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Strategic energy market intelligence

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Credit and collateral in the GB energy markets

Phase 2

Assessment of change options

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Control sheet

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1 Introduction and summary

This Section explains the purpose of this report, the approach adopted to assess the options and briefly summarises the key findings.

1.1 Objectives

1.1.1 Scope

The Department of Energy and Climate Change (DECC) Energy Markets and Consumers Team commissioned Cornwall Energy in December 2013 to deliver two objectives:

- Objective (1)—conduct a review of current and anticipated credit and collateral arrangements in the GB energy markets; and
- Objective (2)—assess less burdensome but proportionate alternative options to the current requirements imposed by the government, market regulators and industry codes only.

To address Objective (1) Cornwall Energy produced a report entitled *Credit and Collateral in the GB Energy Markets* (the Phase 1 report) dated June 2014. The Phase 1 report:

- established the segmentation of credit by amount and cost, by different rules, codes and orders, and by current requirements;
- assessed the impact of credit arrangements on different types of market participants;
- quantified the inter-relationship between different forms of credit and collateral and their application under different frameworks; and
- considered how the overall burdens of credit and collateral might be impacted by known future policy changes.

This report (the Phase 2 report) addresses Objective (2) by:

- focussing on potential options for alternative credit arrangements based on the findings of the Phase 1 report; and
- creating a framework of alternative approaches that could be used to inform more detailed work with relevant stakeholders on how options that are attractive in principle might be taken forward in practice.[1]

Table 1.1 sets out the frameworks referenced in the Phase 1 report that are in scope of the Phase 2 report.

Table 1.1: Phase 2 report scope

In scope	Out of scope
Balancing and Settlement Code	Contract for difference (CfD), Capacity Market
Connection Use of System Code (CUSC), Distribution and Use of System Code (DCUSA), Unified Network Code (UNC) transmission and distribution	Smart Energy Code (SEC)
UNC balancing	Exchange and bilateral power and gas trading

[1] The Phase 2 report does not seek to set out all of the detailed implementation considerations for the alternative options. This would necessitate considerable work with industry stakeholders, code administrators and the regulator.

We have treated the SEC as out of scope in this report, despite it being an operational code at the date of publication. Given the infancy of the code's rules there is very limited experience of the operational application of it and therefore of the potential challenges. A full assessment of the impacts of the scheme inevitably requires estimates and assumptions to be made about the shape of the market, which might change in the future. From an analytical perspective the SEC has much more in common with the CfD and Capacity Market and we therefore believe it should be treated in the same manner for Phase 2.

1.2 Phase 1—main findings

The main findings of the Phase 1 report as they apply to the scope of Phase 2 are set out below:

- credit burdens fall heaviest on suppliers.

  Generators are less exposed due to the reduced exposure of their business to credit demands across different frameworks.

  Of the suppliers, large suppliers are less exposed to collateral costs than smaller, independent suppliers by virtue of the benefits of vertical integration, the ability to post Parent Company Guarantees (PCGs) as credit or acquire unsecured allowances based on their strong rating, and the cheaper financing costs;

- new entrant suppliers feel the burdens most of all.

  Collateral demands for new market supplier entrants, who enter with limited customers in supply, are immediate and relatively large. They also endure—at least until the new entrant supplier achieves a good payment record, but frequently much longer.

  A working capital squeeze is created by the combination of setting collateral requirements against a future expectation of market activity, and access to credit and pricing of credit being set against the relatively fragile financial standing of the respective new entrant. The ability to manage this squeeze through pricing of tariffs and contracts to customers is limited;

- acquisitive new entrants to the energy supply market face similar demands**.**

  Given their scale of existing operation they are better able to manage these than new market entrants. Nonetheless, these demands impose important additional costs relative to their peers, which might dilute their ability to compete effectively unless they can gain an advantage through economies of scale and/or benefit from relatively cheap financial support. This situation lends itself to acquisitive new entrants tending to come from established energy market participants in other countries;

- balancing activities are the most credit intense activities.

  For both the BSC and UNC balancing this reflects the fact that the allowable credit instruments are limited to letters of credit or cash, which are the most costly forms of credit. Furthermore, for electricity suppliers under the BSC, the prevalence of "headroom" in the credit posted reflects a degree of fear of the consequences of BSC default, and concerns about being able to comply with the complicated nature of the credit cover calculation; and

- transmission and distribution requirements are least demanding for suppliers, except for new entrant suppliers.

  Transmission and distribution frameworks permit use of unsecured credit allowances and allow PCGs to be posted as credit. Transmission and distribution credit arrangements also reward good payers and strong financial parties with large allowances of unsecured credit linked to a percentage of the Regulated Asset Value (RAV) of the relevant network operator.

  However, transmission and distribution activities are much more credit-intensive for new entrant suppliers. Given the difference in credit costs for both new entrants and acquisitive new entrants relative to their peers, the result is likely to be a higher cost for their consumers or a reduction in competitive tension in the market.

1.3 Approach

Building on these findings, this report presents a deeper evaluation of both the current set of arrangements under the BSC, UNC, CUSC and DCUSA and the alternative options.

To provide a consistent analytical framework that can be used for comparison between different options, the current credit arrangements and alternative options are assessed using an outcomes-based approach. This approach involves assessment of the alternative options to a series of desired outcomes.

These desirable outcomes are set out in Table 1.2.

Table 1.2: Desirable outcomes for energy market credit arrangements

Credit arrangements should:	This means
Avoid losses	▪ exposure of the consumer, code administrators or other non-defaulting energy market participants to the costs of bad debts is minimal; ▪ there are appropriately strong incentives for market participants to honour their payment commitments; ▪ the credit rules are capable of accommodating the changing shape of market participation over time without increasing default risks; ▪ overall levels of credit are capable of dealing with, and proportionate to, levels of liability created by historic default, but also possible default events that might occur in the future based on possible changes to the make-up of the market; and ▪ the credit rules minimise the requirements for the injection of financial support from outside the energy markets, including support through Energy Supply Company Administration (ESCA)[2].
Be relatively consistent and simple	▪ frameworks dealing with similar categories of market activity (such as those relating to balancing or those relating to transmission and distribution) are consistent in terms of methods of collateralisation, methodology for calculating credit cover, and governance; ▪ credit rules are accessible, contained in single rule books for each framework, with supporting plain English guidance materials; and ▪ methods for calculating credit cover requirements are capable of being adopted by all market participants without distortive effects based on the scale or sophistication of the systems or resources of different types of participants
Not be detrimental to competition or new entry	▪ credit arrangements do not tie up large amounts of capital across multiple participants inefficiently; ▪ they avoid higher than necessary costs or barriers to entry for new entrants; ▪ the requirements should, where appropriate, provide choice; ▪ they do not create cross subsidies, and limit uneven distribution of costs of credit on participants arising from the instruments that they are able to post; and ▪ credit rules determine burdens of credit based on a balanced assessment of a participant's probability of default and the losses resulting from default.

The assessment is supported by data analysis to quantify impacts and demonstrate the extent of the contribution to the desired outcome. We analyse the impact of options on different hypothetical benchmarks used in the Phase 1 report. A brief description of each benchmark, and the shorthand we use in charts and tables, are included in Table 1.3.

[2] Under ESCA financial support could be granted to a defaulting company that is the subject of an ESCA order with the amounts recovered from the energy sector over time. This is still external financial assistance in the first instance.

Table 1.3: Supplier benchmarks

Supplier type	Graph/table shorthand	Description
Intermediate domestic supplying electricity and gas	Intermediate domestic	An intermediate domestic supplier of both electricity and gas (in a ratio of 55:45 per customer), with 500,000 domestic customers.
Niche domestic electricity supplier	Niche domestic	A small electricity supplier to domestic customers from niche forms of generation (such as purchasing all power from green generation), with tariff offers differentiated on that basis, with 50,000 customers.
Industrial and commercial electricity supplier	I&C electricity	An electricity supplier to large industrial and commercial business customers (no domestic customers or smaller business customers), with 95 customers.
Small and medium-sized enterprise electricity supplier	SME electricity	An electricity supplier to small and medium sized business customers (no domestic customers or larger industrial or commercial customers), with 16,799 customers.
Industrial and commercial gas supplier	I&C gas	A gas supplier to large industrial and commercial business customers (no domestic customers of smaller business customers), with 1,000 customers.
Small and medium-sized enterprise gas supplier	SME gas	A gas supplier to small and medium sized business customers (no domestic customers or larger industrial or commercial customers), with 40,000 customers.
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	Large VIU	A large electricity and gas supplier (in a ratio of 60:40 per customer) to domestic and industrial and commercial customers; however, the supply arm is part of a wider business, with access to power purchasing options from their own generation fleet and through Power Purchase Agreements (PPAs) entered into with third party generators. It has 8.5mn customers.
Large domestic gas and electricity supplier	Large domestic	A large electricity and gas supplier to domestic customers (in a ratio of 60:40 per customer). It has no generation fleet as part of its wider group but has the ability to source power through writing PPAs with third party generators, with 6mn customers.

The analysis draws on evidence acquired through discussions with market participants during preparation of the Phase 1 report, including Hudson Energy, Haven Power, Co-operative Energy, Opus Energy, Spark Energy, Good Energy, First Utility, and Business Energy Solutions. These discussions focussed on credit rules under different frameworks and their related impacts.

Our Phase 1 analysis demonstrated that suppliers face the largest burden of collateral. Consequently this Phase 2 report focusses on a range of possible changes as they impact on suppliers. Impacts on generators are discussed at section 1.5.

Consistent with the Phase 1 report, the analysis in this report assumes that where any of our supplier benchmark companies have gas customers or are pure gas suppliers then they are also a gas shipper.

To inform our thinking, we have also reviewed credit arrangements in a range of international energy markets, and relevant findings are summarised in Annex M.

1.4 Options

The report divides the alternative options for credit rules into two categories:

- evolutionary alternatives—these options do not seek to alter fundamental principles of credit cover under the relevant frameworks, but refine how the credit cover requirements might be delivered. This includes changing the allowable credit instruments, or specifying qualifications and limiting factors on the amount of different instruments that are required to be posted. These options do not necessitate significant changes to legislation, code or regulations; and
- more fundamental change alternatives—these options change the principles of credit cover under the relevant frameworks. They include introducing aggregate credit arrangements across singular or multiple frameworks, or placing the responsibility for covering the risk of default on different market participants. These options would necessitate more significant changes to codes and regulations.

There are nine options in total[3]. These are shown at Table 1.4. All of the options contribute to some degree to the objective of reducing the amount and cost of credit in aggregate. Some involve a redistribution of credit amounts and costs, which could mean some types of participants could incur an increased burden, even if total credit amounts for the framework are lower.

Table 1.4: Key to options

Key
Option 1: Unsecured allowances in balancing
Option 2: Unsecured credit allowances for new entrants for transmission and distribution
Option 3: Widening pool of issuers and credit instruments in balancing
Option 4: Umbrella credit insurance for BSC and UNC balancing
Option 5: Credit pools for BSC and UNC balancing
Option 6: Credit pools for transmission and distribution
Option 7: Credit pools with parent company guarantees
Option 8: Credit pool with aggregate credit product
Option 9: Regulated credit reserves in transmission and distribution

[3] 11 options are shown in the table as some options address more than one issue.

These options are set out in Table 1:5, alongside the issue they are intended to address, their categorisation, and in which section of this report they are discussed.

Table 1.5: Summary of assessment issues, impacts and options

Framework	Identified Issue	Impact	Applicable options	Category of option	Section of report
BSC and UNC balancing	Credit cover levels are disproportionate to risk. Cost of credit cover heavily influenced by financial market changes, rather than risk of supplier.	Significant confidence in robustness of the code, but Increases cost of market participation and hampers competition.	Option 1 Option 3 Option 4 Option 5 Option 7 Option 8	Evolutionary Evolutionary Fundamental Fundamental Fundamental Fundamental	3.1 3.3 4.1 4.2 4.4 4.5
CUSC DCUSA UNC Tx/Dx	Over-prioritisation of the probability of default as a guide to credit posting, and not enough focus on losses of default. Credit arrangements introduce potential cross subsidies between participants who are secured and participants who are unsecured. Particular impact on small suppliers/new entrants	Distribution of credit postings only based on one credit metric, and does not fairly reflect total risks. Discrimination against less financially strong suppliers who face financing costs and additional credit costs if unsecured creditors default. Damaging to competition. Challenging for new entrants.	Option 2 Option 6 Option 7 Option 8 Option 9	Evolutionary Fundamental Fundamental Fundamental Fundamental	3.2 4.3 4.4 4.5 4.6

1.5 Treatment of generators

Our Phase 1 analysis demonstrated that suppliers face the largest burden of collateral, with generators collateral exposure significantly smaller by comparison. We have not undertaken modelling analysis for impacts of the change options on generators. Whether generators face material credit demands depends to a large part on whether or not they are shielded from the requirement to post credit directly through PPAs or (in the case of CCGTs) tolling agreements, which are very project specific. As a consequence, our review of options focusses predominantly on the impact of the current arrangement and alternative options on energy suppliers.

Certain options considered in this report will have impacts on generators not shielded from posting credit under balancing codes through PPAs and tolling agreements. The options of most relevance to these generators are 1, 3, 4, 5, 7 and 8, which focus on credit arrangements under the BSC and the UNC. Whilst we have not undertaken any specific modelling to support analysis of the impacts of these options on generators, our expectation is that options 1 and 3 would have a definite positive effect in terms of reducing costs of credit for all generators.

For credit pooling options 4, 5 and 7, the impact depends on whether or not generators are exposed to credit demands directly, and then the extent to which their share of trading volumes dictates their level of credit posting. Our benchmark analysis for Phase 1 revealed only very low levels of credit posting for all but the directly trading CCGT and biomass conversion plant. Indeed most independent CCGTs will reallocate their BSC volumes to large suppliers providing them with PPAs. As a result, their share of the overall trading volumes used to derive the contribution of a large CCGT plant with no PPA to a credit pool under options 4, 5 and 7 is anticipated to be relatively small.

In our view it would be reasonable to focus analysis on the impacts on larger generators not subject to PPA or tolling arrangements. Even then, data on the levels of imbalance charges for a large CCGT station show that they are lower than those of an independent supplier's.

1.6 Key concepts

Below we set out some important concepts relevant to the assessment and consideration of options:

1.6.1 Secured and unsecured credit arrangements

The report refers to secured credit and unsecured credit as a means of covering a party's credit limit. Secured credit is that portion of a party's required credit limit covered by physical instruments that attract a direct financing cost. These include letters of credit, cash, performance or bank guarantees or insurance policies. Unsecured credit is that portion of a party's credit limit that is covered by an allowance that permits a party to avoid posting physical instruments, or is covered by issuing PCGs.

1.6.2 Credit ratings agencies and independent credit assessments

Credit ratings agencies as referred to in this report are Standard and Poor's (S&Ps), Moody's and Fitch. These are agencies who credit rate large companies for the purposes of providing a risk assessment to banks, financial institutions or investors who are engaged in underwriting or buying debt (usually in the form of publically traded bonds) issued by such companies. In the energy sector, the large, vertically integrated energy companies in the GB markets all have ratings from credit ratings agencies. These are used under transmission and distribution frameworks to determine allocations of unsecured credit allowances.

Independent credit assessments as referred to in this report are undertaken by companies seeking to demonstrate to code administrators their credit strength for the purposes of securing an award of unsecured credit allowances. Such ratings companies include Experian, Dun and Bradstreet, Equifax and Graydons.

1.6.3 Proportionality

Where there is supportive data, this analysis examines proportionality in terms of the amount of credit posted in total at a framework level as a multiple of the maximum historic unpaid charges arising as a result of serious defaults under each framework.

Our method of assessing proportionality is not an established method in the energy markets; indeed there are no established methods of examining proportionality. We recognise that there are other dimensions to proportionality. A more developed approach would be to determine the appropriate coefficient between collateral and default losses. This has not been considered in this report as it would involve a much wider mathematical analysis of the relationship between credit and defaults.

In measuring proportionality we only consider the total credit posted under each framework, and not the application of rules governing use of credit. There are discretionary choices in the design of the rules as to how total levels of credit can be used to cover defaults. Whether framework rules should allow access to the total level of credit under a given framework is considered separately as part of the assessment of fundamental change options in chapter 4.

1.6.4 Cross-subsidy

In a number of places the report refers to the concept of cross-subsidy.

By this we mean a cross-subsidy from those suppliers providing cash or letters of credit to those able to benefit from unsecured credit allowances (or posting PCGs). This cross-subsidy arises as a result of the supplier benefiting from unsecured credit allowances (or securing their obligations via a PCG). If this supplier defaults the code administrators are unsecured, and it is far from certain that any money will be recovered from this type of supplier to cover their outstanding liabilities. The unrecovered sums may need to be recouped through higher framework charges over time levied on the non-defaulting parties, including those who have already paid out to finance their own credit postings. The cost of finance for letters of credit or cash borrowings increases for these same parties as a result of the general, higher perceived risk of being a participant in that segment of the energy markets. In such a circumstance, the defaulting, unsecured supplier will have enjoyed low credit costs in the period prior to default. Secured suppliers by contrast will have had to bear the ongoing cost of providing collateral, will face higher framework charges after the unsecured supplier's default, and also experience an increased cost in financing their collateral.

1.6.5 Consistency

In examining consistency between credit rules, we compare credit rules approaches within frameworks of the same broad categories. We divide the categories into two: balancing; and transmission and distribution. Balancing on the one hand, and transmission and distribution activities on the other are different.

Balancing systems are designed to derive a price for the balancing of energy production and consumption; transmission and distribution systems are designed to provide predictable revenues to transmission and distribution system operators to maintain and operate the grid. Under balancing arrangements, payments are more frequent, there is more volatility and less predictability in the level of charges. Credit rules reflect these differences.

1.6.6 New entrants and acquisitive new entrants

The report makes references to the impact of alternative credit options on two different types of new entrants into the gas and electricity markets—new entrants and acquisitive new entrants:

- new entrants refer to brand new entrants into the gas or electricity market; and
- acquisitive new entrants refer to new entry that occurs through the acquisition of an existing, established company that is operating in the gas and electricity markets.

For determining amounts and costs of credit for these two types of new entry, we have developed profiles derived from the original supplier benchmarks as introduced in the Phase 1 report. The new entrant suppliers are assumed to have 25% of the customers and volumes of their equivalent original supplier benchmark. The acquisitive new entrants have the same number of customers and volumes as their equivalent original supplier benchmarks.

Both new and acquisitive new entrant suppliers are assumed to face a premium on the original benchmark suppliers financing costs, owing to the greater risk attached to new entry. This premium is greater for the new entrant on the basis that acquisitive entrants are assumed to have a more substantial credit rating and better risk profile, given they have the capability to finance an acquisition.

1.6.7 ESCA and SoLR

The report takes into account the presence of measures such as the Supplier of Last Resort (SoLR) and ESCA (details of these schemes are set out in Annex G and Annex H respectively). The existence of these schemes is an important consideration in the assessment of the current frameworks (where rules typically predate the introduction of ESCA), and may influence any options adopted for reforming credit rules.

The objectives of these schemes are different to the objectives of framework credit arrangements. The credit arrangements are designed to minimise unsecured losses and incentivise participants to honour their payment obligations; SoLR and ESCA are primarily intended to ensure that energy supplies to customers are not disrupted by supplier insolvency. SoLR is the first line of defence, with ESCA being a contingency for where SoLR is likely to fail to achieve the objective of maintaining customer supply.

The credit objective of minimising unsecured loss and SoLR and ESCA objectives of ensuring continued customer energy supply in or after insolvency are not always complementary. For example, SoLR only commences if Ofgem is satisfied that the supplier is to be the subject of an insolvency. The transfer of a licence from a defaulting supplier to a non-defaulting supplier under SoLR ensures that future liabilities of the defaulting supplier can be met by the new supplier, but any accumulated losses and liabilities prior to the transfer date still need to be recovered. The extent of these losses depends on the time between the commencement of payment defaults and the exercise of SoLR. There are no fixed timing obligations for SoLR commencement. Without adequate credit arrangements, recovery of accumulated unpaid debt would be left to the more uncertain insolvency process.

Appointment of an energy supply company administrator through ESCA arrangements is a court process. It relies on the Secretary of State (or Ofgem with the Secretary of State's endorsement) to apply to the court for the granting of an order, based upon an informed judgement of the continuing solvency of an energy company. Such decisions are unlikely to be taken lightly in the case of a very large, international energy company. Furthermore, there is no absolute commitment by the Secretary of State to provide additional financial resources to a defaulting company to honour all of its outstanding debts under each framework and different types of market activity. This is discretionary and requires HM Treasury's approval.

In theory, it is likely that in the case of a very large supplier default, both an application for ESCA would ultimately be made and financial support would be extended if necessary. But this does not give code authorities access to a committed and liquid source of funds equivalent to credit postings, in order to deal with unpaid sums in the interim.

1.7 Summary evaluation

DECC has indicated that a final judgement on whether to take forward any of the options in this report will only be made following detailed engagement with Ofgem, the code administrators, industry participants and other stakeholders. In Table 1.4 we offer our own perspective on the summary assessment of each option against the desirable outcomes set out in section 1.3.

This represents our broad judgement of the merits and disadvantages of each option and may be used as a framework for challenge and discussion with wider stakeholders in due course.

Table 1.6: High-level summary evaluation

Option		Avoiding losses					Simplicity					Competition and barriers to entry			
No	Category	Increases risk in most circumstances but disproportionate	Increase in risk in limited circumstances but proportionate	No effect	Reduces risk in some circumstances but proportionate	Reduces risk in most circumstances but disproportionate	Very complex	Relatively complex	Neutral	Relatively simple	Very Simple	No reductions in costs differentials and barriers	Limited effect	Limited reductions in costs differentials and barriers	Large reductions in costs differentials and barriers
1	Evolutionary		✓					✓						✓	
2	Evolutionary		✓							✓				✓	
3	Evolutionary		✓								✓		✓		
4	Fundamental			✓				✓						✓	
5	Fundamental			✓			✓								✓
6	Fundamental				✓			✓							✓
7	Fundamental		✓		✓		✓								✓
8	Fundamental		✓		✓		✓								✓
9	Fundamental				✓			✓							✓

1.8 Structure of report

Following this introductory and summary chapter, the rest of this report is structured as follows:

- Chapter 2 assesses the current credit rules;
- Chapter 3 sets out and assesses the evolutionary change alternatives; and
- Chapter 4 sets out and assesses the fundamental change alternatives.

In addition there are a series of technical annexes that are included at the end of this report.

2 Assessment of current frameworks

This Section evaluates the credit and collateral arrangements across all in-scope frameworks against the criteria established in the previous section.

2.1 Baseline framework overview

Table 2.1 sets out the amounts and costs of collateral identified against each of the baseline frameworks in the Phase 1report.

Table 2.1: Frameworks amounts and collateral costs, 2011-13 average

Framework	Collateral amount annual average, 2011-13	Estimated collateral cost annual average, 2011-13
BSC (£mn)	387.2	12.1
CUSC (TNUoS, BSUoS) (£mn)	611.0	0.3
CUSC (Generator User Commitment) (£mn)	432.0	4.5
DCUSA (£mn)	435.7	8.1
UNC Tx/Dx (£mn)	1370.0	12.4
UNC Balancing (£mn)	345.1	10.5
Total (£mn)	**3581**	**47.9**

Table 2.2 sets out the summary of credit instruments permissible under the rules of the relevant current frameworks.

Table 2.2: Permissible credit instruments under in-scope frameworks

Framework	Letter of credit	Bank Grantee [4]	Cash deposit [5]	PCG[6]	Bilateral Insurance	Prepayment Agreement	Unsecured rating	Unsecured payment history
BSC	✓	×	✓	×	×	×	×	×
UNC Balancing	✓	×	✓	×	×	×	×	×
CUSC	✓	✓	✓	✓	✓	✓	✓	✓
DCUSA	✓	✓	✓	✓	×	×	✓	✓
UNC Tx/Dx	✓	✓	✓	✓	×	✓	✓	✓[7]

[4] Including Performance Bonds

[5] Including Escrow

[6] Including Independent Security Arrangements

[7] Only for the first two years of participation.

2.2 Assessment of the BSC

2.2.1 Avoiding losses

There have been several high-profile instances of payment default under the BSC, but in all cases the level of credit cover has been sufficient to ensure unsecured and unrecoverable losses have been kept to a minimum. Overall, since the BSC's inception only £9.56mn has been subject to mutualisation (hence being losses after recovery from posted credit and insolvency administrators), spread across 16 separate defaults. The highest profile examples of default are Enron Capital and Trade and Resources Limited (ECTRL), which went into administration in November 2001, and the TXU insolvency in 2002.

Enron operated a major trading operation in the GB and European power and gas markets, and as a result entered into counterparty trading arrangements with a significant number of companies in the GB energy markets. The administration triggered a default automatically under the BSC rules, as it signalled an inability to settle. As a result of the trading nature of its business, ECTRL had indebtedness under the BSC at the time of its insolvency, which continued to grow in the days following default. The letter of credit held against ECTRL was sufficient to cover this indebtedness, with a surplus left over. Elexon made proportionate drawings under the letter of credit to cover the debts as they fell due[8].

TXU was a very large, vertically integrated power and gas business in the GB market, second only to the Big Six in terms of market scale at the time of its default. In 2002, prior to its insolvency it supplied 27.5TWh of electricity, which was a c8% market share. TXU filed for insolvency in November 2002, but this was under the threat of a petition from AES, who at the time owned Drax power station and had entered into a long term offtake agreement with TXU. It was not being paid under this PPA. Elexon immediately suspended TXU's ability to trade. Unsecured losses for mutualisation under the BSC as a result of the TXU default were negligible.

In a review of credit arrangements in 2002 following the TXU defaults, Ofgem noted that the electricity trading arrangements under the BSC had proved robust to both failures, despite the complex financial structures employed by TXU.[9]

More recently, the credit rules have demonstrated an ability to cope with multiple defaults of emerging, independent suppliers in an increasingly competitive supply market. Between 2006 and 2009, three independent suppliers have defaulted. Electricity4 Business, Utility Link and BizzEnergy all became insolvent, accounting for nearly £9mn of the £9.56mn unsecured losses, with one of these insolvencies accounting for more than half of the total[10].

None of the BSC defaults have created a domino effect of serial default across other users in the BSC[11]. This situation could occur if the default of a particular party, and its failure to honour payments to other parties, or the mutualisation of unpaid liabilities across other parties, caused any other party to default. Any liabilities that have exceeded the level of the credit cover posted by defaulting parties have previously been smeared across all BSC parties through scale-down and mutualisation procedures. This has been to the financial detriment of other trading parties, but it has not caused wider BSC defaults or more widely destabilised the power market. Even when very large power businesses have defaulted, such as TXU, the BSC credit arrangements have been resilient in terms of minimising unsecured losses, with mutualisation occurring where necessary. Furthermore, all of the BSC defaults have been absorbed within the credit framework, without the need for external financial support from government.

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[8] Source: *Elexon response to Ofgem consultation in 2002, Arrangements for gas and electricity supply and gas shipping credit cover.*

[9] https://www.ofgem.gov.uk/ofgem-publications/59648/310-11march02.pdf; https://www.ofgem.gov.uk/ofgem-publications/61665/2018-14feb03.pdf

[10] Information has been provided to us on an anonymised basis so we cannot specify the counterparty.

[11] The default of TXU did however create unexpected financial costs for a number of other companies, including UK Coal, Scottish and Southern Energy, International Power and AES as a result of the commercial, commodity or offtake contracts they had entered into with these parties.

Actual annual levels of credit in the BSC between 2011-13 have ranged between £355mn to £425mn.

