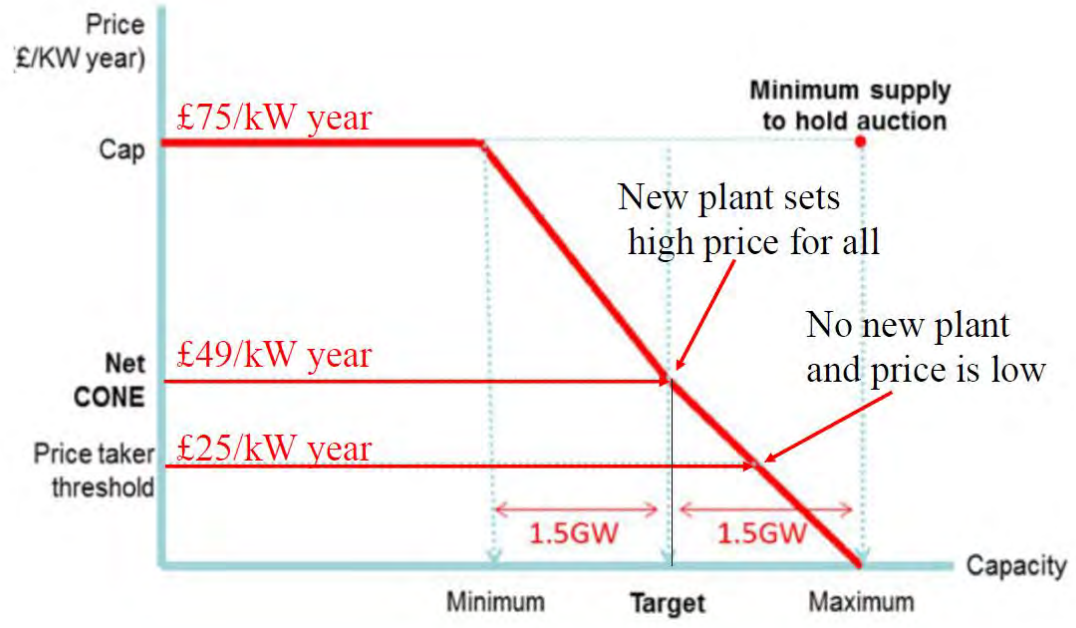

Figure 1 Demand schedule set for capacity auction
Source: DECC (2013, p58), National Grid (2014a)

The estimated CONE was based on new entry of CCGT, and in fact a single CCGT (but 2 CMUs) entered,[2] supplying about 60% of the total of 2,795 MW of new entry, as shown in figure 2. Second, the next largest technology of new entry contributing 28% was OCGT/ reciprocating engines with an average size of 11 MW.

