Appendix 10.3: Analysis of retail supply profitability – ROCE and economic profit

Contents

Purpose of this appendix

1. In this appendix, we set out our analysis of the profitability of the retail supply of gas and electricity in GB. The profitability of electricity generation is analysed separately. This analysis forms one part of our assessment of whether the prices observed in the retail supply market are above the level that we would expect in a well-functioning market. We have had to make a number of assumptions and judgements in coming to a view on the level of profits earned by the firms that are active in this sector. As a result, we consider our results to be indicative rather than precise estimates. We have concentrated on those areas that are likely to have a material impact on the results. This appendix should be read in conjunction with the other analysis we have undertaken in order to assess whether prices in energy retail are above the level that would be expected in a well-functioning market (the various terms used in this paper are defined in Annex A to this appendix).

Introduction

2. On 8 December 2014, we published, and consulted on, a working paper setting out our proposed approach to assessing profitability at each stage of

the energy supply chain in GB, namely in power generation and retail supply.[1] In that paper, we set out our intention to measure profitability using both return on capital employed (ROCE) and profit margins for the supply businesses. On 17 April 2015, we shared our preliminary analysis of the ROCE earned by the retail supply businesses of the Six Large Energy Firms with those firms. We invited them to comment on our approach and the interpretation of our preliminary results, and we requested some additional financial information in order to refine our analysis.

3. We have received responses on these two consultations from parties and we have taken these into account, adapting and refining our approach as appropriate. In this appendix we provide an explanation of the analysis we have undertaken in order to come to a provisional view on the level of economic profits in the energy retail supply industry. In Appendix 10.1: Approach to profitability and financial analysis, we set out the basic principles that have guided our approach to analysing the economic profitability of both the electricity generation and energy retail supply sectors. In this appendix, we focus on how we have applied those general principles to the specific circumstances of energy retail supply.

4. The structure of this paper is as follows:

   (a) **Scope of analysis and principles of economic profitability:** briefly recaps the proposed scope of our analysis of the profitability of the retail supply businesses, as well as the basic principles that we have applied in our analysis, including our approach to the recognition and valuation of capital employed.

   (b) **Adjustments to firms' financial information:** provides an overview of the data that we have received from the relevant firms and discusses the adjustments we have made in order to ensure that our analysis is economically meaningful.

   (c) **Results of analysis:** sets out our estimates of the ROCE for the supply businesses of the Six Large Energy Firms, including a small number of sensitivities where we consider this to be appropriate.

5. In Section 10: Financial and profitability analysis in retail energy supply, we set out our interpretation of the results of the various elements of our analysis on the financial performance of the Six Large Energy Firms over the 2009 to

[1] Approach to financial and profitability analysis working paper.

2013 period. This analysis includes the ROCE and economic profit[2] work contained in this appendix, together with our analysis of profit margins, efficiency and benchmark prices.

Scope of analysis and principles of economic profitability

The scope of our analysis

6. We adopted the following scope for our profitability analysis:

   (a) The relevant geographic market was GB, in line with the markets referred.

   (b) The relevant firms were Centrica, EDF Energy, E.ON, RWE, SSE and Scottish Power.

   (c) We collected data for 2007 to 2013, which we will extend to 2014 when the data become available (this will be following the publication of our provisional findings).

   (d) The relevant activities for retail supply comprised all the activities that a stand-alone supplier would need to undertake to compete in the markets. These include forecasting energy demand, making decisions regarding how and when to buy electricity and gas, managing customer relationships, billing, marketing and so on. We note that a stand-alone supplier may choose to employ staff directly to execute trades or it can purchase these services from a third party. We have analysed the profitability of the retailing of energy to both domestic and non-domestic customers, including SMEs and large industrial and commercial (I&C) customers on a combined basis.