On these measures, there are legitimate questions arising with regard to the proportionality of the BSC credit arrangements to the risk of unsecured losses arising, and whether lower levels of credit might be collected in aggregate and deployed differently without reducing the resilience to unsecured losses. These concerns are shared amongst electricity market participants, as evidenced by recent modifications proposed for reform of the BSC credit arrangements, under the coordination of Energy UK. These aim to address the issue of over-collateralisation and costs of credit for market participants under the BSC. These are P306, P307 and P308:

- P306 proposes to allow individual parties to obtain a letter of credit from a regulated insurance company that is capable of providing security of a similar level and form as that provided by a bank;
- P307 proposes to amend the timings, triggers and thresholds in relation to credit default; and
- P308 proposes to introduce a centrally provided alternative security product as an alternative method for securing credit under the BSC, which parties could use in place of the existing requirements to provide credit cover individually[12]. We cross-refer to these modifications in section 3 and 4 where appropriate.

2.2.2 Relative consistency and simplicity

There is broad consistency between electricity balancing credit arrangements under the BSC and the gas balancing arrangements under the UNC. Both limit allowable credit to letters of credit and cash, and both are based on a time-based (a month's) calculation of charges at a counterparty level.

However, there are differences. Currently, the BSC limits the provision of letters of credit to banks. The rules do not allow letters of credit to be issued by non-bank financial institutions such as insurance companies[13]. Whilst the UNC does permit letters of credit from non-bank financial institutions (wider than merely banks), it similarly limits the terms of the letters of credit tightly. This means, even though the UNC affords some flexibility in terms of issuers, banks dominate the provision of credit under the code as they are most familiar with issuing these forms of credit.

Furthermore, the calculation of indebtedness is different under each framework. As described in the Phase 1 report, the BSC adopts a formulaic approach to calculating indebtedness for credit cover purposes. This uses both actual and forecast data across metred volumes, and charges, underpinned by assumptions (such as the Credit Assessment Price, or CAP), which are themselves subject to regular change. Despite the complexity, this allows for more real-time credit coverage of changing market conditions.

By contrast the UNC credit cover calculation is more straightforward, but arguably less responsive to changing real-time market conditions.

A new user's secured credit limit is derived from three days' non-deliverability at the 12-month average system average price. The secured credit limit is then set such that 85% of the secured credit limit (based upon an estimate of projected annual imbalance throughput) is equal to this number.

For existing users, the method of calculation is discretionary and based on past levels of secured credit limits. The limits are reviewed at least annually, or when Xoserve believes that there are reasonable grounds to conduct a review in the interim.

Finally, the BSC credit rules are documented in a single code and they are supported by plain English guidance produced by Elexon. The guidance material helps participants understand their obligations and

[12] Details on these modifications can be found here: http://www.elexon.co.uk/mod-proposal/p306/, http://www.elexon.co.uk/mod-proposal/p307/, http://www.elexon.co.uk/mod-proposal/p308/.

[13] The BSC permits letters of credit to be issued by any UK clearing bank or banks or any other bank or banks which has (have) a long-term debt rating of not less than single A by Standard & Poor's Corporation or by Moody's Investors Service, Inc. 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.

how the rules apply in practice. Under the UNC, users must be conversant with two sets of rules: the *Energy Balancing Credit Rules* established by National Grid NTS dated 1 March 1996; and *UNC Transportation Principal Document*, section X. The rules are in simpler English than the code. Both codes and supporting documentation could be made more user friendly.

2.2.3 Competition and barriers to entry

The equitable treatment of all trading parties through limiting credit instruments to letters of credit or cash does not necessarily translate into equitable burdens of cost. Historically, particularly prior to the financial crisis of 2008, the difference in financing costs of letters of credit and cash borrowing for suppliers of different financial strength was not material, absolute levels of financing costs were reasonably low, and the cost of credit for participant companies was based on a financial institution's assessment of a market participant's financial strength.

In 2009-10, the difference in the cost of financing between companies of different credit grades widened, only converging again in recent times. The primary driver of this movement was the degradation of confidence in the inter-bank lending markets, which limited the amount of capital banks had to deploy in support of their clients, driving more selective lending and a higher cost of credit. Annex A illustrates this trend in more detail.

During 2012 and 2013, Moody's Investors Services and Standard and Poor's downgraded several licensed banks. This resulted in a reduction in the number of financial institutions with an adequate credit rating to provide security on behalf of BSC trading parties. A smaller pool of prospective security providers, along with the potential for further downgrading, is unlikely to have incentivised banks and similar entities to maintain or reduce charges for providing security.

Lower credit rated suppliers are likely to have seen their relative financing costs climb, without any commensurate change to their actual business risk or risk of default. The Phase 1 report demonstrated that new supplier market entrants in particular will not have strong financial capability. This means that they would most likely feel the detrimental competitive impact of this phenomenon the most. Meanwhile, better rated companies, including large suppliers, would likely have seen a more marginal increase in their financing costs.

The financial markets have stabilised more recently. But financing costs have not returned to pre-crisis levels, with the speed of any downward correction being slower for lesser rated companies than their better rated counterparts. These circumstances may be rare, but when they happen the effect on pricing is long lasting. There could even be a transfer of increased cost to consumers of less financially able, but nonetheless financially stable, suppliers, without any change in their operating or financial performance, over a period of several years. This is a very different phenomenon to a situation in which financing costs of the same companies rise as a result of deterioration in the financial performance of their business.

In combination with the fact that letters and credit and cash are the most costly forms of collateral, there could be a case for widening the allowable forms of credit that reduce costs, and increase the pool of issuers that participants can access.

In addition, there are practical challenges for smaller suppliers in avoiding over-collateralisation under the BSC. Validation conducted in the production of the Phase 1 report highlighted a bias for prudence in the posting of BSC credit amongst smaller, independent suppliers. This is as a result of two factors: the relative complexity of the calculated indebtedness figure that drives credit cover requirements, and the considerable reputational and financial damage that would flow from the consequences for a business of either a credit or a payment default under the BSC.

At the extremes, default could see a party being unable to manage its imbalance because it can be barred from submitting further contracts. In turn this could lead to all metered volumes being subject to imbalance pricing, which can quickly lead to escalating costs and insolvency. Smaller, independent suppliers indicated that monitoring the level of indebtedness and its relationship to credit cover (and hence an awareness of

the proximity of credit defaults) is not a simple task, particularly if they do not have the manpower or systems to deploy in constantly monitoring this relationship.

As a result, smaller, independent electricity suppliers indicated that they have built in headroom into their BSC credit postings in order to avoid being caught out by a damaging BSC credit default. By contrast, larger suppliers tend to have both the scale and the experience to manage and closely monitor their balancing exposures and changes to CAP and CALF (Credit Assessment Load Factor) under the BSC[14]. Hence they will optimise their credit cover more closely to their actual exposures.

This prudence can accentuate the different in costs between large suppliers and their smaller, independent supplier counterparts[15].

2.3 Assessment of UNC balancing

2.3.1 Avoiding losses

There are limited examples to assess the robustness in circumstances of trading party default under the UNC. The most high profile and recent example of UNC balancing default relates to Lehman Brothers failure in 2008. This company was a gas trader rather than a physical and licensed shipper of gas. The default resulted in an initial unpaid UNC balancing debt of c£10mn. Following distributions from the application of securities, this was reduced to just under £5mn, meaning half the unpaid debt was recovered through the application of code security[16].

The default of Lehman's was effectively dealt with under the UNC rules and did not lead to any contagion for other parties. However, the failure to avoid unsecured loss on Lehman's default signalled possible frailties in the credit approach under the UNC, and a number of modifications were proposed to the UNC. The energy balancing credit rules were also revised. These included revising credit limits for financial institutions issuing letters of credit, and providing access to and monitoring of credit rating outlooks provided by the major rating's agencies by Xoserve.

There have been no further failures resulting in energy balancing defaults since 2008, despite the turbulent economic situation over this period. It is therefore hard to judge how effective the current rules would be in minimising unsecured losses arising from participant defaults.

In terms of proportionality of cover, the £345mn of annual average credit between 2011-13 would have provided over 30x cover over the initial unpaid balancing debt in the Lehman's example. In the absence of wider examples of default, we can examine the overall level of payment performance under the framework to illustrate the level of historic risk of unsecured losses relative to the aggregate level of security cover.

Table 2.3 sets out the percentage of payments made by due date between 2008-13. It illustrates timely payment performance of the UNC credit arrangements, and the avoidance of unsecured losses over a turbulent economic cycle.[17]

With sustained low levels of non-payment and low historic unsecured losses, there is a legitimate question as to whether the aggregate level of credit posted under the UNC is disproportionate to the risk of unsecured losses arising. It is also relevant to ask whether the lower level of aggregate credit could be adopted and deployed in a different way, without compromising the ability to cover the risk of loss.

[14] These concepts are described in further detail in Phase 1, Volume 2, Section 2.

[15] It was a regular feature of our validation sessions with market participants that our mathematical estimate of BSC credit amounts for supplier benchmarks was deemed 'light' and that this prudence bias, based on operating model, was often the reason for perceived under-allocation by our modelling.

[16] Remaining debt was then the subject of a sale at a discount. Overall, 86% of the original value of the debt was recovered with the final settlement being received and £1.5mn smeared across other market participants in March 2013.

[17] Source, *April 2014 EBCC operational report*.

Table 2.3: UNC balancing, percentage of payments made by due date

Year	Percentage paid by due date
2008	98.74
2009	99.61
2010	99.36
2011	99.26
2012	99.73
2013	99.90

2.3.2 Relative consistency and simplicity

See section 2.2.2 above.

Furthermore, at a qualitative level, and based on feedback from market participants, it is our view that the UNC rules are more easily understood and more user-friendly.

2.3.3 Competition and barriers to entry

All trading parties have to post the same collateral instruments (letters of credit and cash), regardless of financial strength or historic payment performance. However, this does not translate into equal burdens of credit financing costs. The financial market debt pricing externalities and their unequal influence on different participants' costs of credit identified under the BSC also apply to UNC balancing.

However, there is an additional factor for the UNC balancing rules that has an influence on which financial institutions participants can turn to when seeking issuers of letters of credit. The energy balancing credit rules impose maximum limits on the aggregate credit cover that can be posted by financial institutions, which flow from their approved credit rating. The matrix of limits to financial institutions ratings is set out in the Phase 1 report (*Volume 2, Section 6)*. The application of the financial institutions' exposure limits adds a further layer of protection for the code authorities, by capping the amount of credit that institutions of certain ratings can provide across all UNC balancing parties.

During 2010-13 the availability of capital in the financial institutions sector was constrained as a result of new capital adequacy and liquidity regulations[18]. Generally, financial institutions also suffered ratings downgrades on a regular basis as a result of the continued financial crisis. The approach of setting credit limits against financial institutions by virtue of their credit rating is likely to have driven trading parties towards a diminishing stock of financial institutions with the strongest credit rating—particularly once lesser rated financial institutions had reached their exposure cap. This is likely to have driven up the price of obtaining credit from this pool of financial institutions.

It is also likely that the financial institutions with headroom would have been more selective in the counterparties to which they extended credit; focussing on extending letters of credit to their largest, and most financially robust clients. Less financially strong, smaller suppliers could have faced higher costs of posting letters or at the extreme found themselves having to post cash as credit (through deposit deeds), which is a more expensive form of collateral.

The pricing of letters of credit for individual parties by different banks over this period is not known. However, we can identify a pattern of modestly increasing, then decreasing, cash credit, in particular in the period 2010-12. This is shown in Annex B. This illustrates the potential effect of bank rationing of supply of

[18] In particular, the capital adequacy and liquidity rules being introduced under the internationally accepted Basel III regulations for banks and Solvency II regulations for insurance companies.

letters of credit during this period, resulting in greater levels of credit postings being made in the form of cash.

In combination with the fact that letters and credit and cash are the most costly forms of collateral for participants to raise, there could be a case for considering the widening of allowable forms of credit under the UNC in order to reduce costs.

2.4 Assessment of transmission and distribution (CUSC, DCUSA and UNC)

Given the similarities in approaches to credit cover between transmission and distribution, this assessment considers the CUSC, DCUSA and UNC transmission and distribution credit frameworks together. We point out by exception the differences between schemes where relevant.

2.4.1 Avoiding losses

The relevant code administrators have been unable to provide quantitative data on the level of historic defaults and losses under the CUSC, DCUSA and UNC transmission and distribution arrangements. However, there have been some notable defaults with public data available on the scale of unpaid debts.

For example, Independent Energy failed in September 2000. Independent Energy operated as an electricity and gas supplier, and was one of the largest independents in the market. Following default, the customer book was eventually purchased by Innogy plc (later to become RWE npower). Notwithstanding the purchase of customers by Innogy, bad debts remained in place, reflecting a long period of financial distress before the trade sale. £19mn of debts were owed to distribution companies across both electricity and gas.

This case, together with those involving Enron and TXU, prompted Ofgem in 2002 to commence a consultation looking at whether credit arrangements between transmission and distribution in gas and electricity should be aligned with those in electricity and gas balancing, and whether it was appropriate for large amounts of unsecured credit to be allocated to users.

Ofgem subsequently published best practice guidelines in February 2005[19]. These did not prevent unsecured credit allowances, but set out measures designed to manage and cap the exposure of network operators to unsecured credit. This package included adopting a consistent credit rating basis of allocating allowances to different users, following best practice from the banking sector. They also included specifying an approach for the capping of unsecured credit allowances that could be achieved to a percentage of the RAV of the network operator. This pinned the proportion of unsecured allowances to the allowable revenues of the network operator[20].

Changes were made to the CUSC, DCUSA and UNC transmission and distribution codes as a result of the guidelines, mainly through industry-led modifications.

Despite the adoption of these rules, there still exist very large elements of unsecured credit and PCG covered credit positions under these frameworks[21]. Subject to key differences identified below, reflecting Ofgem best practice, the CUSC, DCUSA and UNC frameworks allow users to post different credit instruments based on an assessment of their (or their parent's) financial strength. The maximum allowance is 2% of the network operator's RAV. The rules use either ratings provided by major credit rating agencies (such as Standard and Poor's, Fitch and Moody's) or independent credit assessments undertaken by other

[19] This document can be found here: https://www.ofgem.gov.uk/ofgem-publications/61607/9791-5805.pdf

[20] Ofgem set out the calculation of unsecured allowances against 2% of a network operators RAV as being an appropriate approach, as well as proposing credit rating and independent credit assessment matrices for use in allocating unsecured credit allowances, and specifying gradated approaches to allocating unsecured allowances for good payment history.

[21] Further data on how the adapted frameworks coped with more recent defaults such as those of Bizz Energy, Utility Link and Electricity4Business (who would have had exposure under the CUSC and DCUSA) has not been made available to us.

credit scoring firms (such as Experian, Dun and Bradstreet, and Graydons) to establish what proportion of this figure can be allocated to different parties.

It is also possible for parties to build up a lower level of unsecured credit allowances over time through good payment history. The maximum level can equal 2% of 2% the network operator's RAV. There is an incremental build up over each month, multiplying the number of months since the start of good payments by 0.033% (deriving an allocation of 0.4% of the network operators RAV per annum). This means that after five years a party can achieve the full good payment history unsecured credit allowance allocation.

The exception is the UNC, which withdraws unsecured credit allowances for good payment two years after entry into the framework. This is based on a modification proposed by National Grid NTS and approved by Ofgem in November 2010 (see section 2.4.2).

As a result of these rules, unsecured credit is a prevailing feature of all three frameworks. Table 2.3 shows the total of unsecured credit (PCGs and unsecured allowances) relative to secured credit (letters of credit or equivalents and cash).

Table 2.4: Unsecured credit vs secured positions, CUSC, UNC and DCUSA, 2011-13

	CUSC		UNC transmission and distribution		DCUSA	
Year	Secured total	Unsecured total	Secured total	Unsecured total	Secured total	Unsecured total
2011 (£mn)	5	1282	209	730	227	389
2012 (£mn)	6	1364	230	751	239	410
2013 (£mn)	8	1400	277	800	252	433
Average (£mn)	**6**	**1349**	**239**	**760**	**240**	**1232**

Table 2.4 expresses this information as a ratio of unsecured credit to secured credit.

Table 2.5: Unsecured credit to secured credit ratio, CUSC, UNC and DCUSA, 2011-13

	Ratio CUSC	Ratio UNC transmission and distribution	Ratio DCUSA
2011	256:1	3:1	2:1
2012	227:1	3:1	2:1
2013	175:1	3:1	2:1
Average	**220:1**	**3:1**	**2:1**

There is a particular concentration and proportion of unsecured credit under the CUSC. This may be partly explained by the fact that unsecured allowances are awarded as a proportion of the 2% of the RAV of National Grid, which is much higher than other network operators. The maximum unsecured allowance under the CUSC—used as the basis for determining different parties unsecured credit position—allows significantly more parties to enjoy unsecured positions against their charges than under the UNC or DCUSA. For example, National Grid's RAV is over £10bn. This is much higher than the RAV of DNOs and GDNOs, which are used in similar calculations under the UNC transmission and distribution and DCUSA frameworks respectively (typically £1bn-£2.5bn).

The impact of this approach is that it leaves these frameworks, and in particular the CUSC, exposed to high risk of losses in the event that a party with a large unsecured credit position defaults. Given that credit levels are a function of volumes of use of system and unsecured allowances are highest for the larger, better rated companies, then unsecured credit allowances will be largest for the biggest suppliers. For example, if our large VIU benchmark were to default under the UNC transmission and distribution framework, this would leave a potential bad debt of c£20mn for one month of non-payment in 2013-14, escalating for every month in which the default persists. Basing whether or not a party should post credit predominantly on the probability of default, without considering the implications for recovery if they default, creates risks. It also has knock-on implications for competition through cross-subsidies, which we explore in section 2.5.3 below.

There are additional risks created as a result of allowing users to build up unsecured credit allowances through good payment history. These are related to the speed of requirement to collateralise obligations if a party loses its good payment allowance for failing to make a payment, and the party's ability to do so. The detailed differences of the approaches adopted under the three frameworks in these circumstances are described in the next section. However, in principle all frameworks adopt an approach in which failure to make payment results in the loss of unsecured credit allowances and a need to post credit in substitute of that loss. Sudden credit calls on suppliers could also result if suppliers fail to maintain good payment history. There is no guarantee credit could be provided or obtained if the failure to pay was representative of real financial distress, rather than administrative error.

2.4.2 Relative consistency and simplicity

It is clear that the CUSC, DCUSA, and UNC transmission and distribution frameworks share a number of common principles that underpin their credit rules. This is born out of changes made to the codes as a result of the publication of Ofgem's best practice guidelines in February 2005. This convergence aids understanding by market participants—particularly those with activities across the gas and electricity markets.

However, all three schemes are subject to separate governance processes and documented under three separate codes. In some cases, different parts of National Grid play a role in the administration of separate schemes (such as the CUSC and in their role as a gas transporter). The CUSC has national coverage in both the reach of its rules and the manner in which it is administered. Meanwhile, both the DCUSA and UNC rely on achieving consistency through a national unified code, but with administration through regional network operators. The involvement of the regional network owners leaves some room for local interpretation and therefore differences in the application of common rules. Discussions with market participants suggest that a lack of consistency between network operators is a significant feature of the market.

Whilst the principles of credit rules have much in common, there are also differences in the detailed terms of the rules. Given the three codes are subjected to industry-led proposed modifications, and the differences in the make-up of parties to each framework, this is not a surprising situation.

For example, the UNC has departed from the CUSC and DCUSA in how it treats good payment history. This is in response to the numerous credit-related issues that have arisen since the publication of the Ofgem 2005 guidelines in gas transportation, in particular in light of the Lehman Brothers default.

Review Proposal 252[22] was raised by Wales and West Utilities to allow a review of the UNC credit arrangements for transportation charges to consider whether they remained fit for purpose. The review group came forward with a number of recommendations, each of which was raised as an individual modification proposal. Some proposals drove greater consistency with the CUSC and DCUSA (for example, adopting Fitch as an approved credit rating agency). Others created differences.

[22] Review proposal 252 can be found here: http://www.gasgovernance.co.uk/sites/default/files/0252ReviewProposalV10.pdf

One of the more material changes (UNC305) rescinded the award of unsecured allowances for good payment history after two years, capping the maximum allowance at 0.8% of 2% of the GDNO's RAV. It was felt that good payment history under UNC was not always a useful means of gauging if an applicant was fully credit worthy, as they may not be paying other creditors and this would not be visible to the gas transporters. In this respect it was felt that credit ratings and assessments offered a more rounded view. Ofgem approved this modification. It noted the potential impact on new entrants and small suppliers, which it felt was mitigated by the fact that after two years a party would have had the opportunity to acquire a reasonable credit rating or independent credit assessment score, giving them access to an unsecured credit allowance.

However, a similar approach has not been adopted to date under either the CUSC or DCUSA.

Similarly, the codes are different in terms of their rules for rescinding the award of unsecured credit allowances based on good payment history, in the event that a party fails to make timely payment. These differences are as follows:

- under the CUSC, failure to make one payment results in the loss of 50% of the current unsecured credit allowance, with a second payment failure in a 12-month period reducing the unsecured credit limit to zero;
- under the DCUSA a single payment default results in resetting the allowance to zero; and
- under the UNC transmission and distribution framework during the first two years, the first instance of a late payment will not result in a user's unsecured credit limit being set to zero. This would instead be deferred to the second missed payment in a rolling 12-month period, as long as on the first occasion the payment is received up to and including two days after the payment due date, and the user's unsecured credit limit is not increased the following month (regardless of payment performance).

2.4.3 Competition and barriers to entry

The allowance for unsecured credit also creates issues for effective competition through a cross-subsidy effect.

Each framework gives an advantage from the awarding of unsecured allowances to companies with very strong credit ratings. For example, under the DCUSA, even with a maximum independent credit assessment score of 10 (with an extremely low probability of default), the total unsecured allowance is 20%. However, a rating from a major credit rating agency of A- would allow them a 40% unsecured credit allowance, with AA standing increasing this to 100%. Only very large companies who issue public debt, such as corporate bonds, acquire credit ratings from major credit ratings agencies in order to provide purchasers of that debt with an ability to assess the risk of repayment. Doing so is a costly exercise in itself. Hence, under these frameworks the options for posting credit and the costs of credit become directly related to not only the user's credit worthiness, but their size, and whether or not they require or warrant assessment by major credit ratings agencies.

Of course, even well-established smaller companies might benefit significantly from unsecured allowances (which, as they are calculated by reference to 2% of the network operators RAV, might be large) in proportion to their actual liabilities (which might be small). But equally our analysis demonstrates that for larger companies the same is true, even if their liabilities are larger. This is particularly so given the ability to enjoy even higher allowances by virtue of a good rating from a credit ratings agency.

This approach of awarding unsecured allowances also creates a potential cross-subsidy between those suppliers providing cash or letters of credit as security. In the main these are the least well-rated companies or new entrants. In contrast those able to benefit from unsecured credit allowances (or posting PCGs) tend to be established market participants and particularly large companies subject to credit rating agency assessment.

This cross-subsidy crystallises in a situation where the supplier benefiting from unsecured credit allowances (or securing their obligations via a PCG) defaults. Whilst the chances of default of companies with strong

ratings are low, the consequences could be significant. Given their unsecured position, it is far from certain that any money will be recovered from them to cover their outstanding liabilities. Claims against such suppliers by DNOs, GDNOs or National Grid would be based on a position as an unsecured creditor. PCGs provide a slightly better position than being purely unsecured, but these do not pay out on-demand, and any claims will be competing against senior secured creditors against the defaulting company in the event of default[23].

The cross-subsidy is created because:

- the defaulting unsecured supplier has foregone ongoing credit costs for letters of credit or cash prior to its default, and potentially avoids material pay-outs upon default; and
- the secured supplier bears the costs of financing its standing security (letters of credit or cash) prior to and after the default of an unsecured supplier—noting that the financing costs could increase as a result of bank nervousness about heightened risks given the default of a major market participant. The secured supplier also may bear the cost of recovering the defaulting unsecured supplier's unpaid liabilities after its default through increased system charges.

There are no formal mutualisation arrangements in the transmission and distribution frameworks. However, the unfulfilled payments (net of recoveries from security or insolvency) created by such defaults may eventually need to be recovered by network operators from increased system charges on non-defaulting parities. This is allowable by Ofgem subject to certain conditions[24].

Alternatively, ESCA may in certain circumstances be invoked against the defaulting supplier, which could eventually allow for unsecured claims by the network operators to be settled.

The extent of this cross-subsidy can be demonstrated by assuming that the large VIU benchmark, which is assumed to enjoy unsecured credit allowances for 100% of their CUSC, DCUSA and UNC liabilities, defaults at the end of 2013-14. Other parties then are required to cover the unpaid sums through higher charges. This example results in peak unsecured monthly liabilities of £63mn for the large VIU across the CUSC, UNC transmission and distribution in 2013-14. This figure might have to be shared by other parties through increases in future system charges. Meanwhile, the avoided financing costs to the large VIU benchmark would have been £1.6mn for the year.

There are two possible mitigating factors that diminish the impact of cross-subsidy:

- low probability of default—those suppliers with the largest unsecured positions will be the strongest financially so are unlikely to default; and
- payment history allowances creates a level playing field—all suppliers could benefit from unsecured credit allowances if they establish a good payment history.

The probability of default for such suppliers is relatively low. However, if a large supplier were to default, the immediate level of unpaid sums that follow for transmission and distribution frameworks are likely to be significant. Arguably, larger companies are in a better position to pay as they have access to a wider pool of financial resources and liquidity, so it is appropriate that they benefit from higher allowances. However this access to financial resources might not be possible if they are in financial distress or insolvency.

Furthermore, even with the ability to build up unsecured credit allowances through good payment history, cross-subsidisation will still be an issue in particular for new entrants. They will have to wait to incrementally build up good payment history, and they may not be able to post credit-worthy PCGs. The ability to accumulate unsecured allowances through good payment history is also capped at 2% of 2% of relevant RAV under the CUSC and DCUSA and 0.8% of 2% of the relevant RAV under the UNC. This

[23] Nor would regulatory back-stop measures such as SoLR provide recovery as this would transfer ongoing liabilities to a new licensee, not cover historic outstanding payments.

[24] Recovery of bad debts through an established regulated price control allowance is permissible. See section 3.2.4 below.

means that the only manner in which material unsecured allowances are likely to be achieved is through acquiring a credit rating or independent credit assessment score.

It should also be noted new entrants are also least likely to obtain a strong independent credit assessment score on the basis of their limited history of financial performance.

2.5 Key findings of assessment

The assessment of the in-scope frameworks identifies the following issues:

- disproportionate credit cover required under balancing frameworks.

  These frameworks attract large amounts of collateral relative to the degree of risk of default and loss. This is based on an approach that demands collateral to cover a time-limited calculation of individual indebtedness and an assumption that every trading party has an equal probability of default;

- balancing frameworks expose parties to financing externalities.

  The high levels of collateral, limited to instruments issued by banks and financial institutions, exposes different participants to certain financial market externalities that will be of direct relevance to their costs of business and therefore their ability to compete. This potential distortion is revealed through the lens of recent, extreme, financial market events, but these are repeatable and should be considered as relevant to consideration of the efficacy of credit arrangements;

- transmission and distribution frameworks create cross-subsidies.

  The award of unsecured credit allowances for credit ratings, independent credit assessment scores and, to a lesser extent good payment history to some parties and not others exposes those unable to benefit from material unsecured allowances to the standing cost of posting their own collateral (in the form of cash or letters of credit) and potentially to the full default costs of unsecured parties;

- transmission and distribution frameworks over-emphasise the probability of default.

  Cross-subsidies indicate an over-emphasis on the probability of default as the primary factor in the level of credit demanded from users, and a limited focus on the loss resulting from default. There is limited cover for the low probability, but high impact events of large, financially strong suppliers defaulting. In contrast there is sufficient cover for higher probability but relatively low impact events of smaller suppliers defaulting; and

- transmission and distribution frameworks create potential barriers to new entry.