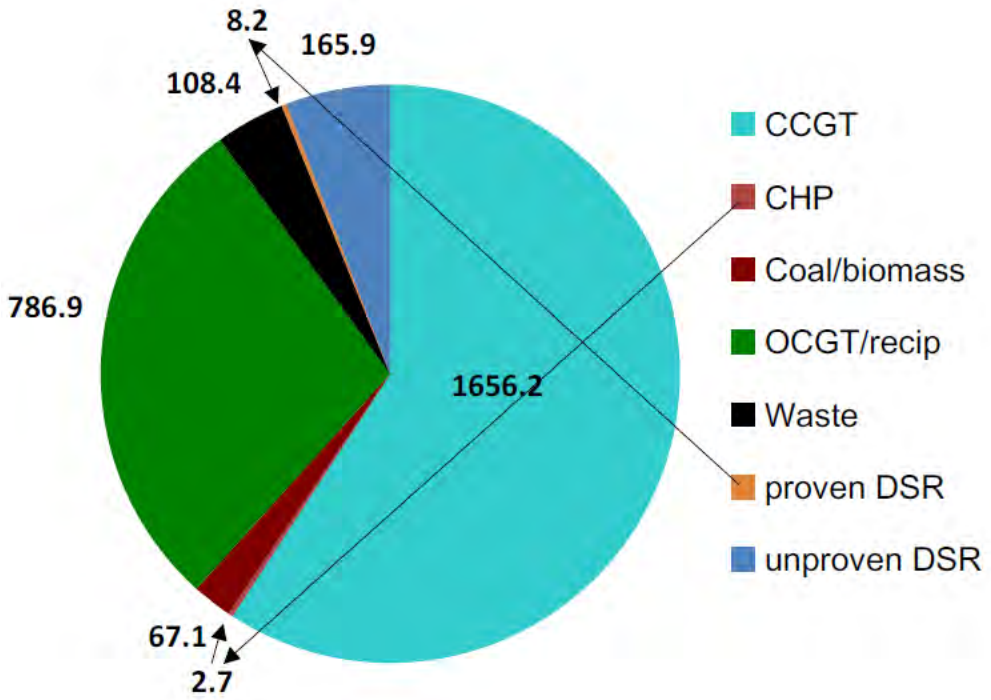

Figure 2 Volume (MW) of new build procured for 2018-19 delivery
Source: National Grid (2014b)

The third largest contribution (6%) was from unproven DSR (all DSR has a one-year agreement, as does all existing plant, while other new entry has a 15-year agreement). One new waste multi-fuel (listed as coal/biomass) plant of 67 MW gained a new entry agreement.

One might have expected that DSR and OCGT/reciprocating engines would require a lower capacity price, particularly as they can contribute to significantly

[2] "Wainstones Energy Ltd (a wholly owned subsidiary of Carlton Power) received a Section 36 Consent from the Department of Energy and Climate Change (DECC) to construct a 1,520MW gas-fired power station to be known as Trafford Power Station on the former coal-fired Carrington Power Station site in April 2010. … new advanced gas turbine units are now commercially available with a capacity of 600MWe. These new units also have the benefit of increased efficiency approaching 61%. This would make Trafford Power one of the most efficient and cleanest gas-fired power stations in the world. Additionally, the technology is designed for very flexible operation with regular start/stop cycles to provide effective back up for the increased amount of intermittent renewable energy generation predicted in the UK." Downloaded from http://www.traffordpower.co.uk/about-trafford-power-station/ on 12/2/15.

reducing TNUoS charges for Load in triad periods if they are embedded with major loads,[3] but the low price that the CCGT was willing to accept is surprising, and may be based on optimistic views both of gas prices (which were expected to decline by the time of the auction) and the possibility that wholesale prices would not fall with the fall in gas prices (perhaps an illustration of the winner's curse). Figure 3, taken as a screen shot from Platts (at http://www.platts.com/price-assessments/natural-gas/uk-nbp) shows that GB gas prices at the National Balancing Point (NBP) appeared to track oil prices closely until the end of 2013, while figure 4 shows futures prices of US crude oil from Nymex indicating a gradual decline starting in August 2014, falling to below $60 before the auction, and with the trend showing at that time no indication of a halt to the decline.

