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Strategic energy market intelligence

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Credit and collateral in the GB energy markets

Phase 1

Volume 2—framework profiles and glossary

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Strategic energy market intelligence

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Cornwall Energy's team of independent specialists have experience of liberalised energy markets and their regulation since their inception in Great Britain and elsewhere in the late 1980s. We provide consultancy, intelligence and training, and are a trusted and reliable partner whether you are a new entrant or a large, established player.

Specific areas of our expertise include:

- wholesale and retail energy market competition and change;
- regulation and public policy within both electricity and gas markets;
- electricity and gas market design, governance and business processes; and
- market entry.

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1 Introduction and summary

To establish whether the current arrangements are impacting competition in GB energy markets the Department of Energy and Climate Change (DECC) Energy Markets and Consumers Team commissioned Cornwall Energy in late December 2013 to conduct a review of credit and collateral arrangements in the GB markets for gas and electricity.

The report examines the detail of the current credit and collateral arrangements (baseline arrangements) and those set to be introduced in the future (new frameworks). It aims to enhance understanding of the interaction between levels of credit and collateral and the costs faced by different types of participants in different segments of energy markets. It will also build on existing knowledge of the impact credit and collateral arrangements have on competition and effective market functioning in the retail and wholesale gas and electricity markets.

1.1 Structure of the report

The report comprises two volumes:

- Volume 1, which is available separately, sets out the framework map and established collateral requirements across current and future frameworks. It also details our methodology for compiling the benchmark maps and key headlines and findings from the application this method to our range of benchmarks; and
- this Volume (Volume 2) provides supporting analysis on the individual frameworks and their credit and collateralisation requirements.

This Volume should be read in conjunction with Volume 1, which sets out method, headline analysis and findings, consists of seven substantive chapters, one for each framework. Chapters 2-7 detail current arrangements under baseline frameworks; chapters 8-10 examine the credit and collateral requirements under new frameworks:

- Chapter 2—the Balancing and Settlement Code (BSC);
- Chapter 3—the Connection and Use of System Code (CUSC);
- Chapter 4—CUSC with Generator user commitment;
- Chapter 5—the Distribution and Use of System Code (DCUSA);
- Chapter 6—the Unified Network Code (UNC) for gas;
- Chapter 7—UNC for gas transmission and distribution;
- Chapter 8—the Contract for Difference (CfD) Feed-in Tariff (FiT) obligation;
- Chapter 9—the Capacity Market (CM) regime; and
- Chapter 10—the Smart Energy Code (SEC).

Chapter 11 then summarises the N2EX and APX credit rules.

In each of these chapters we set out an overview of the key credit and collateral parameters for each framework, including:

- the types of collateral accepted and whether there are any criteria where unsecured credit may be accepted;
- the period/level of cover required; and
- the circumstances under which a collateral call will be made.

We also provide an illustration of total system collateral amounts and costs under each framework for the period 2011-13. These illustrations are accompanied with worked examples where appropriate. For the new frameworks we use Cornwall Energy's own modelling of the CfD, and for the Capacity Market and SEC we have taken numbers from DECC impact assessments (which are quoted in real terms within the period 2011-13) and used these as representative of the annual amounts of credit.

2 The Balancing and Settlement Code (BSC)

2.1 Overview

The key BSC credit parameters are shown in Table 2.1.

Table 2.1: Key BSC credit parameters

Who is impacted?	Electricity suppliers and generators
Purpose	Trading parties may have debts (or be due payments) in respect of trading charges incurred, on average, over the previous 29 days. These primarily relate to energy imbalance charges The purpose of credit and collateral under the BSC is to ensure that, should a trading party default, there is liquid collateral available to pay defaulted debts
Average annual credit amounts	2011—£424mn 2012—£383mn 2013—£354.5mn Annualised average £387.2mn
Type of collateral accepted	Letter of credit from an A rated financial institution (with duration of at least three months) or cash
Split between instruments	2011 £351.4mn letter of credit, £72.6mn cash 2012 £329.5mn letter of credit, £53.5mn cash 2013 £307.0mn letter of credit, 47.5mn cash
Period/ level of cover required	29 days of charges; indebtedness estimates based on actual and projected charges
Unsecured credit criteria	None
Other protections	Mutualisation payments relating to a defaulting trading party that cannot be covered by the posted letter of credit, or cash, by that defaulting trading party
Trigger for call	Non-payment default. There are specific grades of default for failure to comply with credit rules (level 1 and level 2) linked to the amount of indebtedness as a percentage of liabilities, which can also lead to BSC suspension and eventual exclusion if not remedied within the terms of the rules
Total scheme cost	2011—£13.7mn 2012—£11.8mn 2013—£10.9mn

The headline points from this section are:

- the BSC demands high quality collateral from trading parties, with in-built protections against declining credit quality of the providers of such collateral and risks associated with collateral expiry;
- collateral is set against calculated rather than actual indebtedness, with defaults ensuing if levels of calculated indebtedness exceed 80% of the credit cover; and

- standing collateral is supported by a mutualisation arrangement for the sharing (and eventual recovery) of any unsecured losses.

2.2 Credit and collateral rules

2.2.1 Background

The BSC was introduced as part of the *New Electricity Trading Arrangements* (NETA), which came into force in England and Wales in March 2001. These arrangements, and the scope of the BSC, were subsequently extended to Scotland in April 2005 as the *British Electricity Trading and Transmission Arrangements* (BETTA). The BSC contains the rules and governance arrangements for the Balancing Mechanism and imbalance settlement processes.

Collateral is necessary under the BSC given the financial flows that hang off the provisions of the code. Payments to and from trading parties in respect of trading charges arising on any particular settlement day are made, on average, 29 calendar days later. This delay means at any given time, trading parties may have debts (or be due payments) in respect of trading charges incurred, on average, over the previous 29 days.

2.2.2 Purpose

The purpose of credit and collateral under the BSC is to ensure that, should a trading party default on its charges, there is liquid collateral available to be called upon to pay the defaulted debts. Collateral is posted with the BSC funds administration agent (FAA) acting on behalf of Elexon as the BSC Company (BSC Co). Collateral rules under the BSC are set out under Section M of the BSC code.

Elexon does not use the collateral posted for its own financing purposes.

2.2.3 Cover

All BSC trading parties must have in place credit cover to cover 29 days of trading charges. This is not arbitrary but directly linked to the payment cycle of amounts due under the BSC. The volume of credit cover required is up to the trading party to decide, based on their trading characteristics.

Elexon advises trading parties to consider the following when determining the collateralisation level:

- how much indebtedness a trading party is likely accrue over 29 days;
- how a trading party's indebtedness would be affected if it experienced a system outage;
- building in an additional mark-up to the collateral level, noting that you must only use up to 80% of the credit cover to avoid credit default processes.

The level of a trading party's credit cover is the sum of the maximum undrawn amount for the time being of any letter of credit delivered by it; and the principal amount of any cash paid by it and credited to the reserve account by the FAA, less the sum of any amounts payable by the trading party in respect of trading charges that have become due for payment and have not been paid.

Indebtedness is expressed as energy indebtedness (EI). This is checked every half-hour by Elexon, and is measured in MWh. To convert credit cover into energy credit cover, it is divided by the credit assessment price (CAP), a parameter set by the Elexon credit committee taking into account the current market value of electricity.

Here is a worked example:

> If a party has £500,000 of credit cover and CAP is set at £100/MWh
>
> Energy credit cover = £500,000 ÷ £100/MWh = 5000 MWh

For each settlement period the EI is the sum over the 29 days of credit assessment energy indebtedness (CEI); metered energy indebtedness (MEI); and actual energy indebtedness (AEI). There are distinctions made based on whether balancing mechanism (BM) units—the trading unit under the BSC—are credit-qualifying, non-credit-qualifying or interconnectors. Credit-qualifying BM units are, broadly speaking, generating units required to submit Final Physical Notifications (FPN) to the system operator but exempt from the requirement to hold a generation licence.

The other key concepts are:

- CEI—This is an estimate of EI used until Elexon carries out the interim information (II) run after five working days. For non-credit-qualifying BM units it is based on each BM unit's contractual position at gate closure compared to an estimated metered volume based on the BM unit's credit assessment load factor (CALF) and the expected maximum demand and consumption over the BSC season—called demand capacity (DC) or generation capacity (GC).

  CALF is a measure of the BM unit's average generation/demand as a ratio of their maximum for the current BSC season.[1] These values are calculated seasonally for each BM unit, and each season's values are published at the beginning of the preceding season. For credit-qualifying BM units and interconnectors, it is based on the BM unit's contractual position at gate closure compared to the latest physical notification submitted to National Grid before gate closure (FPN);

- MEI—This is based on metered volumes received two working days after a given settlement date. It compares these volumes to the contracted volumes submitted to provide the parties imbalance volume, which is the MEI. MEI is only calculated for credit-qualifying BM units; and

- AEI—This is an estimate of trading charges for a given settlement period expressed in MWh. It is calculated from five working days after a settlement day using the interim information run data. It replaces the CEI (and MEI) for those particular settlement periods.

The components are calculated for every BM unit, in MWh, and are aggregated to produce a party's overall EI figure. Essentially this is an estimate of the party's imbalance volume over the 29-day period.

The suitability of a trading party's credit cover is assessed by the credit cover percentage. This is the percentage of a trading party's energy indebtedness for a settlement period compared to the amount of energy credit cover that the trading party has most recently been notified by the FAA.

2.2.4 Types

Credit cover is provided to the FAA through either a letter of credit, or cash.

The letter of credit must be for a period of not less than three months. It must be an unconditional, irrevocable standby letter of credit, in the form of a standard template contained as an annex to the BSC Code. The currency must be sterling and the beneficiary must be Elexon Clear Limited as the BSC clearer. There are stipulations relating to the credit quality of the issuing financial institution. It must be a bank that has a long-term debt rating of not less than A by Standard and Poor's (S&P) or by Moody's Investors Service or such other bank or banks as the panel may approve; and which shall be available for payment at a London branch of the issuing bank.

In terms of cash, the FAA will post cash to the reserve account, which is an account held by the Elexon bankers in the name of Elexon Clear Limited as the BSC clearer. The cash once posted becomes the legal property of Elexon Clear and its sole purpose will be to cover payment default on trading charges. No interest earned on this cash is returned to trading parties.

[1] BSC Spring is1 March to 31 May inclusive; BSC Summer is1 June to 31 August inclusive; BSC Autumn is 1 September to 30 November inclusive; and BSC Winter is 1 December to 28 February (or 29 February) inclusive.

2.2.5 Calls

There are various thresholds for the credit cover percentage that can lead to heightened risk of calls on collateral. Breach of these are defaults under the BSC.

2.2.5.1 Level 1 credit default

The key steps are:

- if in relation to any settlement period a trading party's credit cover percentage, as determined by the energy contract volume aggregation agent (ECVAA) becomes greater than 80% then the ECVAA shall, as soon as possible after gate closure issue a level 1 default notice. The trading party has a 24-hour period from receipt of notice to issue its own notice to the ECVAA if it believes the default is erroneous;
- if requested by the ECVAA, the trading party shall provide further information and explanation in support of its view that the ECVAA's determination of the credit cover percentage was erroneous;
- at the end of the 24-hour period the ECVAA will redetermine the trading party's credit cover percentage for the relevant settlement period, and give notice to the trading party of the credit cover percentage as redetermined. If the redetermined credit cover percentage is not greater than 80%, the level 1 default notice will be deemed to be cancelled and no further action taken, if the redetermined credit cover percentage is greater than 80%, or if no default query notice was given, the trading party shall ensure that its credit cover percentage becomes no greater than 75% in relation to at least one settlement period in the period commencing on expiry of the initial 24 hours and ending at midnight of the first following full business day ("level 1 credit default cure period");
- at the end of the level 1 credit default cure period, if the credit cover percentage (as determined by the ECVAA) was greater than 75% during the level 1 credit default cure period, then the trading party shall be in "level 1 credit default";
- the ECVAA shall (as soon as reasonably practicable following the expiry of the level 1 default cure period) notify the trading party that it is in level 1 credit default and post on the BSC website a level 1 credit default statement in relation to the trading party; and
- the trading party will cease to be in level 1 credit default with effect from gate closure for the next settlement period (if any), in relation to which the trading party's credit cover percentage becomes not greater than 75%. As soon as practicable after gate closure for that settlement period the ECVAA will cancel the level 1 credit default statement on the BMRS or the BSC website.

2.2.5.2 Level 2 credit default

This is dealt with procedurally the same as Level 1, except that:

- the threshold is 90% and that any Energy Contract Volumes Notifications (ECVNs) or Meter Volume Reallocation Notifications (MVRNs) that are submitted, which would increase (or not decrease) energy indebtedness at any point in the future, will be refused. In addition any energy contract volumes or meter volume reallocations that have been previously notified, which increase energy indebtedness for the upcoming settlement period, will be rejected on a settlement-period-by-settlement-period basis. In this case the counter-parties to the notification will be informed by the ECVAA; and
- you will no longer be in level 2 credit default when your CCP becomes less than 90%. At this point, the notice will be removed from the BSC website.

A level 1 or level 2 credit default will not in its own right lead to a demand made under collateral. This can only happen following a payment default or upon failure to replace and renew security (*see section 2.3.1*).

2.2.6 Other protections

The letter of credit, or cash, is the first line of defence against payment default under the BSC, but all trading parties are further protected by:

- a small credit facility (up to a maximum of £10mn) held by Elexon Clear Limited with the BSC bank; and
- mutualisation across other parties of any unpaid amounts by a defaulting trading party that cannot be covered by its posted letter of credit, or cash.

The shares of unsecured defaulting trading charges (plus interest and VAT) to be covered by mutualisation is derived using each non-defaulting trading party's annual funding share for the month in which the default occurs to split outstanding trading charges. In such a scenario each non-defaulting party must pay its own trading charges and an additional amount to cover the default.

2.3 Impacts

2.3.1 Beneficiary

Letters of credit and cash are liquid forms of collateral.

Letters of credit and cash have an obvious face value so have transparent capability to cover different levels of loss. By limiting the issuers of letters of credit to publicly-rated financial institutions, it is possible for Elexon to have confidence in the assessment of the financial strength of the institution legally-bound to pay under the instrument.

Further assurance is provided by provisions dealing with a reduction in the credit quality of the issue of the letter of credit. If at any time the issuing bank ceases to have the required credit rating, the trading party must, within three business days after notice from the FAA, either provide to the FAA a new letter of credit from a bank that has the required credit rating, valid for a period of not less than three months; and/or deliver cash to the FAA on behalf of Elexon Clear Limited as BSC clearer. If there is a combination of cash and letter of credit then the aggregate amount must not be less than that of the current letter of credit.

A three-month term to the letter of credit reduces Elexon's exposure to an inability of trading parties to reissue the letter of credit once it reaches expiry. This is bolstered by provisions relating to renewal. These state that by 10 business days before the current letter of credit is due to expire, the trading party shall:

- provide to the FAA confirmation from the issuing bank that the validity of the current letter of credit will be extended by a further period of not less than three months; or
- provide to the FAA a new letter of credit, valid for a period of not less than three months, commencing no later than the expiry of the current letter of credit, and for an amount not less than that of the current letter of credit.

If a trading party fails to perform against these obligations, the original letter of credit will be called.

2.3.2 Issuer

Letters of credit and cash are the most expensive forms of collateral. Cash posted as security is money that could otherwise be used for productive purposes. If we assume all firms fund either cash deposits or letters of credit from bank facilities, then this exposes them to different degrees of financing costs.

Both types of facilities will be priced taking into account the risk of the company raising the finance, and any associated costs to the bank of funding their commitment under the facility. Letters of credit are cheaper to obtain as they are promises to pay and therefore unfunded instruments and, whilst they attract a fee versus their face value, this is not on top of an underlying interest rate. Cash facilities on the other hand

typically attract a margin (based on company risk as per a letter of credit) over an underlying interest rate and are likely to be more expensive.

2.4 Costs

2.4.1 System collateral amounts

Table 2.2 shows the average levels of total credit posted under the BSC for the period 2011-13. These gross collateral figures can be further broken down into the two allowable collateral instruments: letters of credit or cash.

Table 2.2: BSC annual average collateral and segmentation

Year	Letter of credit (£mn)	Cash (£mn)	Total
2011	351.4	72.6	424
2012	329.5	53.5	383
2013	307.0	47.5	354.5

Table 2.2 also demonstrates the preference for issuing letters of credit over posting cash, which is a rational decision considering the lower financing and opportunity costs relative to cash.

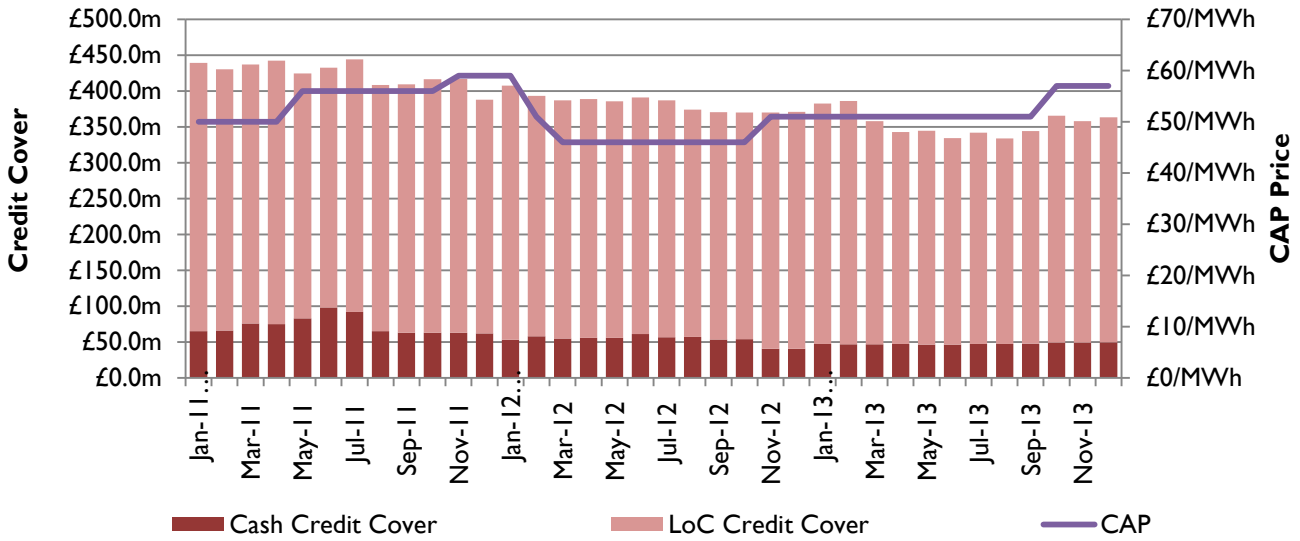
The average proportion of letter of credit posting over the three years analysed is 85.2%, compared to 14.8% for cash. The 14.8% for cash is relatively high in comparison to other frameworks, and is a reflection of the ability of the FAA to make cash calls or notify users to post additional collateral at short notice under the BSC.

Collateral postings have been relatively stable, with a general marginal declining trend over the period. There is a stable relationship between collateral postings and the credit assessment price (CAP)—shown as the blue line in Figure 2.1). The CAP is a notional value of 1MWh of energy that is used in determining a party's energy indebtedness and amount of energy credit cover, this value assesses adequacy of credit cover.

The decline in total collateral posted can be explained by commodity price reductions, which have driven a fall in average energy imbalance prices[2], and linked reductions in the CAP.

[2] System sell price fell by 7% between Q211 and Q213.

Figure 2.1: Total credit cover vs CAP price, 2011-13

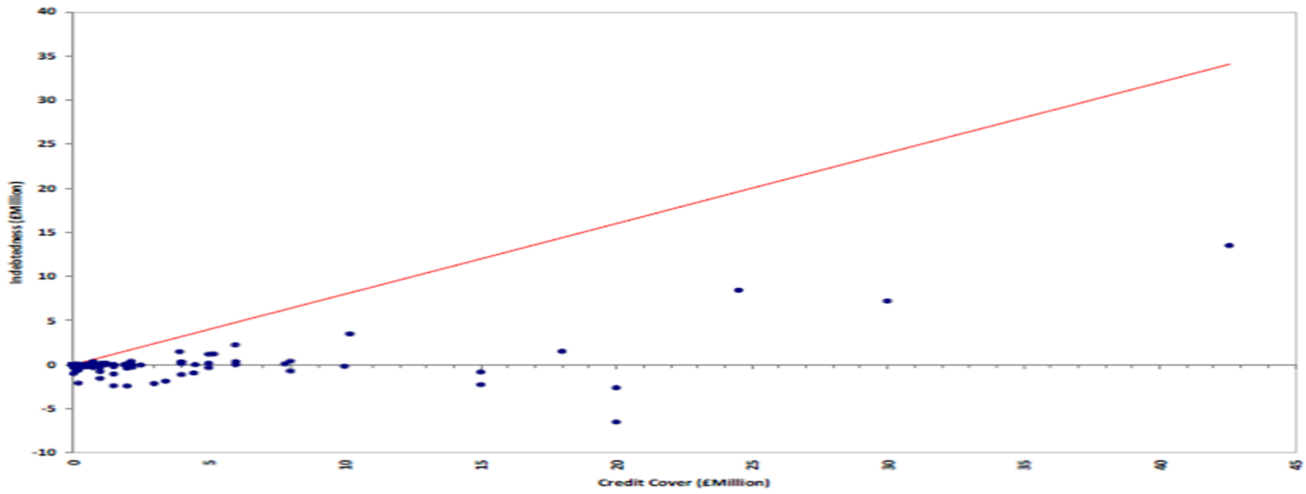


Source: Elexon

Figure 2.2 sets out the relationship between average calculated energy indebtedness and average credit cover at December 2013. Each spot represents an anonymised party, with the red line representing the point at which indebtedness would exceed 80% of that party's credit cover. The graph shows a group of parties with relatively small amounts of calculated indebtedness but with small headroom against credit default triggers, and a material number of parties with higher levels of calculated indebtedness but greater levels of headroom against credit defaults (including significant headroom of credit cover).

This distribution reflects the desire of parties to match collateral with levels of calculated indebtedness to avoid excessive and unnecessary costs of over-collateralisation, but shows that a significant number of parties have an excess of credit cover.

Figure 2.2: Average calculated indebtedness vs average credit cover, December 2013



Source: Elexon

2.4.2 *Estimated system collateral costs 2011-13*

Table 2.3 shows the segmentation of BSC collateral costs, as well as the total collateral cost.

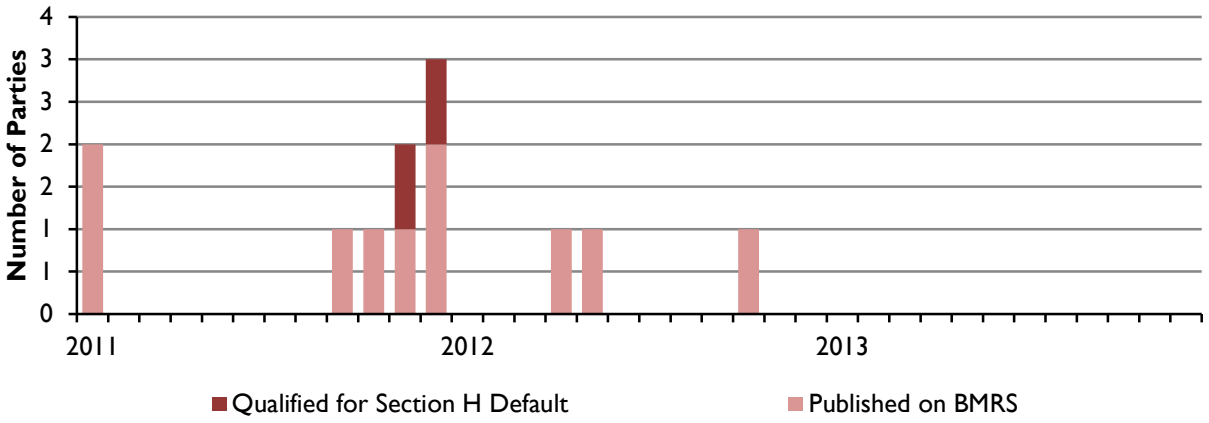
Table 2.3: BSC estimated collateral annual cost

Year	Letter of credit (£mn)	Cash (£mn)	Total (£mn)
2011	8.8	4.9	13.7
2012	8.2	3.6	11.8
2013	7.7	3.2	10.9

2.4.3 *Incidents of default*

Figure 2.3 shows the number of trading parties subject to different types of levels of level 1 and level 2 default under the BSC in the 2011-13 period. Incidents of default have been low over this period.

Figure 2.3: Number of parties by month that did not resolve credit within the query period



Source: Elexon[3]

2.4.4 *Benchmark map 2011-13*

Figure 2.4 shows the annual collateral amounts required to be posted by our core supplier benchmarks under the BSC for the 2011-13 period. Table 2.4 shows the assessed cost. Pure gas suppliers are excluded as they are not party to the BSC.

[3] A party is placed in Section H default following a defined period of either level 1 or 2 credit default.

Figure 2.4: BSC collateral—supplier benchmark map, 2011-13

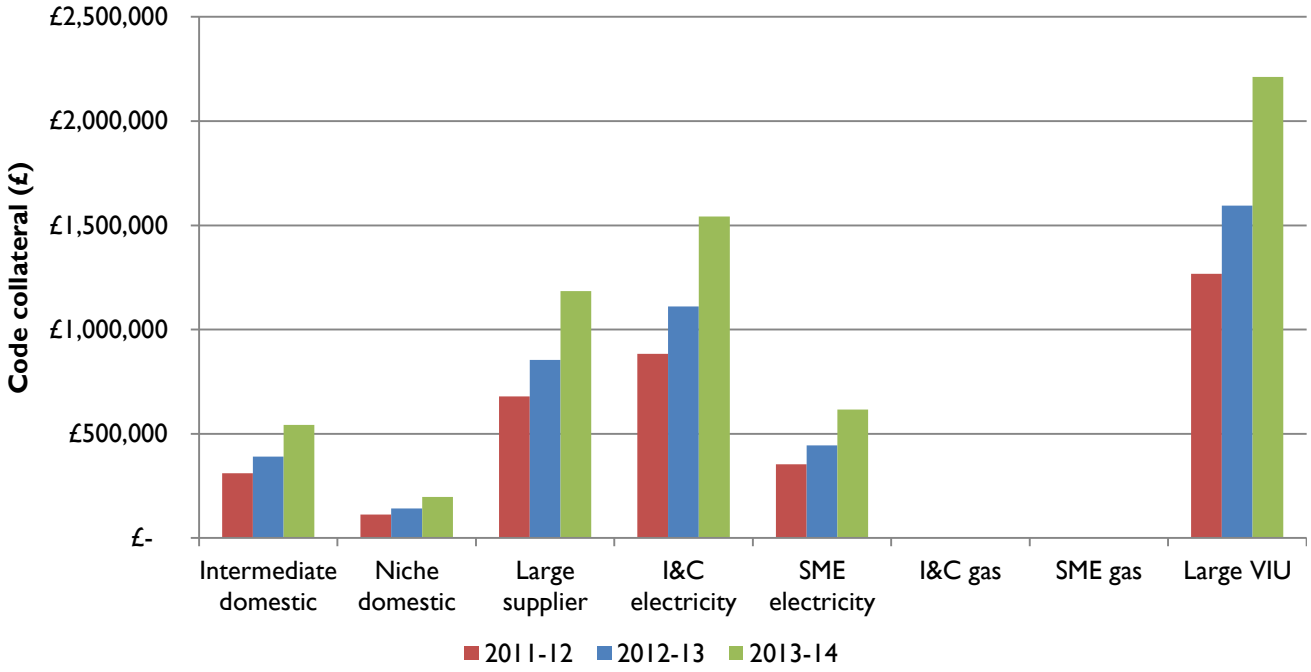


Table 2.4: BSC supplier benchmark—collateral amounts, 2011-13

Supplier	2011-12 (£)	2012-13 (£)	2013-14 (£)
Intermediate domestic supplying electricity and gas	311,091	391,261	542,759
Niche domestic electricity supplier	113,124	142,277	197,367
Large domestic gas and electricity supplier	678,743	853,660	1,184,201
Industrial and commercial electricity supplier	883,780	1,111,536	1,541,928
Small and medium sized enterprise electricity supplier	353,512	444,614	616,771
Industrial and commercial gas supplier	-	-	-
Small and medium sized enterprise gas supplier	-	-	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	1,267,929.51	1,594,684	2,212,153

Figure 2.5 shows the annual collateral amounts required to be posted by our core generator benchmarks under the BSC for the period 2011-13. Table 2.5 shows the assessed cost. Offshore and onshore wind and solar are subject to PPAs which insulate them from BSC collateral, hence do not post credit.