7. We considered whether we should seek to allocate capital employed between I&C customers and domestic customers and SMEs (including micro-businesses) since the former is not part of the terms of reference. Whilst it would be possible to make reasonable assumptions in order to do this, our preferred approach for our ROCE analysis is to make only limited adjustments to firms' data, therefore we have analysed ROCE for the retail business as a whole, including the I&C business. Given that there are lower competition concerns in the I&C segment (it was excluded from our terms of reference) we consider that it is reasonable to assume that any profits in excess of the cost of capital arise predominantly in the domestic and SME segments. However,

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[2] The amount by which returns have exceeded the cost of capital, a measure of 'excess profits'. This approach is set out in our *Market Investigations Guidelines (Guidelines) (CC3).* Economic profits is a representation of ROCE and is useful for assessing asset light businesses.

we will take into account the relative margins earned on each customer type when interpreting the results of our analysis.[3]

Principles of economic profitability analysis

8. The fundamental purpose of the analysis is to identify the current economic costs and value of the net assets of the retail supply businesses, measured on a 'value to the business' (VTB) basis. This involves separating the retail arms from the rest of the integrated businesses. This is done in two ways:

   (a) Separating out assets, liabilities and transactions that are attributable to retail.

   (b) Measuring transfer prices for services that flow between retail and the rest of the group.

9. These approaches can be substitutes, as in the case of buildings, where we can either seek to identify the assets and costs associated with retail supply activities (an 'ownership' or 'on balance sheet' approach) or we can substitute a notional arm's length rental cost for the services received by retail supply, thus avoiding the complications of cost allocation and capitalisation (a 'rental' or 'off balance sheet' approach).

10. Our emphasis on 'stand-alone' costs arises from the need to identify economic costs, such as would arise from 'arm's length' trading between the retail supply business and the rest of its parent group.

11. Our ideal measurement basis is current VTB (as explained in Appendix 10.1) but we have to use proxies at times. These include historical cost, which may be a good proxy where asset lives are short (eg the customer relationships) and prices do not change much (also a feature of the period studied). We have sought to identify all economic costs, assets and liabilities, such as the cost of building customer relationships. However, we have avoided recording intangibles such as general goodwill, as the value could reflect the prospect of monopoly profits. Hence, we measure customer relationships at cost rather than at market value.

12. The approach that we have taken to estimating the ROCE for the supply business is consistent with that set out in our Guidelines.[4] We have used the relevant firms' accounting information as a starting point and made a number of adjustments in order to provide economically meaningful estimates of

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[3] Profitability of retail energy supply: profit margin analysis working paper.
[4] *Guidelines (CC3),* paragraph 115.

returns. In making these adjustments, we have been guided by two broad principles described below.[5]

Operating returns and assets

13. In a competition analysis we are concerned with the profitability of the relevant business activities as described in paragraph 6*(d)* above, independently of how those activities are financed. As a result, we estimate the ROCE using the operational profits and capital employed by the relevant businesses, which will be compared with the pre-tax WACC.[6] The general principle is that all revenues, costs, assets and liabilities necessarily arising from the operation of the businesses should be included, whether or not these items are recorded in the financial statements of the business.[7]

14. All financing costs, whether short or long term, and whether provided by a third party, such as a bank, or from another company within the same group, are excluded. Similarly, corporation tax and any associated deferred tax charges, as well as any pension deficit or surplus, are excluded.

Economic profits and costs

15. The level of profits earned and assets employed should reflect the economic costs of those resources, which may differ from the accounting costs.

16. For operating items, economic costs are the costs of resources used at a price at which they would be traded in a competitive market, where entry to and exit from the market is easy. For example, where a retail supply business purchases electricity from the generation business of the same group, the cost of the electricity should reflect the market price of the electricity that the retail business would have paid if it had purchased it from a third party generator. If this were not the case, the cost base of the retailer should be adjusted accordingly.[8]