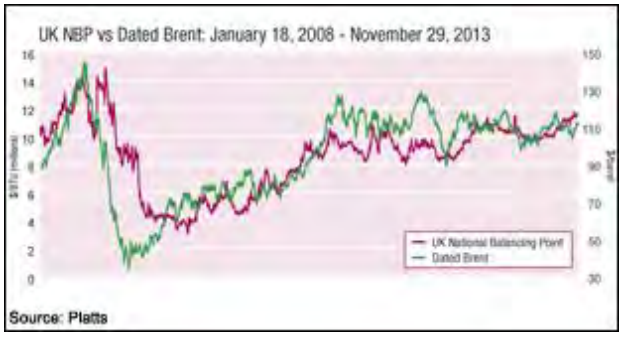

Figure 3 Relationship between oil and GB gas prices

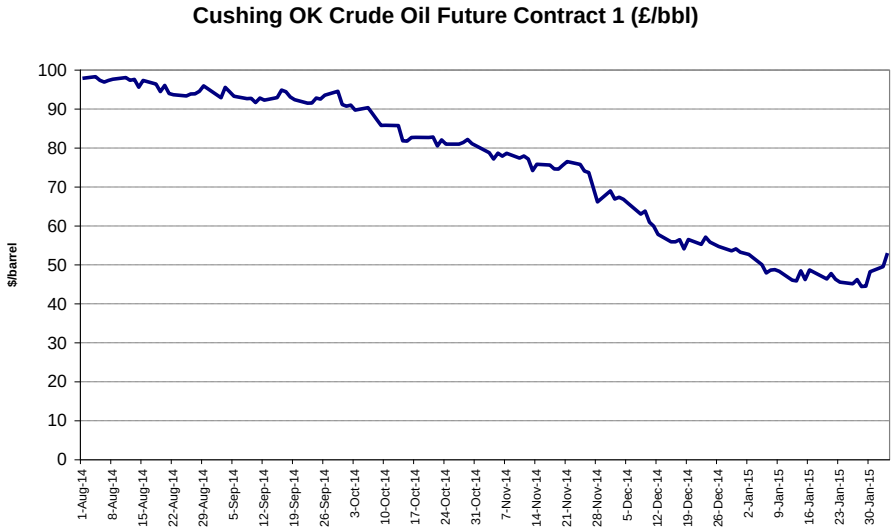

Figure 4 Crude Oil futures prices in New York, August 2014 to Feb 2015.
Source: EIA at http://www.eia.gov/dnav/pet/pet_pri_fut_s1_d.htm

[3] Load above a minimum size has to pay annual Transmission (TNUoS) charges based on their retrospective demand in the "triad" – the three half-hours of maximum system load separated by at least 10 days.

The European oil prices are essentially the same as the US futures prices, as the IEA in figure 5 data from https://www.iea.org/oilmarketreport/omrpublic/ shows.

