Title: **Energy Bill 2012 Impact Assessment: Liquidity Measures** **IA No: DECC0078** **Lead department or agency: DECC** **Other departments or agencies:** N/A	**Impact Assessment (IA)** **Date: 31/08/2012** **Stage: Final** **Source of intervention:** Domestic **Type of measure: Primary Legislation** **Contact for enquiries:** Vikram.balachandar@decc.gsi.gov.uk; Nick.geddes@decc.gsi.gov.uk

Summary: Intervention and Options

RPC: RPC Opinion Status

Cost of Preferred (or more likely) Option				
Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANCB in 2009 prices)	**In scope of One-In, One-Out?**	**Measure qualifies as**
£-0.26m	£0	£0	Yes	Zero Net Cost

What is the problem under consideration? Why is government intervention necessary?

The GB wholesale electricity market suffers from low liquidity. This creates a barrier to entry to independent generation and retail supply and could also prevent the successful and cost-effective delivery of Government's security of supply and decarbonisation goals. The rationale for regulatory intervention on liquidity is that poor liquidity may be explained by reciprocal externalities theory, a "market failure" whereby the market is stuck at a low liquidity equilibrium. Ofgem is currently developing proposals for interventions to enhance liquidity in GB wholesale electricity markets. However, there is a risk that Ofgem and industry actions may not be sufficient or timely enough to meet wholesale electricity market objectives. The Secretary of State needs to take powers to, if it proves necessary, improve liquidity to ensure that Government's decarbonisation, security of supply and affordability objectives can be met.

What are the policy objectives and the intended effects?

Government's objective in seeking to take powers is to gain certainty that appropriate action can be taken, if needed, to ensure cost-effective delivery of its decarbonisation and security of supply goals and contestable retail and wholesale markets. We aim to do this whilst minimising any potentially negative impacts incurred through the taking of primary powers.

This impact assessment examines the costs and benefits of taking primary powers. The impact of any specific interventions, if powers were exercised, would be examined separately, alongside any consultation on secondary legislation, with a full impact assessment.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

We have considered the following options:

-Option 1: "Do nothing": Government does not take primary powers on liquidity and transparency;
-Option 2: Taking powers to improve liquidity, with no constraints on using the powers;
-Option 3: Taking powers to improve liquidity, with constraints on using the powers;
-Option 4: Taking powers to support reference prices for CfDs only

In addition, we considered alternatives to regulation.

Option 3 is our preferred option, as it contributes most fully towards reducing barriers to entry to electricity generation and supply, thereby reducing costs to consumers, while limiting negative impacts on wider regulatory uncertainty.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 2018/19

Does implementation go beyond minimum EU requirements?			**N/A**		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro Yes**	**< 20 Yes**	**Small Yes**	**Medium Yes**	**Large Yes**
What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)			**Traded: N/A**	**Non-traded: N/A**	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister: Michael Fallon Date: 30/04/2013

Summary: Analysis & Evidence

Policy Option 3 (preferred)

Description: Taking powers to improve liquidity, with constraints on using the powers

FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2013	Time Period 7 years	Net Benefit (Present Value (PV)) (£m)		
			Low: N/A	High: N/A	Best Estimate: -0.26

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low				
High				
Best Estimate	0.26		N/A	**0.26**

Description and scale of key monetised costs by 'main affected groups'

Government staff and consultancy costs associated with exercising the primary powers (i.e. policy development and stakeholder engagement).

Other key non-monetised costs by 'main affected groups'

Direct costs of primary legislation include increased costs of capital for investors in the energy sector, as a result of a possible increase in regulatory uncertainty. Additionally, there may be delays to Ofgem's reforms and an increase in rent-seeking activity. Under Option 3, we judge these costs to be limited, since it would be clear that Government would work closely with Ofgem and ensure consistency with wider reforms.
Direct costs of specific interventions will be considered at the secondary legislation stage.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low				
High				
Best Estimate	N/A		N/A	**N/A**

Description and scale of key monetised benefits by 'main affected groups'

N/A

Other key non-monetised benefits by 'main affected groups'

Taking powers to support liquidity may be seen by potential investors and new entrants as insurance against the risk that market developments and Ofgem's interventions, if adopted, may not be sufficient or timely enough to allow them to appropriately manage the risks they face in the electricity market. It therefore contributes towards reducing barriers to entry to generation and retail supply, potentially reducing costs of capital, improving competition and ultimately reducing costs to consumers.

Direct benefits of specific interventions will be considered at the secondary legislation stage.

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5%

Government can successfully implement liquidity and transparency obligations if needed.

BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: N/A	Benefits: N/A	Net: 0.0	Yes	Zero Net Cost

Evidence Base (for summary sheets)

Contents

Background

1. This Impact Assessment (IA) examines the arguments for and against Government taking primary powers to intervene to support liquidity and transparency in the Great Britain (GB) wholesale electricity market. The impacts of any specific interventions, if powers are exercised, would be examined separately, alongside any consultation on secondary legislation, with a full impact assessment. This background section sets out:

   - the definition of liquidity and why it is important;
   - GB electricity trading arrangements;
   - GB energy market regulatory arrangements and the "Ofgem Review";
   - a summary of Ofgem's Liquidity project; and
   - the relevance of liquidity to Government's Electricity Market Reform (EMR) mechanisms.

The importance of liquidity

2. Liquidity is an important feature of a well-functioning market. We can define liquidity as the ability to quickly buy or sell a desired commodity or financial instrument without causing a significant change in its price and without incurring significant transaction costs. A key feature of a liquid market is that it has a large number of buyers and sellers willing to transact at all times[1].

3. Liquidity is a key driver of effective competition and market entry. In the context of a fully liberalised energy market, liquid wholesale markets are desirable as they:

   - facilitate new entry in generation and supply by allowing new entrants to buy and sell electricity to match their output and customer base with confidence;
   - reduce the ability of market participants to engage in market manipulation;
   - are likely to provide a wider range of products and counterparties for participants to hedge their risk exposure;
   - increase confidence in traded prices (a large number of gas and electricity supply contracts between buyers and sellers are referenced to market prices);
   - allow non-vertically integrated entrants to participate on the same terms (at the margin) as vertically integrated incumbent firms;
   - can allow parties to better manage long-term risk and provide long-term price signals about future market developments, which inform investment decisions and promote long-term security of supply; and
   - can allow market participants to fine tune their physical positions without incurring high costs.

GB electricity trading arrangements

4. The market is divided between network companies (transmission and distribution), generators and suppliers. National Grid is the System Operator responsible for the day to day real time operation of the network ensuring that supply and demand is in balance at all times.

5. The wholesale market is divided into 30 minute periods for trading purposes; "normal" trading occurs until one hour prior to the start of each period – a point known as "gate closure". After gate closure, electricity generators and purchasers may not trade any further with each other, but may trade with National Grid.

6. The GB electricity market (BETTA[2]) is based on bilateral trades between buyers and sellers (usually between generators and suppliers, who sell directly to consumers). Power is traded in different ways according to the needs and capabilities of market participants:

   - Off-market: These are trades arranged directly between two market participants. Such trades could include internal transfer within a vertically integrated group. Another mechanism for trading energy is through structured contracts where energy is purchased directly from generators or producers using contracts that are arranged bilaterally, often on a long-term basis (structured contracts are often considered as a subset of the OTC market). Structured contracts may not enhance liquidity as the energy is not sold via the wholesale markets (OTC platforms or exchanges), although volumes sold using structured contracts may be subsequently traded in the GB wholesale markets (contributing to

[1] "Liquidity in the GB wholesale energy markets", Ofgem, 8 June 2009.
[2] British Electricity Trading and Transmission Arrangements.

liquidity). However, the volumes and prices of such contracts may not be known which frustrates transparency, in particular price discovery.

- Over-the-Counter (OTC): In this document, OTC trades are taken to refer to trades arranged through a third-party broker who matches the requirements of each counter-party. Trades are posted through market information platforms. Counterparty risk is borne by the counterparties themselves, although in some cases brokerages may clear trades through exchanges or offer bespoke clearing services.
- On power exchanges: These allow parties to anonymously trade commodities, derivatives and other financial instruments. Exchanges trade contracts on standardised terms and conditions and provide clearing services that help to eliminate counterparty risk for traders. Trading can be continuous or through periodic auctions.

7. Trading can take place on spot, prompt or forward markets[3].

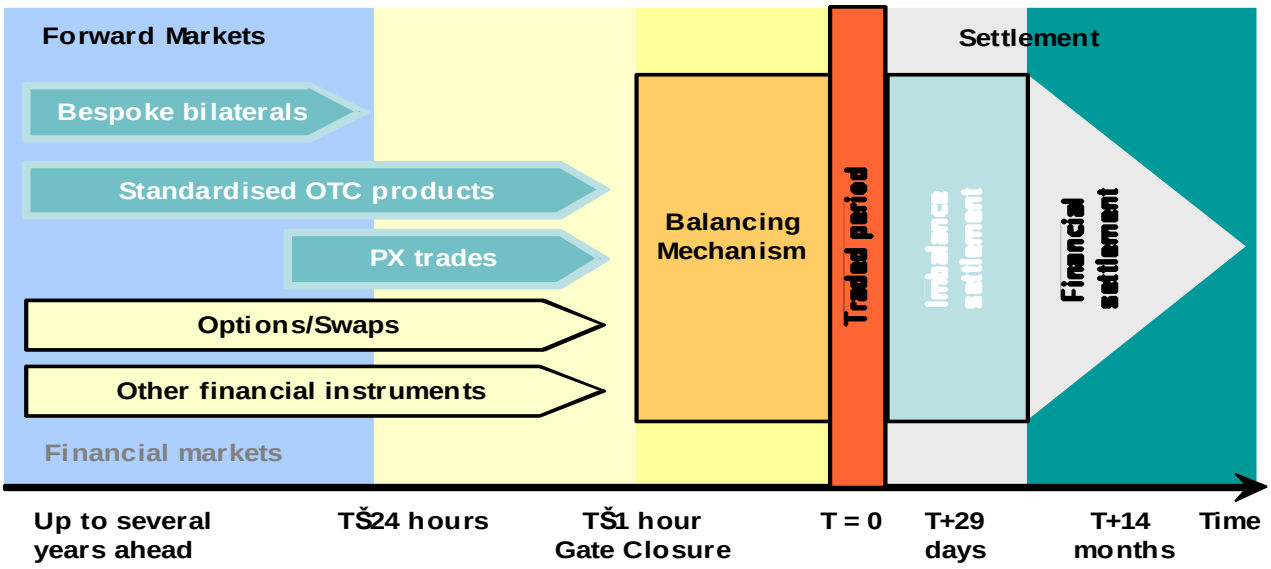
- Spot trading refers to trading for delivery on the same day as the trade (within-day).
- Prompt trading refers to trading for delivery between (but not including) within-day trading and the next month (front month). This includes a number of products, such as products for delivery in the following day (e.g. day-ahead), weekend, weekdays, and trades for the balance of week and balance of month.
- Forward trading generally consists of trades over a longer duration than prompt and spot trading, with contracts for delivery over months, seasons or years.

8. Generally, market participants trade:

- Forward to mitigate “price risk”, i.e. to give some certainty of price for electricity sales/purchases; and
- Spot and prompt to fine-tune positions (as factors such as weather, demand, and plant availability are better known).

9. Participants are incentivised to contract fully against metered output/consumption by the use of imbalance charges, known as “cash-out” prices. Figure 1 below provides a schematic overview of BETTA.

