

UK Energy Policy Before and After the 2015 General Election

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Outline

- Introduction and background
- Electricity Market Reform Update
- Energy Policy and the 2015 General Election (7 May)
- What Energy Policy Should Be
- Concluding Thoughts

INTRODUCTION AND BACKGROUND

UK Decarbonisation targets

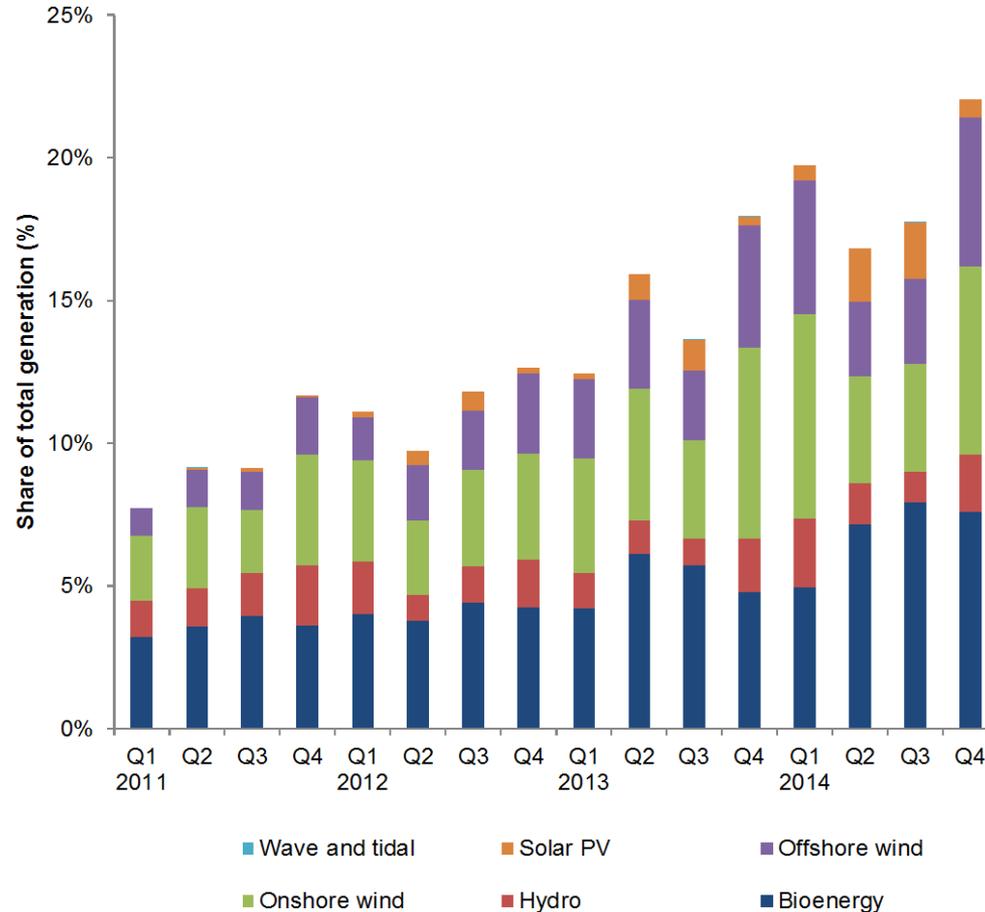
- UK in 2014 GHGs: -35.7% relative to 1990
- Kyoto Target: -12.5% by 2012; UK Target -34% by 2020
- 2008 Climate Change Act:
 - 80% reduction by 2050
 - Climate Change Committee
 - Five Year Carbon budgeting
 - Latest projections: 90%+ decarbonisation of electricity by 2030
 - Latest target: -50% relative to 1990 by 2023-27.

UK Renewables Targets

- UK committed to 15% target for renewables contribution to total final energy consumption in 2020 (2009/28/EC) (5.2% in 2013)
- The 'target' is for c.30% of electricity from renewables by 2020 as part of the above (19.2% in 2014).
- Previous 2010 target of 10% for electricity from renewables (2001/77/EC) missed. Only 7.3% was achieved.
- Clearly, strong policies are required.

Growth of Renewables in UK

Chart 6.1 Renewables' share of electricity generation



Source: Energy Trends March 2015, p.48.

