

<b>Title:</b> Electricity Market Reform – Supplier Obligation  <b>IA No:</b> DECC0150  <b>Lead department or agency:</b> Department of Energy & Climate Change  <b>Other departments or agencies:</b> N/A	<b>Impact Assessment</b>
	<b>Date:</b> 23/06/2014
	<b>Stage:</b> Final
	<b>Source of intervention:</b> Domestic
	<b>Type of measure:</b> Secondary legislation
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<b>Summary: Intervention and Options</b>	<b>RPC Opinion Status:</b> N/A

Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB in prices)	In scope of One-In, One-Out?	Measure qualifies as
-£341m – -£715m	-£341m – -£715m	-	No	N/A

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

Under Contracts for Difference (CfDs), monies are collected from electricity suppliers by the CfD Counterparty through the Supplier Obligation mechanism to fund payments to electricity generators. CfD payments will be volatile and uncertain, as they depend on market reference prices and the volume of CfD generation, both of which will fluctuate. This uncertainty may be challenging for suppliers to manage, and information asymmetries and market power could disadvantage smaller market participants and lead to a lack of competition. Therefore, this IA assesses the impact of different designs of the Supplier Obligation on the CfD Counterparty, electricity suppliers and consumers.

**What are the policy objectives and the intended effects?**

The policy objective for the design of the Supplier Obligation is to enable the CfD Counterparty to meet the costs of CfDs in a cost-effective way, which works within the tax and accounting rules. This helps to support delivery of decarbonisation instruments while meeting the affordability aims of Electricity Market Reform (i.e. minimising costs to taxpayers and helping to keep energy bills down).

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

The October 2013 Consultation presented four possible designs for the Supplier Obligation: a variable levy, a generation fixed levy, a unit cost fixed-rate levy, and a fully fixed levy. Based on responses to the consultation, two of these options have been taken forward for consideration in this IA: a variable levy and a fixed unit cost levy. The fixed unit cost rate levy design option has been split out into two sub options which vary according to the frequency with which the levy rate and reserve amount are set and reconciliation is carried out.

This IA considers three potential options for the design of the Supplier Obligation. Without Government intervention and creation of a CfD Counterparty, generators lack the certainty over CfD payments required to make investment decisions. This means that while the headline NPV figures do use this as the counterfactual, it is not appropriate to judge policy options against this 'do nothing' counterfactual. We consider a variable levy design as a more appropriate counterfactual against which to judge all policy options:

- **Option 1: Variable levy** ('do minimum' counterfactual) – suppliers pay the CfD Counterparty their market share of actual CfD payments. This is also used as a counterfactual, against which other options are assessed.
- **Option 2a: Annual fixed unit cost levy**: the CfD Counterparty forecasts CfD payments and demand for the year ahead, and determines an interim £/MWh rate and reserve amount, which is communicated with suppliers three months before the start of the levy year. Suppliers are invoiced for interim rate payments on a daily basis according to metered amount supplied, and make a lump sum reserve payment at the beginning of the levy year.
- **Option 2b: Quarterly fixed unit cost levy**: this option is similar to the annual fixed-rate levy, except that the CfD Counterparty sets the interim £/MWh rate and collects a reserve payment on a quarterly rather than an annual basis.

All of the options above result in a net negative NPV reflecting the fundamental purpose of the Supplier Obligation: to deliver CfD payments from suppliers to generators. Benefits associated with the establishment of a creditworthy counterparty and supporting competition in the market are not quantified.

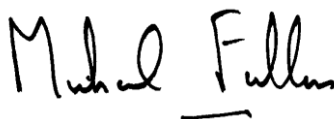
Option 2b is preferred, as it provides the best balance between certainty of payment for generators and affordability for consumers, while not imposing additional risks on suppliers, over and above those they currently manage or providing a competitive advantage to one group of suppliers over another.

**Will the policy be reviewed?** will be reviewed. **If applicable, set review date:** 2020

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.	<b>Micro No</b>	<b>&lt; 20 No</b>	<b>Small Yes</b>	<b>Medium Yes</b>	<b>Large Yes</b>
What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)			<b>Traded:</b> N/A	<b>Non-traded:</b> N/A	

*I have read the IA 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:



Date: 18 June 2014

## Summary: Analysis & Evidence

## Policy Option 1

Description: Variable Levy ('do minimum' counterfactual)

### FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2014	Time Period Years 8	Net Benefit (Present Value (PV)) (£m)		
			Low: - £339m (0 vs Option 1)	High: - £717m (0 vs Option 1)	Best Estimate: -£528m (0 vs. Option 1)

COSTS (£m)	Total Transition (2012 – 2014) (Constant Price) Years	Average Annual (2015 – 2020) (excl. Transition) (Constant Price)	Total Cost (2012 – 2020) (Present Value)
Low	£32m	£64m	£339m
High	£65m	£137m	£717m
Best Estimate	£49m	£100m	£528m

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

Administration costs for set up and operation of the CfD Counterparty and suppliers in establishing the necessary framework for the Supplier Obligation are expected to be **£32m - £65m for one-off set-up costs** for the period 2012 – 2014, and **£28m - £35m average ongoing costs per year** for 2015 – 2020. Administration costs are highest with a variable levy reflecting the additional forecasting cost to suppliers. Administration costs are expected to be higher under a variable levy.

Financing costs of the Supplier Obligation are expected to vary by policy option, and are expected to be lower under a variable levy option (estimates given are for 2015 – 2020):

The cost to suppliers of posting collateral is estimated at **£5m - £7m per year**, with a small additional cost to cover insolvency risk of **£0.1m per year**;

A risk premium is expected to be applied by suppliers to cover the risk that CfD payments are higher than expected. This is likely to amount to **£31m – £94m per year**.

The administration and financing costs above are assumed to be passed on to customers' bills by suppliers in the form of higher bills. This option is expected to increase average domestic electricity bills by an estimated **£0.60 - £1.40 per year**, for the period 2014 - 2020.

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

Potential adverse impact on competition and barriers to entry through advantages for suppliers with superior resources and/or access to better information for forecasting and ability to manage the volatility of likely future Supplier Obligation liabilities (e.g. vertically-integrated and/or larger suppliers).

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

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

Benefits have not been monetised in this Impact Assessment.

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

Benefits include increasing CfD reference market liquidity and encouraging suppliers to develop risk management resources and capabilities, through management of all key risks relating to CfD payment volatility under this option.

<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate (%)</b>	3.5
<p>This option is treated as a ‘do minimum’ counterfactual, against which other options should be assessed. Risk Premia to account for inaccurate forecasting are calculated for a range of 10 – 30% based on evidence submitted by industry stakeholders.</p> <p>As suppliers pay actual CfD amounts owed to generators under a variable rate option, there is no reserve fund (or associated cost of financing a reserve fund).</p> <p>Collateral is assumed to be posted as cash and to incur an industry-weighted cost of finance (6.7% - 10%), which has been revised upwards to reflect stakeholder feedback to the October Consultation.</p> <p>Insolvency risk coverage would be collected as cash and is also assumed to carry an industry-weighted cost of finance (6.7% - 10%).</p>		

**BUSINESS ASSESSMENT (Option 1)**

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>In scope of OIOO?</b>	<b>Measure qualifies as</b>
<b>Costs:</b> £64m - £137m	<b>Benefits: 0</b>	<b>Net:</b> -£64m - -£137m	No	N/A

## Summary: Analysis & Evidence

## Policy Option 2a

Description: Annual Fixed Unit Cost Levy

### FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2014	Time Period Years 8	Net Benefit (Present Value (PV)) (£m)		
			Low: - £403m (- £64m vs Option 1)	High: - £807m (- £90m vs Option 1)	Best Estimate: -£605m (-£77m vs Option 1)

COSTS (£m)	Total Transition (2012 – 2014) (Constant Price) Years		Average Annual (2015 -2020) (excl. Transition) (Constant Price)	Total Cost (2012 – 2020) (Present Value)
Low	£27m		£79m	£403m
High	£52m		£159m	£807m
Best Estimate	£39m		£119m	£605m

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

Administration costs for set-up and operation of the CfD Counterparty and suppliers in establishing the necessary framework for the Supplier Obligation are expected to be **£27m - £52m for one-off set-up costs** for the period 2012 – 2014, and **£18m - £22m average ongoing costs per year** for 2015 – 2020.

Financing costs of the Supplier Obligation are expected to vary by policy option. This option carries the highest financing costs (estimates given are for 2015 – 2020):

The cost to suppliers of posting collateral is estimated at **£5m - £7m per year**, with a small additional cost to cover insolvency risk of **£0.1m per year**.

A risk premium is expected to be applied by suppliers cover the risk that CfD payments are higher than expected. This is likely to amount to **£31m - £94m per year**.

Fixed unit cost levy options will require payment of a reserve fund cover the potential for actual CfD payments being higher than forecast. The CfD Counterparty will collect a fund up front to cover this up to a 95% level of certainty. This is expected to carry financing costs of **£24m – £36m per year** for an annual fixed unit cost levy.

The administration and financing costs above are assumed to be passed on to customers' bills by suppliers in the form of higher bills. This option is expected to increase average domestic electricity bills by an estimated **£0.80 - £1.60 per year**, for the period 2014 - 2020.

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

Potential adverse impact on competition and barriers to entry through advantages for suppliers with superior resources and/or access to better information for forecasting and ability to manage the volatility of likely future Supplier Obligation liabilities (e.g. vertically-integrated and/or larger suppliers).

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

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

Benefits have not been monetised in this Impact Assessment.

<p><b>Other key non-monetised benefits by ‘main affected groups’</b></p> <p>Benefits include supporting competition through the provision of centralised forecasts of CfD payments that some market participants are have less ability to undertake. This is also expected to provide efficiency gains over each individual supplier taking on responsibility for forecasting requirements. CfD payments due from suppliers can be expected to be less volatile under a fixed unit cost levy versus a counterfactual variable levy.</p>	
<p><b>Key assumptions/sensitivities/risks</b></p> <p>Risk Premia to account for inaccurate forecasting are calculated for a range of 10 – 30% based on evidence submitted by industry stakeholders.</p> <p>A reserve fund is set to cover the difference between the forecast expected CfD payments and an ‘extreme event’ profile such that the CfD Counterparty will have 95% certainty that it will be able to meet CfD payments. Financing costs of the reserve fund held by the CfD Counterparty are calculated on basis of funds being composed entirely of cash, with a cost of (6.7% -10%).</p> <p>Collateral is assumed to be posted as cash and to incur an industry-weighted cost of finance (6.7% - 10%).</p> <p>Insolvency risk coverage would be collected as cash (incorporated into the reserve fund) and is also assumed to carry an industry-weighted cost of finance (6.7% - 10%).</p>	<p><b>Discount rate (%)</b></p> <p>3.5</p>

**BUSINESS ASSESSMENT (Option 2a)**

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: £79m - £159m	Benefits: 0	Net: : -£79m - -£159m	No	N/A

## Summary: Analysis & Evidence

## Policy Option 2b

Description: Quarterly Fixed Unit Cost Levy (preferred option)

### FULL ECONOMIC ASSESSMENT

Price Base Year 2012	PV Base Year 2014	Time Period Years 8	Net Benefit (Present Value (PV)) (£m)		
			Low: - £341m (- £2m vs Option 1)	High: - £715m (£2m vs Option 1)	Best Estimate: -£528m (same as Option 1)

COSTS (£m)	Total Transition (2012 – 2014) (Constant Price) Years	Average Annual (2015 – 2020) (excl. Transition) (Constant Price)	Total Cost (2012 – 2020) (Present Value)
Low	£27m	£66m	<b>£341m</b>
High	£52m	£139m	<b>£715m</b>
Best Estimate	£39m	£102m	<b>£528m</b>

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

Administration costs for set up and operation of the CfD Counterparty and suppliers in establishing the necessary framework for the Supplier Obligation are expected to be **£27m - £52m for one-off set-up costs** for the period 2015 – 2020, and **£18m - £22m average ongoing costs per year** for 2015 - 2020.

Financing costs of the Supplier Obligation are expected to vary by policy option. Financing costs are lower under a quarterly levy than an annual levy due to a lower reserve fund financing cost, but higher than a variable levy where there is not reserve fund required (estimates given are for 2015 – 2020):

The cost to suppliers of posting collateral is estimated at **£5m - £7m per year**, with a small additional cost to cover insolvency of **£0.1m per year**.

A risk premium is expected to be applied by suppliers cover the risk that CfD payments are higher than expected. This is likely to amount to **£31m - £94m per year**,

Fixed unit cost levy options will require payment of a reserve fund cover the potential for actual CfD payments being higher than forecast. The CfD Counterparty will collect a fund up front to cover this up to a 95% level of certainty. This is expected to carry financing costs of **£11m - £16m per year** under a quarterly fixed unit cost levy.

The administration and financing costs above are assumed to be passed on to customers' bills by suppliers in the form of higher bills. This option is expected to increase average domestic electricity bills by an estimated **£0.60 - £1.40 per year**, for the period 2014 - 2020.

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

Potential adverse impact on competition and barriers to entry through advantages for suppliers with superior resources and/or access to better information for forecasting and ability to manage the volatility of likely future Supplier Obligation liabilities (e.g. vertically-integrated and/or larger suppliers).

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

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

Benefits have not been monetised in this Impact Assessment.

<b>Other key non-monetised benefits by 'main affected groups'</b>	
Benefits include supporting competition through the provision of centralised forecasts of CfD payments that some market participants are have less ability to undertake. This is also expected to provide efficiency gains over each individual supplier taking on responsibility for forecasting requirements. CfD payments due from suppliers can be expected to be less volatile under a fixed unit cost levy versus a counterfactual variable levy.	
<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate (%)</b> 3.5
<p>Risk Premia to account for inaccurate forecasting are calculated for a range of 10 – 30% based on evidence submitted by industry stakeholders.</p> <p>A reserve fund is set to cover the difference between the forecast expected CfD payments and an 'extreme event' profile such that the CfD Counterparty will have 95% certainty that it will be able to meet CfD payments. Financing costs of the reserve fund held by the CfD Counterparty are calculated on the basis of funds being composed entirely of cash, with a cost of 6.7% -10%.</p> <p>Collateral is assumed to be posted as cash and to incur an industry-weighted cost of finance (6.7% - 10%).</p> <p>Insolvency risk coverage would be collected as cash (incorporated into the reserve fund) and is also assumed to carry an industry-weighted cost of finance (6.7% - 10%).</p>	

**BUSINESS ASSESSMENT (Option 2b)**

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
<b>Costs:</b> £66m - £139m	<b>Benefits: 0</b>	<b>Net: -£66m - -£139m</b>	No	N/A



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# 1. Overview

## *Development of the Supplier Obligation modelling and options*

1. This Impact Assessment (IA) presents an update to the Supplier Obligation (SO) Consultation IA that was published in October 2013 alongside the *Electricity Market Reform: Consultation on Proposals for Implementation*<sup>1</sup>. This IA includes more comprehensive analysis on selected policy options considered for the implementation and a final design recommendation for the SO.
2. The October Consultation presented four options for delivery of the SO. Based on industry feedback, two of these options have been taken forward and considered in greater depth in this IA: a variable levy and a fixed unit cost levy. A fixed unit cost levy design has been further considered in two forms to reflect feedback to the October Consultation: an annual fixed unit cost levy rate and a quarterly fixed unit cost levy rate. These options are set out in Section 6, discussed in detail in the cost-benefit analysis in Section 7, and appraised in Section 8.
3. In response to industry feedback to the October Consultation, DECC wished to explore the potential impact of collecting a reserve fund on an annual basis and a quarterly basis to explore the potential of reducing associated costs. The reserve fund would be collected to ensure the CfD Counterparty has sufficient cash to pay generators on a daily basis.
4. The intuition behind shortening the period over which a reserve fund is collected is that the most significant cost to suppliers of a fixed rate levy is the opportunity cost faced as a result of providing funds upfront to the CfD Counterparty. By increasing the frequency of the reserve fund collection, the average amount of supplier funds held in reserve by the CfD Counterparty over the year is decreased, reducing the opportunity cost to suppliers. Under this design there would be the dual benefit of providing suppliers with centralised forecasts of expected CfD payments over the forthcoming quarter, alleviating suppliers of the costs associated with forecasting, and providing a more competitive foundation for the electricity supply market, while recognising the cost to suppliers of providing the CfD Counterparty with reserves to manage inaccuracies of their forecast, and reducing it significantly when compared with providing an annual fund.