Figure 1 BETTA Schematic Overview



10. Products that are traded can be:

- “baseload” (continuously supplied over a 24 hour or longer period);
- “peak” (matching morning and evening peak demand above baseload); or
- “shaped” (a combination of peak and baseload that matches typical customer demand).

11. Products also vary seasonally e.g. between winter and summer. Power products tend to be sold in defined contract sizes (“clip sizes”, usually expressed in MW).

12. Many small to medium sized independent generators do not trade power directly in the wholesale market and rely on long-term contracts, known as Power Purchase Agreements (PPAs), with (typically) a large

[3] Ofgem, “Liquidity in the GB Wholesale Energy Markets”, 8 June 2009. Definitions of these terms can vary across different markets.

vertically-integrated (VIU) supplier. PPAs allow independents to pass on some risks associated with ensuring the power is sold to the "offtaker" and can be essential to securing investment[4]. Power is sold to the PPA provider at a discount to the wholesale price to reflect the risk transfer. Larger independent generators may use a combination of PPAs and direct trading.

GB energy market regulatory arrangements and the "Ofgem Review"

13. The Office of Gas and Electricity Markets (Ofgem) regulates the gas and electricity networks and the competitive markets in gas and electricity supply and retail. The protection of consumer interests lies at the heart of the regulator's role, including those interests in reducing greenhouse gas emissions and security of supply

14. The role played by independent economic regulation in realising benefits to energy consumers has been widely acknowledged[5] and, following the 2009 adoption of the EU Third Internal Energy Market Package ("EU Third Package"), this model is now being rolled out across Europe[6]. In the UK, the Government recently reaffirmed its commitment to independent economic regulation and went further by publishing its own "Principles for Economic Regulation" (see Annex 2)[7].

15. While the fundamentals of the regulatory system remain sound, the breadth of the contribution that the energy sector is now expected to make to wider policy goals and the scale of the challenge ahead has made the current world very different from that of the 1980s. The "Ofgem Review" [8] (Government's review of the role of Ofgem) found that, as Ofgem's role has become more complex, there has been a blurring of responsibilities between Government and Ofgem causing some erosion of the regulatory certainty that independent regulation was designed to provide.

16. In order to address this issue, while ensuring consistency with the Principles for Economic Regulation, Government announced, in the conclusions of the Ofgem Review, that a new statutory "Strategy and Policy Statement" will be established as soon as Parliamentary time allows. This Statement will set out the Government's policy goals for the gas and electricity markets; describe the roles and responsibilities of Government, Ofgem, and other relevant bodies; and define policy outcomes that Government considers Ofgem to have a particularly important role in delivering[9].

17. However, through its democratic mandate, it remains the role of Government to set strategy and policy for the energy sector and, where necessary, to facilitate the achievement of these policies through the use of its legislative powers. Through these powers, the Government seeks to minimise barriers to achieving its goals, and to incentivise behaviours that support delivery.

Ofgem's Liquidity Project

18. Ofgem has set out proposals aimed at improving overall liquidity and meeting the needs of independent generators and suppliers.

19. In October 2008, Ofgem published the findings from its investigation into energy supply markets ("The Energy Supply Probe"). The report found that the level of wholesale market liquidity, especially in the electricity market, was of concern. Ofgem announced a programme of work in June 2009[10] to improve

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[4] In general, many project financers require generators to enter into a PPA with a creditworthy third party "offtaker" (a buyer of power, which may be either an electricity supplier or independent "aggregator"), in order to have confidence that offtake risks (the risk that a buyer for the power cannot be found) and balancing risks (the risk of exposure to cash-out prices) can be managed.

[5] Ofgem Review: Call for Evidence – A Government Response, DECC, December 2010: http://www.decc.gov.uk/en/content/cms/consultations/ofgem_review/ofgem_review.aspx

[6] EU Third Internal Energy Market Package, European Commission: http://ec.europa.eu/energy/gas_electricity/legislation/third_legislative_package_en.htm

[7] Principles for Economic Regulation, BIS, April 2011: http://www.bis.gov.uk/policies/better-regulation/improving-regulatory-delivery/principles-for-economic-regulation

[8] http://www.decc.gov.uk/en/content/cms/meeting_energy/markets/regulation/regulation.aspx

[9] Ofgem will be expected to set out annually how it plans to deliver its contribution to each policy outcome and how it will monitor progress. In some cases the delivery of an outcome will be the sole responsibility of the regulator, while in others it will not hold all the levers and will need to articulate its own contribution. Ofgem will also be expected to report annually on progress, outlining and justifying decisions and, where progress is not on track, explaining why and what mitigating action might be needed.

The Strategy and Policy Statement will be intended to remain stable over at least the length of a Parliament. However, to balance this desire for stability with the need to maintain coherence with the broader policy framework, it will be possible for Government to seek a change in the Statement should there be a significant change in policy.

[10] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=58&refer=Markets/WhlMkts/CompandEff

liquidity in the wholesale electricity market. Ofgem's March 2011 Retail Markets Review (RMR)[11] showed that liquidity fell overall in the GB power market over the course of 2010 from an already low base.

20. Ofgem concluded that the market was failing to develop and that action was required. In the RMR, Ofgem put forward two proposals for intervention (the Mandatory Auction[12] and Mandatory Market Maker[13]) to provide the electricity market liquidity that market participants, in particular independent market players, require to compete against existing firms and to encourage competition between vertically-integrated players, to the benefit of consumers.

21. In early 2012, Ofgem consulted[14] on taking forward its Mandatory Auction (MA) proposal (to address liquidity in the forward market) that it originally put forward in RMR. Ofgem's final decision on whether, and how, to intervene is expected to take place ahead of Winter 2012. If Ofgem decides to intervene, implementation would follow in 2013 (after a further consultation on detailed implementation in late 2012).

Ofgem's review of cash-out arrangements

22. On 1 August 2012 Ofgem launched their electricity balancing Significant Code Review[15]. It is primarily concerned with reforms to the short-term balancing arrangements and imbalance (cash-out) price regime. Ofgem's primary considerations also include new electricity balancing arrangements, such as consideration of a balancing energy market and alternative arrangements for renewable generation. Initial consultation ends in October 2012 and Ofgem plan to publish their final decision on any code modifications in early 2014. Changes to cash-out arrangements may impact liquidity as opaque or uncertain cash-out arrangements may harm near-term liquidity.

Government's EMR programme

23. On 12 July 2011, the Government published "Planning our electric future: a White Paper for secure, affordable and low-carbon electricity" (referred to in this document as the "EMR White Paper")[16]. The EMR White Paper sets out key measures to attract low carbon investment, reduce the impact on consumer bills, and create a secure mix of electricity sources including gas, new nuclear, renewables, and carbon capture and storage.

24. Key elements of the reform package include:

- a Carbon Price Floor (announced in Budget 2011) to reduce investor uncertainty, putting a fair price on carbon and providing a stronger incentive to invest in low-carbon generation now;
- the introduction of new long-term contracts (Feed-in Tariff with Contracts for Difference) to provide stable financial incentives to invest in all forms of low-carbon electricity generation. A contract for difference approach has been chosen over a less cost-effective premium feed-in tariff;
- an Emissions Performance Standard (EPS) set at 450g CO2/kWh to reinforce the requirement that no new coal-fired power stations are built without CCS, but also to ensure necessary short-term investment in gas can take place; and
- a Capacity Mechanism, including demand response as well as generation, which is needed to ensure future security of electricity supply.

25. A Feed-in Tariff with Contract for Difference (CfD) is a long-term contract between an electricity generator and a contract counterparty. The contract enables the generator to stabilise its revenues at a pre-agreed level (the strike price) for the duration of the contract. Under the CfD, payments can flow from the contract counterparty to the generator, and vice versa. By providing stability of revenues, the CfD should increase the rate of investment and lower the cost of capital, thereby reducing costs to consumers.

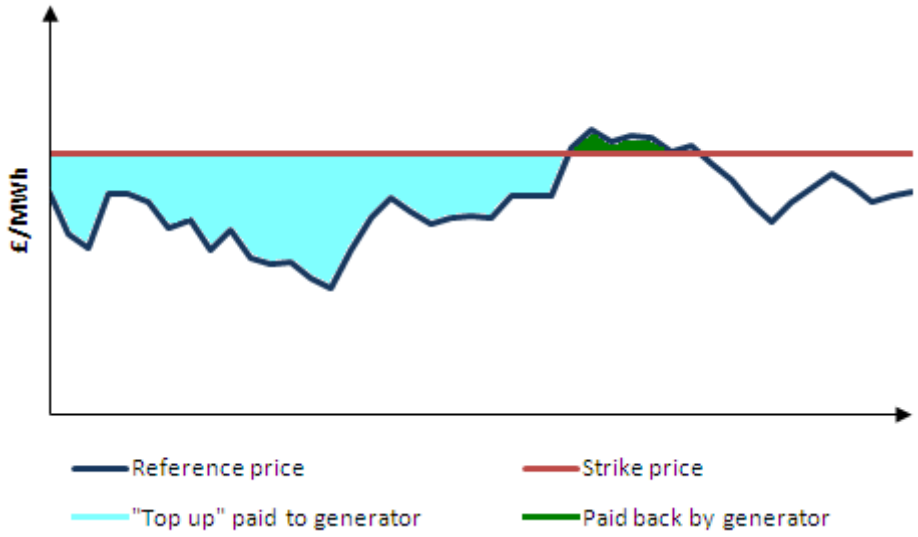
26. In terms of setting the "strike price", the Government is minded to move from administrative price discovery processes for low-carbon technologies to more competitive forms of price discovery such as auctions or tenders when the wider conditions in the market will support their successful deployment. This is because the price discovery characteristics of an auction should enable financial support to be

[11] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?file=RMR_FINAL.pdf&refer=Markets/RetMkts/rmr
[12] A new licence condition that would require large vertically-integrated generators to make available between 10 per cent and 20 per cent of their power generation into the market.
[13] A new licence condition that would require large vertically-integrated players to offer buy and sell prices for specified products and volumes on a continuous basis.
[14] "Retail Market Review: Intervention to enhance liquidity in the GB power market", Ofgem, 22 February 2012.
[15] http://www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/electricity-balancing-scr/Documents1/Electricity%20Balancing%20SCR%20Launch%20Statement.pdf
[16] http://www.decc.gov.uk/en/content/cms/legislation/white_papers/emr_wp_2011/emr_wp_2011.aspx

set at a level just high enough to promote deployment but not high enough to lead to excessive profits, with bids driven down by competition.

27. A “two-way” CfD provides for payments to be made to a generator when the market price for its electricity (the reference price) is below the strike price set out in the contract. However, when the reference price is above the strike price, the generator pays back the difference. That is, generators return money to consumers if electricity prices are higher than the agreed tariff.

Figure 2 Operation of FiT CfD



28. In the EMR White Paper, the Government proposed[17] that “intermittent”[18] generators would receive a CfD referenced to a day-ahead market price, while “baseload”[19] generators would receive a CfD referenced to a year-ahead baseload price[20].

29. Publication of the White Paper marked the first stage of the reform process. The Government intends to legislate for the key elements of this package in the second session of this Parliament, which starts in May 2012, and for legislation to reach the statute book by the third session (November 2013) so the first low-carbon projects can be supported under its provisions around 2014.

The relevance of liquidity to EMR mechanisms

30. A significant proportion of consultation respondents to Government’s December 2010 EMR consultation[21] underlined that improving liquidity could be essential to support the operation of CfDs. A number of stakeholders have expressed concerns that there is currently insufficient market liquidity to support an effective CfD.