ELECTRICITY MARKET REFORM UPDATE

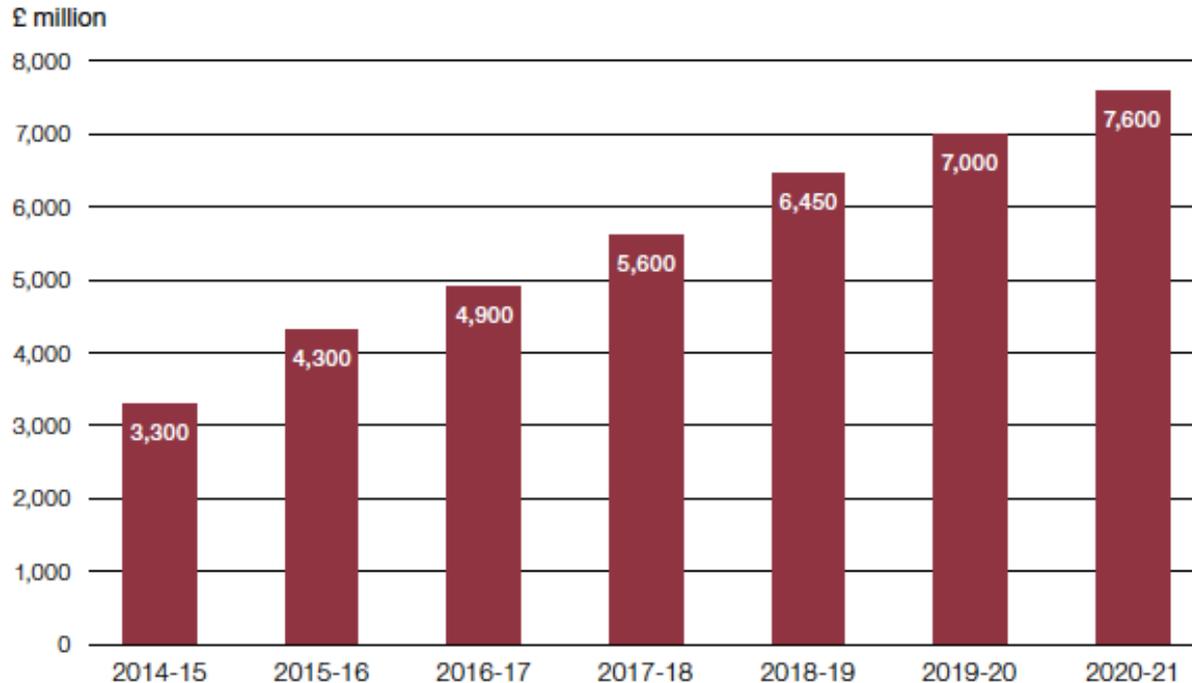
EMR – Electricity Market Reform

- Four elements proposed in December 2010:
 - 1. Fixed prices for low carbon generation (CfD-FiTs)
 - 2. Carbon Price Support (CPS)
 - 3. Capacity Mechanism (CM)
 - 4. Emissions Performance Standard (EPS)
- Draft Energy Bill issued in May 2012, legislated in 2013. Subject to a subsidy control framework.
- ***EMR remains flagship decarbonisation policy.***

Subsidy Control Framework for Electricity

Figure 3

Levy Control Framework caps for electricity policies rise to 2020-21



Total expenditure on Electricity is c.£33bn.

Notes

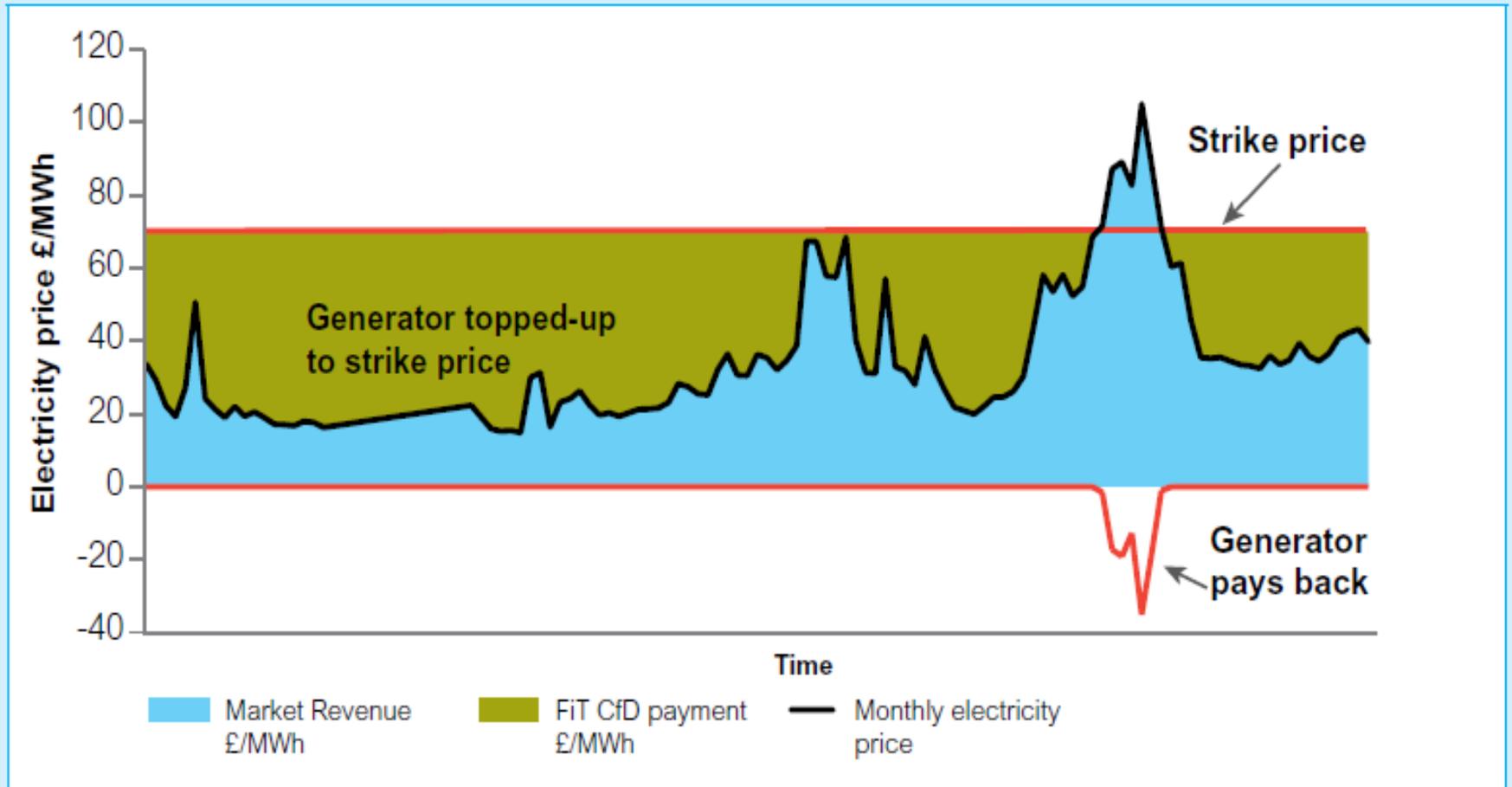
- 1 The Department has published Framework caps to 2020-21 in 2011-12 prices.
- 2 The Department publishes Framework caps in nominal terms at the time of the relevant spending review or spending round. It has, however, estimated that the cap in 2020-21 will be £9.8 billion in nominal terms (i.e. 2020-21 prices).