Figure 2.5: BSC collateral—generator benchmarks, 2011-13

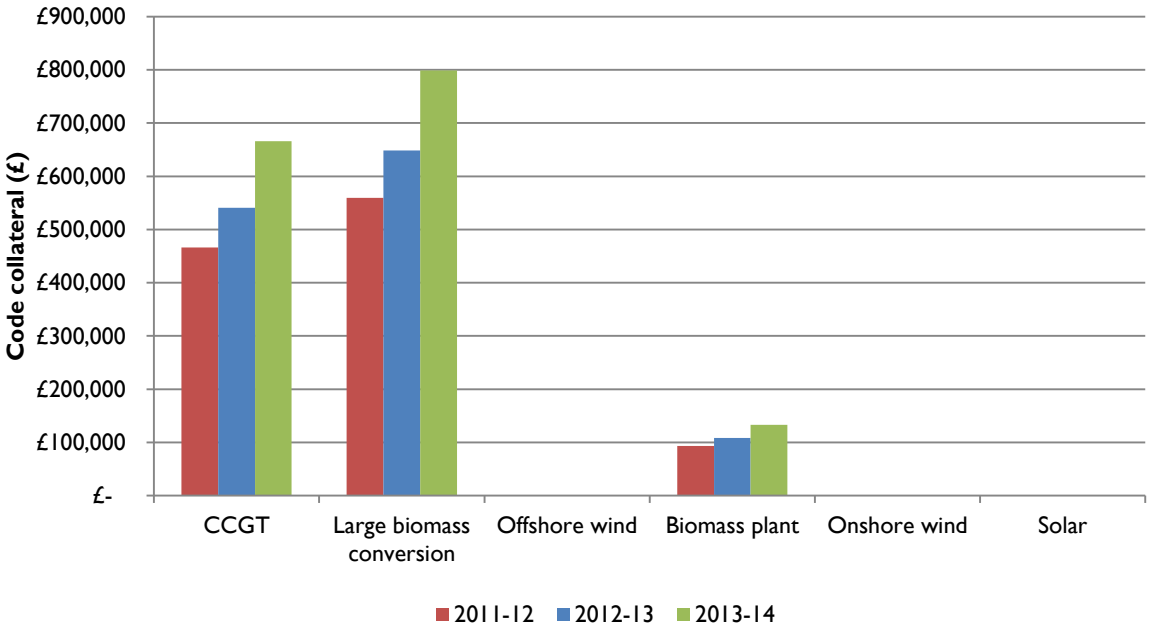


Table 2.5: BSC generator benchmark—collateral amounts, 2011-13

Generator	2011-12 (£)	2012-13 (£)	2013-14 (£)
CCGT	465,985	540,603.34	665,777.38
Large biomass conversion	559,183	648,724.01	798,932.85
Offshore wind	-	-	-
Biomass plant	93,197	108,120.67	133,155.48
Onshore wind	-	-	-
Solar	-	-	-

Many developers and owners of assets in the renewables sector will use third party PPAs to sell their power. Under these agreements the off-taker will assume balancing services on behalf of the generator, subsuming the output of the generating station as part of its overall portfolio. In return for this, a discount is typically charged on the indexed market value of different benefits sold to the off-taker by the generator.

For supplier and generators, as BSC collateral reflects both volumes and an ability to balance effectively, there is not a direct correlation between market share or size of supplier and the amount of collateral that they are required to post. For example, a large vertical integrated utility (VIU) supplier retains a greater ability to avoid balancing charges through its vertically integrated structure than other supplier types. As a result, the amount of collateral it posts is not proportionate to the scale of its participation in the energy markets.

The benchmarks all follow broadly the same profile of collateral demand over the three years. This is a result of an assumption of all benchmarks' exposure to changing balancing prices over those years. It is important to note that in practice collateral amounts are likely to be higher because our benchmarks are seeking to post higher levels of collateral than 29 days' trading charges. This is to cover issues relating to

shock events such as outages, and to take into account a desire to avoid credit default under the code. This is covered further in Volume 1.These figures represent a conservative estimate of required collateral.

Figure 2.5 shows the annual collateral costs posted by our core supplier benchmarks under the BSC for the period 2011-13. Table 2.6 shows the assessed cost in £.

Table 2.6: BSC supplier benchmark—estimate collateral costs, 2011-13

Supplier	2011-12 (£)	2012-13 (£)	2013-14 (£)
Intermediate domestic supplying electricity and gas	12,443.62	15,650.43	21,710.34
Niche domestic electricity supplier	13,574.86	17,073.19	23,684.01
Large domestic gas and electricity supplier	10,181.14	12,804.89	17,763.01
Industrial and commercial electricity supplier	44,188.99	55,576.80	77,096.39
Small and medium sized enterprise electricity supplier	12,372.92	15,561.50	21,586.99
Industrial and commercial gas supplier	-	-	-
Small and medium sized gas supplier	-	-	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	19,018.94	23,920.25	33,182.29

Figure 2.6 shows the annual collateral costs posted by our core generator cases under the BSC for the 2011-13 period. Table 2.7 shows the assessed cost.

Figure 2.6: BSC collateral cost generator benchmark map, 2011-13

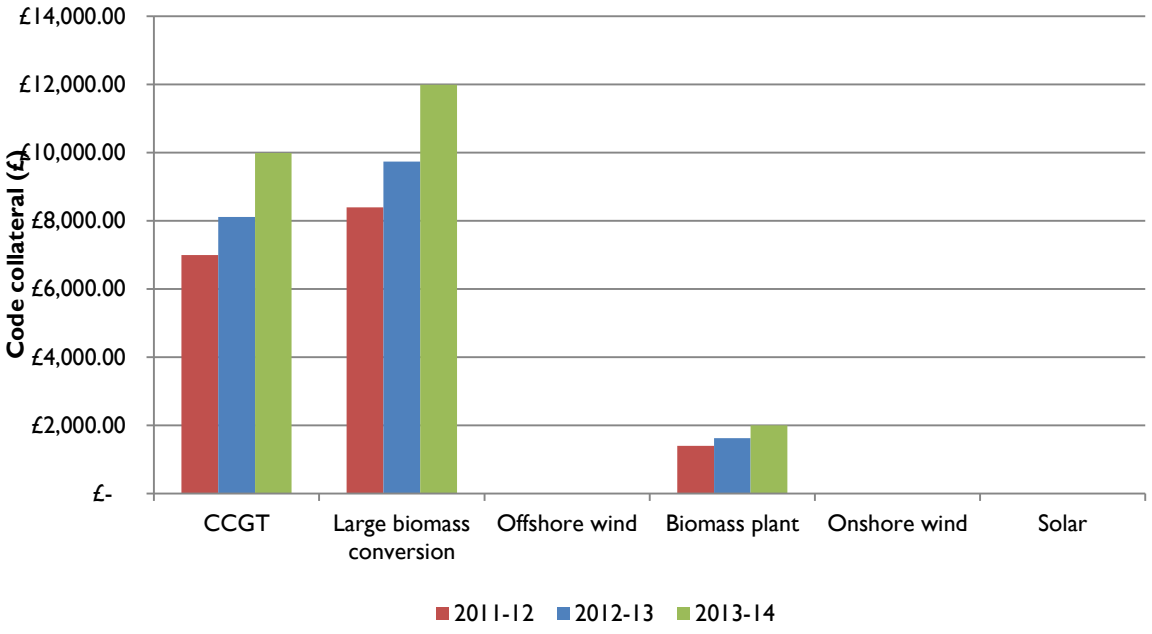


Table 2.7: BSC collateral—generator benchmark cost breakdown, 2011-13

Generator	2011-12 (£)	2012-13 (£)	2013-14 (£)
CCGT	6,989.78	8,109.05	9,986.66
Large biomass conversion	8,387.74	9,730.86	11,983.99
Offshore wind	-	-	-
Biomass plant	1,397.96	1,621.81	1,997.33
Onshore wind	-	-	-
Solar	-	-	-

This cost data for suppliers reflects different costs associated with raising collateral for different types of benchmark, in the case of the BSC the variance in fees chargeable for letters of credit. Again, we see that large VIU suppliers, despite having the third highest amount of collateral posted in each year, face the lowest cost of any benchmark in meeting that collateral demand. Their costs are less than the niche supplier benchmark, despite placing on average £105,000 more collateral over the period. The large supplier faces the second highest cost, but its costs are low in proportion to the amount of collateral posted. The industrial and commercial (I&C) supplier collateral costs are more than double that of the large VIU supplier, despite it being required to post 70% of the collateral of the large VIU supplier.

3 Connection and Use of System Code (CUSC)—networks

3.1 Overview

Table 3.1: Key CUSC credit parameters—TNUoS and BSUoS

Who is impacted?	Electricity suppliers and generators	
Purpose	To cover unsecured losses from non-payment of transmission use (TNUoS) and balancing (BSUoS) charges; to recover funds from the termination of a party's participation in CUSC	
Average annual credit amounts (TNUoS and BSUoS)	2011—£597mn 2012—£626mn 2013—£610mn	Annualised average £611mn
Type of collateral accepted	Letters of credit; insurance performance bonds/ bilateral insurance policies provided by an A-rated institution; independent security arrangement; parent company guarantee; and cash in an escrow account	
Split between instruments	2011—£2mn letter of credit; £3mn cash, £592mn PCG 2012—£3mn letter of credit, £3mn cash, £620mn PCG 2013—£5mn letter of credit, £3mn cash, £610mn PCG	
Period/ level of cover required	Amount based on value at risk CUSC—29 days BSUoS—32 days	
Unsecured credit criteria	An independent credit assessment score or credit rating allows for up to 2% of National Grid's RAV to be awarded as unsecured credit (the maximum unsecured credit limit). Good payment history can allow the participant to access lower levels of unsecured credit (capped at 2% of the maximum unsecured credit limit)	
Other protections	None	
Trigger for call	Payment default or failure to pay cancellation charges	
Total scheme cost	2011—£0.25mn 2012—£0.28mn 2013—£0.33mn	

The headline points from this section are:

- CUSC collateral demands fall primarily on suppliers;
- the CUSC allows for lesser rated or non-publicly-rated participants to avoid the requirement to post high-quality collateral (letters of credit or cash) through good payment history, an independent rating or a PCG. PCGs are not cost free, but they do not attract direct and tangible financing costs like a letter of credit or cash;
- the greatest burden of collateral is likely to fall on bad payers or on new entrants if they are relatively financially weak or cannot source a well-rated PCG; and

- the calculation of an unsecured limit as a percentage of National Grid's regulated asset value (RAV) affords a high degree of unsecured lines to parties under the CUSC relative to the charges they incur under the code.

3.2 Credit and collateral rules

3.2.1 Background

The CUSC constitutes the contractual framework for connection to, and use of, National Grid's high voltage transmission system. Each CUSC user is required to pay use of system charges. Use of system charges are charges made or levied by National Grid Electricity Transmission (NGET) for the provision of services under the transmission business section of its transmission licence.

Use of system charges comprise balancing services use of system (BSUoS) charges and transmission network use of system (TNUoS) demand charges. Collateralisation requirements are linked to liability positions users are exposed to under these two charging mechanisms (deriving a value at risk, or VAR, for security calculation purposes). Upon accession to the CUSC framework agreement, users must adhere to the security cover for arrangements set out in CUSC sections 3.22-28.

TNUoS recovers the cost of providing and maintaining shared (or potentially shared) electricity transmission assets—these are assets that cannot be solely attributed to a single user. TNUoS charges are recovered from all generation and demand users of Britain's electricity transmission system. These charges vary by location, reflecting the costs that users impose on the electricity transmission network.

The TNUoS charges are billed by two methods: half hourly (HH) and non-half hourly (NHH). The charge calculations for both of these methods are initially based on forecasts provided by the customer:

- HH—this is done after the end of the financial year when the reconciliation between the actual usage and the forecast usage that was charged for takes place. Typically, this results in periods of the year where the user is in credit and periods when they are in debt. The value that the customer is in debt is their liability (essentially the half hourly value at risk or HHVAR); and
- NHH—the liability is calculated based on total consumption between 16:00 and 19:00 every day. These are charged monthly using the forecast provided by customers. An initial reconciliation between the forecast and the actual usage is done in May/June immediately after the end of that financial year (FY+1). A final reconciliation is then done in July of the following financial year once all meter data is retrieved. As the charges are spread evenly throughout the year there is a period where system use is higher, which results in the counterparty being in debt (the non-half hourly value at risk or NHHVAR).

BSUoS charges relate to the costs of the day-to-day operation of the transmission system. These costs primarily relate to the balancing of Britain's electricity system and include the costs of constraining generation. These costs are calculated daily as a flat tariff across all users. BSUoS charges are dependent on the balancing actions that National Grid takes each day. The methodology that calculates BSUoS is set out in Section 14 of the CUSC.

As the prices for BSUoS change every half an hour the costs are charged daily, billed daily and paid daily. Like the BSC payments, the payments are made 29 days in arrears. There is, therefore, always a 29-day settlement risk period where charges have been incurred but not paid for. This makes up the BSUoS liability (or the BSUoS VAR). It should be noted that for credit/security purposes for suppliers this liability is increased by 10% to 32 days as the demand values are more likely to differ from the forecasts so this reduces potential exposure for National Grid. BSUoS liabilities for security purposes are calculated quarterly as the variation on a day-to-day basis will be minimal. The winter quarter's security arrangements are highest as there is much higher system usage.

Once a year the accuracy of all suppliers' forecasts is analysed and fed into a calculation (which is detailed in CUSC Section 3, appendix 2). These calculations apply certain weightings to each month's accuracy level

(with the largest weightings applying in the winter months and later months of the financial year). When these are all combined they result in a forecasting performance VAR for the year.

3.2.2 Purpose

The primary purpose of collateral posted under the CUSC is to reduce unsecured losses arising from payment default of TNUoS and BSUoS. In doing so, it performs the function of delivering a pool of liquid working capital to NGET in instances where a user is unable to meet its liabilities. This gives NGET greater confidence that it can appropriately maintain and operate transmission assets and systems even in instances of payment failure. A secondary purpose would be to cover any sums owed upon termination of a party's participation in the CUSC.

3.2.3 Cover

Each user under the CUSC will have an associated VAR. This is the sum of (and varies according to) the size of the users liabilities across TNUoS and BSUoS and forecast performance. The VAR is the maximum anticipated charging exposure for a customer at any point throughout the year under these charges. It is used to determine the requirement for the customer to put security in place (having taken into account any unsecured credit allowance that may be extended to the customer).

To minimise the risk of unsecured loss each supplier has to ensure that their VAR is always covered by a combination of unsecured credit and, if necessary, security. Upon accession to the CUSC framework agreement, users must provide evidence to establish their allowable unsecured credit limit. Users are required to provide security cover where VAR exceeds their allowed unsecured credit limits.

The maximum unsecured credit limit for any supplier is capped at 2% of NGET's RAV. Each supplier's credit allowance will therefore be between 0% and 2% of the total RAV for the system operator.[4] The relevant percentage applicable to an individual user is a function of their credit rating[5] or payment history.

To establish the credit quality of a user two possible measures are used:

- public credit ratings provided by either S&P or Moody's rating agencies; or
- where there is no public credit rating, NGET will commission an independent rating, by agencies such as Dunn and Bradstreet (D&B), Graydons and Experian.

The latter category is more relevant for the independent participants in the electricity industry, which are not publicly rated. There is a sliding scale of permissible unsecured credit based on the user's credit rating and their past payment performance.

Table 3.2 sets out the percentage of unsecured credit cover applicable to different public ratings.

[4] The RAV for 2013-14 is £10,108mn which results in a maximum credit limit of £202.2mn. However, RAV is changed each year.

[5] Precise method outlined in Appendix 1, Section 3 of the CUSC.

Table 3.2: CUSC approved rating unsecured credit cover percentage

Approved long-term credit rating			User's allowed credit as % of unsecured credit cover
S&P	Moody's	Fitch	
AAA AA+ AA AA-	Aaa Aa1 Aa2 Aa3	AAA AA+ AA AA-	100
A+ A A-	A1 A2 A3	A+ A A-	40
BBB+	Baa1	BBB+	20
BBB	Baa2	BBB	19
BBB-	Baa3	BBB-	18
BB+	Ba1	BB+	17
BB	Ba2	BB	16
BB-	Ba3	BB-	15

Where users do not have a public credit rating then this rating is the output of the independent credit score exercise mapped against the following matrix, as shown in Table 3.3.

Table 3.3: CUSC independent credit score credit cover percentage

Credit assessment score	User's allowed credit as % of unsecured credit cover
10	20
9	19
8	18
7	17
6	16
5	15
4	13.33
3	10
2	6.67
1	3.33
0	0

Should a user's public credit rating decrease then their unsecured credit limit will be adjusted accordingly. If the unsecured credit limit has reduced below VAR, alternative security will have to be provided immediately. If a credit rating increases it is the responsibility of the counterparty to provide details to NGET, who will then review the party's credit allowance.

If a user does not have an approved credit rating or an independent rating then an unsecured credit is not automatically offered. The CUSC will still permit an unsecured credit to be offered up to a limit that is calculated using the user's payment history record. This is built up over time based on payment performance of BSUoS and TNUoS.

Users can access a lower level of unsecured credit through demonstrating good payment history. Unsecured allowances will accumulate at 0.033% of a figure that is equivalent to 2% of the maximum unsecured credit limit (which is defined as 2% of NGETs RAV) for each month of good payment performance. Thus 2% of the maximum unsecured credit limit can be built up over five years of perfect payment history. Any late payment immediately halves the supplier's current level of unsecured credit. If a second late payment is made within 12 months of the first late payment, then the unsecured credit allowance is reduced to zero.

The good payment history provision is helpful to smaller, unrated suppliers as the large quantum of NGET RAV relative to the CUSC liabilities or intermediate/small non-Big Six suppliers means that with good payment history they can modestly reduce the requirement to post any letters of credit or cash over only a couple of years.

Security is only required to be posted where the VAR for a user exceeds its unsecured credit limit.

3.2.4 Types

Collateral can be posted via a combination of the following instruments:

- letters of credit;
- insurance performance bond;
- bilateral insurance policy;
- independent security arrangement;
- parent company guarantees; and
- cash deposit in an escrow account.

The letter of credit must be in pounds sterling, and an irrevocable standby letter of credit allowing for partial drawings and providing for the payment to NGET on their demand. The issuing bank must have a minimum credit rating of A by S&P or Moody's Investment Services, unless otherwise approved by NGET.

Independent security arrangements, insurance performance bonds, and bilateral insurance policies must be in favour of NGET; provided by an entity which holds a rating of at least A- in S&P's long-term debt rating or A3 in Moody's long term debt rating; and reside in a country with a sovereign credit rating from S&P of not less than A or a rating not less than A2 by Moody's Investor Services. The security provided must be legally enforceable with no material conditions preventing the exercise by NGET of its rights under the security. NGET may accept such security from an entity who does not meet the requirements up to an agreed value, but this is at their discretion.

A PCG can be provided as security by a parent company of a user as security but it has to be provided by a company with rating of at least BB-. A PCG can only secure an amount equal to the unsecured credit limit that would be allocated to the company providing the PCG if it were a direct user of the CUSC. A PCG provider cannot exceed its own unsecured own credit limit, so if it is offering multiple PCGs these would be summed to ensure that the parent remains a reliable source of security for the aggregate obligations it is supporting. Where the guarantee is provided by a foreign entity then legal opinions will be sought with

regard to its validity and enforceability. This is of significant importance if one considers the large size of 2% NGET RAV versus CUSC liabilities, even for large supply companies that are part of Big Six VIUs. Even if at the user level their amount of unsecured credit allowance is low, the cost of collateralising their liabilities can be significantly reduced through the provision of PCGs.

In all cases, if any item of security above falls below their minimum required ratings then the user must replace it with an alternative and valid form of collateral at the required rating, or post cash to an escrow account for an equivalent sum.

If the supplier wishes to use cash as a form of security then an escrow account is set up by NGET. The supplier can then make a cash deposit sufficient to cover the security requirement (or remaining part of the security requirement if a combination of security types is being used). In the event of default of payment, NGET can then draw on the cash. Interest on the money held in the escrow account is paid quarterly to the supplier at a rate of bank base rate minus 0.5%. The supplier can request the money be returned at any point providing another form of security is posted, or they have achieved the required level of unsecured credit to allow security to be released.

3.2.5 Calls

Demand made under collateral will follow a payment default and to cover termination amounts following events of default relating to disconnection or de-energisation.

3.3 Other protections

There are no other forms of collateralisation or mutualisation under the CUSC.

3.4 Impacts

3.4.1 Beneficiary

There are a mix of liquid forms of collateral, including strongly-rated standby letters of credit and cash.

Cash has an obvious face value, so the transparency of convertible value to cover losses is faultless. By limiting the issuers of letters of credit to publicly-rated financial institutions it is equally possible for NGET to have confidence in the assessment of the financial strength of the institution bound under the instrument.

Assurance is further garnered from provisions dealing with a reduction in the credit quality of the issuing institution for the current letter of credit, PCGs, independent security arrangements and bilateral insurance policies.

PCGs and independent security arrangements are less enforceable and not as liquid as cash and letters of credit. Even with the protections of requiring a minimum credit rating they still require by the company to pay up, and may involve court action to enforce as oppose to being payable on demand at a bank. Under such instruments it is possible to make a demand but be part of a queue of creditors seeking payment from a defaulting company.

The flexibility to enjoy and build-up a proportion of unsecured credit based on good payment history means NGET is content to accept increasing proportions of unsecured positions amongst long-standing, performing users. If the financial or trading circumstances of these users changed suddenly, then NGET might be left with no ability to recover a portion of unpaid liabilities as a result of allowing these positions to accrue and increase. However, the counter-balancing incentive is for users to focus on ensuring good payment performance to avoid being hit with an immediate collateral demand. In any event this exposure is capped at 2% of the maximum unsecured credit limit (which is defined as 2% of National Grid's RAV).

3.4.2 Issuer

Given the combination of the size of NGET's RAV and the 2% derived cap on unsecured credit allowance under the CUSC, the likely liabilities of users under the CUSC relative to the cap, the ability to gradually build unsecured credit allowances and the ability for certain users to avoid the cost of cash or letters of credit through PCGs, then the burden of collateral on users under the CUSC is low.

PCGs are not cost free for group parent companies, not least as the build-up of PCGs as contingent liabilities are likely to have an impact on their own credit ratings. However, relative to posting cash or letters of credit the impact is far less.

The costs of posting collateral are therefore assumed to be negligible at a framework level (this is borne out by the benchmark mapping). The exceptions to this are:

- new entrant users who are unrated and are not owned by strong investment grade companies. They cannot avoid cash or letters of credit by virtue of payment history performance or PCGs;
- recent entrants yet to establish a meaningful unsecured credit limit as a proportion of their overall CUSC liability, even if they have displayed good payment performance; and
- recent entrants that do not make payments promptly.

Such entities could be exposed to posting cash posted as security that could otherwise be used for productive purposes.

3.5 Costs

3.5.1 System collateral review 2011-13

Table 3.4 shows the levels of total credit posted under the CUSC (TNUoS and BSUoS) for 2011-13 and the segmentation of collateral posted. This is represented in Figure 3.1 as a snapshot taken in March of each year.

Table 3.4: CUSC annual collateral segmentation, 2011-13

Year	Letter of credit (£mn)	Cash (£mn)	PCG (£mn)	Total (£mn)	Unsecured (£mn)
2011	2	3	592	597	690
2012	3	3	620	626	744
2013	5	3	602	610	798

These figures on face value appear high relative to other schemes that require collateralisation. However, this is because they include the PCGs. PCGs are not cost free to their issuers as they will be taken into account in terms of any credit rating or assessment of the borrowing capability of the issuer when they engage with credit ratings agencies or banks. The assessment of this cost is intangible at a systemic level and relies on a case-by-case assessment of the issuer. In comparison, cash or letters of credit will have a direct and tangible cost as instruments of collateral, and will be less preferable forms of collateralisation for users under CUSC.

Figure 3.1: CUSC collateral segmentation, 2011-13 (£mn)

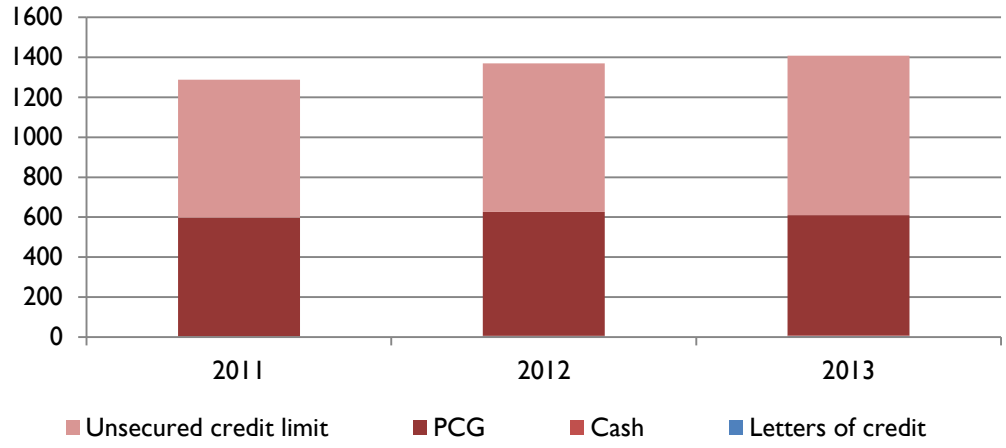


Figure 3.1 illustrates the extent of unsecured credit allowance that operates under the CUSC for TNUoS and BSUoS. On average this is 55% of the value of credit limits over the three years analysed.

Figure 3.2 provides a more detailed breakdown. Actual values are shown at Table 3.5.

The value of cash and letters of credit collateral is marginal (averaging at 0.5% of total credit limits over the three years analysed). That said, it is telling that there is a proportionately higher percentage volume of these more expensive forms of collateral. On average 16% of users are posting cash or letter of credit, denoting a concentration of smaller market participants unable to benefit from unsecured credit allowances.

Figure 3.2: CUSC annual collateral segmentation volume vs value, 2011-13

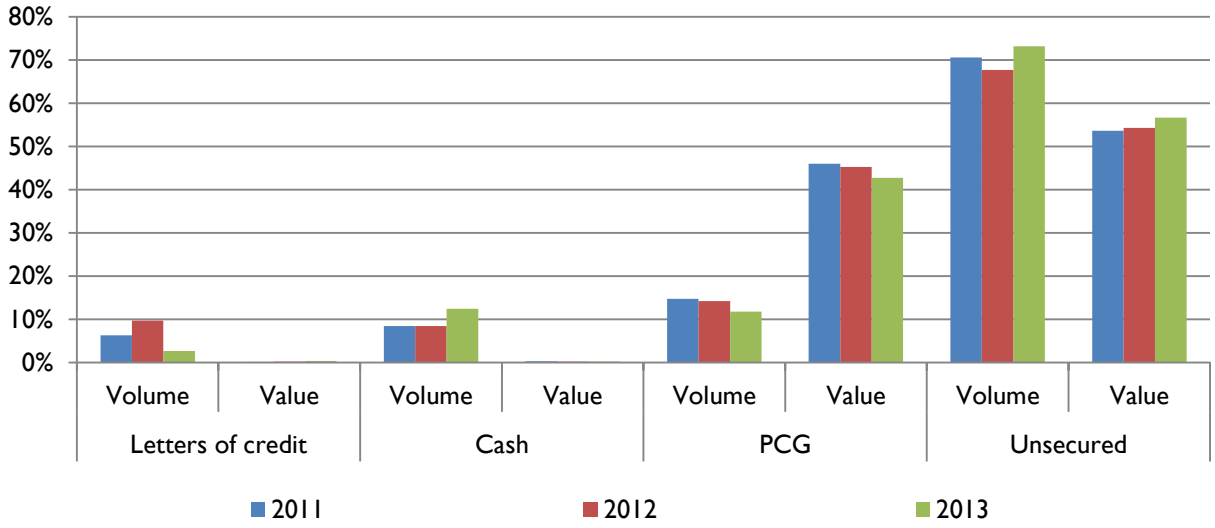


Table 3.5: CUSC annual collateral segmentation volume vs value, 2011-13

Year	Letter of credit (%)		Cash (%)		PCG (%)		Unsecured (%)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
2011	6.3	0.2	8.4	0.2	14.7	46.0	70.6	53.6
2012	9.7	0.2	8.4	0.2	14.2	45.3	67.7	54.3
2013	2.6	0.4	12.4	0.2	11.8	42.8	73.2	56.7

3.5.2 Estimated system collateral costs 2011-13

Again, for stated reasons, it is important to note that we do not include a cost for posting PCGs.

Table 3.6 shows the segmentation of CUSC collateral costs, as well as the total collateral cost.

Table 3.6: CUSC estimated collateral cost, 2011-13

Year	Letter of credit (£mn)	Cash (£mn)	Total (£mn)
2011	0.05	0.20	0.25
2012	0.08	0.20	0.28
2013	0.13	0.20	0.33

3.5.3 Benchmark map 2011-13

It is assumed that the parties represented by our core benchmarks are established participants. Therefore, it is assumed that they have built up a good payment history under the CUSC, which affords them access to an unsecured credit allowance.

As the CUSC unsecured credit allowance can be established as a proportion of 2% of NGET's RAV then, for all of our benchmarks, their unsecured credit allowance exceeds their modelled VAR by virtue of their independent credit assessment score or credit rating. In Section 3 of the benchmark map, analysis is undertaken of circumstances in which supplier benchmarks would not be in a position to receive unsecured credit allowances.