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<sup>1</sup> <https://www.gov.uk/government/consultations/proposals-for-implementation-of-electricity-market-reform>

## External Analysis

5. In December 2013, DECC commissioned Redpoint Energy to undertake further analysis on the impact of supplier payment volatility and the size and cost of a reserve fund under different policy options for the SO.
6. Unlike the previous scenario-based modelling carried out by Redpoint Energy for DECC on potential variation in Contract for Difference (CfD) settlement payments, the new modelling is stochastic and based on historical distributions of gas prices, wind speed and demand to generate probabilistic scenarios for CfD payments.
7. Redpoint Energy's report, which is published alongside this IA<sup>2</sup>, considers four levy design options:
  - Variable: this option presents a fully variable levy, where no reserve fund is collected and CfD payments are paid to the CfD Counterparty by suppliers according to actual generation.
  - Annual fixed: this option presents an annual fixed unit cost levy mechanism as proposed in the October Consultation. A levy rate is set at the beginning of the levy year, with a reserve fund collected annually and reconciled three months later. The Counterparty therefore holds a reserve fund for 15 months at a time.
  - Quarterly staged: here, the CfD Counterparty sets an annual reserve fund requirement at the beginning of the levy year, but collects the annual reserve fund in four quarterly payments rather than one lump sum.
  - Quarterly fixed: under this option, the Counterparty estimates the size of the reserve fund required on a quarterly basis and collects payments on a quarterly basis.

Note: the quarterly fixed option still assumes an annual interim rate and annual reconciliation. Additionally, it is based on annual simulations of CfD payments whereas in fact the CfD Counterparty would be re-forecasting on a quarterly basis. We have reflected this change in our analysis presented in this IA. Table 1 shows the different funding approaches to fixed levy rate options between Redpoint Energy analysis and DECC's final policy position.

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<sup>2</sup> *Analysis of Contract for Difference Supplier Obligation funding options*, Redpoint Energy, Baringa Partners, 2014. Available at: <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

**Table 1 Funding approach frequency under SO policy options**

Funding method	Interim rate setting	Reserve fund setting	Reconciliation
<b>Annual</b>	Annual	Annual	Annual
<b>Staged Quarterly</b>	Annual	Annual	Annual
<b>Quarterly Fixed</b>	Annual	Quarterly	Annual
<b><i>Latest DECC policy position</i></b>	Quarterly	Quarterly	Quarterly

Source: Redpoint Energy (2014)

8. Since Redpoint Energy undertook their analysis, DECC have made some changes to the design of the 'quarterly fixed' option as presented above. In the final policy design, the interim £/MWh rate is reset on a quarterly basis and reconciliation is also carried out quarterly, completed by the end of the next quarter. These changes should ensure that the interim rate is more accurate and the reserve fund for each quarter is only held for six months at a time. This is expected to lessen the financing costs to suppliers, assumed to be passed onto consumers in the form of higher bills.
9. In this IA we only consider the impact of the variable, annual fixed and quarterly fixed levy designs. As our understanding of the way in which the CfD Counterparty would collect a reserve fund has developed, the proposition of setting, collecting, and reconciling a reserve fund on a quarterly basis dominates that of just collecting money on a quarterly basis (as set out in the 'quarterly staged' option above). The increased accuracy of the CfD Counterparty's forecasting CfD payments on a quarterly basis above annual forecasting and the resulting unit cost levy it sets, and the ability of the CfD Counterparty to return unused reserve funds to suppliers on a more regular basis, negates the need to consider doing so on a less frequent basis. For this reason, we have disregarded the 'quarterly staged' option as set out above, and only consider 'annual' and 'quarterly fixed' designs as viable options for a fixed unit cost levy. These options are considered alongside a variable levy design.
10. The modelling undertaken by Redpoint Energy is described in greater detail in the Cost Benefit Analysis section (Section 7) of this IA. The sizing of the reserve fund and costs of financing upfront payments are also considered in Section 7.

#### *Elements of Cost considered*

11. There are two broad cost classifications outlined in this IA: administrative costs and financing risk costs. It is helpful to briefly present the various elements of these costs upfront.

### Administration costs

12. Four elements of administrative cost were shown in the October IA; CfD Counterparty costs, delivery body costs, generator costs, and supplier costs. Cost estimates have been revised and improved since the October IA and are reflected in this IA. Some of these costs relate directly to the SO, but others are administrative costs related to EMR more widely, which are accounted for in this IA but are not directly related to the SO. The total administrative costs of each institution captured in this IA are described below:

- CfD Counterparty: the CfD Counterparty will be responsible for signing and managing CfDs, forecasting CfD payments, setting the SO interim levy rate and reserve amounts, billing and making payments to or from suppliers and generators. The CfD Counterparty's total administrative costs are captured in this IA.
- Electricity suppliers: the SO will impose administrative costs on electricity suppliers, in terms of establishing systems to forecast and manage payments. Suppliers' administrative costs are therefore entirely related to the SO and the relative role of the CfD Counterparty in forecasting.
- CfD generators: electricity generators will face administrative costs related to billing and settlement of payments to and from the CfD Counterparty. These costs are not attributable to the SO itself but are wider costs to generators from managing CfDs. We therefore present these costs separately to that of the SO.
- Delivery Body (National Grid): National Grid's costs as delivery body are not related to the collection of CfD payments from suppliers and so are also presented separately.

13. Additional EMR administration costs are given in Table 13. Total administration costs for EMR (including SO administration costs) are presented in Table 25.

### Financing costs

14. Financing and risk costs have four elements outlined briefly here, and discussed in greater detail in the Cost Benefit Analysis in Section 7.

15. Suppliers will be required to post collateral to the Counterparty to provide some coverage in case of delay or default on payments from the supplier.

16. A small additional amount will be required to cover insolvency risk, after a supplier's collateral is exhausted and before payments can be mutualised across other suppliers (the 'mutualisation gap'). Cost estimates have changed to reflect more sophisticated, stochastic modelling undertaken by Redpoint Energy and an improved understanding of the length of the potential 'mutualisation

gap'; the details of these and other 'backstops' are provided in the policy handbook and government response to the October Consultation.<sup>3</sup>

17. Suppliers are also considered to factor in the possibility that CfD costs will be higher than expected when setting customer tariffs. We have isolated this element of cost to consumers and refer to it as 'risk premium' in this IA.
18. Finally, SO design options with an upfront reserve fund collection are considered to carry financing costs. This reflects the opportunity cost to suppliers of providing money up front to ensure the CfD Counterparty holds a positive cash balance at all times so it can provide generators with CfD payments in a timely fashion.
19. Since the October IA we have developed our understanding of how risk premium and reserve fund costs would be managed by suppliers. In the October IA, the full costs associated with risk that actual CfD payments are underestimated are treated as the same under a variable levy and a fixed unit cost levy. However, feedback to the October IA suggested that suppliers would need to charge an equal risk premium under all options to cover risk potential under-collection from customers for CfD payments. Costs of financing reserve fund payments would be a separate, additional cost to cover liabilities to generators above CfD levy payments under a fixed unit cost option. This additional cost is reflected in this IA and as a result, total financing cost under a fixed unit cost levy is higher than under a variable levy design.

### *Policy Recommendation*

20. A variable levy and a quarterly fixed unit cost levy are shown to present the lowest cost approaches to delivering the SO. However, considering the unquantified costs and benefits of centralised forecasting provided by the CfD Counterparty under a fixed levy design, and the lower quantified costs with more frequent collection and reconciliation of reserve fund payments, analysis presented in this IA is broadly supportive of the choice of a quarterly fixed unit cost levy (Option 2b) as a preferred option. This is discussed in greater detail in Section 8.

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<sup>3</sup> Available at: <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

## 2. Background

### *Policy evolution*

21. As part of the 2012 draft Energy Bill, it was proposed that the CfD would be a statutory instrument that placed obligations on electricity suppliers and participating generators. Under that model, all suppliers would have been obliged to make payments for the output from each low-carbon generator. The generator who had applied for the CfD would have been on the other side of this arrangement. This model aimed to provide investors with a level of certainty about the legal status of CfDs, equivalent to a conventional contract with a strong counterparty.
22. However, market participants raised significant concerns with this model, particularly regarding the dispute resolution procedures that would apply, and the impact on suppliers' balance sheets. The Energy and Climate Change Committee also raised concerns about the suitability of this model in its report on the draft Energy Bill.<sup>4</sup>
23. As a result, an alternative payment model was developed for the Energy Bill when it was introduced to Parliament in November 2012. Two key components of this revised model were the creation of a new institution (the CfD Counterparty) to sign private law contracts with generators, and the inclusion of revenue-raising powers within the Bill (to enable the CfD Counterparty to collect funds from suppliers to fund payments to generators under CfDs, i.e. 'the Supplier Obligation').
24. In November 2012, the Government also outlined a high-level approach to the SO, setting out that (subject to the passage of legislation through Parliament) the Government would introduce a statutory obligation on suppliers to make payments to the CfD Counterparty, in order to fund payments to generators that are due under CfDs. More detail on the approach was included in the *Feed-in Tariff with Contracts for Difference: Operational Framework*.<sup>5</sup>
25. The Government stated that it was considering implementing a variable rate SO, where the precise amounts owed to the generators under CfDs in a given period would be collected from suppliers as soon as possible after that same period. It was felt that this design would be relatively simple for the CfD

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<sup>4</sup> <http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenergy/275/27502.htm>

<sup>5</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/65635/7077-electricity-market-reform-annex-a.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65635/7077-electricity-market-reform-annex-a.pdf)

Counterparty to administer, with a mechanism to reconcile any under, or over, collections.

26. Alongside this high-level approach, in light of feedback from industry and from the Energy and Climate Change Committee, the Government also published a call for evidence on the design of the SO.<sup>6</sup> Analysis of responses suggested that a variable levy could have a material adverse impact on suppliers, and smaller suppliers in particular. In light of these responses and ongoing analysis, the Government announced that it was minded to charge suppliers using a fixed formula-based levy; these proposals formed the basis of the consultation in October 2013<sup>7</sup>.

### *The Supplier Obligation*

27. Initially, only licensed electricity suppliers in Great Britain (GB) will be obliged to pay the SO (the SO will not be levied in Northern Ireland until Northern Ireland generators are capable of benefitting from the regime i.e. CfDs can be allocated in Northern Ireland)<sup>8</sup>. It is intended that in time the SO will be imposed equally on all UK suppliers in relation to their market share. Money raised through the SO will be used to fund the payments that are due to generators under CfDs. The contract with each CfD generator will determine the level of payments each generator would be entitled to, with the amounts owed by individual suppliers dependent on their market share. Market share will be based on volume of electricity supplied.

28. CfDs have been designed to give investors the certainty they need to invest in low-carbon electricity generation. Therefore, the SO must be designed to ensure that the CfD Counterparty can meet its contractual obligations and provide certainty to generators that they will receive the amounts due to them under CfDs. Similarly, the SO should be designed in a way that is wary of the impacts on suppliers and consumers.

### *Consultation Responses*

29. Government consulted on a range of proposed designs for the SO<sup>9</sup> in October 2013. The preferred option was a fixed unit cost levy, reflecting the

<sup>6</sup> <https://www.gov.uk/government/consultations/contracts-for-difference-cfd-supplier-obligation-call-for-evidence>

<sup>7</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/252273/131022\\_IA\\_-\\_Supplier\\_Obligation\\_final\\_for\\_publication\\_21\\_10\\_2013\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252273/131022_IA_-_Supplier_Obligation_final_for_publication_21_10_2013_.pdf)

<sup>8</sup> CfDs will not be available to projects in Northern Ireland before 2016 at the earliest.

<sup>9</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/252273/131022\\_IA\\_-\\_Supplier\\_Obligation\\_final\\_for\\_publication\\_21\\_10\\_2013\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252273/131022_IA_-_Supplier_Obligation_final_for_publication_21_10_2013_.pdf)



Government's desire to ensure CfD generators receive payments in a timely manner to support investment in low-carbon generation without placing an undue burden of costs on suppliers and consumers, and to limit the disadvantages placed on small suppliers in particular.

30. In total, 123 responses were received to the Consultation. The key concerns raised by respondents were that the requirement for a reserve fund and annual reconciliation under a fixed unit cost levy (the preferred option in the October Consultation) resulted in a levy that was effectively not 'truly fixed', as suppliers would still be exposed to actual CfD payments at year end. In addition, some respondents suggested that the reserve fund was an inefficient way of managing payment risk that will be particularly hard for smaller suppliers to deal with because of the need to make potentially large lump-sum payments. Suppliers would still be exposed to CfD payment uncertainty under this form of levy. There was no consensus from respondents on what the optimal SO design would look like, although suggestions included:

- Reverting to a variable levy as originally proposed in October 2012;
- Implementing a 'truly fixed' levy where any end-of-year surplus was 'rolled over' into the following year and used to reduce the levy rate;
- Allowing the CfD Counterparty access to Government working capital to manage in-year differences between payments collected from suppliers and payments owed to CfD generators, rather than collecting a reserve fund from suppliers;
- More frequent collection of the reserve fund.

31. The need for further modelling of CfD payment volatility and CfD Counterparty cash flows was identified during the consultation and reinforced by responses received from a range of stakeholders. In light of this, DECC commissioned an external research project in December 2013 which was undertaken by Redpoint Energy, a business of Baringa Partners. This work simulated CfD payments using dispatch modelling of the GB electricity system and stochastic inputs for gas prices, demand, and wind speeds (parameterised from historic data). Outputs were used to assess the cash flow position of the CfD Counterparty under different designs for the supplier obligation, to understand the resulting payment volatility for suppliers, and to estimate the size and associated cost of a reserve fund where necessary.

32. A report detailing the analysis undertaken by Redpoint Energy is published alongside this IA<sup>10</sup>. This modelling allows examination of the implications of

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<sup>10</sup>*Analysis of Contract for Difference Supplier Obligation funding options*, Redpoint Energy, Baringa Partners, 2014.

the frequency of setting a levy rate, collection of a reserve fund and reconciliation.

33. This IA aims to analyse the policy options presented in the consultation in greater detail. Considering responses to the Consultation, and supported by DECC-commissioned analysis on the SO to date<sup>11</sup>, this IA presents evidence on options considered for implementation of the SO.

### **3. Problem under consideration**

34. This IA considers two high level approaches to how the CfD Counterparty collects payments from electricity suppliers to fund CfD payments to generators: allowing payments to vary with the level of CfD payments or fixing a rate in advance for a set period that suppliers will be obliged to pay.
35. Under a variable approach, the precise amounts owed to CfD generators are collected by the CfD Counterparty from suppliers as soon as possible before being passed through to generators. Conversely, a fixed rate would involve the CfD Counterparty forecasting the level of electricity demand and the amount of CfD payments due over a forthcoming period to set an interim £/MWh rate for suppliers to pay according to market share. Any under or over payment would be reconciled at the end of a predetermined levy period.