Source: Department of Energy & Climate Change

Exceeding cap in 2014-15 but below 20% headroom.
Source: The Levy Control Framework, NAO 2013, p.6.

(1) CfD-FIT

Figure 5: The operation of an intermittent Feed-in Tariff with Contract for Difference



Source: DECC (2011), *Planning our electric future: a White Paper for secure, affordable and low-carbon Electricity*, p.38.

(i) Support for Low Carbon Generation

The reform sets up of a system of contracts for differences (CFD-FITs) whereby the government would contract with low-carbon generators to supply electricity at fixed prices for a prolonged period. These contracts pay the generators the difference between the average wholesale price of electricity and the contract price.

New CfDs for 15 years indexed to general inflation (CPI).

Progress with CfDs

- Hinkley C, 35 year contract agreed with EdF and Chinese investors at £92.50 / MWh (2012) for delivery in 2023.
- Est. £1844m p.a. cash flow net of running cost and decommissioning fund (DECC, 2013, costs)
- NPV of Hinkley C discounted cash flow from 2023:
 - £19564 m, at 10% p.a. for 35 years
 - £31707 m, at 5% p.a. for 35 years
- This implies a refinancing gain of £12bn if on budget opening of plants.
 - This is equivalent to a £28 / MWh
 - i.e. Strike price could be £64.50 / MWh
- EU did push back on refinancing of project.
- Project now on hold.

Draft strike prices... (£1 = 1.4 Euro)

	Levy Control Framework – Upper Limits on Spend (£m) (2011/12 prices) ¹						
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
	3,300	4,300	4,900	5,600	6,450	7,000	7,600
Renewable Technology	Draft Strike prices (£/MWh) (2012 prices)					Potential 2020 Deployment Sensitivities (subject to VfM and cost reduction) (GW) ²	
	2014/15	2015/16	2016/17	2017/18	2018/19		
Advanced Conversion Technologies ³ (with or without CHP ⁴)	155	155	150	140	135	c. 0.3	
Anaerobic Digestion (with or without CHP)	145	145	145	140	135	c. 0.2	
Biomass Conversion ⁵	105	105	105	105	105	1.2 – 4	
Dedicated Biomass (with CHP) ^{6,7}	120	120	120	120	120	c. 0.3	
Energy from Waste (with CHP) ⁸	90	90	90	90	90	c. 0.5	
Geothermal (with or without CHP) ⁹	125	120	120	120	120	< 0.1	
Hydro ¹⁰	95	95	95	95	95	c. 1.7	
Landfill Gas	65	65	65	65	65	c. 0.9	
Offshore Wind	155	155	150	140	135	8 – 16	
Onshore Wind	100	100	100	95	95	9 – 12	
Sewage Gas	85	85	85	85	85	c. 0.2	
Large Solar Photo-Voltaic	125	125	120	115	110	2.4 – 3.2	
Tidal Stream ¹¹	305	305	305	305	305	c. 0.1	
Wave ¹²	305	305	305	305	305		

Notes:

1st CfD Auction results Feb 2015

Technology		2015/16	2016/17	2017/18	2018/19	Total Capacity (MW)
Advanced Conversion Technologies	£/MWh			119.89	114.39	
	MW			36	26	62
Energy from Waste with Combined Heat and Power	£/MWh				80	
	MW				94.75	94.75
Offshore wind	£/MWh			119.89	114.39	
	MW			714	448	1162
Onshore wind	£/MWh		79.23	79.99	82.5	
	MW		45	77.5	626.05	748.55
Solar PV	£/MWh	50	79.23			
	MW	32.88	38.67			71.55

Source: DECC

(2) Carbon Pricing

The reform introduced a carbon price support (CPS) based on the existing climate change levy (CCL). This involves increasing the rate and coverage of the climate change levy to effectively increase the price of carbon emissions from the electricity sector in the UK above that in the rest of the EU.