  The competitive distortion of loading costs of issuing letters of credit or posting cash security on to new entrant suppliers will reduce the ability of such suppliers to compete effectively with their more established peers. Furthermore, were a large supplier to default, the cross-subsidy effect would most particularly impact the competitive position of new entrant suppliers, who are most likely to be secured creditors.

3 Evolutionary alternatives

This Section sets out a range of evolutionary alternative options to address the issues identified in Section 2. It briefly assesses the impact of each option using the same criteria adopted to evaluate the current frameworks, utilising quantitative modelling of the impact of changes on either the framework map or supplier benchmarks presented in the Phase 1 report where applicable, and drawing on international evidence where appropriate.

3.1 Option 1—Unsecured credit allowances in balancing

3.1.1 Background

Under this option a proportion of credit required to be posted under both the BSC and UNC by individual trading parties would be:

- derived through an allocation of an unsecured allowance to each trading counterparty based on either their or their parent's credit rating[25];
- calculated as a percentage of the trading party's overall indebtedness using a credit rating scale matrix to allocate the unsecured allowances, as under the current transmission and distribution frameworks; and
- any residual amount of liability not covered by the unsecured allowances would continue to be collateralised by letters of credit or cash.

The intention behind this option would be to address the prevalence of excess credit in these frameworks, which are currently solely being covered through cash deposits and letters of credit, resulting in relatively high costs of collateralising obligations and exposing certain parties to financial market externalities.

3.1.2 Headline assessment

Table 3.1 sets out the key strengths and weaknesses of this option.

[25] Given the potential volatility in charges, we do not assume that good payment history can be used to derive an unsecured allowance.

Table 3.1: Option 1—strengths and weaknesses

Strengths	Weaknesses
Reduced framework collateral amounts This option would reduce the levels of collateral required to be posted in aggregate under the BSC and the UNC by between 15-19%.	**Over-collateralisation remains** This option will still leave a considerable proportion of credit in place relative to the historical risk of default.
Reduced benchmark costs It would also reduce costs and amounts of credit associated with posting collateral for all supplier benchmarks under the BSC and UNC.	**Introduction of cross-subsidy** This option would introduce an element of cross-subsidy into the BSC and UNC balancing (albeit to a far lesser degree than under the CUSC, DCUSA and UNC).
	Distributional impacts favour large suppliers The benefit of this option would be most keenly felt by the larger, stronger suppliers (40% for large VIU under the BSC and the UNC). Smaller suppliers are likely to see some benefit but the differential in costs of business between smaller suppliers and new entrants and those of larger suppliers will grow.

3.1.3 Impact on credit amounts and costs

At a framework level, we can establish credible scenarios of the impact of this option on amounts and costs of credit based on establishing an 'average' allocation of unsecured allowances for BSC and UNC balancing participants.

In our analysis we assume that the CUSC Approved Rating Unsecured Credit Cover percentage and the Independent Credit Score Credit Cover percentage matrices would be applied under the corresponding rules for the BSC and UNC balancing. This allows us to derive the percentage share of charges that could be allocated as unsecured allowances under both the BSC and UNC. These matrices are based on guidelines established by Ofgem; it is, therefore, highly probable they would at least form the reference point for the determination of unsecured allowances under the balancing frameworks. The matrices are at Annex C.

Based on our experience, we know that larger suppliers and shippers with relatively strong credit ratings will account for large volumes of electricity and gas balancing activity, leading to a possible weighting towards the upper end of the scale based on these matrices. However, as it is not possible to determine an exact average, we can capture a range of possible 'average' unsecured credit allocation by using different credit rating assumptions.

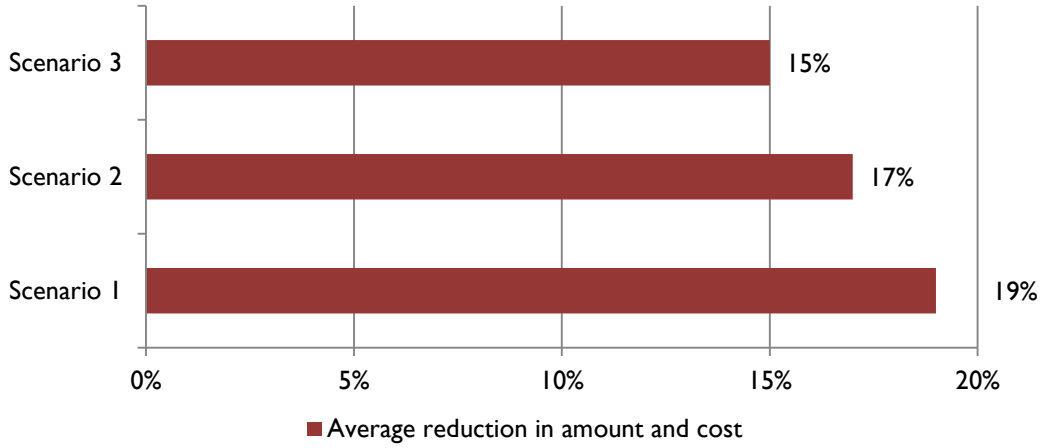
We have set out three scenarios to establish illustrative averages:

- **scenario 1**: average allocation of 19% based on an average credit rating of BBB (approved rating) or a score of 9 (independent credit score) across all participants in the BSC and UNC balancing;
- **scenario 2**: average allocation of 17% based on BB+ (approved rating) or a score of 7 (independent credit score) across all participants in the BSC and UNC balancing; and
- **scenario 3**: average allocation of 15% based on BB- (approved rating) or a score of 5 (independent credit score) across all participants in the BSC and UNC balancing.

The reduction in both amounts and cost of credit on average in the period 2011-13 under the BSC and the UNC balancing correspond to the average allocation and range between 15%-19%. The nominal reductions in credit amounts for the BSC in 2011-13 under these scenarios range between £58mn-£74mn. The equivalent for the UNC ranges between £52mn-£66mn.

The percentage reductions are summarised at Figure 3.1, with actual nominal data of credit reductions included in Annex D.

Figure 3.1: Average annual percentage reductions in amounts and cost of credit, unsecured allowance scenarios, BSC and UNC, 2011-13



To establish the possible distributional impacts of this change, we can analyse the effect on our supplier benchmarks. We have made some assumptions on the mapping of these against the CUSC matrices to derive unsecured credit allowances as set out in Table 3.2.

Table 3.2: Supplier benchmark unsecured credit allowance mapping

Supplier Benchmark	Matrix	Allowance
Large vertically integrated utility (VIU) supplying gas and electricity to domestic and non-domestic consumers	Approved rating	40%
Large domestic gas and electricity supplier	Approved rating	20%
Intermediate domestic supplying electricity and gas	Independent credit score	15%
Niche domestic electricity supplier	Independent credit score	6.7%
Small and medium sized enterprise gas supplier	Independent credit score	13.3%
Small and medium sized enterprise electricity supplier	Independent credit score	13.3%
Industrial and commercial gas supplier	Independent credit score	16%
Industrial and commercial electricity supplier	Independent credit score	16%

By applying these allowances to the average amounts calculated for the period 2011-13, we can determine the reduction in credit postings under the BSC and UNC balancing. The percentage reductions in amounts secured through letters of credit and cash are shown in Figure 3.2 for the BSC and Figure 3.3 for the UNC respectively. Actual nominal data is included in Annex E.

Figure 3.2: Average annual percentage reductions in amounts and cost of credit, supplier benchmarks BSC, 2011-13

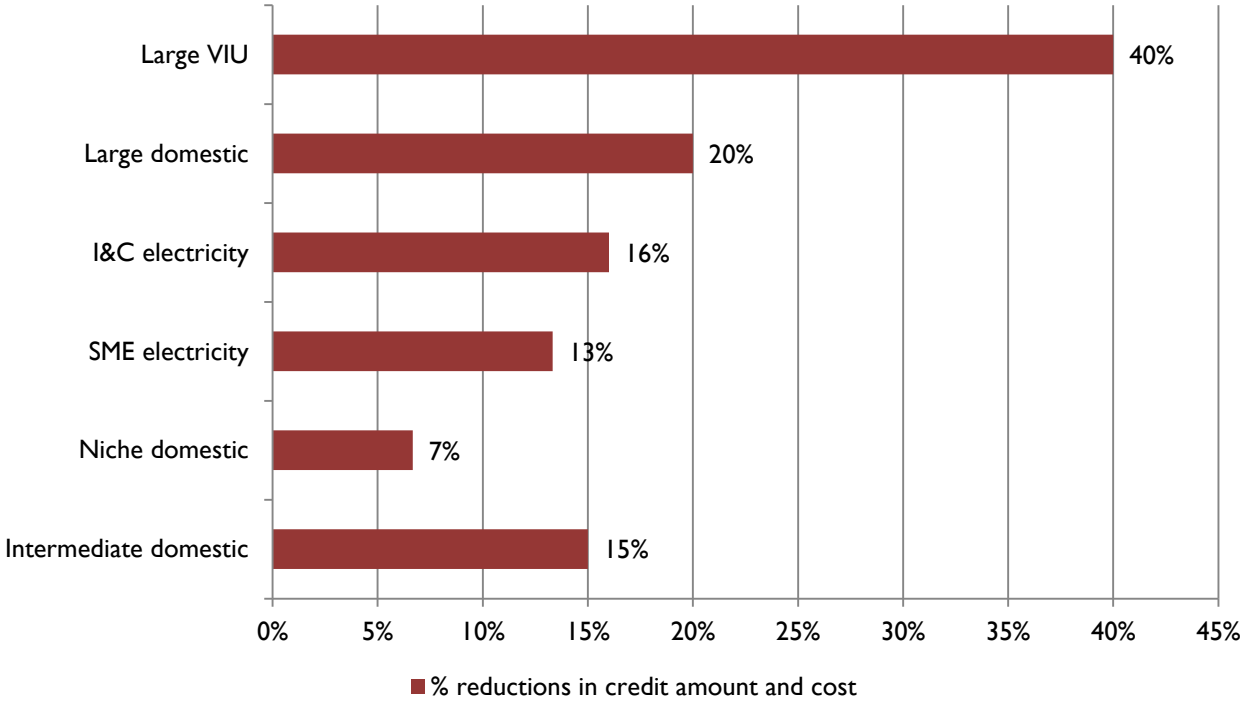
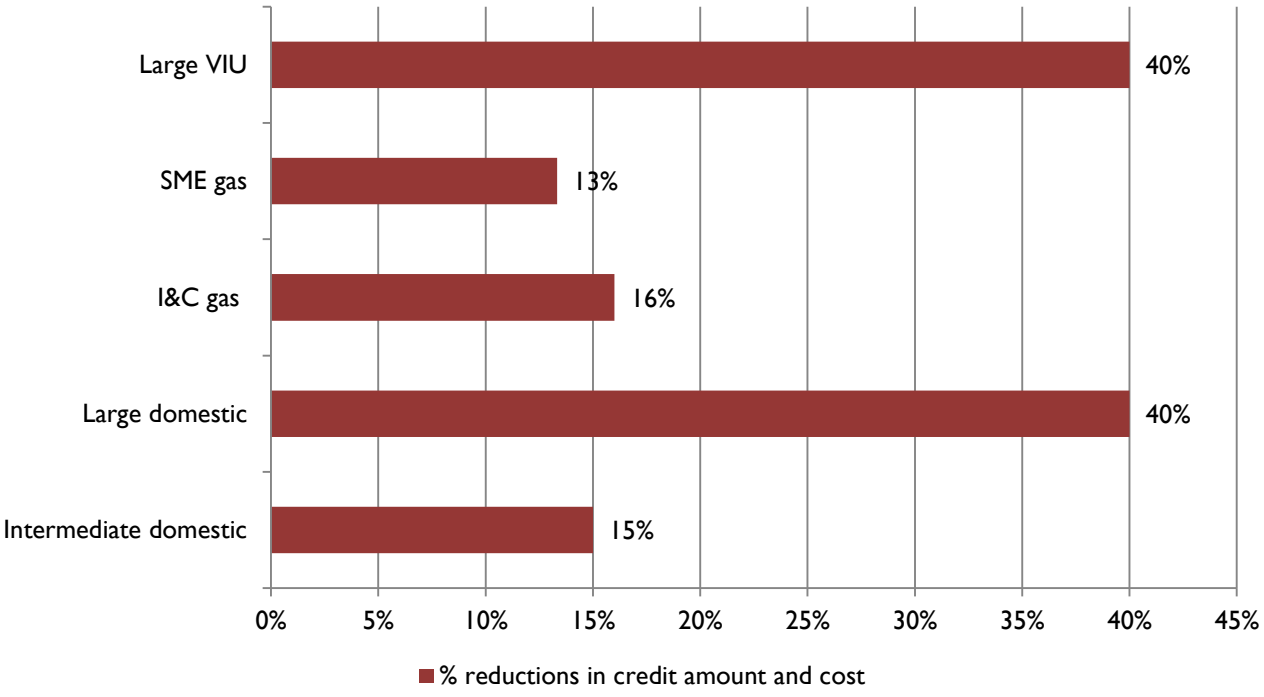


Figure 3.3: Average annual percentage reductions in amounts and cost of credit, supplier benchmarks UNC, 2011-13



3.1.4 Avoiding losses

The introduction of option 1 would on average have reduced (across the three scenarios) credit amounts and credit costs in the period 2011-13 by £66mn and £2.1mn for the BSC, and £59mn and £1.8mn for the UNC respectively. However, the multiples of cover versus historic losses will still remain large. For example, under the BSC, the revised average collateral number 2011-13 of £321mn is still 33.5x the total mutualised losses since BSC inception. The equivalent revised number for the UNC of £286mn is 26x the initial outstanding UNC balancing debt following the Lehman Brothers default.

There could, of course, be risks under the revised approach relating to how the code administrators would track volatile potential exposures to loss following party default. This is particularly relevant given the frequency of settlements and volatility in charges that occur in balancing under the BSC and UNC, which would need to be reflected in the nominal level of unsecured allowances. There might also be consequential impacts for other trading parties in the event of mutualisation following a party default.

This risk might be partly addressed through the application of a nominal cap on unsecured allowances as applied in the Pennsylvania, New Jersey and Maryland (PJM) market (*see section 3.1.7*). Further work would need to be undertaken to establish the adequate level of such a cap. The level at which a cap might be set would have consequences for the distributional impact on different types of market participants. In particular it could result in larger suppliers facing an arbitrary maximum unsecured credit allowance unrelated to their underlying credit strength.

3.1.5 Relative consistency and simplicity

This option is consistent with the Ofgem-approved approach to calculation of unsecured credit allowances under the CUSC, DCUSA and UNC transmission and distribution. However, the nature of balancing on the one hand and transmission and distribution systems on the other are very different, particularly in terms of the volatility of collateralised charges. So, whilst there would be a consistency of approach, there is likely to be an inconsistency of exposure to risk between Elexon and Xoserve relative to gas and electricity network operators under the relevant codes.

3.1.6 Competition and barriers to entry

This option recreates in the BSC and UNC balancing frameworks the cross-subsidy effect witnessed in the CUSC, DCUSA and UNC transmission and distribution frameworks. However, this is on a much more limited scale, as demonstrated by the relatively high share of remaining credit being posted under the BSC and UNC relative to the very low share under transmission and distribution frameworks.

This asymmetry results from the reference amount used as a basis for determining the level of unsecured allowance under this option. Unlike the CUSC, DCUSA and UNC balancing, the approach to calculating unsecured allowances would be to determine a percentage of a trading parties' own liabilities, rather than as a percentage of a much larger RAV of the network owners. Under the CUSC, DCUSA and the UNC transmission and distribution frameworks, the RAV-based approach can drive very large amounts of unsecured allowances as a proportion of a party's actual liability. By contrast, adoption of this option for the BSC and UNC balancing will drive a much lower overall share of unsecured credit as a percentage of a trading party's total credit level, and as a result limit the extent of cross-subsidy.

Our analysis shows that all benchmark suppliers would receive real benefit from the adoption of this option. Figures 3.2 and 3.3 illustrate that it is the largest suppliers would still receive the greatest benefit in terms of reduced costs.

It is also relevant that new entrants are likely to be less able to demonstrate a relatively strong financial rating and their allocation of unsecured credit is likely to be relatively low when compared to their competitors. Hence, they are likely to be most exposed to additional costs relative to established supplier businesses, possibly diminishing their ability to compete.

3.1.7 International examples

There are credible examples of where unsecured credit allowances are used in comparable circumstances, particularly in North America.

Under the PJM market, users are able to obtain unsecured credit allocations based on their own credit strength or based on the credit strength of any corporate guarantor. To apply for unsecured credit using a guarantee from a guarantor, they must fill out an executive guarantee in the PJM approved format. If the applicant does not meet the required quality or there is insufficient unsecured credit to meet its expected liabilities, the unsecured line is topped up by a cash deposit or letters of credit. These must be submitted before PJM can approve the credit application. In addition, the amount of unsecured credit is capped.

Similarly in the smaller Alberta Electric System Operator (AESO) market, unsecured credit allowances are also used, again by applying allowances based on the credit rating of the market participant (both for rated and unrated companies). The matrices and a flow chart of decision-making on the award of unsecured allowances under AESO are at Annex M.

3.2 Option 2—Unsecured credit allowances for new entrants for transmission and distribution

3.2.1 Background

Under this option:

- new entrants that become a party to the CUSC, DCUSA and UNC transmission and distribution frameworks could opt to be awarded an unsecured credit allowance (as a percentage of 2% of the relevant network operator's RAV) determined by an assumed proxy independent credit assessment score unsecured at the lower end of the independent credit assessment matrix used in each framework;
- this allowance would apply for the first year after market entry, which based on the Phase 1 report is a significant portion of the period during which new entrants find themselves most vulnerable to challenging working capital positions;
- it would be determined by looking at the average actual independent credit assessment score that applied to existing companies from the same business segment (essentially segmenting the market in a similar way to how we have segmented our benchmarks) at the first anniversary of their market entry. The proxy score would need to be re-determined regularly to ensure it reflected changing credit assessments of market participants over time;
- this approach assumes that the new entrant will succeed in the market and acquire a comparable financial position to those ultimately acquired after one year by historic new entrants. For example, under the CUSC, if analysis demonstrated that the average independent credit assessment score was four for an intermediate domestic electricity supplier, this would result in a 13.33% of 2% of RAV being the award of unsecured allowance for new entrants in the intermediate domestic electricity supplier sector;
- the approach is based on the principle that, rather than having to demonstrate financial capability through acquiring a credit rating over time (with unsecured allowances building up incrementally), it is instead assumed that after a defined period following market entry, new entrants will achieve a minimum level of financial capability;
- new entrants will be free at any point prior to the first anniversary of market entry to apply for an independent credit assessment should they believe they are likely to exceed the proxy level. If they undertake this and their actual independent credit assessment score is higher than the proxy, then their unsecured credit allowance will be adjusted upwards in proportion to their score, using the matrices under each framework. However, if their score is lower than the proxy, then they face the risk of their

allowance being reduced using the same method, until they can demonstrate otherwise through failure to make good and timely payment;

- at the first anniversary after market entry, they will face a mandatory independent credit assessment to determine their actual unsecured credit allowance. If this is lower than the proxy allowance, they will be required to place credit to meet their revised credit obligations;
- good payment performance would, in the interim period, be the only tangible mechanism of determining the ability of parties to honour their financial obligations under the respective codes. To reflect the beneficial change in approach for new entry and the reduction in security for network operators, the penalties for poor payment performance could be strengthened during their first year after entry; and
- this might mean that:
  - failure to maintain full and timely payment in a single instance reduces the unsecured allowance immediately to zero; and
  - a 'lock-out' rule could be applied. This could involve the party being prevented from acquiring unsecured allowances—either through good payment or acquiring their own independent credit assessment—for a defined period following such an instance.

The intention behind this option is to reduce the working capital pressure on new entrants and acquisitive new entrants, whilst maintaining hard incentives on them to continue to meet their obligations.

3.2.2 Headline assessment

Table 3.3 sets out the key strengths and weaknesses of this option.

Table 3.3: Option 2—strengths and weaknesses

Strengths	Weaknesses
Reduced barriers to entry This option will materially reduce the contribution that posting credit makes to barriers to entry into the supply markets. This could boost working capital and improve ability to win customers. It should enable more rapid growth and deliver benefits in terms of enhanced competition in the supply market.	**Increased risk** This will increase the allocation of unsecured credit overall, with a concentration on one of the riskier segments of the markets (being new entry). Even with the relief of working capital pressures afforded by this change, new entrants would be exposed to wider financial challenges related to their ability to hedge and trade.
Reduced amounts and costs This option will reduce the aggregate levels and costs of collateral required to be posted under the CUSC, DCUSA and the UNC transmission and distribution frameworks.	**Introduction of cross-subsidy** This option could intensify the exposure to unsecured credit amongst non-defaulting users as the recovery of unsecured losses could eventually flow through to charges, increasing value at risk for all users. It could also afford new entrants a beneficial position relative to the risk they pose to the system. The extent to which this is an issue depends on the volume of new entrants in the market at any given time and their susceptibility to default.
	Inequitable to recent entrants This option may face opposition from recent new entrants who have sunk costs and have had to post credit. Against this, the penalties imposed under this option on new entrants for failure to maintain good payment could be more stringent than the current rules.

3.2.3 Impact on credit amounts and cost

Our analysis demonstrates that this option could result in new entrants and acquisitive new entrants being able to avoid posting any credit under the CUSC, DCUSA and UNC transmission and distribution frameworks during the first year following market entry.

Using data collated for the Phase 1 report, Figures 3.4 and 3.5 show the percentage reduction in credit amounts and costs posted in total across all frameworks and activities that they could benefit from as a result of the introduction of this option. Actual data is at Annex F.

Figure 3.4: Average annual percentage reductions in total amounts and costs of credit, new entrants, 2011-13

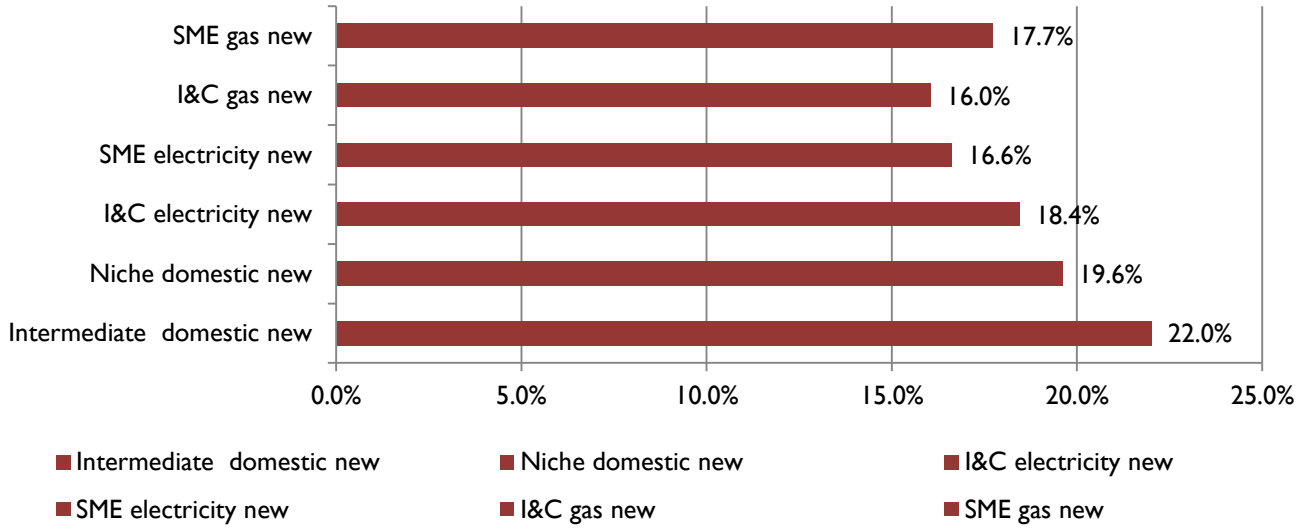
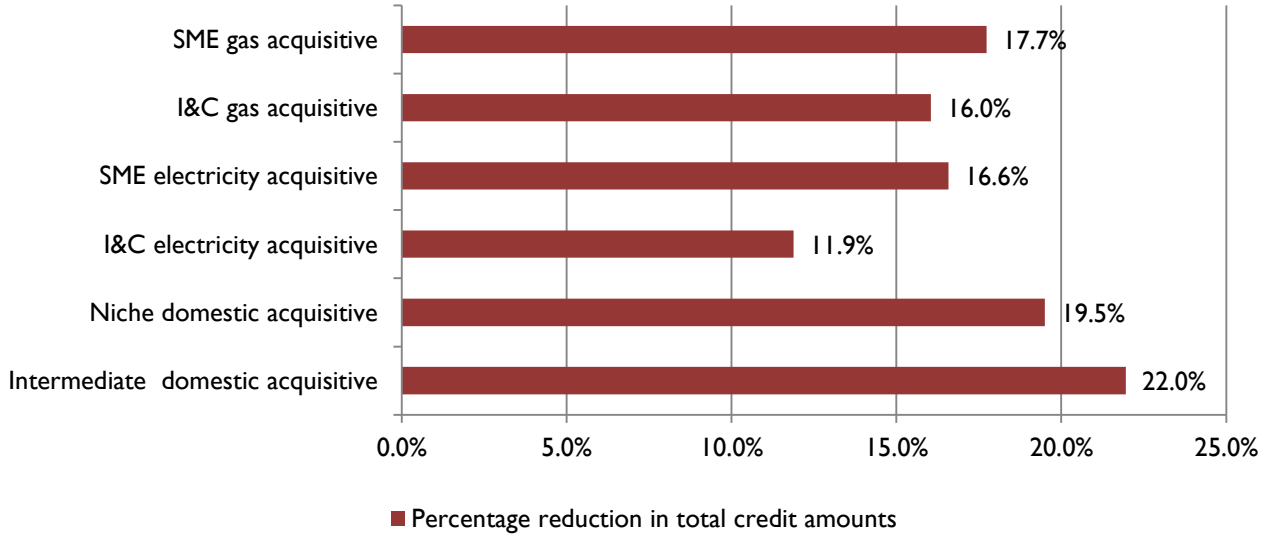


Figure 3.5: Average annual percentage reductions in total amounts and costs of credit, acquisitive new entrants, 2011-13



Figures 3.4 and 3.5 show that on average across all supplier benchmark types, new entrant and acquisitive new entrant suppliers would avoid average collateral amounts and costs of 18% and 17% respectively.

In both cases, there is not a substantially large range between the lowest and highest levels of reductions. Indeed there is a relatively flat distributional impact across different types of suppliers. However, there is a marginally greater beneficial impact for new entrants in the domestic electricity supply market. This can be explained by the current significant secured position they would be exposed to under the CUSC, which they would avoid under this option.

3.2.4 Avoiding losses

The extension of unsecured credit allowances to new entrants could increase the overall level of unsecured positions at a framework level. This would reduce the ability of network operator companies to recover

money from failed new entrants. In our judgment, the probability of default for new entrants must be deemed more likely given the wider financial pressures and uncertainties they face.

In our estimation, this issue of increasing risk of unsecured losses is likely to be less pronounced for acquisitive new entrants. Whilst our analysis demonstrates that equally they are unlikely to be posting any credit under this option, the probability of larger, more established companies defaulting is lower when compared to new entrants. Furthermore, they are most likely to be in a position to opt for an independent credit assessment that establishes their actual unsecured credit allowance given the financial capability they would have demonstrated to make an acquisition, and hence are unlikely to rely heavily on this option.

In this context we would highlight that there is a comparatively low level of bad debt liabilities associated with new entrants. For example, our analysis demonstrates that across all of the electricity benchmarks the total unsecured monthly level of charges for the CUSC in the period 2011-13 is on average £220,000 and £430,000 for new entrants and acquisitive new entrants respectively.