31. The Government acknowledges these concerns, and agrees that it is crucial that there is strong liquidity in the electricity wholesale market for the CfD to function effectively by providing a robust, credible and durable reference price and providing suppliers and generators with risk management opportunities and routes to market.

32. The CfD requires a robust and transparent reference price which is reflective of market fundamentals and cannot be manipulated. This is to ensure that payments made under CfD cannot be distorted, which could leave consumers paying more than is necessary or generators receiving less than anticipated at the point of the investment decision. It is also crucial for the functioning of the CfD that generators have confidence they can achieve the reference price.

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[17] A more detailed explanation of this is contained at Annex B to the EMR White Paper (http://www.decc.gov.uk/assets/decc/11/policy-legislation/EMR/2173-planning-electric-future-white-paper.pdf).

[18] Plant which has little or no control over when it generates or at what level of production (beyond a decision to be available or not) and for which fuel costs are not a consideration. This class therefore includes wind as well as other renewable technologies such as wave and solar.

[19] Plant which operates at a constant level of generation, either for economic reasons or because the plant has limited ability to vary output at short notice to respond to shifts in demand. In addition to nuclear generation, this class may also include some biomass plant and Carbon Capture Storage (CCS) plant.

[20] These proposals are subject to the final design of any Capacity Mechanism.

[21] http://www.decc.gov.uk/en/content/cms/consultations/emr/emr.aspx

33. If risk-averse low carbon generators want the price certainty for their output that the CfD is designed to provide, they can best achieve this by ensuring that they always achieve the market reference price. In other words, their incentive should be to trade in the reference market. This way, they can ensure that their revenues are always "topped up" to the agreed strike price.

34. "Basis risk" is the term used to describe the risk of deviation between the market price achieved by the generator and the reference price in CfD contracts. If the reference price cannot be achieved, possibly because of poor liquidity, this reduces the effective level of price certainty likely to raise the strike price required to secure investment, raising costs to consumers.

35. As stated at paragraph 9, market participants are exposed to "balancing risk" – the risk of exposure to cash-out prices, as a result of any imbalance between their metered and contracted positions. This is a particular risk for wind generation and other intermittent generation technologies, which can only forecast output with accuracy close to delivery.

36. Where these technologies are supported by a CfD, the strike price may be inflated if the balancing risk is high. To a large extent, increased penetration of intermittent generation, and the associated volatility in output and within-day electricity prices, is likely to raise balancing risks going forward. But low liquidity, or the perception of low liquidity, may further increase the costs (or perceived risks) of trading to balance a position. These costs may be borne directly by the generator or by another party, on behalf of the generator (i.e. a PPA provider, or offtaker – see paragraph 12) who may require a higher discount to reflect the increased risk.

37. Alternatively, in making it more costly to ensure balance between generation and customer demand, illiquid markets might be a barrier to entry to independent generation or to alternative PPA providers (e.g. independent aggregation), potentially resulting in a less diverse range of investors. For a given decarbonisation target, a less diverse range of investors could increase the cost of support for low carbon technologies, by, for example, reducing competitive pressure in a CfD auction (see paragraph 26).

38. The Government stated in the EMR White Paper that it will work closely with Ofgem to ensure that, taken together, Electricity Market Reform and the liquidity reforms reduce barriers to entry to investment in electricity generation. The Government stated that it would act where necessary to introduce reforms where the structural barriers to market entry are not addressed through the actions taken by Ofgem.

Problem under consideration

39. The GB wholesale electricity market has low liquidity when compared to other European electricity markets, and when compared to the GB gas market. The GB wholesale electricity market has relatively low levels of overall trading, low availability of longer-dated products and low transparency of trading, and it is difficult for smaller players to secure products "sized" and "shaped" to meet their needs. Annex 1 contains a summary of the GB electricity market's performance against key liquidity metrics.

40. Ofgem has found some evidence of a market which is evolving to meet participants' needs[22]. However, the pace of change is slow and independent participants continue to raise concerns. Ofgem has been concerned that an illiquid wholesale electricity market was potentially forming a barrier to entry in retail supply, and limiting the development of a healthy, competitive generation market.

41. As highlighted in the "Background" section above, liquidity is important in creating competitive pressure in both the retail and wholesale markets, in particular by facilitating the buying or selling of energy in the market to maintain new entry (or the threat of new entry). Without a liquid wholesale market, new suppliers may find it difficult to enter the market and independent generators/producers may not be confident of a market for their output. Without adequate routes to market, independent generators will find it difficult to secure investment from financiers. In addition, low levels of liquidity can increase market risk as it becomes more difficult to hedge and respond to changes in market conditions. This may raise the costs of investment, and/or make it more difficult to raise finance.

Rationale for intervention

42. This section considers the rationale for the Secretary of State taking powers to support wholesale market liquidity and transparency. In summary, the rationale for regulatory intervention on liquidity is that poor liquidity may be explained by reciprocal externalities theory, a "market failure" whereby the market is stuck at a low liquidity equilibrium. While Ofgem is currently developing proposals for interventions to enhance liquidity in the GB wholesale electricity market, there is a risk that there may be constraints to

[22] "Retail Market Review: Intervention to enhance liquidity in the GB power market", Ofgem, 22 February 2012.

Ofgem meeting its and Government's objectives in a timely manner. Taking powers would give Government additional certainty of being able to meet its objectives. We believe this would be consistent with Government's Principles for Economic Regulation. In addition, Government has overall responsibility for ensuring its decarbonisation, security of supply and affordability objectives are met, and therefore feels it should ultimately be accountable for delivery on liquidity.

Poor liquidity may be explained by market failure

43. Ofgem's (2010) consultation on liquidity proposals[23] expressed the view that declining liquidity is likely to eventually result in a self re-enforcing cycle where low levels of liquidity prevent entry and lead companies to find alternative ways of trading, such as vertical integration, which in turn may lead to further reductions in liquidity.

44. This self-enforcing cycle can be explained by the theory of "reciprocal externalities". The term "reciprocal externalities" is used to describe the situation where the level of activity of one agent depends positively on the level of activity of another agent. Thus, if one agent is active, another agent will be active and vice versa. The existence of reciprocal externalities was used in the 1980s, initially by Peter Diamond[24], as a method of explaining involuntary unemployment.[25].

45. These ideas can be adapted to consider the problem of liquidity in traded markets; in other words, the possibility that there are self-sustaining low and high liquidity equilibrium states. The high liquidity state is characterised by multiple opportunities to trade, low transaction costs and high levels of entry, in turn resulting in greater levels of liquidity. Conversely, in the low liquidity state there are few opportunities to trade, high transaction costs and little incentive to enter the market, which incentivises market participants to find alternative ways of trading, such as vertical integration, which further reduces liquidity levels. This model is consistent with Diamond's key assumption that the arrival of trading partners is an increasing function of the level of activity i.e. an increase in the level of activity makes trading easier and encourages entry.

46. There are various potential reasons why the wholesale electricity market may be in a low liquidity state For example, the exit of a number of previously active participants from the market, including large US trading companies, and increased collateral requirements which may have reduced the ability of smaller participants with lower credit ratings to operate effectively. In addition, some stakeholders have cited the lack of a wholesale electricity "pool"[26] under the current GB electricity trading arrangements as a contributing factor. However, arguably, the increasing use of exchange-based day-ahead auctions (see paragraphs 74 and 75 below) replicate some of the functions of a pool.

47. The behaviour of a number of independent market participants also provides some support for this. For instance, Drax and International Power have entered the supply market[27] and the output of a number of independent power stations is sold on a long-term basis to one of the large VIUs.

48. Taken together, it seems plausible that liquidity in the GB wholesale electricity market has settled into a low liquidity self-sustaining equilibrium. If this is so, significant increases in liquidity would require a large external shock; without such an influence, the market would be unlikely to create a material increase in liquidity.

Government needs certainty that its objectives can be met

49. Ofgem is currently developing proposals for interventions to enhance liquidity in the GB wholesale electricity market. Government supports and shares Ofgem's high-level objectives for improving GB

[23] "Liquidity Proposals for the GB wholesale electricity market", Ofgem, 22 February 2010.
[24] "Aggregate demand management in search equilibrium", Journal of Economic Studies, 90, pp 881-894.
[25] Its essential insight was that both high and low steady state equilibrium levels of involuntary unemployment can exist. The low unemployment level is characterised by numerous trading opportunities and thus strong incentives to produce. Conversely, a high unemployment level involves few trading opportunities and hence low incentives to produce. Market imperfections, such as coordination failures, mean that it is difficult for the economy to move from one equilibrium state to another.
The equilibrium level of unemployment in which an economy remains depends on the initial level of unemployment and whether, and what type, of shocks to the economy have subsequently occurred. Only a large shock will move the economy from one equilibrium to another: Small shocks may cause temporary deviations from the equilibrium but the economy will in time return to the same equilibrium. This concept has been applied to other aspects of economic activity.
[26] The England and Wales "pool" operated between 1990 and 2001. It was a compulsory bulk electricity spot market that determined the generation cost order and wholesale price of electricity. It operated as a compulsory day-ahead last price auction with non-firm bidding.
[27] For firms that are vertically integrated between generation and retail supply, generation assets can provide a natural hedge against volatile wholesale prices; when wholesale prices are high, generation margins increase whilst retail margins fall, and vice versa. Independent suppliers and generators do not have the natural hedge of integrated players, but ideally they should be able to hedge as effectively through trading in a liquid and accessible wholesale market.

wholesale electricity market liquidity (see Annex 4 for a more detailed comparison of Government and Ofgem objectives). Strong liquidity is key to achieving Government's objectives for the electricity market: it not only contributes to ensuring consumer prices are as low as they can be on an ongoing basis, but also facilitates the competition and cost-effective investment in generation required to achieve Government's security of supply and decarbonisation goals.

50. Ofgem has yet to make a decision on intervening, since first identifying poor liquidity as an issue approximately four years ago (see paragraphs 18 to 21 above). This may simply reflect the best course of action to meet its objectives, given the available evidence. However taking powers would give Government additional certainty of being able to act to meet wholesale market objectives and in turn its wider decarbonisation and security of supply goals should industry and Ofgem actions prove insufficient.

Fit with the Principles for Economic Regulation

51. Government's Principles for Economic Regulation highlight best practice in relation to economic regulation generally and the role of Government and the regulator in particular. The principles state that the roles and responsibilities between Government and economic regulators should be allocated in such a way as to ensure that regulatory decisions are taken by the body that has the legitimacy**,** expertise and capability to arbitrate between the required trade-offs.

52. Government interventions in the electricity market, (e.g. EMR) create trade-offs between what is required for cost-effective delivery of policy mechanisms (e.g. reference prices for CfDs) and for ongoing retail and wholesale market contestability. Given these potential conflicts are caused by Government intervention, Government feels it is the body that has the legitimacy and capability to arbitrate between the required trade-offs.

Policy objective

53. Government's objective in seeking to take powers is to gain certainty that appropriate action can be taken, if needed, to ensure cost-effective delivery of decarbonisation and security of supply goals and contestable retail and wholesale markets. We aim to do this whilst minimising any potentially negative impacts incurred through the taking of primary powers.

Options under consideration

54. We consider the following options in the "cost-benefit analysis" section below.

- Option 1: "Do nothing": Government does not take primary powers on liquidity;
- Option 2: Taking powers to improve liquidity, with no constraints on using the powers;
- Option 3: Taking powers to improve liquidity, with constraints on using the powers;
- Option 4: Taking powers to support reference prices for CfDs only.