Began April 2013 with a target CO₂ price is £30/tonne (in 2009 terms) – forward EUA price + CPS - by 2020 (possibly £70/tonne by 2030). *However CPS now capped at £18 /tCO₂ (now binding).*

The CPS directly impacts the wholesale price via raising the price of marginal fossil generation. In 2015-16 it will raise household bills by 5-11%, and revenue of £2bn, making it difficult to get rid of.

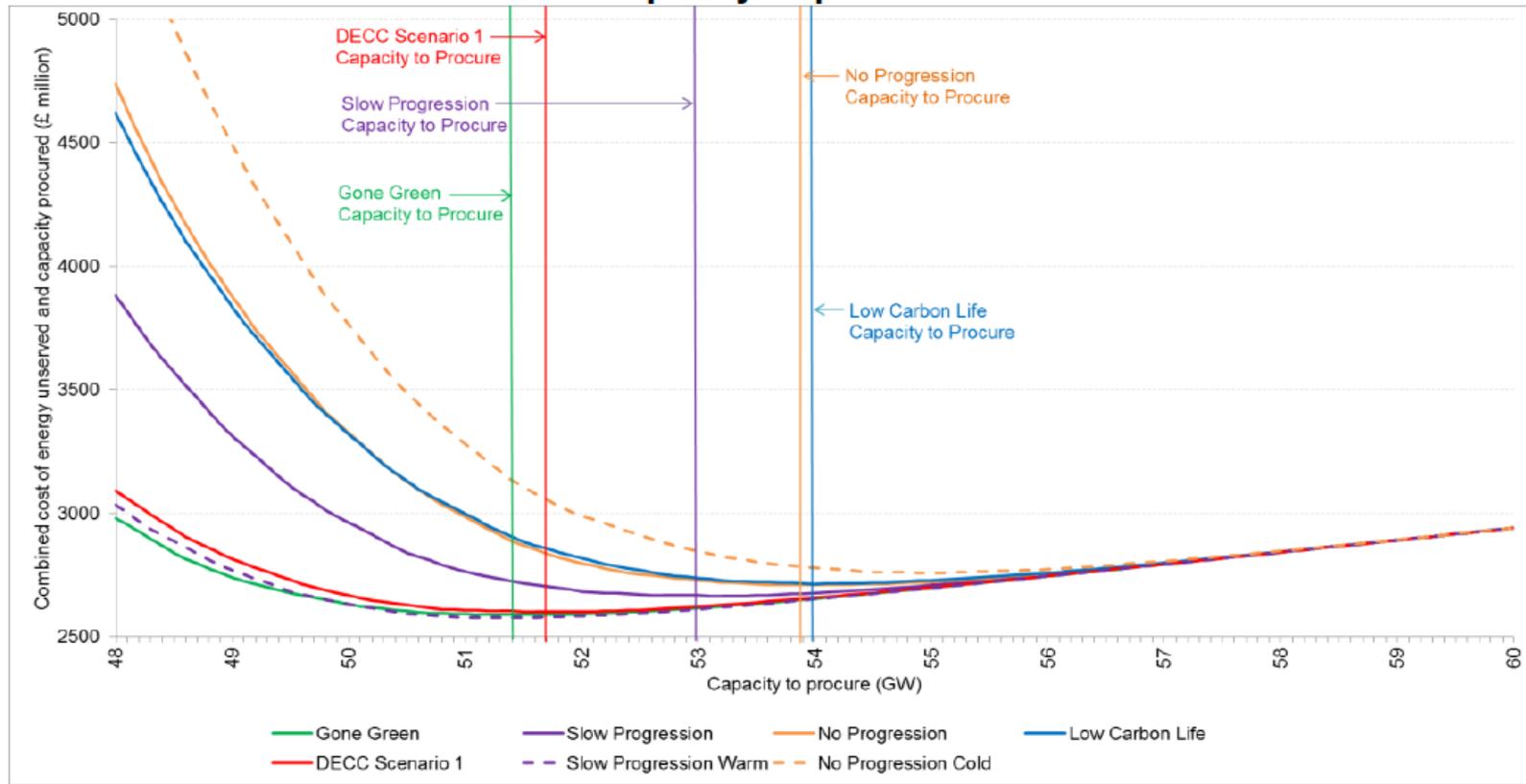
(3) Capacity Mechanism

The reform has introduced a capacity mechanism (CM) to contract for the necessary amount of capacity to maintain security of supply. This involves the introduction of payments to generators for maintaining availability, supplementing the market for units of electrical energy that exists at the moment. This deals with predicted low capacity margins by 2018.

Note: The amount of capacity to be contracted for is decided by the government.