Even if we assume that new entrants corresponding to all our benchmarks defaulted, these defaults occurred at the same time and each company had three months of charges unpaid, it would only expose National Grid to unpaid bad debts of £660,000 for new entrants and £1,290,000 for acquisitive entrants. This should be compared with total recoverable revenues of over £2bn for the financial year 2013-14. This exposure can also be compared to the potential exposure to three months of the unsecured bad debts for the established large VIU benchmark of £21mn.

The relatively small incremental levels of new risk of bad debt that might arise from taking forward this option should be manageable by network operators. They are already able to pass through proportions of unrecovered bad debts into increased charging on other customers, subject to certain conditions imposed by Ofgem. These include:

- network operators having implemented credit control, billing and collection procedures in line with Ofgem's best practice guidelines;
- network operators providing self-certification of compliance with the best practice guidelines and the amount of loss incurred, which may be subject to audit by Ofgem; and
- network operators being able to pass-through a proportion of unpaid debts that varies inversely with the age of the debt. The lower the age of the debt, the more that can be passed through (up to 100% for debts less than 30 days old).

Overall, our view is that this option does not add materially to risks associated with currently accepted levels of unsecured allowances under these frameworks but could reduce collateral burdens on new entrants. However, there are counter-balancing competitive affects (see below).

3.2.5 Relative consistency and simplicity

The option would be simple to implement, relying on drafting changes to codes, and building off pre-existing principles familiar to code parties and code administrators. New drafting would need to be included to set out the basis of determining the proxy credit assessment score, and it is likely that code administrators would need to regularly re-determine this score, taking into account updated data.

However, the approach would not be consistent with current approaches under the BSC and UNC balancing codes. In our view, it may not be appropriate to extend this option into balancing frameworks for new entrants given the absence of an appropriate benchmark for establishing the initial award of unsecured credit at least without a degree of modification, given that balancing frameworks do not currently base award of unsecured allowances on credit assessment of trading parties.

The combination of more volatile underlying charges and therefore the relatively limited predictability in a new entrant's ability to avoid payment default are also factors that we think render this approach inappropriate for application to credit associated with balancing.

3.2.6 Competition and barriers to entry

This option will definitively help the competitive position of new entrants into the gas and electricity markets by reducing the overall amount of credit that they are required to post in the period after their initial entry.

However, affording new entrants the benefit of unsecured credit allowances, determined by a typical rating for more established market participants, puts them in the same position as much better rated companies that overcame the challenge of posting credit following their market entry. These companies have also invested in developing their financial capability to underpin an actual independent credit assessment score that supports their unsecured credit allowance. There has been a cost to these companies in reaching this position. An argument could be made that this approach creates a potential subsidy in favour of new entrants. As we have already noted, this option might be seen as more acceptable through the inclusion of more penal rules relating to loss of unsecured allowances on untimely payment.

Ultimately, this situation might be managed by code administrators adopting a 'discounting' approach whereby rather than using the independent credit assessment score level established through empirically averaging the credit scores of real-life companies they instead move to the tier immediately below. This might assuage concerns of existing players about affording new entrants an unfair advantage whilst still reducing a new entrant's exposure to the possible of fully securing their credit positions under the CUSC, DCUSA or UNC transmission and distribution frameworks with letters of credit or cash.

3.2.7 International examples

There are no obvious examples we can find of this approach being used in other jurisdictions.

3.3 Option 3—Widening pool of issuers and credit instruments in balancing

3.3.1 Background

Under this option:

- under the BSC, sourcing letters of credit from non-bank financial institutions, and in particular regulated insurance companies (regulated by the International Credit Insurance & Surety Association (ICISA))[26] would be permissible, subject to the insurance company achieving similar minimum ratings standards that currently apply to credit issuers under these codes (A- Standard and Poor's or the direct Moody's or Fitch equivalent); and
- under both the BSC and the UNC the form of permissible security would be widened from cash and letters of credit to include forms of security—such as insurance performance bonds—issued by regulated insurance companies.

The purpose of this option is to increase competition amongst allowable financial institutions that can issue credit on behalf of market participants under the terms of the code. Some reductions would therefore be realised in cost of credit provision under the BSC and UNC balancing arrangements. This option has similarities with current industry modifications CMP228 under the CUSC and P306 under the BSC. This is drawn out in the evaluation below.

3.3.2 Headline assessment

Table 3.4 sets out the key strengths and weaknesses of this option.

[26] The International Credit Insurance and Surety Association (ICISA) provides a forum for the continuous exchange of ideas and information, in order to support improving and developing the specialised services its members give the business world. Founded in 1928, ICISA promotes sustained technical excellence, industry innovation and product integrity, as well as solves business problems generated by legislation.

Table 3.4: Option 3—strengths and weaknesses

Strengths	Weaknesses
Increased capacity in credit provision This option would provide a wider pool of possible issuers of credit under the BSC and UNC balancing, potentially reducing credit costs.	**No impact on overall credit postings** This option will not reduce the levels of credit posted by individual market participants or aggregate levels of credit at a framework level.
Simplicity This option can be very simply implemented through amending definitions and clauses in the current BSC and UNC.	**No material impact on competition** Widening the pool of issuers of credit may result in marginally lower costs, but this would be realised by all market participants. It does not address the differential cost burdens of credit between larger and smaller suppliers. New entrants in particular will see no material reduction in barriers to entry.

3.3.3 Impact on credit amounts and cost

This option would not alter the levels of security required from parties to either the BSC or UNC balancing rules. Therefore, there would be no reduction to the nominal levels of protection afforded by overall security arrangements. There could be some reductions in terms of the costs of credit for some market participants.

3.3.4 Avoiding losses

Under this option, maintaining protection against losses will rely on there being no dilution to the quality of credit provided by regulated insurance companies, in the form of insurance performance bonds. The objectives should be two-fold: to ensure that issuers of newly allowable forms of credit are reputable and credit rated; and to ensure that the terms of the credit instruments are enforceable and comparable in their liquidity and protection to existing letters of credit posted under the BSC and UNC balancing rules.

An important consideration will be ensuring that the terms and conditions of the insurance performance bonds are (in so far as possible) standardised to a form acceptable to Elexon under the BSC and Xoserve under the UNC. This would ensure that the appropriate standards were met with regard to credit being unconditional and on-demand. Elexon and Xoserve could therefore have confidence that the bonds were enforceable in an equivalent manner to letters of credit. A standardised and clear approach would also offer transparency and certainty to counterparties when engaging with insurance companies for issuing credit, reducing the costs and time taken to procure acceptable security.

In terms of credit rating, we see no obvious reason not to apply the same ratings requirements to regulated insurance companies that currently apply to credit issuers under the BSC and UNC balancing rules. The same credit ratings agencies will cover the main regulated insurance companies, and independent credit assessments could be made of any companies who are not publically rated. In addition, in order to acquire comfort on the reputable nature of companies providing credit, the rules could state that credit will only be accepted from ICISA regulated entities.

With regard to the terms of products being commensurate to letters of credit, there are some positive, initial indications that this is achievable. Under the consideration of CMP228 (see section 3.3.4 below) for the CUSC, National Grid sought legal advice on the ability of products provided by insurance companies to match the protection provided by letters of credit and attained a required level of comfort.

A version of this option is already being considered under the BSC through the industry-led modification P306. E.ON UK raised P306 on 4 June 2014, under a wider programme of BSC credit arrangement reforms being coordinated by Energy UK. The BSC Panel has agreed to submit P306 to a three-month assessment

procedure, with the assessment report being presented on 11 September 2014. The first working group was held on 9 July.

No similar proposals have yet been brought under the UNC balancing rules.

3.3.5 Relative consistency and simplicity

This option could be very simply implemented through:

- changing the definitions of institutions qualified to issue security under the BSC to include regulated insurance companies. A similar change would not strictly be necessary under the UNC, as it does not restrict issuers to banks, although for the avoidance of doubt a positive inclusion of regulated insurance companies may be beneficial. The codes would also have to specify ICISA qualification for insurance companies to issue credit instruments, and tie them into required credit ratings standards; and
- under both the BSC and UNC balancing rules including an insurance performance bond as an allowable credit instrument, with possible provisions of standardised template insurance performance bonds included as schedules to the codes.

3.3.6 Competition and barriers to entry

Currently, the BSC limits the provision of letters of credit to banks, and does not allow issuers to be non-bank financial institutions[27]. Whilst the UNC does permit issuance of letters of credit from financial institutions (wider than merely banks), it similarly limits the terms of the letters of credit. This means in practice that, even though the UNC affords some flexibility in terms of issuers, banks dominate the provision of credit under its auspices. To exemplify this, as at the end of 2013, all issuers of letters of credit under the UNC balancing rules were banks (see Annex I).

By widening the pool of credit providers to regulated insurance companies, this option is likely to diversify market participants away from the banks as the sole issuers of credit and simultaneously increase the competition amongst providers of credit instruments. This option could therefore lead to some reduction in the costs of credit and provide more available options and capacity of credit provision to parties, nullifying the impact of financial market rationing and externalities on certain market participants.

Quantifying the extent of direct cost reduction is not possible at this stage. This would require detailed engagement with insurance companies (and other financial institutions) about the terms of bonds or policies needed to qualify with the requirements of the BSC and UNC arrangements. Actual pricing of individual insurance performance bonds would depend on the provider's view of the credit quality of their client and the probability of a call being made under the insurance performance bond.

It is already evident that industry participants think some cost benefits can be realised given the recent pursuit of two versions of this option through P306[28] under the BSC and CMP228[29] for the CUSC. Under CMP228 RWE has proposed amendments to the Qualified Bank definition of the CUSC in order to open up the provision of letters of credit and performance bonds to non-bank financial institutions, and in particular to performance bonds or sureties provided by regulated insurance companies[30].

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[27] The BSC permits letters of credit to be issued by any UK clearing bank or banks or any other bank or banks which has (have) a long term debt rating of not less than single A by Standard & Poor's Corporation or by Moody's Investors Service, Inc. 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. The letter of credit must be in substantially the form set out in the code.

[28] BSC modification proposal P306 www.elexon.co.uk/wp-content/uploads/2014/06/P306.pdf

[29] CUSC modification proposal CMP228 www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP228/

[30] For CMP228 RWE highlighted the issues that arose in costs and availability of credit when European banks were downgraded. It argues that the change will increase the range of providers capable of providing CUSC security but would not result in a reduction in the level of security currently provided by users.

The primary drawback of this option under the BSC and UNC balancing rules is that it will not reduce the overall levels of credit under the BSC or UNC balancing frameworks and so can only ever have a marginal impact on costs. The option also does not really address the distributional cost impacts of current credit arrangements on competition.

Furthermore, in our judgement it is reasonable to assume that, amongst all the market participants, new entrants would still be least able to raise insurance performance bonds. If they could do so, it would be at the highest relative cost. Providers of insurance performance bonds credit assess risk of parties in much the same way as banks. There are no compelling reasons why they would adopt a policy of extending material amounts of credit to new entrants where banks have not. Thus, this option would most likely have a negligible impact on reducing barriers to entry.

3.3.7 International examples

There are no examples of this from the benchmark international credit rules that we have reviewed.

http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP228/

4 Fundamental change options

This Section sets out a range of more fundamental change options to address the issues identified in Section 2. It briefly assesses the impact of each option, utilising where appropriate quantitative modelling of the impact of changes, and drawing on international evidence where appropriate.

4.1 Option 4—Umbrella credit insurance for BSC and UNC balancing

4.1.1 Background

Under this option for both the BSC and UNC balancing rules:

- an insurance product would be adopted as an allowable form of credit under both the BSC and UNC balancing rules. The insurer would be ICISA regulated. The rating of the insurer would be A- Standard and Poor's (or direct Moody's and Fitch equivalent) or better, maintaining equivalent credit quality to current providers of letters of credit under both frameworks;
- parties to each code could voluntarily opt to fall under the umbrella of the insurance product. If they opt to do so, they will not be obliged to post their own letters of credit or cash to the code administrators. Parties not opting in would continue to collateralise their obligations through individual postings of letters of credit or cash;
- the price of the insurance product would be based on the insurer's view of the overall risk they are adopting across all parties opting into the umbrella arrangement, but taking into account that there is no risk sharing approach between participants. There would be no counter security offered to the insurer, or an ability to recover claims made under the product from non-defaulting participants based on counter-indemnities (which in effect would be a form of mutualisation). However, it is likely that any claim on the insurance product would lead to an increase in premiums payable by all parties to the umbrella post default;
- the insurance product would be structured to pay out, on demand, against any liability owed by a party who had opted in upon an instance of their payment default. There would be no excess or deductible, and no requirement on the code administrators to prove loss or for there to be a loss adjustment process before monies flow;
- the total amount insured at any one time would be the aggregate sum of the individually allocated and calculated credit obligations to trading parties as per the current BSC and UNC balancing rules. There would be no reduction in the levels of credit required to be posted;
- in our judgement, it is likely that an insurer would:
  - desire an annual ability (or other fixed date) to renew or cancel the scheme;
  - want approval rights for any party that came into the umbrella, as the risk of their product being called would be a direct reflection of the default risk of the counterparties that were included under the umbrella; and
  - noting common practice in both the insurance and banking world, it is also likely that they would set an overall cap on the risk they would accept;
- insurers would not wish to accept suppliers into the umbrella if it were felt that accommodating their risk could breach the overall cap;
- commercially, the insurer would most likely insist on control of entry into the umbrella arrangement. It would need to agree a process for application, consideration and approval that would apply in the event of suppliers acceding to the arrangement. For assessing capacity within the aggregate cap, this would involve modelling for potential future volatility in BSC or UNC liabilities and its effect on credit

obligations, and would possibly also entail the insurer always desiring some 'headroom' between current or historic aggregate credit obligations and their own cap;

- initial modelling of usage against the cap could be done by a committee (the "credit umbrella committee"), which would be an industry-led body or even club of participants. The committee would provide the insurer with modelled projections of utilisation against the cap each time a new party applied to come under the umbrella. The insurer would perform due diligence on the model and then (at its own discretion) determine whether or not to accept the party into the umbrella;
- it is likely that the credit committee would need to develop procedures to translate and allocate portions of the umbrella insurance product to individual counterparties, and would be required to notify the code authorities of the segmentation regularly (each month to align with existing credit arrangements);
- Elexon or Xoserve would continue to calculate the required credit postings and value at risk as a multiple of posted credit at an individual counterparty level, assessing notified proportions of the umbrella credit product for each counterparty against their actual value at risk. The code authorities would issue notices to both the credit committee and a defaulting counterparty in the event that the proportion of credit allocated to an individual counterparty breached credit default or cash call thresholds;
- as the insurance policy is capped, the party in credit default would then be the responsible party for posting additional permissible credit in the form of letters of credit or cash raised outside of the umbrella arrangement;
- if it was unable to do so, the code governance authority would be able to make a call under the insurance policy for that party's most recent calculated allocated proportion. It could then take further action against the defaulting supplier as per the current rules of the code;
- similarly, upon a payment default, the code administrator would make a claim against the insurance product up to the most recently allocated proportion of the product to the defaulting supplier;
- it is unlikely the insurer would not accept any liability or additional risk through being obliged to increase the cap in these instances. It would be in the same position as a bank providing a letter of credit under the current rules, providing cover but not being responsible for the adequacy of posted credit, and under no obligation to increase their facility;
- however, the insurer would be expected to provide evidence of the level of cover in place regularly to the code administrator. The credit committee would need to provide a monthly breakdown of the proportions of the insured sum that are allocated to parties under the umbrella product, reconciling to the cap, and an unconditional undertaking by each party that they accept that this is the credit posting against which they will be measured for the purposes of credit default and cash call thresholds; and
- mutualisation and smear back arrangements would apply in instances where the demands on a trading party's share of the umbrella product (or any other credit they may have posted at that stage) cannot cover the outstanding level of debt.

The purpose of this option is to reduce the requirement for individual counterparties to post individually procured credit instruments.

In addition, even if there is no official risk sharing between participants under this option (as each counterparty is still exposed to a requirement to meet their own calculated level of credit), there could still be some cost benefit to participant companies if the umbrella wraps in large, well-rated parties. The insurer may price the premium based on the weighted risk of all the counterparties involved; therefore, smaller, less well-rated suppliers could feel some benefit of the lower financing costs that result from this approach.

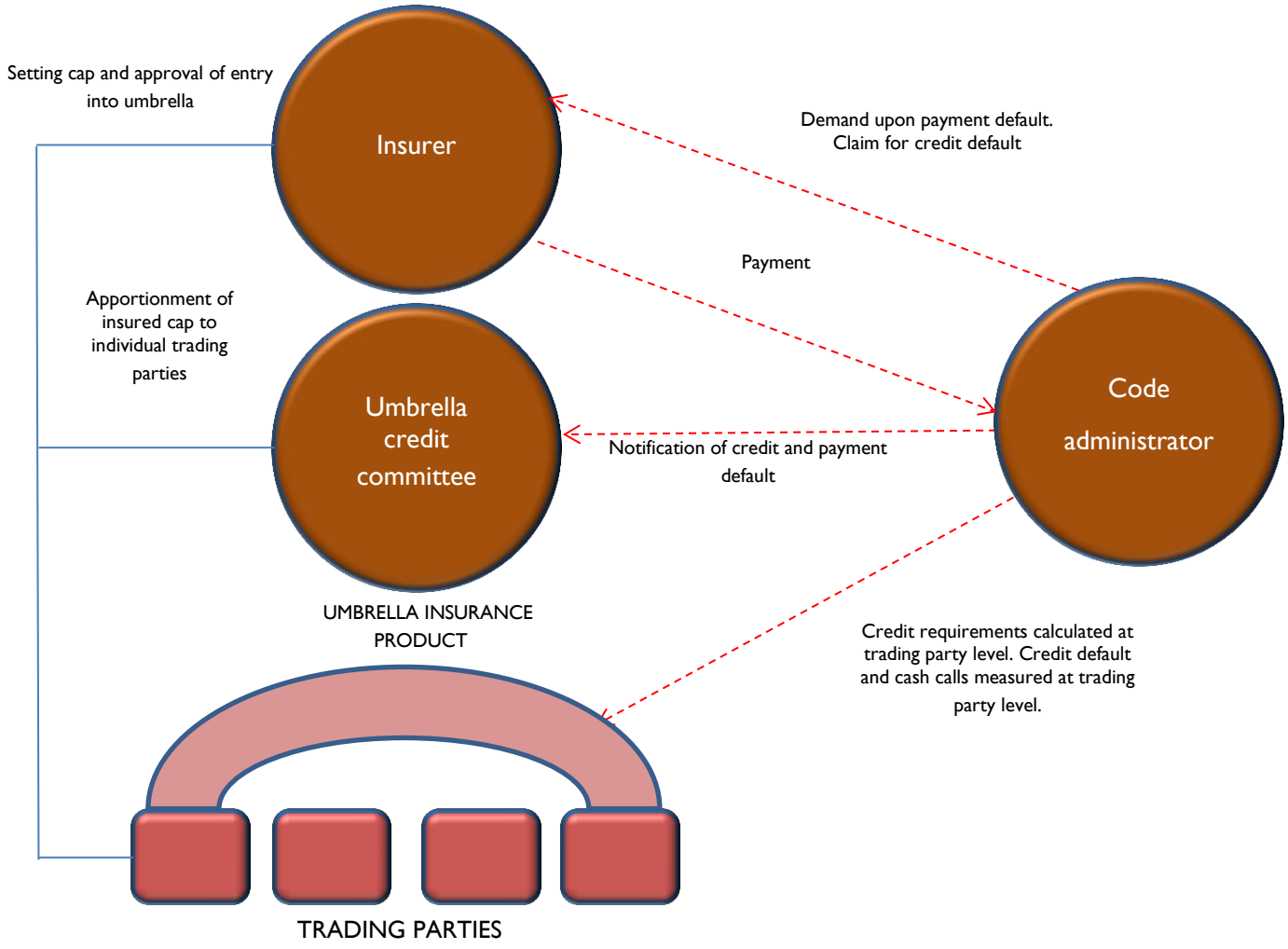
This option might also reduce the impact of financial market externalities on the costs of credit for market participants. This might increase the capacity of financial institutions that can issue credit on behalf of market participants under the terms of the code. In turn, this could realise some reductions in cost of

credit provision under the BSC and UNC balancing arrangements through less exposure of market participants to the effects of rationing behaviour by banks.

It should be noted that this option is an elaboration of P308, which has been proposed by Eggborough Power for adoption under the BSC through a modification dated 12 June 2014. P308 sets out a broad framework for inclusion of a product of this type, but does not specify the detailed implementation proposals, code changes or governance process that would need to accompany such a change. The BSC Panel recommended that P308 be progressed to assessment by a BSC workgroup to review and propose how to take the modification forward.

This option is set out in Figure 4.1.

Figure 4.1: Umbrella insurance product



4.1.2 Headline assessment

Table 4.1 sets out the key strengths and weaknesses of this option.

Table 4.1: Option 4—strengths and weaknesses

Strengths	Weaknesses
Equivalent protection against losses to letters of credit Initial work undertaken for P308 suggests that an unconditional, on-demand credit product could be offered by an insurer.	**Weak incentives for larger players to participate** Larger, well-rated suppliers who already benefit from relatively low credit financing costs and can readily access letters of credit may foresee no benefit in participating in the umbrella, unless the financing costs of doing so are lower or equal to their existing credit costs. Rationally, as the umbrella is likely to encompass a wide range of companies from across the credit spectrum the average cost should exceed the credit pricing of the better-rated suppliers.
Possibility of reduced credit costs A weighted average approach to pricing the insurance product could lead to reductions in credit costs for less well-rated suppliers if there is participation in the umbrella arrangement by larger, better-rated suppliers.	**No guarantee of competitive benefit to established market participants** If larger participants do not fall under the umbrella insurance product, then the level of cost benefit to other market participants is likely to be far less material. In any event, all participants are likely to be exposed to material increases in financing costs should a substantive market participant default.
Reduced reliance on banks for the issuance of letters of credit This option would increase the capacity of eligible sources of credit instruments, reducing pressure on the supply of letters of credit by strongly-rated banks, diminishing the increases in pricing or reduced appetite to issue letters of credit that results from financial market externalities and rationing behaviour by financial institutions.	**Complex new institutional arrangements may be necessary** This option would require changes to code drafting and would also necessitate setting up new industry bodies to manage the relationship between parties to the umbrella, the insurer and the code administrators.
Beneficial for new entrants As new entrants are likely to be least able to raise letters of credit or post cash, and certainly face the largest costs of doing so, we estimate that the most material cost benefits would accrue to them.	

4.1.3 Impact on credit amounts and costs

This option would have no effect on the amount of credit required to be posted under either the BSC or the UNC balancing frameworks.

It should impact on the cost of credit but, without detailed engagement with an insurer, and an understanding of its own measures for assessing risk in the energy markets, it is not possible to quantify the impact that this option will have. The risk profile of the participating companies would also be a driving factor of costs and potential savings. For P308, Energy UK has engaged in preliminary conversations with the insurer Marsh for the provision of a product of this type but to date Marsh has not formally documented the likely premium or financing cost that could apply under this option.

4.1.4 Avoiding losses

If the insurance product can be structured to behave like a performance bond or letter of credit, any detrimental impact on protecting against bad debts and losses under the BSC and UNC balancing frameworks will be negligible. Initial discussions with Marsh with regard to P308 suggest that behaviour like a performance bond—unconditional, on-demand and immediately payable—should be achievable but the working group will need to establish this formally, based on legal advice.

Insisting on a minimum credit rating of A- or better would also ensure that the financial strength of the insurer was equivalent to banks and other financial institutions currently providing letters of credit under both the BSC and UNC balancing rules.

Importantly, counterparties will still be exposed to incentives to maintain appropriate levels of credit cover through the application of current credit default or cash call thresholds. Ultimately failure to comply with these rules could lead to expulsion of parties from the codes. This means that, should it become clear that the cap applied to the insurance product— and in particular their share of it—is likely to be insufficient to avoid credit default being triggered under the BSC, or cash calls being made under the UNC, then a party is likely to seek urgently to collateralise any shortfall through additional postings or letters of credit or cash.

4.1.5 Relative consistency and simplicity

This option would be relatively complex to implement. It would require expanding the range of permissible credit instruments allowable under both the BSC and UNC balancing rules. Furthermore, it would require possible modifications to the drafting of assessment of credit default trigger and cash call triggers under the BSC and UNC respectively. These would need to ensure that they capture a party's share of the umbrella insurance product as an instrument against which assessments of cover are made.

Whilst this option could be implemented through code modification, it would also require significant administrative investment to ensure it can work efficiently. Part of this will involve the industry forming and resourcing the credit committee that is a critical element of the interface between the code administrators, trading parties and the insurer.

This institution will be required to perform important functions and responsibilities on behalf of its members. These include calculating an acceding party's possible utilisation of the credit product, communicating with the insurer, and notifying the code administrators of the aggregate level of cover and the apportionment of cover between individual parties. Of course, these functions could be absorbed within the existing code administrators themselves. However, this could create some areas of conflict—not least apportioning credit amongst trading parties and then assessing the acceptability of such sums against its own credit rules. In any event this would probably necessitate a significant level of investment of time and cost.

4.1.6 Competition and barriers to entry

This option's competitive benefits are predicated on delivery of reduced costs of credit to market participants. There are commercial considerations for different types of market participants that will influence the likely impact on credit costs and hence impacts on levels of competition.

In a voluntary arrangement, and given that larger suppliers are likely to face relatively low credit financing costs under the current rules, it is not clear whether the better-rated companies would have any incentive

to participate, unless by doing so they could at least match their current credit costs. They would also then have to reconcile themselves to the prospect of affording their competitors a financing cost advantage based in part on putting their own financial strength behind the pricing of the product. They would be exposed to increases in premiums arising from any defaults by other counterparties.

Even if there were potential cost advantages to existing smaller, independent and less well-rated suppliers, these may only apply in circumstances where there is no large supplier default. If a large or even moderately sized supplier default occurred, it is reasonable to assume a lasting step change in the level of premiums would be applied to this product by the insurer.

However, for new entrants this could be a very beneficial product. This is because new entrants are least likely to be in a position to raise letters of credit or post cash to secure their obligations under the BSC and the UNC balancing rules at competitive costs, and are likely to face the highest financing costs of all suppliers. They are most likely to see an improvement in their credit costs and competitive position through coming under the umbrella product, even if the average cost of the insurance product is derived from a group that excludes the larger suppliers.

4.1.7 International examples

There are no examples of this precise approach being adopted that we have identified in comparable peer energy markets.