55. The following would apply to each of Options 2 to 4:

- The powers would be time-limited.
- Any decision by the Secretary of State to exercise powers would be subject to a cost-benefit analysis.
- The Secretary of State would have powers to implement measures through amending the conditions of licences held by (most) physical market participants. Licences are the principal means by which Ofgem regulates market participants' activities.
- Government would continue to work with Ofgem and industry to secure existing market-led developments.

56. Under Option 2, Government might take powers to achieve the following objectives:

- Supporting robust market prices, including reference prices for CfDs, by improving liquidity and/or price transparency in the reference markets; and
- Ensuring market participants have adequate risk management opportunities.

57. The Secretary of State would examine the direction of market travel and Ofgem's decision on interventions before deciding whether to exercise his/her powers, and if so, what intervention to take.

58. Under Option 3, Government would take powers to achieve the same objectives as under Option 2. In addition, however, if intervention was judged to be needed, Government would consider with Ofgem how best to deliver this. Any intervention would need to be compatible with wider reforms, including EMR, EU legislation, and reforms on liquidity and cash-out chosen by Ofgem.

59. Under Option 4, the constraints faced by Government in using the powers would be the same as for Option 3, but Government would take powers to achieve a single objective: supporting robust market reference prices for CfDs, by improving liquidity and/or price transparency in the reference markets only.

60. In the sub-section below ("Other options considered"), we explain why we decided not to examine alternative options in more detail in the cost-benefit analysis. These alternative options include clarifying Ofgem's objectives through the Strategy and Policy Statement (SPS), and alternatives to regulation.

Other options considered

61. We also considered amending Ofgem's objectives through the Strategy and Policy Statement and alternatives to regulation. We judged that neither of these options would be sufficient to meet Government's objectives within the necessary period of time.

Clarifying Ofgem's objectives

62. A possible way of ensuring that Government's objectives for electricity market liquidity and contestability are met might be to define policy outcomes that Government considers Ofgem should deliver, using the soon-to-be introduced Strategy and Policy Statement (see paragraph 16 for an explanation of the Statement).

63. The Statement could be used to ensure that Ofgem has a strengthened justification for taking action to support liquidity in the CfD reference markets and improving contestability of investment in low-carbon generation. Ofgem could balance these new objectives with its existing duties and objectives, ensuring that, taken together, its actions benefit consumers as much as possible.

64. However, the Statement may not come into force until Summer 2014. Once in force and published, Ofgem would need time to consult on and develop interventions. The first CfD contracts are expected to be issued in April 2014 and will require a robust reference price to minimise basis risk for investors. Given these time inconsistencies we do not consider this to be a viable option, as it would not be effective in allowing the Government to provide certainty of market liquidity conditions for early CfD-supported investments. However, if the Secretary of State has not decided to exercise primary powers on liquidity before the Statement comes into force, we will examine whether there is a case for using the Statement to achieve its objectives through Ofgem.

65. In addition, Government feels it is best placed to consider the wider trade-offs involved in enabling the investment required to deliver wider strategic goals such as the EU 2020 renewables target and the Government's Carbon Budgets. As such, Government feels that using Ofgem to achieve these objectives may not be appropriate.

Alternatives to regulation

66. Taking powers to intervene does not rule out the possibility of pursuing non-regulatory approaches (e.g. voluntary approaches). As noted above, under any of Options 2 to 4, Government would continue to work with Ofgem and industry to secure existing market-led developments. If voluntary solutions give businesses more flexibility to meet Government's objectives, there is a possibility that net costs to business might be lower than with Government intervention.

67. A credible regulatory threat, with clear objectives, could increase the likelihood of industry achieving the objectives Government wants to see. This may lead to some industry participants bearing direct costs, relative to the costs industry would have borne in the absence of a threat of intervention. However, we would only expect industry to pursue these non-regulatory alternatives if the benefits to the wider market exceeded the costs to particular participants.

68. Voluntary approaches are more likely to succeed if it is in business' (collective) commercial interests to agree to taking action. But there may be co-ordination failures hindering action, and there may be a role for Government in resolving these.

Cost-benefit analysis

Summary and comparison of options

69. This section first describes what might happen under "Do Nothing" and then examines the costs and benefits of Options 2 to 4, relative to doing nothing. The cost-benefit analysis focuses on the "direct" impacts of taking primary powers, i.e. the costs and benefits that can be attributed to the act of introducing primary legislation alone. Indirect impacts are also examined and, at Annex 3, we set out the high-level impacts of potential interventions that might achieve our objectives. The impacts of any

proposed interventions would be examined more fully, alongside any consultation on secondary legislation, with a full impact assessment.

70. To summarise, Option 3 (powers to improve liquidity, with constraints) is our preferred option. Taking powers to support liquidity may be seen by potential investors and new entrants as insurance against the risks that market developments and Ofgem's interventions, if adopted, may not be sufficient or timely enough to allow them to appropriately manage risks. It therefore contributes towards reducing barriers to entry to generation and retail supply, potentially reducing costs of capital, improving competition and ultimately costs to consumers. Option 3 also limits negative impacts on wider regulatory uncertainty by making it clear that Government will work closely with Ofgem and ensure consistency with wider reforms.

71. The negative impacts of Option 4 (support CfD reference prices only) on regulatory uncertainty are lower than Option 3, since the powers would be more limited. However, Option 4 would only allow Government to take measures that ensure the CfD mechanism can operate cost-effectively, which is a narrow subset of the potential objectives for improved liquidity. As such, Option 4 would not give generators and retailers the fullest confidence that they will be able to manage their risks effectively.

72. Option 2 (powers to improve liquidity, without constraints), has similar benefits to Option 3, but has potentially significant impacts on wider regulatory uncertainty. We believe that Option 3 is necessary to provide the fullest confidence to investors and potential new entrants of strong market liquidity.

Option 1: Do Nothing

Summary

73. This section considers the direction of travel for liquidity in the GB wholesale markets, assuming Government does not take powers to support liquidity, and assuming that Ofgem's liquidity package progresses. In particular, we explore the following dimensions of liquidity:

- Near-term liquidity and reference prices; and
- Forward market liquidity and reference prices.

In summary, and as highlighted in the "Rationale for Intervention" section above, though we have seen some positive developments , we see a risk that industry and/or Ofgem's process will fail to meet Ofgem's stated liquidity objectives as quickly as Government would like.

Near-term liquidity and reference prices:

74. Day-ahead (DAH) market liquidity is currently relatively strong, and has been improving since Ofgem's Summer 2011 Assessment. Following announcements by SSE[28], E.ON[29], ScottishPower[30], RWE npower[31], EDF[32] and Centrica[33], trading on exchange-based day-ahead auctions has increased substantially since October 2011. Ofgem reports that stakeholders are "…broadly in agreement…" that these developments are "positive"[34]. More recently, during Q1 2012, 21% of GB power consumption was traded on day-ahead auctions, over 10 times the volume traded during the same period last year. Figure 5 in Annex 1 illustrates the recent trend in day-ahead auction volumes.

75. Going forward, the trend appears to be towards exchange-based day-ahead auctions. The drivers for this include:

- "Market Coupling[35]": developments in EU network codes are likely to mean that exchange-based day-ahead auctions will be the principal way in which to take advantage of arbitrage opportunities across interconnectors linking national markets[36].

[28] http://www.sse.com/PressReleases2011/WholesaleElectricityPriceTransparency
[29] http://pressreleases.eon-uk.com/blogs/eonukpressreleases/archive/2012/01/04/1774.aspx
[30] http://www.scottishpower.com/PressReleases_2271.htm
[31] http://www.npowermediacentre.com/Press-Releases/RWE-to-sell-a-third-of-its-annual-UK-generation-volume-on-day-ahead-auctions-115a.aspx
[32] http://www.icis.com/heren/articles/2012/07/03/9574975/corrected-centrica-electricity-auction-move-stops-short-of-buy-side.htm
[33] http://www.centrica.com/index.asp?pageid=1041&newsid=2506
[34] http://www.ofgem.gov.uk/Markets/RetMkts/rmr/Documents1/July%202012%20liquidity%20open%20letter.pdf
[35] Market coupling is a method for integrating electricity markets in different areas. With market coupling, the daily cross-border transmission capacity between the various areas is not explicitly auctioned among the market parties, but is implicitly made available via energy transactions on the power exchanges on either side of the border (hence the term implicit auction).
[36] While it is hard to quantify the extent of these opportunities, we believe them to be significant. As an indication, in 2010, there were 98 days on which flows on the UK-France interconnector over the evening period (3pm to 7pm) went in the opposite direction to that implied by the GB-France price differential. On those days, the average price differential (in absolute terms) was around £6.5/MWh. This indicates an opportunity to profit from trading and making efficient use of the interconnector, possibly in excess of the actual costs of trading on an exchange.

- National Grid's procurement of a "virtual hub" for Market Coupling: the possibility of a single GB auction reference price emerging might attract more day-ahead trading, currently split across two exchange platforms;
- The EU Regulation on Wholesale Energy Market Integrity and Transparency (REMIT): this will introduce trade reporting requirements, which might be more economical to meet through trading on exchanges; and
- Increased wind output: the variability of wind output is likely to increase the importance of trading day-ahead (when market participants have more visibility over wind output, and thus are better able to work out which generator might be the marginal, price-setting, plant)

76. Increases in volumes and number of counterparties will increase the robustness of the day-ahead price. Specifically with respect to CfDs, increased trading volumes on day-ahead auctions, and the possible emergence of a single reference price could reduce or eliminate basis risk for intermittent CfD-supported generators. This would ensure the greatest possible certainty to investors of revenues. To the extent that the drivers for recent and expected increases in day-ahead auction trading are commercially sound, this is likely to mean greater durability and credibility of the reference price.

77. Despite this, there remains a risk that day-ahead market liquidity will not develop in the way currently envisaged, or that it could fall away without continued regulatory pressure or intervention. If that were the case, then early CfD-supported projects may perceive a higher degree of risk associated with accessing the reference price. With time, we would expect that increasing volumes of CfD-supported generation would trade around the reference prices[37], and that this would further ensure durability and robustness. However, this risk is probably minimal, given Ofgem has stated the following in their February 2012 consultation[38]:

> *"…[W]e believe that sufficient progress towards objective three [an effective near term market] has been made to lessen the rationale for intervening in support of it at this stage. However, we will continue to monitor market developments to ensure that these improvements are maintained. If improvements stall, we will consider intervention in support of this objective."*

78. The future direction of intra-day liquidity is uncertain, although likely to be positive – the drivers are similar to those for day-ahead trading (see paragraph 75). Ofgem has stated that "…intraday liquidity remains under review…"[39], but that "…generally, the intra-day market offerings are deemed sufficient at present[40].

Forward market liquidity and reference prices

79. Developments in forward market liquidity are more uncertain. However, achievement of Ofgem's stated objectives, through some combination of industry action or intervention by Ofgem[41], should deliver a minimum amount of forward liquidity, and could ensure robust reference prices for baseload CfDs.

80. With time, the CfDs themselves may concentrate liquidity around a forward reference price. While this may arguably be at a detriment to liquidity in other forward products, industry action or intervention by Ofgem might mitigate this impact, by stimulating liquidity in a variety of forward products.

81. To the extent that there are delays to Ofgem meeting its objectives, then, as described above, there is a possibility, in the absence of a sufficient alternative solution, of temporarily higher costs to consumers associated with delivering low carbon investment.