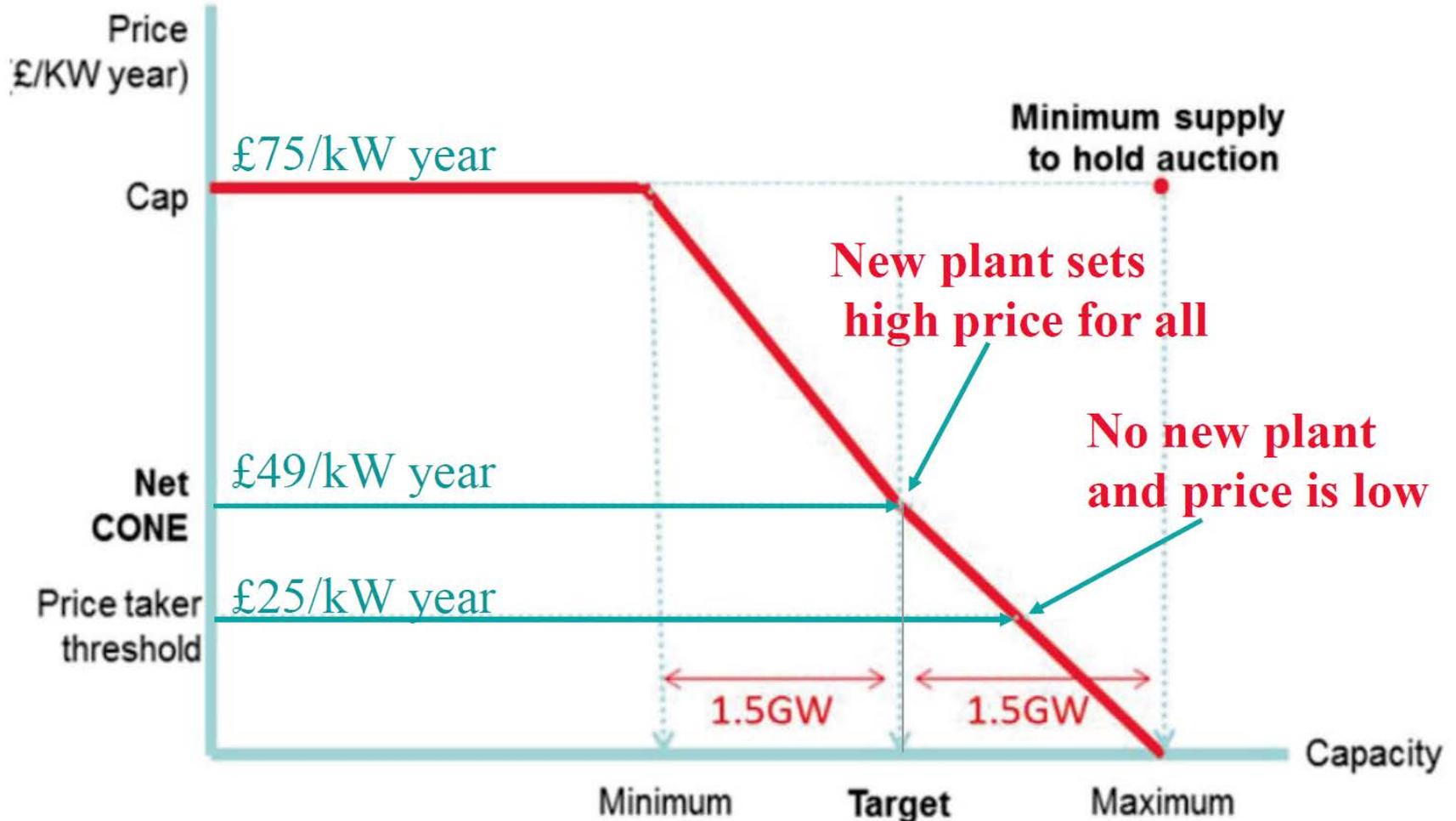
How much capacity?

Figure 12: Combined cost of energy unserved and procured capacity against capacity to procure



Source: National Grid (2014, p.50)

Capacity Market auction design



CONE = Cost of New Entry
Source: DECC and David Newbery

GB Capacity Market Auction for 2018/19

Figure 1 shows the Demand Curve and the supply curve. The supply curve is found by cumulatively adding the Bidding Capacities of CMUs, according to their Exit Ranking. The supply curve meets the Demand Curve at a Price of £19.60 / kW.