4.2 Option 5—Credit pools for BSC and UNC balancing

4.2.1 Background

Under this option:

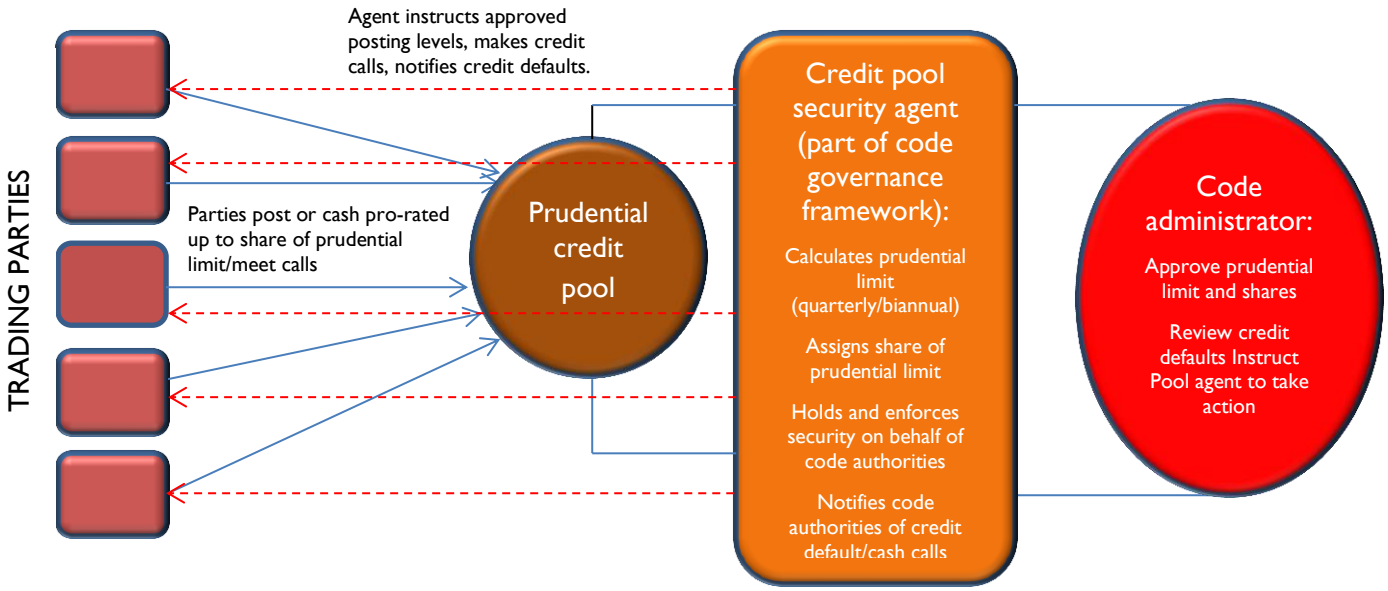
- trading parties under the UNC and BSC balancing frameworks do not collateralise their own individual trading charges. All pre-existing credit instruments and code rules are cancelled;
- in replacement, separately under the BSC and UNC balancing rules, a prudential limit is established for the purposes of establishing a credit "pool" for each framework. The prudential limit would be based on a modelled estimate of maximum exposure of the framework to unpaid liabilities. This would be based on assessing bad debts that would arise from substantial instances of default by a specified number (for example the biggest three) of the largest (by charges) trading parties (the "reference group") in a relevant "credit reference period";
- the "credit reference period" could be a calendar quarter or biannual period ahead of the upcoming quarterly or biannual "credit period"[31];
- there would be risks arising from credit postings being based purely on past charges and thus not covering possible volatility, new entry and seasonal changes in the upcoming "credit period". To address this, there could also be included an incremental amount added on to cover for potential future volatility in the forthcoming "credit period". Alternatively, or in addition, a seasonality multiplier could be applied: this would adjust shares in the credit reference period to take into account known general historical movements in charges that occur at times of the year into which the next credit period falls;
- each party would collateralise the pool with letters of credit (in the same form and using the same credit ratings rules as under the current code rules) or cash in proportion to their share of value at risk (invoiced but unpaid liabilities)in the relevant credit reference period;

[31] For prudential purposes the actual limit could be determined by taking the highest daily imbalance charge in the period for each member of the "reference group" and multiplying it by the number of days in the "credit reference period".

- parties would be required to post credit amounts for the upcoming credit period (to the extent necessary) ahead of the end of the current credit period. Failure to do so would result in a default and the code administrator calling on the parties posted credit and hold the sum in cash as collateral;
- this administrative process could be managed through the creation of a 'Pool Security Agent', or through the use of existing bodies such as Xoserve under the UNC and the Funds Administration Agent (FAA) under the BSC;
- current rules under the UNC for cash calls and under the BSC for credit default would be obsolete, as credit would now be determined by share of the credit pool and not individual counterparties indebtedness;
- but, as a counter-balance, failure to meet the required level of credit posting (as recalculated from time to time) would constitute a default in its own right;
- calls on the credit pool would be applied to the defaulting parties share of the pool first, and then spread across other non-defaulting parties credit postings in proportion to their share of the pool;
- any losses not recoverable under the credit pool would be mutualised. After making drawings under the credit pool, the Pool Security Agent would seek replenishment of credit from all remaining parties up to the prudential limit. Any new calls would take into account the revised share of the prudential limit attributed to non-defaulting parties given the exclusion of a defaulting party (they would probably have been suspended or exited from the codes as a result of their default);
- the Pool Security Agent would then seek to recover any proceeds from the defaulting party through the normal process of administration if applicable. It would then disburse this money to non-defaulting participants in proportion to their contribution to covering the initial liability (either through calls being made on their credit or through mutualisation); and
- new entrants would be captured in the regular reconciliation of collateral contributions to the prudential credit pool. Interim exposure will be reflected in the incremental upward adjustment to the prudential limit.

This structure is set out in Figure 4.2.

Figure 4.2: The balancing credit pool



The purpose of this option is to:

- reduce excess collateral postings without diminishing the ability of the frameworks to withstand expected low probability but high impact risk events, capping overall credit at that level;
- provide cover that would be able to deal with higher probability but lower impact singular or multiple defaults (such as the default of non-Big Six suppliers), without necessitating every counterparty collateralising their individual obligations; and
- reduce credit costs for smaller suppliers, allowing for less constraint on customer and business growth, and potentially enhancing competition.

4.2.2 Headline assessment

Table 4.2 sets out the key strengths and weaknesses of this option.

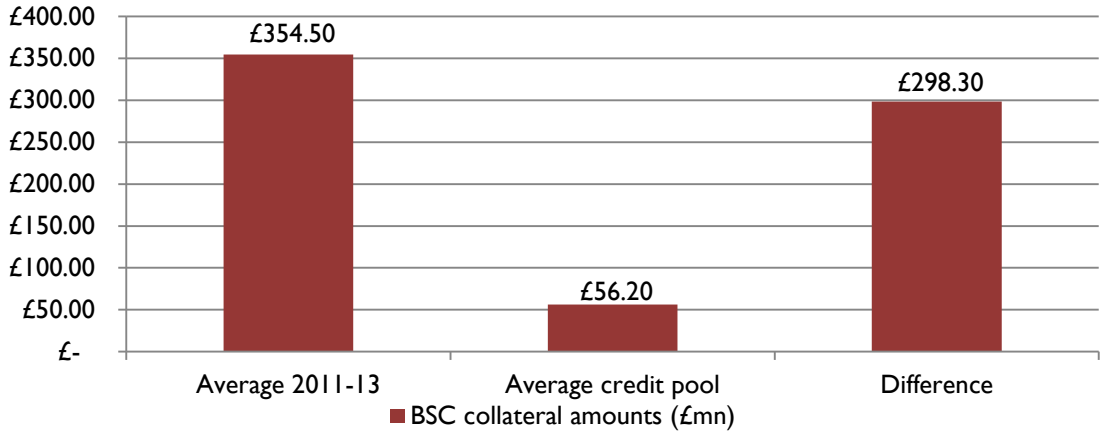
Table 4.2: Option 5—strengths and weaknesses

Strengths	Weaknesses
Significant reduction in credit amounts and costs This option would reduce collateral significantly, for example under the BSC it could reduce standing credit from over £350mn, to £56.2mn, and costs by £9.1mn.	**Distributional impacts will see a large increase in credit from larger suppliers** The principle of linking the portion of a party's contribution to the credit pool to their share of charges will mean larger suppliers will face a large increase in both amounts and costs of credit. If this is adopted across both the BSC and UNC balancing rules then large, dual fuel suppliers in particular would be exposed to the largest increase in credit amounts and costs.
Maintain robust credit protection for majority of probable default events By calibrating the pool limit to an estimation of the possible bad debts arising from multiple defaults by large counterparties, this option will provide an aggregate credit amount capable of dealing with low probability, but high impact defaults. It should therefore provide adequate cover for a range of other smaller, higher probability events.	**Radical shift in credit principles** This option will require a significant shift in approach of basing required credit postings on an individual counterparty's liability over a given time period, to a concept of maximum probable default in the framework as a whole. The consequential changes to the rules are likely to be significant and we would estimate a long process to gain consensus, review the code and shape and implement the necessary modifications.
	Frailty to significant market failure This option could see there being a shortfall in credit available to code administrators in instances of widespread and simultaneous trading party default.

4.2.3 *Impact on credit amounts and costs*

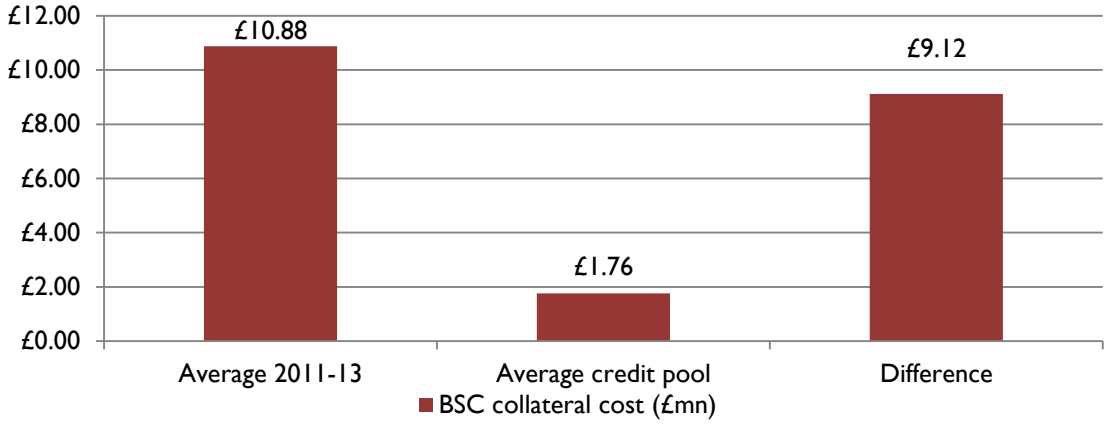
To exemplify the possible impact of a credit pool, we can utilise analysis of the possible consequence of this approach under the BSC[32]. We have based this scenario on covering the maximum expected liabilities of three of the Big Six for a quarterly "credit reference period" of 90 days [33]. The effect of this approach is to reduce the amount and cost of collateral posted under both the BSC, immediately taking a large quantity of credit out of the system. The reduction in amounts for the BSC if this option had been applied to the period 2011-13 is illustrated in Figure 4.3.

Figure 4.3: Reductions in collateral amounts, BSC from credit pool (£mn)



Cost reductions for the BSC assuming this option had been applied in 2013 are illustrated in Figure 4.4.

Figure 4.4: Reductions in credit costs (£mn)

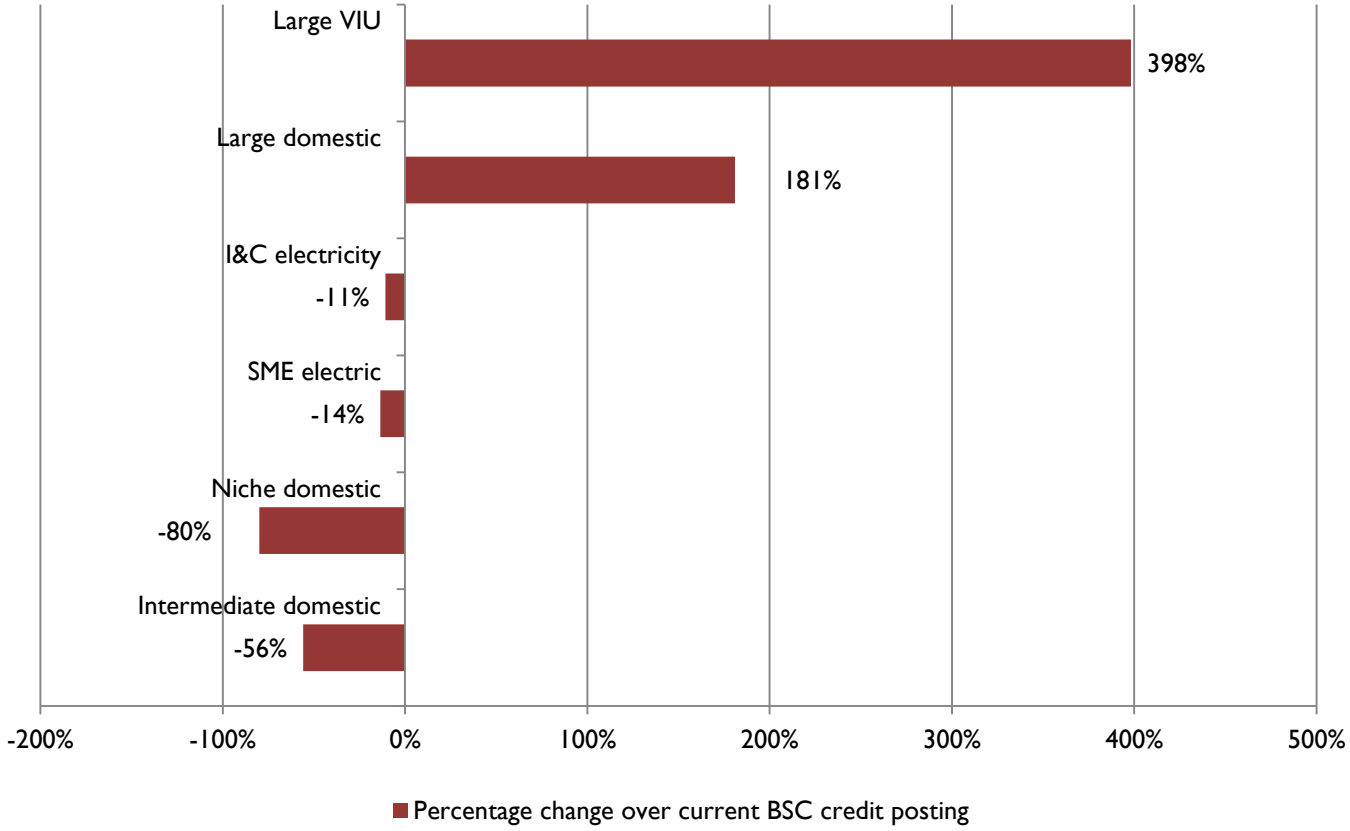


[32] The UNC has much wider exposure to different types of counterparties (including up-stream gas producers, shippers, traders and wholesale businesses). However, similar logic could be applied to UNC balancing to derive a credit pool, although it should be noted that this might have the effect of increasing rather than reducing credit demands on suppliers given they are not necessarily the primary or most value intensive users of the UNC balancing framework.

[33] We have used actual March 2013 to March 2014 BSC data, taking the sum of the peak imbalance charges from the four companies over the annual period and multiplying by 90 to derive a possible prudential limit that could apply on quarterly basis in the year 2013-14.

The impact of this approach on individual market participants can be assessed by analysing its effect on the supplier benchmarks[34]. The percentage decreases and increases in collateral amounts and costs are shown in Figure 4.5[35]: Actual data is included in Annex J.

Figure 4.5: Average collateral amount and cost increases and decreases for BSC credit pool, supplier benchmarks (% of status quo collateral)



The large supplier and Large VIU supplier benchmarks would see their BSC credit obligations increase very materially under this arrangement. This reflects these parties relatively higher share of charges and liabilities. All other supplier benchmarks would see a reduction in credit demands under this approach.

4.2.4 Avoiding losses

The option would significantly reduce the level of credit cover at a framework level, making posted credit more proportionate to the historic risk of default. The principle that supports the adoption of reduced levels of credit cover is that, whilst probability of default for larger players may be low, it is these events that would have the greatest impact on the financial integrity of the BSC and UNC balancing arrangements. If the resultant levels of credit can protect against these events, the resultant security net should also be sufficient to capture multiple lower value, sustained defaults and bad debt events.

[34] We have used market share as a proxy for share of BSC liabilities as it is not possible to consider hypothetical companies as shares of the real market.

[35] Amount and cost increases in percentage terms are the same as the financing cost assumptions are unchanged.

The prudential limit would be designed to capture the default of multiple large parties. However, the arrangements could potentially be frail in circumstances where a major default created a substantial domino effect of serial failure across a large proportion of smaller trading parties at the same, or all of the vertically integrated utilities. Whilst this is an improbable combination of events (as it signals a highly significant market failure without any intervention to prevent its occurrence) it is a circumstance that would need to be considered when assessing whether to adopt this option or not.

Even in this scenario, the credit pool would act as a significant reserve of working capital to access to avoid bad debt accumulation whilst wider action was taken under ESCA, SoLR or both.

4.2.5 Relative consistency and simplicity

As this option could be delivered separately in the BSC and the UNC balancing rules, it would allow for a consistent credit approach between both balancing codes.

However, it would require substantial amendments to existing code arrangements to implement the arrangements. This would be underpinned by a significant shift in the principles used to govern how trading parties' obligations are collateralised. The single biggest change is moving from demanding credit from individual parties based on their individual liabilities over a fixed period of time, to basing it on a view of systemic maximum estimated risk of loss over a fixed period of time.

Given the significance of the change, and the likely opposition to it from certain types of market participant, it is unlikely this option could be implemented through a series of code modifications without first being pre-empted by a more significant code review. Either way the establishment of working groups that examine the risks, costs and benefits of the option, and make recommendations on the final detailed implementation proposals would be essential.

Transitional phasing arrangements would need to be developed to allow for the implementation of the option without detrimental and unintended effects on market participants or the code administrators.

4.2.6 Competition and barriers to entry

The redistribution of credit burdens to larger suppliers illustrated in Figure 4.5 means this option could be met with opposition. It redistributes the burden of security to those with the largest liabilities under the BSC and the UNC. Our analysis shows that this will be most keenly felt by intermediate domestic electricity, large domestic electricity and large vertically integrated suppliers under the BSC. We estimate that a similar effect would be apparent under the UNC. This means that, were this option to be adopted under both the BSC and UNC balancing rules, large, dual fuel suppliers in particular would face a significant increase in credit burdens.

However, smaller independent suppliers are likely to be neutral or supportive to the change, as a result of the higher costs faced by their large competitors and the increased ability to compete that this could create.

Whilst the percentage changes are dramatic, these increases have to be placed in context. For example, the total BSC credit that a Large VIU benchmark would be required to have in place at one time under this option would be c£5mn, whilst for the large domestic supplier it would be c£2mn.

Furthermore, the principle of implementing a system where contribution and credit provision increases in proportion to scale is not without precedent. The principle of distributing credit burdens based on share of activity in a market is consistent with the approach being adopted for the collateralisation of both the CfD and Capacity Market supplier levies.

Notwithstanding the intention to call upon the defaulting party's contribution to the credit pool first, this approach could see scenarios where the recovery of losses, following a participant's default, is divorced from the defaulting party, and default costs socialised across all users of the credit pool. In particular in instances of default by smaller parties, their relatively lower contribution to the pool could see non-

defaulting suppliers facing demands being made on their credit provided to the pool (or be exposed to mutualisation) at a much earlier point than is currently the case under the BSC or UNC balancing arrangements.

4.2.7 International examples

There are no examples of this precise approach being adopted in comparable energy markets.

4.3 Option 6—Credit pool for transmission and distribution

4.3.1 Background

This option is identical to option 5, other than that the framework would be applied to each of the CUSC, DCUSA and UNC transmission and distribution frameworks separately. There would also be other adaptions to option 5 that reflect the differences between balancing and transmission and distribution arrangements. These are outlined below.

The main additional features are:

- this option breaks the link between collateralisation and the RAV of network operators across each of the CUSC, DCUSA and UNC transmission and distribution;
- the proportion of credit provided by each party to the pool may be less volatile than under option 5. This is because changes in proportionate shares of total charges under each transmission and distribution framework will not be as volatile as under balancing frameworks, as they are less elastic to short-term factors affecting operating performance and demand. Moreover, charges are generally easier to forecast and more predictable;
- as a result, under this option, a period of one month, rather than three months, could be used as a basis for calculating the credit pool limit;
- seasonality adjustments will still be a sensible mechanism to include in the scheme, but the levels of adjustment should be less than under balancing arrangements; and
- under the UNC and DCUSA the implementation of this approach may necessitate more fundamental change, moving the collection of credit from DNOs and GDNOs (as is current practice) to a central, national coordinator of credit. Otherwise, multiple credit pools may need to be adopted at DNO or GDNO level which would add to administrative complexity. This change may therefore present a useful opportunity for consolidation and the application of consistency in credit practice, and improved transparency of total risk exposure and mitigation through credit arrangements at DNO and GDNO level.[36]

This option would have the effect of removing unsecured allowances to (or permitted postings of PCGs by) individual counterparties from the credit rules for transmission and distribution frameworks, replacing them with obligations to post only letters of credit and cash.

The impact of simply removing unsecured allowances without adopting a credit pool with its associated prudential limit, and instead requiring each party to collateralise their obligations under the current rules through letters of credit and cash, would be to massively increase the cost of credit provision and the demand placed on banks and financial institutions to provide such credit (average unsecured credit allowances across these frameworks is in excess of £3bn in the period 2011-13).

[36] In conversations with market participants during the production of the Phase 1 report some raised the issue of variable practice by different DNOs and GDNOs with regard to their interpretation of the consolidated DCUSA and UNC rules. Furthermore, in attempting to source data on the level of credit cover under the DCUSA for the Phase 1 report there appeared to be no central governance body either holding or capable of providing aggregate information on the amount of credit held at a national level in support of distribution charges.

The introduction of this option with its associated prudential limit means all parties are required to post the same types of credit instruments, removing cross-subsidy, levelling the playing-field and improving resilience to default by affording a pool of liquid, high quality credit instruments.

4.3.2 Headline assessment

Table 4.4 sets out the key strengths and weaknesses of this option.

Table 4.4: Option 6—strengths and weaknesses

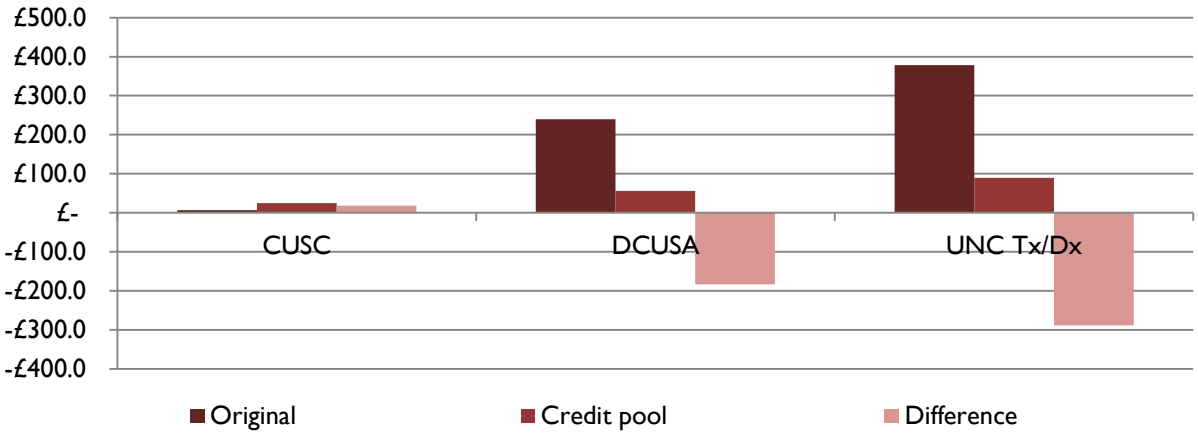
Strengths	Weaknesses
Removal of cross-subsidy This option will completely remove unsecured credit allowances from transmission and distribution frameworks. There will be much less exposure to code administrators to defaults by large suppliers under these arrangements, and less of a cost differential between large and small suppliers in the amounts of credit that they are required to post.	**Increased amounts and costs for CUSC** Despite the net reductions in credit costs, this option will see a ten times increase in credit required to be posted under the CUSC, increasing costs for market participants by £0.84mn. If it was to be solely pursued for the CUSC and not DCUSA (£5.7mn saving) and UNC transmission and distribution (£10mn saving) then it would result in increased credit burdens for electricity market participants.
Maintain robust credit protection for majority of probable default events By calibrating the pool limit to an estimation of the possible bad debts arising from multiple defaults by large counterparties, this option will provide an aggregate credit amount capable of dealing with low probability, but high impact defaults. It should therefore provide adequate cover for a range of other smaller, higher probability events.	**Distributional impacts will see a huge increase in credit from larger suppliers** The principle of linking the portion of a party's contribution to the credit pool to their share of charges will mean larger suppliers will face a large increase in both amounts and costs of credit as they would not be allowed to benefit from unsecured credit allowances.
Reduction in credit amounts and costs This option will see a significant reduction in the amount of security provided for by letters of credit and cash in the DCUSA and UNC transmission and distribution frameworks, reducing costs for market participants. The net impact on the costs of credit across all three frameworks is nearly £15mn. Noting that not every supplier will be dual fuel and face the UNC, across the electricity frameworks (DCUSA and CUSC) the net reduction is £4.9mn.	**Radical shift in credit principles** This option will require a significant shift in approach of basing required credit postings on an individual counterparty's liability over a given time period, to a concept of maximum probable default in the framework as a whole. The consequential adaptions to the rules are likely to be significant and we would estimate a long process to gain consensus, review the code and shape and implement the necessary modifications.
	Regional models may be incompatible Under the DCUSA and UNC, distribution network operators currently administer and collect credit within their geographical area. Implementing a credit pool through a regional model risks variations in interpretation of the rules and inconsistent implementation. Moving to national administration of a credit pool will require establishing new administrative structures, possibly with cost and time implications.
	Frailty to significant market failure This option could see there being a shortfall in credit available to code administrators in instances of widespread and simultaneous trading party default.

4.3.3 *Impact on credit amounts and costs*

The credit pool prudential limit would be established on the basis of unpaid charges for a single month in instances where three equivalent large VIU supplier benchmarks default on their CUSC, DCUSA and UNC transmission and distribution frameworks.

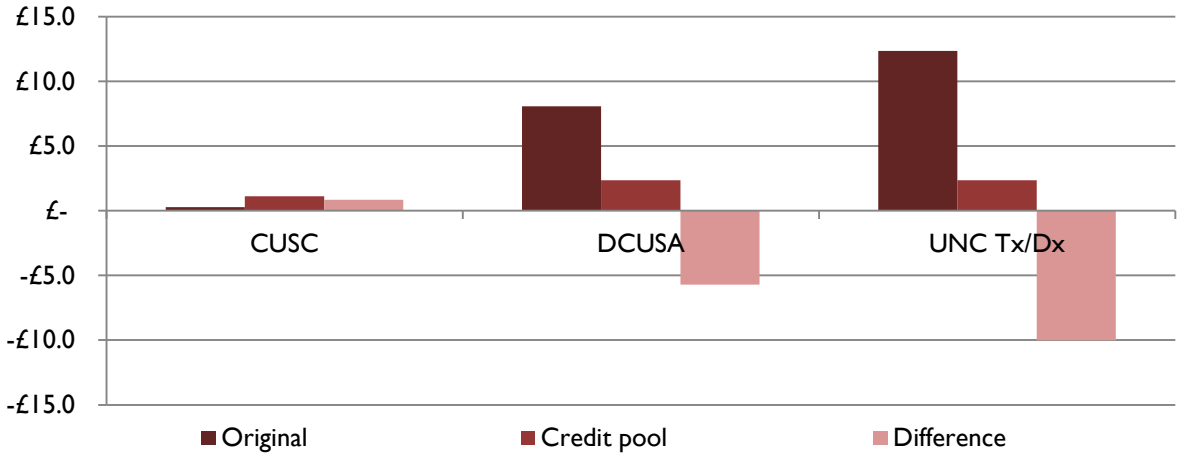
The consequence of this option could be to increase the level of secured credit (through letters of credit and cash) under the CUSC, but to reduce them under both the DCUSA and UNC transmission and distribution[37]. This is set out in Figure 4.6 with actual data in Annex K.

Figure 4.6: Average changes in secured credit under credit pool CUSC, DCUSA and UNC transmission and distribution, 2011-13 (£mn)



The effect on credit costs is shown in Figure 4.7. Actual data for amounts and costs is shown in Annex K.