4 CUSC—generator user commitment

4.1 Summary

Table 4.1 Key CUSC generator user commitment credit parameters

Who is impacted?	Generators only	
Purpose	To recover costs of stranded investments	
Average annual credit amounts	2011—£417mn 2012—£468mn 2013—£411mn	Annualised average £432mn
Type of collateral accepted	Performance bond or letter of credit from a qualified bank; a cash deposit in a bank account; and/or a performance bond or guarantee from a qualified company	
Split between instruments	2011—£95mn letter of credit; £22mn cash, £300mn PCG 2012—£136mn letter of credit; £18mn cash, £314mn PCG 2013—£150mn letter of credit; £17mn cash, £244mn PCG	
Period/ level of cover required	Amount based on rules relating to the proximity to the date of plant commissioning	
Unsecured credit criteria	A credit rating for long term debt (A- and A3) as set by S&P or Moody's; an indicative long term private credit rating (A- and A3) as set by S&P or Moody's; or a short term rating by S&P or Moody's that correlates to a long term rating of A- and A3 respectively	
Other protections	None	
Trigger for call	Termination of a connection agreement or failure to pay the invoiced cancellation charge	
Total scheme cost	2011—£3.86mn 2012—£4.61mn 2013—£4.90mn	

The headline points from this section are:

- CUSC generator user commitment security requirements fall on generators in the pre-commissioning period of projects. Transmission-connected projects will always face the costs and burdens of security arrangements. Embedded generators will face the costs and burdens of certain elements of the liability only if they are subject to a Bilateral Embedded Generation Agreement (BEGA);
- liabilities are split between shared, wider investments and those directly attributable to the individual generating project;
- security requirements reduce as a percentage of cancellation charge liabilities as projects approach commissioning, but the charges increase as projects approach commissioning;
- security can be provided through letters of credit, cash, PCGs or performance guarantees with rules in place to ensure that the issuers have a high credit rating; and
- the majority of collateral is undertaken through PCGs and, to a lesser degree, letters of credit.

4.2 Credit and collateral rules

4.2.1 Background

Under the CUSC, transmission-connected generators are obliged to post security to support liabilities incurred in facilitating the connection of their plant to the transmission network. This is commonly referred to as the generator user commitment.

Arrangements for generation user commitment have been modified as a result of the CUSC modification proposal (CMP)192. The proposal was raised by NGET in February 2011 and approved by Ofgem on 30 March 2012. The new arrangements took effect from 1 April 2013.

The new arrangements are formally set out in Section 15 of the CUSC and comprise of a generic liability to cover wider system investment, with a specific liability to cover local generator-driven investment. All generation projects would be liable for a proportion of the wider amount but generators only cover 50% of this cost, with the remaining 50% being covered by consumers. Only pre-commissioning generation projects would be liable for their particular attributable amount, with these generators covering 100% of this cost. Security reduces as a project progresses to completion. No security is required for post-commissioning users.

The distinction made between pre- and post-commissioning projects is due to the differing impact of each type of generation on the system. The cancellation of a pre-commissioning power station could affect attributable and wider transmission system investment decisions; the closure of a post-commissioning generation project will only affect new wider transmission system investment decisions.

In the new arrangements, embedded generation will not carry a user commitment liability after commissioning, the pre-commissioning user commitment arrangements will apply to embedded generation projects with an impact on the transmission system.

Embedded generation projects with BEGAs have access to the transmission system. In this case, National Grid will pass the pre-commissioning wider liability to the generation project, and the attributable liability to the DNO.

For embedded generation without transmission access—i.e. Bilateral Embedded Licence Exemptible Large Power Station Agreement (BELLA) and Statement of Works (SOW) projects—both the wider liability and the attributable liability will be passed to the DNO. It is often the case that the DNO chooses to pass a liability on to the embedded generation project through their distribution connection agreement.

4.2.2 Purpose

NGET and the other transmission owners (TOs) undertake investment works to accommodate the needs of generators already connected and those expected to connect to the electricity transmission network. Sometimes a generator may decide to cancel its project or reduce its capacity after the commencement of the associated works. This may result in costs to other network users and ultimately the consumer.

User commitment security arrangements place obligations on generators triggering particular investment works to financially secure the investment being undertaken on their behalf. User commitment security also provides a financial stake to generators that incentivises the provision of accurate and timely information, and to ensure that the risk of stranded assets is placed on those parties best placed to mitigate and manage the risk.

4.2.3 Cover

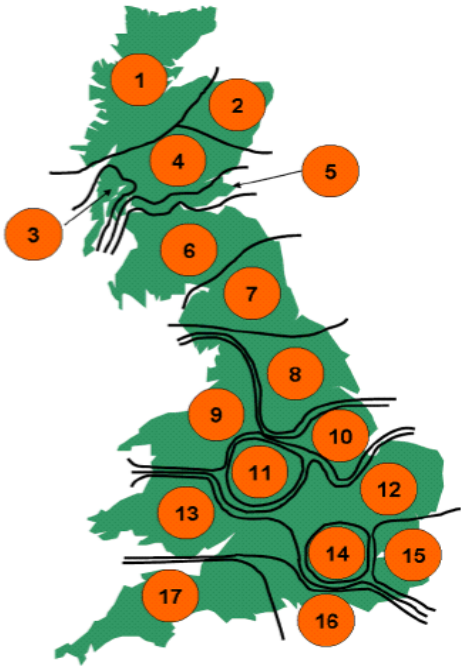
Security is intended to cover two charging elements: the wider charge; and the attributable charge. These are calculated in the following ways.

The wider liability is a zonal £/MW charge. The charges are to be published annually and are calculated from the apportionment of wider load-related and non-load-related capital expenditure across system boundaries and then mapped to generation zones. Each TO provides the load-related and non-load-related capital expenditure for the next four years to give the total wider VAR. The wider VAR is then reduced by two factors: the user risk factor (URF) of 50% (this factor accounts for the 50:50 share between generation and consumers), and the global asset reuse factor (GARF) 33%. This value is fixed and represents the transmission assets that a TO could potentially reuse on another project. Remaining VAR is then apportioned by boundaries and mapped to "generation zones", with each zone's cancellation tariffs set by reference to a table such as that represented in Figure 4.1 (for 2013-14):

Figure 4.1: CUSC generator wider liability generation zones

2013/14 Cancellation Charge Tariff Statement

Zone	Tariff (£/MW)
Z1	29,221.20
Z2	21,624.46
Z3	18,200.85
Z4	16,358.15
Z5	10,305.45
Z6	9,885.35
Z7	6,722.85
Z8	3,216.11
Z9	1,455.89
Z10	1,196.99
Z11	1,857.54
Z12	959.31
Z13	654.03
Z14	959.31
Z15	342.67
Z16	1,973.64
Z17	6,553.22



Source: NGET

For pre-commissioning generation, the wider liability begins four years before the contracted completion date, and builds up from 25% of the wider liability to 100% in the year immediately before commissioning. For post-commissioning generation, the wider liability profile is driven by notice given of closure. With over two years' notice, the liability will be 0% of the wider charge, but this increases to 75% with one year's notice, and 100% with five days' notice.

The attributable liability is calculated biannually and will be specific to the components that make up the attributable works. Components are considered to be substations, or lengths of cable, or overhead line between substations; but not the individual assets making up that component. Each TO provides for each component, the total capital expenditure estimate, and the current estimate of expenditure that the TO will incur during the next six-month security period to give the total VAR per component.

The attributable VAR for each component is then reduced by three factors:

- the strategic investment factor. That is, ensuring the generator is not liable for more than their proportion should the TO build a component with greater capability that removes the volatility of

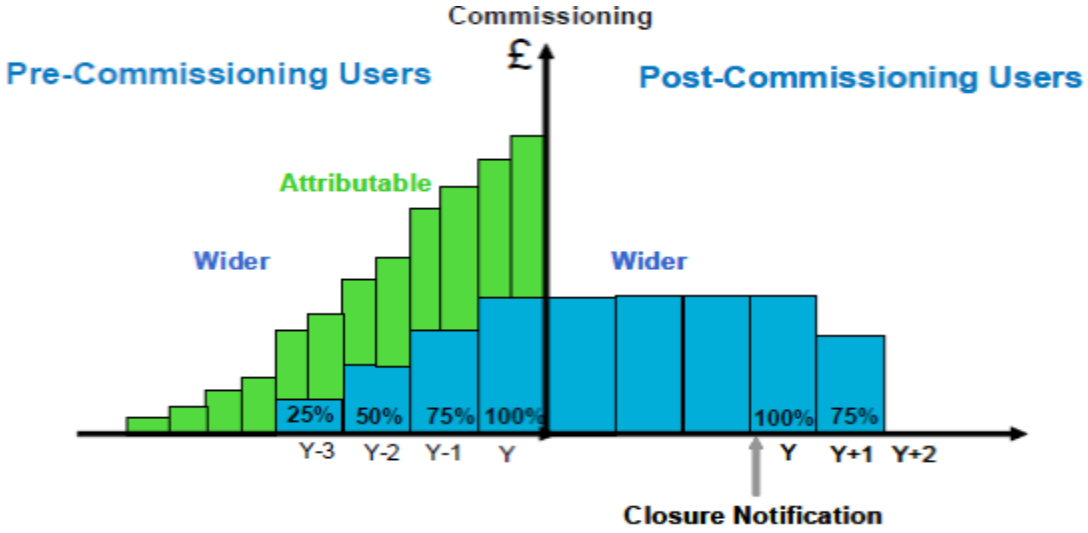
previous sharing arrangements, where actions of one generator could significantly impact the liability of another generator;

- the local asset reuse factor (LARF). This is an estimate of what percentage of the component could be re-used should the attributable generator cancel its project. The LARF is an approximation of asset reuse and does not vary through the construction programme; and
- the distance factor. Where the nearest suitable main integrated transmission system MITS is not the connection MITS, then the attributable works will be the pro-rata share of the transmission capacity to connect the generation project to the nearest suitable MITS on the transmission network.

The attributable liability begins when the TO commits cost to the attributable assets. This liability will be provided twice yearly, and will give an estimate of the next half-yearly security period and for the total attributable capital expenditure for each generation project.

Figure 4.2 illustrates the liability profile for a generation project pre- and post-commissioning:

Figure 4.2: Generator CUSC liability profile

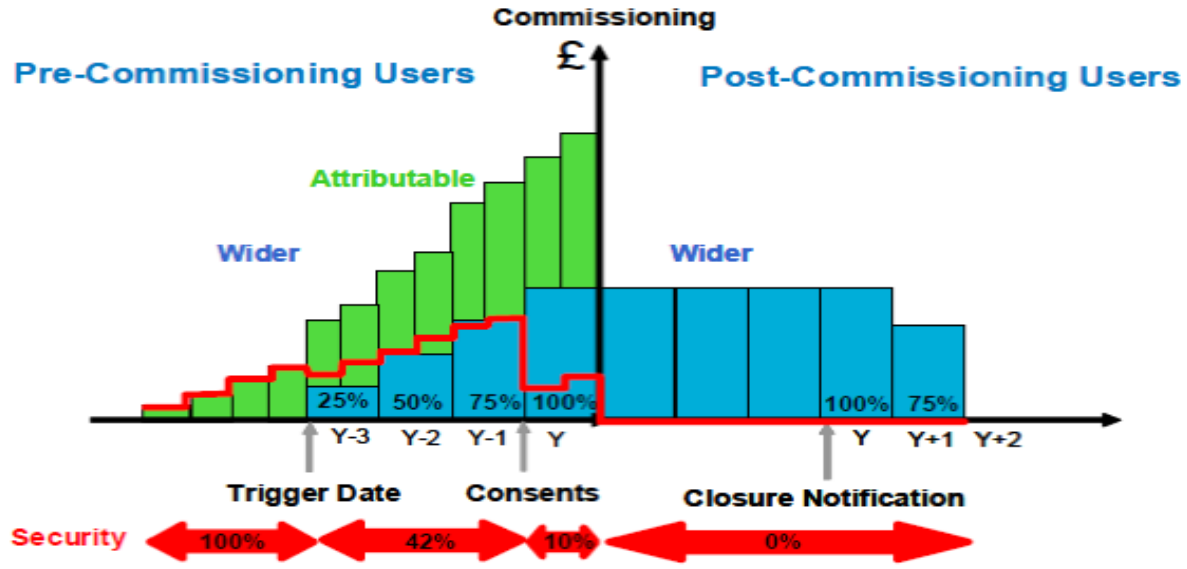


Source: NGET

The level of required security does not follow the same profile as the liability. Post-commissioning generators are not required to secure their wider liability. Pre-commissioning generators do secure a percentage of the liability, although this percentage reduces at trigger points as likelihood of completion increases.

At least four years ahead of the scheduled completion date, security is required for 100% of the annual liability (represented as the aggregate of green and blue blocks in Figure 4.2). At four years, this triggers a reduction in security to 42% of the annual amount. Once the project has achieved its key consents (planning consent with all conditions likely to be satisfied) the security amount reduces to 10% of the annual liability. Post-commissioning this reduces to 0%. This is represented in Figure 4.3.

Figure 4.3: CUSC generator security profile



Source: NGET

Each user that has a construction connection agreement is obliged to provide security in-line with the above profile, as notified to them from time to time in the cancellation charging statement.

4.2.4 Types

There will be no requirement to post security, if a user entering into a connection construction agreement has either:

- a credit rating for long term debt of A- and A3 as set by S&P or Moody's respectively;
- an indicative long term private credit rating of A- and A3 respectively as set by S&P or Moody's as the basis of issuing senior unsecured debt;
- a short term rating by S&P or Moody's that correlates to a long term rating of A- and A3 respectively; or
- where the user's licence issued under the *Electricity Act 1989* (as amended by the *Utilities Act 2000*) requires that user to maintain a credit rating, the credit rating defined in that user licence

Even though there is no requirement to post security, the user is obliged to notify at periodic intervals each year that it retains the required rating and to notify NGET if it is placed on negative credit rating watch.

If a user entering a construction agreement does not have the required credit rating, or breaches the rules relating to notification of their required credit rating, then it must provide the following types of security:

- a performance bond or letter of credit from a qualified bank to be valid for at least the applicable security period and to be renewed periodically where applicable;
- a cash deposit in a bank account, which can be increased or reduced periodically where applicable, and
- a performance bond from a qualified company to be valid for at least that security period and to be renewed periodically where applicable.

The performance bond is on demand irrevocable performance bond or performance guarantee executed as a deed allowing for partial drawings. The letter of credit means an irrevocable standby letter of credit

providing payment on demand. A "qualified bank" means a City of London branch of a bank, which has a rating of at least A- in S&P's long-term debt rating or A3 in Moody's long-term debt rating.

A qualified company is a company which is either a shareholder of the user or any holding company of such shareholder (or a subsidiary, subject to restrictions) which has a rating of at least A- in S&P's long-term debt rating or A3 in Moody's long-term debt rating or such lesser rating that NGET may allow at its discretion.

There are provisions dealing with reductions in the credit quality of issuers of security. If the user becomes aware that the bank issuing the performance bond or letter of credit ceases to be a qualified bank, or that the company giving the performance bond ceases to be a qualified company, the user shall so notify NGET in writing as soon as it becomes so aware. If NGET becomes aware that the bank issuing the performance bond or letter of credit ceases to be a qualified bank, or that the company giving the performance bond ceases to be a qualified company, it may notify the user to that effect in writing.

The user shall within 21 days of notice provide a replacement performance bond and/or letter of credit from a qualified bank or qualified company, and/or provide a cash deposit in the required amount in a bank account. The user may provide different securities at any one time, each securing a different amount, provided that the aggregate amount secured shall be not less than the required cancellation charge secured amount for that security period.

4.2.5 Calls

Should a connection agreement be terminated, NGET will invoice for the liability associated with a cancellation charge. Should the generation project fail to pay the invoiced cancellation charge, NGET would draw down on the secured amount and seek to recover any remainder through other channels.

4.3 Other protections

There are no other protections.

4.4 Impacts

4.4.1 Beneficiary

These are a mix of liquid items of collateral, with strongly-rated standby letters of credit, performance guarantees being highly liquid, and enforceable. Letters of credit cash have an obvious face value so have a transparent capability to cover different levels of loss. By limiting the issuers of letters of credit and performance guarantees to publicly-rated financial institutions of a minimum rating, NGET can have confidence in the assessment of the financial strength of the institution legally bound under the instrument. Similarly, there are ratings requirements supporting the issuers of PCGs.

Assurance is further acquired from provisions dealing with a reduction in the credit quality of the issuing institution for the current letter of credit, performance bonds and PCGs. If at any time the issuers do not have the required credit rating, the user must replace with a qualifying alternative instrument necessary to maintain the required level of security cover.

PCGs are less enforceable than cash, letters of credit and bank-issued performance guarantees, and not so obviously liquid. Even with the protections of requiring a minimum credit rating they still require the company to pay up, and may involve court action to enforce, as opposed to being payable on demand at a bank. It is possible to make a demand but be part of a queue of creditors seeking payment from a defaulting company.

4.4.2 Issuer

Companies with strong approved credit ratings can enjoy not having to post collateral under the CUSC for generator user commitment.

Others are able to secure their obligations through letters of credit, cash or PCGs. Letters of credit and cash are the most expensive forms of collateral. Cash posted as security is cash that could otherwise be used for productive purposes.

Both types of facilities will be priced taking into account the risk of the company raising the finance, and any associated costs to the bank of funding their commitment under the facility. Letters of credit are cheaper to obtain as they are unfunded instruments, while they attract a fee versus their face value, this is not on top of an underlying interest rate. Cash borrowing facilities typically attract a margin (based on company risk as per a letter of credit) over an underlying interest rate and are therefore more expensive than letters of credit.

Issuing PCGs can create issues for group parent companies. For example, the build-up of PCGs as contingent liabilities is likely to have an impact on their own public credit ratings. However, relative to posting cash or letters of credit, the impact is far less .

A significant issue for generators is the timing of issuing the security. Independent developers without strong parent companies will find it challenging to raise letters of credit from banks unless they are able to provide counter-security to the issuing bank. They will be unable to offer adequate counter-security through the project company because there are no cash flows or material assets associated with the prospective generating project at the time they are initially required to post security. The challenge clearly diminishes over time, as prospective commissioning gets closer and particularly when consents have been secured. However, it should be noted that banks typically will only give credence to projected revenue generation at a point in time when all significant contracts relating to the design, build, operation and route to market of the generating project have been signed. This could be sometime after consents have been secured.

4.5 Costs

4.5.1 System collateral review 2011-13

Table 4.2 shows the levels of total credit posted under the CUSC Generator user commitment for 2011-13, as a snapshot taken in March of each year, and segmentation of collateral under the CUSC for generator user commitment. This is represented graphically in Figure 4.4.

Table 4.2: CUSC generator user commitment annual collateral segmentation, 2011-13[6]

Year	Letter of credit (£mn)	Cash (£mn)	PCG (£mn)	Total (£mn)	Unsecured (£mn)
2011	95	22	300	417	75
2012	136	18	314	468	104
2013	150	17	244	411	14

[6] The variations will be driven by the scale of new build generation, subject to the CUSC Generator user commitment rules, in each year between 2011-13, taking into account the changes to demanded collateral amounts against the prescribed milestones and the location of the new build.

These figures on face value appear moderately high relative to other schemes that require collateralisation. However, this is because they include the value of PCGs posted by participants.

Figure 4.4: CUSC collateral segmentation, 2011-13 (£mn)

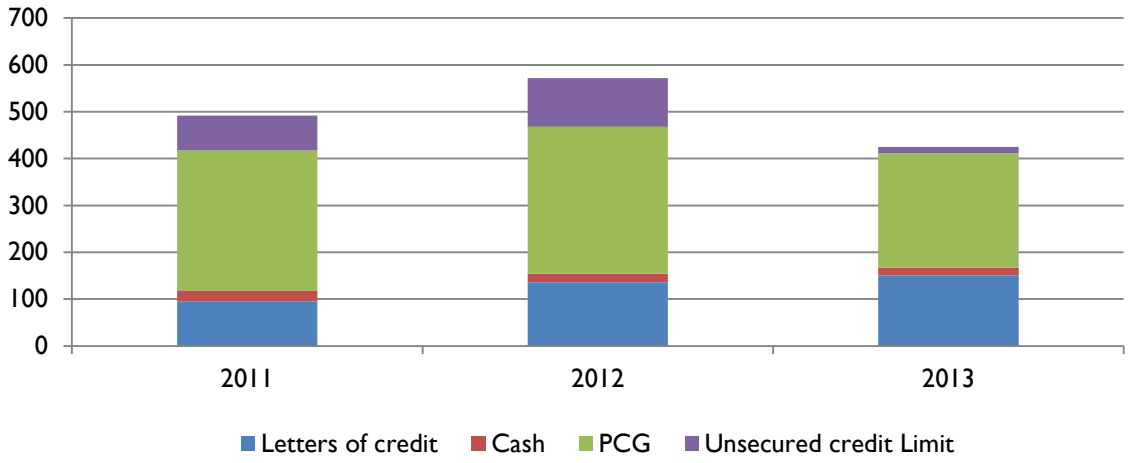


Figure 4.4 illustrates the significant use of PCGs and unsecured allocations to collateralise CUSC generator user commitment liabilities. These two items accounted for on average 70% of the required security over the three-year period, with the vast majority (58%) being security in the form of PCGs exemplifying the role well credit-rated companies (such as vertically integrated utilities) play in developing new generation plant in the GB energy markets. The lower but still material element made up by letters of credit and cash (30% on average) signifies a very meaningful contribution being made to new-build generation by independent developers, with the majority being posted as letters of credit (26%).

Figure 4.5 provides a more detailed breakdown. Actual values are shown at Table 4.3. There is a strong correlation between the volume (numbers of instruments) and value of collateral in most cases, the exceptions being cash and unsecured credit. For cash, there are a relatively high number of low-value cash postings to secure the generator user commitment. For unsecured credit, the opposite phenomenon is occurring, with a relatively low number of high-value allocations of unsecured credit.

Figure 4.5: CUSC generator user commitment annual collateral segmentation volume vs value, 2011-13

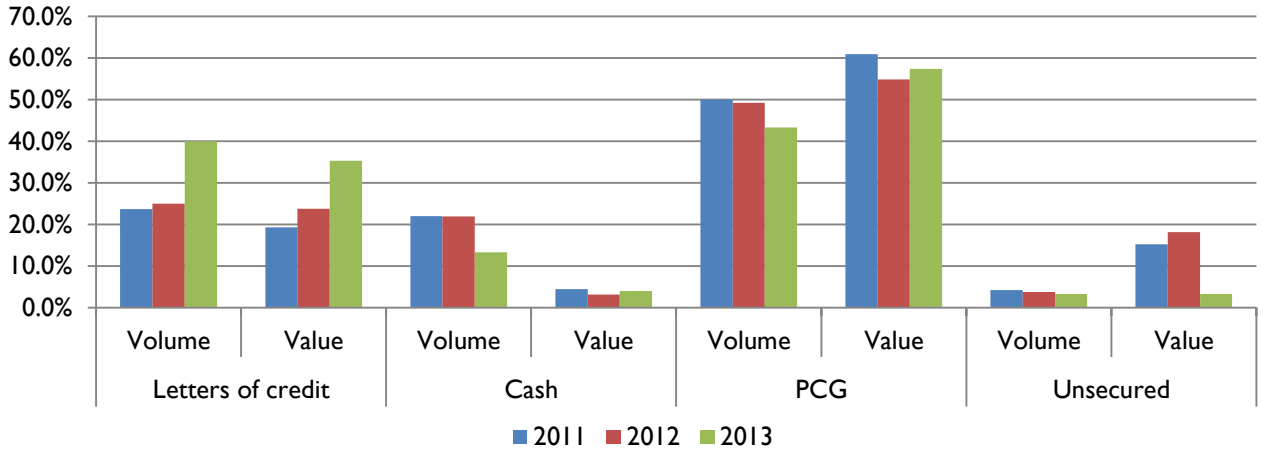


Table 4.3: CUSC generator user commitment annual collateral segmentation volume vs value 2011-13

	Letter of credit (%)		Cash (%)		PCG (%)		Unsecured (%)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
2011	23.7	19.3	22.0	4.5	50.0	61.0	4.2	15.2
2012	25.0	23.8	22.0	3.1	49.2	54.9	3.8	18.2
2013	40.0	35.3	13.3	4.0	43.3	57.4	3.3	3.3

4.5.2 Estimated system collateral costs 2011-13

It is important to note that we do not include a cost for posting PCGs.

Table 4.4 shows the segmentation of CUSC generator user commitment collateral costs, as well as the total collateral cost.

Table 4.4: CUSC generator user commitment estimated collateral cost 2011-13

Year	Letter of credit (£mn)	Cash (£mn)	Total (£mn)
2011	2.38	1.48	3.86
2012	3.40	1.21	4.61
2013	3.75	1.15	4.90

4.5.3 Benchmark map 2011-13

It is assumed that the generators represented by our core benchmarks are not new build. In Volume 1, Chapter 4, benchmark map profiles, analysis is undertaken of circumstances in which generator benchmarks are in the pre-commissioning phase.

5 Distribution Connection and Use of System Agreement (DCUSA)

5.1 Summary

Table 5.1: Key DCUSA credit parameters

Who is impacted?	Electricity suppliers and embedded generators	
Purpose	Security for payments of charges under DCUSA relating to distribution network use	
Average annual credit amounts	2011—£413mn 2012—£435mn 2013—£459mn	Annualised amount £435.7mn
Type of collateral accepted	Letter of credit or equivalent bank guarantee (available for an initial period of not less than six months), escrow account deposit; cash deposit; qualifying guarantee or other as agreed	
Split between instruments	2011—£179.5mn letter of credit, £47.7mn cash, £185.9mn PCG 2012—£189mn letter of credit, £50.2mn cash, £195.7mn PCG 2013—£199.4mn letter of credit, £53mn cash, £206.5mn PCG	
Period/ level of cover required	Total value at risk plus 15 days	
Unsecured credit criteria	An independent credit assessment score or credit rating allows for up to 2% of a DNO's RAV to be awarded as unsecured credit (the maximum unsecured credit limits). Good payment history can allow the participant to access lower levels of unsecured credit (capped at 2% of the maximum unsecured credit limit)	
Other protections	None	
Trigger for call	Payment default	
Total scheme cost	2011—£7.71mn 2012—£8.11mn 2013—£8.37mn	

The headline points from this section are:

- DCUSA collateral demands fall primarily on suppliers;
- the DCUSA allows for lesser-rated or non-publicly-rated participants to avoid the requirement to post high-quality collateral (letters of credit or cash) through good payment history, an independent rating;
- users can also post PCGs as security. These are not cost free, but do not attract direct and tangible financing costs like a letter of credit or cash;
- the greatest burden of collateral is likely to fall on bad-payers or on new entrants if they are relatively financially weak or cannot source a well-rated PCG; and

- the calculation of an unsecured limit as a percentage of each respective DNO's RAV. This affords access to a reasonably large degree of unsecured lines to parties under the DCUSA relative to the charges they incur under the terms of the code.

5.2 Credit and collateral rules

5.2.1 Background

DCUSA was established in October 2006 as a multi-party contract between the licensed electricity distributors, suppliers and generators of GB. It is concerned with the use of the electricity distribution systems to transport electricity to or from connections to them. DCUSA replaced numerous bilateral contracts, giving a common and consistent approach to the relationships between these parties in the electricity industry. It is a requirement that all licensed electricity distributors and suppliers become parties to DCUSA. DCUSA administers the governance of DCUSA. The governance and day-to-day operations are managed by a panel, which is made up of individuals elected from within the industry, which acts through a secretariat. To assist in their work they may establish working groups from within the industry.

Under DCUSA, charges are payable by generators and suppliers to DNOs for connection and use of the electricity distribution networks. These are charges that must be levied in accordance with the terms of condition 14 of a DNO's distribution licence, and relate to the performance of a range of obligated services set out in the distribution licences. These include meter point administration; metering equipment provision; data services; and any flows to compensate for any additional costs a DNO has incurred as a result of complying with a direction from Gas and Electricity Markets Authority (GEMA) direction to supply electricity to premises in accordance with a last resort supply direction. Charges may also relate to ancillary services provided by DNOs to users, which result in costs under the BSC or CUSC, and any administrative costs relating to DCUSA.

There are common charging methodologies are set out in the DCUSA document. Ofgem does not approve the level of charge, but does approve the methodology used to calculate them.

5.2.2 Purpose

The purpose of collateral is to provide security for the payment of charges under the DCUSA, and ensure DNOs have adequate resources and working capital to perform their licence obligations even if users default in payment of charges.

5.2.3 Cover

Users of distribution services are the subject of a credit limit, this is the sum of the credit allowance (effectively an unsecured credit limit) plus any additional security posted. A user will need to have regard to their VAR. This is the value of billed but unpaid charges plus 15 days of estimated value of charges based on their average daily charges during the previous month, less any prepayments. Users will always be incentivised to ensure that their credit limit exceeds their VAR by a given amount due to the arrangements described below. To establish the balance between the unsecured credit allowance and posted security, users are subject to a calculation methodology for unsecured credit based on the following formula:

$$\text{Credit allowance} = \text{RAV} \times 2\% \times \text{Credit Allowance Factor (CAF)}$$

This determines the unsecured credit allowance of a user as a proportion of 2% of the RAV of the specific DNO, using a CAF based on the user's financial strength. Where the user has a credit rating from Moody's Investors Service or S&P that is Ba3/BB– or above, CAF will determined according to the table set out in Table 5.2.