#### *Variable rate*

36. Under a variable levy, the exact payments made by the CfD Counterparty to generators would be collected directly from suppliers, in proportion to their market share (by volume of electricity sold). The CfD Counterparty would be responsible for collecting and processing data received from generators and suppliers in order to ensure timely collection and delivery of CfD payments to generators. As it will not be possible to collect this information in real-time, a settlement period will be established following the end of the billing period (e.g. day or month), within which each supplier's outstanding liability must be settled.

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<sup>11</sup> As well as Redpoint Energy's new analysis detailed in this IA, DECC has previously commissioned analysis undertaken by Redpoint Energy, Deloitte and KPMG to support option appraisal under the Supplier Obligation. These were detailed in the October IA on the Supplier Obligation, available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/252273/131022\\_IA\\_-\\_Supplier\\_Obligation\\_final\\_for\\_publication\\_21\\_10\\_2013\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252273/131022_IA_-_Supplier_Obligation_final_for_publication_21_10_2013_.pdf)

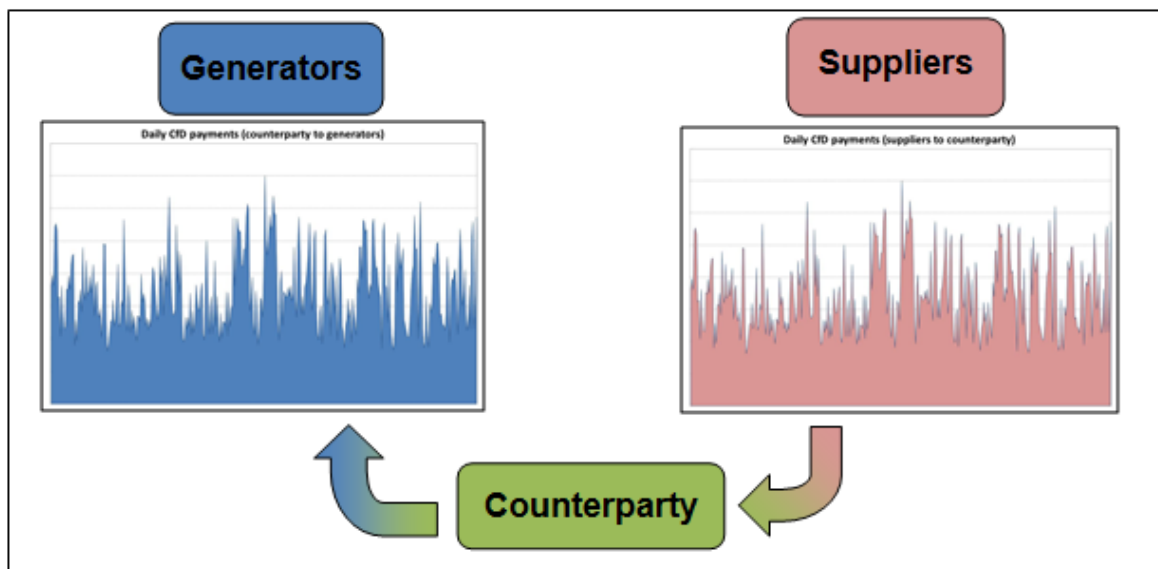
37. This difference in timing between receiving monies from customers and paying monies to the CfD Counterparty creates cashflow risks for suppliers, who typically do not change their prices for customers on standard variable tariffs more than once a year. In addition, they offer retail customers fixed price tariffs for a period of time that may go beyond a year (e.g. 18 months or 2-3 years). However, generators need to receive CfD payments shortly after generating in order to avoid cashflow issues of their own. Any delays to such payments could undermine their confidence in CfD payment streams, which are intended to support investment in low-carbon generation.
38. Under a variable rate regime, suppliers are responsible for forecasting their CfD payment liabilities and ensuring they have sufficient funds to cover any underestimates of CfD payments and customer demand. This would involve predicting wholesale electricity prices, CfD generation (influenced by wind speeds, weather patterns, etc.), electricity demand, as well as the likelihood of unforeseen extreme events. The ability of suppliers to make these predictions with any degree of accuracy will vary substantially with the sophistication of modelling techniques, experience in the marketplace, and levels of vertical integration into the electricity generation market, which are likely to correlate with size of the supplier's market share.
39. CfD payments are expected to vary on a daily basis, mirroring movements in the underlying reference price (Day-Ahead and Season-Ahead price)<sup>12</sup>. Under a fully variable levy, suppliers are exposed to full volatility of CfD payment liabilities. This will be significantly affected by technology mix, and will rise over time with increasing generation from intermittent sources. The increase in volatility will require suppliers to develop more sophisticated risk management tools in order to participate in this changing market. Even the most sophisticated models are likely to have limited accuracy, due to the inherent volatility of wholesale prices and intermittent renewable generation, which is impossible to predict with perfect accuracy. Moreover, vertically-integrated suppliers may already be somewhat protected from volatility costs as the generation arm could act as an in-built (or 'natural') hedge, providing them with a competitive advantage.
40. Feedback to the October Consultation indicated that hedging options for suppliers are still relatively immature. Although we would expect market instruments to develop over time to allow suppliers to manage CfD payment

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<sup>12</sup> Reference price varies by type of generation (intermittent or baseload). Government intend to base the reference price for baseload generation on the traded prices for seasonal contracts. Please see Electricity Market Reform – Contract for Difference: Contract and Allocation Overview (August 2013) for further information

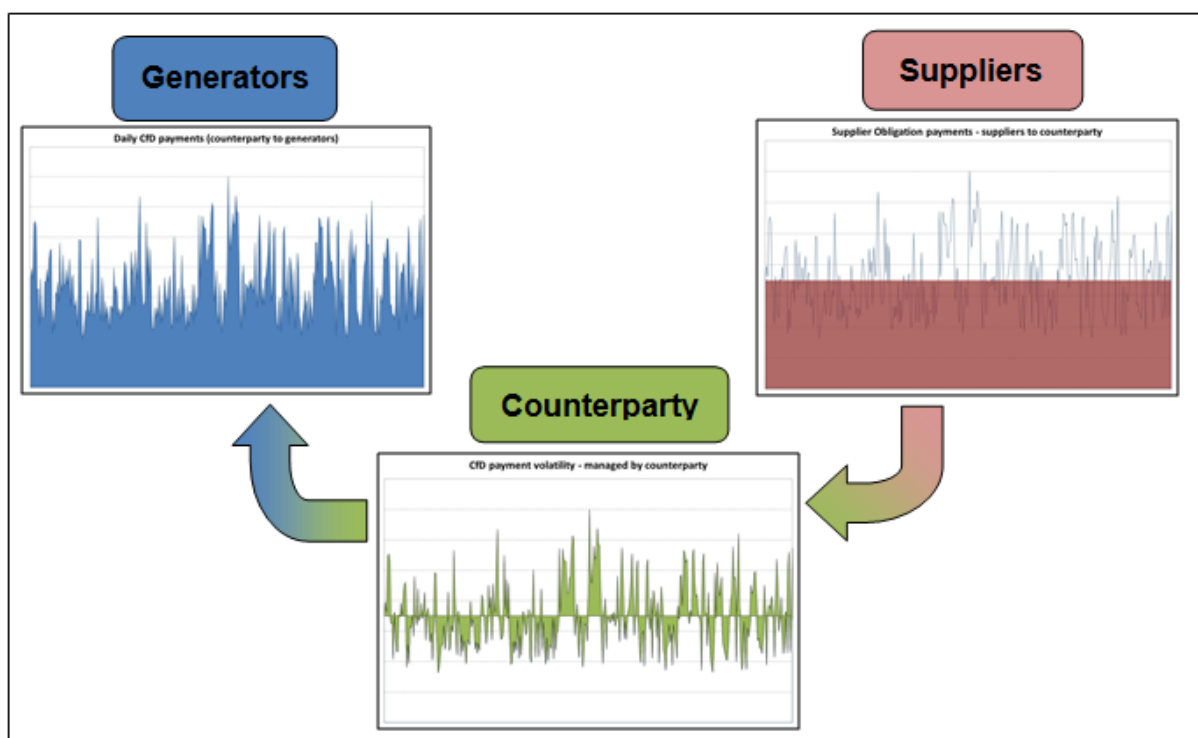
volatility more effectively, feedback that in the meantime there could be value in setting a fixed unit cost levy rate to help control this volatility.

**Table 2 Payment flows under variable-rate Supplier Obligation**



*Fixed rate*

41. Under a fixed rate levy, the CfD Counterparty would forecast expected CfD payments and electricity demand, and set a fixed interim levy rate for a predefined levy period. However, actual payments to CfD generators will depend on wholesale prices and generation volume which cannot be forecast to a high degree of accuracy, so the payments received from suppliers for each billing period are unlikely to match the payments out to generators which would be paid according to actual generation.
  
42. In order to ensure that the CfD Counterparty has sufficient funds to make CfD payments, the CfD Counterparty would need to establish a reserve fund to smooth payments and account for any errors in forecasts, with a reconciliation process between the CfD Counterparty and suppliers shortly after the levy period to 'true up' what each supplier has paid against their underlying liability to generators.

**Table 3 Payment flows under fixed-rate Supplier Obligation**

43. Consultation responses from some (particularly smaller) suppliers indicated that it would be beneficial if the CfD Counterparty provided centralised forecasting and set a fixed £/MWh price for CfD payments.
44. Evidence submitted and feedback provided to the October Consultation suggested that suppliers will have differing capabilities with regards to forecasting future CfD payment volatility and implementing effective hedging strategies. Larger market participants may have access to more sophisticated forecasting operations and higher quality information on the key drivers of CfD payment levels due to greater participation in generation markets, as well as a greater ability to use SO payments to hedge against wholesale price risks. In contrast, smaller suppliers are likely to have less sophisticated modelling operations and less access to data on which to base their forecasts, and are likely to be more limited in their ability to hedge electricity price risk and effectively manage CfD payment volatility.
45. Providing centralised forecasting of expected CfD payments for all market participants can remove the CfD payment forecasting advantage held by large suppliers and support greater competition in the electricity supply market.

## 4. Rationale

46. In deciding whether the market will operate effectively without intervention, there are two key considerations that need to be taken into account:

- whether market mechanisms currently available are accessible to all private sector participants to effectively manage the CfD payment process in an equitable fashion or if market characteristics may adversely impact the ability of some market participants to operate and compete effectively
- whether greater efficiency can be achieved through a centralised mechanism to lower overall transaction and forecasting costs

47. In response to feedback from both industry stakeholders and Parliamentarians at the pre-legislative scrutiny stage of the Energy Bill, a CfD Counterparty was created to address concerns around the 'bankability' of CfDs and increase the confidence of potential low-carbon investors in the CfD regime. In addition, having a central body (the CfD Counterparty) to manage payments between suppliers and generators may offer significant transaction cost savings, relative to a multitude of bilaterally-negotiated payment arrangements across many suppliers and generators and help reduce the competitive imbalance between small suppliers and/or larger vertically integrated suppliers.

48. Advice from Deloitte as detailed in the October IA, and feedback from industry participants to the October Consultation, indicates that the market does not yet offer instruments accessible to all participants to adequately manage the forecasting process associated with CfD payments. Therefore, this suggests a role for the CfD Counterparty (and hence Government) in managing some specific risks.

49. In addition, information asymmetries between larger and smaller suppliers and the use of market power may impact on competitive dynamics in the energy retail market, leading to a reinforcement of the existing market structure and potentially acting as a barrier to entry for new potential suppliers. This suggests that establishing a CfD Counterparty to provide forecasts of CfD payment costs on a per unit basis and manage transaction costs for all participants on a fair and equal basis can enhance transparency and competition in the market.

## 5. Objectives

50. The overarching policy objective for the design of the SO is to enable the CfD Counterparty to make payments of CfDs in a cost-effective way, which works within the tax and accounting rules. This supports EMR through delivering decarbonisation and affordability for businesses and consumers.

51. When assessing which type of levy to adopt, this IA will consider:

- the CfD Counterparty's administrative costs;
- ease of administration for suppliers;
- market instruments available to manage operational risks and their accessibility to all market participants;
- access to the market and implications of each type of levy on market participants; and
- the financial impact of posting collateral, coverage of insolvency risks, the cost and administration of any necessary reserve funds, and how they compare.

*Criteria success should be judged against*

52. The October Consultation set out the six key principles that should underpin a decision on the choice of SO levy design:

1. The levy should provide value for money to consumers.
2. The levy should not unduly provide a competitive advantage to one group of existing suppliers/generators over another.
3. The levy should not create additional barriers to entry or increase the likelihood of suppliers leaving the market.
4. The levy should not have a negative impact on market liquidity.
5. The policy design is workable/credible with industry.
6. Risks should be allocated where they can best be managed where possible.

53. The October Consultation concluded that based on these criteria, Government's preferred approach was to implement a fixed unit cost levy, consistent with Option 3<sup>13</sup>. These criteria will again be used to assess the choice of levy design in this IA.

## 6. Options under consideration

54. The October Consultation outlined the different options available in the design of the SO. These were as follows:

- **October Consultation Option 1 – Variable levy:** Payments are recovered by the CfD Counterparty through a variable rate, where suppliers pay the CfD Counterparty based on metered generation supplied and their market share at settlement points;
- **October Consultation Option 2 – Generation fixed levy:** Generation output is forecast by the CfD Counterparty, but supply is based on metered data and reference price is based on actual wholesale price for the billing period;
- **October Consultation Option 3 – Fixed unit cost levy:** the CfD Counterparty forecasts/fixes all elements except for supply, which is based on metered information; leads to £/MWh rate for suppliers, with monies collected from each supplier according to the metered amount supplied in a given period; and
- **October Consultation Option 4 – Fully fixed levy:** All elements forecast by CfD Counterparty to estimate total amount to be collected and allocated to each supplier in line with their market share.

55. All fixed levy options (Consultation Options 2 – 4) would require a reserve fund to be collected to manage variations in CfD payments above a predetermined level.

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<sup>13</sup> The October Consultation is available here:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/252273/131022\\_IA\\_-\\_Supplier\\_Obligation\\_final\\_for\\_publication\\_21\\_10\\_2013\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252273/131022_IA_-_Supplier_Obligation_final_for_publication_21_10_2013_.pdf)



## *Changes since October*

56. There have been a number of changes both to the options under consideration and our approach to assessing the costs and benefits of these options since October, informed by consultation responses, discussions with stakeholders, and additional modelling commissioned from Redpoint Energy. These changes are summarised in this section.

### Feedback on October Consultation Options

57. No consultation respondents supported implementing the 'generation fixed' or 'fully fixed' options consulted on in October 2013. Given that these options were analysed in October, not recommended to be taken forward, and did not receive support from stakeholders, they are not considered further in this IA. However, there was some support from respondents for both a variable and a fixed unit cost levy design.

58. A number of respondents proposed alternative designs for the SO that were not included in the October consultation. The main proposals were as follows:

- **Rollover levy.** This proposal involved the CfD Counterparty setting a unit cost fixed £/MWh rate (incorporating a reserve fund if necessary), but with no end-year reconciliation. Instead, any surplus funds would be used to reduce the levy rate in the following year, meaning that suppliers' liabilities in a year would be fully fixed before the beginning of the year (and any difference between forecast and outturn CfD payments in a year would be reflected in the following year's unit cost fixed rate). Whilst we can see some advantages from this mechanism, we set out in the Government response to the consultation that it would have an adverse impact on public sector finances and would therefore not be consistent with Government policy, and so it is not assessed as part of this IA.
- **Working capital.** A number of suppliers suggested that the CfD Counterparty access working capital to manage in-year differences between payments collected from suppliers and payments owed to CfD generators, rather than collecting a reserve fund from suppliers. We recognise that there may be benefits to suppliers, from avoiding paying a lump sum reserve fund up front under this design. However, it would increase Government net debt and involve potentially putting taxpayer funds at risk if suppliers failed to make repayments as required, and would therefore not be consistent with Government policy, so it is not assessed as part of this IA.