Option 2: Taking powers to improve liquidity, with no constraints on using the powers

Direct benefits

82. As discussed under Option 1, we believe there are risks that the market and/or Ofgem's proposals will not deliver the improvements in reference prices and risk management opportunities required to ensure that costs to consumers of delivering low-carbon investment are minimised. While the probability of these risks materialising is small, even the perception that they may materialise may deter entry by new

[37] See paragraph 33.
[38] "Retail Market Review: Intervention to enhance liquidity in the GB power market", Ofgem, 22 February 2012, p12.
[39] "Retail Market Review: Intervention to enhance liquidity in the GB power market", Ofgem, 22 February 2012.
[40] http://www.ofgem.gov.uk/Markets/RetMkts/rmr/Documents1/July%202012%20liquidity%20open%20letter.pdf
[41] In its open letter of 16 July 2012, Ofgem states:
"Ahead of the autumn, we will continue to develop our detailed MA proposals…and to monitor market developments. We will also explore ways of making sure that, where industry commitments are helping to meet our objectives, they are secured and, if necessary, strengthened, for example through licence conditions. As a key part of our work, we will seek to discuss market developments and the issues outlined in this letter with market participants.
"This will be a critical period and we intend to reach a decision on if, and how, to proceed ahead of winter 2012."

participants. The principal risk is that industry and/or Ofgem intervention does not meet Ofgem's stated liquidity objectives as quickly or sufficiently as Government would like. So investors' perception of increased certainty associated with Government taking powers might drive the majority of the benefits. It is possible that investors may not have confidence Government can provide more certainty than Ofgem, in which case, the benefits described below may not materialise.

83. It is difficult to monetise the precise contribution that taking primary powers can make towards improving outcomes for consumers. However, it is possible to give some sense of order of magnitude of the risks, and their importance. The following example focuses on the potential impact that increased confidence in a liquid market could have on investment in low-carbon electricity generation.

Box 1: Potential impact of increased confidence in liquidity on investment in low-carbon electricity generation – balancing risk and basis risk

Increasing revenue certainty to low-carbon generators can reduce costs to consumers associated with investment. By reducing exposure to wholesale electricity price volatility, the CfD is estimated to reduce "hurdle rates" (required rates of return in order to invest), by between 0.3 and 1.5 percentage points for a range of low-carbon technologies[42], compared to alternatives that keep generators exposed to wholesale price risk. In doing so (as noted in paragraph 25), the CfD reduces the cost of decarbonisation to 2030 by £2.5 billion, to deliver a given level of investment[43,44].

Basis risk and balancing risk may be lesser issues in determining overall revenue certainty, when compared to overall wholesale price risk, but they are still an important component of overall revenues and the ability of independent generators to secure project finance. An illiquid market may serve to increase basis risk and balancing risk, preventing full realisation of the benefits of CfDs. Even small contributions towards making it more certain to investors that these risks can be efficiently managed might result in, greater investment, lower costs of capital and significant reductions in costs to consumers.

- Wholesale prices form a significant proportion of revenues for low-carbon generators, and are currently around £40-45/MWh[45].
- We understand that typical discounts on the wholesale price offered contained in PPAs are in the range of 10-15% of the wholesale price. A large proportion of this discount may go towards covering balancing costs.
- Newbery (2011)[46] calculates an average cost of imbalance for wind generators[47], from being unable to contract for errors in forecasting at the day-ahead stage at the realised (intraday) spot wholesale market price (and thus having to face the relevant cash-out price) at between £2.50/MWh and £5.03/MWh[48]. This range overlaps with the costs implied by PPA discounts.
- Improved liquidity, including intraday, might allow generators (or aggregators, on generators' behalf) to more easily avoid balancing costs (though not completely).
- Basis risk could be of a similar order of magnitude. The draft CfD Operational Framework[49] noted that, for intermittent CfDs, the choice of the GB day-ahead "virtual hub" price should remove basis risk. However, should market coupling arrangements not be implemented as planned, a likely fallback option would be to apply a (volume weighted) average of the hourly prices from each day-ahead auction conducted by the GB power exchanges (currently APX and N2Ex). The average absolute difference in baseload[50] day-ahead prices between APX and N2EX, has been £1.11/MWh over April 2011 to July 2012, with a maximum difference of £7.72/MWh. Basis risk is likely to also exist in forward markets, where liquidity is less developed. Improved liquidity might be expected to result in arbitrage, eroding differences between different price indices, and reducing basis risk.

[42] EMR White Paper Impact Assessment ("Electricity Market Reform – options for ensuring electricity security of supply and promoting investment in low-carbon generation", 12 July 2011), page 41, Table 9 (http://www.decc.gov.uk/assets/decc/11/policy-legislation/EMR/2180-emr-impact-assessment.pdf)

[43] This is based on a comparison with an alternative low-carbon support mechanism, the Premium Feed-in Tariff (PFiT), conceptually similar to the existing Renewables Obligation (RO). The PFiT, while providing additional support for low-carbon technologies, would not reduce investors' exposure to overall wholesale price risk.

[44] Additional sensitivity analysis in the EMR White Paper Impact Assessment suggests that, if the assumed reduction in hurdle rates from a CfD for offshore wind was higher (0.8 percentage points, rather than 0.5), there would be an increase in net welfare, relative to the central CfD package scenario, of £363 million (NPV, real 2009). This is due to the resulting lower capital costs for offshore wind projects.

[45] The average of day-ahead baseload prices from January to June 2012 is £44.7/MWh (Source: LEBA).

[46] "Contracting for wind generation", David Newbery, Electricity Policy Research Group, University of Cambridge, 9 May 2011

[47] Note that similar issues also apply to non-intermittent generators, where errors in forecasting could arise due to unplanned outages (i.e. plant breakdowns).

[48] As a comparison, estimates of levelised (long-run average) costs of wind projects starting in 2011 vary from £90/MWh (onshore, >5MW) to £149/MWh (offshore, Round 3). See http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Renewable%20energy/policy/renew_obs/1834-review-costs-potential-renewable-tech.pdf.

[49] http://www.decc.gov.uk/assets/decc/11/policy-legislation/EMR/5358-annex-b-feedin-tariff-with-contracts-for-differe.pdf

[50] Baseload prices represent the time-weighted average of prices for individual hours. Variation between platforms in prices for individual hours may be different.

- To the extent that increased contestability of the PPA market, as a result of increased confidence in market liquidity, may reduce discounts offered on the wholesale price (i.e. by reducing the margins earned by PPA providers), this could also reduce the costs to consumers of investment in low carbon generation.

84. KPMG, acting as consultants for DECC, have identified a number of scenarios in which a lack of robust CfD reference prices could lead to gaming of EMR support mechanisms, potentially leading to increased costs to consumers and/or the perception of a non-level playing field. If participating generators believe the reference price can be gamed then this could increase the cost of capital. As such, certainty in Government intervention would help to reduce costs to business, and thus to customers.

85. From the point of view of investors, the act of Government taking powers to support liquidity might be seen as "insurance" against such risks. As such, even if the powers are not actually exercised, they may provide increased certainty of market conditions to investors in low-carbon generation, which might lower required CfD strike prices, resulting in lower costs to consumers.

Direct costs

86. Options 2 to 4 would result in a direct increase in resource costs of further policy development, borne by Government, primarily staffing, consultancy and stakeholder engagement, estimated at £0.26m, based on current team size and a one-year completion rate.

87. In addition, the act of taking powers could itself directly lead to some increase in uncertainty for market participants[51]. This could be the case if, for example, it was unclear:

- How long the powers would be valid for, and whether they might be used for wider purposes at some point in the future;
- whether any Government intervention was robust to changes in the European legislative landscape.

88. Any uncertainty could raise the perceived risks to operating in the GB wholesale market, thus raising costs of capital for investors, thereby increasing costs to consumers. Uncertainty around whether Government intervention was compatible with EU legislation could have a similar effect, if investors believed there was a risk that Government intervention might need to be abandoned or revised.

89. It is difficult to quantify the impacts precisely, as we cannot estimate the direct impact of taking powers on the costs of capital for different investors. To the extent that costs of capital are increased, the costs could be significant. Government estimates that investment in new electricity generation capacity up to 2020 could be approximately £75 billion.

90. Time limits[52] on the powers (through use of a sunset clause) could serve to limit negative impacts on wider uncertainty of when the powers might be used, or whether they may be used in the future to pursue wider objectives.

- With time, CfD-supported generation will start trading around the market reference prices. If there are sufficient volumes being traded by CfD-supported generators, representing a number of different counterparties, this could be enough to sustain robust and durable reference prices. Evidence that the CfD mechanism was successful in attracting new independent investment may also reduce the need to use powers to improve market conditions for independent investment.
- If powers have not already been used by this time, a sunset clause on the primary powers could provide certainty to business that they would not incur costs unnecessary to meet Government's objectives. If powers had already been used by this time, a sunset clause on the obligation itself would give business some certainty that they would only incur costs as long as the obligation was needed. If needed, Government could seek to renew powers.

[51] The Government has stated publically (in the EMR White Paper) that it would act where necessary to introduce reforms where the structural barriers to market entry are not addressed through the actions taken by Ofgem. It could be argued that the risk of intervention may already have been anticipated by market participants. However, the risk may also arguably been heavily discounted, since Government did not explicitly say it would be taking powers at that stage.

[52] Time limits could potentially apply to the primary powers themselves, or to any obligation actually introduced as a result of secondary legislation, by introducing a "sunset clause". Domestic legislation that imposes a regulatory burden on businesses or civil society organisations and which comes into force on or after April 2011 is now required to include a sunset clause.
The inclusion of a sunset clause in a new regulation means that the regulation will expire automatically on a certain date unless positive action is taken to renew it. Sunset clauses should ordinarily take effect seven years after commencement unless some other time period is appropriate in a particular case. See HM Government, "REDUCING REGULATION MADE SIMPLE", December 2010.

Indirect benefits and costs

91. The indirect impacts of taking powers are examined below. These would be examined more fully, if powers were exercised, alongside a secondary stage consultation document, with a full impact assessment.

92. Ofgem proposes two potential interventions; Mandatory Auction (MA) and licence conditions to "secure and promote" greater liquidity[53].

93. An MA could help to ensure key products are traded on a monthly basis, generate robust reference prices, and may improve access to the wholesale market. This should help provide a route to market for generators and a reliable market in key traded products, enhancing competition.

94. The licence conditions option was only proposed in July 2012 and therefore is less developed than the MA intervention option. However licence conditions aimed at securing and promoting further market led developments could help increase confidence in the durability of recent developments and provide the basis for further improvements in the trading terms offered by incumbents. .

95. There would be one-off implementation costs and ongoing running costs associated with the platform used to deliver the MA. There are potentially also transfers from obligated parties to other businesses. For example, to the extent that obligated parties are forced to sell power at a loss, other parties may gain. There are wider costs that would need to be considered carefully: for example, MMM obligations under developing EU financial legislation could see vertically integrated utilities (VIU) classified as financial institutions, potentially resulting in more increased collateral requirements and costs of doing business incurred by the VIUs, which will likely be passed on to consumers.

Option 3: Taking powers to improve liquidity, with constraints on using the powers

Direct benefits

96. Relative to "do nothing", Option 3 could have similar benefits to Option 2 in terms of providing certainty to investors of market conditions and robust CfD reference prices, as the objectives of any intervention would be broadly similar. It could be argued that the constraints on exercising the powers (see paragraph 58), and resulting loss in flexibility for Government to intervene, might mean lower benefits than under Option 2. However, in practice, Government broadly shares Ofgem's objectives, so this is a limited constraint on Government action.

Direct costs

97. In terms of costs, setting conditions on when the powers could be used would limit any wider perceived regulatory risk associated with taking powers. With the conditions specified, investors could be reasonably confident that any intervention Government might take would not impose unnecessary costs on industry, limiting the negative impacts set out above.