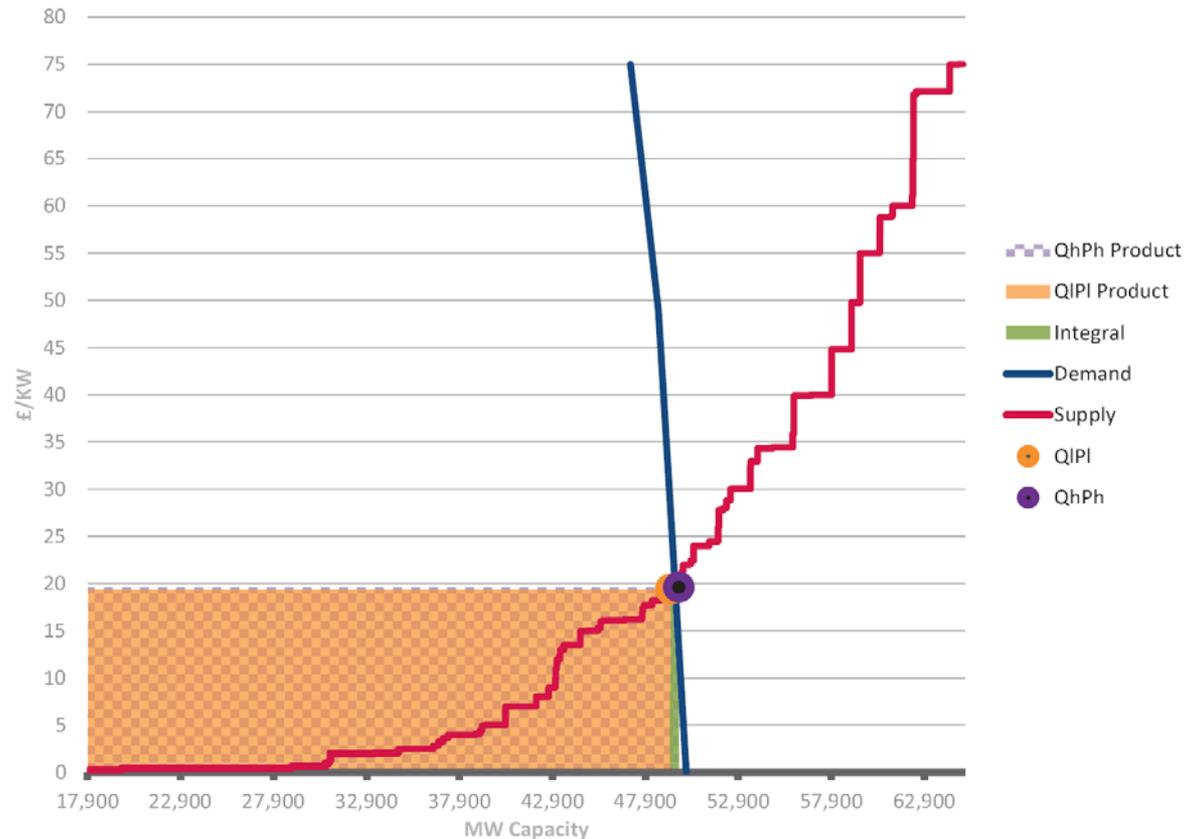


Figure 1: The Supply Curve

Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/389832/Provisional_Results_Report-Amendment.pdf

Capacity auction results

- Target 53.3 GW, with 2.5 GW acquired at T-1.
- EMR Expert Panel on capacity mechanism critical of calculation of capacity requirement. At least 2.3GW of interconnectors available
- Assumed that no capacity due to interconnectors. Actually should be 2.3 GW (or 62%), by 2018 this could be 3.3 GW.
- The Clearing Price is: **£ 19.40 / kW / year**
- The Aggregate Bidding Capacity of Capacity Market Units awarded Capacity Agreements is: **49,258.938 MW. Cost: £955m.**
- **So probably over paid by *at least* £260m.**

(4) Emissions Performance Standard (EPS)

New supercritical coal fired generation has average CO₂ emissions of around 790g/kWh; a modern gas-fired power plant about 360g/kWh. The reform introduces an emissions performance standard (EPS) for all new power plants of 450g/kWh, designed to rule out the building of new coal-fired power plants without carbon capture and storage (CCS) technology fitted (to a substantial part of a new plant).

Note: that new peaking plant will be permitted as maximum emissions are calculated at an 85% load factor.

Emissions Performance Standard

- The EPS may be having an impact.
- Coal prices remain very low at 0.772p/kWh, with gas prices at 2.026p/kWh (DECC, QEP321, Q4 2014);
- At 45% and 60% efficiencies, the fuel cost of a kWh of coal and gas would be:
 - 1.72p/kWh (coal) and 3.38p/kWh (gas) of electricity
- This would need an EUA price of c.£38/tCO₂ or 52 Euro/tCO₂ to make gas attractive.

Conclusions on EMR experience so far

- CfD auctions look good, administered contracts look bad.
- Carbon Price Support (CPS) has hit predictable problems of unsustainability.
- Capacity auction has been politicised as predicted and been unnecessarily costly.
- Emissions Performance Standard (EPS) may be preventing investment in coal.
- Pushing UK back towards government as 'single buyer' of generation...

ENERGY POLICY AND THE 2015 GENERAL ELECTION

What happened after 2010 General Election?

- The coalition agreement specified three elements of EMR (CfD-FiTs, CPS, EPS) and hinted at the fourth (CM). The four elements of EMR that emerged were drawn from the Committee on Climate Change, *Meeting Carbon Budgets – the need for a step change*, Progress Report 2009 (where even wider capacity obligation is mentioned).

What the CCC are saying this time?

- Committee on Climate Change, *Meeting Carbon Budgets – 2014 Progress Report to Parliament*, July 2014, is a very important guide.