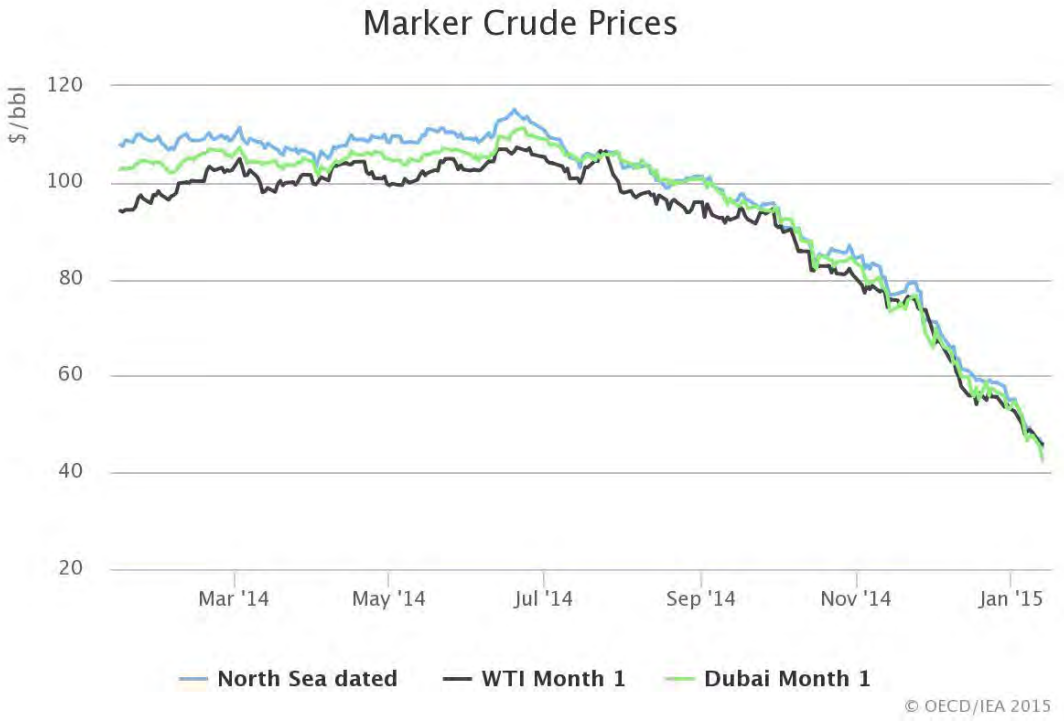

Figure 5 Crude oil spot prices in Europe

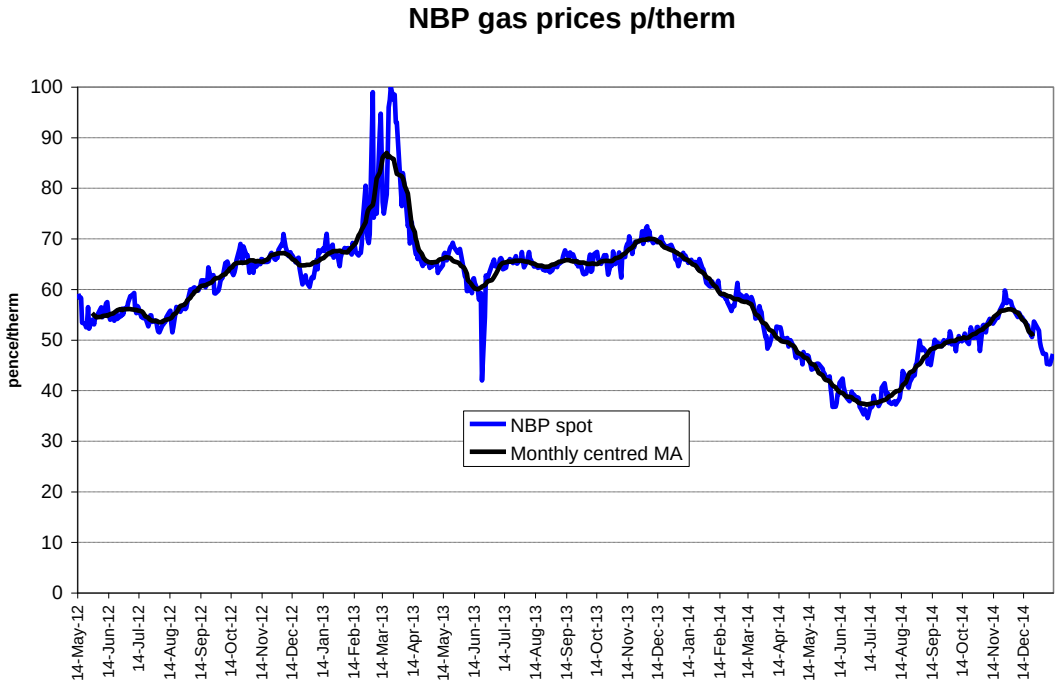

Figure 6 GB spot gas prices at NBP

Forward gas prices in GB in January 2015 are down 28% compared to last year according to *Energyspectrum* 459 but the NBP spot prices in figure 6 were rising from June 2014, giving a somewhat different picture from the futures oil price. Perhaps that reflects the fact that at least in the short run, gas and oil prices in GB are now delinked. It is therefore plausible that an optimist (not worried about the winner's curse) projected weak oil prices lasting quite some time (the 1986 oil price crash lasted nearly 2 decades) and that eventually the gas-oil price link would reassert itself. The fact that the new entry CCGT is more efficient that existing CCGTs should mean that it runs a larger fraction of the time, which will help its revenues. It could pull out of the agreement if the replacement capacity cost became even lower, although that would incur substantial penalties,[4] not to mention the costs already incurred up to the exit moment).

References

DECC (2013). *Electricity Market Reform – Capacity Market Impact Assessment*
National Grid (2014a). *National Grid EMR: Electricity Capacity Report.*
National Grid (2014b). *Provisional Auction Results: T-4 Capacity Market Auction 2014*

[4] Collateral is forfeit 18 months after the auction if they cannot demonstrate that the project is actively under development, leaving time to replace the capacity at the T-1 auction.