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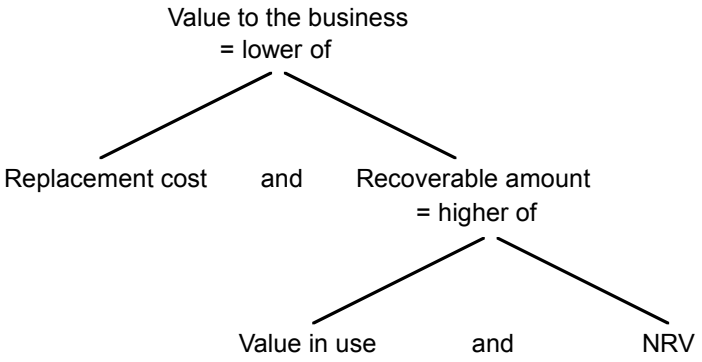
[5] These principles are set out in detail in Edwards, Kay & Mayer (1987), *The Economic Analysis of Accounting Profitability*.
[6] This pre-tax nominal WACC takes into account the typical financing structure observed in the industry. As set out in Appendix 10.1, our preliminary view is that a stand-alone retail supply business would be likely to be wholly equity-financed, such that the pre-tax WACC was equal to the pre-tax cost of equity.
[7] We note that only those operating costs incurred in relation to the relevant period should be included in our analysis or our estimates of the profitability of operators during the period will be distorted. Where firms are making payments to cover costs that were incurred prior to the relevant period, for example by reducing a pension deficit that was incurred previously, these should not be included in our analysis as they do not reflect the costs associated with the relevant period.
[8] We note that, in this case, any such adjustments to the profits of the energy retailers would require an equal and opposite adjustment to the profits of the generation businesses.

17. For capital assets, the economic costs should reflect their current VTB, which is the loss the entity would suffer if it were deprived of the asset involved. That measure, which is also referred to as the deprival value, or value to the owner, will depend on the circumstances involved as set out in Figure 1.

18. In most cases, as the entity will be putting the asset to profitable use, the asset's value in its most profitable use will exceed its replacement cost. In such circumstances, the entity will, if deprived of the asset, replace it, and the current value of the asset will be its current replacement cost.[9] An asset will not be replaced if the cost of replacing it exceeds its recoverable amount. In such circumstances, the asset's current value is that recoverable amount, which is the higher of the amount that can be obtained by selling it, and the present value of the future cash flows obtainable from operating the asset.

Figure 1: Establishing which valuation basis for an asset gives its VTB



Source: UK Accounting Standards Board, Statement of Principles (1999).
Note: NRV means net realisable value.

The use of ROCE

19. Several of the Six Large Energy Firms argued against the use of ROCE to measure the profitability of their retail supply businesses:[10]

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[9] Where the asset would be replaced with a different asset, eg due to technological advances, the asset would be valued with reference to the modern equivalent asset (MEA). The MEA value is the cost of replacing an old asset with a new one with the same service capability allowing for any differences both in the quality of output and in operating costs. An integral requirement of the MEA approach is to adjust the profits of a business as well as the value of its capital employed to reflect the performance of the MEA. For example, a new piece of equipment may be more costly to acquire but may also have lower running costs. Both of these changes should be reflected under the MEA approach. In practice, it may be problematic to make such adjustments where there is limited evidence on the performance of MEAs.

[10] EDF Energy noted that it did not consider ROCE to be a suitable measure as the profits of its supply business were not wholly driven by the value of capitalised assets. EDF Energy response to S55. E.ON stated that it considered EBITDA margins to be the most appropriate, readily available and a consistent measure to assess the profitability of an energy supply business. It considered that ROCE analysis did not yield meaningful results due to the absence of valuation estimates of intangible assets for organically grown customers. RWE told us that a ROCE assessment was particularly difficult for a supply business because it was necessary to reflect the value of a number of asset types including intangibles and risk capital in capital employed. Further, RWE explained that

(a) SSE observed that there were several practical difficulties with measuring the capital employed by an energy supply business, which had few tangible fixed assets and a number of intangible assets which would need to be valued, including a customer base, a highly skilled workforce, the value of ROCs[11] and other certificates, a customised billing system, goodwill arising from the purchase of other businesses and working capital (the latter including both collateral and risk capital).

(b) Similarly, Centrica told us that conventional ROCE and economic profit measures, based on reported balance sheets, omitted risk capital (including contingent capital) committed to the supply business and hence led to implausibly high rates of return, which had not attracted other sophisticated participants to enter this market. Centrica said that this contingent/risk capital was held at group level and was complex to estimate for a stand-alone supplier.