CCC Suggestions 1 (p.16-17)

- ‘By 2016, publish a strategy to **develop carbon capture and storage (CCS)** in both power and industry, including CO2 infrastructure development, minimum levels of deployment over the period to 2030...
- **Strengthen the near-term framework for energy efficiency improvement** in residential buildings: increase ambition on insulating lofts and cavity walls while finalising the Energy Company Obligation (ECO)...
- Develop additional measures to tackle fuel poverty in England to supplement the Affordable Warmth element of the ECO, **possibly including targeting of the RHI.**
- In 2016, **set a carbon intensity target range for 2030 under the Energy Act 2013**...(e.g. 50-100 g/kWh).’

CCC Suggestions 2

- ‘Work with partner organisations (e.g. industry, local authorities, the Green Investment Bank) **to tackle financial and non-financial barriers to electric vehicle uptake by providing:** new, low-cost approaches to financing; on- street residential charge points and a national network of rapid charge points; softer time-limited measures such as access to bus lanes and parking spaces.
- **Over time, adjust fiscal levers** (i.e. Vehicle Excise Duty, Company Car Tax and Enhanced Capital Allowances) to align to new vehicle CO2 targets and provide additional incentives for ULEVs.’

CCC Suggestions 3

- **‘When considering future airport expansion, plan on the basis of 2050 emissions at around 2005 levels, implying an increase in demand – provided aircraft efficiency continues to improve significantly – of around 60% on 2005 levels by 2050.**
- Use the **“2050 decarbonisation roadmaps”**, planned for spring 2015, to identify and set out the opportunities for reducing emissions in industry, then by 2017 publish a strategy for delivering abatement in the 2020s.’

Before the election...

- *A Conservative led coalition* might continue with existing policies, possibly with more opposition on onshore wind and more support for natural gas.
- *A Labour led coalition* would introduce a price freeze (cap), an Energy Security Board to decide on the mix of generation and a National Infrastructure Commission (again!).
- EMR will continue untouched but the levy control framework may begin to bite by the end of the parliament, in terms of threatening achievement of 2023-2027 carbon budget of -50% on 1990 levels.

Conservative Manifesto – Action Plan (p.57)

‘We will promote competition to keep your bills as low as possible

We have helped increase the number of independent energy suppliers from seven to 21, made it easier for customers to switch to better deals, slashed the number of tariffs to just 4 per supplier, and cut switching times in half. We will go even further, implementing the recommendations of the Competition and Markets Authority investigation that we triggered. We will ensure that every home and business in the country has a SmartMeter by 2020, delivered as cost-effectively as possible, so consumers have instant, accurate bills and can switch to an alternative provider within one day. And we will support low-cost measures on energy efficiency, with the goal of insulating a million more homes over the next five years, supporting our commitment to tackle fuel poverty.’

Conservative Manifesto – Action Plan

'We will secure your energy supplies

We will continue to support the safe development of shale gas, and ensure that local communities share the proceeds through generous community benefit packages. We will create a Sovereign Wealth Fund for the North of England, so that the shale gas resources of the North are used to invest in the future of the North. We will continue to support development of North Sea oil and gas. We will provide start-up funding for promising new renewable technologies and research, but will only give significant support to those that clearly represent value for money.'

Conservative Manifesto – Action Plan

‘We will halt the spread of onshore windfarms

Onshore wind now makes a meaningful contribution to our energy mix and has been part of the necessary increase in renewable capacity. Onshore windfarms often fail to win public support, however, and are unable by themselves to provide the firm capacity that a stable energy system requires. As a result, we will end any new public subsidy for them and change the law so that local people have the final say on windfarm applications.’

Conservative Manifesto – Action Plan

‘We will protect our planet for our children

We have been the greenest government ever, setting up the world’s first Green Investment Bank, signing a deal to build the first new nuclear plant in a generation, trebling renewable energy generation to 19 per cent, bringing energy efficiency measures to over one million homes, and committing £1 billion for carbon capture and storage. We are the largest offshore wind market in the world. We will push for a strong global climate deal later this year – one that keeps the goal of limiting global warming to two-degrees firmly in reach. At home, we will continue to support the UK Climate Change Act. We will cut emissions as cost-effectively as possible, and will not support additional distorting and expensive power sector targets.’

Commitments since General Election...

- **Boosting UK oil and gas production:**
 - by creating an independent regulator for exploration and production from the territorial sea and UK continental shelf.
 - will promote industry collaboration (following independent Wood Review) in order to drive down costs.
- **Local planning authorities to decide on onshore wind applications**
 - Currently Secretary of State for Energy and Climate Change decides on projects greater than 50 MW.
 - This power will transfer to local planning authorities.
- **Support for comprehensive, rules based agreement on climate change in Paris in December**
 - Reaffirms UK commitment to limiting global warming to 2 degrees
 - Notes that EU, US and China are committed to a deal.

(Source: Amber Rudd blog on Queen's Speech on DECC website)

WHAT ENERGY POLICY SHOULD BE

What energy policies should be pursued?

- The most important **potential driver of change is at the EU level**: on the ETS, on RES markets, on product and vehicle standards. For anyone interested in cost effective policy that may actually work, this is where the real action is. The UK must actively support EU efforts (which are largely sensible) on energy and climate. This will involve adjusting the CPS and CM.
- In power **increased emphasis on market mechanisms in procurement** (CfD auctions) and efficient connection. This would be facilitated by non-firm connection, and small scale DG and DSM procurement auctions. There is the possibility of DSO platform markets being established (as in the State of New York).