98. To the extent that the exact nature of the issues Government is seeking to address, and the interactions with Ofgem's objectives, may not be clear to stakeholders, there might still be some perceived regulatory risk. However, Government is clear and will be clear that these are backstop powers that will be used if industry and Ofgem do not achieve the necessary improvements.

99. In addition, as with Option 2, Option 3 relative to the "do-nothing" scenario would result in some government staff, consultancy and stakeholder engagement costs, estimated at £0.26m

Indirect benefits and costs

100. The indirect impacts of taking primary powers under Option 3 are likely to be similar to Option 2.

Option 4: Taking powers to support CfD reference prices only, with constraints on using the powers

Direct benefits

101. Similarly to Options 2 and 3, Option 4 can be seen as valuable "option" to intervene, given the risk that robust reference prices, against which early CfDs can be struck, will not emerge in time. It may also serve to reduce costs of capital associated with basis risk and the perception of manipulation of reference prices. However, the option might appear to be less valuable to market participants, when compared to Options 2 and 3. This is because the scope of the powers would be narrower - Option 4

[53] See Annex 3 for a detailed description of the potential interventions.

would only give the ability to deal with basis risk for generators receiving CfDs, and wouldn't be able to cover wider liquidity objectives to reduce barriers to entry to both generation and retail entry[54].

Direct costs

102. However, the costs of Option 4, in terms of regulatory uncertainty, would also be limited. The need for CfD reference prices is clearly an issue created by Government's choice of decarbonisation policy. In addition, the sorts of interventions that would be needed to provide reference prices (e.g. mandatory auctions in reference markets) are reasonably well-defined.

103. As with Options 2 and 3, Option 4 would result in a direct increase in government resource costs of further policy development, borne by Government, primarily staffing, consultancy and stakeholder engagement, estimated at £0.26m.

Indirect Benefits and Costs

104. The indirect impacts under Option 4 are likely to be limited compared to Options 2 and 3 as Government's powers would be limited. To support robust reference prices for CfDs, potential interventions could include mandatory auctions for day-ahead and year-ahead products.

105. Day-ahead liquidity is currently relatively strong and so any impact of intervention relative to doing nothing would likely be small in scale. Developments in forward market liquidity are more uncertain and so intervention may help to ensure certainty over reference prices for baseload CfDs, which would reduce costs of capital for investment in low-carbon generation and thus costs borne by consumers.

106. Any intervention would have set-up and ongoing running costs, expected to be lower than interventions under Options 2 or 3. In addition, there are unintended consequences. For example, there is a risk that increases in liquidity of year-ahead products may come at the detriment of other forward products. This may be mitigated through wider action from Ofgem or industry to stimulate liquidity in a variety of forward products.

Net direct costs to business

107. The section above ("Cost-benefit analysis") discusses cost and benefits to society at large, including business, from taking powers. For the purposes of one-in, one-out (OIOO), we believe the direct impacts on business, as a result of taking powers, are:

- An increase in certainty over market conditions for generators and suppliers (positive impact on business); and
- A possible increase in regulatory uncertainty for market participants, which might result in higher costs of capital (negative impact on business).

108. In choosing our preferred option (Option 3), we believe the positive impacts outweigh any negative impacts. Both sets of impacts are difficult to monetise. However, given that we argue the impacts are relatively small in magnitude, and offset each other to some extent, we believe it reasonable to assume that the net direct impacts of taking primary powers is negligible (though overall positive). We thus assess the proposal to be a "Zero Net Cost" IN.

109. As stated above, we believe we can limit (through careful communication) the impact on regulatory uncertainty. Clearly, there may be costs and benefits to business if/when the powers are actually used. These will be assessed separately, with secondary legislation.

Specific impact tests

Microbusiness impacts

110. Primary legislation is not expected to have significant direct impacts on microbusinesses. The potential impact on microbusinesses will be considered in more detail if secondary legislation is introduced.

Equalities

111. Primary legislation is not expected to have any differential impacts on the basis of the protected characteristics. We will consider equality impacts in more detail, if the Secretary of State decides to use primary powers.

[54] See paragraphs 2, 3, 36 and 37 for an explanation of some of these potential wider objectives for liquidity.

Human Rights

112. To the extent that human rights may be engaged, we consider the approach to be compatible with the Human Rights Act 1998.

Post-implementation Review

113. The Secretary of State would examine the direction of market travel and Ofgem's decision on interventions before deciding whether to exercise his/her powers, and if so, what intervention to take. Exercising the powers themselves would likely be subject to a sunset or review clause. We envisage that monitoring and enforcement of any intervention would be the role of Ofgem, and that further details of the monitoring and evaluation process would be made available at a more advanced stage of policy development.

Annex 1 – Liquidity Metrics

114. Adequate liquidity can be characterised by two elements:

- Market Depth - sufficient traded volume in the market to absorb the impact of buying or selling large volumes without moving the market price; and
- Market Breadth - the discount between the market price and the sale bid is low (vice versa if buying) ensuring the value of the transaction is maintained and participants can trade out of positions without incurring excessive costs.

115. Ofgem has identified other important dimensions of liquidity[55]:

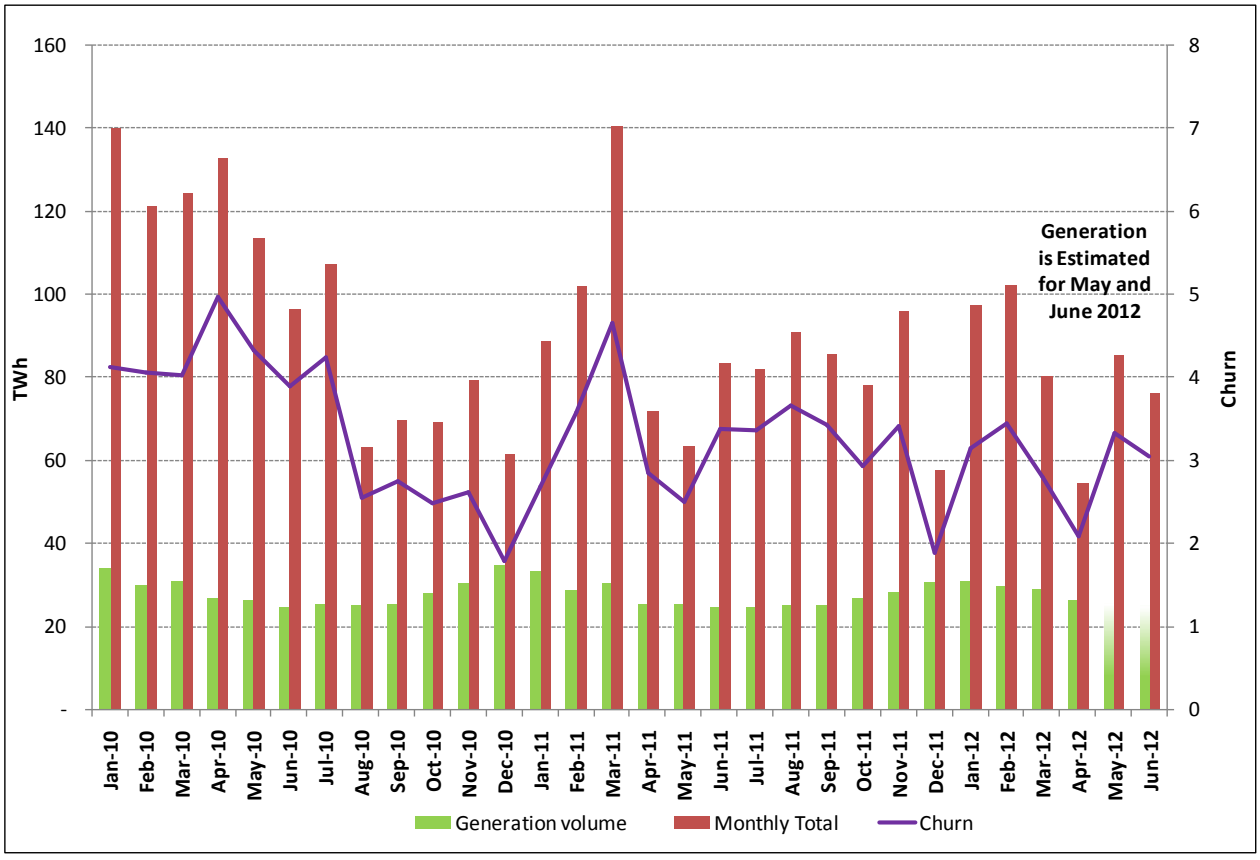
- Use of platforms which promote price transparency;
- The availability of key longer dated products and/or financial derivatives; and
- Meeting independent suppliers' and others' wholesale requirements

Market Depth

116. Aggregate churn is defined as the number of times a unit of generation is traded. Liquid market are often characterised as having physical volumes traded many times over. The wholesale electricity markets of Germany and Nordpool have high levels of churn, in which each unit of electricity generated is traded seven and ten times respectively[56].

117. Churn declined in the second half of 2010 and whilst there was some recovery in the first months of 2011, this was not sustained and there was a decline in churn in the first half of 2012, Levels for the first half of 2012 were around 2.9.[57]

Figure 3 GB trade volume, generation output and annual churn



Source: Ofgem open letter of 16 July 2012, Annex 2

55 http://www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/Documents1/GB%20wholesale%20electricity%20market%20liquidity%20-%20summer%202010%20assessment.pdf. The Independent Generators' Group (IGG) have also identified some of these metrics.

56 More broadly for comparison, the Brent Crude Oil market has a churn ratio of approximately 20, and the GB gas market (NBP) has a ratio of around 9.

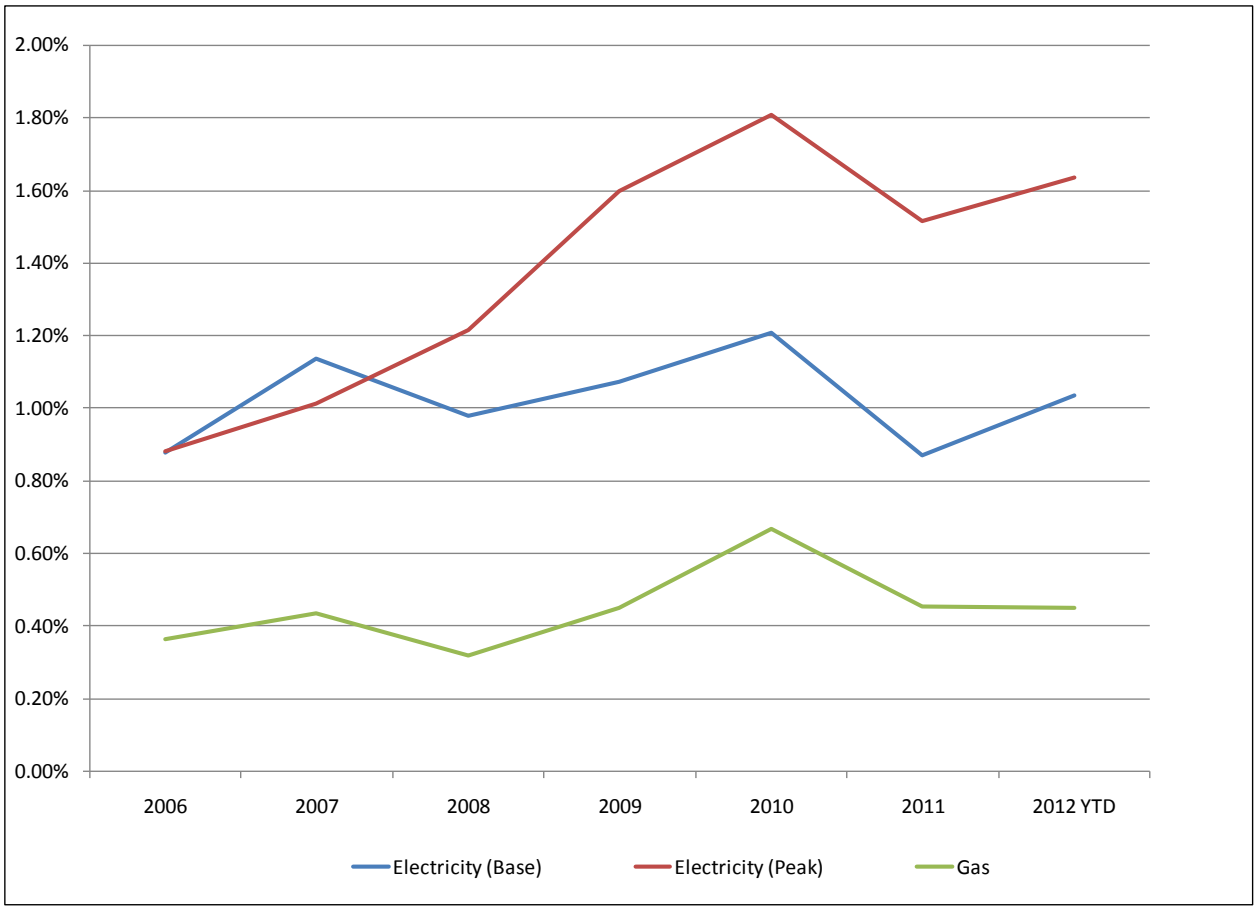
57 Ofgem (2012) " Retail Market Review: GB Wholesale market liquidity update", Annex 2