Figure 4.7: Average changes in secured credit costs under credit pool CUSC, DCUSA and UNC transmission and distribution, 2011-13 (£mn)



[37] We took the CUSC as an exemplar because this is the code under which the impacts would actually have the least benefit from a cost perspective. It is the appropriate example for the analysis if this option is to be exposed to further scrutiny.

Whilst there is an increase for credit costs under the CUSC, this is more than offset by reductions in credit costs for the DCUSA and UNC transmission and distribution frameworks. The net credit cost reduction is nearly £14.9mn. However, much of this is attributable to the UNC and it will be only dual fuel suppliers that will be able to offset the increase in CUSC credit costs with reductions under the UNC transmission and distribution arrangements. Across electricity (CUSC and DCUSA), the net figure is a reduction of £4.9mn.

The impact of this approach on individual market participants can be assessed by analysing its effect on the supplier benchmarks[38]. We analyse its effect on the CUSC, where the level of unsecured credit is at its highest amongst the transmission and distribution frameworks.

Percentage increases are irrelevant given the modelled amounts of secured credit for each supplier benchmark under status quo credit rules are zero. The nominal increases in supplier benchmark collateral amounts and costs are shown in Figure 4.8 and Figure 4.9 below, with data tables set out in Annex L.

Figure 4.8: Average collateral amount increases for CUSC credit pool, supplier benchmarks (£mn)

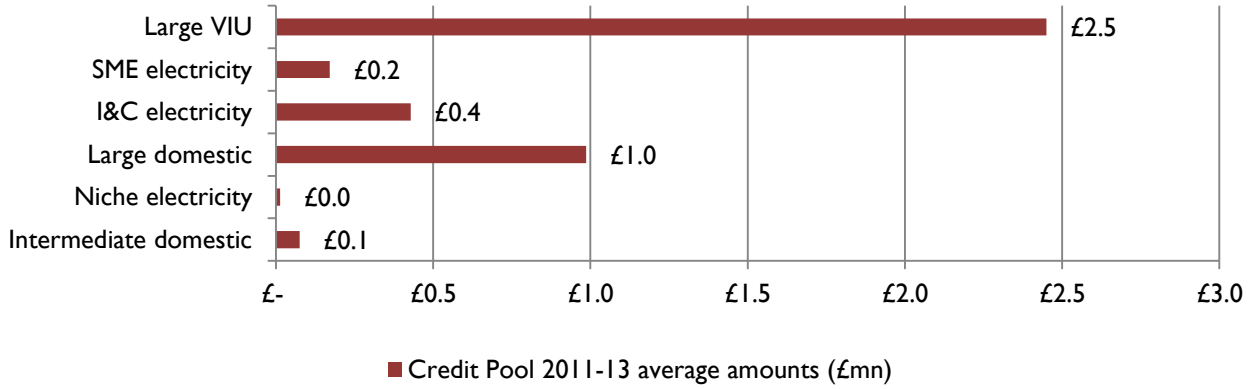
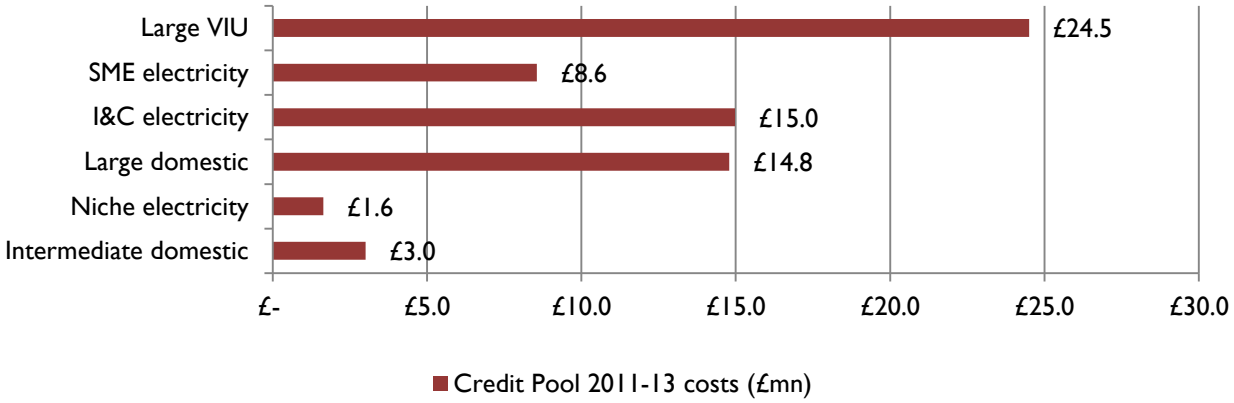


Figure 4.9: Average collateral cost increases for CUSC credit pool, supplier benchmarks (£k)



The impact of this option would be to increase collateral amounts and costs for all of our supplier benchmarks under the CUSC. Like the introduction of the credit pool in balancing, the heaviest burden

[38] Again, we have used market share as a proxy for share of CUSC liabilities.

would fall on the largest suppliers. Again, their lower cost of credit partially offsets the large increase in credit amounts. We estimate that increased cost burdens for the large supplier and large VIU supplier would also occur under the DCUSA and the UNC.

However, the collateral postings for new entrants under all transmission and distribution codes could be reduced by this approach. Currently, new entrants may typically have to fully collateralise their monthly charges under the CUSC as they do not benefit from an unsecured allowance as a result of strong independent credit assessments or credit ratings, or indeed from accumulation of a relatively lower level of unsecured allowances through demonstrating good payment history. As a result they would see higher relative costs as a result of their weaker credit ratings for posting collateral. A credit pool approach will still require new entrants to post letters of credit and cash at the next monthly credit pool reconciliation point following their CUSC entry. However, their level of credit posting will be reduced by 18% on average across all supplier benchmarks through the adoption of the credit pool approach.

4.3.4 Avoiding losses

Under the CUSC we estimate that there would be just over an £18mn increase in secured credit through adopting a credit pool, strengthening its ability to accommodate bad debts and default events.

The adoption of this option would, however, have very different impacts on aggregate levels of letters of credit and cash posted under each of the transmission and distribution frameworks. Under the DCUSA and UNC there would be a reduction in secured credit amounts as a result of the adoption of a credit pool.

Whilst the reductions in the DCUSA and UNC are material, they still leave a large amount of secured credit in place—at £56mn and £90mn respectively. As these amounts would be designed to cover multiple large supplier default for a period of one month, it would be anticipated that they would be sufficient to cover a range of smaller defaults that might occur in the market from time to time.

As with option 5, however, the arrangements could potentially be frail in circumstances where a major default created a substantial domino effect of serial failure across a large proportion of smaller trading parties at the same time, or all of the vertically integrated utilities. Whilst this is an improbable combination of events, as it signals a highly significant market failure without any intervention to prevent its occurrence, it is a circumstance that would need to be considered when assessing whether to adopt this option or not.

4.3.5 Relative consistency and simplicity

As this option would be delivered separately in the DCUSA, CUSC and UNC transmission and distribution frameworks, it could allow for a consistent credit approach between these codes.

However, it would require substantial amendments to existing code arrangements to implement the arrangements, underpinned by a significant shift in the principles used to govern how network users' obligations are collateralised. The biggest changes are:

- moving from demanding credit from individual parties based on their individual liabilities over a fixed period of time, to basing it on a systemic view of maximum estimated risk of loss over a fixed period of time;
- breaking the link to a network operators RAV and determination of credit amounts; and
- removing the opportunity to build up unsecured credit allowances through good payment history and credit ratings or independent credit assessments.

Given the significance of these changes, and the likely opposition to it from certain types of market participant, it is unlikely this option could be implemented through a series of code modifications without first being pre-empted by a more significant code review. As with option 5, the establishment of working groups that examine the risks, costs and benefits of the, and that make recommendations on the final detailed implementation proposals would be essential.

Moreover, the removal of setting credit requirements by reference to the RAV of the network operator, and possible consolidation of credit management across DNOs and GDNOs introduces an opportunity to establish consistency in the credit obligations placed on the same market participant across different regions and to improve transparency in risk management of the DCUSA and UNC at the systemic level.

In our judgement it would be inefficient to implement a credit pool system through the DNO and GDNO structures for the DCUSA and UNC respectively. This would require either regional sub-pools to be created with the risk that there are different interpretations and implementation approaches. Instead a better solution would be centralising the administration of the pool on a national basis. The disadvantage of this is that it would probably necessitate the creation of new governance processes and administrative responsibilities with associated cost and timing implications.

Transitional phasing arrangements would need to be developed to allow for implementation of the option without detrimental and unintended effects on market participants or the code administrators.

4.3.6 Competition and barriers to entry

This option would remove cross-subsidy from transmission and distribution frameworks. In doing so, our analysis demonstrates that it is likely to increase credit demands generally on market participants given the concentration of unsecured positions or PCG postings currently present under the CUSC, DCUSA and the UNC amongst the larger, financially able suppliers.

Such entities incur the majority of liabilities under these frameworks but currently enjoy the largest benefit from unsecured allowances or PCG postings. The impact for these suppliers would be more substantial compared to the introduction of a credit pool in balancing frameworks given under the BSC and UNC there is already a base of letters of credit and cash that the larger suppliers are obliged to post.

It should be noted that new entrants in particular could benefit from the adoption of this approach given the reduction in credit demands when compared to the current rules.

4.3.7 International examples

There are no examples we have identified of this precise approach being adopted in comparable peer energy markets.

4.4 Option 7—Credit pools with PCGs

4.4.1 Background

The application of credit pools in options 5 and 6 could be combined with:

- contributors being allowed to collateralise a share of their obligations using PCGs, but
  - only in a standard form as provided by the code administrators;
  - only if the provider of the PCG's credit rating exceeded a minimum credit rating threshold of BBB+;
- the share of credit pool contributions that a party could meet through PCGs would increase incrementally for ratings of BBB+ and above. For example, mirroring the approach in the CUSC:
  - a rating of BBB+ could see the share of the credit pool contributions being met by PCGs being 20%;
  - a rating of A- to A+ could see the share of credit pool contributions being met by PCGs being 40%;
  - and AA- and above could see the share of credit pool contributions from being met by PCGs being 100%;

- if the rating of the PCG provider fell below the minimum rating level, then the party would need to replace it with an alternative PCG of the required minimum rating, or a qualifying letter of credit (as per the existing BSC and UNC balancing rules) or cash within a specified period;
- failure to do so would constitute a default under which the code administrator would be able to take action to enforce the PCG;
- this would provide the code administrator confidence that:
  - the enforceability of PCGs is consistent and strong;
  - the probability of the provider of the PCG defaulting is low;
  - the PCG was of a credit rating equivalent to a letter of credit provided by a bank (A-);
  - no-one other than the very strongest counter-parties would be in a position where they post no letters of credit or cash.

This option would introduce the benefits outlined in options 5 and 6, whilst simultaneously attempting to minimise the distributional impact on the credit costs of larger suppliers without diminishing the confidence of respective code administrators in the robustness of the credit arrangements.

4.4.2 Headline assessment

Table 4.4 sets out the key strengths and weaknesses of this option.

Table 4.4: Option 7—strengths and weaknesses

Strengths	Weaknesses
Significant reduction in credit amounts and costs This option would reduce collateral significantly. For example, under the BSC we estimate that a credit pool on its own could reduce standing credit from over £350mn, to £56.2mn, and costs by £9.1mn. With the option of meeting contributions to the credit pool through PCGs it is highly likely that there would be further reductions to these credit amounts and costs. Quantifying this at a framework level would require further analysis of the credit ratings of participants, which we have not attempted here.	**Distributional impacts will still see large increases in credit from larger suppliers** The principle of linking the portion of a party's contribution to the credit pool to their share of charges will still mean larger suppliers will face a large increase in both amounts and costs of credit, even with the ability to net off through posting credit in the form of PCGs. It should also be noted that PCGs will have an impact on large suppliers in that they will be considered by credit ratings agencies in their assessment of liabilities.
Maintain robust credit protection for majority of probable default events By calibrating the pool limit to an estimation of the possible bad debts arising from multiple defaults by large counterparties, this option will provide an aggregate credit amount capable of dealing with low probability, but high impact defaults. It should therefore provide adequate cover for a range of other smaller, higher probability events.	**Radical shift in credit principles** This option will require a significant shift in approach of basing required credit postings on an individual counterparty's liability over a given time period, to a concept of maximum probable default in the framework as a whole. The necessary changes to the rules are likely to be significant and we would estimate a long process to gain consensus, review the code and shape and implement the necessary modifications.
Less extreme distributional impacts than under option 4 The ability to avoid posting letters of credit and cash, replacing them with PCGs, will reduce the increases in credit posting for larger suppliers.	**Frailty to significant market failure** This option could see there being a shortfall in credit available to code administrators in instances of widespread and simultaneous trading party default.

4.4.3 Impact on credit amounts and costs

This option would replicate the impact on credit amounts under options 5 and 6. Framework credit costs could be reduced in proportion to the number of parties able to post PCGs for a share of their required credit pool credit contributions.

It is not possible to determine this reduction accurately at a framework level. However we can analyse the impact on the BSC to provide an indication of possible effects. The impact of this approach on the large VIU supplier under the BSC would be to reduce the increase in credit amounts and costs that would be attributable to increases in letters of credit or cash to c198%, as oppose to c400% under option 5. For the large domestic electricity supplier the equivalent figures are c125% as opposed to c180%.

It is important to remember that even though PCGs do not attract a direct financing cost—and therefore are more advantageous to companies to post as credit when compared to letters of credit and cash—they will have other consequences for the guarantor companies. In particular, credit ratings agencies will consider the risk attached to calls on PCGs issued by the guarantor when assessing that company's credit rating. For each rating decrement companies will inevitably see an increase in their costs of capital.

On its own account, the amount to be posted under this option as PCGs is unlikely to be considerable enough to influence a credit rating decision. For example, again under the BSC for the large VIU

benchmark, the PCG amount on average in the period 2011-13 would have been no more than c£2mn. However, this has to be placed in the context of already significant likely issue of PCGs by larger suppliers to support trading, transmission and distribution and PPA activity.

4.4.4 Avoiding losses

The robustness to avoiding losses would be diminished relative to options 5 and 6 with regard to defaults by larger suppliers that could benefit from posting PCGs.

Even with minimum ratings thresholds and a ratings scale to determine the amount of credit that could be provided by PCGs, the risk will still remain that a rapid default by a supplier and its guarantor could leave the administrators in a position where they are unable to recover all owed amounts.

PCGs are only effective forms of credit whilst the guarantor is in a position to honour its payment obligation. Relative to options 5 and 6, this would accelerate the pace at which calls will need to be made non-defaulting parties' credit or the speed at which mutualisation occurs.

4.4.5 Relative consistency and simplicity

Adopting this option alongside either of options 5 or 6 would require substantial amendments to existing code arrangements, underpinned by a significant shift in the principles used to govern how a market participant's obligations are collateralised. The single biggest change is moving from demanding credit from an individual party based on its individual liabilities over a fixed period of time, to basing it on a view of systemic maximum estimated risk of loss over a fixed period of time.

In addition, the new rules would not only have to contend with this radical change in approach but would also have to include matrices and rules for allocating credit based on credit rating and independent financial assessments.

Given the significance of the change, and the likely opposition to it from certain types of market participant, it is unlikely this option could be implemented through a series of code modifications without first being pre-empted by a more significant code review. Either way the establishment of working groups that examine the risks, costs and benefits of the option, and make recommendations on the final detailed implementation proposals would be required.

Transitional phasing arrangements would need to be developed to allow for implementation of the option without detrimental and unintended effects on market participants or the code administrators.

4.4.6 Competition and barriers to entry

Allowing large, well-rated suppliers to meet a share of their credit pool obligations through posting PCGs would reduce the increase in the amounts of letters of credit and cash that they are required to post through the adoption of a credit pool. It is therefore likely to reduce the strength of opposition to the introduction of a credit pool that might be witnessed under options 5 and 6. However, we estimate that for all frameworks, upon introduction of this option, this category of supplier would still be asked to post larger amounts of credit than under the current credit rules, so they would still have to bear an increased burden of cost.

Given the possibility of suppliers below a certain rating not having an ability to meet a proportion of their credit obligation through PCGs, this option is likely to have a further detrimental competitive impact for those suppliers that fall into these ratings categories but which are contributing significant amounts to the credit pool based on the scaling approach to collateralisation. Arguably, this is a justifiable outcome based on an assessment of financial capability, and therefore the acceptability of a PCG, but it is nonetheless likely to be a feature of this option that is met with resistance by those suppliers who fall the wrong side of a particular credit rating.

4.4.7 International examples

There are no examples of this option that we have identified being adopted in peer international markets.

4.5 Option 8—Credit pool with aggregate credit product

4.5.1 Background

This option could replicate options 5 or 6 in terms of the method used to establish a credit pool prudential limit for both balancing and transmission and distribution frameworks. But the method of posting credit is achieved through a different credit instrument. This option could be applied to all frameworks that adopt a credit pool solution, whether in balancing or transmission or distribution.

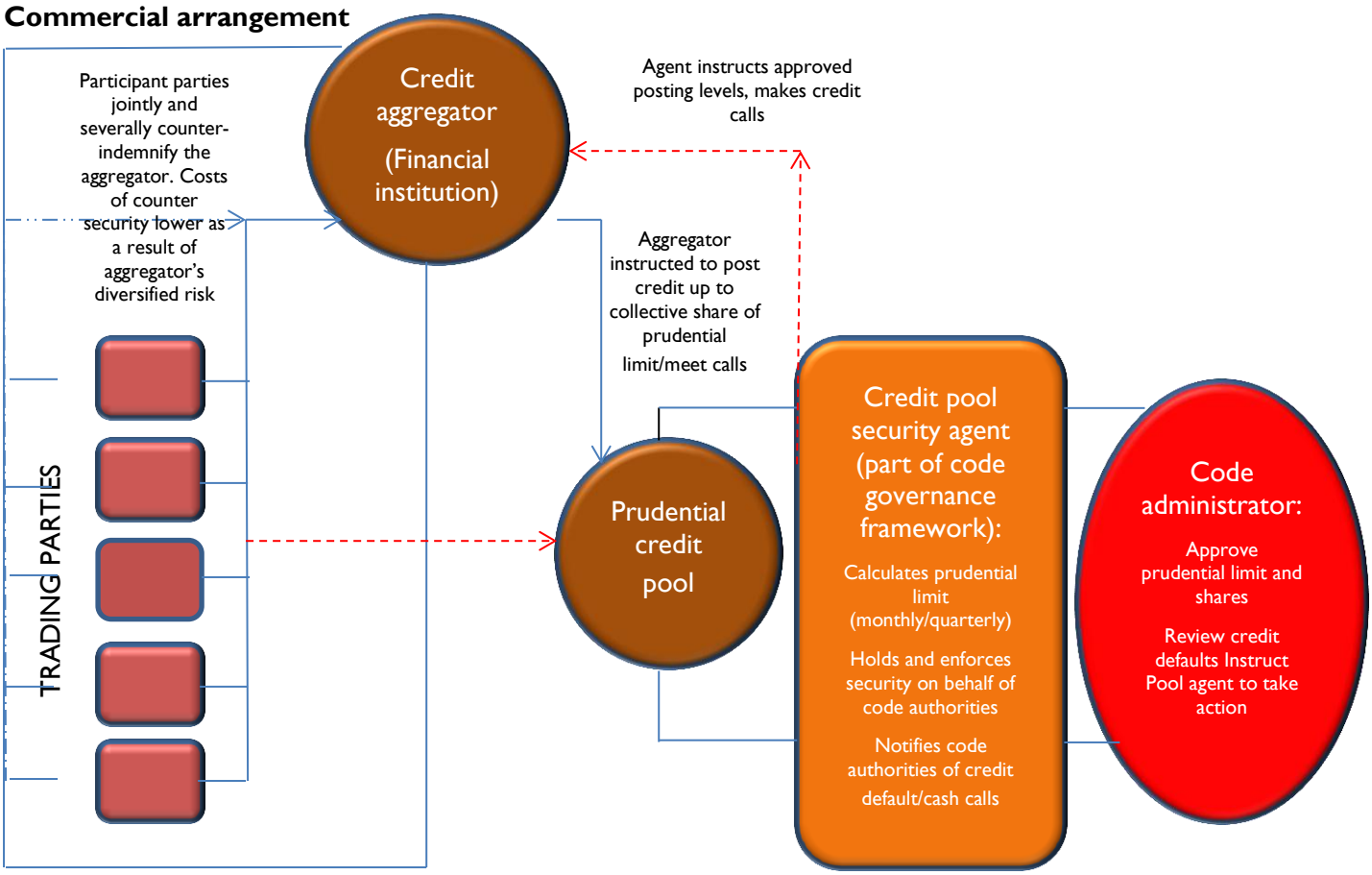
The main elements of this are set out below:

- a single "aggregated credit product" is used to secure all of the obligations of the pool. This could be an unconditional, on demand letter of credit or an insurance product provided by a "credit aggregator", which would be a financial institution that meets the current minimum ratings thresholds (A- Standard and Poor's or the Moody's or Fitch equivalent);
- the role of credit aggregator could be annually retendered by the code administrators. Bids would be invited from interested financial institutions who would bid on the basis of their view of the weighted average price of risk in the relevant market, and their ability to achieve the unconditional and on-demand basis of the credit instrument;
- the aggregator would (in addition to their cost levied on participants) also receive a service fee from the code authorities for providing the aggregation product. Financial institutions would be within their rights to team-up to provide the aggregation role if they so desired, so long as each party met the minimum rating threshold of A-;
- the cost of the product to participants would be a uniform monthly charge, rather than being differentiated by risk or volume of individual participants. This would mean that all considerations of risk would need to have been taken into account when establishing this charge;
- the second place bid would be held over as a reserve bid, to be called upon for the residual part of the annual term should the original winning bidder fail to satisfy the minimum credit rating requirement at any stage;
- participation by trading parties under the wing of the aggregated credit product would be mandatory. This is as a result of the requirement for new code governance institutions, which would need to be created to manage the interface between the code authorities, the credit aggregator and trading parties and to appoint the credit aggregator;
- a credit pool security agent would be established to hold the aggregated credit product, calculate the level of the prudential limit required to be covered by the aggregated credit product from time to time, indicate shares of the prudential limit to each trading party and hence their level of counter-indemnification to the aggregator (see below). This agent would also report to the code administrators in instances of default that require demands to be made under the umbrella instrument, and arrangements that need to be made to replenish the aggregated security to the required level;
- rather than each party issuing their own credit for their own share of the prudential credit pool limit, trading parties would instead jointly and severally agree to indemnify the aggregator to the equivalent level. This would mean that any claim on the aggregated credit would be met by the credit aggregator recovering sums from each party. The counter-indemnity would be essentially a promise to pay issued by the company or a parent guarantor and not a letter of credit or cash; otherwise it would not confer any additional effect on participants than already considered under options 5 or 6. Credit aggregators would need to give consideration to the risk of this in how they choose to price the aggregated credit product when they bid to become credit aggregators;

- a party's share of counter-indemnification would be based on their most recently calculated share of the charges incurred in the last credit reference period. This arrangement would allow the aggregated credit product to be priced on a genuine diversified basis, taking into account the weighted average risk profile of all parties to the arrangement. As this is mandatory, it would reflect the large weighting applied to the bigger, better-rated market participants;
- current rules under the UNC for cash calls and under the BSC for credit default linked to thresholds of code indebtedness would be obsolete as credit would not now be determined by individual counterparties indebtedness;
- individual trading parties would still be liable to meet their own payment obligations. Any payment default would be met by a call on the aggregated credit product by the credit pool security agent. Each trading party would then reimburse the credit aggregator in accordance with their share of counter-indemnification. This would allow the aggregated credit level to be restored to its previous level;
- to avoid incentives on trading parties to continually miss payments due to the mutualised protection offered by these arrangements, a requirement to post individual letters of credit and cash would follow any instance of payment default, even if remedied within a specified grace period, and any payment default not remedied could lead to expulsion from the relevant code;
- failure of the aggregated credit product to meet the required level of credit posting (as recalculated regularly by the credit pool security agent) would not constitute a credit default for all parties in the pool. However, it would trigger a requirement for additional credit to be posted within a specified time period under threat by the credit security agent to exercise a right to call the whole of the aggregated credit product and hold credit as a cash reserve; and
- such an action would see all parties having to honour their counter-indemnities to the aggregator. This should act as an incentive for the parties to agree to increase their pro-rated level of counter-indemnification in order to allow the aggregated credit product limit to be increased.

This structure is set out in Figure 4.10.

Figure 4.10: Credit pool with umbrella credit product



This option provides a single unit cost for the provision of credit that neutralises the impact of credit costs on a party's competitive position. All parties would face the same cost of credit. Administration costs for market participants would also be greatly reduced as money spent on bank, legal and internal administration of individual credit instruments would be saved.

Through asking financial institutions to regularly compete based on a weighted average assessment of total risk, this option would generate competitive tension in setting the unit cost of credit. It also avoids the effect of rationing behaviour that might restrict access to credit or increase its costs to smaller market participants.

Furthermore, it should be a reasonably compelling proposition for financial institutions as this approach streamlines administration relative to issuing multiple letters of credit across many counterparties. It will constitute relatively short-term commitments (a year), will be a large-scale financing opportunity, and it should genuinely diversify their risk.

4.5.2 Headline assessment

Table 4.8 sets out the key strengths and weaknesses of this option.

Table 4.8: Option 8—strengths and weaknesses

Strengths	Weaknesses
Single, lower cost of credit The amounts of credit would be the same as under options 5 and 6 respectively. However, this option would establish a single cost of credit that is likely to be lower than the weighted average cost of credit that would apply under a credit pool. It would make credit costs irrelevant to the competitive position of market participants on an ongoing basis. At this stage it is not possible to quantify the precise impact on credit costs.	**Concentration risk** This option could leave code administrators exposed to having all credit provided by a single financial institution. This could be addressed through asking for an increasing number of financial institutions to share the provision of the aggregated credit product at different thresholds of calculated prudential limits for the credit pool, or a reserve bidders approach for substitution of providers who fall below A- (or equivalent) minimum ratings thresholds.
Streamlined administration of credit This option would reduce the number of parties involved in dealing with credit demands and counterparty defaults, potentially facilitating deeper and more focussed due diligence on the financial capability of providers of credit and swifter action by code administrators in instances of default.	**Removal of established and proven incentives** This option removes incentives on parties to post credit at given levels relative to their own individual indebtedness and changes incentives on parties to always pay in a full and timely manner. Whilst different penalties and incentives could be introduced under this option to achieve the same objectives, further work will be required to establish whether they are likely to proportionate and effective.
Competitive price discovery The cost of the aggregated product would be discovered through competitive processes. The scale of the facility, the short term of the facility, and the risk sharing basis of counter-indemnification are likely to prove attractive to financial institutions.	**Distributional impacts will negatively impact larger, better credit rated suppliers** The immediate impact of this option would most likely increase the amounts of credit that are required to be posted by larger players, without allowing them to neutralise the impact through leveraging their individual and relatively lower credit financing costs. Moreover, they are likely to be responsible for achieving reductions in credit costs for their competitors given the key role they will play in the aggregator's determination of the single cost of credit for the aggregated credit product.

4.5.3 Impact on credit amounts and costs

The additional impacts of this approach, relative to options 5 and 6, could be to lower the costs of credit. Quantifying the extent of cost reduction is not feasible at this stage and would require significant and detailed stakeholder testing with the financial community.

However, there can be reasonable confidence that this approach would deliver lower costs of credit overall. Each party under the umbrella would agree to jointly and severally counter-indemnify the aggregator in the event of any call against the umbrella product. This makes the solution cheaper by giving the aggregator a stronger, diversified position of recovery in the event of calls being made on the aggregate credit product. This should allow for a lower aggregate financing cost than under the credit pool

arrangements set out in options 5 or 6, or when compared to costs that are realised under the current credit rules.