Table 5.2: DCUSA credit allowance factor ratings matrix

Moody's	Standard and Poor's	Unsecured credit limit (%)
Aaa to Aa2	AAA to AA	100
Aa3 to A3	AA- to A-	40
Baa1	BBB+	20
Baa2	BBB	19
Baa3	BBB-	18
Ba1	BB+	17
Ba2	BB	16
Ba3	BB-	15

Where the user does not have a credit rating as per above; and where an independent credit assessment has not been carried out within the preceding 12 months; and where the user has not requested that the DNO uses the payment record history; then CAF shall be determined by reference to the independent credit assessment as per the matrix in Table 5.2 and the CAF matrix in Table 5.3.

Table 5.3: DCUSA independent credit ratings matrix

Credit assessment score	Check It (ICC) credit score report	Dun and Bradstreet comprehensive report	Equifax	Experian bronze, silver or gold report	Graydons level 1, 2 or 3 report
10	95-100	5A1	A+	95-100	1A
9	90-94	5A2/4A1	A/A-	90-94	1B/2A
8	80-89	5A3/4A2/3A1	B+	80-89	1C/2B/3A
7	70-79	4A3/3A2/2A1	B/B-	70-79	2C/3B/4A
6	60-69	3A3/2A2/1A1	C+	60-69	3C/4B/5A
5	50-59	2A3/1A2/A1	C/C-	50-59	4C/5B/6A
4	40-49	1A3/A2/B1	D+	40-49	5C/6B/7A
3	30-39	A3/B2/C1	D/D-	30-39	6C/7B/8A
2	20-29	B3/C2/D1	E+	20-29	8B
1	10-19	C3/D2/E1	E/E-	10-19	8C
0	Below 10	Below E1	Below E-	Below 10	Below 8C

The credit assessment score is then mapped against the matrix in Table 5.4 to establish the CAF.

Table 5.4: DCUSA independent credit assessment CAF matrix

Credit assessment score	CAF (%)
10	20
9	19
8	18
7	17
6	16.66
5	15
4	13.33
3	10
2	7
1	3.33
0	0

Users can also build up a lower level of unsecured allowances through good payment history. Where the user's payment record factor is to be used to determine the CAF, the allowance will be built up by multiplying the number of months since the start of good payments by 0.033% (deriving an allocation of 0.4% per annum) of a maximum value of 2% of the maximum unsecured credit limit (the maximum secured credit limit is 2% of the relevant DNO's RAV). This means 2% of the maximum secured credit limit could be achieved after five years of good payment history. If the user misses a payment the unsecured allowance is reset to zero.

It should be noted that if VAR exceeds 85% of the credit allowance then additional security will be required, or the user will be in default.

5.2.4 Types

The collateral instruments allowable under DCUSA are:

- a letter of credit or equivalent bank guarantee (available for an initial period of not less than six months);
- an escrow account deposit;
- a cash deposit;
- a qualifying guarantee; or
- any other form of collateral as agreed between the company and the user from time-to-time, including but not limited to performance bonds, bilateral insurance, and independent security.

A DNO may rate the effectiveness of such collateral as being between 0% and 100%. Where the effectiveness of such collateral is rated as less than 100%, its contribution to the aggregate level of cover provided will be reduced accordingly.

A letter of credit has to be an unconditional irrevocable standby letter of credit approved by the DNO, allowing for partial drawings and providing for the payment on demand by any bank which has a long-term debt rating of not less than single A by S&P or by Moody's Investors Service.

An escrow account deposit is a deposit into a separately-designated bank account in the name of the user, at any bank in the UK as the DNO shall specify on terms to be approved by the DNO, and which provides that the funds held in the escrow account may be released by the bank to the DNO when collateral is capable of being called.

A "cash deposit" means a deposit of funds by or on behalf of the user into a bank account in the name of the DNO.

A qualifying guarantee is a guarantee in favour of the DNO that is legally enforceable in the UK and in such form as may be agreed between the company and the user and which may specify a maximum value. Where a qualifying guarantee is provided, the maximum unsecured credit allowance assigned to the user shall be calculated by substituting the issuer for the user in all such calculations. Where the company issuing a qualifying guarantee for the user also issues guarantees for other users of the DNO's distribution system, the aggregate of all issued qualifying guarantees shall not exceed the maximum unsecured credit allowance determined for the issuing company.

5.2.5 Calls

Collateral may be called if after 17:30 on any payment date the DNO has been notified by the user (or otherwise has reason to believe) that the user has not remitted to it all or any part of any amount that was due to be paid (other than any disputed amounts).

Subject to a right of set off against any amounts owing to the user by the DNO, the amount of funds then standing to the credit of the escrow account or the amount of any cash deposit (excluding any interest accrued to the user) shall be released to DNO to apply against the amounts unpaid by the user. To the extent there is insufficient cash standing to an escrow account or cash deposit, the DNO may demand payment under any letter of credit.

The DNO may also demand payment under any outstanding qualifying guarantee. The DNO may then demand payment under any other form of collateral provided in a manner that the DNO and the user have previously agreed as appropriate in relation to that particular form of collateral; or, in the absence of such agreement, in a manner which the DNO (acting reasonably) considers appropriate.

5.3 Other protections

There are no further credit or collateral protections available to DNOs.

5.4 Impacts

5.4.1 Beneficiary

These are a mix of liquid items of collateral, with strongly-rated standby letters of credit and cash being highly liquid, and enforceable. Letters of credit and cash have an obvious face value, so have a transparent capability to cover different levels of loss. By limiting the issuers of letters of credit to publicly-rated financial institutions, it is possible for DNOs to have confidence in the financial capability of the institution legally bound to pay under the instrument.

Assurance is further acquired from provisions dealing with a reduction in the credit quality of the issuing institution for the current letter of credit, or qualifying PCG. If at any time the issuers do not have the required credit rating, the user must replace with a qualifying alternative necessary to maintain the required level of security cover.

PCGs are less enforceable and not so obviously liquid, and require the company to pay up. This may involve court action to enforce as oppose to being payable on demand at a bank. Under such instruments it is possible to make a demand but be part of a queue of creditors seeking payment from a defaulting company.

The flexibility to enjoy and build up a proportion of unsecured credit based on payment history means DNOs are content to accept increasing proportions of unsecured positions amongst long-standing, performing users. If the financial or trading circumstances of these users changed suddenly, then DNOs might be left with no ability to recover a portion of unpaid liabilities as a result of permitting unsecured positions to accrue and increase. However, the counter-balancing incentive is for users to focus on maintaining good payment performance to avoid being hit with an immediate collateral demand, and in any event this exposure is capped at 2% of the maximum unsecured credit limit (which is defined as 2% of the relevant DNO's RAV).

5.4.2 Issuer

Given the combination of the DNOs RAV and the 2% derived level of unsecured credit allowance under the CUSC; the likely liabilities of users under DCUSA; and the ability to gradually build unsecured credit allowances, then the burden of collateral on users under DCUSA is low. The costs of posting collateral are therefore assumed to be negligible at a framework level, and this is borne out by the benchmark mapping. The exceptions to this are:

- new entrant users who are unrated and are not owned by investment grade companies: they cannot avoid cash or letters of credit by virtue of payment history performance or PCGs;
- recent entrants yet to establish a meaningful unsecured credit limit as a proportion of their overall CUSC liability, even if they have displayed good payment performance; and
- recent entrants who do not make payments promptly.

Such entities could be exposed to posting cash as security that could otherwise be used for productive purposes.

5.5 Costs

5.5.1 System collateral review 2011-13

It has proven challenging to acquire collateral figures for the 14 DNOs who collect security under the rules of DCUSA. To provide a consistent and useful illustration of levels of collateral posted under this framework, we have used the annual use of system charges reported by the 14 DNOs on the DCUSA website for 2012-13 and 2013-14 as a starting point for a logical estimation of aggregate DCUSA collateralisation. These are outlined in Table 5.5.

Table 5.5: Reported use of system revenues (DCUSA)

DNO	2012-13 (£mn)	2013-14 (£mn)
ENWL	448.4	499.4
Northern Power Grid (Yorkshire)	275.3	302.5
Northern Power Grid (North East)	348.3	383.9
SP Distribution	365.7	362.9
SP Manweb	341.6	382.9
Southern Electric Power Distribution	560.1	559.1
Scottish Hydro Electric Power	251.7	259.1
Eastern Power Networks	516.3	511.8
London Power Networks	410.7	455.8
South Eastern Power Networks	337.1	382.2
Western Power distribution (East Midlands)	433.5	400.1
Western Power Distribution (South West)	238.5	267.6
Western Power Distribution (South Wales)	312.9	344.4
Western Power Distribution (South Wales)	424.9	445.0
Total	**5265.1**	**5556.6**

To derive collateral estimates we have applied the following assumptions:

- knowledge of the credit rules to derive estimated total VAR;
- an estimate of the proportion of unsecured credit allowances based on average levels of unsecured credit allowances under schemes where users can enjoy unsecured allocations (CUSC, UNC transmission and distribution). This is 33%;
- an estimate of the proportion of security allocated to PCGs based on average levels of PCG posting under other similar frameworks (CUSC, UNC transmission and distribution). This is 45%;
- an estimate of the segmentation of secured limits between cash and letters of credit based on the average segmentation across similar schemes (CUSC, UNC transmission and distribution). The ratio of letters of credit to cash based on this averaging is 79:21; and
- we use the same growth seen between 2012 and 2013 to derive a 2011 base figure.

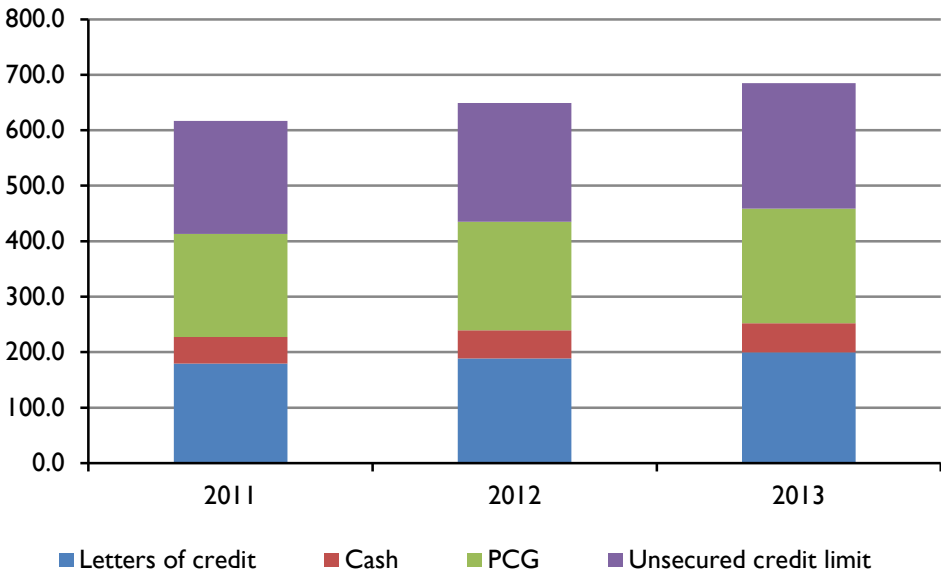
Table 5.6 shows the levels of total credit posted under the DCUSA based on this approach for 2011-13, and provides a segmentation of collateral. This is further represented graphically in Figure 5.1.

These figures on face value appear moderately high relative to other schemes that require collateralisation. However, this is because they include the value of PCGs posted by participants.

Table 5.6: DCUSA estimate collateral segmentation, 2011-13

Year	Letter of credit (£mn)	Cash (£mn)	PCG (£mn)	Total (£mn)	Unsecured (£mn)
2011	179.5	47.7	185.9	413	203.5
2012	189.0	50.2	195.7	435	214.2
2013	199.4	53.0	206.5	459	226.1

Figure 5.1: Estimated DCUSA estimate collateral segmentation, 2011-13 (£)



5.5.2 Estimated system collateral costs 2011-13

It is important to note that we do not include a cost for posting PCGs. They do not attract a direct financing charge, but equally they are not cost free. Issuing PCGs will have impacts on the credit assessment of the issuing company when undertaken by a rating agency or financial institutions. The total PCG values are captured in the aggregate figures for amounts of collateral posted, but capturing the implied costs of issuing PCGs is beyond the scope of this report. The cost figures therefore focus on the costs of estimated levels of letters of credit and cash only. The net result is a moderately large overall collateral amount total, relative to a smaller estimate of cost.

Table 5.7 shows the estimated segmentation of DCUSA collateral costs, as well as the total collateral cost.

Table 5.7: DCUSA estimated collateral cost, 2011-13

Year	Letter of credit (£mn)	Cash (£mn)	Total (£mn)
2011	4.49	3.22	7.71
2012	4.72	3.39	8.11
2013	4.99	3.39	8.37

5.5.3 Benchmark map 2011-13

As the DCUSA unsecured credit allowance is established as a proportion of 2% of each DNO's RAV then, for all of our electricity benchmarks, their unsecured credit allowance exceeds their modelled VAR by virtue of their independent credit assessment score or credit rating. In Section 3 of the benchmark map, analysis is undertaken of circumstances in which supplier benchmarks would not be in a position to receive unsecured credit allowances.

6 Uniform Network Code (UNC)—balancing

6.1 Summary

Table 6.1: Key UNC balancing credit parameters

Who is impacted?	Gas suppliers and gas shippers	
Purpose	To cover the risk of payment default on UNC energy balancing charges	
Average annual credit amounts	2011—£300.62mn 2012—£357.76mn 2013—£376.85mn	Annualised average £345.1mn
Type of collateral accepted	Highly rated letter of credit (supported by smearing/mutualisation) or cash, accompanied by a deposit deed	
Split between instruments	2011—£261.4mn letter of credit; £39.2mn cash 2012—£311.1mn letter of credit; £46.7mn cash 2013—£327.7mn letter of credit; £49.2mn cash	
Period/ level of cover required	One month	
Unsecured credit criteria	None	
Other protections	After two months outstanding balances will be recovered through the smearing process. Money received as a result of directed recovery steps will be shared back to users on a prorate basis	
Trigger for call	Payment default	
Total scheme cost	2011—£9.1mn 2012—£10.9mn 2013—£11.5mn	

The headline points from this section are:

- the energy balancing rules interact with the UNC to demand high-quality collateral from trading parties, with in-built protections against declining credit quality of the providers of such collateral and risks associated with collateral expiry;
- the rules limit the exposure of the framework to letters of credit issued by different banks, on behalf of users, by reference to the bank's credit rating; with only highly-rated banks being capable of providing letters of credit as security cover; and
- standing collateral is supported by a mutualisation arrangement for the sharing (and eventual recovery) of any unsecured losses.

6.2 Credit and collateral rules

6.2.1 Background

The UNC is the legal and contractual framework for the supply and transport of gas. It has a common set of rules that governs balancing of the gas system, network planning, and the allocation of network capacity.

The introduction of the UNC came about following the sale of National Grid's four grid distribution network (GDN) businesses. Each new GDN owner, along with National Grid Gas (NGG), is still required to produce its own network code. However, to prevent inappropriate fragmentation, the substantive provisions of these codes are incorporated by reference to a common document known as the UNC.

In the gas market, the primary obligation to balance daily is on shippers. NGG is responsible for moving gas around the national transmission system (NTS). The shippers notify their intended inputs and off-takes through contract nomination, and can then trade during and after the day. NGG, as system operator (SO), retains a residual balancing obligation. Balancing occurs at a single notional point: the National Balancing Point (NBP). Shippers are then charged according to their energy imbalances and these cover differences between nominations and inputs/outputs. Shippers are subject to system marginal buy and sell prices for imbalance. The billing period for users is a calendar month.

Shippers must post credit with the NTS to cover their outstanding energy balancing indebtedness, in accordance with the *Energy Balancing Credit Rules*. The indebtedness covers amount of invoiced but unpaid, charges and cumulative un-invoiced indebtedness or accruals as at the date of invoice (23 days after month end).

The *Energy Balancing Credit Rules* are the rules established by National Grid NTS dated 1 March 1996. They provide for the specified forms and the basis on which a user may secure their indebtedness in respect of energy balancing charges. They do not officially form part of the UNC, but are cross-referred to copiously in Section X of the *UNC Transportation Principal Document*.

6.2.2 Purpose

The primary purpose of collateral posted under the UNC is to cover the risk of unsecured loss in relation to user's financial exposure as a result of their gas energy balancing positions, and to ensure the costs of balancing are adequately covered.

6.2.3 Cover

Under the *Energy Balancing Credit Rules*, users are required to collateralise up to the level defined by the secured credit limit. This represents the value of the security provided by a user that, in the event of a default, may be realised to meet its outstanding energy balancing indebtedness.

Setting the secured credit limit depends on whether you are a new or existing user. A new user's secured credit limit is equal to a sum derived from three days' non-deliverability at the 12 month average SAP. This must be 85% of the secured credit limit (based upon an estimate of projected annual imbalance throughput). For existing users, 75% of peak indebtedness over the last 12 months must be 85% of the secured credit limit, noting that where the existing secured credit limit is reduced by 50% then NGG will either calculate as per the new user; or retain the existing level. The application of existing user calculations is discretionary and based on past levels of secured credit limits.

A user's secured credit limit will be reviewed at least every 12 months. However, a review may be initiated at any other time if it is deemed there are reasonable grounds to do so. In the event of a change in value of the user's secured credit limit any security lodged would be changed accordingly. In the case that any lodged security is due to expire and requires renewal, it will have a deemed value of zero one month prior to the actual expiry date. Users are incentivised to ensure they maintain the right secured credit limit to avoid cash calls.

6.2.4 Types

Security up to the secured credit limit may be in the form of a letter of credit or cash, accompanied by a non-registrable deposit deed. However, the extent to which a user is able to collateralise its secured credit limit through a letter of credit will depend heavily on the credit rating of the issuing bank and the extent of utilisation of its UNC aggregate credit limit. The letter of credit must be an irrevocable standby letter of credit in a form substantially set out in the rules, issued by a UK branch of a financial institution with a long-term credit rating of not less than A3 provided by Moody's Investors Services or equivalent rating by S&P. Where ratings conflict, the lower of the ratings will be used. It must be in favour of NGG.

It is possible for single letters of credit to be issued on behalf of multiple users, to cover scenarios where individual companies from the same company group may wish to reduce administration costs of securing individual letters of credit and instead consolidate their security provision. However, whilst it is acknowledged that the value of the multiple letters of credit can count as security towards each individual user's secured credit limit, this does not diminish the level of security to be provided by each individual user.

If NGG makes a demand on a multiple letter of credit as a result of a single user's default, and the sum demanded is greater than their secured credit limit, then NGG can reduce the secured credit limit of the other users covered by the multiple letter of credit as it sees fit. This serves to ensure that other users subject to the multiple letter of credit are either exposed to cash calls, or must adjust their behaviour to reduce exposure to balancing charges.

There is nothing in the rules to prevent the presentation of several letters of credit on behalf of the same user, so long as these do not entail breach the aggregate limits set out for financial institutions in the ratings matrix. This sets total credit exposure that may be allocated to an individual financial institution, across all users, under the UNC and is set out in Table 6.2.

Table 6.2: UNC balancing financial institution exposure limits

Ratings comparison		Aggregate limit (maximum exposure acceptable for an individual financial institution) (£)	Rating action
Moody's	S&P		
Aaa Aa1 Aa2 Aa3	AAA AA+ AA AA-	62,000,000	Rating is acceptable provided that the maximum aggregate limit is not exceeded.
A1 A2 A3	A+ A A-	25,605,000	Rating is acceptable provided that the maximum aggregate limit is not exceeded.
Baa Baa1 Baa2 Baa3	BBB+ BBB BBB-	Zero	Rating is not acceptable. In the event of a downgrade below Moody's A3 or equivalent, user(s) will be notified to provide alternative security within 30 days. If alternate security is not provided within 30 days, the user(s) secured credit limit will be set to zero and indebtedness will be managed via the cash call process.
Ba1 Ba2 Ba3 or below	BB+ BB BB- or below	Zero	Rating is not acceptable. In the event of a downgrade below Moody's Baa3 or equivalent, the user(s) will be notified to provide alternative security and the user(s) secured credit limit will be set to zero with immediate effect. Indebtedness will be managed via the cash call process.

The financial institutions are monitored daily. As can be seen, only highly-rated financial institutions are recognised as being able to issue letters of credit.

In addition, this matrix sets out the actions that will be taken in instances of a ratings downgrade of financial institutions providing security.[7] Notwithstanding the face value rating, the letter of credit will have a deemed value of zero for the purposes of security one month prior to maturity in order to incentivise prompt renewal.

Users can also post cash as security in a non-registrable deposit deed. This is a deed containing terms (i.e. protection from default) relating to the depositing of cash that can be for an amount that is either part or all of the agreed secured credit limit. The non-registrable deposit deed must be in the form set out in the rules, issued in favour of NGG, and the cash is then held in the form of the non-registrable deposit deed, held in a separate designated account.

In the event that a renewal of security is required, the user will be notified in writing before the expiry date, to put in place revised security 30 days prior to the existing security's expiry. Where a user fails to

[7] The referenced 30-day periods are subject to extension to 60 days if users request it within seven days of notice, or they have already replaced security once in the preceding six months as a result of a ratings downgrade, and to 90 days if twice.

put in place revised security, there is a requirement to provide cash payment of an adequate sum to replace the expiring security.

Regardless of whether a user has fully collateralised their secured credit limit, there will be a further level of security demanded if their level of indebtedness exceeds a percentage threshold of the secured credit limit. This is known as the cash call limit and is currently defined as 85% of the secured credit limit.

At this threshold, the user is issued with a cash call notice requiring payment of a prescribed amount of cash to NGG to reduce the level of indebtedness to 90% of the cash call limit. Payment must be received by the following business day unless an appeal is lodged. Payment of any energy balancing charges may be withheld until the user's outstanding energy balancing indebtedness falls below 85%, with no late payment interest. Payment received as a result of a cash call is held in a separate cash call account; and those monies may be repaid upon a user's request where indebtedness falls below 90%.

This cash call approach—to return to a level with headroom against the cash call limit—aims to prevent a user receiving a series of subsequent small cash calls in conjunction with the further security request process.

The further security request process arises if a user is issued with more than one cash call in a 28-day period. This will be additional security up to a value calculated by dividing the peak indebtedness over the 28-day period by 85% and subtracting current indebtedness.

6.2.5 Calls

Security can be realised in instances of payment default where a user does not pay an invoice in full on the due date. In that case, NGG is entitled to serve a notice of termination if the user does not pay the outstanding amount in full. The security may be then realised against the monies due.

6.3 Other protections

Any outstanding balance of the debt still remaining after two months will be recovered from other relevant users (on a pro rata basis) as part of the neutrality mechanism operated within the gas market (known as "smearing"). Money received as a result of "directed recovery steps" (which is, effectively, receivership) will then be shared back to users pro-rata based on their position at the time the default occurred.

6.4 Impacts

6.4.1 Beneficiary

These are high liquid items of collateral.

Letters of credit and cash have an obvious face value so have a transparent capability to cover different levels of losses. By limiting the issuers of letters of credit to publicly-rated financial institutions, it is possible for NGG to have confidence in the assessment of the financial strength of the institution legally bound under the instrument.

6.4.2 Issuer

Letters of credit and cash are the most expensive forms of collateral. Cash posted as security is cash that could otherwise be used for productive purposes.

Both types of facilities will be priced taking into account the risk of the company raising the finance, and any associated costs to the bank of funding their commitment under the facility. Letters of credit are cheaper to obtain as they are unfunded instruments; and whilst they attract a fee versus their face value, this is not on top of an underlying interest rate. Cash borrowing facilities typically attract a margin (based on company risk as per a letter of credit) over an underlying interest rate and so are likely to be more expensive.

6.5 Costs

6.5.1 System collateral review 2011-13

Table 6.3 shows the segmentation of these gross collateral amounts between letters of credit or deposit deeds and shows the closing collateral positions in each calendar year for UNC balancing:

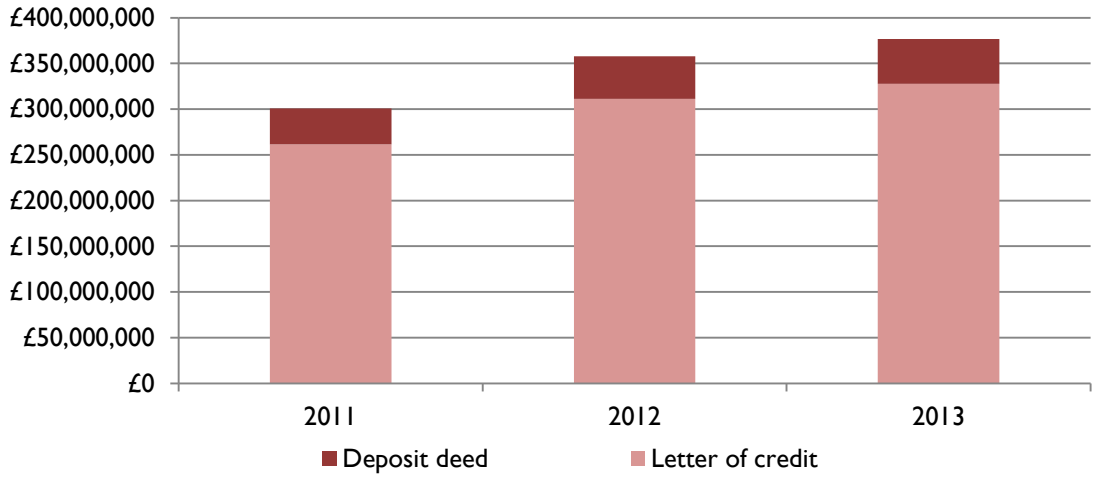
The figure for 28 January 2014 was £388,334mn.

Table 6.3: UNC balancing annual collateral segmentation, 2011-13

Year	Letter of credit (£mn)	Deposit deed (£mn)	Total (£mn)
2011	261.4	39.2	300.6
2012	311.1	46.7	357.8
2013	327.7	49.2	376.9

This demonstrates the preference for issuing letters of credit over posting cash, which is a rational decision considering the likely differential between financing and opportunity costs of the two different types of collateral instruments. The average proportion of letter of credit to cash posting over the three years analysed is 87:13. The volatility of total collateral and the split between the different elements is illustrated in Figure 6.1 below.

Figure 6.1: UNC balancing collateral segmentation, 2011-13



6.5.2 Estimated system collateral costs 2011-13

Table 6.4 shows the segmentation of UNC balancing collateral costs, as well as the total collateral cost.

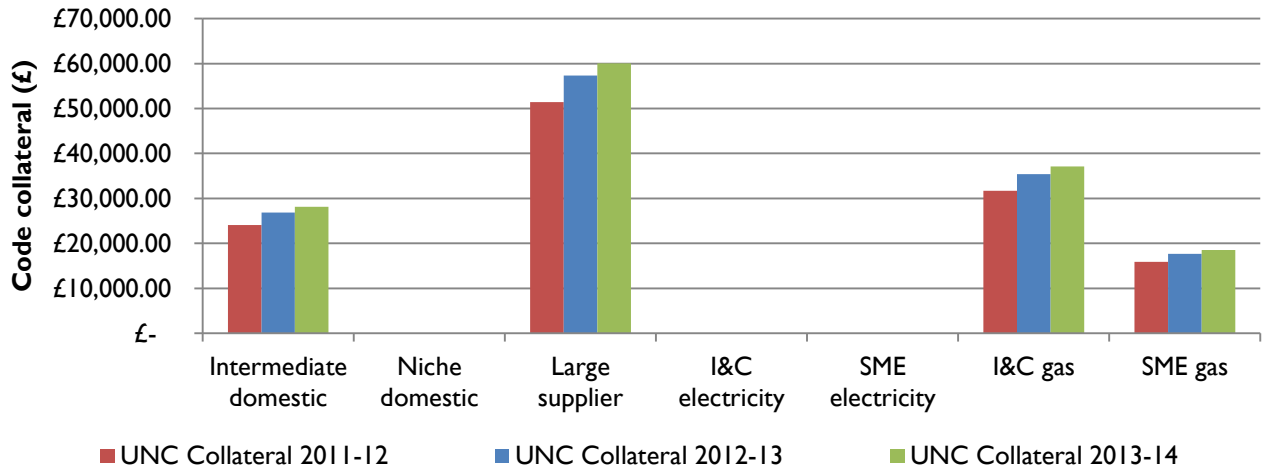
Table 6.4: UNC balancing estimated collateral annual cost, 2011-13

Year	Letter of credit (£)	Cash (£)	Total (£)
2011	6,535,255	2,644,425	9,179,680
2012	7,777,373	3,147,036	10,924,409
2013	8,192,443	3,314,990	11,507,434

6.5.3 Benchmark map 2011-13

Figure 6.2 shows the annual collateral amounts posted by our core supplier benchmarks under the UNC balancing framework for the period 2011-13. The data is represented in Table 6.5.

Figure 6.2: UNC collateral supplier benchmark map, 2011-13



It should be noted that the UNC is not applicable to I&C electricity and SME electricity suppliers as they do not trade in the gas market. As a result no UNC amounts or costs are listed against them in this analysis.