(c) Scottish Power highlighted that its supply business had few tangible assets, which made the calculation of a return on capital statistic less meaningful. It noted that while adjustments could be made to include the value of some intangible assets, such as the customer base, and risk capital, the business would still fundamentally be relatively asset-light. Additionally it said that the industry was characterised by high levels of profit volatility and low levels of asset intensity, thus producing large swings in ROCE. As a result, it argued that it was not possible to draw any meaningful conclusions from the resulting ROCE statistics.

(d) E.ON said that the retail energy supply businesses had a low physical asset base, relative to their operational costs – ie they were 'asset-light'. In other words most expenditures were not capitalised on the balance sheet, and hence the capital employed element of ROCE appeared low for such businesses.

(e) RWE added that the considerable challenges inherent in estimating ROCE for an asset-light supply business must be considered when interpreting the results. It said that primary weight ought to be put on margin analysis. It also said that investors sought a return on more than just tangible fixed assets and intangible assets (eg customer base), noting that, theoretically, a firm's ROCE must recognise the potential requirement that investors might need to make investments to cover future liabilities, which might or might not materialise. For a consistent

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ROCE within a supply business tended to be a volatile measure of profit and was very sensitive to year-on-year changes to EBIT.

[11] See Appendix 2.1: Legal and regulatory framework.

comparison of the WACC to ROCE, RWE emphasised that it did not matter whether these investments were actually made. The fact that risks existed created the possibility that additional capital would be required. As such, investors expected to earn a return that was commensurate with these risks. Finally, it observed that between 2007 and 2013, the median ROCE for asset-light FTSE 100 firms was 28%, which was substantially above the typical cost of capital. RWE noted that this analysis included large firms, operating in competitive markets, and, therefore, it considered that this provided evidence that ROCE was not an appropriate measure for asset-light firms. RWE also commented that regulatory precedent for asset-light firms used ROCE analysis less frequently and secondarily to the margin approach.

(f) EDF Energy said that profitability of retail supply was not driven by capital investment in assets.

20. We considered each of these arguments in turn. First, we recognise the need to ensure that all capital employed by firms is identified and included in our analysis, regardless of the accounting treatment (ie whether it is included on firms' balance sheets or not). We have reviewed the Six Large Energy Firms' submissions on the types and extent of intangible assets employed in their businesses and have included those categories of assets that meet our criteria for recognition. However, we do not agree that a low level of capital employed, in itself, makes a ROCE analysis less meaningful. Investors expect to earn a return on the actual capital they put at risk, which is limited to their equity or debt holding in a firm with limited liability. We do not agree that they expect to earn a return on the potential future capital they might choose to put at risk, as RWE asserts. We note that the analysis of the ROCE of asset-light firms in the FTSE 100, performed by RWE, does not seek to adjust the capital employed figures for the various types of intangible assets that we have sought to identify and recognise in our analysis. Hence, we do not consider that this provides evidence that ROCE analysis, properly conducted, is unreliable.

21. We agree that in a relatively asset-light business, such as energy retail supply, the level of ROCE can fluctuate significantly year on year and across firms in response to movements in working capital (and therefore, total capital employed). Therefore, in addition to ROCE, we have also calculated economic profits, which shows the absolute level of returns above the cost of capital. Economic profits are less sensitive to such movements in the capital base and, as a result, may give a more easily comparable measure of profits across firms and over time.

22. Finally, we observe that although Centrica uses profit margins, it also uses economic profit, a measure which is closely related to ROCE, to assess the financial performance of its supply business. More significantly, the calculation used by Centrica did not include an allowance for 'notional capital'. Centrica told us that it had used economic profit as one measure (among others) primarily to remunerate staff rather than as an indicator of its absolute or relative commercial performance with its peers.

23. We hold the view that listed firms such as Centrica that adhere to corporate governance codes remunerate their staff on absolute and/or relative commercial performance. Therefore if economic profit was used by Centrica to remunerate its staff, it is reasonable to infer that Centrica believed that it would shed light on commercial performance in absolute and/or relative terms compared to Centrica's peers.