The competitive element of appointing the credit aggregator should maximise the potential cost saving from this approach by challenging bidders to pitch competitive single prices for their view of general risk in the relevant sector (gas or electricity balancing or different segments of gas or electricity transmission and distribution).

4.5.4 Avoiding losses

In addition to the impact on avoiding bad debts and losses identified in options 5 and 6, this option has an additional advantage of allowing code administrators to have control over the identity, financial standing and form of credit being provided by the credit aggregator. Due diligence on these areas will be concentrated on a single institution or much more limited group of institutions (assuming that financial institutions team up to provide an aggregation facility). This will allow for deeper ongoing coverage of the financial standing of the credit provider relative to having to assess the ongoing financial standing, and credit ratings of multiple financial institutions.

In addition, the interface between the code administrator and the aggregator in instances of multiple party default will be far more streamlined than dealing with many different financial institutions—each with their own processes for settlement of payments on credit instruments. In theory, this could allow for quicker disbursements from demands made on credit, even in the event of significant numbers of defaults occurring.

Conversely, this option introduces a degree of concentration risk, in that the code authorities would find themselves relying on a much smaller group of financial institutions to collateralise the obligations of parties under the codes. If one of these financial institutions failed, it means that the system of credit support is put under considerable threat. Under the current UNC balancing rules, there is an attempt to manage this risk by imposing maximum limits on the credit that can be posted by financial institutions at different credit rating levels.

In part, this concentration risk is manageable by combining the introduction of this approach with a credit pool. As our analysis of this option demonstrates, this could significantly reduce the overall level of credit that has to be provided. For example, the credit pool limits range between £25mn-£90mn across separate codes that we have analysed. These are not material numbers in the context of large, A- rated financial institutions, and the ability to replace a defaulting financial institution with another financial institution for provision of facilities of this size should not be prohibitive. This is particularly the case, if there is an approach that retains a reserve bidder as we have proposed.

There could still be some understandable reluctance to concentrate the provision of an aggregate credit product on a single counterparty. This risk could be addressed by the bidding rules that establish that a credit aggregator service is provided by no less than a minimum number of institutions—with a matrix formed that sets out a minimum number of financial institutions that must comprise an aggregator service based on the level of the prudential limit required for the relevant credit pool. Further work would be required to develop this approach, based on code administrators' attitude to maximum levels of exposure they would accept to individual financial institutions.

There is a trade-off with the identified benefit of streamlining processes in the event of multiple default. However, in recognition of the low probability of multiple default events occurring, it may be felt appropriate to seek to impose this sort of bidding requirement to reduce exposure to this type of concentration risk.

Of further potential concern could be the break that this option creates between individual counterparty indebtedness and credit postings. In particular, under the BSC and UNC balancing arrangements there would no longer be an ability to place parties into credit default or make cash calls in instances where their level of indebtedness rises above a certain threshold of credit cover. These provisions are useful as they place powerful incentives on parties to ensure that they adjust their credit postings to account for increased charges under these frameworks.

A different set of incentives would apply under this option that would allow the administrators to call part, or all of the aggregated credit product in instances where they have notified all parties and the credit aggregator that the level of credit falls short of the prudential limit for the credit pool as recalculated from time to time. Given the counter-indemnification arrangements, it would be in the collective interests of all parties to agree to increase their own level of counter-indemnity to allow the aggregator to increase the limit of the aggregated credit product than face a demand from the aggregator to reimburse them for a total pay-out under the aggregated credit product. Further work will be required to explore whether these replacement incentives are proportionate to the risk and effective in driving the right behaviour from market participants.

A similar concern would exist with regard to incentives on parties to pay in a full and timely fashion. The fact that all parties would effectively be liable for a share of non-payment bad debts by a defaulting party could lead to perverse incentives on parties to delay or avoid payment, given the lack of exposure to the full costs of doing so. This risk could be managed by retaining the ultimate sanction of code expulsion for a payment default that is not remedied by a party by the end of specified grace periods. There could also be a requirement for any party in payment default to remain party to counter—indemnity arrangements under the credit pool, and still be required to post their own credit in the forms of letters of credit or cash for their liabilities. Again, further work will be required to explore whether these replacement incentives are proportionate to the risk and effective in driving the right behaviour from market participants.

4.5.5 Relative consistency and simplicity

This option has even greater added complexity than the introduction of a credit pool. Amendments to codes would need to limit permissible credit to only an aggregated credit product. Rules and procedures governing the roles, responsibilities and obligations of the credit security agent and the credit aggregator would also need to be established. A credit pool security agent would need to be created.

It might be necessary for the credit aggregator to become a party to codes whilst they are performing the aggregation role to ensure that they do not vary the terms of the aggregated credit product.

A regular tendering process for the award of the credit aggregation service would need to be created. Further work would need to be undertaken with regard to the necessary level of compliance with UK and EU procurement law.

Transitional phasing arrangements would need to be developed to allow for implementation of the option without detrimental and unintended effects on market participants or the code administrators.

4.5.6 Competition and barriers to entry

Introducing this option would have an ongoing impact exposing all parties to the same cost of credit, making it an irrelevant factor in determining costs of business and hence competitive advantage or disadvantage between different parties.

New entrants would feel the benefit of this option most of all as their share of the volume usage of different frameworks would be low. Their heightened risk would not be playing a significant role in establishing the single cost of credit for aggregated credit products, but they would benefit from the price established by better established, and financially stronger companies.

However, upon its implementation there would be an immediate alteration in the competitive landscape that could be detrimental to the larger, better credit rated suppliers. They would face the distributional impacts illustrated in the analysis of options 5 and 6, but every supplier would be facing the same cost.

Furthermore, larger, better-rated suppliers would equally argue that they would be facilitating a significant reduction in credit costs for the rest of the market given the relatively low default risk that the credit aggregator would apply. However, they would still be exposed to increases in the price of the aggregated credit product for defaults by other counterparties.

4.5.7 *International examples*

There are no obvious and accessible examples of this approach being used in other jurisdictions.

4.6 Option 9—Regulated credit reserves in transmission and distribution

4.6.1 *Background*

Under this option, which would apply to frameworks administered by regulated network owners:

- the requirements for credit cover at individual counterparty level in the CUSC, DCUSA, and UNC transmission and distribution arrangements would be removed altogether. Therefore, no credit cover is provided by users of these frameworks;
- as a result all bad debts resulting from user failure would be absorbed within the regulated price control frameworks for National Grid and other network operators, which make provision for the collection of regulated credit reserves/bad debt allowance. Therefore, all the costs of the defaulting party are initially borne by the network operators in the first instance;
- the current rules regarding pass-through of bad debts, set out by Ofgem, would no longer apply. Instead of bad debts being subject to possible pass through after they occur, given the eradication of credit postings at individual counterparty level, an allowance will be made to charges to account for an estimate of bad debt ;
- well-judged pre-estimates of possible bad debts would be used to determine an additional charge to be recovered from users as part of regulated price controls, to act as cover for bad debts. This would be based on historic levels of losses following defaults, with adjustments to historical levels being made by the network operators if justifiable based on an expectation of material changes in the constituency of the market, or risks posed to market participants;
- it would not be based on estimates of the total level of loss that could follow a number of large counterparty default (and so differs from options 5 and 6). Ofgem would set out guidance for network operators for the determination of the pre-estimates and resulting charges;
- the unit charge for each participant could be determined by dividing the bad debt estimate by the total volumes of usage for the underlying framework. This would resolve a per unit charge, which would mean that those companies responsible for the greatest volumes of activity through the respective framework would be exposed to the largest charges;
- to cover defaults the network operator could access the bad debt reserve that it holds as a result of these charges, which would in effect provide a working capital facility;
- bad debts that exceed the pre-estimate would be met from network operators' own working capital reserves or facilities[39], with an upward adjustment to the bad debt charge for the following period to recover their working capital position (money spent plus any interest or financing charge);
- access to a working capital facility of this type would need to feature as part of their overall agreed financing package for their regulated price control period and hence the costs of this facility would be incorporated into the charges on industry users. Any drawings under this facility (including financing costs) could then be repaid through adjustments and pass-through to charges to non-defaulting users; and
- given the general absence of bad debts under these frameworks, it is not expected that such facilities would be used often for this purpose.

[39] We are aware that many already hold revolving credit facilities, which could be used for this purpose. If necessary they could borrow under this at rates that are lower than any individual market participant.

It should be noted that the price control process is a complex area. Consideration of the detailed implementation approach to this option in practice, and how it might apply to National Grid, the DNOs and GDNOs is beyond the scope of this particular report.

However, this approach is similar to that adopted in the regulated water sector where companies make an allowance for bed debt in their price control submissions. In the water sector bad debt is more of a problem than it is in transmission and distribution activities in the energy sector, predominantly because water companies are dealing directly with retail and business customers as opposed to large energy suppliers.

Balancing frameworks do not operate under regulated price controls so directly replicating the implementation procedures of this option is not possible under the BSC and UNC. [40]

The aim of this option is to reduce costs of credit, and eradicate the cross-subsidy inherent in the allocation of unsecured credit allowances under current transmission and distribution frameworks. If the approach were applied to the energy networks consideration would be required as to how the mechanism should be established given longer-term price controls for transmission and gas distribution are already in place. The finalisation of the next electricity distribution controls is at a very advanced stage.

4.6.2 Headline assessment

Table 4.9 sets out the key strengths and weaknesses of this option.

[40] In theory, BSCCo and Xoserve could replicate option 9 by collecting an additional charge from participants for pre-estimates of bad debts ahead of a given period (quarterly, biannual or annual). However, the levels of charges under these codes are less predictable than in transmission and distribution and driven by the activity of participants rather than costs of delivering a service and infrastructure to the energy markets. To credibly cover the less predictable and more volatile possible charges and to avoid immediate mutualisation of uncovered bad debts that could result from forecasting errors, it would most likely need to be a very high charge to provide confidence to stakeholders that it could avoid unacceptable increase in the risk of losses. In fact, it would in our view need to be set in a fashion commensurate to that used to set the prudential credit pool limit in option 5. This variation could be viewed as a pre-funded variation of a credit pool with no obvious advantages over that option.

Table 4.9: Option 9—strengths and weaknesses

Strengths	Weaknesses
Removes the cross-subsidy effect Through stripping out the obligation on all parties to directly post credit, it removes the potential for secured suppliers to cross-subsidise unsecured suppliers that might arise in instances of unsecured supplier default.	**Misalignment between pre-estimates and actual bad debts** This option exposes the network operators to the risk of forecasting errors in estimating the possible extent of bad debts under their codes.
Beneficial to less well rated independent suppliers and new entrants This option will remove costs for those suppliers who currently contribute the greatest share of letters of credit and cash as credit under these frameworks, allowing money to be invested in business growth and customer acquisition.	**Complex implementation** This option would involve not only changes to codes as they apply to participants but also regulated price controls as they apply to network operators. It would also involve the establishment of new forms of charges and over-arching guidance from the regulator regarding their calculation and administration.
Flexible credit resource This option will grant the code governance authorities a form of liquid credit that can be applied to any instance of default, rather than being tied to using a defaulting counterparty's credit for recovery of bad debts in the first instance.	

4.6.3 Impact on credit amounts and costs

This option will eradicate the direct cost of credit for market participants to the CUSC, DCUSA and UNC transmission and distribution frameworks. However, there will be an off-setting impact through the increase in charges under these frameworks that will reflect the pre-estimate of bad debts that might arise. It is not possible to quantify the precise net cost position for different types of suppliers as we cannot determine the pre-estimate of levels of possible bad debt without detailed consultation with network operators. The qualitative impacts of this are further considered further below.

This option might lead to potentially higher financing costs to the network operators. The risk this option creates is that the pre-estimate that has formed the basis of increased charges to cover possible bad debts is not sufficient and hence network operators must seek external financial support.

The impact on network operator credit costs is also uncertain. At this early stage, there is no categorical basis for determining how credit ratings agencies would view this risk. Their treatment of this option is important as the credit ratings they give to network operator companies have a significant bearing on the cost of the financing arrangements in to which they enter and the level of investor appetite for supporting them. There is the risk that this option results in a negative drag on credit ratings by virtue of eradicating the network operators' access to a pool of liquid, on-demand credit instruments to cover possible bad debts. However, given the preponderance of either unsecured allowances or PCGs under these frameworks, there is already a very low level of liquid and on-demand credit cover.

It is reasonable to assume that the credit rating agencies would closely examine the implications of this option if network operators were to discontinue the current credit and security process without alternative compensation or mitigation as this would shine a spotlight on the issue. However, in our view the approach is unlikely to materially change a credit rating.

Initial and informal conversations with a major rating agency with regard to the removal of counterparty credit arrangements suggest that the implications for network operators' credit ratings and costs of finance are unlikely to be material. This because:

- there is no specific allowance for bad debt in the network price controls currently, but they believe it may be covered in broad total expenditure allowance, falling below Ofgem's materiality threshold for line items; and
- there is generally a positive view on the low probability of default and bad debt risk amongst the customers of the network operators; and if this is the case, it could be more efficient for the cost of bad debts to be reflected in the cost of finance of the network operators rather than users of the transmission and distribution frameworks, as their costs of finance are likely to be the lower.

There would be additional considerations with regard to incentives on market participants to pay promptly and to avoid bad debt costs accumulating in charges levied on other non-defaulting market participants. This could be achieved by strict rules that restricted or prevented a supplier or shipper from registering new sites if there were a record of untimely payment, or in the extreme non-payment of debts would remain a default event under the terms of these frameworks[41]. However, in our view, even with such measures, it is reasonably clear that there would be a significant dilution of incentives on individual market participants to maintain good payment under this option.

4.6.4 Avoiding losses

This option would remove the ability to absorb losses through credit posted directly by individual market participants. It would replace this with a bad debt reserve effectively established through charges levied on market participants in proportion to their volumetric use of each framework.

Consistent with our assumption that unsecured credit allowance and PCGs are of minimal value when seeking to recover bad debts, then the effect on the ability of code administrators to avoid losses under this option depends on the difference between the pool of letters of credit and cash posted under each framework and the scale of the cash bad debt reserve established through charges. This is the essential comparison between levels of "secured" credit between the status quo and this option.

As there is only a very minimal level of letters of credit and cash under the CUSC (£6.3mn on average between 2011-13), it is likely that this approach will have a negligible effect on the ability of the National Grid to cover liabilities created by instances of counterparty default. However, under the DCUSA and UNC the same cannot be said with great certainty given that the levels of secured credit under these frameworks averaged £240mn and £378mn respectively over the same period., It is likely that the pre-estimation of bad debts would result in the bad debt reserve standing at a lower level.

As the bad debt reserve would be deployable to cover bad debts in all instances of default—regardless of the counterparty—even if there is a reduction in the level of secured credit through this option, it still may create a beneficial position relative to the current rules. Under current rules, letters of credit and cash are only of value to meet liabilities in instances where the default is by the party who has posted these forms of credit. Letters of credit and cash posted by other non-defaulting parties cannot be accessed to cover a defaulting party's debts. If a supplier that benefited from large unsecured allowances defaulted, there would be no immediate pool of money that could be accessed to cover the liabilities created by the default. Conversely, adopting this option would mean that in these circumstances money would be available to fund the liabilities created by these defaults, affording code administrators much greater flexibility in the use of mitigating credit measures following instances of default.

[41] Although the practical ability to implement this could be challenging.

4.6.5 *Relative consistency and simplicity*

This option would be complex to implement. The code rules for each of the CUSC, DCUSA and UNC would need to be significantly revised to accommodate the removal of credit obligations on participants, and to account for new charging elements for coverage of bad debts. There would also need to be revisions made to regulated price control arrangements, including those already established.

These would need to countenance money being raised by network operators specifically for the purposes of covering bad debts, and guidance would need to be issued by Ofgem to network operators to ensure a consistent approach was adopted in establishing and administering the associated charges.

4.6.6 *Competition and barriers to entry*

This option would completely remove the cross-subsidies evident in transmission and distribution frameworks; it would neutralise the advantages afforded to participants able to enjoy large accumulations of unsecured credit allowance or that can meet their credit obligations through posting PCGs. As a result, it avoids the risk of cost transfers to those secured suppliers in instances of defaults by unsecured suppliers.

In addition, this option could enhance the competitive position of smaller, independent and less well credit rated market participants more generally. Stripping out the letters of credit and cash posted by individual participants to transmission and distribution frameworks is likely to benefit these parties most on the basis that they are least able, of the established participants, to access unsecured credit allowances.

However, through a general increase in regulatory charges, there could be detrimental impacts. This is particularly true for those established, larger and well rated suppliers that enjoy very large allowances of unsecured credit. Whilst they would not be asked to post further credit under this option, they would see a cost increase through the increase in charges to cover the pre-estimate of bad debts.

Quantifying the net effect on each type of participant is very difficult. However, it is reasonable to assume that so long as pre-estimates used to determine the bad debt elements of charges are based on historical levels of losses (and not significantly adjusted) then it could result in material cost savings for smaller, less well rated suppliers. At the same time, it should not be overly detrimental to larger suppliers relative to their current cost position under these frameworks.

The exception could be in the period after a default has occurred, if this prompts a material increase in charges to create the bad debt reserve. If this was as a result of default by smaller suppliers in the market then larger suppliers may legitimately question whether it is appropriate for them to bear the most significant share of increased costs and whether this in itself constituted some form of subsidy.

Further work would be required to establish the precise net benefit and costs to different market participants. Ofgem would need to ensure that all pre-estimates are established on the basis of a consistent methodology, and that they do not lead to unreasonable or unearned returns.

However, we can quantify the extent of the benefit that this option could deliver to new entrants. Under the current rules, we estimate that credit amount and costs across all new entrant supplier benchmarks across the CUSC, DCUSA and UNC transmission and distribution averages 18.4% of their total credit in the period 2011-13, and 17.3% for acquisitive new entrants.

New entrant intermediate and niche domestic electricity suppliers would benefit most as their share of credit derived from these frameworks amounts under the current rules amounts to 22% and 19.5%. This pattern is also true of acquisitive new entrants where the equivalent figures are 22% and 19.6%. This is predominantly due to relatively high credit demands under the DCUSA.

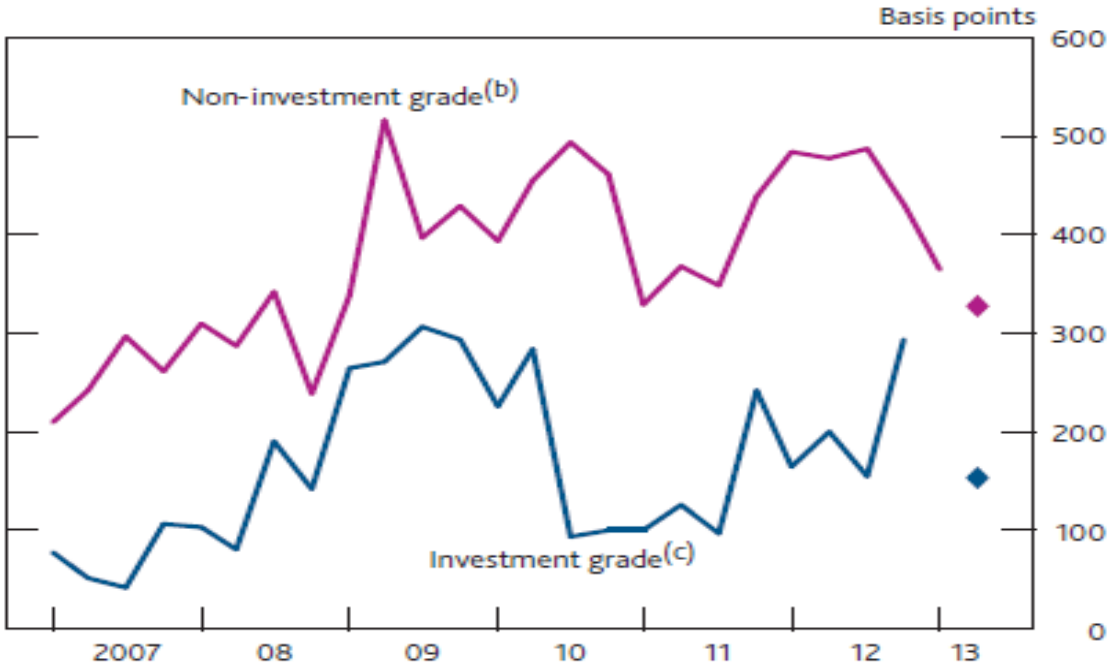
4.6.7 *International examples*

There are no examples of this approach that we are aware of being used in other jurisdictions.

Annex A—Credit cost movements

Figure A.1[42] captures pricing for syndicated loans for UK corporates. Whilst these transactions are at the larger end of the bank debt market, they will set benchmarks for pricing of corporate loans down the scale of bank lending activity for companies of equivalent risk rating.

Figure A.1: Average estimated spreads on syndicated loans (basis points)



Sources: Dealogic and Bank calculations.

(a) Average disclosed spreads over reference rates in the currency in which loan tranches are denominated, weighted by tranche size. Classification may be adjusted if ratings change over the life of the loan providing this is confirmed by the banks involved in the loan. The share of loans for which spread details are disclosed varies over time. Data for 2013 Q2, denoted by diamonds, are based on deal information available at the time of publication. Data are quarterly. Non seasonally adjusted.
(b) Non-investment grade is Dealogic leveraged and highly leveraged categories.
(c) Investment grade is classified by Dealogic as a rating of BBB- or higher, on announcement of the loan. If there is no rating then the loan spread on origination is used as the basis for classification, with any spread up to 250 basis points classified as investment grade. There are no disclosed spreads for investment-grade deals in 2013 Q1 in the current data.

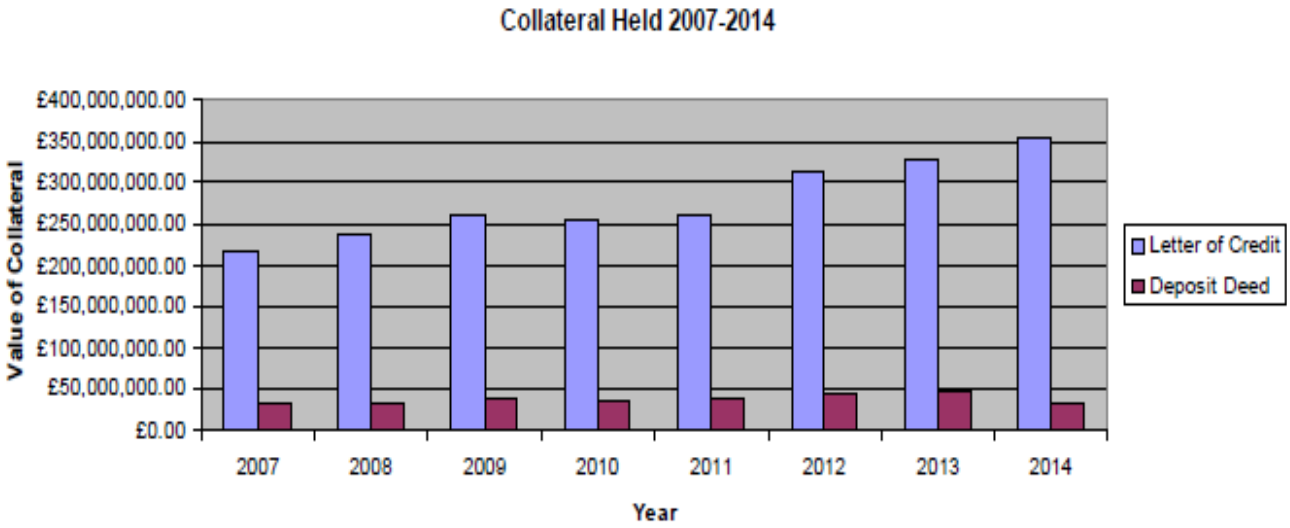
Investment grade companies saw their costs of credit increase after the credit crunch—dramatically so in 2008 and 2009, as a result of the chaotic impact of the shock on financial markets and loan provision by banks. But a "flight to quality" in the period from 2010 onwards, where banks deployed more finite appetite for lending amongst stronger credit rated companies, saw a downward correction in financing costs for the more financially strong corporates. Meanwhile, sub-investment grade companies (those with a credit rating or BBB- or below) saw no such correction and continued to bear very high financing costs until the very recent period.

[42] Source: Bank of England Trends in Lending, July 2013, chart 2.6

Annex B—Trend in cash UNC balancing deposits

Figure B.1 shows an increasing level of credit being provided by cash placed in deposit deeds in the years 2010, 2011, 2012 and 2013. During 2014, the level of cash standing as monthly security has reduced back to levels more aligned to the historic trend, which Xoserve attributes to the improving position of many financial institutions providing letters of credit[43].

Figure B.1: UNC Balancing profile of credit by instrument (2007-14)



Source: Xoserve

[43] Source: EBCC presentation.