Table 6.5: UNC balancing supplier benchmark collateral amounts, 2011-13

Supplier	2011-12 (£)	2012-13 (£)	2013-14 (£)
Intermediate domestic supplying electricity and gas	24,096.31	26,875.91	28,163.14
Niche domestic electricity supplier	-	-	-
Large domestic gas and electricity supplier	51,405.46	57,335.27	60,081.37
Industrial and commercial electricity supplier	-	-	-
Small and medium sized enterprise electricity supplier	-	-	-
Industrial and commercial gas supplier	31,731.77	35,392.14	37,087.27
Small and medium sized enterprise gas supplier	15,865.88	17,696.07	18,543.63
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	51,579.33	57,529.20	60,284.59

For the core supplier benchmarks that supply gas, the level of exposure to having to post credit under the UNC balancing rules depends on both volumes and an ability to effectively balance.

Figure 6.3 shows the annual collateral costs posted by our core supplier benchmarks under UNC balancing for the period 2011-13. Actual values are shown at Table 6.6.

Figure 6.3: UNC balancing supplier benchmark estimated collateral cost map, 2011-13

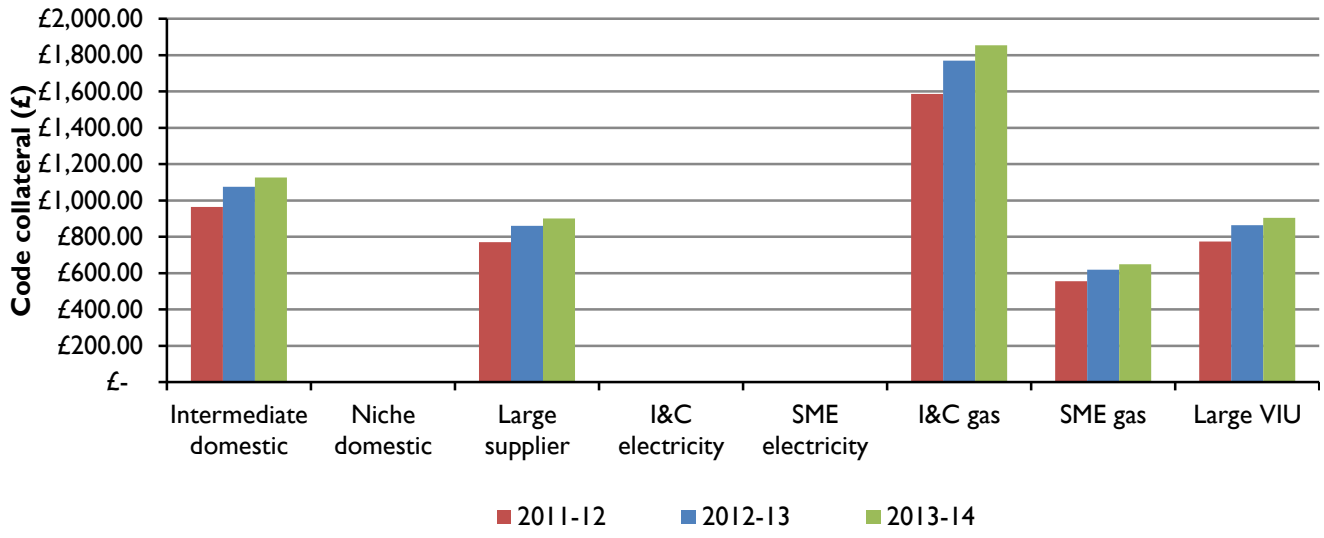


Table 6.6: UNC Balancing supplier benchmark estimated collateral cost, 2011-13

Supplier	2011-12 (£)	2012-13 (£)	2013-14 (£)
Intermediate domestic supplying electricity and gas	963.85	1,075.04	1,126.53
Niche domestic electricity supplier	-	-	-
Large domestic gas and electricity supplier	771.08	860.03	901.22
Industrial and commercial electricity supplier	-	-	-
Small and medium sized enterprise electricity supplier	-	-	-
Industrial and commercial gas supplier	1,586.59	1,769.61	1,854.36
Small and medium sized enterprise gas supplier	555.31	619.36	649.03
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	773.69	862.94	904.27

This cost data reflects different costs associated with raising collateral for different types of benchmark. In the case of the UNC, the variance in fees chargeable for letters of credit. Again, we see that large suppliers, despite having the highest amount of collateral posted in each year, face the lowest cost of any benchmark in meeting that collateral demand, with slightly cheaper costs than the SME gas supplier benchmark, despite placing over three times more collateral in each year over the period.

Further commentary on the relative exposures to amounts and costs to collateral is contained in Volume 1, Chapter 3, benchmark profiles.

7 UNC—transmission and distribution

7.1 Summary

Table 7.1: Key UNC transmission and distribution credit parameters

Who is impacted?	Gas shippers and gas suppliers
Purpose	To ensure gas network operators have access to working capital to cover non-payment of gas network use charges in the event of a user failure
Average annual credit amounts	2011—£1348mn[8] 2012—£1396mn 2013—£1366mn Average annual credit amounts £1370mn
Type of collateral accepted	Letters of credit, deposit deed, cash or pre-payment agreement
Split between instruments	2011—£234mn letter of credit; £10mn cash, £144mn other secured, £930mn PCG 2012—£302mn letter of credit; £10mn cash, £148mn other secured, £936mn PCG 2013—£538mn letter of credit, £10mn cash, £6mn other secured, £802mn PCG
Period/ level of cover required	One month
Unsecured credit criteria	An independent credit assessment score or credit rating allows for up to 2% of a GDNO's RAV to be awarded as unsecured credit (the maximum unsecured credit limit). Good payment history can allow the participant to access lower levels of unsecured credit (capped at 2% of the maximum unsecured credit limit).
Other protections	None
Trigger for call	Payment default
Estimated annual average financing cost	2011—£10.87mn 2012—£11.92mn 2013—£14.27mn

The headline points from this section are:

- the UNC allows for lesser-rated or non-publicly rated participants to avoid the requirement to post high-quality collateral (letters of credit or cash) through good payment history, or an independent rating;
- the calculation of an unsecured limit as a percentage of each respective GDNO's RAV affords a high degree of unsecured lines to parties under the UNC, relative to the charges they incur under the code; and

[8] UNC Transmission and distribution credit amounts, costs and segmentation numbers are based on actual data received from National Grid for the four of the gas networks it operates. We have then extrapolated out these numbers for the remaining four gas networks using the share of total customer numbers attributable to the National Grid gas networks to establish a factor for resolving the amount of total credit across all networks. Further detail on the method is contained in Volume 2.

- the greatest burden of collateral is likely to fall on bad payers or on new entrants if they are relatively financially weak.

7.2 Credit and collateral rules

The UNC is the legal and contractual framework for the supply and transport gas. It has a common set of rules that govern balancing of the gas system, network planning, and the allocation of network capacity.

The introduction of the UNC came about following the sale of National Grid's four grid distribution network (GDN) businesses. Each new GDN owner, along with NGG, is still required to produce its own network code. However, to prevent inappropriate fragmentation, the substantive provisions of these Codes are incorporated by reference to a common document known as the UNC.

National Grid is the sole owner and operator of gas transmission infrastructure in the UK. Gas producers supply gas to the NTS through reception terminals. Gas from the importation terminals is injected into the NTS and gas that is being held in storage can be reintroduced into the system. National Grid is able to recover the costs of managing and maintaining the system in accordance with allowable recovery under cost control agreements with Ofgem.

GDN charges, known as local distribution zone (LDZ) charges, are levied by GDN operators to recover their regulated allowed revenue as determined through the regulated price control framework. Shippers must establish credit with each of the distribution network operators when they accede to the UNC. This is set out in *UNC Transportation Principal Document*, Section V.

These LDZ charges take the form of capacity and commodity charges based on firm supply. Commodity charges are expressed and billed in pence per kilowatt hour (KWh). Capacity charges are expressed and billed in pence per peak day kilowatt hour per day. Fixed charges are expressed and billed in pence per day and use supply point off-take quantity (SOQ) in the determination of the charges. The billing period is monthly.

As noted above, these charging and credit requirement rests on the shipper, as the UNC user. But commercial practice dictates that if a supplier uses a shipper service then these charges are often passed back by contract to be recovered in full.

7.2.1 Purpose

The primary purpose of collateral posted under the UNC transmission and distribution rules is to provide surety behind charges necessary to allow the gas transmission system to be appropriately operated and maintained.

7.2.2 Cover

Shippers are required to provide security by reference to a code credit limit. Users may enjoy an unsecured credit limit, but must top this up with additional security or surety if this is below their credit code limit. The credit code limit must not be less than a user's value at risk under the code.

The maximum unsecured credit limit is limited to 2% of the transporter's RAV. The RAV is the value of the transporter's regulated assets as published by the authority at the start of the relevant price control period. (Section V of the *Transportation Principal Document*, 3.1.1)

The level of unsecured credit limit is calculated as a percentage of the maximum unsecured credit limit according to the credit rating of the shipper. Where the shipper has a credit rating from either S&P, Moody's or Fitch then the limit can also be determined by the rating of their parent company (if they have offered a PCG). It must be noted that where a PCG is provided by the same company for more than one shipper then the PCG cannot exceed the amount allowable to the company under the matrix set out in Table 7.2.

Table 7.2: UNC transmission and distribution approved ratings matrix

Approved credit rating			User's % of maximum unsecured credit limit	Parent company	Qualifying company
Standard and Poor's	Moody's Investors Service	Fitch Ratings			
AAA	Aaa	AAA	100	✓	✓
AA+	Aa1	AA+	100	✓	✓
AA	Aa2	AA	100	✓	✓
AA-	Aa3	AA-	100	✓	✓
A+	A1	A+	40	✓	✓
A	A2	A	40	✓	✓
A-	A3	A-	40	✓	✓
BBB+	Baa1	BBB+	20	✓	✓
BBB	Baa2	BBB	19	✓	✓
BBB-	Baa3	BBB-	18	✓	✓
BB+	Ba1	BB+	17	✓	✓
BB	Ba2	BB	16	✓	✓
BB-	Ba3	BB-	15	✓	✓

Where a user does not have a credit rating from S&P, Moody's or Fitch then the user's unsecured credit limit can be derived from payment history, or through an independent credit assessment of either the user or their parent company (if they have provided a PCG), with the result mapped against the matrix in Table 7.3.

Table 7.3: UNC transmission and distribution independent assessment ratings matrix

Independent Assessment Score	Equivalent of the independent assessment score to credit scores by the independent credit rating agencies for independent assessments			% of transporter's maximum unsecured credit limit
	Dunn and Bradstreet/N2 check comprehensive report	Experian bronze, silver or gold report	Graydons level 1, level 2 or level 3 report	
10	5A1	95-100	1A	20
9	5A2/4A1	90-94	1B/2A	19
8	5A3/4A2/3A1	80-89	1C/2B/3A	18
7	4A3/3A2/2A1	70-79	2C/3B/4A	17
6	3A3/2A2/1A1	60-69	3C/4B/5A	16
5	2A3/1A2/A1	50-59	4C/5B/6A	15
4	1A3/A2/B1	40-49	5C/6B/7A	13 2/3
3	A3/B2/C1	30-39	6B6C/7B/8A	10
2	B3/C2/D1	20-29	8B	6 2/3
1	C3/D2/E1	10-19	8C	3 1/3
0	Below E1	Below 10	Below 8C	0

Any unsecured credit limit allocated in accordance with this matrix is reviewed annually, with the user paying 20% of any costs incurred by the transporter in acquiring the independent assessment.

In terms of acquiring unsecured allowances through payment history, a user can gradually build these up at 0.033% for each month of good payment to an allowance equivalent to 0.8% of the maximum unsecured credit limit (defined as 2% of the GDNO's RAV). This level can therefore be achieved over the first two years after accession to the code.

A user does not necessarily avoid needing to post security as a result of acquiring an unsecured credit limit. They must ensure that they cover their VAR through the sum of their unsecured credit limit and (if necessary) any further security. In other words, their credit code limit must be higher than the VAR. The VAR is the sum of the amount of invoiced but unpaid indebtedness under the UNC and any ancillary agreements (other than energy balancing charges), and the average daily rate of the aggregate amount (other than energy balancing charges) invoiced to the user in the previous calendar month multiplied by 20.

A user's code credit limit may from time to time be reviewed and revised, at intervals of approximately 12 months. This could occur at the user's request; where any published rating of the user or any person providing security for the user is revised downwards; where any instrument of surety or security expires or is called; or at the transporter's request where it has reasonable grounds to believe that the effect of the review will be to reduce the user's code credit limit.

Where any published credit rating of the user or any person providing surety for a user is revised downwards, to the extent that the credit rating following such revision is less than the minimum approved

rating by S&P, Moody's and Fitch, then the user's code credit limit may be immediately reviewed and revised by the transporter on notice to the user on the next business day.

Where the transporter requires the user to provide additional security, the notice shall require that the user shall provide additional security in a form acceptable to the transporter, on the second business day after the notice. The security will need to result in the value at risk of the user not exceeding 100% of the users code credit limit. If it does exceed this limit then the user will be subject to a financial penalty (a fee, escalating according to the value of the missing security, plus a late payment margin).

7.2.3 Types

The following forms of credit are deemed acceptable in terms of extending a user's exposure beyond its unsecured credit limit:

- letter of credit;
- guarantee;
- deposit deed; and/or
- prepayment agreement.

The letter of credit shall mean an unconditional irrevocable standby letter of credit; from a bank with a long-term credit rating of A; and under which payment may be made at a UK branch of the bank.

As already mentioned, a user can achieve an unsecured credit limit by reference to the rating of their parent, but only if they provide a PCG. In essence, this is not a genuinely unsecured limit as the guarantee is acting as surety.

Guarantees from other companies and banks (in the form of performance bonds) can also be used to extend a user's exposure beyond its unsecured credit limit. Such guarantees must be an on demand irrevocable guarantee or performance bond provided by a qualifying company—which means any company with a long term debt rating of at least A provided by a credit rating agency—and in a form acceptable to the user by the transporter.

A deposit deed is a legal agreement that enables the user to deposit cash as security. The deed must be legally enforceable.

A prepayment agreement is an agreement between the transporter and the user that is legally enforceable. Its purpose is to enable a user to make payments of amounts calculated on a monthly basis by the transporter (using an accrual methodology) representing the transporter's estimate of the relevant amounts that will become due by the user in a charging month.

It should be noted that a letter of credit or guarantee is deemed to have zero value for user's code credit limit purposes 30 days prior to the date of its expiry, unless either extended or replaced by security or surety effective from no later than the day after the expiry date of the existing security.

7.2.4 Calls

Security is callable upon payment default.

7.3 Other protections

There are no other protective arrangements.

7.4 Impacts

7.4.1 Beneficiary

These are a mix of liquid items of collateral, with strongly-rated standby letters of credit and cash being highly liquid, and enforceable. Letters of credit and cash have an obvious face value and therefore have a transparent capability to cover different degrees of losses. By limiting the issuers of letters of credit to publicly-rated financial institutions, it is equally possible to have confidence in the assessment of the financial strength of the institution legally bound under the instrument.

Assurance is further acquired from provisions dealing with a reduction in the credit quality of the issuing institution. If at any time the issuers do not have the required credit rating, the user must replace the security with a current qualifying alternative necessary to maintain the required level of security cover.

PCGs and other company guarantees are, by comparison, less liquid. Even with the protections of requiring a minimum credit rating, they still require the company to pay up, and may involve court action to enforce as oppose to being payable on demand at a bank. Under such instruments, it is possible to demand but be part of a queue of creditors seeking payment from a defaulting company.

The flexibility to enjoy and build-up a proportion of unsecured credit based on good payment history means GDNOs are content to accept increasing proportions of unsecured positions amongst long-standing, performing users. If the financial or trading circumstances of these users changed suddenly, then GDNOs might be left with no ability to recover a portion of unpaid liabilities as a result of allowing these positions to accrue and increase. However, the counter-balancing incentive is for users to focus on maintaining good payment performance to avoid being hit with an immediate collateral demand. In any event this exposure is capped at 0.8% of the maximum unsecured credit limit (which is defined as 2% of the relevant GDNO's RAV).

7.4.2 Issuer

The burden of collateral on users under UNC transmission and distribution is low given the combination of the size using RAV and the 2% derived level of unsecured credit allowance; the ability to build unsecured credit allowances based on payment; and the ability for certain users to avoid the cost of cash or letters of credit through PCGs. PCGs are not without issue for group parent companies, not least as the build-up of PCGs as contingent liabilities is likely to have an impact on their own public credit ratings. However, relative to posting cash or letters of credit, the impact is far less as there is no direct financing margin or fee.

The costs of posting collateral are therefore assumed to be negligible at a framework level, and this is borne out by the benchmark mapping.

The exceptions to this are:

- new entrant users that are unrated and are not owned by strong investment-grade companies: they cannot avoid cash or letters of credit by virtue of payment history performance or PCGs;
- recent entrants yet to establish a meaningful unsecured credit limit as a proportion of their overall UNC transmission and distribution liability, even if they have displayed good payment performance; and
- recent entrants that do not make payments promptly.

7.5 Costs

7.5.1 System collateral review 2011-13

Credit data relating to amount and segmentation between instruments for each year between 2011-13 has been received for four of the eight gas networks from National Grid. For the other networks we have

extrapolated out the actual data by calculating the four network's share of total customers served by all gas networks. This is equal to 50%. We have then used the residual percentage of customers for the other four networks to determine a factor to increase the actual credit numbers to establish estimated total credit, and its segmentation, across all eight gas networks. In this case this involves multiplying the actual credit data by 200%.

This approach has some limitations in that it assumes that customers in all regions, served by all networks, have a similar profile of demand. Whilst this is unlikely to be the case, the extent of variability is unlikely to be material. It also cannot adequately take into the effect that different levels of RAV will have on unsecured credit allowances. However, without accurate alternative data this is in our judgement a reasonable approach.

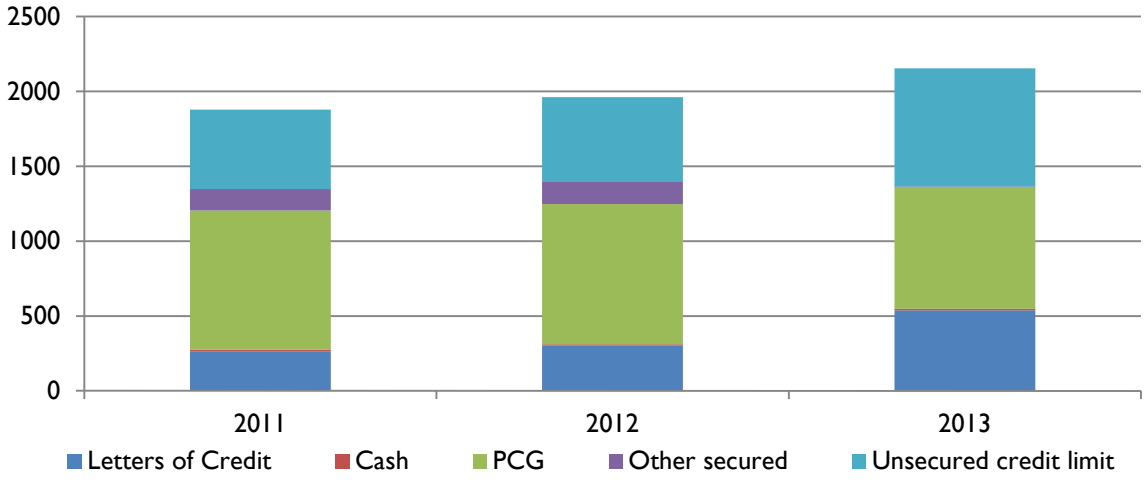
Table 7.4 shows snapshot collateral positions in March of each calendar year for UNC transmission and distribution and shows the segmentation of these gross collateral amounts between different credit instruments between 2011 and 2013. This is further illustrated in Figure 7.1.

Table 7.4: UNC transmission and distribution average collateral segmentation, 2011-13[9]

Year	Letter of credit	Cash	Other Secured	PCG	Unsecured	Total
2011	264	10	144	930	530	1878
2012	302	10	148	936	566	1962
2013	538	10	6	812	788	2154
Average	**368**	**10**	**99**	**893**	**897**	**2267**

This demonstrates the preference for issuing letters of credit or guarantees and prepayment agreements (captured in "other secured") over posting cash, which is a rational decision considering the lower differential financing costs of the two different types of collateral instruments.

Figure 7.1: UNC transmission and distribution collateral segmentation, 2011-13



[9] The variances in figures for posted collateral over the period reflects the increase in gas transmission and distribution charges for National Grid and GDNOs as part of their regulated price agreements. Note the total figure is higher than that shown in Table 7.1 because we include unsecured credit allowances for the purposes of segmentation.

The average value proportions of unsecured, letters of credit, other secured, and cash posting over the three years analysed is 31%, 18.1%, 5.2% and 0.5% respectively. There has been a decrease in the value of "other secured" and PCGs and an increase in the amount of letters of credit and unsecured credit allowances in the last two years.

Figure 7.2 shows a high number of smaller market participants unable to benefit from unsecured credit allowances, and so having to issue letters of credit or cash as security. Actual values are shown at Table 7.5. This is reflected in the difference between the value and volume of security posted for these instruments. On average, 18.6% of required security value was posted through letters of credit and cash, but 52% of collateral instruments received were letters of credit or cash.

Figure 7.2: UNC transmission and distribution annual collateral segmentation volume vs value, 2011-13

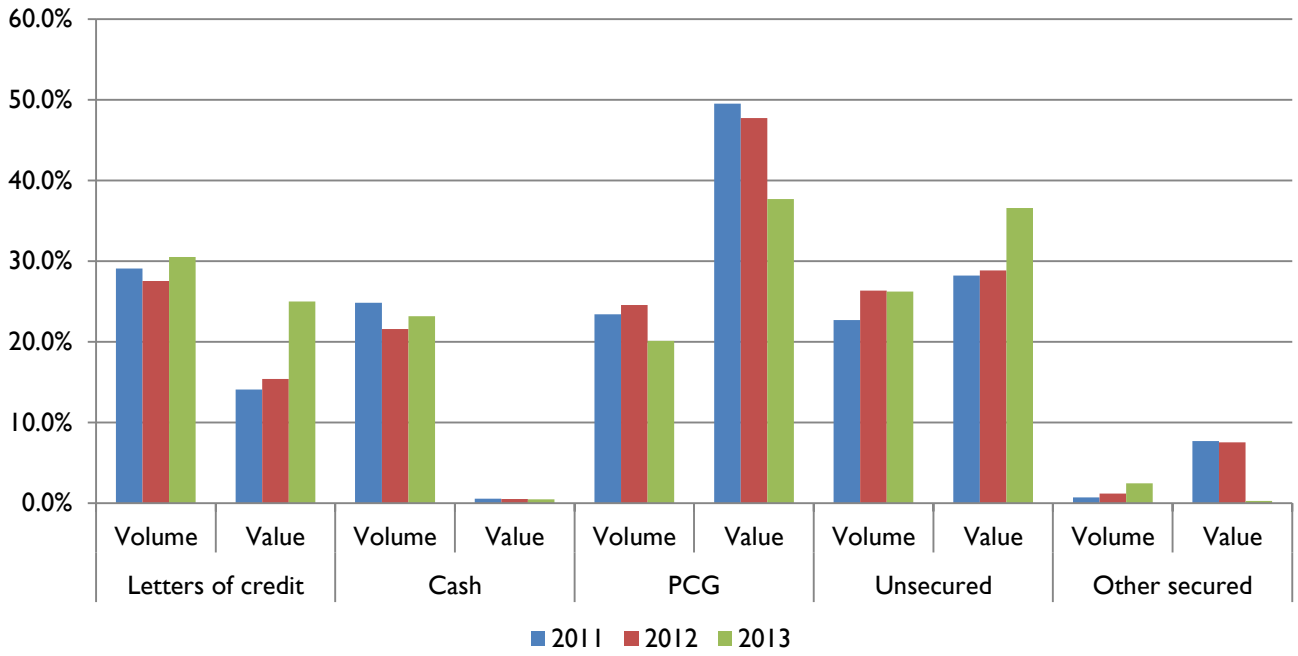


Table 7.5: UNC transmission and distribution annual collateral segmentation volume vs value, 2011-13

	Letter of credit (%)		Cash (%)		PCG (%)		Unsecured (%)		Other secured (%)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
2011	29.1	14.1	24.8	0.5	23.4	49.5	22.7	28.2	0.7	7.7
2012	27.5	15.4	21.6	0.5	24.6	47.7	26.3	28.8	1.2	7.5
2013	30.5	25.0	23.2	0.5	20.1	37.7	26.2	36.6	2.4	0.3

7.5.2 Estimated system collateral costs 2011-13

It is important to note that we do not include a cost for posting PCGs. They do not attract a direct financing charge but equally they are not cost free. Issuing PCGs will have impacts on the credit assessment

of the issuing company when undertaken by a rating agency or financial institutions. The total PCG values are captured in the aggregate figures for amounts of collateral posted, but capturing the implied costs of issuing PCGs is beyond the scope of this report. The cost figures therefore focus on letters of credit, other secured (assuming these are bank guarantees/facilities of some description) and cash only. The net result is a large overall collateral amount total, relative to a much smaller estimate of cost.

Table 7.6 shows the segmentation of CUSC collateral costs, as well as the total collateral cost.

Table 7.6: UNC transmission and distribution estimated collateral cost, 2011-13

Year	Letter of credit	Cash	Other Secured	Total
2011	6.60	0.67	3.60	10.87
2012	7.55	0.67	3.70	11.92
2013	13.45	0.67	0.15	14.27

7.5.3 Benchmark map 2011-13

As the UNC transmission and distribution unsecured credit allowance is established as a proportion of 2% of each GDNO's RAV then, for all of our gas benchmarks, their unsecured credit allowance exceeds their modelled VAR by virtue of their independent credit assessment score or credit rating. In Section 3 of the benchmark map, analysis is undertaken of circumstances in which supplier benchmarks would not be in a position to receive unsecured credit allowances.

8 Contracts for Difference (CfD)—supplier obligation[10]

This section was written against the October 2013 CfD supplier levy consultation proposals and does not reflect modified policy decisions taken in June 2014, which include moving to a quarterly levy and reserve fund reconciliation and removal of the insolvency reserve fund.

8.1 Summary

Table 8.1: Key CfD credit parameters

Who is impacted?	Suppliers only
Purpose	Collateral for 21 calendar days of supplier levy payments, to ensure the CfD counterparty has working capital to pay generators in the event of non-payment of charges under the supplier obligation Reserve fund to cover levy forecasting errors, and daily mismatches between amounts collected from suppliers and payments made to generators Insolvency reserve fund to provide funds in the event of supplier insolvency in circumstances where the supplier 'collateral has been exhausted and mutualisation amounts are yet to be received from non-defaulting suppliers.
Average annual credit amounts	Representative year (2020)—£486mn
Type of collateral accepted	For the collateral for 21 calendar days of supplier levy payments, letters of credit from a financial institution or cash. For the reserve fund, cash For the insolvency reserve fund, cash or letters of credit
Period/ level of cover required	21 calendar days (rolling) for collateral for supplier levy payments Additional funding obligations prior to the obligation period for the reserve fund and the insolvency reserve fund
Unsecured credit criteria	None
Other protections	The regime is underpinned by mutualisation arrangements
Trigger for call	For the collateral for 21 calendar days of supplier levy payments, a supplier payment default For the reserve fund, to cover levy forecasting errors and to smooth out payment flows as a result of daily mismatches that might occur between sums collected from suppliers and payments to generators under a fixed £/MWh levy For the insolvency reserve fund, to cover the CfD counterparty's working capital requirements between a supplier's 21 calendar days collateral being exhausted and mutualisation amounts being received.
Total scheme cost	Representative year (2020)—£15.3mn

[10] Based on the 21 October impact assessment.
www.gov.uk/government/uploads/system/uploads/attachment_data/file/252273/131022_IA_-_Supplier_Obligation__final_for_publication_21_10_2013_.pdf

The headline points from this section are:

- collateral is required to ensure that an otherwise uncapitalised company (the CfD counterparty) is able to build confidence amongst generators and investors that they will receive payments under the CfD;
- the CfD demands collateral from both suppliers and (only in certain circumstances where the reference price is above the strike price and in the light of their history of payment performance) generators, with in-built protections against declining credit quality of the providers of such collateral and the risks associated with collateral expiry;
- collateral requirement for generators is set out in the CfD contract. Generators' obligations to post collateral are contingent on payment performance and will therefore only be truly operative when reference prices exceed strike prices;
- supplier credit and collateral takes the form of letters of credit or cash provided to cover for 21 calendar days of supplier levy payment liabilities owed in instances of single supplier default;
- the CfD counterparty can access other reserves that are pre funded or collateralised by electricity suppliers and which therefore create additional financing demands on suppliers and in our view should be treated as credit requirements. This includes cash funding of a reserve fund to cover working capital demands on the CfD counterparty and to smooth out payment flows as a result of daily mismatches that might occur between sums collected from suppliers and payments to generators under a fixed £/MWh levy. It also includes letter of credit or cash funding of an insolvency reserve fund (supported by mutualisation) to provide the CfD counterparty with the ability to continue to make CfD payments to generators in instances of the simultaneous default of a number of suppliers;
- the total credit across collateral for 21 calendar days of supplier levy payments, the reserve fund and the insolvency reserve fund is higher than in other parts of the energy market, reflecting the volume and value of payments being predicted to flow in relation to CfD settlement and the direct role credit standing of the CfD counterparty will have on the ability of generators to raise finance; and
- there are also linkages between the forms of risk protection required by the CfD counterparty and the nature of the fixed-rate levy scheme, not least the fact that fixing the levy rate in advance of the settlement year means the CfD counterparty would wish to be protected (and provide generators with assurance of protection) against shortfalls in making payments to generators.