Market Breadth

118. A tight spread between the bid price (the price at which buyers are prepared to buy) and the offer price (the price which sellers are willing to sell) is a good indication of a liquid market as it indicates that arbitrage opportunities have been exhausted by the presence of numerous players in the market.

119. Bid-offer spreads in the GB electricity market are notably wider than those in the gas market all along the curve and bid-offer spreads widened slightly in the first half of 2012.[58] At the same time, bid-offer spreads widened for some forward products in the gas market, suggesting wider factors (for example the economic outlook) could be having an impact.

Figure 4 Average bid-offer spreads in the GB gas and electricity markets, Season+4 products



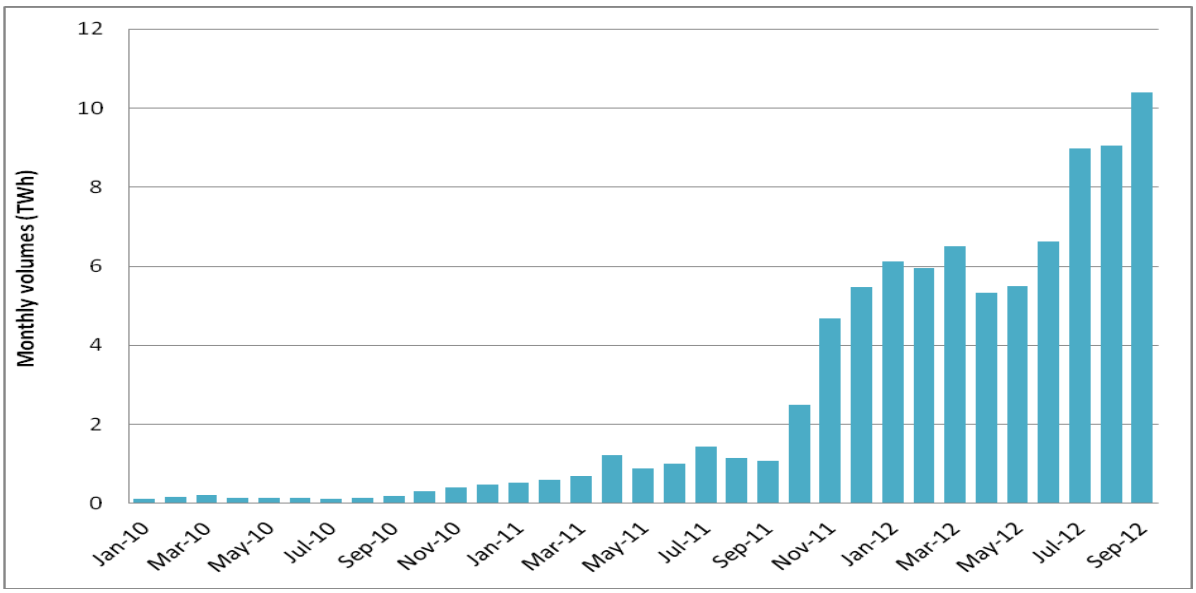
Ofgem (2012) " Retail Market Review: GB Wholesale market liquidity update", Annex 2.

Near-term trading

120. Following announcements by SSE[59], E.ON[60] ,Scottish Power[61],RWE npower[62] EDF[63] and Centrica[64] trading on exchange-based day-ahead auctions has increased substantially since October 2011. More recently, during Q1 2012, 21% of GB power consumption was traded on day-ahead auctions, over 10 times the volume traded during the same period last year. Since January 2012 E.ON has traded approximately 60% of its UK generation and matched retail volumes through on the N2EX Day Ahead auction platform[65]

[58] Ofgem (2012) " Retail Market Review: GB Wholesale market liquidity update", Annex 2.
[59] SSE committed to trading all of their electricity supply and demand in the day ahead market by the end of 2011 "(subject to market conditions and costs)" http://www.sse.com/PressReleases2011/WholesaleElectricityPriceTransparency
[60] E.ON committed to trade in excess of 30% of their generation through the N2Ex day ahead market. http://pressreleases.eon-uk.com/blogs/eonukpressreleases/archive/2012/01/04/1774.aspx
[61] Scottish Power committed to trade in excess of 30% of their generation through the N2Ex day ahead market by 1st March 2012: http://www.scottishpower.com/PressReleases_2271.htm
[62] RWE npower signed a deal to sell a third of annual generation on the N2EX day-ahead auction platform in May 2012: http://www.npowermediacentre.com/Press-Releases/RWE-to-sell-a-third-of-its-annual-UK-generation-volume-on-day-ahead-auctions-115a.aspx
[63] EDF committed to placing volumes on the N2EX platform in April 2012: http://www.icis.com/heren/articles/2012/07/03/9574975/corrected-centrica-electricity-auction-move-stops-short-of-buy-side.htm
[64] Centrica committed to sell at least 30% of the company's generation in the N2EX day-ahead auction from July 2012: http://www.centrica.com/index.asp?pageid=1041&newsid=2506
[65] http://pressreleases.eon-uk.com/blogs/eonukpressreleases/archive/2012/05/30/1829.aspx

Figure 5 Traded volumes on GB exchange-based day-ahead auctions

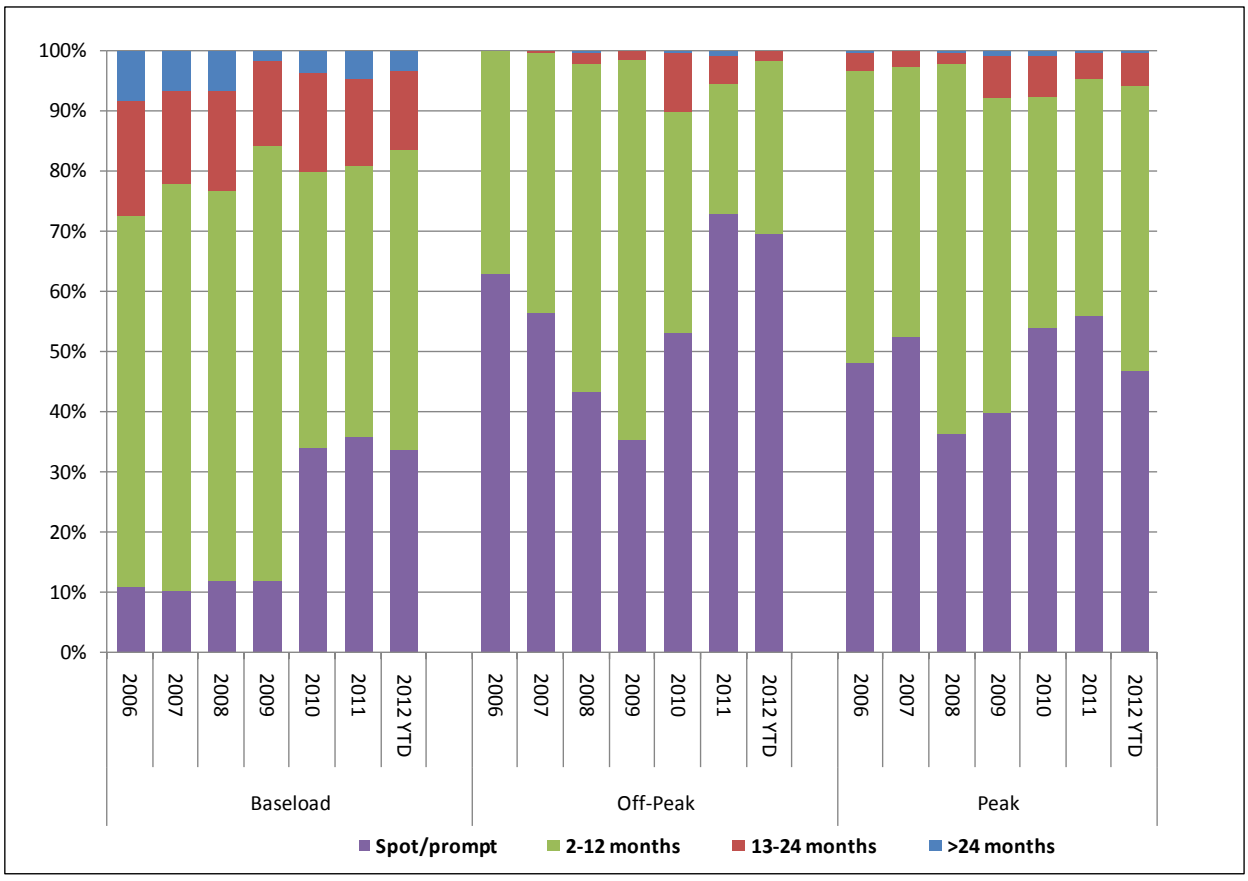


Source: DECC calculations, based on APX Group and Nord Pool Spot data

The availability of key longer dated products and/or financial derivatives

121. According to Ofgem's latest assessments, the share of trading along the curve in peak and off peak products declined in 2011[66], a trend which has continued in the first half of 2012. For example, OTC products traded more than 13 months ahead of delivery fell from 18% to 16% of the market across all product types (although there was a slight increase in the proportion of trading in longer-dated peak products) [67].

Figure 6 Proportion of GB OTC traded volume by period of delivery



Source: Ofgem (2012) " Retail Market Review: GB Wholesale market liquidity update", Annex 2

[66] Ofgem (2011) "GB wholesale electricity market liquidity: summer 2011 assessment".
[67] Ofgem (2012) " Retail Market Review: GB Wholesale market liquidity update", Annex 2.

122. Ofgem has argued that the presence of financial derivatives could make hedging easier for market participants[68]. Until 2011, volumes traded in financial products in the GB market were very low. However, since the Autumn of 2011 there has been a notable increase in trading in these products, with more than 12TWh traded so far in 2012 (see figure 4). While this increase has been significant, volumes remain uncertain and are still a small proportion of the overall market.