Adjustments to firms' financial information

24. In this section, we provide a brief overview of the financial information provided by each of the Six Large Energy Firms and set out our consideration of the appropriate approach to the recognition and valuation of income and assets (as set out in the firms' financial statements) based on the principles set out in paragraphs 8 to 18 above.

Financial information provided by the Six Large Energy Firms

25. In response to our supply questionnaire, all of the Six Large Energy Firms provided us with information on the financial performance and position of their supply businesses. We observe that some of the firms were able to provide this information more easily than others. RWE and EDF Energy highlighted that the information requested by the CMA was not readily available for the whole of the relevant period and that, as a result, both firms had had to make a number of assumptions in order to present financial statements for supply as separate from their other operations.[12]

26. We reviewed the financial information provided and the submissions of the Six Large Energy Firms and noted three broad issues that we considered would require adjustments in order to come to a view on economic profitability.

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[12] RWE operated a consolidated balance sheet across its supply and generation businesses and reported its business within the group of RWE as a single business segment up until FY12. After FY12, financial consolidation allowed for generation and supply and other businesses to be reported separately. Therefore, RWE performed some analysis to derive the accounting capital employed for FY07 to FY11 for its GB supply business.

27. The first issue is that some of the financial information provided was incomplete or unsuitable for the purposes of our analysis. This was generally due to difficulties of separating out the relevant supply activities (the scope of which is set out in paragraph 6*(d)* above) from those of generation and/or trading. As a result, certain assets/costs were either over- or under-stated for the purposes of analysing the profitability of retail supply. For example:

(a) SSE told us that the supply business balance sheet provided included both supply and trading activities [✂].

(b) EDF Energy told us that there were certain areas within its balance sheet where it had been impossible, due to the general ledger structure, to make any logical assumptions on the split between generation and supply, including: cash balances, trade creditors, intercompany balances and hedge derivative asset/liability.

(c) Centrica highlighted that its trading (mid-stream) business undertook some activities on behalf of its retail supply business and therefore that an analysis of its retail supply business on a stand-alone basis would need to include in capital employed some working capital that currently sat within its mid-stream business. [✂].

28. The second issue is similar to the first but arises for different reasons. Not all of the economic assets employed in operating the business may be recorded on the balance sheets of firms due to the prudent approach of accounting standards. An economic profitability analysis needs to include these assets even where accounting standards consider that it is more prudent to expense the costs associated with developing them. In contrast, there may also be certain assets recognised on the balance sheets of energy retailers that do not represent separately identifiable economic assets for the purposes of profitability analysis and therefore should not be reflected in the capital base.

29. The third issue is that the level at which costs and/or assets are recorded will not reflect the VTB principles as set out in paragraphs 8 to 18 above in all cases. For example, where a tangible asset such as a building is recorded at its historic cost, this may not be representative of what it would cost to replace that asset today (allowing for an appropriate level of depreciation). In such cases, we have considered whether it would be appropriate to revalue such assets to reflect their deprival value.

30. In the next section, we first set out how we have addressed the issue of incomplete or unsuitable financial information before providing an overview of the approach that we have taken to the recognition and valuation of each category of assets employed by the businesses in turn.

Incomplete or unsuitable financial information

31. We observed that the issue of incomplete or unsuitable financial information was most pronounced for [✂]. During our consultation, SSE provided information on the carrying value of certain categories of fixed assets employed by its supply business, including land and buildings, IT systems and billing systems and software. SSE also provided further information on its average debtor and creditor days. We have included the adjustments that appear reasonable. We note that SSE prepared this information on a best endeavours basis but it faced considerable challenges in doing so (ie more assumptions and adjustments were required) than other suppliers. Hence we had less confidence in the reliability of SSE's information than that of other suppliers.

32. In other cases, the extent to which information was unsuitable or incomplete was less material. For example, RWE stated that it had not been able to separate out the capital employed by activities that were out of scope, such as boiler installation and servicing, or consultation and advisory services. RWE observed that these out of scope activities formed a small part of the overall RWE generation and supply segments and would not expect this to alter the overall capital employed position materially. In these cases, we have not sought to make adjustments to the firms' financial information as our initial view is that this is unlikely to have a material impact on the results of our analysis.