- **More frequent collection of the reserve fund.** Some suppliers suggested that, if a rollover levy or working capital were not possible, the reserve fund should be collected more frequently to avoid the need for large lump-sum payments to cover an entire year. This proposal has been taken forward, and is described in more detail in the next section.

### *Options Considered in this Impact Assessment*

59. Taking into consideration the previous analysis undertaken on Supplier Obligation design and Consultation responses, the high-level options assessed in this IA have been narrowed down to two: a variable levy and fixed unit cost levy (Consultation Options 1 and 3 respectively).

60. A 'do minimum' variable rate levy option is presented alongside a fixed rate levy set on a fixed unit cost basis i.e. £/MWh. The fixed rate levy has been separated into two sub options, 2a and 2b. These represent alternative approaches to how frequently the levy rate and reserve fund are set and how frequently payments are reconciled.

### Choice of counterfactual and options

61. CfDs aim to incentivise investment in low carbon electricity generation by providing a stable price signal for low carbon electricity generation via a predetermined 'strike price'. The price difference between the 'reference price', i.e. the market price, and the strike price determines the support cost of CfDs. In the absence of any Government intervention, CfD payment arrangements between suppliers and generators could be subject to significant transaction costs, time delays, and ultimately the conclusion of payment may not occur. Therefore, to ensure the policy is workable, a CfD Counterparty is required to provide a legal entity with which both generators and suppliers can contract, and to manage and collect payment flows between suppliers and generators.

62. Under the final EMR design, a genuine 'do nothing' counterfactual with regards to the SO would not be meaningful. In this IA we therefore use a 'do minimum' (see below) as the counterfactual against which we assess the policy options for the potential design of the SO.

- **Option 1: Variable Levy ('do minimum'):**  
Suppliers pay the CfD Counterparty based on actual CfD costs and their market share at settlement points, shortly after the day of generation. Under this option, risks outlined in the previous section are managed by

suppliers. Analysis and industry feedback to the October Consultation suggests that given the inherent uncertainty over CfD payments, suppliers would need to charge a 'risk premium' to customers to ensure that tariffs charged would cover an underestimated CfD forecasting errors resulting in an under-recovery of costs. Feedback from suppliers indicated that this supplier risk premium would be essential to ensure volatility in CfD payments did not create a significant risk to their business.

### Fixed Unit Cost Levy

63. Under a Fixed Unit Cost Levy, the CfD Counterparty sets an interim £/MWh rate in advance of the levy period based on forecasted expected CfD payments and electricity demand over the levy period, and invoices suppliers according to their metered supply each day in the levy period. The Counterparty also determines a reserve fund which suppliers pay at the start of the levy period, sized to ensure that the CfD Counterparty had sufficient funds to pay generators to a 95% level of certainty (e.g. if CfD payments were higher than forecast or demand was lower). Reconciliation would occur at the end of each period, 'truing up' what each supplier has paid the CfD Counterparty against their underlying liability for CfD payments. The financing cost of this reserve fund is expected to be passed on to consumers in addition to risk premium outlined under Option 1.

- **Option 2a: Annual Fixed Unit Cost Levy:**

In this option the interim £/MWh rate and reserve fund are set three months before the start of a levy year, to cover expected and potential CfD payments over the course of that year. Suppliers would pay the totality of the reserve fund in one lump sum at the beginning of the fiscal year. Reconciliation payments would be finalised three months after the end of the year, meaning that at any given time, the CfD Counterparty will hold 15 months of reserve fund payments.

- **Option 2b: Quarterly Fixed Unit Cost Levy (preferred option):**

Under this option, suppliers are notified three months before the start of each quarter of the interim £/MWh rate and reserve fund amount due. The interim rate and reserve fund are set to cover expected and potential CfD payments over the course of a quarter. Reconciliation payments are calculated at the end of each quarter, with payment due three months later, meaning that at any given time, the CfD Counterparty will hold six months of reserve fund payments.

## 7. Cost Benefit Analysis

64. A Cost Benefit Analysis (CBA) should assess the relative size of the costs and benefits across different policy options to provide insight into which policy options provide the best overall value for money. Building on the analysis presented in the October Consultation and taking into account consultation feedback, this IA quantifies the costs attributable to each policy option in the preceding section.

65. To assist with the quantification of these costs and evaluate the overall impact of the different options under consideration, DECC commissioned external analysis.

### *External Analysis*

66. Analysis presented in the October consultation was informed by three sets of external analysis – from Redpoint Energy, KPMG and Deloitte. We will firstly briefly outline the analysis undertaken for the October IA, and the further analysis commissioned in December 2013 to support this IA.

### *October 2013 Consultation IA Analysis<sup>14</sup>*

#### Redpoint Energy analysis

67. In January 2013, Redpoint Energy was commissioned to analyse the potential variation in CfD settlement payments under a range of potential scenarios. These scenarios set out the changes in wholesale electricity prices and CfD payments, as conditions in the GB electricity market vary. Scenarios were defined to assess variations in fossil fuel prices, different levels of new low-carbon generation and changes in the patterns of wind output<sup>15</sup>. The fluctuation in the level of CfD payments and the relationship of this to the wholesale electricity price was intended to provide the basis for

<sup>14</sup> For more detailed description of the analysis under taken for the October Consultation, see here: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/252273/131022\\_IA\\_-\\_Supplier\\_Obligation\\_final\\_for\\_publication\\_21\\_10\\_2013\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252273/131022_IA_-_Supplier_Obligation_final_for_publication_21_10_2013_.pdf)

<sup>15</sup> 12 scenarios were analysed: a central 'base case', high/low fossil fuel prices, 50g & 200g emissions intensity in 2030, +/- 20% wind generation, 'high wind' scenario (2 consecutive months), volatile gas prices (2006 profile), gas price fall (25% decrease in 2020, 2025, 2030), 20% CfD Capacity increase, and a 'Cornwall Energy' case

analysis of the potential financial impact on suppliers of the Supplier Obligation under a range of market conditions.

68. Power prices and CfD generation data were calculated using the Plexos model of the GB electricity market, using key assumptions provided by DECC (consistent with the EMR modelling as of January 2013). Despite significant alignment of input assumptions with the DDM model, a number of factors affecting power prices and generation can lead to a different level of CfD payments (e.g. wind profile, demand profile, gas price profile, interconnections regime, operational assumptions of particular technologies).
69. CfD payments were modelled over a time horizon of 2016 to 2030, with results presented in the form of weekly, monthly and yearly CfD payments and total suppliers payments. The outputs of this analysis were then used by Deloitte to conduct analysis of different aspects of the SO regime.

#### Deloitte analysis

70. In November 2012, Deloitte was engaged to provide advice to DECC about the potential impacts on suppliers of a variable levy for the SO (i.e. Option 1, in the context of the October IA). This covered both the likely accounting treatment of the Supplier Obligation by suppliers, as well as the scale of risk to suppliers from volatility associated with Supplier Obligation payments.
71. In February 2013, on the back of this analysis and feedback from the Call for Evidence in November 2012, Deloitte undertook further analysis on the formulation and impacts of a fixed levy SO supported by Redpoint Energy's analysis from January 2013 (as described above). Deloitte's further analysis informed Options 2 – 4 as presented in the October IA.

#### KPMG analysis

72. In parallel with the analysis commissioned from Deloitte above, KPMG were also engaged to provide advice relating to an Insolvency Reserve Fund. This analysis looked at how an Insolvency Reserve Fund should operate (e.g. who should contribute, how it should be accessed, how it should be repaid) and the size of fund required (as well as impacts on suppliers and consumers).

#### *June 2014 IA Analysis*

#### Further Analysis from Redpoint Energy

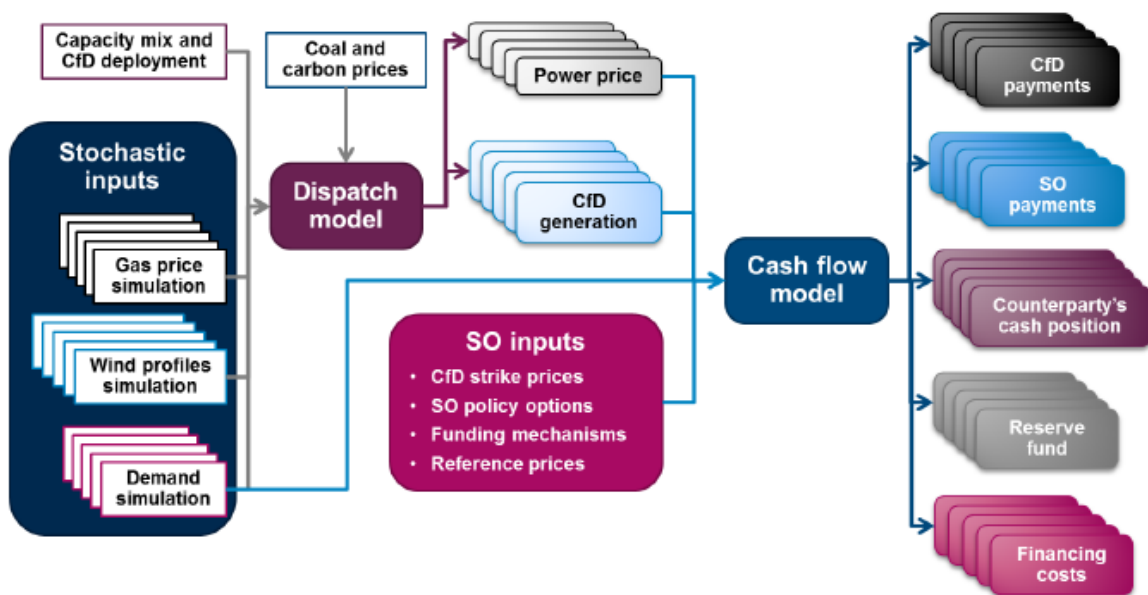
73. Consultation responses underlined the need to develop a better understanding of potential CfD payment volatility and its impact on supplier

payments and the size of the reserve fund required under a variable levy and a unit fixed cost levy. In December 2013, DECC commissioned further analysis from Redpoint Energy to assist in the decision making process.

74. Redpoint Energy conducted probabilistic analysis of payment volatility under CfDs based on uncertainty in gas prices, wind levels and electricity demand. This was used to inform an assessment of supplier risk premiums (discussed further in this section) under different policy options. Redpoint also assessed the size of the reserve fund needed by the CfD Counterparty to manage differences between payments to generators and receipts from suppliers under a fixed rate regime, allowing estimation of the financing cost to suppliers of providing an upfront reserve fund to the CfD Counterparty. Redpoint Energy have presented their methodology and results in a report published alongside this IA<sup>16</sup>.

75. Table 4 below provides an overview of the modelling framework Redpoint Energy have used to forecast power prices and CfD generation in years 2017/18 and 2020/21:

**Table 4 Redpoint Energy Modelling Framework**



Source: Redpoint Energy, 2014

<sup>16</sup> *Analysis of Contract for Difference Supplier Obligation funding options*, Redpoint Energy, Baringa Partners, 2014. Available at: <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

## Dispatch Model

76. The tool used to model electricity system dispatch, PLEXOS, is third party power market modelling software configured for the GB electricity market using DECC's assumptions on capacity mix, fuel and carbon prices.<sup>17</sup>

77. Redpoint Energy considered two fiscal years to provide snapshots of expected CfD payments in 2017/18 and 2020/21. For each fiscal year considered, the model generates 100 sets of inputs for hourly wind generation, daily gas prices, and hourly electricity demand and runs the dispatch model for each set, producing 100 corresponding simulations of GB power prices and CfD generation. This method is called a Monte Carlo simulation. Variable inputs into the power dispatch model include:

- Gas price: Redpoint Energy have simulated gas prices from the standpoint of the CfD Counterparty estimating possible scenarios for the next fiscal year in the previous November, using eight fiscal years of GB gas prices from 2005/05 to 2012/13 broken down by monthly average prices and summer/winter volatility. Simulated gas price are scaled to reflect historical forward premiums/discounts observed from November to the next fiscal year such that the average price from all simulations matches DECC forecasts. This should illustrate the degree of error that the Counterparty could expect in forecasting gas prices over a year
- Wind output: 20 years of historical wind speed data is used to create simulations for nine regions across GB, which is then scaled to match DECC expectations of wind load factors.
- Electricity demand: GB electricity demand is modelled as an annual demand (following a normal distribution based on historical year-on-year variation of GB electricity demand over 16 years) coupled with an hourly profile drawn from eight historical profiles.

78. The modelled GB capacity mix is aligned to the EMR Delivery plan<sup>18</sup> published in December 2013. The dispatch modelling is discussed in greater detail in Redpoint Energy's report<sup>19</sup>.

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<sup>17</sup> Aligned with assumptions used to inform the EMR Delivery Plan (December 2013), available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/268221/181213\\_2013\\_EMR\\_Delivery\\_Plan\\_FINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268221/181213_2013_EMR_Delivery_Plan_FINAL.pdf)

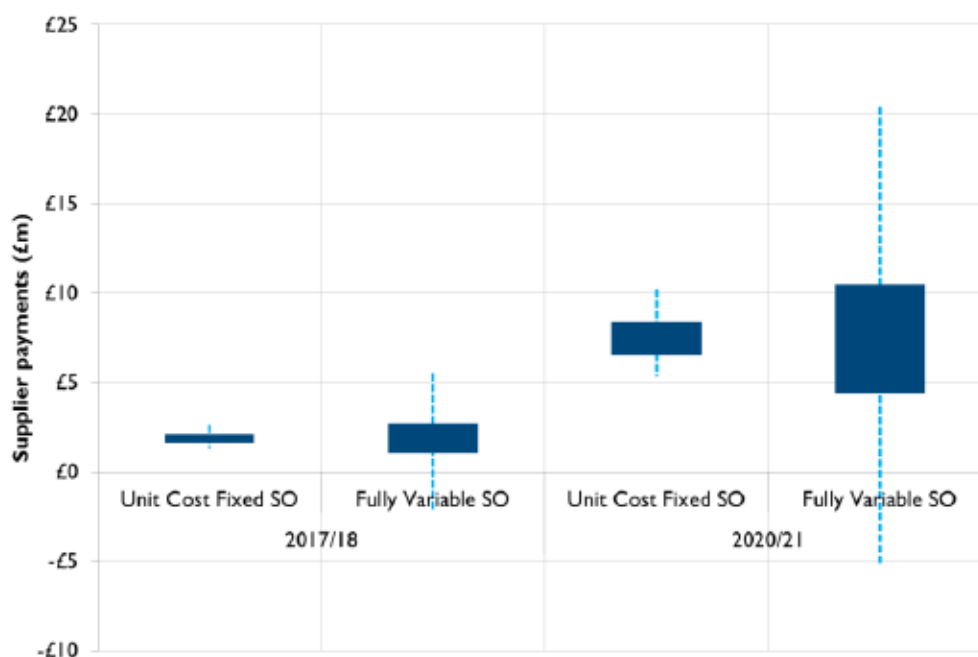
<sup>18</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/268221/181213\\_2013\\_EMR\\_Delivery\\_Plan\\_FINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268221/181213_2013_EMR_Delivery_Plan_FINAL.pdf)

<sup>19</sup> *Analysis of Contract for Difference Supplier Obligation funding options*, Redpoint Energy, Baringa Partners, 2014.

CfD Payments and CfD Counterparty Cash Flow

- 79. Redpoint Energy’s analysis provided an assessment of CfD payment volatility under a variable levy, and the CfD Counterparty’s cash balance under a fixed unit cost levy.
  
- 80. CfD payments are expected to be volatile and vary every day depending on strike prices, reference prices and volume of electricity generated. In order to help manage this volatility and provide electricity suppliers with daily certainty of payments, the CfD Counterparty would forecast CfD payments for the forthcoming year/quarter and set a fixed £/MWh interim rate. Suppliers would be charged against the amount of electricity supplied each day.
  