Annex C—CUSC credit rating and independent credit assessment matrices

Figure C.1: 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

Figure C.2: 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

Annex D—Framework credit amount and cost reductions, unsecured allowance scenarios for BSC and UNC

Table D.1: Average BSC collateral amounts, 2011-13 original and with unsecured scenarios

Scenario	Average original collateral	Average reduction	Average revised collateral
BSC scenario 1 (£mn)	387	74	314
BSC scenario 2 (£mn)	387	66	321
BSC scenario 3 (£mn)	387	58	329

Table D.2: Average BSC collateral costs, 2011-13 original and with unsecured scenarios

Scenario	Original central case	Revised central case	Reduction
BSC scenario 1 (£mn)	12.1	9.8	2.3
BSC scenario 2 (£mn)	12.1	10.1	2.1
BSC scenario 3 (£mn)	12.1	10.3	1.8
Average (£mn)	**12.1**	**10.1**	**2.1**

Table D.3: Average UNC collateral amounts, 2011-13 original and with unsecured scenarios

Scenario	Average original collateral	Average reduction	Average revised collateral
UNC scenario 1 (£mn)	345	66	280
UNC scenario 2 (£mn)	345	59	286
UNC scenario 3 (£mn)	345	52	293

Table D.4: Average UNC collateral costs, 2011-13 original and with unsecured scenarios

Scenario	Original central case	Revised central case	Reduction
UNC scenario 1 (£mn)	10.5	8.5	2.0
UNC scenario 2 (£mn)	10.5	8.7	1.8
UNC scenario 3 (£mn)	10.5	9.0	1.6
Average (£mn)	**10.5**	**8.7**	**1.8**

Annex E—Benchmark credit amount and cost reductions, unsecured allowance scenarios for BSC and UNC

Table E.1: BSC—supplier benchmark changes in amounts and cost of credit between core and unsecured scenarios

BSC	Credit amount (£)			Credit cost (£)		
Supplier	Baseline	With unsecured	Reduction in credit	Baseline	With unsecured	Reduction in credit
Intermediate domestic supplier	415,037	352,781	62,255	16,601	14,111	2,490
Niche domestic supplier	150,922	140,856	10,067	18,111	16,903	1,208
SME non-domestic electricity supplier	471,632	408,764	62,869	23,582	20,438	3,143
I&C non-domestic electricity supplier	1,179,081	990,428	188,653	41,268	34,665	6,603
Large supplier	905,534	724,428	181,107	13,583	10,866	2,717
Large VIU supplier	1,691,589	1,014,953	676,635	16,916	10,150	6,766

Table E.2: UNC—supplier benchmark changes in amounts and cost of credit between core and unsecured scenarios

UNC	Credit amount (£)			Credit cost (£)		
Supplier	Baseline	With unsecured	Reduction in credit	Baseline	With unsecured	Reduction in credit
Intermediate domestic supplier	26,378	22,422	3,957	1,055	897	158
Large domestic supplier	56,274	33,764	22,510	6,753	4,052	2,701
I&C gas supplier	34,737	29,179	5,558	1,216	1,021	195
SME gas supplier	17,369	15,053	2,315	868	753	116
Large VIU supplier	56,464	33,879	22,586	565	339	226

Annex F—Benchmark credit amount and cost reductions, new entrant unsecured credit allowance for CUSC, DCUSA, and UNC transmission and distribution

Table F.1: Credit amount reductions for new entrant suppliers, CUSC, DCUSA and UNC, including percentage reduction to original new entrant credit amount

Framework	Intermediate domestic new	Niche domestic new	I&C electricity new	SME electricity new	I&C gas new	SME gas new	Average
CUSC (£)	103,110	18,747	994,183	203,439	-	-	**219,913**
DCUSA (£)	251,529	45,733	674,086	384,560	-	-	**225,985**
UNC Tx/Dx (£)	393,546	-	-	-	1,628,201	184,464	**367,702**
Total Tx/Dx (£)	748,185	64,480	1,668,269	587,999	1,628,201	184,464	**813,600**
Total credit posted originally by new entrants (%)	**22.02**	**19.61**	**18.45**	**16.62**	**16.04**	**17.74**	**18**

Table F.2: Credit amount reductions for acquisitive new entrant suppliers, CUSC, DCUSA and UNC, including percentage reduction to original new entrant credit amount

Framework	Intermediate domestic new	Niche domestic new	I&C electricity new	SME electricity new	I&C gas new	SME gas new	Average
CUSC (£)	412,441	74,989	1,281,884	813,757	-	-	**430,512**
DCUSA (£)	1,006,116	182,930	2,696,346	1,538,240	-	-	**903,939**
UNC Tx/Dx (£)	1,574,182	-	-	-	6,512,806	737,855	**1,470,807**
Total Tx/Dx (£)	2,992,740	257,919	3,978,230	2,351,997	6,512,806	737,855	**2,805,258**
Total credit posted originally by acquisitive new entrants (%)	**21.95**	**19.50**	**11.80**	**16.51**	**16.04**	**17.74**	**17.26**

Table F.3: Credit cost reductions for new entrant suppliers, CUSC, DCUSA and UNC, including percentage reduction to original new entrant credit costs

Framework	Intermediate domestic new	Niche domestic new	I&C electricity new	SME electricity new	I&C gas new	SME gas new	Average
CUSC (£)	6,187	2,625	54,680	14,241	-	-	**12,955**
DCUSA (£)	15,092	6,403	37,075	26,919	-	-	**14,248**
UNC Tx/Dx (£)	23,613	-	-	-	89,551	12,912	**21,013**
Total Tx/Dx (£)	44,891	9,027	91,755	41,160	89,551	12,912	**48,216**
Total credit posted originally by acquisitive new entrants (%)	**22.02**	**19.61**	**18.45**	**16.62**	**16.04**	**17.74**	**18**

Table F.4: Credit cost reductions for acquisitive new entrant suppliers, CUSC, DCUSA and UNC, including percentage reduction to original new entrant credit costs

Framework	Intermediate domestic new	Niche domestic new	I&C electricity new	SME electricity new	I&C gas new	SME gas new	Average
CUSC (£)	24,746	10,499	70,504	56,963	-	-	**27,119**
DCUSA (£)	60,367	25,610	148,299	107,677	-	-	**56,992**
UNC Tx/Dx (£)	94,451	-	-	-	358,204	51,650	**84,051**
Total Tx/Dx (£)	179,564	36,109	218,803	164,640	358,204	51,650	**168162**
Total credit posted originally by acquisitive new entrants (%)	**21.95**	**19.50**	**11.80**	**16.51**	**16.04**	**17.74**	**17.26**

Annex G—Energy Supply Company Administration (ESCA)

Overview

The *Energy Act 2011* includes provisions to establish a special administration regime for energy supply companies, known as energy supply company administration (ESCA). The purpose of ESCA is to ensure that if a large gas or electricity supply company is in financial difficulty, arrangements are in place to allow the company to continue operating normally until it is either rescued, sold, or its customers transferred to other suppliers. This will reduce the risk of financial failure spreading across the energy market and maintain market stability.

ESCA is intended as a backstop to the Supplier of Last Resort (SoLR) arrangments. It is essentially a contingency measure to deal with a low probability, but high impact event. It will allow the company to continue trading normally, potentially with financial assistance from the government if the company is unable to secure funding from commercial sources, until it is either rescued, sold or its customers transferred to other suppliers

Summary of the key provisions

Securing an *Energy Supply Company Administration Order* is a court process. The court may make the order if the company meets the statutory tests for insolvency as set out in the *Insolvency Act 1986*.

In the event that a large company is in financial distress, where no trade sale seems likely and Ofgem advises it is not practicable to appoint a SoLR, the Secretary of State (or Ofgem with the consent of the Secretary of State) may apply to the court for an *Energy Supply Company Administration Order*.

There is a requirement to notify the Secretary of State and Ofgem of any move to liquidate the company, put it into administration, or enforce a security over property. The notification period is 14 days. This allows the Secretary of State time to apply for an *Energy Supply Company Administration Order*, and assuming the court makes the Order, prevents the company from being wound up or going into ordinary administration.

The Secretary of State is empowered to make grants and loans to the company under an *Energy Supply Company Administration Order* and may also give guarantees in respect of any sum borrowed by the energy supply company while it is in administration. He may also agree to indemnify the energy administrator (and those involved with his business) against loss or liability incurred during the exercise of his or her duties.

Cost recovery

Provisions in the *Energy Act 2011* allow for the recovery from the company of any financial assistance provided by the government. However, the government recognises that any company entering energy supply company administration may not be in a position to repay some, or all of the funding it receives. It has therefore introduced, through licence conditions, a cost recovery mechanism. This allows the government to issue a direction to National Grid to recover any shortfall in meeting the expenses of an *Energy Supply Company Administration Order* through charges levied on electricity suppliers, gas suppliers and shippers.

Annex H—Supplier of Last Resort (SoLR)

Overview

When a company in a competitive energy market is deemed "unable to pay its debts" and a trade sale seems unlikely Ofgem will consider appointing a supplier of last resort (SoLR).

In this instance Ofgem will revoke the initial supplier's license and give it to another gas or electricity supplier that Ofgem is satisfied can supply the additional customers without affecting current service. This is so that the customers of the failed supplier can continue to receive energy.

Criteria for revoking

Ofgem can revoke a supplier's licence if a supplier:

- is unable to pay its debts, which occurs when a company failed to pay after three weeks or is deemed so by any judgement decree;
- has a receiver for all or part of its assets;
- has an *Energy Supply Company Administration Order* issued to it by the court, decreeing it cannot pay its debts; and
- has an order from the High Court to cease trading.

Factors considered

If a supplier meets the criteria for having its licence revoked Ofgem will consider a number of factors before deciding whether or not to revoke it.

Firstly Ofgem will consider the payment of post-receivership charges by the receiver. If the receiver agrees to pay them then Ofgem will usually allow them time to sell the company's assets in a trade sell, as that is preferable for Ofgem. If they do not, however, Ofgem would then consider the risk to other parties and the customers and make a decision on whether to transfer the licence based on this consideration.

Ofgem also must be satisfied with the alternative suppliers under an SoLR transfer, requiring them to be able to meet the demands of the new customers without negatively impacting existing customers. It establishes this with a series of detailed questions on how the potential SoLRs would deal with the various aspects of customer transfer and integration.

Method

After a supplier has been declared insolvent, Ofgem will collect information about its customer portfolio, from the network operators and the supplier.

Ofgem will appoint the SoLR that it feels is best placed to deal with the supply licence. To assess this, Ofgem appoints a panel of staff to access the information against the criteria that SoLRs must meet. The panel may need to contact suppliers to clarify responses.

When appointing a SoLR Ofgem would prefer to appoint a SoLR for gas and a SoLR for electricity. In cases where the portfolio needs to be split, Ofgem will split by domestic and non-domestic customers, as well as splitting electricity based on Grid Supply Point Group.

Following the appointment and revocation of the supply licence, it is for the newly appointed SoLR and network operators to decide the best method to transfer customers, although customers will still be charged for electricity and gas consumption in that transfer period.

Timing

Ofgem will first start collecting information on the insolvent supplier when it goes into receivership, enabling it to start collecting information about potential SoLRs as soon as possible.

As soon as Ofgem has decided it wants to revoke the supplier's licence and appoint a SoLR it will issue a notice of revoked supply, 30 days in advance.

Ofgem has to establish potential SoLRs before revoking a supply license, and once it has done so, it must issue a 24 hour warning before doing so. Following that, SoLRs are given four to six hours to provide all the requested information, so that Ofgem can appoint the SoLR.

The appointment and revocation coincide, being posted at 00:01 for electricity and 06:00 for gas the day after it is decided. The timescale for revocation and appointment is dependent on the circumstances on failure. The SoLR Ofgem can direct the SoLR for six months after the appointment, at which point the contract price will revert to the normal rate.

Ofgem selection criteria

When assessing potential suppliers to take on the licence of the failed supplier Ofgem will look at a number of qualities to decide who should become the SoLR. SoLRs have to meet certain criteria.

They have to:

- be able to supply additional customers without negatively impacting their existing customers;
- comply with current credit rules;
- be able to implement the change of supplier with minimal disruption;
- be able to deal with customer queries;
- be able to deal with prepayment meter customers; and
- give any reasons for increased charges to customers.

After that, however, Ofgem will give preference to firms who volunteer to be SoLR and will not claim for last resort supply payments.

Liabilities

Following the appointment of the SoLR, the new supplier must fulfil all contractual obligations for the supply of gas and electricity that are agreed upon by it, Ofgem and the failed supplier. These will vary depending on the circumstances.

The SoLR is obligated to comply with the *Data Protection Act 1998* when handling the information on the failed supplier's customers, which will be supplied by Ofgem. The SoLR also has to take responsibility for the meter readings of customers of the failed supplier and must ensure all additional electricity and gas for the new customers is bought as economically as possible.

Additionally, the SoLR is required to provide a notice to customers, which contains the following information:

- the failed supplier is no longer supplying them;
- the SoLR is their new supplier from the date of appointment;
- they are supplied under a deemed contract;
- they may switch to another supplier; and
- the charges payable and how they are determined.

Annex I—Financial institutions issuing letters of credit (UNC)

Figure I.1 shows the make-up of financial institution providers of letters of credit under the UNC at the end of 2013, relative to their remaining headroom to issue credit under the terms of the code. Notably, all are banks.

Figure I.1: UNC Balancing letter of credit providers

Data Correct as of: 05/12/2013

Bank	Available Head room %
Credit Agricole Corporate and Investment Bank	0.00%
BNP Paribas	0.64%
Bank of Tokyo-Mitsubishi UFJ, Ltd.	22.01%
ING Bank N.V.	22.75%
HSBC Bank plc	23.45%
Deutsche Bank AG	29.92%
JPMorgan Chase Bank, NA	34.27%
Sumitomo Mitsui Banking Corporation	35.95%
Mizuho Bank, Ltd.	36.50%
Lloyds Bank Plc	50.49%
SEB	51.57%
Barclays Bank PLC	52.84%
Rabobank Nederland	57.94%
Svenska Handelsbanken AB	61.29%
Santander UK PLC	64.07%
Standard Chartered Bank	75.40%
Citibank, N.A.	81.47%
Societe Generale	82.03%
Royal Bank of Scotland plc	84.38%
Nordea Bank Finland Plc	86.61%
Macquarie Bank Limited	90.24%
DNB Bank ASA	90.63%
DBS Bank Ltd.	94.35%
Bank of Nova Scotia	95.31%
National Westminster Bank PLC	99.26%

Source: Xoserve

Annex J—BSC credit pool impact on supplier benchmarks

Table J.1: Average collateral amount increases and decreases for BSC, credit pool, supplier benchmarks

Supplier	Average annual change, 2011-13
Intermediate domestic supplier (£)	-197,271
Niche domestic supplier (£)	-112,581
Large supplier (£)	-55,333
I&C electricity supplier (£)	-106,850
SME electricity supplier (£)	1,311,336
Large VIU supplier (£)	4,042,647

Table J.2: Average collateral cost increases and decreases for BSC, credit pool, supplier benchmarks

Supplier	Average annual change, 2011-13
Intermediate domestic supplier (£)	-7,890.86
Niche domestic supplier (£)	-4,503.26
Large supplier (£)	-2,213.31
I&C electricity supplier (£)	-4,274.01
SME electricity supplier (£)	52,453.45
Large VIU supplier (£)	161,705.89

Annex K—Credit pool impact on CUSC, DCUSA and UNC framework amounts and costs

Table K.1: Average collateral amount changes in CUSC, DCUSA and UNC for credit pool

Framework	Original	Credit Pool	Difference
CUSC (£mn)	6.3	24.6	**18.3**
DCUSA (£mn)	239.6	55.7	**-183.9**
UNC Tx/Dx (£mn)	378.0	89.5	**-288.5**

Table K.1: Average collateral cost changes in CUSC, DCUSA and UNC for credit pool

Framework	Original	Credit Pool	Difference
CUSC (£mn)	0.3	1.1	**0.8**
DCUSA (£mn)	8.1	2.4	**-5.7**
UNC Tx/Dx (£mn)	12.4	2.4	**-10.0**

Annex L—CUSC credit pool impact on supplier benchmarks

Table L.1: Average collateral amount increases for CUSC, credit pool, supplier benchmarks

Supplier	Average annual change, 2011-13
Intermediate domestic supplier (£mn)	0.08
Niche electricity supplier (£mn)	0.01
Large domestic supplier (£mn)	0.99
I&C electricity supplier (£mn)	0.43
SME electricity supplier (£mn)	0.17
Large VIU supplier (£mn)	2.45

Table L.2: Average collateral cost increases for CUSC, credit pool, supplier benchmarks

Supplier	Average annual change, 2011-13
Intermediate domestic supplier (£k)	3.01
Niche electricity supplier (£k)	1.64
Large domestic supplier (£k)	14.79
I&C electricity supplier (£k)	14.98
SME electricity supplier (£k)	8.56
Large VIU supplier (£k)	24.50

Annex M—Selected international arrangements

AEMO—Australia

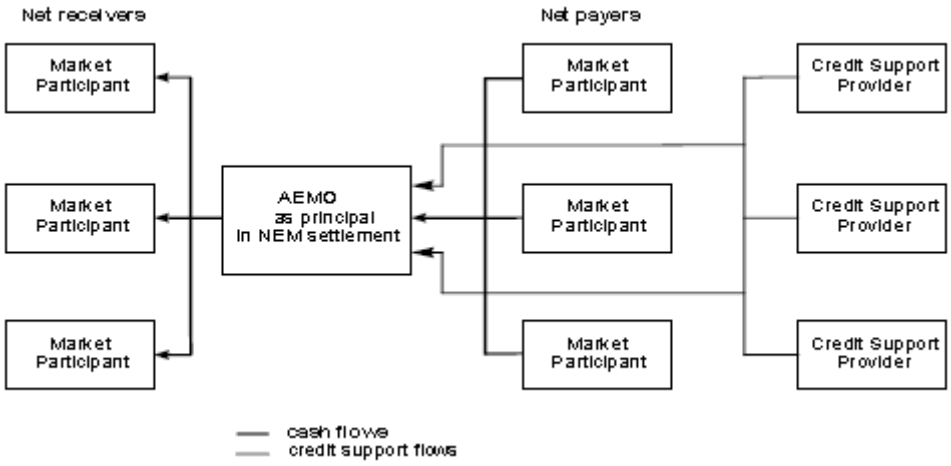
Geography of operation

Australia

Collateral rules

National Electricity Market (NEM): NEM participants must procure credit support with a value not less than the current Maximum Credit Limit (MCL). The MCL is an amount that provides a 2% likelihood of a party's credit support being exceeded by its outstandings the end of the reaction period following the participant exceeding its outstandings limit (OSL) on any day. The MCL for all NEM participants is reviewed approximately every 3 months[44].

Figure M.1: Settlement of NEM transactions



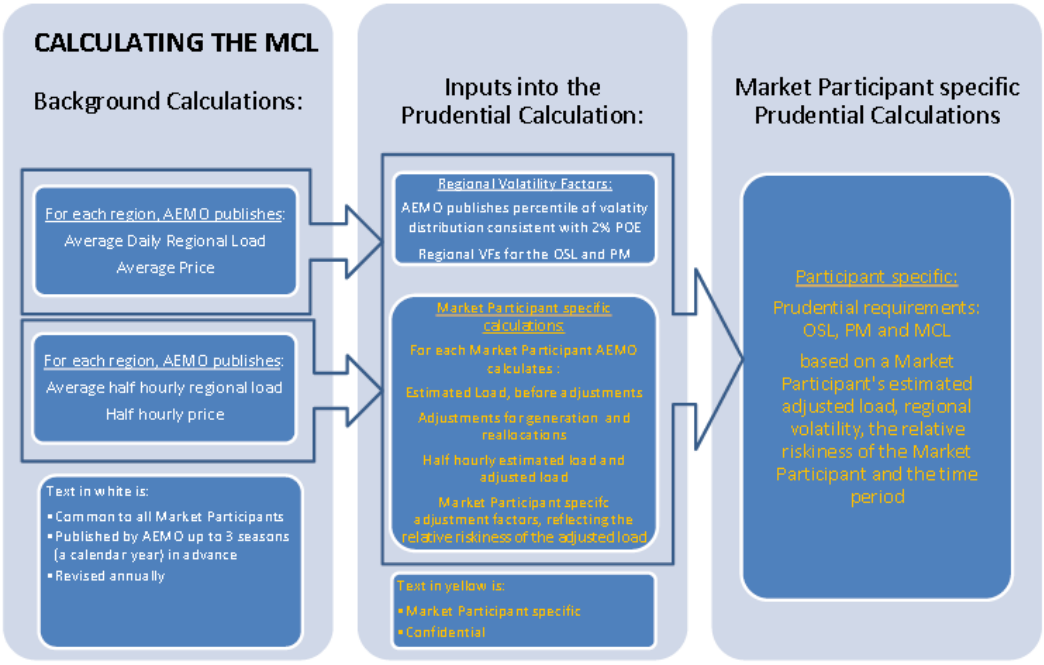
Source: AEMO

The MCL calculation takes into account:

- expected *regional load* and RRPs;
- a measure of *regional* volatility consistent based on probability of exceedance (POE) with a 2% POE target;
- market participants' expected load, generation and reallocations;
- a market participant's load weighted price applicable to their load, generation and reallocations; and
- the relevant time period, in days.

[44] http://www.aemo.com.au/

Figure M.2: Calculating the MCL



The following table has been provided as a guide to the nominal OSL and PM values that *AEMO* may determine as part of the assessment of a new *Market Participant*. Individual *Market Participant* calculations may vary.

PARTICIPANT TYPE	SIZE	REQUIREMENT	OSL	PM[1]
Market Generator - not yet generating	≤ 1 MW	Auxiliary/ commissioning load coverage	$0	$1,000
Market Generator - not yet generating	1 to 10 MW	Auxiliary/ commissioning load coverage	$0	$10,000
Market Generator - not yet generating	> 10 MW	Auxiliary/ commissioning load coverage	$0	$10,000 per 10 MW
Market Customer – inactive	-	Cover for unintentional NMI transfer	$0	$1,000
Market Customer – planning to acquire customers	-	3 month growth estimates available	As per section 5, $9,000 minimum	As per Section 6, $1,000 minimum

Source: AEMO

Declared wholesale gas market (DWGM) and short-term trading market (STTM): Prior to the end of each financial year AEMO determines and provides confirmation to each DWGM and STTM market participant of their minimum exposure. The minimum exposure is calculated as AEMO's reasonable estimate of the participant fees payable by the market participant to AEMO in respect of a billing period in the following financial year. Unless exempted participants must procure credit support not less than the value of the current minimum exposure and must ensure that the amount of support lodged with AEMO never falls below their minimum exposure amount.

Gas supply hub (GSH): Parties must provide and at all times maintain credit support for the amount and forward period required to ensure that it's Trading Margin does not fall below zero. Unlike the other

markets, AEMO does not set a minimum credit support level for parties in the GSH. Market participants have the discretion to manage and provide credit support to levels appropriate based on their trading volume and reallocations.

Nord Pool

Geography of operation

Norway, Denmark, Sweden, Finland, Estonia, Latvia and Lithuania.

Elspot (day-ahead) and Elbas (intra-day).

- Elspot is a next day delivery trading system. Members submit their orders, equilibrium between AD and AS is established for all bidding areas, the prices calculated and then submitted.
- Elbas is a first-come first-serve system that prioritises low sell prices and high buy prices, reducing risk.

Collateral rules

All members are required to post collateral as a guarantee, either as cash on a pledged account or as an on-demand guarantee. The minimum collateral is €30 000 or one week's worth of trading, for both Elspot and Elbas. Traders may be required to post "base collateral" to cover overnight risks or face collateral calls[45].

PJM

Geography of operation

Covering but not limited to Pennsylvania, New Jersey, and Maryland.

Collateral rules

PJM establishes credit requirements on two levels—long-term and short-term. The long-term requirement establishes the credit the participant must maintain, whilst the short-term one involves measuring current obligations and comparing them with a working credit limit (WCL), to see if it has exceeded the WCL[46].

With regards to unsecured credit, PJM settlement will analyse the financial standing of the applicant and/or its proposed guarantor and determine whether they are eligible for unsecured credit and if the amount is sufficient.

PJM has also established credit provisions for certain activities, including virtual activities, reliability pricing model (PRM) and the financial transmission rights (FTR) markets are all subject to these special provisions. FTRs are financial instruments that entitle the holder to a stream of revenues based on the hourly congestion price difference across the day-ahead markets, assisting participants with hedging their price risk.

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[45] Nord Pool website: http://www.nordpoolspot.com/TAS/Settlement-and-collateral/Collateral/ , Clearing Rules: http://www.nordpoolspot.com/PageFiles/rulebook/Clearing%20Rules.pdf , Nord Pool Report: http://www.energy-community.org/pls/portal/docs/61819.PDF

[46] PJM website: http://www.pjm.com/about-pjm.aspx, PJM Settlement for Financial Credit: http://www.pjmsettlement.com/, PJM credit application procedures: http://www.pjm.com/~/media/pjm-settlement/credit/pjm-credit-application.ashx , Markets and Operations: http://www.pjm.com/markets-and-operations/ftr.aspx , Order 741: http://www.cftc.gov/stellent/groups/public/@requestsandactions/documents/ifdocs/iso-rto4cappfercchart.pdf

Long-term credit requirement (peak market activity):

This is a credit requirement for long-term activity (the same as GB's year-ahead trading), where PJM uses historical activity to measure potential future credit needs. It is essentially the same as the GB market's year-ahead credit requirement, with every year divided into two separate halves at October and April. For this long-term trading, each participant must have credit with PJM equal to the three highest consecutive weeks of total PJM bills, which is called the participant's "peak market activity" (PMA). When calculating the PMA, FTR is included since they are subject to separate credit requirements.

Short-term credit requirement (current obligations and WCL):

The short-term credit requirement involves the continual monitoring of activity against available credit for each participant. To do this, PJM establishes a WCL for each participant, which is 75% of the participant's market credit, with the 25% reserve acting as a buffer for specified cure periods and for market activity. The participant's obligations cannot exceed this WCL; if they do, PJM requires either an early payment or increased collateral.

There are multiple credit types in PJM. There are cash deposits, letters of credit and unsecured credit, however unsecured is not accepted in the FTR market.

The amount and eligibility of unsecured credit granted to a participant is decided by PJM Settlement and is based on the financial stability of the participant or their guarantor. To apply for unsecured credit using a guarantor, the participant must fill out an executive guarantee in the PJM approved format. If the applicant does not meet the required quality or there is insufficient unsecured credit to meet its needs, then a cash deposit or letter of credit must be submitted before PJM can approve the credit application. Unsecured credit is to be limited to no more than $50mn per market participant.

The value of any guarantee will be limited by the creditworthiness of the guarantor and by any cap placed on the guarantee. Forms for this are available on the PJM Settlement website and need to be submitted with a corporate seal. Letters of credit from financial institutions with ratings less than A will not be accepted.

AESO—Alberta

Geography of operation

Alberta, Canada

Collateral rules

There are three main types of collateral in the AESO market, cash deposits, letters of credit and guarantees, with AESO attributing as financial security up to the unsecured credit limit[47].

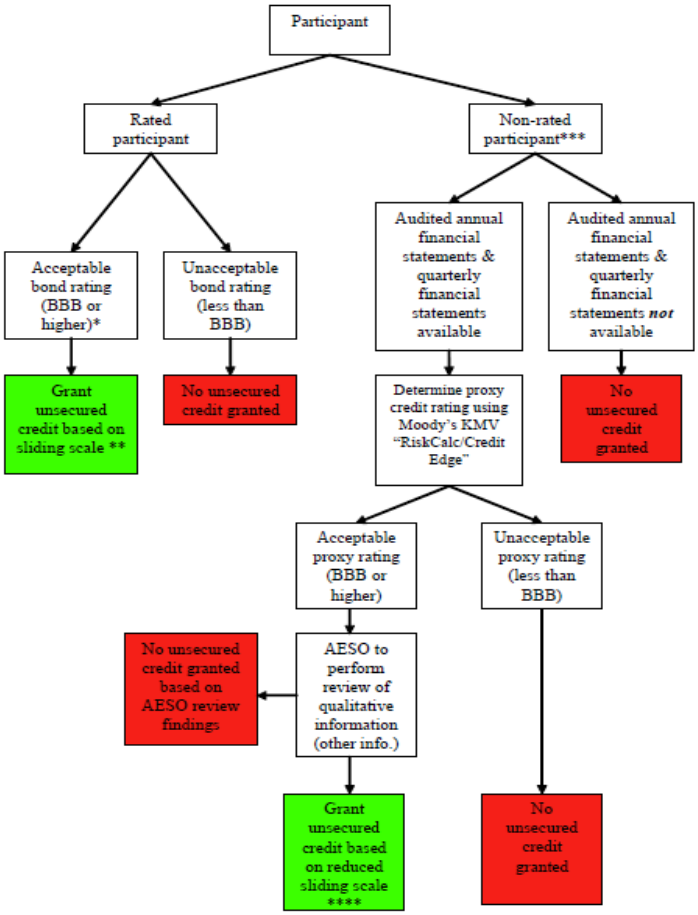
The letter of credit in AESO has to be issued by a financial institute with at least an A- rating from Standard and Poor's or a similar rating from another recognised ratings agency. If the financial institution is outside of Canada then AESO can determine whether or not to accept the letter of credit.

The guarantee must be a written, irrevocable, continuous and unconditional guarantee that is payable on demand. This guarantee's demand is based on the financial reliability of the guarantor. Any time after the financial security has been established, AESO can reduce the financial security attributed to it, regardless of credit rating.

[47] Website: http://www.aeso.ca/market/1922.html Credit Procedures: http://www.aeso.ca/downloads/AESO_Credit_Procedure_Guide_2013.pdf ISO Rules: http://www.aeso.ca/rulesprocedures/9072.html ISO appendix 3: http://www.aeso.ca/downloads/Appendix_3_-_ISO_Rules.pdf

The amount of collateral a market participant is required by AESO is equal to how much their owed financial obligations exceed their unsecured credit limit. To determine their financial obligations, AESO takes the annual net energy consumed for the two most recent settlement periods and multiplies it by an estimated prudential pool price. To be applicable for unsecured credit the participant needs a creditworthiness rating of BBB or above. The levels of unsecured credit available to a participant are dependent on the credit rating, as seen in the tables below.

Figure M.3: AESO unsecured allowance decision tree flow chart



Source: AESO

Table M.1: AESO rated company unsecured credit matrix

Rating	Unsecured Credit Limit ($)
AAA	25,000,000
AA	20,000,000
A	15,000,000
BBB	10,000,000
>BBB	0

Table M.2: AESO non-rated company unsecured credit matrix

Proxy Credit Rating	Unsecured Credit Limit ($)
AAA	10,000,000
AA	5,000,000
A	2,500,000
BBB	1,250,000
>BBB	0