8.2 Credit and collateral rules

8.2.1 Background

The CfD regime is the new support framework for low-carbon generation in the UK, and will be introduced under powers contained in the *Energy Act 2013* and secondary legislation passed in 2014 and is scheduled to come into force 1 August 2014. It is anticipated that the first CfDs will be signed late 2014.

Collateral requirements under the CfD relate to two sets of payment flows:

- an obligation on electricity suppliers to pay the CfD counterparty to recover the costs of the CfD feed-in tariff (FiT) scheme. All licensed suppliers in GB (and Northern Ireland once the CfD is implemented in Northern Ireland in 2017) will be obliged to pay the CfD supplier obligation—a compulsory levy—by virtue of the regulations that set out the terms of the supplier obligation; and
- the payments under contract by generators to the CfD counterparty in circumstances where the reference price of wholesale electricity exceeds the strike price in the CfD.

This analysis deals with security relating to the supplier obligation.

The *Energy Act 2013* includes powers in primary legislation to make regulations to create the supplier obligation. These allow for regulations for the holding of collateral, the mutualisation of debts and holding sums in reserve.

The stated purpose of the supplier obligation regulations is that they are 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 the CfDs, whilst taking into account the impacts on suppliers and consumers. It is intended that the supplier obligation, as set out in the regulations, will be enforceable as if it were a licence condition.

The CfD counterparty will establish a fixed unit cost (£/MWh) applicable in each levy year, 1 April to 31 March. This is known as the interim rate. The basis of calculating the interim rate and the final CfD levy (which is the adjusted unit cost to the interim rate after all CfD settlement runs are complete) will be set in legislation with a formula, as the exact amount owed cannot be known until all generation and supply data is finalised at least 14 months after the end of the levy year.[11] To set the interim rate, the CfD counterparty will forecast the total CfD costs for the period taking into account strike prices, generation output, and reference price and estimated supply (demand) data. The CfD counterparty will have some flexibility to include other appropriate inputs to ensure the model is as accurate as possible. The industry will be given the opportunity to input to the yearly forecasting process[12].

The CfD counterparty will share its methodology and forecast data (where not commercially sensitive) with suppliers and generators at the time the rate is announced. It will update its model assumptions throughout the year as new data becomes available, including actual CfD payment and supply data. The CfD counterparty will provide reports on such updating at least once every quarter.

The CfD counterparty will notify suppliers of the interim rate, in £/MWh, for the following levy year, by 6 January each year. During the levy year, suppliers will be billed in line with the metered supply data (MWh) for each billing period.

Under the scheme, suppliers will be required to collateralise their levy payment obligations. This is particularly important to generators given that, under the CfD regime, the CfD counterparty is contractually bound only to pay out in proportion to what it receives. Its only sources of money are the levy sums collected and any associated collateral.

8.2.2 Purpose

The purpose of collateral for 21 calendar days of supplier levy payments is to provide the CfD counterparty with liquidity in the event of a supplier payment default.

Aside from collateral for the 21 days of supplier levy obligation payments, there are further levels of protection against the CfD counterparty not having sufficient money to make payments to CfD generators which can also be categorised as collateral to the extent that they require suppliers to provide sources of capital to cover contingent risks of the CfD counterparty. These include:

- reserve fund—to protect against a shortfall in money being available to the CfD counterparty to make payments to CfD holding generators as a result of levy forecasting errors and daily payment mismatches that might occur between sums collected from suppliers and payments to generators under a fixed £/MWh levy; and
- insolvency reserve fund[13]—to protect the CfD counterparty from shortfalls in money available to make payment to CfD holding generators as a result of supplier default. It is intended to cover a conservative estimate of the maximum likely period between exhaustion of a defaulting supplier's collateral; and the achievement of an enduring solution (the appointment of an energy supply company administrator

[11] It leans heavily on BSC settlement runs.

[12] The design has since been changed to one where the counterparty sets a fixed unit cost rate for each quarter, three months in advance.

[13] The insolvency reserve fund has also since been dropped.

(ESCA), or supplier of last resort) to supplier default. At a system level, this could be sized to cover three of the largest small suppliers simultaneously going insolvent for a period of time. DECC estimates the size of this fund being £19mn-£28mn by 2020. The requirement is to pre-fund the "insolvency reserve fund" to required levels in advance of the commencement of a levy year, with notice of the necessary amounts being given no later than 6 January before the commencement of the levy year to which such funds relate.

8.2.3 Cover

The arrangements for cover for the collateral for 21 days of supplier levy payments, the reserve fund and the insolvency reserve fund are set out in Table 8.2.

Table 8.2: CfD collateral, instruments and timing[14]

	Obligation period (prior to 31 March 2015)		Subsequent obligation periods (1 April – 31 March)	
Measure	**First view**	**Payment required**	**First view**	**Payment required**
Fixed-rate levy: daily payment	By 1 October	Prior to 1 April 2015—daily payments not required After 1 April 2015—five days after invoices being issued for each billing period (one day). Invoices should be received seven working days following the billing period	6 January each year	Five working days after invoices being issued for each billing period (one day)Invoices should be received seven working days following the date of supply
Fixed-rate levy: reconciliation runs			Notification on three dates following the obligation period: 30 June; 30 Sept; and 31 March	Taken from/ paid into reserve fund balance
Fixed-rate levy: final reconciliation			31 May (14 months following obligation period)	90 days following 31 May
Reserve fund	By 1 October. Payment based on market share in	Up-front cash payment on 16 December in that period	Estimated amount due for following year reserve at the same time of levy rate announcement. Notification of	1 July in that period

[14] Based on the 21 October 2013 impact assessment.

	month prior to calculation		actual amount on 20 May. payment based on market share in November preceding the obligation period	
Collateral		Collateral is due on the first day of supply in the obligation period (with a two day rectification period). Each day the collateral requirement will be the sum of relevant supplier amounts for that supplier for the previous 21 calendar days for which data is available.		Rolling
Insolvency reserve fund	1 October	Fully-funded by the first day of the obligation year.	6 January. Based on market share in November. Takes into account market share of the 7th, 8th and 9th largest suppliers	Three working days after first day in obligation period
CfD counterparty operational costs		Before 1 January 2015: ▪ 31 January 2015 (for costs between 1 July 2014 and 31 August 2014); ▪ 28 February 2015 (for costs between 1 September 2014 and 30 October 2014); and ▪ 31 March 2015 (for costs between 1 November 2014 and 31 December 2014)	Seven working days following the billing day	14 days following the billing day

8.2.4 Types

Collateral for the 21 calendar days of supplier levy obligation payments is to take the form of letters of credit; and/or cash.

In terms of the letter of credit, this must be issued by an institution that holds a long-term debt rating of A3 or better by Moody's, or A- or better by S&P[15]; and it must be on terms which the CfD counterparty has determined to be appropriate. If the issuing institution ceases to hold the required rating, then it will not constitute appropriate collateral and the supplier must validly replace the credit on the tenth working day following the credit rating reduction. Any cash collateral provided will be held in an interest bearing bank account within the Government Banking Service.

Contributions to the reserve fund must be made in cash in proportion to the market share of the individual supplier.

Contributions to the insolvency reserve fund can take the form of letters of credit and/or cash, as per the specifications for payment collateral. Each supplier's contribution to the IRF is calculated according to their market share for the month of November. In the event that a defaulting supplier's collateral and contribution to the IRF is exhausted, the contribution of non-defaulting suppliers will be used, with IRF topped up through the mutualisation process.

8.2.5 Calls

Collateral for the 21 days of supplier levy payments can only be used by the CfD counterparty if there is a payment default across the supplier obligation (excluding the operational cost levy). The CfD counterparty can only use any amount of a supplier's collateral that the CfD counterparty determines is equal to, or less than, any amount of payments that supplier has failed to pay. Where the CfD counterparty uses any amount of a supplier's collateral, the CfD counterparty must issue a notice to that supplier notifying them of the amount of that collateral that was called.

8.3 Other protections

Where an electricity supplier ("the defaulting supplier") fails to make a supplier levy related payment (this excludes supplier payments in relation to the operational cost levy), the CFD counterparty may require every other non-defaulting electricity supplier to pay a share of an amount equal to the amount which was not paid by issuing a mutualisation notice to each non-defaulting supplier. A mutualisation notice may only be issued where the CFD counterparty is of the opinion that it will not hold any of the defaulting supplier collateral on the day that mutualisation amounts are due.

Non-defaulting suppliers must pay the amount specified in the notice by the date specified in the notice. The amount each supplier must pay will be based on the amount of money withdrawn from the risk fund, divided by their market share for the billing day to which the default relates. If money is eventually recovered from the defaulting supplier, then non-defaulting suppliers who have made mutualisation payments will be repaid in proportion to their share of the mutualisation payments.

8.4 Impacts

8.4.1 Beneficiary

Letters of credit and cash are liquid forms of collateral. They have obvious face value and a transparent capability to cover different levels of loss. By limiting the issuers of letters of credit to publicly-rated

[15] We understand that credit ratings requirements have yet to be finalised but will be in the final CfD regulations.

financial institutions, it is equally possible for the CfD counterparty to have confidence in the financial capability of the institution legally bound to pay under the instrument. Assurance is further acquired from provisions dealing with a reduction in the credit quality of the issuing institution for the current letter of credit.

In the case of supplier levy collateral, there are a number of additional and highly robust levels of protection for the CfD counterparty. These reduce the risk of not being able to settle payments to generators to all but the most extreme scenarios of supplier default.

The overall effect is that the CfD counterparty can have reasonable confidence that it will be able to discharge its duties under law, regulation and contract.

8.4.2 Issuer

Letters of credit and cash are the most expensive forms of collateral. Cash posted as security is cash that could otherwise be used for productive purposes, and may be borrowed from banks.

Both types of facilities will be priced taking into account the risk of the company raising the finance, and any associated costs to the bank of funding their commitment under the facility. Letters of credit are cheaper to obtain as, whilst they attract a fee, this is not on top of an underlying interest rate. Cash borrowing facilities typically attract a margin (based on company risk as per a letter of credit) over an underlying interest rate and hence are likely to be more expensive.

8.5 Costs

8.5.1 System collateral review 2014-20

We have run our own analysis of projected costs and collateral amounts under the supplier obligation, both at a systemic and benchmark level based on the October 2013 policy proposals. We have projected these out across the period to 2020.

In doing so, we have utilised a number of assumptions that qualify the accuracy of this data:

- capacity for offshore and onshore wind and demand assumptions are taken from the 2013 *Future Energy Scenario* report by National Grid[16];
- we do not know the precise proportion of renewable generators that will opt for CfD or the Renewables Obligation (RO), so we have used an arbitrary assumption of a 50:50 split for generation coming on board before April 2017;
- we use connection dates as the driver for commencement of generation. It is again likely that there will be variations in real generation commencement against connection dates, and which ramp-up profiles of different plant that will impact actual levy amounts;
- power prices, strike prices and load factors assumptions from DECC *EMR Delivery Plan* modelling[17];
- load factors are applied to estimate output each year. This output is used to calculate the total CfD cost for each year based on DECC's assumptions on power prices and strike prices;
- the annual figure is divided by predicted total demand for the year to calculate the fixed levy rate (we have excluded the effect of exempting energy-intensive users on the basis that the regulation for this is yet to be confirmed, and we cannot know how this will impact individual suppliers);

[16] http://www2.nationalgrid.com/uk/industry-information/future-of-energy/future-energy-scenarios/

[17] https://www.gov.uk/government/consultations/consultation-on-the-draft-electricity-market-reform-delivery

- benchmark costs are calculated using a notional market share. We do not vary this so our analysis assumes a fixed market share position throughout the period of analysis;
- similarly, the size of the IRF is based on the market share of the current three largest independent supplies (GDF SUEZ, Total and Opus, collective market share of 7.2%) for 38 days, as per DECC's current stated guidance for how they are likely to size this fund. Again, we do not assume changes to market share in this analysis;
- the reserve fund is calculated using DECC numbers given the difficulty in accurately modelling what it considers to be sensitivities for the purposes of reserve sizing. We only have figures for 2016 onwards covering the period 2016-2020; and
- the collateral requirement is calculated by multiplying the daily fixed unit rate obligation by 21 days, which is the current period for collateralisation stated in the EMR implementation consultation.

It should be noted that our numbers differ from those presented by DECC at a systemic level. This is predominantly due to our more optimistic assumptions on projects coming forward under the CfD, and different inputs relating to the proportion of projects likely to come forward under the CfD and RO prior to 2017. Without access to information regarding individual investment decisions, we have made reasonable assumptions instead. The implication for the most part (other than in 2017) is a higher cost for suppliers to bear.

Table 8.3 sets out the total collateral amounts required for suppliers under the CfD, including letters of credit and cash for the collateral for 21 calendar days of supplier levy collateral, and collateral for the insolvency reserve fund and reserve fund:

Table 8.3: CfD estimated annual collateral

Year	Amount (£)
2015	22,945,874
2016	266,944,927
2017	315,665,869
2018	369,848,140
2019	427,373,834
2020	486,310,189

Our analysis in Volume 1 takes 2020 as the representative year.

The calculations of various amounts to be posted as collateral are proportionately linked to the volume and value of CfD levy payments, and so the demands of collateral grow as levy expenditure increases to support an ever greater number of CfDs and investment contracts entered into with generators. Table 8.4 illustrates the breakdown of the make-up of the total collateral across the 21 calendar days of supplier levy, the reserve fund and the insolvency reserve fund.

Table 8.4: CfD estimated annual collateral breakdown

Year	Total 21 calendar days levy settlement collateral amount, letters of credit or cash (£mn)	Total reserve fund, cash only(£mn)	Total insolvency reserve fund, letters of credit or cash (£mn)	Total collateral (£mn)
2015	20,340,033	0	2,605,841	22,945,874
2016	29,203,545	234,000,000	3,741,382	266,944,927
2017	60,867,849	247,000,000	7,798,020	315,665,869
2018	100,919,007	256,000,000	12,929,133	369,848,140
2019	139,501,719	270,000,000	17,872,115	427,373,834
2020	176,675,583	287,000,000	22,634,606	486,310,189

Table 8.4 illustrates the largest demand being made under the reserve fund and the requirement to cover the 21 days of daily levy payments, with a relatively small proportion made up by the requirement to collateralise the insolvency reserve.

8.5.2 Estimated system collateral costs 2014-20

Tables 8.5 shows the estimated annual total cost of collateral across collateral for the 21 calendar days of supplier levy payments, reserve fund and insolvency reserve fund between 2015 and 2020. This assumes that suppliers collateralise their CfD obligations in the same 85:15 ratio letter of credit to cash as the BSC, and hence attract the central case financing charges associated with these instruments as a result.

Table 8.5: CfD estimated collateral costs £mn

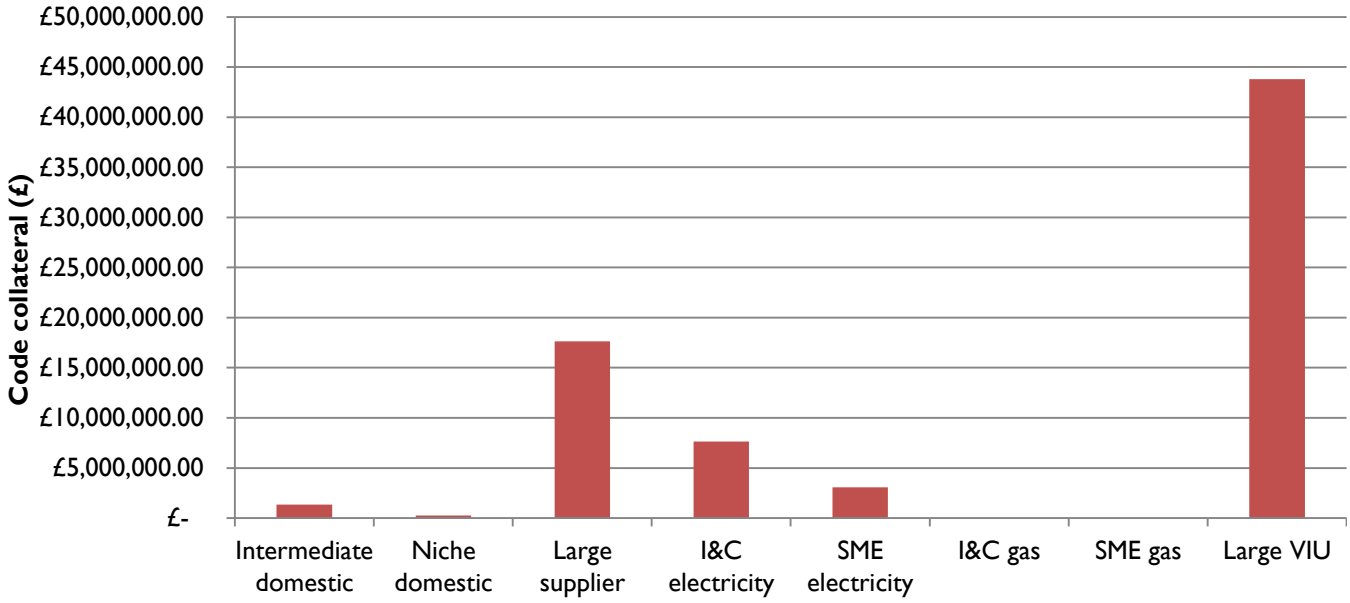
Year	Cost (£mn)
2015	0.7
2016	8.3
2017	9.9
2018	11.6
2019	13.4
2020	15.3

Our analysis in Volume 1 takes 2020 as the representative year. This illustrates that in aggregate the CfD will drive the most expensive collateral requirements of any policy, regulatory or code framework in the UK energy markets; and is comparable to collateral required to be posted under commercial trading arrangements. This position arises predominantly as a result of the interface of two factors: first the multi-layered requirement for posting high quality collateral (for settlement risk, insolvency and reserve funds); and second, the size of the CfD financial flows that are to be settled.

8.5.3 Benchmark map (illustrative year in period up to 2020)

Figure 8.1 shows the annual collateral amounts posted by our core electricity supplier benchmarks in 2020, when the CfD will be an established part of the electricity market. It should be noted that supplier benchmarks who do not supply electricity will be exempt from the CfD levy. This is why there are no cost or amount listings against pure gas suppliers in this analysis.

Figure 8.1: CfD estimated collateral amounts, representative year (2020) supplier benchmarks



The analysis assumes that the collateral requirements and characteristics of each core benchmark is frozen as at 2013 as the best available representation of actual positions of each benchmark in the energy markets). The data is further set out in Table 8.6.

Table 8.6: CfD estimated collateral amounts, representative year (2020) supplier benchmarks

Supplier	Representative year 2020 (£)
Intermediate domestic supplying electricity and gas	1,346,825.83
Niche domestic electricity supplier	244,877.42
Large domestic gas and electricity supplier	17,631,174.49
Industrial and commercial electricity supplier	7,652,419.48
Small and medium sized enterprise electricity supplier	3,060,967.79
Industrial and commercial gas supplier	-
Small and medium sized enterprise gas supplier	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	43,802,449.12

As collateral amounts posted under the CfD are derived by market share, there is a clear correlation between the size of the supplier benchmark (by volume of the market) and the amounts of collateral that they are required to post.

Figure 8.2 shows the annual collateral costs posted by our core supplier benchmarks under the CfD in the representative year, using each benchmark's respective costs of finance. Actual data is set out in Table 8.7.

Figure 8.2: CfD estimated collateral costs, representative year (2020)

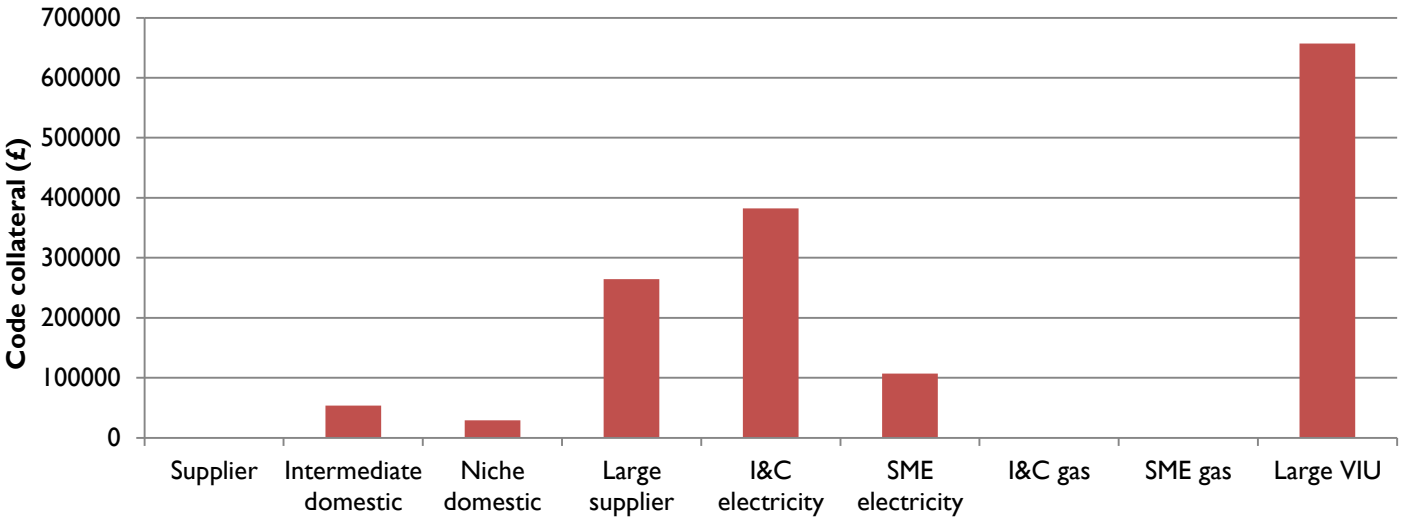


Table 8.7: CfD estimated collateral costs, representative year (2020) supplier benchmarks

Supplier	Representative year (£)
Intermediate domestic supplying electricity and gas	53,873.03
Niche domestic electricity supplier	29,385.29
Large domestic gas and electricity supplier	264,467.62
Industrial and commercial electricity supplier	382,620.97
Small and medium sized enterprise electricity supplier	107,133.87
Industrial and commercial gas supplier	-
Small and medium sized enterprise gas supplier	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	657,036.74

9 Capacity Market

9.1 Summary

Table 9.1: Key Capacity Market credit parameters

Who is impacted?	Electricity suppliers only
Purpose	To cover the risk of the Capacity Market Settlement Agency not having working capital to pay generators under the supplier obligation
Average annual credit amounts	Representative year (2019)—£75mn
Type of collateral accepted	A-rated letters of credit or cash
Period/level of cover required	One month plus 10%
Unsecured credit criteria	None
Other protections	None
Trigger for call	Payment default
Total scheme cost	Representative year (2019)—£2.35mn

The headline points from this section are:

- the Capacity Market arrangements, collateral arrangements and associated regulations are in the process of ongoing consultation. Hence, the final design is subject to change. This analysis is based on a review of the preferred policy options set out in the October 2013 consultation, which relates to proposals for the implementation of EMR[18];
- licensed suppliers will fund the Capacity Market payments through a levy obligation;
- these licensed suppliers will be required to collateralise a month of levy payments;
- the forms of collateral will be highly-rated letters of credit or cash;
- unlike the CfD regime, there are no additional layers of collateral. A reserve fund is not required due to the more predictable nature of the levy amounts. There is no insolvency reserve fund or mutualisation arrangement;
- the analysis is based on consultation drafts of the policy and so could be subject to change.

9.2 Credit and collateral rules

9.2.1 Background

The Capacity Market is being introduced to ensure that there is sufficient supply of electricity to meet both consumer and business electricity demand; and to ensure adequate capacity flexibility to cope with the changing electricity mix. It will be open to both new and existing generation assets, as well as companies offering demand-side response. However, currently entities will not be able to participate if their plant already benefits from Rocs, a CfD, or the FiT regime.

[18] Details can be found here: https://www.gov.uk/government/consultations/proposals-for-implementation-of-electricity-market-reform.

The system will operate predominantly on the basis of a forecast of future capacity needs, four and a half years ahead of the relevant delivery year. The requisite amount of net capacity for such future delivery year will then be contracted through a competitive central auction four years ahead. The auction is planned for the end of 2014, with the corresponding year-ahead auctions starting from 2017. The first new capacity contracted under this mechanism would deliver capacity over winter 2018-19.

Successful bidders will be awarded a "capacity agreement" under which they will receive a monthly capacity payment (paid for by electricity suppliers) in return for committing to provide capacity when requested. There will be financial penalties to obligated generators based on the extent to which they fail to provide their obligated capacity when required during system "stress events".

Collateral requirements under the Capacity Market will impact on two types of participants: generators will have to post collateral where they bid for a capacity agreement for new plant; and suppliers will have to fund the payments required under the scheme. This section deals with supplier collateral arrangements only[19].

9.2.2 Purpose

Under draft regulations governing the operation of the Capacity Market energy, suppliers will be obliged to post collateral to the Capacity Market settlement body. This will support payment of levies used to make payments under the Capacity Market to participating generation, in the form of cash in an escrow account or letters of credit. The required collateral will need to be in place 12 working days before the start of the relevant month.

The purpose of supplier collateral is to:

- provide the settlement body with liquidity in the event of a supplier default so that it can make payments to generators who have been awarded capacity contracts in Capacity Market auctions;
- give generators confidence that they can still receive the anticipated payments under the Capacity Market framework, even in circumstances of supplier default; and
- provide generators with an ability to raise finance to underpin new-build generation projects.

9.2.3 Cover

The amount of credit cover required from suppliers will equal one month of settlements under the Capacity Market plus 10%. This will be notified by the settlement agent to the settlement body in a monthly schedule in advance of the start of a Capacity Market year. The additional 10% is intended to provide further headroom in the event that a supplier's payments are mutualised across other suppliers.

9.2.4 Types

Collateral will take the form of:

- letters of credit; or
- cash in an escrow account.

The letter of credit must be from a bank with that is A- as rated by S&P; or A3 as rated by Moody's.

[19] As the amount of capacity to be procured is not yet known, and nor is the proportion of new and existing plant that might be required to meet it, it is not possible to project generator collateral at a systemic level for the Capacity Market. Instead, we take this into account when modelling the new-build CCGT variant in the benchmark map.

9.2.5 Calls

Instances of non-payment of the levy by obligated suppliers, although this is to be confirmed once draft regulations relating to the supplier levy for the capacity mechanism are published and finalised.

9.3 Other protections

There is likely to be mutualisation under the Capacity Market.

9.4 Impacts

9.4.1 Beneficiary

These are liquid items of collateral, with strongly-rated standby letters of credit and cash being highly liquid, and enforceable. Letters of credit and cash have an obvious face value and have a transparent capability to cover different levels of loss. By limiting the issuers of letters of credit to publicly-rated financial institutions, it is equally possible for the settlement body to have confidence in the assessment of the financial strength of the institution legally bound under the instrument.

Further comment will be possible once draft regulations relating to the capacity mechanism supplier levy are published.

9.4.2 Issuer

Letters of credit and cash are the most expensive forms of collateral. Cash posted as security is cash that could otherwise be used for productive purposes. If we assume that all firms finance either cash deposits or letters of credit from bank facilities, then this exposes them to different degrees of financing costs.

Both types of facilities will be priced taking into account the risk of the company raising the finance, and any associated costs to the bank of funding their commitment under the facility. Letters of credit are cheaper to obtain as they are unfunded instruments. Whilst they attract a fee versus their face value, this is not on top of an underlying interest rate. Cash borrowing facilities typically attract a margin (based on company risk as per a letter of credit) over an underlying interest rate, and so are likely to be more expensive.

9.4.3 System collateral review 2014-20

Table 9.2 sets out an estimate of the total collateral amounts required for suppliers under Capacity Market in a representative year post 2018-19[20].

Unlike the CfD, where there is sufficient information in the public domain to conduct modelled forecasts of CfD collateral sums, the collateral amount for the Capacity Market has been calculated by taking the figure for the Capacity Market payments to generators for 2019 of £900mn (2012 prices) from the October 2013 *Capacity Market Impact Assessment*[21]. This is the estimated figure that will need to be supported by the Capacity Market levy from suppliers, and hence will form the basis of credit postings. This figure has then been divided by 12 to derive a monthly standing collateral figure to apply to a single the year.

It should be noted that the impact assessment projects a range of gross payments to generators from £900mn to £2.6bn (in 2012 prices) peaking in 2024. The range of collateral as a result could be £75mn to

[20] This assumes that suppliers collateralise the Capacity Market charges in the same 85:15 ratio letter of credit to cash as the BSC, and hence attract the central case financing charges associated with these instruments as a result.

[21] The *Capacity Market Impact Assessment* can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252743/Capacity_Market_Impact_Assessment_Oct_2013.pdf

£217mn taking this range into account, there is a significant degree of possible variance to DECC's figures as the credit postings will ultimately depend on the amount of capacity procured under the Capacity Market, which at this stage is not known.