- 81. The outputs of the dispatch model were used to calculate daily CfD payments under different market simulations (simulated in the dispatch model) using CfD Strike Prices, reference prices and deployment rates associated with each CfD technology.
  
- 82. Under a variable levy, suppliers are subject to full volatility of CfD generation and reference prices. Suppliers must manage the variation of CfD liabilities. Under a fixed unit cost levy, an average rate is set and actual CfD payments are reconciled at the end of the period. Redpoint Energy’s analysis shows the difference in CfD payment volatility observed as a result of setting interim levy rates, as shown in Table 5.

**Table 5 Daily CfD payment volatility under variable levy and fixed unit cost levy approaches**



Source: Redpoint Energy, 2014.



83. Ultimately, the risk of CfD payments being higher or lower sits with suppliers under a variable levy or fixed unit cost levy. The volatility of daily CfD payments is reduced significantly under a fixed levy option. Payment volatility is estimated to be 41% – 44% of the average with daily settlement. Under a variable levy Volatility of daily CfD payments is estimated at 13% under a fixed unit cost levy.
84. To ensure that the CfD Counterparty has sufficient funds to make CfD payments under a fixed unit cost levy design (Options 2a and 2b) a reserve fund is required. This will be funded by suppliers as a lump sum payment at the start of every levy period (the levy period being defined by the choice of option; annual under Option 2a or quarterly under Option 2b).
85. The CfD Counterparty's cash balance was calculated on a daily basis as CfD levy payments (the interim levy rate multiplied by electricity demand) received from suppliers, minus forecast CfD payments owed to CfD generators for actual generation. Payments from suppliers were calculated as the interim rate multiplied by demand on the day of supply. Interim rates were set on an annual and quarterly basis for Options 2a and 2b respectively. The CfD Counterparty's cash balance factors in the timing of the payments received by the CfD Counterparty from suppliers 19 days after the day of supply (a simplification of the 13 working day period for payments set out in the CfD SO Regulations), and payments are made to CfD generators 28 days after the day of generation, in line with the terms of CfDs. The CfD Counterparty's cash position at the end of the period reflected the cumulative impact of this daily calculation. Note that under a variable rate levy, suppliers would be required to make payments in line with actual CfD generation, while under a fixed unit cost levy suppliers are invoiced for the fixed £/MWh interim rate against daily electricity supplied, generators are paid *actual CfD payments* in line with *actual daily generation*, and reconciliation of discrepancies between the two amounts takes place at the end of the period.
86. The Counterparty's cash balance was used to estimate the reserve fund that might be required under the fixed unit cost levy policy options. The reserve fund was calculated based on the maximum fall of the CfD Counterparty's cash balance between the start and the end of the levy period (year and quarter, for Options 2a and 2b respectively) in the 'p-95' simulation. P-statistics are used to represent a level of risk. They are calculated by ranking values from 1 -100 in order of increasing magnitude, p-1 being the lowest total average CfD payments across the period, and p-100 being the highest. For instance, a p-95 reserve fund size is the 6<sup>th</sup> largest reserve fund size in 100 simulations used and provides 95% certainty that the reserve fund collected would be sufficient to meet payments to generators. This was

judged to be a conservative estimate of the certainty the CfD Counterparty would need to ensure payments could be made to generators on time. Although 100 simulations is not a large enough sample size to characterise a true p-95 scenario, and this analysis serves as a proxy to provide indicative reserve fund sizes and financing costs.

87. In the October IA, suppliers' cost of financing was assumed to be 6.7% based on DECC's assessment of a weighted average of industry wide cost of financing. Reflecting responses to the October Consultation, we now present a range of financing cost between 6.7% and 10%.

88. In this IA, total average daily CfD payment results have been scaled to EMR Delivery Plan CfD payment forecasts from December 2013<sup>20</sup> to provide consistency with DECC's forecasts of CfD generation.

#### *Interim rate and reserve fund*

89. Under a fixed unit cost levy option, suppliers will pay interim rate payments on a daily basis, with amounts owed calculated by multiplying the applicable interim £/MWh rate by the volume of electricity supplied on each billing day. Suppliers will be invoiced seven working days in arrears of the day of supply<sup>21</sup>, and will have five working days to make payments.

90. In Redpoint Energy's modelling, the interim rate for each year<sup>22</sup> is calculated as total average CfD payments across all simulations divided by total average electricity demand across all simulations to provide a £/MWh rate.

91. The amount required for the reserve fund is calculated as the maximum cash drop between the start and end of the levy period. This ensures that the CfD Counterparty never has a negative cash balance during the period in 95% of all simulations.

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<sup>20</sup>[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/268221/181213\\_2013\\_EMR\\_Delivery\\_Plan\\_FINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268221/181213_2013_EMR_Delivery_Plan_FINAL.pdf)

<sup>21</sup> Initial estimates of the volume of electricity supplied by each supplier are first provided by Elexon five days after the day of supply. The CfD Counterparty is given two days to calculate amounts owed and issue invoices. Suppliers are given five working days to make payments in line with standard industry timescales. Available at: <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

<sup>22</sup> Redpoint Energy use an annual levy rate for both annual and quarterly fixed unit cost option assessments. Subsequently the policy decision was made to set a levy rate on a quarterly basis to allow the CfD Counterparty to forecast on an ongoing basis, improving accuracy of forecasting. For the purposes of this IA we have re-calculated the reserve fund requirements for option 2b using a quarterly levy rate using Redpoint Energy inputs.

### Annual Reserve Fund

92. Under an annual levy design (Option 2a), reserve fund payments are made in one lump sum at the start of the year. Reconciliation will be completed three months after at the end of the fiscal year, where supplier's liability for actual CfD payments will be netted off against in interim levy rate payments and reserve fund payments.
93. This means that for a three month period after the end of each fiscal year, the CfD Counterparty will hold each reserve fund amount for 15 months while it is processing reconciliation. This is reflected in the financing costs associated with reserve fund collection under Options 2a and 2b.
94. Forecast annual reserve fund collections<sup>23</sup> for fiscal years 2015/16 to 2020/21 are shown in Table 6 below.

**Table 6 Estimated Annual Levy Reserve Fund Collections by Year, £m (2012 prices)**

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
31	124	226	284	577	798

Source: Redpoint Energy, DECC 2014.

### Quarterly Reserve Fund

95. Similarly, under a quarterly levy design (Option 2b), upfront payments to the CfD Counterparty are made to cover the p-95 minimum cash balance over the course of the quarter. Reconciliation occurs at the end of the quarter where suppliers' liability for actual CfD payments will be subtracted from the payments to the CfD Counterparty during the quarter for interim levy payments and the upfront reserve fund).
96. Under a quarterly levy rate, the Q1 reserve fund is collected at the beginning of Q1. Invoices are sent to suppliers one quarter in advance. Similarly, suppliers are invoiced for the Q2 reserve fund at the beginning of Q1, and the Q2 reserve fund is collected from suppliers at the beginning of Q2. At the end of Q2, the CfD Counterparty will have completed the reconciliation of Q1 payments; on average this will lead to full repayment of the reserve funds to suppliers, reflecting the *average expected* levy rates that have been set. In reality, the reconciliation amount for Q1 will be netted off against the invoice for the reserve amount for Q3, so that suppliers make a single payment at the

<sup>23</sup> The CfD Counterparty requires three months to complete the reconciliation process, meaning reserve funds are held for 15 months under an annual unit cost levy and for 6 months under a quarterly fixed unit cost levy. This makes presenting reserve fund amounts held unhelpful. Here we show amounts collected each period and note that financing costs are calculated for the full term for which the collected amount is held.

start of Q3 reflecting both amounts to the CfD Counterparty. At the beginning of Q3, the Q3 reserve fund is collected. At the end of Q3, the CfD Counterparty will reconcile for Q2 collects its Q4 reserve fund requirement. The collection of the reserve amounts and offsetting against reconciliation payments continues in this way for the duration of the SO.

97. In the same way as an annual fixed unit cost levy (Option 2a), as the CfD Counterparty gives suppliers three months' notice of the reconciled amounts, it will require a full quarter to complete the reconciliation process. This means that under a quarterly fixed unit cost levy (Option 2b), the CfD Counterparty will hold two quarters' reserve funds at any given time. Compared to an annual fixed unit cost levy (Option 2a) where the CfD Counterparty holds reserves for 15 months at a time, the average size of the reserve fund held by the CfD Counterparty under a quarterly fixed unit cost levy (Option 2b) is expected to be significantly lower.

98. Forecast quarterly reserve fund collections in each quarter<sup>24</sup> for fiscal years 2015/16 to 2020/21 are shown in Table 7 below:

**Table 7 Estimated Quarterly Levy Reserve Fund Collections by Quarter, £m (2012 prices)**

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Q1	5	22	44	51	100	145
Q2	7	29	52	74	153	208
Q3	10	41	73	100	207	282
Q4	12	48	85	111	230	330

Source: Redpoint Energy, DECC, 2014.

99. On average, suppliers should expect to receive each quarter's reserve fund contribution back three months after the end of the quarter. For instance, in a period (year or quarter) where CfD generation turns out to be higher than expected, the CfD Counterparty will have used some of its reserves to pay generators, and suppliers will be reimbursed for the remaining reserves that were not used. In a period where CfD generation is lower than expected, suppliers will be reimbursed for the full amount of the reserve fund, as well as an additional amount equal to the interim rate payments made by suppliers (which were set to cover *expected* CfD payments) less *actual* CfD payments made. Therefore over the long-term, as long as the CfD Counterparty's forecasts for CfD payments are not systematically higher or lower than actual payments, under-payments and over-payments should cancel out.

<sup>24</sup> Here, the CfD Counterparty collects a reserve fund every quarter and reconciles payments after six months. We therefore show the full amount held by the Counterparty in reserve in each quarter.

100. Reserves held by the CfD Counterparty are considered a temporary transfer from suppliers to the CfD Counterparty, and do not represent an additional resource cost to society (as all monies will ultimately be adjusted to reflect outturn CfD payments). However, since there is a timing difference between monies collected from suppliers and reconciliation by the CfD Counterparty at the end of the levy period, a financing cost is incurred, which is the opportunity cost of the reserve fund. It is these financing costs that are most likely to be passed onto consumers.

### *Supplier Obligation Costs - changes from October 2013*

101. We consider two broad types of cost resulting from the adoption of each of the three policy options for the design of the SO:

- Administrative costs applicable to the CfD Counterparty and suppliers for set-up and ongoing cost of the SO
- Financing costs of risk management tools including the CfD Counterparty's reserve fund (for fixed unit cost Options 2a and 2b), risk premium, collateral and insolvency risk coverage.

102. A number of changes have been made to our approach to assessing the costs of the SO, in response to evidence provided through the consultation process:

- **Administration costs:** The October IA presented administration costs of EMR under the cost of the SO. This included costs to the CfD Counterparty and suppliers, as well as costs to National Grid as the delivery body for CfDs and costs to generators for managing CfD arrangements. However, only some costs to the CfD Counterparty and suppliers directly relate to the SO itself. Administration costs of the SO are therefore made up of CfD Counterparty and supplier costs only. We present National Grid and generator costs in the costs summary Table 25 to give a complete representation of EMR administration costs. In this IA, we separate administration cost for set up costs from 2012 – 2014 and operational costs from 2015 – 2020.
- **Financing costs:** The approach to calculating financial costs of the SO has been updated to reflect feedback to the October Consultation and new probabilistic modelling. Further details on design of the SO are set out in the SO Regulations<sup>25</sup>.

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<sup>25</sup> Available at: <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

- Collateral: Calculated based on 21 days of collateral as set out in the Implementing Electricity Market Reform document<sup>26</sup>. Under a fixed unit cost levy rate, the minimum credit cover required by a supplier will be sized on a rolling basis, according to the supplier's interim rate payments for the previous 21 days of supply for which data is available (in line with a quarterly or annual levy rate). Under a variable rate, collateral will reflect the supplier's share of actual CfD payments. Costs presented in this IA are updated to reflect Redpoint Energy's probabilistic modelling of CfD payments.
- Insolvency Risk: In the October consultation<sup>27</sup> it was proposed that there would be a separate 'insolvency reserve fund' to cover insolvency risk. Under the fixed rate options the Government has decided that insolvency risk will now be managed within the general reserve fund. Under a variable rate levy it is likely that a separate insolvency reserve fund would still be required. In either case, the expected requirement to be put aside to cover insolvency risk has been reduced from the original proposal to cover 38 days of non-payment by the three largest small suppliers, as set out in the Government response. It is now judged that insolvency risk coverage is only needed for four days of non-payment by the three largest small suppliers, because the CfD Counterparty could commence mutualising any payment default seven days before the defaulting supplier's collateral is exhausted and would therefore start receiving mutualisation payments 10 days after initiating mutualisation (plus two days payment rectification period), so the 'mutualisation gap' will only be four working days at most.
- Risk Premium: Based on feedback to the October consultation, we expect suppliers to charge customers a premium on their electricity tariffs to cover the risk that actual CfD payments are higher than forecast. As suppliers may only be willing to adjust tariffs once a year on average (discussed further in the next section), they may be unwilling to absorb losses if CfD payments are forecast too low. Suppliers have indicated that a risk premium of 10% – 30% would be added to consumers' tariffs to account for this possibility. Unlike its treatment in the October Consultation, based on industry feedback we now assume that this is applied by suppliers under a variable or fixed levy rate to cover forecasting errors up to a 95% certainty, which has been estimated using Redpoint Energy's probabilistic modelling of CfD payments.

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<sup>26</sup> Available at: <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

<sup>27</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/252273/131022\\_IA\\_-\\_Supplier\\_Obligation\\_final\\_for\\_publication\\_21\\_10\\_2013\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252273/131022_IA_-_Supplier_Obligation_final_for_publication_21_10_2013_.pdf)

- **Financing Costs:** Financing costs are only applicable under fixed unit cost levy rate options (2a and 2b) where an upfront reserve fund is collected. As described in the preceding section, a reserve fund is collected to cover the largest fall in the CfD Counterparty’s cash balance in each interim period (annual or quarterly), scaled from Redpoint Energy’s assessment of reserve fund size (and adapted to account for a quarterly levy rate). As this money is provided up front (assumed to be cash), it is assumed to carry an opportunity cost valued at a range of the weighted average cost of finance of 6.7% and 10%.

103. With the exception of reserve fund financing costs, all cost categories apply to all three policy options. Table 8 summarises the costs considered in this IA.

**Table 8 Summary of components of SO costs**

<b>Summary of Supplier Obligation costs</b>
<b>Administration costs</b>
CfD Counterparty
Suppliers
<b>Financing costs</b>
Collateral
Insolvency risk coverage
Risk premium
Reserve fund financing cost (Options 2a and 2b only)

104. Additional administrative costs to generators and National Grid as the EMR delivery body are presented alongside SO (Table 9).

**Table 9 Summary of components of additional EMR Administration costs**

<b>Additional EMR administration costs</b>
Generator costs
National Grid costs

105. Some of these costs are applicable to all policy options, while others vary across options. Collateral costs and risk premium costs do not vary and are applicable to all options. This is also true for the majority of administration and set up costs. All other costs are option specific and are considered within the option appraisal. This section considers costs applicable under all Supplier Obligation levy design options.

### *Administration Costs*

#### Supplier Obligation Administration costs

106. Suppliers and the CfD Counterparty are expected to incur incremental administration costs in adopting any of the three SO options considered in this IA.

107. The costs for administration to support the collection of money from suppliers and for the management of transactions to and from the CfD Counterparty fall into two main categories, as given below:

- The set-up and ongoing cost of administration processes of the CfD Counterparty; and
- The set-up and ongoing administration costs for suppliers.