123. The participation on the N2EX has increased substantially since Ofgem's Summer 2010 Assessment. The number of total members on the prompt market has increased from 16 to 36[69], with the number of banks increasing from 4 to 6. However, the number of members for futures trading is somewhat lower, with 12 members[70], with limited participation from banks.

Meeting independent suppliers' and others' wholesale requirements

124. Analysis by Ofgem suggests that, in 2011, GB wholesale power products have become less diverse compared to the preceding three years, with only nine baseload products accounting for 94% of trading activity.[71]

125. Some smaller and independent players have suggested to Ofgem a small increase in the number of counterparties willing to trade. However, at the time of their Summer 2011 assessment, Ofgem has seen no real increase in the number of small independent participants on trading places.

126. Smaller market participants have been concerned about limited availability of products with small clip sizes. Ofgem[72] has seen low levels of trading in small clip sizes for baseload and peak products. Ofgem is concerned that low levels of trading in small clip sizes could have an impact on the ability of smaller players to meet their wholesale power requirements. However, since 25 July 2011, all members of N2EX are now able to trade clip sizes as low as 0.1 MW in the day-ahead auction[73]. In addition, since 22 November 2011, members of APX can trade clip sizes as low as 0.1MW in the continuous (within-day) spot market. On the N2EX futures market, members can trade a minimum clip size of 1MW.

[68] http://www.ofgem.gov.uk/Markets/RetMkts/rmr/Documents1/summer%202011%20assessment.pdf
[69] http://www.n2ex.com/physicalmarket/memberlistparticipants/, as of 26 January 2012.
[70] http://www.n2ex.com/financialmarket/memberlist/, as of 26 January 2012.
[71] Ofgem (2011) "GB wholesale electricity market liquidity: summer 2011 assessment" p.16.
[72] http://www.ofgem.gov.uk/Markets/RetMkts/rmr/Documents1/summer%202011%20assessment.pdf
[73] http://www.n2ex.com/newsroom/operationalmessage/lotsizesdayaheadauction/

Annex 2 - The Government's Principles for Economic Regulation

Accountability

- Independent regulation needs to take place within a framework of duties and policies set by a democratically accountable Parliament and Government.
- Roles and responsibilities between Government and economic regulators should be allocated in such a way as to ensure that regulatory decisions are taken by the body that has the legitimacy, expertise and capability to arbitrate between the required trade-offs.
- Decision-making powers of regulators should be, within the constraints imposed by the need to preserve commercial confidentiality, exercised transparently and subject to appropriate scrutiny and challenge.

Focus

- The role of economic regulators should be concentrated on protecting the interests of end users of infrastructure services by ensuring the operation of well-functioning and contestable markets where appropriate or by designing a system of incentives and penalties that replicate as far as possible the outcomes of competitive markets.
- Economic regulators should have clearly defined, articulated and prioritised statutory responsibilities focussed on outcomes rather than specified inputs or tools.
- Economic regulators should have adequate discretion to choose the tools that best achieve these outcomes.

Predictability

- The framework of economic regulation should provide a stable and objective environment enabling all those affected to anticipate the context for future decisions and to make long-term investment decisions with confidence.
- The framework of economic regulation should not unreasonably unravel past decisions, and should allow efficient and necessary investments to receive a reasonable return, subject to the normal risks inherent in markets.

Coherence

- Regulatory frameworks should form a logical part of the Government's broader policy context, consistent with established priorities.
- Regulatory frameworks should enable cross-sector delivery of policy goals where appropriate.

Adaptability

- The framework of economic regulation needs capacity to evolve to respond to changing circumstances and continue to be relevant and effective over time.

Efficiency

- Policy interventions must be proportionate and cost-effective while decision making should be timely and robust.

Annex 3 – Analysis of potential intervention options

127. This Annex contains descriptions and high-level analysis of potential Ofgem interventions that might be consistent with our identified objectives. These interventions are not necessarily mutually exclusive, and could be used in combination. Any GEMA decision to intervene would be subject to a consultation and full impact assessment.

Mandatory Auction

128. The Mandatory Auction (MA) proposed by Ofgem[74] would require each of the obligated parties to sell a proportion of their generated output in defined products in a regular auction. Other market participants would be free to participate in the auction on either the buy or sell side.

129. Ofgem considers that the MA mechanism is able to deliver the following key benefits:

- **Regular availability of a range of hedging products** – the MA makes sure that key products are traded on a monthly basis.
- **Potentially improved access to wholesale market** – through influence over platform selection process, Ofgem will seek to ensure that MA facilitates access to trading for all market participants
- **Generation of robust reference prices** – by its nature, the MA would deliver a sharp, transparent price in the range of products it sells.

130. As a result, the Ofgem believes the MA should enhance competition in the generation and supply markets. For suppliers, it provides a reliable market in key products. For generators, it provides an additional route to market, and serves to drive liquidity along the curve.

Licence Conditions

131. In their Open Letter to industry published in July 2012 Ofgem stated that:

> "We will also explore ways of making sure that, where industry commitments are helping to meet our objectives, they are secured and, if necessary, strengthened, for example through licence conditions."

132. Ofgem are currently exploring how industry commitments may be "secured and, if necessary, strengthened". This option is at an early stage of development and we are yet to see any additional detail from Ofgem. We expect to see further detail on how this option by winter 2012.

[74] http://www.ofgem.gov.uk/Markets/RetMkts/rmr/Documents1/Liquidity%20Feb%20Condoc.pdf

Annex 4 – Comparison of Government and Ofgem objectives for wholesale market liquidity

133. In general, Ofgem's objectives line up well with Government's objectives. Both Ofgem and Government want to see a market with reduced barriers to entry, and reduced costs to consumers. This Annex compares Government's and Ofgem's objectives in more detail.

Government's vision for the electricity market

134. The primary objectives of Electricity Market Reform are to:

- ensure the future security of electricity supplies;
- drive the decarbonisation of our electricity generation; and
- minimise costs to the consumer.

135. As described in the "Background" section above, liquidity is important in creating competitive pressure in both the retail and wholesale markets, in particular by facilitating the buying or selling of energy in the market to maintain new entry (or the threat of new entry) into generation and retail supply. In doing so, liquidity not only contributes to ensuring consumer prices are as low as they can be on an ongoing basis, but also facilitates cost-effective investment in generation to achieve Government's security of supply and decarbonisation goals.

136. The EMR package is designed to support a wide range of investors and attract new entrants to the generation market. The Government wants to see reduced barriers to entry and a market that provides:

- Robust, reliable and transparent prices, including reference prices for longer-dated contracts, accessible to all generators; and
- Good availability of risk management products – both short- and long-term.

137. Specifically, in the context of CfD FiTs, the day-ahead and year-ahead market reference prices (MRPs) have a number of requirements:

- They must be **achievable**, i.e. are transparent and can be accessed (at minimum basis risk) by the generator in order to sell power;
- They must reflect a **credible** indices reflecting the weight of the market (so that CfDs can be approved by financiers and become bankable contracts);
- They must be **robust** so that they cannot be manipulated to distort payments made under the difference contracts; and
- They should be **durable** so that they can continue to reflect the market during the lifetime of the CfD contracts.

138. KPMG, acting as consultants for DECC, have identified a number of scenarios in which a lack of robust CfD reference prices could lead to gaming of EMR support mechanisms, potentially leading to increased costs to consumers and/or the perception of a non-level playing field. For example, participating baseload generators could try to drive reference prices down to maximise CfD payments. If the reference price were driven to below zero these generators would still receive the strike price while non-participating competitors would face negative prices. The extent to which this game is plausible depends on the level of liquidity in the market, and the extent of any market power.

Ofgem's objectives

139. Ofgem's main objective is to protect energy consumers' interests wherever appropriate through effective competition or by other means. In the context of its liquidity project, Ofgem has stated that, at a high level, the objective of the liquidity intervention is to improve choice and competition for consumers by making sure that liquidity in the GB power market is sufficient to underpin competitive generation and supply markets. To meet this objective, Ofgem[75] believes the wholesale market should deliver:

- Availability of products which support hedging;
- Robust reference prices along the curve; and
- An effective near-term market[76].

140. Ofgem intends for these three objectives to capture a range of wholesale markets features including:

[75] "Retail Market Review: Intervention to enhance liquidity in the GB power market", Ofgem, 22 February 2012.

[76] Ofgem do not currently propose to intervene in support of objective three but will monitor market developments and intervention to support near-term markets remains a possibility.

- Range of longer-dated physical products strongly traded in the market; and/or financial products widely traded, including by independent suppliers
- Robust prices in longer-dated products
- Reasonable and transparent trading terms
- Independents able to meet shaping requirements
- Depth of trading in key products:
  - Near-term (up to intra-day)
  - Longer-dated (over a year-ahead)
- Narrow bid-offer spreads along the curve
- Robust price generation in products which could be used as the basis for CfDs
- Robust day-ahead price for GB market coupling; continued growth of day-ahead volumes

141. The detailed development of Ofgem's liquidity interventions also requires that the following success criteria and policy design principles are met:

- **Success Criteria:** Any intervention to support liquidity should:
  - Improve product availability and depth of trading for both independent suppliers and generators;
  - Enable the market to provide clearer investment signals; and
  - Improve market transparency.
- **Design Principles:** The design of Ofgem's interventions should:
  - Align with what works well in the market;
  - Allow GB to evolve towards being an integrated part of the European market;
  - Take into account changes resulting from the EMR; and
  - Not incur significant cost in the event that they do not achieve their objectives.

How Ofgem's objectives compare to Government's objectives

142. In general, Ofgem's objectives line up well with Government's objectives. Both Ofgem and Government want to see a market with reduced barriers to entry, and reduced costs to consumers.

143. However, Ofgem agrees that its proposals are not designed to deliver everything that the Government may want in order to support low generation carbon investment and the successful delivery of the EMR interventions. In particular, Ofgem has not committed to timescales for achieving its stated objectives. Government feels there is a need to ensure that it can act to introduce necessary reforms to electricity trading and transparency, in time to ensure cost-effective delivery of early CfD projects, which may be making investment decisions some time in advance of the issuance of the first CfDs (for example, lead times for offshore wind are around 2-3 years).

144. Government considers that the risk highlighted above could make the outlook for investment sufficiently unclear to prevent the successful achievement of its objectives, and that it may be prudent to take proportionate and targeted powers to increase wholesale market liquidity.

145. Table 1 below compares Government's objectives for attracting new investors in electricity generation with Ofgem's stated objectives for its liquidity project. Table 1 also summarises where Government sees potential gaps where Ofgem's objectives are not sufficient to meet Government's vision, and other potential risks for Government.

Table 1 Summary table: Comparison of Government and Ofgem objectives

Government Objective	Corresponding Ofgem Objective / desired market feature	Gap / risk for Government?
Robust, reliable and transparent reference prices accessible to all generators. CfD reference prices should be achievable, robust, durable and credible.	"Robust reference prices along the curve" "Effective near-term market" "Robust day-ahead price…" "Robust price generation in products which could be used as the basis for FiTs with CfDs" "…transparent trading terms"	No difference in objectives at present.

Government Objective	Corresponding Ofgem Objective / desired market feature	Gap / risk for Government?
Good availability of risk management products – both short- and long-term	Liquidity project: Improve product availability and depth of trading for both independent suppliers and generators; Availability of products which support hedging	No difference in objectives at present.
First low-carbon projects around 2014	Expected implementation of liquidity proposals in 2013.	Timing of achievement of Ofgem objectives uncertain, which may affect investment decisions for early CfD projects.