Table 9.2: Capacity Market estimated collateral amount (£mn)

Representative year (2019)	75

9.4.4 Estimated system collateral costs[22]

Tables 9.3 shows the estimated annual total cost of collateral to be posed under the Capacity Market in a representative year after 2018-19.

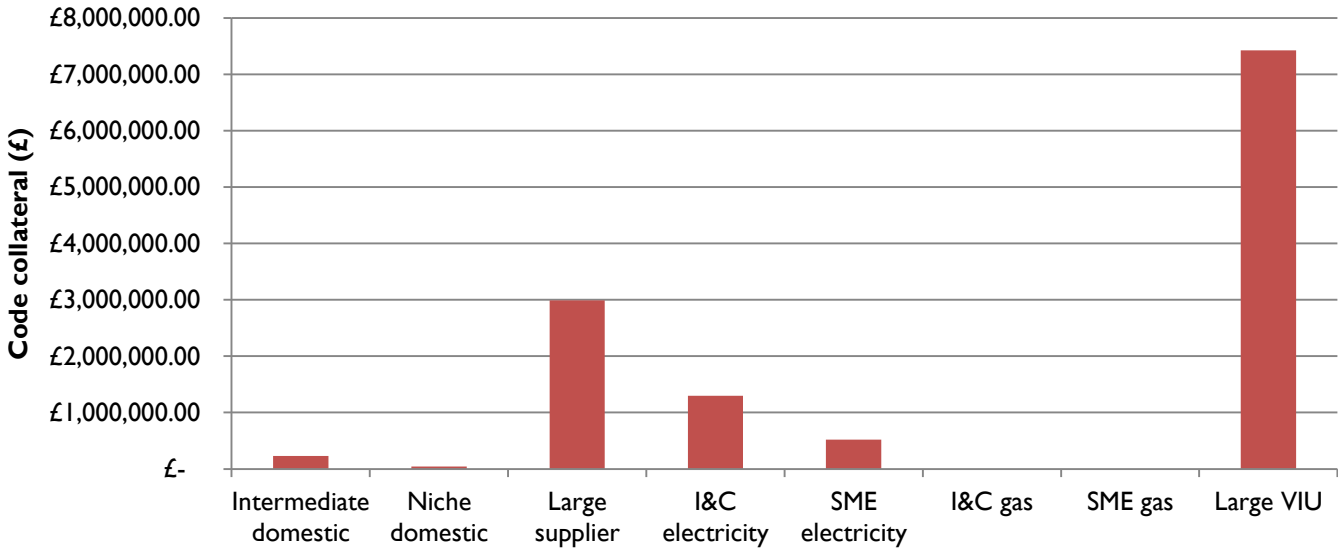
Table 9.3: Capacity Market estimated collateral costs (£mn)

Representative year (2019)	2.35

9.4.5 Benchmark map (illustrative year in period up to 2020)

Figure 9.1 shows the estimated annual collateral amounts posted by our core supplier benchmarks in an illustrative year post 2018-19, when the Capacity Market will be an established element of the electricity market.

Figure 9.1: Capacity Market collateral amounts, representative year supplier benchmarks



[22] This assumes that suppliers collateralise the Capacity Market levy obligation in the same 85:15 ratio letter of credit to cash as the BSC, and hence attract the central case financing charges associated with these instruments as a result.

Table 9.4 Capacity Market collateral estimated amounts representative year

Supplier	Representative year (2019) (£)
Intermediate domestic supplying electricity and gas	228,301.89
Niche domestic electricity supplier	41,509.43
Large domestic gas and electricity supplier	2,988,679.25
Industrial and commercial electricity supplier	1,297,169.81
Small and medium sized enterprise electricity supplier	518,867.92
Industrial and commercial gas supplier	-
Small and medium sized enterprise gas supplier	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	7,425,000.00

Given that the Capacity Market levy is only raised on electricity suppliers, there are no amounts or costs listed against gas supplier benchmarks.

Collateral amounts posted under the Capacity Market are derived by market share. As a result, there is a clear correlation between the size of the supplier benchmark (by volume of the market) and the amounts of collateral that they are required to post.

Figure 9.2 shows the annual collateral costs posted by our core supplier benchmarks under the Capacity Market in the representative year. The data is further set out in Table 9.5.

Figure 9.2: Capacity Market estimated collateral costs, representative year (2019) supplier benchmarks

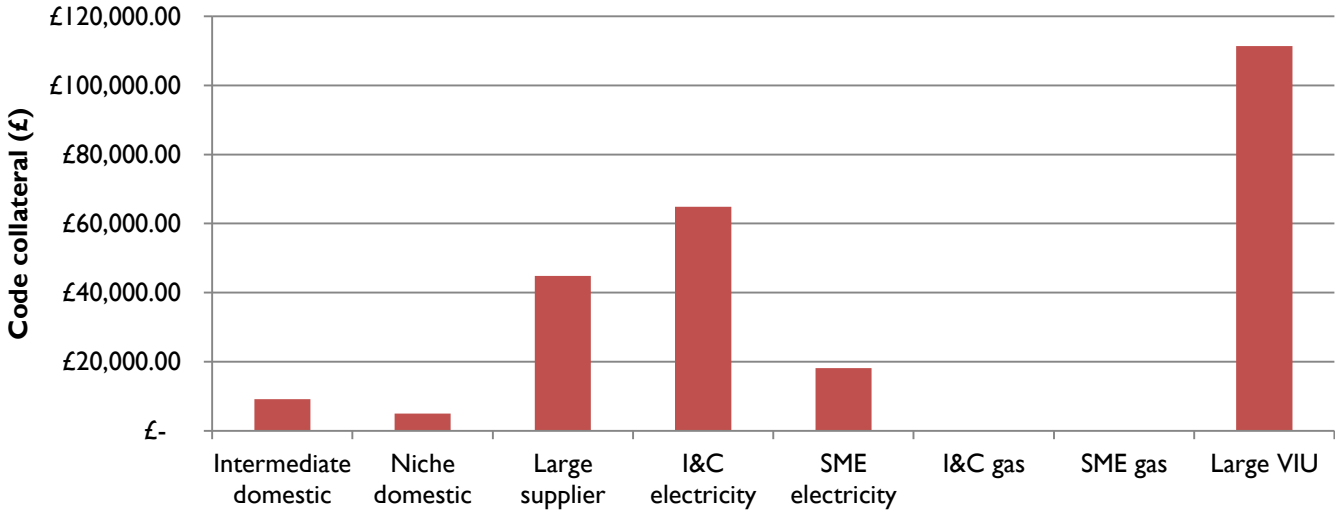


Table 9.5: Capacity Market estimated collateral costs, representative year supplier benchmarks

Supplier	Representative year (2019) (£)
Intermediate domestic supplying electricity and gas	9,132.08
Niche domestic electricity supplier	4,981.13
Large domestic gas and electricity supplier	44,830.19
Industrial and commercial electricity supplier	64,858.49
Small and medium sized enterprise electricity supplier	18,160.38
Industrial and commercial gas supplier	-
Small and medium sized enterprise gas supplier	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	111,375.00

10 Smart Energy Code (SEC)

10.1 Summary

Table 10.1: Key Smart Energy Code credit parameters

Who is impacted?	Suppliers and networks
Purpose	To cover charges levied by the DCC and estimated charges during the invoice settlement period
Average annual credit amounts	Representative year—£4.5mn
Type of collateral accepted	Letters of credit, bank guarantees or cash
Period/ level of cover required	1.4 multiple of the monthly invoice amounts for eligible DCC charges
Unsecured credit criteria	An independent rating or a PCG, subject to the parent having a suitable credit rating
Other protections	None
Trigger for call	Payment default
Total scheme cost	Representative year—£0.1mn

The headline points from this section are:

- the credit cover provisions are part of the developing SEC and could be subject to change. The analysis here is based on the 30 January impact assessment[23];
- the forms of collateral will be highly-rated letters of credit, bank guarantees or cash;
- suppliers can obtain a reduction in the required level of credit cover through demonstrating their credit rating; and
- the DCC is vehicle that has not been set up either corporately or financially to bear the risk of bad debt or payment default. Service providers to the DCC are not the appropriate entities to assume this risk, as they have no control over financial flows from parties to the code and in doing so would be most likely to factor in a risk premium to their service charges, increasing costs of delivering the scheme. Therefore, as in other codes and regulations the parties to the SEC are deemed to be the most appropriate companies to provide cover the risk of payment default.

10.2 Credit and collateral rules

10.2.1 Background

The government's vision is for every home in GB to have smart energy meters by 2020. To achieve this vision, DECC has created the Smart Metering Implementation Programme (SMIP). The SMIP is a customer-focussed, supplier-led approach to the roll-out of an estimated 53mn smart electricity and gas meters to homes and small businesses. The government announced that all major energy suppliers will now be

23 www.gov.uk/government/uploads/system/uploads/attachment_data/file/276656/smart_meter_roll_out_for_the_domestic_and_small_and_medium_and_non_domestic_sectors.pdf

expected to be able to use the shared infrastructure provided by the Data and Communications Company (DCC) by late autumn 2015, and to complete their smart meter roll-outs by 2020.

The role of the DCC is critical to this strategy. Its job is to provide the shared infrastructure necessary for smart meters to operate consistently for all consumers, regardless of their energy supplier. The DCC performs this function and interfaces with energy suppliers through the terms of the Smart Energy Code (SEC). The SEC is an industry code that all suppliers must accede to and comply with if they wish to use DCC's services.

The DCC commercial framework is set out in the DCC licence and the SEC. A key element of the commercial framework is the charging methodology, which is contained within section K of the SEC. It is intended that the DCC should remain as close to 'cash neutral' as possible. It cannot incur debt, must avoid over-recovering costs, and must make a best estimate of revenues to ensure that service charges do not need to be amended during a regulatory year. Service charges exceeding costs incurred (along with any interest) will be used to reduce charges in future years. The SEC outlines the steps that the DCC must take should any SEC party fail to establish credit cover or fail to pay its invoice within the specified time periods.

The DCC creates a budget for each regulatory year estimating fixed revenue, explicit revenue and elective revenue. This budget is an estimate of the costs that DCC expects to incur, and is used to set service charges within the charging statement.

DCC issues invoices to SEC parties on a monthly basis in order to pay their costs, external service providers, and SECCo. Fixed revenue is for the provision of DCC services that benefit all energy suppliers and network operators. DCC invoices fixed revenue by applying a fixed monthly charge per meter. Explicit revenue is for the provision of DCC services to specific service users such as messages sent to them by Smart Metering Systems. Elective revenue is for the provision of DCC services to one or more service users through a bilateral agreement with DCC. The DCC establishes defined levels of credit cover for all service prior to invoicing them for these charges.

The following analysis is based on the drafting of the SEC version 3 so could be subject to change given the evolution of the scheme.

10.2.2 Cover

Suppliers will be required to collateralise against a credit cover requirement established by DCC. This requirement will be calculated at least weekly and will be determined by the user's VAR multiplied by the user's credit cover factor.

The VAR is the sum of the charges (inclusive of VAT) set out in invoices addressed to, but not yet paid by, the user; plus the charges (inclusive of VAT) that DCC reasonably estimates are likely to be incurred by the supplier in the period until the next invoice. There is a materiality is threshold. Where a supplier's VAR would otherwise be £500[24] or less, the VAR is deemed to be zero. Invoices are issued monthly and are payable either five working days following receipt of such invoice; or eight working days following the end of the month to which the invoice relates, whichever is the later.

The user's credit cover factor is determined by a credit rating, other than where the supplier has failed to pay invoiced charges by their due date on three or more occasions during the 12 months preceding the date on which the credit cover factor is being determined. In that instance the user's credit cover factor defaults to 100%.

If a supplier has a credit rating by S&P; Moody's; Fitch; and/or DBRS Ratings (a "recognised credit rating") then the matrix in Table 10.2 will be used to determine the credit cover factor.

[24] DECC is now consulting on this being £2,000 and applying this value to credit cover in SEC4.

Table 10.2: DCC recognised credit rating matrix

DBRS		Moody's		Fitch		Standard and Poor's		Credit cover factor (%)
Long-term	Short-term	Long-term	Short-term	Long-term	Short-term	Long-term	Short-term	
AAA	R-1 H	Aaa	P-1	AAA	F1+	AAA	A-1+	0
AA (high)	R-1 H	Aa1	P-1	AA+	F1+	AA+	A-1+	0
AA	R-1 M	Aa2	P-1	AA	F1+	AA	A-1+	0
AA (low)	R-1 M	Aa2	P-1	AA-	F1+	AA-	A-1+	0
A (high)	R-1 L	A1	P-1	A+	F1	A+	A-1	0
A	R-1 L	A2	P-1	A	F1	A	A-1	0
A (low)	R-1 L	A3	P-2	A-	F2	A-	A-2	0
BBB (high)	R-2 H	Baa1	P-2	BBB+	F2	BBB+	A-2	50
BBB	R-2 M	Baa2	P-3	BBB	F3	BBB	A-3	50
BBB (low)	R-2 L	Baa3	P-3	BBB-	F3	BBB-	A-3	50
lower	lower	lower	Lower	lower	lower	lower	lower	100

If a supplier is guaranteed by a PCG, and the issuer has a recognised credit rating, then the matrix in Table 10.2 will also be used to determine a supplier's credit cover factor. Where the rating of the PCG is insufficient to provide security to cover the supplier's full VAR then the credit cover factor will be the weighted average (using the value of the respective securities) of the percentage derived from the PCG, and the percentage derived from the application of a further credit assessment matrix for suppliers that do not have a recognised rating.

This credit assessment matrix is set out in Table 10.3.

Table 10.3: DCC independent credit assessment matrix

Check It (ICC) credit score report	Dunn and Bradstreet/N2 check comprehensive report	Equifax	Experian Bronze, silver or gold report	Graydons Level 1, Level 2 or Level 3 report	Credit cover factor (%)
95-100	5A1/	A+	95-100	1A	50
90-94	5A2/4A1	1/1-	90-94	1B/2A	60
80-89	5A3/4A2/3A1	B+	80-89	1C/2B/3A	70
70-79	4A3/3A2/2A1	B/B-	70-79	2C/3B/4A	80
60-69	3A3/2A2/1A1	C+	60-69	3C/4B/5A	90
50-59	2A3/1A2/A1	C/C	50-59	4C/5B/6A	100
40-49	1A3/A2/B1	D+	40-49	5C/6B/7A	100
30-39	A3/B2/C1	D/D	30-39	6C/7B/8A	100
20-29	B3/C2/D1	E	20-29	8B	100
10-19	C3/D2/E1	E/E	10-19	8C	100
Below 10	Below E1	Below E	Below 10	Below 8C	100

In such circumstances, the cost of obtaining the credit assessment score in respect of the supplier (and/or its guarantor) is met by the supplier and needs to be refreshed at least once every 12 months. Where no valid credit assessment scores exist for a supplier (or its guarantor) then the credit cover factor is deemed to be 100%. Where the supplier's VAR (and/or the guarantor's PCG cap) exceeds the recommended exposure limit associated with its credit assessment score, its credit assessment score will be the weighted average of the credit assessment score that would otherwise have applied and 100%. This is weighted by reference to the recommended exposure limit, and the amount by which the VAR (or PCG cap) exceeds such a limit.

If at any stage the value of the credit support is less than the supplier's credit cover requirement, the DCC will notify the supplier and within two working days after receipt of notice. The supplier must procure additional credit support to ensure that the aggregate value of all posted credit support is equal to or greater than their credit cover requirement.

10.2.3 Types

One or more of the following forms of credit support qualify:

- a bank guarantee;
- a letter of credit; and/or
- a cash deposit.

A bank guarantee means an on demand bank guarantee in a form acceptable to the DCC from a bank with a rating of A- by S&P; and/or A3 by Moody's; and/or A- by Fitch; and/or A(low) by DBRS (the "required bank rating"). To be acceptable collateral the bank guarantee must have at least one month left until expiry.

A letter of credit means an unconditional irrevocable standby letter of credit substantially in the form of a template set out in the code schedules. It has to be from a bank with the required bank rating.

With regards to the bank guarantee and letter of credit, there are provisions relating to what happens when these instruments approach their expiry date. In the event that there are 20 working days or fewer until expiry, the DCC will notify the supplier who, within ten working days of this notice, must replace the security with acceptable credit support of equivalent value. If the supplier fails to do this then the DCC can claim the full undrawn amount under the bank guarantee or letter of credit and hold this as a deposit.

A cash deposit means a deposit of funds by or on behalf of the supplier into a bank account in the name of the DCC.

10.2.4 Calls

The collateral can be called where a supplier fails to pay the charges set out in invoice issued by the DCC on its due date, and where the DCC has issued a notification of payment failure. On the next working day the DCC can claim an amount equal to the unpaid charges plus interest (or, if lower, as much as is available to be claimed) under any bank guarantee or letter of credit provided on behalf of that user; remove an amount equal to the unpaid charges plus interest (or, if lower, as much as is available to be removed) from any cash deposit account; or undertake a combination of the above in respect of a total amount equal to the unpaid charges plus interest (or, if lower, as much as is available to be claimed or removed).

10.3 Other protections

Where a party fails to pay to the DCC the required charges, resulting in an event of default, and the credit cover of the defaulting party is insufficient to cover outstanding liabilities then the DCC may determine the level of an Unrecovered Bad Debt Payment that is to be paid by each non-defaulting party in one or more subsequent months of the regulatory year as determined by the DCC. The share of the payment made by individual non-defaulting parties will be equal to their share of total payments by all non-defaulting parties in the 12 months before the month in which the default occurred

10.4 Impacts

10.4.1 Beneficiary

These are a mix of liquid items of collateral, and therefore have a transparent capability to cover different levels of loss. Letters of credit and cash have an obvious face value. By limiting the issuers of letters of credit and bank guarantees to publicly-rated financial institutions, it is possible for the DCC to have confidence in the assessment of the financial strength of the institution legally bound under the instrument.

10.4.2 Issuers

The necessity to post letters of credit, bank guarantees or cash means suppliers could incur reasonably high costs of collateralising their obligations under the DCC if they are not able to access a reasonable unsecured credit allowance. Unsecured credit allowances are capped at 50% for parties subject to an independent credit assessment (see Table 10.3). For a highly-rated company with a recognised credit rating by S&P, Moody's or Fitch in which case it is possible (with an A-, or A3 rating or better) to face no credit requirement, and such companies can enjoy a 50% unsecured allowance until their rating falls below BBB- (see Table 10.2).

10.4.3 System collateral review 2014-20

Table 10.4 below sets out the total collateral amounts required for suppliers under the DCC. This figure is based on the total DCC cost, including the communication equipment in premise charge, of £2,374mn (in

2011 present value terms) quoted in DECC's smart meter roll-out impact assessment from 30 January 2014[25]. This figure is divided by 18 (being the number of years over which this cost was derived, 2013-2030) to arrive at an annual figure. This is then divided further by 12 and multiplied by 1.4 (being 1.4 months, the period which credit cover is to be provided for—to derive the relevant credit cover amount[26]. DECC assumes the full roll-out of smart meters by 2020. This resolves to a figure of £15.4mn[27].

To reflect possible levels of unsecured credit allowances and hence how much actual credit will be posted, we have assumed certain market shares and credit ratings for both the large, vertically integrated utilities and smaller companies that could apply in 2020.

In terms of market share we have assumed that the largest, best rated companies have an 80% share of the market by 2020. It is currently higher but, noting the policy objective of improving energy market competition and recent strides made by independents, a reduced share for the largest companies is in our judgement a reasonable assumption.

To determine the credit cover factors that might apply to this category we segment the 80% taking into account the current credit ratings of the Big Six utilities. This results in a two third, one third split between companies with A- ratings and companies with BBB+ ratings by S&P. Thus, for 2020 we assume that this is continuing feature of the market, and hence two thirds of 80% of DDC charges are subject to no credit cover, whilst a third is subject to credit cover factor of 50%.

For the remaining 20% of DCC charges, we assume that, on average other companies are required to maintain an 80% credit cover factor.

This approach is based on a range of estimates assumptions about the make-up and financial condition of the market in 2020, and a simplified portrayal of annualised DCC costs which will not take into account cost profiling over time. Actual charges and credit levels faced in 2020 are likely to vary from these estimates. Thus, it has its limitations, but is a reasonable means of forecasting the possible level of credit requirements in the absence of more precise data.

Table 10.4: DCC estimated collateral amounts (£mn)

Representative year (2020)	4.5

10.4.4 Estimated system collateral costs 2014-20[28]

Table 10.5 shows the estimated annual total cost of collateral to be posted under the DCC credit rules in a representative year post 2018-19.

Table 10.5: SEC estimated collateral costs (£mn)

Representative year (2020)	0.1

[25] The Smart Metering Impact Assessment is contained here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276656/smart_meter_roll_out_for_the_domestic_and_small_and_medium_and_non_domestic_sectors.pdf

[26] The *Smart Metering Impact Assessment* from 31 January 2014 provides an estimated total DCC-related cost of £2,374mn (in 2011 present value terms) out to 2030.

[27] This does not reflect the profile of expenditure by the DCC over time.

[28] This assumes that suppliers collateralise the DCC obligation in the same 85:15 ratio as letter of credit to cash as the BSC, and hence attract the central case financing charges associated with these instruments as a result.

10.4.5 Benchmark map (illustrative year in period up to 2020)

Figure 10.1 shows the estimated annual collateral amounts posted by our core supplier benchmarks. The data is further represented in Table 10.6.

Figure 10.1: DCC estimated collateral amount, supplier benchmarks

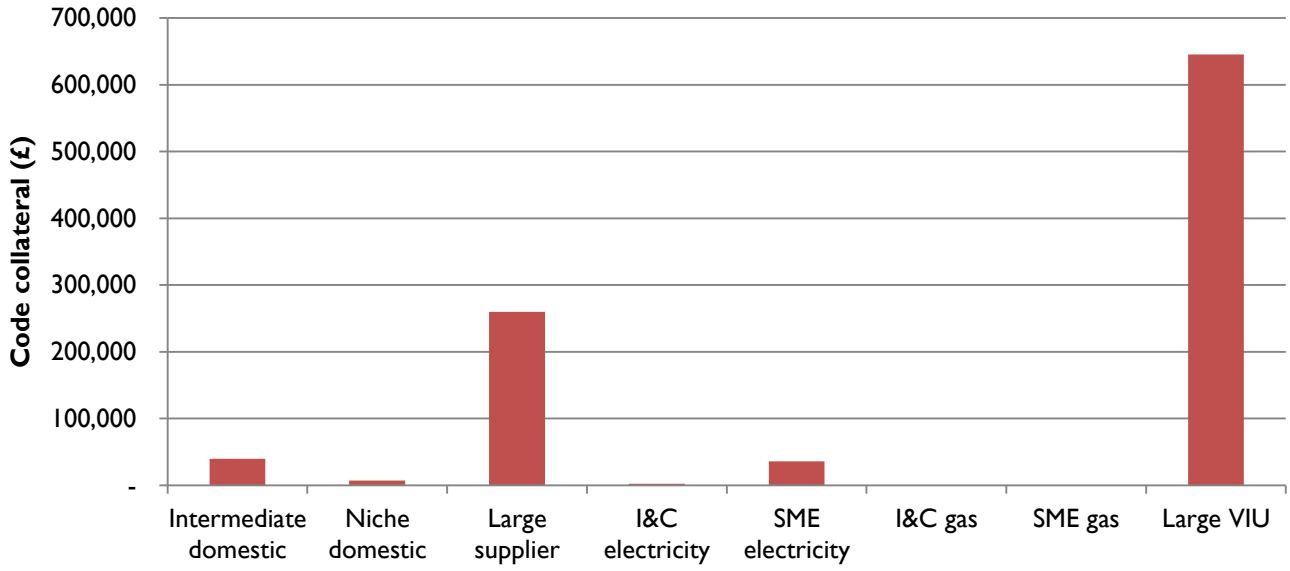


Table 10.6: DCC estimated collateral amounts, supplier benchmarks

Supplier	Representative year (£)
Intermediate domestic supplying electricity and gas	39,681.39
Niche domestic electricity supplier	7,214.80
Large domestic gas and electricity supplier	259,732.75
Industrial and commercial electricity supplier	2,254.62
Small and medium sized enterprise electricity supplier	36,073.99
Industrial and commercial gas supplier	-
Small and medium sized enterprise gas supplier	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	645,273.55

The collateral amounts above take into account credit cover factors based on assumed credit ratings for each benchmark. For example, the Large VIU benchmark is assumed to have a BBB+ rating and hence a 50% credit cover factor. The basis of calculating charges is a supplier benchmark's market share.

Figure 10.2 shows the annual collateral costs posted by our core supplier benchmarks under the SEC market in the representative year. The data is further set out in Table 10.7. This shows the benefit large suppliers (with strong credit ratings) receive in terms of 0% credit cover factors under the scheme.

Figure 10.2: DCC estimated collateral costs, supplier benchmarks

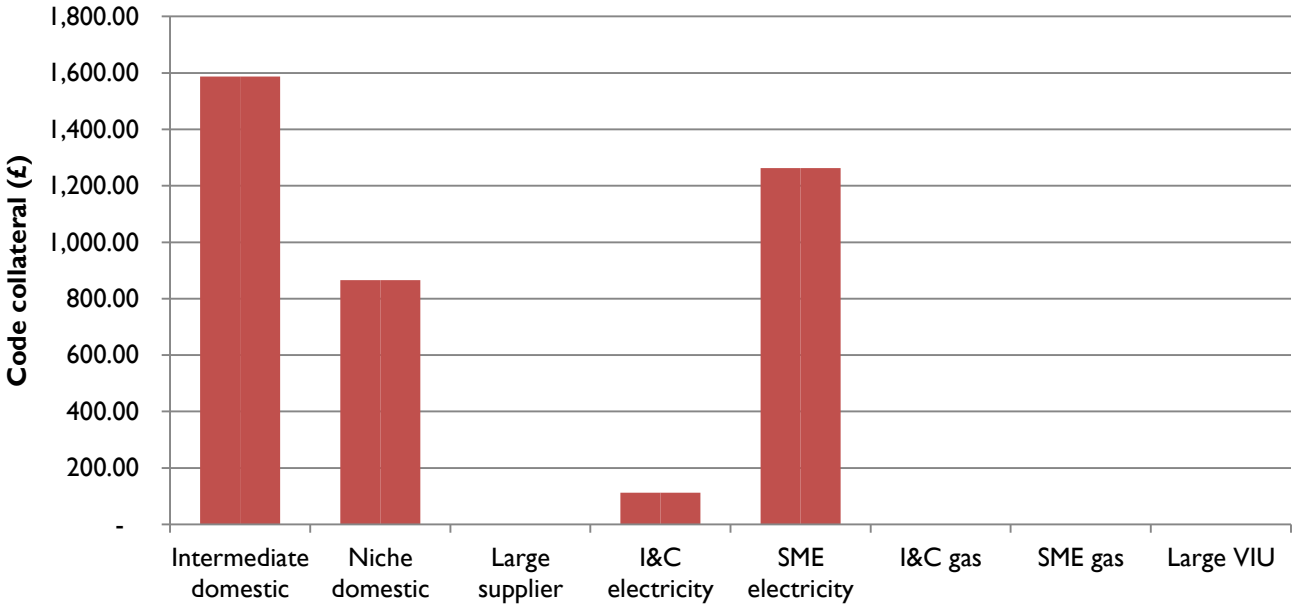


Table 10.7: DCC estimated collateral costs

Supplier	Representative year (£)
Intermediate domestic supplying electricity and gas	1,587.26
Niche domestic electricity supplier	865.78
Large domestic gas and electricity supplier	-
Industrial and commercial electricity supplier	112.73
Small and medium sized enterprise electricity supplier	1,262.59
Industrial and commercial gas supplier	-
Small and medium sized enterprise gas supplier	-
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	-

11 N2EX and APX credit rules

11.1 N2EX

N2EX is the GB power market operated jointly by Nord Pool Spot and NASDAQ OMX Commodities Europe. It is a major platform for energy trading, particularly in the day ahead market and by August 2013 had acquired 49% of volume in this marketplace. It also trades prompt and intraday and as such is likely to be a key stakeholder in the trade management and reference price determination of intermittent technology Contracts for Differences under Electricity Market Reform, and could see it play a major role in any North West European coupling adopted as part of the European Union's energy market integration programmes.

11.1.1 N2EX credit rules

N2EX impose collateral requirements on participants to the exchange, typically in the form of high quality collateral being either letter of credit or cash. Firstly, there is base collateral, required to be posted ahead of trading to limit N2EX exposure to overnight risk before settlement of a trade. It is based on the expected cost of default for failure to close out a contract before the posting of collateral on the day of settlement or delivery, or the taking of the same risk on non-clearing days (such as weekends or bank holidays). The base collateral must be either cash held in the participant's collateral account with N2EX or through a letter of credit/bank guarantee.

The base collateral call is up-front minimum collateral to be posted before trading can commence, and each member is obliged to estimate its own base collateral call in co-operation with the clearinghouse.

The base collateral call is designed to limit the clearing house's overnight risk for the expected cost of closing out a defaulting member's contracts, which are not collateralized until the next clearing day, and typically covers:

- the risk of tradable contracts where collateral is due the next clearing day; and
- the risk during non-clearing days (weekends and long holidays).