108. As part of the analysis for the October IA, Deloitte estimated supplier administrative costs, split between upfront set-up costs and ongoing annual costs. These cost estimates are updated from those provided in October 2013 to reflect more accurate cost estimates. We present set-up costs of the CfD Counterparty and suppliers separately to operational costs for a clear distinction of ongoing costs once the SO has begun.

#### SO Set-up Costs

109. Total set-up costs for the SO are presented below in Table 10.



**Table 10 Estimated set-up Administration costs, 2012 – 2014, (£m)**

£m	Option 1 (variable)		Option 2a (annual fixed unit cost)		Option 2b (quarterly fixed unit cost)	
	Low	High	Low	High	Low	High
<b>Total Set-up Costs (2012 – 2014)</b>						
CfD Counterparty <sup>28</sup>	15	15	15	15	15	15
Suppliers	17	50	13	37	13	37
<b>Total set-up costs</b>	<b>32</b>	<b>65</b>	<b>27</b>	<b>52</b>	<b>27</b>	<b>52</b>

Source: Deloitte 2013, DECC 2014

110. CfD Counterparty set-up costs are not expected to vary across options. A central estimate is provided for the cost of setting up the CfD Counterparty, including establishing the settlement agent function, consultancy and legal costs, IT costs and staff costs (note that these costs are the total set-up costs for the CfD Counterparty, whose functions include managing CfDs in addition to administering the SO). These costs have been updated to reflect clearer forecasts of expected costs. The cost of setting up the CfD Counterparty is funded by DECC until 1 August 2014<sup>29</sup>, and not passed onto suppliers so will not be reflected in consumer bills.

111. Supplier set-up costs are expected to be higher under a variable option to reflect the additional costs to suppliers of setting up internal systems to forecast CfD payments and managing CfD payment process and additional staff costs. It is expected that all supplier costs are reflected in customers' electricity bills.

### SO Operational Costs

112. Deloitte's estimates of supplier operational costs are calculated on a per-company basis, and aggregated up to industry-level costs. We have assumed there to be a total of 30 suppliers in the market<sup>30</sup>.

113. Although CfD Counterparty operational costs are expected to be consistent across options as sunk costs for administering the scheme, administrative costs applicable to suppliers are higher under a variable levy (Option 1) rate than under a fixed unit cost levy (Options 2a and 2b). This is

<sup>28</sup> CfD Counterparty costs here include some costs attributable to EMR as a whole rather than SO costs specifically.

<sup>29</sup> It is assumed settlement systems development is funded by DECC until 31 March 2015.

<sup>30</sup> Based on data for the total number of companies in the UK counted as sellers of electricity in 2012, as set out in UK Energy Sector Indicators (2013): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/254261/ukesi\\_2013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/254261/ukesi_2013.pdf)

because it is assumed that under a variable levy, each supplier would have to forecast supplier obligation payments separately whereas under the fixed levy options they rely on the forecasts carried out by the CfD Counterparty. Note that it is possible that some suppliers might choose to forecast SO payments even under a fixed unit cost levy, which could increase their administrative costs in options 2a and 2b.

114. Operational costs for all three options are presented below in Table 11:

**Table 11 Estimated operational costs, 2015 – 2020, (£m)**

£m	Option 1 (variable)		Option 2a (annual fixed unit cost)		Option 2b (quarterly fixed unit cost)	
	Low	High	Low	High	Low	High
<b>Average Annual Operational Costs (2015 – 2020)<sup>31</sup></b>						
CfD Counterparty <sup>32</sup>	15	15	15	15	15	15
Suppliers	13	20	4	7	4	7
<b>Total average operational costs</b>	<b>28</b>	<b>35</b>	<b>18</b>	<b>22</b>	<b>18</b>	<b>22</b>

Source: Deloitte 2013, DECC 2014.

115. CfD Counterparty's operational costs are estimated to be the same for all options, and are update from the October IA estimates with more accurate forecasts of expected costs. This are provided as a central estimate of £15m. Supplier costs are expected to be higher under a variable levy as reflected in the table above.

#### Additional EMR administration costs

116. Here we present additional administration costs of EMR. These costs are not directly attributable to the SO and are not reflected in Net Present Value estimates, or price and bill impacts of the SO. We present them alongside SO administration costs to give an indication of total administrative liability of EMR.

117. Deloitte estimated generators' CfD administration costs for the October 2013 IA, and these estimates are assumed to be the same. This includes the

<sup>31</sup> In the October IA results were presented for 2014 – 2020. In this IA, to align operational cost estimates with financial cost estimates we provide all ongoing costs for 2015 – 2020.

<sup>32</sup> Counterparty costs presented here include all the functions of the Counterparty, not just administering the SO.

cost of regulatory staff and cost of managing the CfDs. It is assumed that generators' administration costs will be met through their revenues (i.e. selling power in the market and the CfD top-ups), so will not be separately passed onto customers' bills. Based on available evidence, we have assumed that there are 51 and 120<sup>33</sup> generators in operation.

118. National Grid administration costs as the EMR delivery body have been revised with new, more up-to-date estimates. These costs will be recovered through bills from April 2013 by charging the power industry under their System Operator charging regime. For set-up costs, we include costs for the Electricity Settlement Company to provide an estimate of wider EMR costs<sup>34</sup>.

119. Total set-up costs for 2012 - 2014 and average annual costs for 2015 - 2020 for National Grid, the Electricity Settlement Company, and generators for delivery of CfDs are presented in Table 12:

**Table 12 Estimated additional EMR Administration costs, 2012 – 2020, (£m)**

£m	Low	High
<b>EMR Administration Costs</b>		
<b>Total Set-up Costs (2012 – 2014)</b>		
Wider EMR	27	27
Generators	17	81
<b>Total additional EMR set-up costs</b>	<b>44</b>	<b>108</b>
<b>Average Annual Operational Costs (2015 – 2020)</b>		
National Grid	6	6
Generators	3	11
<b>Total average additional EMR operational costs</b>	<b>9</b>	<b>17</b>

Source: Deloitte 2013, DECC 2014.

120. As National Grid and generator costs are not directly related to the SO, they do not vary across policy options. Total administration costs of EMR (including SO administration costs) are presented in Table 25 of this IA.

<sup>33</sup> Based on the number of major power producers as listed in Table 5.11 of DUKES (2013), plus an estimated number of non-major power producers with more than 5MW of capacity (a subset of 'Other power stations' in Table 5.11)

<sup>34</sup> Cost estimate includes provisional estimates for the Electricity Settlements Company costs for 2012 – 2016. Further details are available at:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/298354/CFD Counterparty and Electricity Settlements Company operational costs.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/298354/CFD_Counterparty_and_Electricity_Settlements_Company_operational_costs.pdf) .

Cost estimates should be regarded as tentative, as the component costs have not yet been fully determined.

Electricity Settlement Company operational costs are not included.

### *Financing costs*

121. There are four elements of financing costs under the SO: collateral, insolvency risk coverage, risk premium and reserve fund financing cost. Suppliers are expected to incur financing costs for posting funds for collateral and a small additional amount for insolvency risk coverage<sup>35</sup>. It is also expected that a risk premium would be applied by suppliers to cover inaccurate forecasting of daily CfD payments either internally or by the CfD Counterparty through the predetermined interim rate(s) over the course of a year. Fixed unit cost levy options 2a and 2b will also carry a cost of financing upfront reserve fund payments. All of these costs are expected to be passed on to consumers in the form of higher bills.
122. Cost estimates have been updated since the October IA and refined in line with new probabilistic Redpoint Energy modelling. In this way, collateral and insolvency risk coverage costs are calculated using the same methodology as presented in the October IA, but with updated stochastic CfD payment schedules. Moreover, policy decisions taken since October have resulted in a fall in the number of days of insolvency risk coverage required; this is discussed further in the Government response to the October Consultation<sup>36</sup>.

### Collateral

123. It has been conservatively assumed that collateral would be financed entirely by cash, attracting financing costs at the weighted average cost of finance above. In reality, collateral could be comprised of a mixture of Letters of Credit and cash, which may carry a lower overall cost of finance, and hence the estimates below should be treated as a likely upper bound.
124. Suppliers are required to post collateral equivalent to their previous 21 days of supplier obligation payments. For a variable rate levy, Collateral is calculated based on actual CfD payments. Under a fixed unit cost levy, levy payments, calculated as demand multiplied by the interim levy rate, are used

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<sup>35</sup> In the October consultation it was proposed that there would be a separate ‘insolvency reserve fund’ to cover insolvency risk. Under the fixed rate options the Government has decided that insolvency risk will now be managed within the general reserve fund. Under a variable rate levy it is likely that a separate insolvency reserve fund would still be required. In either case, the amount expected to be required to be put aside to cover insolvency risk has been reduced from the original proposal, as set out in the Government response.

<sup>36</sup> Available at: <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

as Collateral. This leads to a similar collateral requirement and cost of financing under all three options.

125. An industry average cost of financing range of 6.7% to 10% is applied to all options to provide an estimation of the cost of to suppliers of raising this collateral. This in turn is expected to be passed on to consumers through bills.

126. Table 13 shows the variation in Collateral requirements between options over the period 2015 - 2020.

**Table 13 Estimated annual collateral financing costs (2015-2020)<sup>37</sup>**

£m	Option 1 (variable)		Option 2a (annual fixed unit cost)		Option 2b (quarterly fixed unit cost)	
	Low	High	Low	High	Low	High
<b>Collateral Financing Costs</b>						
<b>2015</b>	0.3	0.5	0.3	0.5	0.4	0.5
<b>2016</b>	1	2	1	2	1	2
<b>2017</b>	3	4	2	4	3	4
<b>2018</b>	4	6	4	6	4	6
<b>2019</b>	8	13	8	12	9	13
<b>2020</b>	11	17	11	16	12	17
<b>Average</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>7</b>

Source: Redpoint Energy inputs, DECC 2014.

127. The amount of Collateral required increases over time, as the amount of expected CfD payments rise. This leads to estimated collateral financing costs of £5m - £7m per year under all three options over the period 2015 - 2020.

128. This has changed from the October Consultation estimates of collateral financing costs of £9m - £14m on average between 2016 and 2020. These changes can be attributed to the changes in CfD payment forecasts as a result of Redpoint Energy’s probabilistic modelling commissioned by DECC.

<sup>37</sup> Collateral is calculated based on the maximum average CfD levy payment throughout each year for Options 2a and 2b. Under a quarterly fixed under cost option (Option 2b), quarterly levies are sometimes higher than annual levy in any given year, and sometimes below (but on average roughly the same). However, this results in higher maximum average levy rate payments under the quarterly levies than under the annual levy each year. As a result, collateral requirements are shown to be marginally higher under a quarterly fixed unit cost levy (Option 2b).

### Insolvency Risk Coverage

129. In the event of a supplier becoming insolvent, the CfD Counterparty would in the first instance draw down the defaulting supplier's collateral. If the Counterparty determines that the defaulting supplier's collateral is likely to be exhausted, the Counterparty can mutualise the outstanding amount across other (non-defaulting) suppliers. However, due to the requirement to give five working days' notice of mutualisation, it is possible that there could be a gap between collateral being exhausted and mutualisation payments being received, leading to a potential funding shortfall for the Counterparty. Therefore, the CfD Counterparty will need to collect a small additional sum to cover this insolvency risk. It is estimated that this period would typically be around four days of interim rate or CfD payments (under a fixed or variable levy, respectively)<sup>38</sup>.

130. The CfD Counterparty will have discretion in determining what level of insolvency risk cover is required. However, in the October IA it was estimated that insolvency risk cover would only be required to cover the risk of default by the 3 largest small suppliers (estimated to have a 7.7% market share). We make the same assumption here. This greatly reduces the financing cost of these additional four days.

131. Table 14 presents the estimated insolvency risk coverage financing cost. Under a variable levy (Option 1), p-95 CfD payments would be needed to cover insolvency risk. Under a fixed unit cost levy (Option 2a and 2b), insolvency risk is covered through average CfD levy payments since a p-95 reserve fund has already been collected. For this reason, financing costs can be expected to vary slightly between options.

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<sup>38</sup> Note that if a supplier defaulted on a reserve fund payment the Counterparty has to give 30 days' notice of mutualisation. However, we do not think this exposes the CfD Counterparty to additional insolvency risk because the CfD Counterparty would be able to draw on the reserve payments made by other suppliers, and the full amount of the reserve fund is extremely unlikely to be required in the first 30 days of a quarter.

**Table 14 Estimated annual insolvency risk financing costs (2015-2020)<sup>39</sup>**

£m	Option 1 (variable)		Option 2a (annual fixed unit cost)		Option 2b (quarterly fixed unit cost)	
	Low	High	Low	High	Low	High
<b>Insolvency risk financing costs</b>						
<b>2015</b>	0.01	0.01	0.005	0.01	0.01	0.01
<b>2016</b>	0.03	0.04	0.02	0.03	0.02	0.03
<b>2017</b>	0.05	0.08	0.03	0.05	0.04	0.05
<b>2018</b>	0.08	0.12	0.06	0.09	0.06	0.09
<b>2019</b>	0.16	0.24	0.12	0.18	0.13	0.19
<b>2020</b>	0.22	0.32	0.16	0.24	0.17	0.25
<b>Average</b>	<b>0.09</b>	<b>0.13</b>	<b>0.07</b>	<b>0.10</b>	<b>0.07</b>	<b>0.10</b>

Source: Redpoint Energy, DECC, 2014.

132. The size of insolvency coverage required tends to increase over time, as the amount of expected CfD payments rises. Average annual financing costs for 2015 – 2020 is approximately £100,000 for all options although exact amount vary as given above. This table shows that insolvency coverage costs can be expected to negligible; although all costs are rounded to the nearest million pounds, it is useful to show the small expected cost for insolvency risk coverage for indicative purposes.

### Risk Premium

133. Based on feedback to the October Consultation, it is believed that suppliers will typically set customer tariffs once a year.<sup>40</sup> Under a variable levy (Option 1), it is assumed that suppliers will set tariffs in accordance with their central forecast of CfD payments over the coming year. Similarly, under a fixed unit cost levy (Options 2a and 2b), suppliers are assumed to set tariffs in line with the CfD Counterparty's central forecast for CfD payments. In either case, suppliers are expected to manage variation in CfD payments by factoring a risk premium into tariffs above the expected CfD payments rather than by seeking to recoup any losses (or repay any surpluses) through the following year's tariffs.

<sup>39</sup> Small differences in financing costs between Option 2a and 2b are explained in footnote 37. As insolvency risk is calculated based on maximum costs in each year, Option 2b shows marginally higher costs.

<sup>40</sup> In reality suppliers may change the £/KWh they charge customers on variable tariffs more often than once a year. Conversely, fixed tariff customers' £/KWh charge changes less frequently (often every 18 – 24 months). The share of fixed and variable tariff customers is also likely to vary between suppliers. Based on Consultation responses, we have made a simplified assumption that suppliers will on average change tariffs annually across all customers.

134. Based on responses to the consultation, we have assumed that suppliers will apply a risk premium of 10% – 30% on tariffs to cover the possibility that actual CfD payments are higher than expected. This is a cost of the SO and is expected to be passed onto customers in the form of higher bills.

135. We have assumed that the risk premium will be charged on the difference between forecast expected CfD payments and a high CfD payment scenario, which we have taken as being equivalent to the ‘p-95’ simulation from Redpoint Energy’s report.

136. Table 15 shows the size of the risk premium under high and a low assumed risk factors of 10% – 30% (provided through feedback to the October Consultation), based on Redpoint Energy forecast average annual CfD payments, scaled to DECC EMR Delivery Plan results (December 2013). As suppliers are expected to charge customers a risk premium under a variable or fixed rate levy, the costs outlined below apply to all options under consideration in this IA. As discussed in the ‘Overview section of this IA, risk premium is now considered as an additional cost that would be placed on customers’ tariffs to cover the risk of underestimating CfD payments, and would be applied equally under all three policy options considered in this IA.