What energy policies should be pursued?

- **CfD-FiT contracts need to be made more politically robust.** This involves removing some or all of the linking to inflation and improving the refinancing gains / the performance benefits to consumers (as is the case in Germany).
- There should be **on-going reform of energy taxation**, clearly taxing winter fuel payments and raising VAT on electricity and gas while switching subsidies to general taxation make fiscal sense. It would also make sense to move towards increasing road user charges ahead of falling petroleum taxes. CPS needs to be made non-distortionary to trade.

What energy policies should be pursued?

- **The CMA should be allowed to determine what happens to the regulation of residential energy prices.** However it seems clear that some light regulation of the standard variable tariff (default tariff) is necessary.
- **An independent system operator (ISO) needs to be created,** to oversee non-discriminatory access to the transmission grid across the UK and to move towards world best practice on the use of IT on the network, nodal pricing and market integration. It would also allow Ofgem to concentrate on economic analysis and impact monitoring rather than delivery.

What energy policies should be pursued?

- There should be **an increased emphasis on transport decarbonisation, then heat, then power** (which has been dealt with). This implies that there is still a need for emphasis on energy R+D and innovation, as there are several exciting developments in prospect e.g. on solar, in batteries, in EVs, in building materials, in product efficiencies.
- There needs to be a move towards the **creation of a whole BI energy market framework**, that is robust to the reality of coalition governments (and devolution, the potential break-up of the UK and integration with ROI) and avoids energy market policy being reset every five years, in the face of a large degree of consensus about policy targets.

CONCLUDING THOUGHTS

Concluding thoughts

- EMR continues as flagship energy policy
- Labour's energy price freeze no more
- Onshore wind under some threat
- Climate action commitment reaffirmed

- Almost all of the weaknesses of current policies still need to be addressed, of which the cost of decarbonisation by 2020 is key...
- BREXIT issues unlikely to effect energy policy.

Reading

- EMR Panel of Technical Experts' (2014) *Final Report on National Grid's Electricity Capacity Report*, London: DECC.
- National Grid (2014a). *Electricity Capacity Report*, at <http://www2.nationalgrid.com/UK/Our%20company/Electricity/Market%20Reform/Announcements/June%202014%20Auction%20Guidelines%20publication/>
- National Grid (2014b). *Provisional Auction Results: T-4 Capacity Market Auction 2014*, at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/389832/Provisional_Results_Report-Amendment.pdf
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- Pollitt, M. and Haney, A.B. (2013), 'Dismantling a Competitive Electricity Sector: The UK's Electricity Market Reform', *The Electricity Journal*, Vol.26, No.10, pp.8-16. *Critique of government EMR*.

UK Electricity Generation

Chart 5.2 Shares of electricity generation

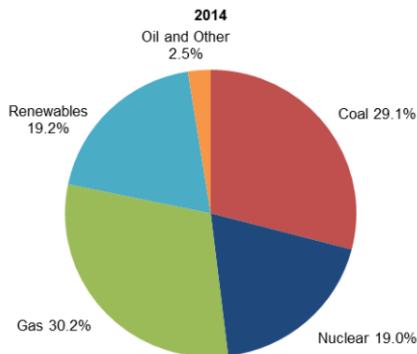
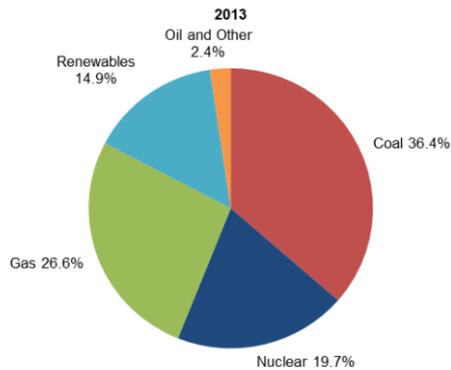
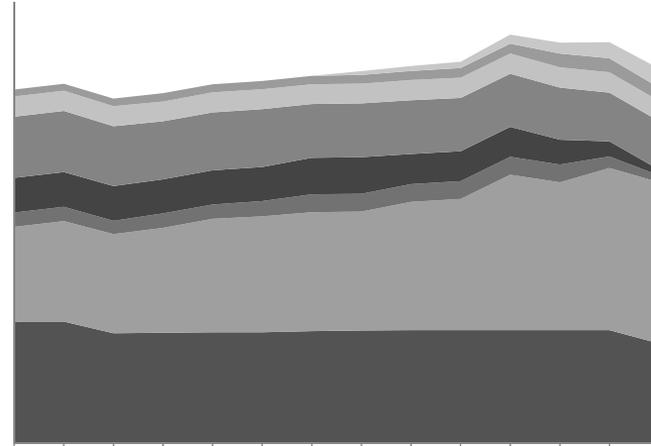


Chart 5.3: Generating capacity of major power producers 2000-2013



Source: DUKES 2014, p.121.

Source: Energy Trends March 2015, p.40