The base collateral call for a buyer (net long position) covers the overnight market risk and settlement risk. For a seller (net short position) the base collateral call covers overnight market risk and delivery risk.

11.1.2 How is the base collateral call calculated?

The base collateral call is calculated according to the following:

base collateral long = daily overnight position long (MWh) * volatility long(£) * day factor long

base collateral short = daily overnight position short (MWh) * volatility short(£) * day factor short

Where:

- daily overnight position(MWh) is to be decided by the participant;
- volatility long= £90 at launch of N2EX (changed to £75 from 14 October 2010);
- volatility short= £150 at launch of N2EX (changed to £125 from 14 October 2010);
- day factor long = 3 at launch of N2EX; and
- day factor short = 3 at launch of N2EX.

The final base collateral call is determined as the highest amount of the results from the calculations above. The clearing house expects that each participant sets a base collateral level which is not changed on a regular basis.

The base collateral call must be covered by cash on the cash collateral account, and/or through an on demand bank guarantee/letter of credit, as defined in the N2EX collateral agreements.

Table 11.1: Rating requirement based on geographical areas

Area	Lowest credit rating level accepted
Nordic (NO, SE, FI and DK)	BB-/Baa3 (S&P and Moody's**)
EU (EX GIIPS*)	BBB-/Baa3 (S&P and Moody's)
PIIGS and "Rest" OECD	A-/A3 (S&P and Moody's

*GIIPS countries: Greece, Ireland, Italy, Portugal and Spain

**NOMX'S rating requirement is based on S&P and Moody's

Table 11.2: Maximum issued amount per member per rating level

Area	Maximum issued amount per
AAA/Aaa	Unlimited
AA+/Aa1	1,000,000,000 EUR
AA/Aa2	1,000,000,000 EUR
AA-/Aa3	800,000,000 EUR
A+/A1	600,000,000 EUR
A/A2	400,000,000 EUR
A-/A3	400,000,000 EUR
BBB+/Baa1	100,000,000 EUR
BBB/Baa2	50,000,000 EUR
BBB-/Baa3	10,000,000 EUR

Account holders may choose to provide collateral through any one, or a combination, of the forms of collateral allowed by the collateral agreements. All collateral arrangements are subject to the approval of NOMX. Unless as otherwise specified in the clearing rules, the collateral posted by each account holder will apply jointly and severally to all its clearing accounts.

Each Account Holder must at its own cost establish and maintain at least one cash collateral account. Cash collateral accounts must be held with a bank that has been approved with NOMX for such purpose. In approving a bank NOMX may require that the holding bank for the cash collateral account has an adequate credit rating (to be determined by NOMX), that the cash collateral account is held in a jurisdiction acceptable to NOMX, that it facilitates automated balance requests from NOMX, and that it otherwise has an account setup and surrounding systems which in the opinion of NOMX are compatible with the cash collateral account arrangements. Notwithstanding the foregoing, individual cash collateral accounts may not be held with the account holder itself or an affiliate.

NOMX may at any time reject and/or depreciate the recognised value of any collateral (or parts thereof) from individual collateral providers if it:

- has reasonable cause to believe that the collateral provider, or any affiliate of the collateral provider, is subject to an Insolvency Event that could reasonably affect the anticipated realisation value of, or NOMX's security interest in, the relevant collateral;
- deems that the credit rating of the relevant collateral provider and/or Settlement Bank is no longer acceptable to it; or
- becomes aware of any other circumstances that may have adverse effects on the anticipated realisation value of, or NOMX's security interest in, the applicable collateral.

There are two further components of trading to be directly collateralised – the margin call (or the "mark-to-market" risk of any open trading position) and an extraordinary margin call. Letters of credit may be used to cover the margin call element, but a level of cash must be posted to cover the extraordinary margin call element.

11.2 APX

APX is one of Europe's major providers of power exchange and clearing services for the wholesale market, operating transparent platforms in the Netherlands, the United Kingdom and Belgium. APX provides exchange trading, central clearing and settlement and benchmark data and industry indices distribution services to over 150 members from more than 15 countries. Belpex SA of Belgium is a 100% subsidiary of APX.

APX Power UK was established in 2000 as the first independent power exchange in the UK. Today APX Power UK offers an anonymous 24/7 marketplace for integrated trading, clearing and notification for spot and prompt power contracts as well as an anonymous auction for Day-Ahead contracts. APX is the central counterparty to all spot market trades; all contracts are traded anonymously, then cleared and settled on behalf of members. The exchange also provides OTC Broker Clearing services for its Power UK products.

11.2.1 APX credit rules

APX will, in accordance determine the member's approved credit limit by reference to a complicated formula that aims to capture a members net indebtedness (Net Exposure) at any one time across invoiced and uninvoiced settlements and "mark-to-market" exposures. APX reserve the right to change the method of calculation from time to time.

APX will then keep the member informed of its approved credit limit. Each member is required to provide APX with collateral in the form of cash transferred to the member account (or, if the member does not have a member account, the collateral account). In addition, APX may, in its sole discretion, accept collateral in the form of a bank guarantee or a letter of credit (such letter of credit being in a form satisfactory to APX).

A bank guarantee must be issued by a bank approved by APX. The creditworthiness of collateral proposed or provided to APX shall be determined by reference to any of the following, and other, factors, at APX's discretion:

- long-term credit rating(s) from Moody's or S&P rating agencies; and/or
- bank and other references; and/or
- corporate history and public records; and/or
- audited financial statements.

The amount of collateral shall at all times be at least equal to the net exposure of the member.

APX has the right to demand supplementary collateral in cash from a member at any time if APX concludes that its risk assessment gives rise to a need for it and/or if APX in its sole discretion deems appropriate in order to protect the interests of the other members, APX and/or the integrity of APX.

The member may, subject to the approval of APX, meet such a demand for supplementary collateral by increasing the coverage of an existing bank guarantee or by providing APX with a bank guarantee or an additional bank guarantee.

APX may charge the member a collateral fee for the processing and management of collateral and the member shall be liable for any costs charged by any bank to APX or any other third party in respect of the administrative process of collateral and these shall subsequently be charged by APX to the member.

Where the member's net exposure exceeds at any time its approved credit limit, APX may issue in writing a demand setting out the action that APX reasonably requires the member to take in order to remedy the situation. This might include

- provide, within one business day, collateral acceptable to APX in an amount equal to the difference between the member's approved credit limit and its net exposure; and/or
- withdraw all or any orders posted by the member.

If the member does not comply APX may withhold amounts otherwise payable in accordance with the terms of the APX Rules to the member in order to reduce the member's net exposure.

APX shall be entitled to initiate a draw upon a member's collateral if:

- a member has not paid in full all amounts owed by it to APX or ENDEX under these APX Rules or the Gas Trading Rules on a due date;
- in respect of a power member an event of default has occurred;
- in respect of a gas clearing member, such gas clearing member is in default of its obligations under these APX Rules and/or the gas trading rules and/or its obligations under the rules of any other exchange, trading platform or clearing house; or
- if the collateral is in the form, in whole or part, of a bank guarantee or a letter of credit, that Bank Guarantee or letter of credit expires or terminates in accordance with its terms within the next 30 days and that bank guarantee or letter of credit has not been renewed, replaced or extended to APX's reasonable satisfaction.

If drawings under the defaulting members collateral are insufficient to cover their liabilities then other members (aside from National Grid Electricity Transmission PLC (NGET) or National Grid Gas PLC) shall, within one business day of receipt of an invoice from APX, pay to APX amount(s) their default contribution which are calculated in proportion to the members share of total spot trades as at the time of the default.

12 Appendix A—Glossary

Actual energy indebtedness (AEI)	This is an estimate of trading charges for a given settlement period expressed in MWh. It is calculated from five working days after a settlement day using the interim information (II) run data. It replaces the CEI (and MEI) for those particular settlement periods.
APX	APX is one of Europe's major providers of power exchange and clearing services for the wholesale market, operating transparent platforms in the Netherlands, the United Kingdom and Belgium. APX provides exchange trading, central clearing and settlement and benchmark data and industry indices distribution services to over 150 members from more than 15 countries. Belpex SA of Belgium is a 100% subsidiary of APX.
Backwardation	A situation that occasionally occurs in futures or options markets, whereby current commodities or contracts with an earlier maturity date have a higher value than contracts with a later maturity date (opposite of contango).
Balancing mechanism (BM)	A market-based mechanism that enables National Grid to instruct generators and suppliers to vary electricity production or consumption close to, or in real time, in order to maintain safe operation of the system.
Balancing mechanism reporting agent (BMRA)/Balancing mechanism reporting service (BMRS)	The body providing data on the BM to the market via dedicated links and www.bmreports.com The service the BMRA provides.
Balancing services adjustment data (BSAD)	Available from the Balancing Mechanism Reporting Service and used in the determination of electricity imbalance prices.
Balancing services use of system (BSUoS)	Charges that are paid by electricity suppliers and generators based on the energy taken from or supplied to the National Grid system in each half-hour settlement period. It varies for each settlement period.
Balancing mechanism unit (BMU)	A subset of electricity generation or consumption that is registered to a supplier or generator under the terms of the BSC. BM units do not need to participate in the BM. A BM unit is typically the smallest available collection of meters with half-hour metering. On the generation side it may be a single combined cycle gas turbine module or a generator set (a powered electricity generator).
Balancing mechanism window	A period during which National Grid Electricity Transmission can instruct suppliers and generators to deliver bids and offers in the balancing window. The total period in which bids and offers can be instructed starts from one hour before gate closure and ends at the end of the half hour to which the bids and offers relate until the end of the half hour period after gate closure.
Balancing & Settlement Code (BSC)	Electricity industry code covering the rules for the balancing mechanism and the settlement of imbalance charges in GB.

Balancing and Settlement Code company (BSCCo)	Elexon is known as the BSCCo. It administers the BSC.
Balancing service charge	The charge applicable to a customer's adjusted electricity imbalance volume when Daily Balancing Service (DBS-1) is being utilised.
Bilateral contract	A bilateral contract is a reciprocal arrangement between two parties where each promises to perform an act in exchange for the other party's act. Each party is an (a person who is bound to another) to its own promise, and an obligee (a person to whom another is obligated or bound) on the other party's promise. A bilateral contract specifies a duty to act in exchange for another party's duty to act.
Bilateral Embedded Generation Agreement (BEGA)	The BEGA Agreement sets out provisions for generators to comply with CUSC, Grid Code and Balancing & Settlement Code. It will offer to customers who have requested access to the GB transmission system but are not directly connected to it. It is applicable to embedded generators wishing to export onto the GB transmission system.
Bilateral Embedded Licence Exemptible Large Power Station Agreement (BELLA)	BELLA was implemented by Ofgem under BETTA in 2005. The BELLA Agreement sets out provisions for generators to comply with both CUSC and Grid Code. The agreements does not commit users to adhere to the BSC as a BELLA does not provide customers rights to operate in the electricity balancing market.
British Electricity Transmission and Trading Arrangements (BETTA)	A plan to create a single electricity market in GB, introduced on 1 April 2005 and based on the NETA (New Electricity Trading Arrangements) mechanism, which has been in operation in England and Wales since March 2001.
Capacity agreement	Capacity agreements will be limited to an annual term in the case of existing plant, three-year contracts for qualifying refurbished plant and new plant will be able to secure ten-year contracts. Projects whose construction commenced after May 2012 will have the option to be treated as new plant for these purposes.
Capacity Market (CM)	The Capacity Market is proposed to be introduced to ensure that there is sufficient supply of electricity to meet both consumer and business electricity demand, and to ensure adequate capacity flexibility to cope with the changing electricity mix. The system will operate predominantly on the basis of a forecast of future capacity needs, four and a half years ahead of the relevant delivery year. The requisite amount of net capacity for such future delivery year will then be contracted through a competitive central auction four years ahead. The first four-year-ahead auction is planned for the end of 2014, with the corresponding year-ahead auctions starting from 2017. The first new capacity contracted under this mechanism would deliver capacity over winter 2018-19.
Capacity Market unit (CMU)	A CMU is a unit of electricity generation capacity or demand reduction that can but put forward in a future Capacity Market auction. It is a product that forms the capacity to be purchased in the Capacity Market

Capacity Market settlement body	The CMSB will make capacity payments and retain accountability and control of the Capacity Market settlement process.
Capacity payment	The payment for providing capacity within the market whereby the provider commits to providing a certain amount of electricity to be delivered when required within the delivery year.
Cash call limit	A provision limit whereby large losses can be collected from reinsurers, rather than paid by the insurer on an account or from funds withheld or a loss escrow account.
Central Electricity Generating Board (CEGB)	Established when the UK electricity industry was nationalised in 1947. The present electricity market in the UK was built upon the breakup of the CEGB during the 1990s into three generating companies and the National Grid company. The three generating companies were Powergen, National Power and Nuclear Electric. The first two were privatised in the early 1990s and the latter was held in public ownership for several years before combining with Scottish Nuclear and privatised as British Energy. A proportion of the CEGB's nuclear fleet, its older Magnox rectors remained in public ownership as Magnox Electric and were later combined with BNFL. Powergen is now owned by the German utility company E.ON. National Power split into a UK business, Innogy, now owned by the German utility company RWE, and an international business International Power.
Collateralisation	Property or other assets that a borrower offers a lender to secure a loan. If the borrower stops making the promised loan payments, the lender can seize the collateral to recoup its losses. Because collateral offers some security to the lender in case the borrower fails to pay back the loan, loans that are secured by collateral typically have lower interest rates than unsecured loans.
Contracts for Difference (CfD)	CfD is the new support framework for low-carbon generation in the UK and will be introduced under powers contained in the 2013 Energy Act and secondary legislation passed during the course of 2014. It is anticipated that the first CfDs will be signed late 2014.
Contract for Difference counterparty	Acts as counterparty, administers CfDs and manages supplier obligations.
Combined-cycle gas turbine (CCGT)	A modern form of gas-fired power station that is able to reach high thermal efficiencies (typically in the 45%-60% range) by combining the use of a steam-raising boiler and turbine with an exhaust gas turbine.
Combined heat and power (CHP)	A technology where heat or steam produced in power generation is used either for space or water heating or to drive an industrial process (e.g. paper production). Potentially leads to very high efficiency ratings. The term is largely interchangeable with co-generation.
Commodity charge	A charge in respect of the use of the system determined by the quantity of gas flow at a certain point.
Company administered	In a pool of aggregated customer volumes administered by National Grid

balancing pool	under daily balancing service for customers who are not members of a third-party pool.
Credit assessment energy indebtedness	The credit assessment energy indebtedness is the net energy contribution determined to be allocated to a trading party for settlement periods.
Credit assessment price (CAP)	CAP is a parameter set by the BSC Panel and subject to periodic review. The CAP is a notional value of 1MWh of energy that is used in determining a party's energy indebtedness and amount of energy credit cover and hence adequacy of credit cover.
Constraint management services	Services in relation to the management of capacity rights by National Grid in order to maintain system pressures within safe limits.
Contango	The situation in a futures market where prices for future delivery are higher than prices for immediate (or nearer) delivery (opposite of backwardation).
Contract Price	The price for your energy consumption as agreed in your contract. This could be a fixed or flexible price depending on your type of contract.
Connection & Use of System Code (CUSC)	The contractual framework for connection to, and use of, National Grid's high-voltage transmission system and the high-voltage systems in Scotland.
DBRS Ratings Limited	Formed in 1976, DBRS provides credit rating opinions that offer insight and transparency across a broad range of financial institutions, corporate entities, government bodies and various structured finance product groups.
Data & Communications Company	The DCC will provide the shared infrastructure necessary for smart meters to operate consistently for all consumers, regardless of their energy supplier. They perform this function and interface with energy suppliers through the terms of the Smart Energy Code (SEC).
Default balancing service	Where a third-party pool has selected pipeline balancing services, other than the company's balancing services, and the pipeline balancing services do not cover the entire imbalance of the pool. National Grid will provide company balancing service for the remainder of the imbalance at maximum rates, as specified in the daily balancing service rate schedule.
Department of Energy & Climate Change (DECC)	DECC was formed in 2008 from the energy division of BERR and parts of DEFRA. Some references to BERR still exist and some energy related publications still reside on the BERR website, although the responsibility now resides with DECC.
Deposit deed	The method of pledging as security for a loan.
Directed recovery steps	The plan used by a company for its recovery from a bad financial position.
Distribution Connection & Use of System Agreement (DCUSA)	DCUSA was established in October 2006 as a multi-party contract between the licensed electricity distributors, suppliers and generators of Great Britain. It is concerned with the use of the electricity distribution systems to transport

	electricity to or from connections to them. It is a requirement that all licensed electricity distributors and suppliers become parties to the DCUSA. Under the DCUSA, charges are payable by generators and suppliers to distribution network operators (DNOs) for connecting to and using, the electricity distribution networks in accordance with the terms the distribution licence.
Distribution network (DN)	An administrative unit responsible for the operation and maintenance of the local transmission system (LTS) and <7barg distribution networks within a defined geographical boundary. There are currently eight DNs, each consisting of one or more LDZs, supported by a national emergency services organisation.
Distribution network operator (DNO)	The operator of an electricity distribution network.
Distribution system	A network of mains operating at three pressure tiers: intermediate (2barg to 7barg), medium (75mbarg to 2barg) and low (less than 75mbarg).
Distribution use of system (DUoS)	Charges that are levied by host distribution companies to electricity supply companies to cover the cost of distributing electricity to their customers. Half-hourly DUoS systems calculate site specific bills for large organisations where their energy consumption is significant on a half-hourly basis.
Electricity balancing	National Grid procures balancing services in order to balance demand and supply and to ensure the security and quality of electricity supply across the GB transmission system. In accordance with the transmission licence, National Grid is required to establish and publish statements and guidelines on balancing services.
Elexon	Elexon implemented and developed one of Great Britain's largest energy industry codes, and continue to handle its day-to-day governance. It also procures and manages contracts for the systems and processes it manages.
Energy Balancing Credit Rules	The EBCR are the rules established by National Grid NTS dated 1 March 1996. They provide for the specified forms and the basis on which a user may secure their indebtedness in respect of Energy Balancing Charges. The indebtedness covers amount invoiced for and unpaid and cumulative un-invoiced indebtedness or accruals. The primary purpose of collateral posted is to cover the risk of unsecured loss in relation to user's financial exposure as a result of their gas energy balancing positions, and hence to ensure the costs of balancing are adequately covered. Under the Energy Balancing Credit Rules users are required to collateralise up to the level defined by the secured credit limit. This represents the value of the security provided by a user, which in the event of a default may be realised to meet its outstanding energy balancing indebtedness.
Energy contract volume aggregation agent (ECVAA)	The ECVAA collates and provides to the settlement administration agent all energy contract volume and metered volume reallocation data. If a party enters Credit Default, where a party will potentially be in default of the Balancing & Settlement Code. A notice will be published by ECVAA.

Energy contract volumes notifications (ECVNs)	ECVNs notify the ECVAA of volumes of energy bought and sold between two energy accounts. These accounts can belong to separate parties or the same party.
Energy credit cover (ECC)	ECC ensures that, should a trading party default, sufficient collateral is available to pay these debts.
Energy indebtedness (EI)	The actual energy indebtedness is the net energy contribution determined to be allocated to a trading party for settlement periods.
Escrow account deposit	A deed, stock, money, or written instrument, that is put into the custody of a third person by its owner, a grantor, an obligor, or a promisor, to be retained until the occurrence of a contingency or performance of a condition.
Feed-in tariffs (FiTs)	A payment made to generators of small scale renewable electricity generation for electricity produced.
Final physical notification (FPN)	The level of generation or demand that a trading party expects to generate or consume. Submitted as a ramped profile to National Grid prior to gate closure.
Funds administration agent (FAA)	Funds administration agent is responsible for carrying out the transfer of funds between payment parties for trades made in the balancing mechanism and for imbalance settlement.
Gas balancing alert (GBA)	The purpose of the gas balancing alert (GBA) is to indicate a potential requirement for demand response.
Gas distribution network (GDN)	A network through which gas is taken from the high pressure transmission system and distributed through low pressure networks of pipes to industrial complexes, offices and homes. There are eight GDNs in Britain, each covering a separate geographical region.
Gas distribution network operator (GDNO)	The operator of a gas distribution network.
Gas and Electricity Markets Authority (GEMA)	The authority is the main onshore gas and electricity regulator in GB. GEMA is in effect the executive board of Ofgem.
Government Banking Service (GBS)	The Government Banking Service was established in April 2008 and is the banking shared service provider to government and the wider public sector. It is part of HM Revenue & Customs (HMRC) and incorporates the Office of HM Paymaster General (OPG) who had provided banking services to the public sector since 1836. It is responsible for holding the working balances of Government Departments and other public bodies.
High-voltage direct current (HVDC) cabling	HVDC cabling is underground cabling that can carry medium and high power (from 100MW to 1,00MW) over distances over 50km. This is often used in submarine applications for connecting offshore wind farms to land.

I&C electricity supplier	An electricity supplier who supplies both industrial and commercial customers.
Impact assessment for electricity market reform	The assessment made for the electricity market reform with regard to cost and the impacts these would have on all those involved directly or indirectly in the market. It covers ROs and FiTs.
Insolvency reserve fund	A fund accessible when a company becomes insolvent.
Levy control framework	An overall cap on consumer expenditure on supporting government policies, including the RO, small-scale FiTs and CfD FiTs. Its purpose is to make sure that DECC achieves its fuel poverty, energy and climate change goals in a way that is consistent with economic recovery and minimising the impact on consumer bills.
Levy exemption certificates (LECs)	LECs provide supplies with evidence needed to demonstrate to HMRC that electricity supplied to UK business customers is Climate Change Levy exempt. The electricity has been produced from designated renewable sources which can be bundled with the power when sold to a supplier.
Letter of credit	A letter from a bank guaranteeing that a buyer's payment to a seller/creditor will be received on time and for the correct amount. In the event that the buyer is unable to make payment on the purchase, the bank will be required to cover the full or remaining amount of the purchase.
Local asset reuse factor (LARF)	For each attributable component listed by a transmission operator. LARF is the estimate of the percentage of component that could be reused should the attributable generator cancel their project. LARF is an approximation of asset reuse that does not vary through the construction programme
Local distribution zone (LDZ)	A geographic area supplied by one or more NTS off-takes. Consists of LTS and distribution system pipelines. There are 12 LDZs which take gas from the high pressure transmission system for onward distribution at lower pressures.
Local transmission system (LTS)	A pipeline system operating at >7barg that transports gas from NTS off-takes to distribution systems. Some large users may take their gas direct from the LTS.
Main integrated transmission system (MITS)	MITS is defined as comprising all 400 and 275kV super-grid elements of the onshore Great Britain transmission system and, in Scotland the 132kV elements of the onshore transmission system operated in parallel with the super-grid.
"Mark-to-market"	A measure of the fair value of accounts that can change over time, such as assets and liabilities. "Mark-to-market" aims to provide a realistic appraisal of an institution's or company's current financial situation.
Metered energy indebtedness (MEI)	This is based on metered volumes received two working days after a given settlement day. It compares these volumes to the contracted volumes submitted to provide the parties imbalance volume, which is the MEI. MEI is only calculated for credit qualifying BM units.

Metered volume reallocation notifications (MVRNs)	MVRNs notify the ECVAA when the energy flowing to or from a particular BM unit is allocated to one or more different party's energy accounts for the purpose of energy imbalance calculations.
Mutualisation	The process of changing a firm's business structure so the owners of the company are eligible to receive cash distributions from the company in direct proportion to the amount of revenue the company earns from each member. This form of business structure is also known as a cooperative in some jurisdictions.
N2EX	N2EX is the GB power market operated jointly by Nord Pool Spot and NASDAQ OMX Commodities Europe. It is a major platform for energy trading, particularly in the day ahead market and by August 2013 had acquired 49% of volume in this marketplace. It also trades prompt and intraday and as such is likely to be a key stakeholder in the trade management and reference price determination of intermittent technology Contracts for Differences under electricity market reform, and could see it play a major role in any northwest European coupling adopted as part of the European Union's energy market integration programmes.
National balancing point (NBP)	The UK NBP gas market us Europe's longest established spot-traded natural gas market. The price of the UK NBP is widely used as an indicator for Europe's wholesale gas market. It is the virtual location for the sale, purchase and exchange of UK natural gas.
National Grid	Owner and operator of the gas and electricity network in the UK.
National Grid Electricity Transmission (NGET)	The electricity transmission licensee in England and Wales.
National Grid Gas (NGG)	The gas transmission licensee in England and Wales.
New Electricity Trading Arrangements (NETA)	A system of wholesale electricity trading introduced in March 2001 to replace the electricity pool. NETA is based on the assumption that free markets should be introduced to as many areas of the electricity system as possible and that the system operator's direct control of generation and production should be limited to the minimum necessary to meet safety requirements, primarily through the balancing mechanism. It was replaced by BETTA on 1 April 2005.
Non-registrable deposit deed	A deed containing terms (i.e. protection from default) relating to the depositing of cash that can be for an amount that is either part or all of the agreed secured credit limit.
NPV	Net present value (NPV) is the discounted sum of future cash flows, whether positive or negative, minus any initial investment.
Ofgem	Regulator of the electricity and gas markets in Great Britain.
Parent company guarantees (PCGs)	A company that controls other companies by owning an influential amount of voting stock or control. Parent companies will typically be larger firms that

	exhibit control over one or more small subsidiaries in either the same industry or other industries. The guarantee is provided by the parent company on behalf of its subsidiary.
Performance guarantees	A performance guarantee is provided against the performance of the project for which financing is requested
Power purchase agreement (PPAs)	Under these agreements the off-taker will assume balancing services on behalf of the generator, subsuming the output of the generating station as part of its overall portfolio that is then exposed to the terms of the BSC. In return for this, a discount is typically charged on the indexed market value of different benefits sold to the off-taker by the generator.
Pre-payment agreement	An agreement between the transporter and the user that is legally enforceable with the purpose of enabling a user to make payments of amounts calculated on a monthly basis by the GDNO.
Reserve fund	A company that controls other companies by owning an influential amount of voting stock or control. Parent companies will typically be larger firms that exhibit control over one or more small subsidiaries in either the same industry or other industries.
Revenue asset value (RAV)	The value ascribed by Ofgem to the capital employed in the licensee's regulated distribution or (as the case may be) transmission business (the 'regulated asset base'). The RAV is calculated by summing an estimate of the initial market value of each licensee's regulated asset base at privatisation and all subsequent allowed additions to it at historical cost, and deducting annual depreciation amounts calculated in accordance with established regulatory methods. These vary between classes of licensee. A deduction is also made in certain cases to reflect the value realised from the disposal of assets comprised in the regulatory asset base. The RAV is indexed to RPI in order to allow for the effects of inflation on the licensee's capital stock.
Renewables obligation (RO)	The Government's main policy measure to encourage the development of electricity generating capacity using renewable sources of energy in the UK.
Renewables obligation certificate (ROC)	Certificate issued by the regulator to generators who demonstrate that they have issued one MWh or renewable electricity.
Secured credit limit	A secure credit limit is backed by collateral such as a business or an existing project.
Smart Energy Code (SEC)	An industry code that all suppliers must accede to and comply with if they wish to use DCC services.
Smart Metering Implementation Programme (SMIP)	SMIP is the governments planned programme to have smart meters and advanced meters in all domestic and small businesses between 2015 and 2020.
Statement of works (SOW)	SOW process is used to indicate whether a connection by a distributed

	generator will have a significant impact on the national electricity transmission system.
Supplier Obligation	The obligation on electricity suppliers to recover the costs of the CfD FiT scheme through a levy on their customers.
Supply off-take quantity (SOQ)	The maximum daily consumption at a supply point
Transmission Network Use of System (TNUoS)	Charges that are paid to National Grid by those generators and suppliers who are considered to have used the electricity transmission network to transport energy. The charges vary for both generators and suppliers according to their geographic location and the demand for grid usage at that location.
Tolling arrangements	A contract where the buyer reserves the tight to take the output from an electricity generation asset by paying a pre-determined premium to the asset owner.
Trading charges	Charges incurred from trading within the market.
Trading parties	Parties involved with trading within the energy market.
Uniform Network Code (UNC)	The UNC is the legal and contractual framework for the supply and transport gas. It has a common set of rules which governs balancing of the gas system, network planning, and the allocation of network capacity.
User's credit cover factor	This is determined by a credit rating other than where the supplier has failed to pay invoiced charges by their due date on three or more occasions during the 12 months preceeding the date on which the credit cover factor is being determined. In that instance the user's credit cover factor defaults to 100%.
Value at risk (VAR)	A statistical technique used to measure and quantify the level of financial risk within a firm or investment portfolio over a specific time frame. VAR is used by risk managers in order to measure and control the level of risk which the firm undertakes. The risk manager's job is to ensure that risks are not taken beyond the level at which the firm can absorb the losses of a probable worst outcome.
Weighted average cost of capital (WACC)	A calculation of a firm's cost of capital in which each category of capital is proportionately weighted. All capital sources - common stock, preferred stock, bonds and any other long-term debt - are included in a WACC calculation. All else equal, the WACC of a firm increases as the beta and rate of return on equity increases, as an increase in WACC notes a decrease in valuation and a higher risk.
Xoserve	A joint venture delivering transportation transactional services, owned by the five major GDNs and NGG.