**Table 15 Estimated risk premiums, 2015 – 2020 calendar years**

Risk Premiums, £m	Risk Premium (£m)	
	10%	30%
<b>2015</b>	2	6
<b>2016</b>	9	28
<b>2017</b>	19	58
<b>2018</b>	28	84
<b>2019</b>	53	158
<b>2020</b>	78	233
<b>Average</b>	<b>31</b>	<b>94</b>

Source: Redpoint Energy, DECC, 2014.

137. Risk premiums charged by suppliers are expected to average between £31m and £93m for the period 2015 - 2020, depending on risk factor applied (10% or 30%).



### Reserve Fund Financing Cost

138. As described earlier in this section, fixed unit cost levy designs (Options 2a and 2b) require a reserve fund to be collected up front by the CfD Counterparty to cover an expected minimum cash balance in a p-95 scenario, derived from Redpoint Energy probabilistic modelling. Recognising the costs to suppliers of borrowing to fund reserve payments, or loss of earnings as a result of transferring cash to the CfD Counterparty, this reserve fund is expected to carry an opportunity cost. Respondents to the consultation indicated that in practice the reserve fund would attract an 'opportunity cost' of 10%. To provide a range of cost estimates we have applied our expected industry weighted average cost of financing of 6.7% as a lower range estimate and a higher rate of 10% in recognition of a higher perceived opportunity cost by suppliers, as suggested in some consultation responses.

139. Reserve fund financing costs are only applicable to fixed unit cost levy options 2a and 2b and are presented below in Table 16 for calendar years 2015 – 2020. Under option 2a, an annual reserve fund is collected every year, with an additional three months for reconciliation at the end of each year. Therefore, each year's reserve fund carries a financing cost for 15 months at a time. For a quarterly fixed option (Option 2b), reserve fund payments are collected every quarter and reconciled by the end of the following quarter. These payments therefore carry financing costs for two quarters at a time.

**Table 16 Estimated reserve fund financing costs, 2015 – 2020 (£m)**

Supplier Obligation Average Annual Reserve Fund Financing costs (£m)	Option 1 (variable)		Option 2a (annual fixed unit cost)		Option 2b (quarterly fixed unit cost)	
	Low	High	Low	High	Low	High
<b>Financing/Opportunity Cost</b>	<b>(6.7%)</b>	<b>(10%)</b>	<b>(6.7%)</b>	<b>(10%)</b>	<b>(6.7%)</b>	<b>(10%)</b>
<b>2015</b>	-	-	2	2	0.6	0.9
<b>2016</b>	-	-	7	11	3	4
<b>2017</b>	-	-	16	23	7	10
<b>2018</b>	-	-	22	33	10	15
<b>2019</b>	-	-	39	58	17	26
<b>2020</b>	-	-	60	89	28	41
<b>Total reserve fund financing costs</b>	-	-	<b>145</b>	<b>215</b>	<b>66</b>	<b>98</b>
<b>Average annual reserve fund financing costs</b>	-	-	<b>24</b>	<b>36</b>	<b>11</b>	<b>16</b>

Source: Redpoint Energy, DECC, 2014

140. Reflecting the increased frequency of reserve fund collection and reconciliation under a quarterly fixed option (Option 2b) compared to an annual fixed option (Option 2a), total reserve fund financing costs are expected to approximately halve under a quarterly fixed option, i.e. moving from an annual levy rate to a quarterly levy rate is expected to roughly halve the associated financing costs of an upfront reserve fund.

## 8. Options Appraisal

### *Summaries of Options under Consideration*

141. As described earlier in this IA, the counterfactual baseline has been set in line with a 'do minimum' design of the SO, provided by a variable levy (Option 1). This is considered a more realistic baseline to judge options against as a 'do nothing' is not feasible under the final EMR design.

**Option 1: Variable levy ('do minimum' counterfactual)**

142. Under a variable levy design, suppliers' liability for the SO would be based on their share of actual CfD payments shortly after the day of generation. This has the advantage of only charging suppliers for actual CfD payments due to generators.
143. As described earlier, it is assumed that suppliers will incur additional administration and set up costs under a variable levy option because they will have to forecast and manage CfD payment volatility themselves.
144. Financial costs under a variable rate levy have been detailed in the previous section. Collateral, insolvency risk coverage and risk premium costs are presented together with administration costs below to provide a summary of total cost expected under a variable levy.

**Table 17 Estimated total costs under a Variable levy**

<b>Option 1 (Variable Levy)</b>		
<b>Average Annual Costs (2015 – 2020), £m</b>	<b>Low</b>	<b>High</b>
<b>Administrative costs</b>		
CfD Counterparty	15	15
Suppliers	13	20
<b>Total</b>	<b>28</b>	<b>35</b>
<b>Financing costs</b>		
Collateral	5	7
Insolvency Risk	0.09	0.13
Risk Premium	31	94
<b>Total</b>	<b>36</b>	<b>102</b>
<b>Total average annual costs, 2015 - 2020 (£m)</b>	<b>64</b>	<b>137</b>
<b>Total set-up costs, 2012 - 2014 (£m)</b>	<b>29</b>	<b>62</b>
<b>Total costs, 2012-2020 (NPV, £m)</b>	<b>339</b>	<b>717</b>

145. Total cost of the SO under a 'do minimum' variable rate option is expected to be in the region of £51m - £137m on average per year for 2015 – 2020. Including SO set-up costs, this amounts to a discounted net present value of £339m - £717m for the period 2012 - 2020.

*Consumer bill impact*

146. The administrative costs in the table above will be charged to suppliers, hence are expected to be passed onto consumers in the form of higher bills. Moreover, suppliers are expected to pass on administration set-up costs to consumers for 2012 - 2014, which are reflected in price and bill impacts in 2015. CfD Counterparty set-up costs are covered by DECC until August 2014, after which they are expected to be passed on to consumers<sup>41</sup>.
147. The additional costs to suppliers of managing the relevant risks under this option (here, the financing costs for collateral, insolvency risk coverage, and suppliers' risk premium) are also expected to be passed on to consumers through higher bills. Unlike other policy options considered in this IA, suppliers do not provide a reserve fund and therefore no reserve fund financing costs are passed on to consumers; as a result, financial cost bill impacts are lower under a variable rate option. The table below shows the impact of the costs discussed in the previous sections on average consumer prices and bills, over the period 2014 - 2020.

**Table 18 Estimated annual average household price & bill impacts under a variable levy (2014 - 2020)**

Average household price & bill impacts	Price (£/MWh)		Bill (£/year)	
	Low	High	Low	High
Administrative costs (2014 – 2020)	0.10	0.10	0.30	0.40
Financial costs (2015 – 2020)	0.10	0.40	0.40	1.10
<b>Total Average (2014 – 2020)</b>	<b>0.20</b>	<b>0.40</b>	<b>0.60</b>	<b>1.40</b>

<sup>41</sup> It is assumed settlement systems development is funded by DECC until 31 March 2015.

## *Benefits*

148. The main benefit of a variable rate levy is that it allows the CfD Counterparty to meet its CfD payment obligations to generators without needing to hold funds in reserve, or to forecast CfD payments itself. This is because the CfD Counterparty uses actual metered CfD generation data to determine the precise amounts owed by suppliers, so there is no need for the CfD Counterparty to collect a reserve fund up front or to forecast CfD payments.
149. A further benefit is that this option may provide suppliers with an incentive to purchase electricity in the relevant CfD reference price markets<sup>42</sup> in order to minimise the risks of overpaying for their electricity. If suppliers choose to manage their risks in this way, this could lead to improved market liquidity. In addition, incentivising this risk management behaviour at the earliest possible stage will help suppliers in the longer term, given that price volatility is likely to increase as intermittent generation is expected to make up a greater proportion of total generating capacity in the future.

## *Other impacts*

150. In order for suppliers to be able to successfully manage reference price risk, they would need to know the amount of electricity generated from CfD plant in each of the different reference markets. If this information is not fully available, then reference price risks will remain and again this could deter new entry. Feedback to the October Consultation suggests that there are information asymmetries in the electricity supply market and larger/vertically integrated suppliers may be better positioned to under forecasting than small suppliers. This may act as a barrier to entry or encourage small supplier to exit the market as they lose competitiveness.
151. The relationship between supplier costs under the SO and generators' CfD earnings offers the opportunity for specific new hedging products to be developed, in order to provide mutual risk mitigation. For example, a hedging product could be developed whereby if CfD payments go up a generator would pay an amount to the supplier and vice versa. Although this opportunity would exist under all options due to the inherent volatility of electricity supply, it is more pronounced under a variable rate option as both cost per unit and electricity demand vary.

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<sup>42</sup> E.g. Day-ahead for wind and year-ahead for baseload (such as nuclear)

152. Stakeholder evidence indicates that these products do not currently exist and such financial innovation could take significant time to develop, if at all. Some of the reasons cited included their complexity, having to take into account future changes in the UK's generation mix, uncertainty over the practical functioning of the CfD mechanism and the extent to which these products may or may not appeal to vertically-integrated suppliers.

In the absence of such products developing, effective risk management may not be possible and this could lead to the exiting of some suppliers (particularly independent and/or smaller suppliers) and act as a barrier to new entrants.

### Fixed Unit Cost Levy

153. Under the Unit Cost Fixed policy the CfD Counterparty forecasts expected reference prices, volume of CfD generation, and level of demand, and uses this to set a £/MWh 'interim rate'. Suppliers are invoiced on a daily basis according to their daily supply volume. The CfD Counterparty also collects a reserve fund in a lump sum at the start of each levy period to cover the possibility CfD payments being higher than expected, up to a 95% level of certainty. Reconciliation follows at the end of each levy period, with the CfD Counterparty calculating the difference between what suppliers were required to pay during the period and their underlying CfD payment liabilities (the actual amounts paid out to generators).

### **Option 2a: Annual Fixed Unit Cost Levy**

154. Option 2a considers a fixed unit cost levy with an interim levy rate, reserve fund collection, and reconciliation on an annual basis. To cover daily CfD payments variability the CfD Counterparty collects a reserve fund to cover upside fluctuation of CfD payments up to a 95% certainty. This ensures (with 95% certainty) that the CfD Counterparty can pay CfD generators on a daily basis.
155. Operational and set-up costs to the CfD Counterparty in implementing the SO are expected to be the same across options, but suppliers benefit from lower administration costs under fixed levy options due to lower forecasting and system management requirements.
156. Additional financial costs beyond those under a variable rate levy reflect the cost to suppliers of the CfD Counterparty collecting a reserve fund up front to cover variability of CfD generation and holding it for 15 months. Total costs are presented in the table below.

157.

**Table 19 Estimated total costs under an annual fixed unit cost levy**

<b>Option 2a (Annual Fixed Unit Cost Levy)</b>		
<b>Average Annual Costs (2015 – 2020), £m</b>	<b>Low</b>	<b>High</b>
<b>Administrative costs</b>		
CfD Counterparty	15	15
Suppliers	4	7
<b>Total</b>	<b>18</b>	<b>22</b>
<b>Financing costs</b>		
Collateral	5	7
Insolvency Risk	0.07	0.10
Risk Premium	31	94
Reserve Fund Financing	24	36
<b>Total</b>	<b>60</b>	<b>137</b>
<b>Total average annual costs, 2015 - 2020 (£m)</b>	<b>79</b>	<b>159</b>
<b>Total set-up costs, 2012 - 2014 (£m)</b>	<b>29</b>	<b>53</b>
<b>Total costs, 2012-2020 (NPV, £m)</b>	<b>403</b>	<b>807</b>

158. Total cost of the SO under an annual fixed unit cost levy is expected to be in the region of £79m - £159m on average per year for 2015 – 2020. Including administrative set-up costs, this amounts to a discounted net present value of £403m - £807m for the period 2012 - 2020. This represents roughly an additional cost of £60m - £90m above the assumed counterfactual (a variable levy design).

### *Consumer bill impact*

159. In the same way as a variable levy, all costs from 2015 – 2020 are expected to be passed on to consumers in the form of higher electricity bills, as well as a proportion of operational costs prior to 2015. The table below shows the impact of the costs discussed in the previous sections on average consumer prices and bills, over the period 2014 - 2020.

**Table 20 Estimated annual average household price & bill impacts under an annual fixed unit cost levy (2014 - 2020)**

Average household price & bill impacts	Price (£/MWh)		Bill (£/year)	
	Low	High	Low	High
Administrative costs (2014 – 2020)	0.10	0.10	0.20	0.30
Financial costs (2015 – 2020)	0.20	0.50	0.70	1.50
<b>Total Average (2014 – 2020)</b>	<b>0.20</b>	<b>0.50</b>	<b>0.80</b>	<b>1.60</b>

*Benefits*

160. It is expected that the CfD Counterparty undertaking centralised forecasting under a fixed unit cost levy will deliver efficiency gains due to economies of scale relative to many individual suppliers forecasting separately under a variable levy. It is also expected that centralised forecasting will support new entry into the supply market, and allow existing smaller market participants to compete more effectively.

161. Under a fixed unit cost levy the CfD Counterparty sets a price per unit for an interim period. However, electricity supply will still vary in the normal way, and as a result so will daily CfD payments. Nevertheless, an annual fixed unit cost option provides the least volatility in daily CfD payments of all options presented in this IA. Conversely, this is likely to result in less accurate forecasting over the levy year than if a new levy rate is set every quarter leading to more volatility reserve and reconciliation payments at the start of each year.

*Other impacts*

162. Reference market liquidity under an annual levy rate may be negatively affected relative to a 'do minimum' approach as there is less volatility in CfD payments (as outlined in Redpoint Energy's report), and therefore less incentive to hedge.

163. The upfront collection of a reserve fund means that suppliers will face a reduced benefit from the hedge against wholesale prices provided by CfDs, which may make them less incentivised to adopt and develop risk management strategies to address reference price risk.



164. However, industry feedback indicates that the necessary hedging products are not yet developed and will be less available to smaller market participants with less information and less sophisticated hedging strategies. In the long run it is expected that setting a fixed levy can encourage greater competition in the electricity supply market which will have a positive effect on consumer bills, relative to a variable levy design (Option 1).

### Option 2b: Quarterly Fixed Unit Cost Levy (preferred option)

165. Option 2b considers a fixed unit cost levy with an interim levy rate, reserve fund collection, and reconciliation takes place on a quarterly basis. The aim of this design is to reduce the financing costs associated with the collection of an upfront reserve fund, and increase the accuracy of the interim levy rate by revising projections more frequently.

166. Operational and set-up costs are the same as those presented previously in this IA and are not expected to vary between annual and quarterly fixed unit cost options. Reserve fund financing costs are expected to vary by the frequency of interim levy rate setting, reserve fund collection and reconciliation. As the CfD Counterparty collects reserve funds and reconciles with suppliers on a more regular basis, opportunity cost to suppliers is reduced. Total costs from 2012 – 2020 for a quarterly fixed unit cost levy are presented in Table 21.

**Table 21 Estimated total costs under a quarterly fixed unit cost levy**

<b>Option 2b (Quarterly Fixed Unit Cost Levy)</b>		
<b>Average Annual Costs (2015 – 2020), £m</b>	<b>Low</b>	<b>High</b>
<b>Administrative costs</b>		
CfD Counterparty	15	15
Suppliers	4	7
<b>Total</b>	<b>18</b>	<b>22</b>
<b>Financing costs</b>		
Collateral	5	7
Insolvency Risk	0.07	0.10
Risk Premium	31	94
Reserve Fund Financing	11	16
<b>Total</b>	<b>47</b>	<b>118</b>
<b>Total average annual costs, 2015 - 2020 (£m)</b>	<b>66</b>	<b>139</b>
<b>Total set-up costs, 2012 - 2014 (£m)</b>	<b>29</b>	<b>53</b>
<b>Total costs, 2012-2020 (NPV, £m)</b>	<b>341</b>	<b>715</b>

167. Average annual ongoing SO costs for 2015 - 2020 under a quarterly fixed unit cost levy are estimated to be £47m - £139m per year. Incorporating set-up costs before 2015 and discounting at a rate of 3.5%, the total net present value of Option 2b ranges from £341m to £715m. This represents a similar level of costs as that of a variable levy (Option 1), and a reduction of £60m to £90m versus an annual fixed unit cost levy (Option 2a).

### *Consumer bill impact*

168. Administrative costs presented (and therefore price and bill impacts) are the same as those under an annual fixed levy (Option 2a). Lower bill impacts under Option 2b compared to Option 2a are due to the lower financing costs associated with more regular reconciliation of the CfD Counterparty's reserve fund. Average consumer prices and bills over the period 2014 – 2020 for Option 2b are given in the table below.

**Table 22 Estimated annual average household price & bill impacts under a quarterly fixed unit cost levy (2014 - 2020)**

Average household price & bill impacts	Price (£/MWh)		Bill (£/year)	
	Low	High	Low	High
Administrative costs (2014 – 2020)	0.10	0.10	0.20	0.30
Financial costs (2015 – 2020)	0.20	0.40	0.50	1.30
<b>Total Average (2014 – 2020)</b>	<b>0.20</b>	<b>0.40</b>	<b>0.60</b>	<b>1.40</b>

### *Benefits*

169. Benefits and other impacts outlined for an annual fixed levy (Option 2a) largely apply to a quarterly option as well. The main additional benefit is that Option 2b offers significantly reduced reserve fund financing costs due to the reduced size of the reserve fund (roughly halved).

170. The CfD Counterparty also takes on the responsibility of forecasting CfD payments, which is likely to be costly for small suppliers and less efficient if undertaken on an industry wide basis. This could reduce the competitive disadvantage faced by smaller suppliers and new market entrants.

### *Other Impacts*

171. As outlined by Redpoint Energy's analysis on CfD payment volatility, a fixed interim levy rate is expected to reduce CfD payment volatility. As quarterly forecasts are likely to be more accurate than annual forecasts, quarterly reconciliation can be expected to be relatively less severe than annual reconciliation.
172. In the same way as described above for an annual levy (Option 2a), centralised forecasting offered under a quarterly fixed unit cost levy is expected to benefit smaller suppliers with less capability to do so. Fixed unit cost levy rates will somewhat reduce the incentive to engage in complex hedging strategies as volatility of CfD payments is reduced, but some incentive will remain as ultimately CfD payment risk sits with suppliers. That said, the reduced incentive to hedge under a fixed unit cost option (Options 2a and 2b) may still have an adverse effect on CfD reference market liquidity.

### *Qualitative assessment of Supplier Obligation Options*

173. As outlined earlier, it has not been possible to quantify all costs and benefits under a variable and fixed unit cost levy. This IA is supported by a Multi Criteria Analysis to provide an indicative assessment of the qualitative and quantitative benefits and costs under each option. Each policy option has been scored from 1 – 5 (low to high) in terms of how well it meets each individual objective, as set out in Section 5 of this IA. This is presented in Table 23 below.
174. Value for money is assessed on the basis of the costs set out above, which show that a variable levy and a quarterly fixed unit cost levy present the most cost effective approaches to the SO. Options 1 and 2b therefore score highly against Objective 1, while Option 2a receives a lower score reflecting its relatively higher costs.
175. However, in terms of competitive advantage (Objective 2), a variable levy option may confer significant advantages to suppliers with superior ability to forecast (and hence anticipate) their likely future SO liabilities. Moreover, as incentives to hedge CfD payments are greater under a variable levy, larger and vertically-integrated suppliers with more information and/or sophisticated forecasting may be placed at a competitive advantage relative

to smaller or new market participants; this notion is supported by responses to the October Consultation. This is reduced under a fixed levy (Options 2a and 2b), while competition could be negatively affected under a variable levy (Option 1).

176. Evidence and industry feedback suggests that smaller suppliers are less able to forecast future liabilities accurately. This could lead to an increased likelihood of exit for existing suppliers and also deter potential future suppliers (Objective 3). This risk is greatest under Option 1. Hence, it is scored lower than Option 2a and 2b.
177. With respect to liquidity (Objective 4), the incentives on suppliers to manage their reference price risk through hedging in the wholesale markets is likely to be greater under a variable levy. Option 1 scores higher than Options 2a and 2b under Objective 4 to reflect this.
178. Given that alternative policy designs suggested in responses to the October Consultation have not been taken forward (as outlined in the 'Background' section of this IA), consultation responses and feedback suggest that a variable levy and a fixed unit cost levy with more frequent interim rate setting and reconciliation were more credible with industry (Objective 5). Options are scored accordingly, with an annual fixed unit cost Option (2a) performing worst.
179. Ultimately, all risk falls to suppliers under all options presented in this IA. However, given that forecasting would take place centrally under a fixed unit cost levy (2a and 2b), the management of the risk of inaccurate forecasting may be better achieved through the CfD Counterparty which can provide a single forecast for all market participants, rather than this burdensome requirement being left to suppliers with varying forecasting capabilities. Therefore, Options 2a and 2b score slightly higher under Objective 6.

**Table 23 Multi Criteria Analysis of Supplier Obligation options<sup>43</sup>**

Objectives	Variable Levy (Option 1)	Annual Fixed Unit Cost Levy (Option 2a)	Quarterly Fixed Unit Cost Levy (Option 2b)
1.The levy should provide value for money to consumers	5	3	5
2.The levy should not unduly provide a competitive advantage to one group of existing suppliers/generators over another	2	4	4
3.The levy should not create additional barriers to entry or increase the likelihood of suppliers leaving the market	2	4	4
4.The levy should not have a negative impact on market liquidity	4	2	3
5.The policy design is workable/credible with industry	4	2	4
6.Risks should be allocated where they can best be managed where possible	3	4	4
<b>Total</b>	<b>20</b>	<b>19</b>	<b>24</b>

180. The qualitative assessment outlined in the Options Appraisal section of this IA, and presented via a Multi Criteria Analysis, ranks a Quarterly Fixed Unit Cost Levy (Option 2b) as the most effective means of implementing the SO. A Variable Levy option (Option 1) is preferential to an Annual Fixed Unit Cost Levy design (Option 2a).

#### *Equality impact*

181. It is not envisaged that the Electricity Market Reform SO options will impact on measures of equality as set out in the Statutory Equality Duties Guidance. Specifically, options would not have different impacts on people of different racial groups, disabled people, men and women, including transsexual men and women. There are also no foreseen adverse impacts of the options on

<sup>43</sup> We have employed an undertaken an unweighted Multi Criteria Analysis, as per guidance available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/191506/Multi-crisis\\_analysis\\_a\\_manual.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191506/Multi-crisis_analysis_a_manual.pdf)

human rights and on the justice system. We will keep a watching brief on this but we are confident that any issues have been addressed at the design stage without adverse impact on either human rights, or on the effectiveness of the mechanism. This applies to all SO options equally and as a result is not featured in Multi Criteria Analysis outlined above.

## 9. Conclusion

182. This IA considers three policy options for implementation of the SO; a variable rate levy, an annual fixed unit cost levy, and a quarterly fixed unit cost levy. The decision to consider these options was informed by the October IA and responses to the consultation.
183. Evaluation of these options is supported by improved stochastic modelling and analysis performed by Redpoint Energy on the variability of CfD payments and the size and cost of a reserve fund, as well as further internal analysis by DECC. The results of this quantitative analysis are detailed in a cost-benefit analysis and options are assessed qualitatively using a Multi Criteria Analysis. Taking all available evidence into consideration, this IA recommends pursuing Option 2b, a quarterly fixed unit cost levy, for delivery of the SO.
184. Suppliers' administrative costs are shown to be relatively higher under a variable levy, when the additional cost imposed on suppliers for forecasting is taken into consideration. Administration costs are not expected to vary by with the frequency that the CfD Counterparty sets a levy rate, collects a reserve fund and reconciles CfD payments, and therefore these costs are expected to be the same under Options 2a and 2b.
185. Financing costs of the SO include the cost to suppliers of posting collateral, a small additional amount for insolvency risk coverage and a risk premium charged to customers to cover the chance that customer tariffs have been set too low. Collateral and insolvency risk expected to vary very little across policy options, and risk premium is not expected to change at all. Additionally, setting an interim fixed levy rate requires the collection of a reserve fund from suppliers to cover variation in daily CfD payments outwards made by the CfD Counterparty to generators above daily CfD levy payments received from suppliers. The cost of this reserve fund is given by the opportunity cost to suppliers of providing a lump sum up front to the CfD

Counterparty. The reserve fund held by the CfD Counterparty is substantially larger under an annual levy than under a quarterly levy, as is the associated financing cost.

186. The Net Present Value of all options is shown to be negative, which reflects that only costs are quantified in this IA. Options 1 and 2b are shown to be best value for money. All costs from 2015 are expected to be passed onto consumers in the form of higher bills, as well as a proportion of set-up costs prior to implementation. Expected costs and price and bill impacts for all options are summarised in Table 24 below, with Table 25 summarising administrative costs of EMR.
187. Industry feedback and responses to the October Consultation indicate that centralised forecasting of reference prices, electricity demand, and CfD payments will help reduce the advantage held by large and vertically integrated suppliers in forecasting and hedging of CfD payments. It is also believed that supporting all market participants with centralised forecasts will provide economies of scale to the industry over each supplier forecasting individually.
188. As there will still be an element of volatility in CfD payments under a quarterly fixed option, it will still be in suppliers interests to hedge in reference markets, so market liquidity protecting market liquidity.
189. The conclusions from the Multi Criteria Analysis in Table 23 are supportive of Option 2b, in terms of its ability to meet the policy objectives. Although Option 2b is not the best option for meeting every objective, it is judged to be relatively high value for money, while supporting competition and new entry into the market, is not expected to have a significant negative effect on market liquidity, allocates risk effectively and is workable with industry. Therefore, the analysis presented in this IA is broadly supportive of the choice of Option 2b as a preferred option.

Table 24

## Summary of all options

Supplier Obligation costs (£m)	Variable Levy (Option 1)		Annual Fixed Unit Cost Levy (Option 2a)		Quarterly Fixed Unit Cost Levy (Option 2b)	
	Low	High	Low	High	Low	High
<b>Average Annual Administration Costs (2015 – 2020)</b>						
CfD Counterparty <sup>44</sup>	15	15	15	15	15	15
Suppliers <sup>45</sup>	13	20	4	7	4	7
<b>Total average administration costs</b>	<b>28</b>	<b>35</b>	<b>18</b>	<b>22</b>	<b>18</b>	<b>22</b>
<b>Average Annual Financing Costs (2015 – 2020)</b>						
Collateral <sup>46</sup>	5	7	5	7	5	7
Insolvency Risk <sup>47</sup>	0.09	0.13	0.07	0.10	0.07	0.10
Risk Premium <sup>48</sup>	31	94	31	94	31	94
Reserve Fund Financing <sup>49</sup>	-	-	24	36	11	16
<b>Total Financing Costs</b>	<b>36</b>	<b>102</b>	<b>60</b>	<b>137</b>	<b>47</b>	<b>118</b>
<b>Total average annual costs, 2015 - 2020 (£m)</b>	<b>64</b>	<b>137</b>	<b>79</b>	<b>159</b>	<b>66</b>	<b>139</b>
Total set up costs (2012 – 2014) <sup>50</sup>	32	65	27	52	27	52
<b>Supplier Obligation Costs, 2012 - 2020 (NPV, £m)</b>	<b>339</b>	<b>717</b>	<b>403</b>	<b>807</b>	<b>341</b>	<b>715</b>
<b>Overall – price impact (£/MWh) (2014 – 2020)</b>	<b>0.20</b>	<b>0.40</b>	<b>0.20</b>	<b>0.50</b>	<b>0.20</b>	<b>0.40</b>
<b>Overall – bill impact (£/year) (2014 – 2020)</b>	<b>0.60</b>	<b>1.40</b>	<b>0.80</b>	<b>1.60</b>	<b>0.60</b>	<b>1.40</b>

<sup>44</sup> CfD Counterparty costs presented here include costs of implementing CfDs well as the Supplier Obligation. Costs are updated since the October IA

<sup>45</sup> Supplier costs are expected to be higher under a variable levy (Option 1) due to the additional forecasting burden placed on suppliers under this option.

<sup>46</sup> Collateral costs have been revised since October 2013 to reflect improved, stochastic modelling of CfD payments undertaken by Redpoint Energy. Collateral is collected according to actual CfD payments under a variable rate levy (Option 1), and according to CfD levy payments under a fixed unit cost levy (Options 2a and 2b), leading to small cost variations across options. Costs in the table above are equal due to rounding of figures.

<sup>47</sup> Insolvency risk costs have been updated to reflect the reduction in non-payment coverage and updated CfD payment modelling. Insolvency risk covers a p-95 scenario of actual CfD payments under a variable levy option (option 1) and average CfD levy payments under fixed unit cost options (Option 2a and 2b), which leads to small cost differences between options. Costs in the table above are equal due to rounding of figures.

<sup>48</sup> A risk premium is charged by suppliers to cover the risk that CfD payments are higher than expected, and customer tariffs have been set too low accordingly. This differs from how risk premium is presented in the October IA. Consistent with feedback during the consultation, it is now applied equally across all options.

<sup>49</sup> The cost associated with financing a reserve fund is charged on fixed unit cost options (Options 2a and 2b) only and varies with the frequency of collection and reconciliation, i.e. the more frequently reserve funds are collected and reconciled, the lower the cost of financing.

<sup>50</sup> Set up costs are higher for a variable levy (Option 1) reflecting additional forecasting set-up costs incurred by suppliers.



**Table 25 EMR Administration Costs**

<b>EMR Administration Costs</b>	<b>Low</b>	<b>High</b>
<b>Total Set-up Costs (2012 – 2014)</b>		
Supplier Obligation (preferred option)	27	52
Wider EMR	27	27
Generators	17	81
<b>Total EMR set-up costs</b>	<b>71</b>	<b>159</b>
<b>Average Annual Operational Costs (2015 – 2020)</b>		
Supplier Obligation (preferred option)	18	22
National Grid	6	6
Generators	3	11
<b>Total EMR operational costs<sup>51</sup></b>	<b>28</b>	<b>39</b>
<b>Overall – price impact (£/MWh)<sup>52</sup></b>	<b>0.10</b>	<b>0.10</b>
<b>Overall – bill impact (£/year)<sup>53</sup></b>	<b>0.30</b>	<b>0.40</b>

<sup>51</sup> Cost estimate includes provisional estimates for the Electricity Settlements Company costs for 2012 – 2016. Further details are available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/298354/CFD\\_Counterparty\\_and\\_Electricity\\_Settlements\\_Company\\_operational\\_costs.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/298354/CFD_Counterparty_and_Electricity_Settlements_Company_operational_costs.pdf).

Cost estimates should be regarded as tentative, as the component costs have not yet been fully determined. Electricity Settlement Company operational costs are not included.

<sup>52</sup> National Grid costs are expected to be passed on in the form of higher bills for consumers from April 2013. Generator costs are not passed on to consumers as they are assumed to be recovered through revenues.

<sup>53</sup> These costs do not include the costs associated with the administration of the Capacity Market, for example, the costs associated with the Electricity Settlement Company. However these costs are estimated to be relatively small, for example costs in 2015 are estimated to add around 5p to an average annual household electricity bill (2012 prices). Cost estimates should be regarded as tentative, as the component costs have not yet been fully determined.