33. Finally, we considered the two, related arguments that Centrica put forward. First, that the balance sheet of a stand-alone retail supply business would need to reflect the working capital currently employed by the trading business on its behalf. Second, that its supply business profit and loss (P&L) would need to reflect:

    (a) the costs of long-term supply contracts, which currently reside in the trading business, rather than recharges for those contracts, which are currently reflected in the retail P&L;

    (b) a higher level of balancing costs as Centrica currently manages these together with its generation business, with any off-setting positions currently reducing balancing costs for the vertically integrated business; and

(c) increased operational expenditure in relation to trading as staff costs would need to include, for example those associated with implementing a 24-hour trading desk.[13]

34. We agree with the principle that all the relevant costs and capital associated with the retail supply of energy to customers should be reflected in the financial statements of the supply business for the purposes of our profitability analysis. We note that Centrica's supply business P&L already reflects some of the costs associated with its trading business. For example, in addition to recharging the costs of long-term supply contracts, [✂].

35. As discussed in Section 6: Vertical integration, we consider that the advantages of VI in relation to balancing were likely to be relatively modest and therefore, we infer that the costs of balancing reported on a stand-alone basis were unlikely to differ significantly from that of a VI business. As regards the costs of the trading function, we consider that a stand-alone retailer would incur costs, including those of holding working capital, to enable it to trade on the wholesale market and that these had generally been reflected in the numbers provided by firms.

Recognition and valuation of assets

36. The main categories of assets recorded on the balance sheets of the supply businesses of the Six Large Energy Firms are:

(a) tangible fixed assets, such as property, plant and equipment, land and machinery, other equipment, and investments;

(b) intangible fixed assets, such as acquisition goodwill, software and billing systems, brand value, and other intangible assets;

(c) working capital, which comprises operating current assets such as stock, trade debtors and other debtors and operating current liabilities such as trade creditors and other creditors;

(d) other current assets, such as cash, deferred tax assets, hedge derivative assets, intercompany/treasury loan, provisions for allowances and certificates; and

[13] Centrica also noted that its supply business would need to replicate certain functions that are currently carried out at the group level on behalf of individual business units (such as risk, tax and treasury) in return for a contribution to group overheads. We have not included this here as Centrica told us that a reduction in the contribution to group overheads would offset these costs.

(e) other current liabilities, such as, tax liabilities, derivatives, and intercompany loans.

37. In addition, as set out in paragraph 19 above, SSE put forward the view that its supply business also employed the following intangible assets:

(a) A customer base.

(b) A highly skilled workforce.

(c) The value of ROCs and similar certificates.

38. SSE also suggested that it would be necessary to measure the level of both collateral and risk capital which were implicitly employed by SSE and which would be needed by a stand-alone retail supply business.

39. Several of the other Six Large Energy Firms put forward similar views on the existence of intangible assets. In this section, we consider each of these categories of assets in turn, setting out the approach that we have taken to recognition and valuation in our analysis.

Tangible fixed assets

40. In general, tangible fixed assets for the supply businesses include land and buildings (head offices and call centres), office equipment, motor vehicles and similar assets. The value of these assets in the balance sheets are typically based on their original cost less any depreciation made against the assets. All tangible assets on the supply balance sheet of energy firms are depreciated on a straight-line depreciation basis over the estimated useful life of the assets.

41. Our approach has been to capitalise all property, plant and equipment employed by the firms, whether or not it was originally recorded on their supply balance sheets, at its carrying value, ie its net book value. Where firms have chosen an appropriate depreciation schedule, we would not expect a material difference between the net book value of these assets and their depreciated replacement cost. In certain other cases, where the carrying value may be slightly understated (eg due to inflation), we considered that revaluing the assets would not have a material impact on the results of our analysis as these assets comprised a small proportion of total capital employed.

42. E.ON highlighted that its supply business did not generally incur material expenditure in respect of tangible fixed assets, although the E.ON UK group businesses that provided services to the supply business did. As a result, it

was necessary to make adjustments to its balance sheet to reflect these assets.

43. However, E.ON told us that its central costs charge included property costs. We would expect these P&L charges to reflect a reasonable opportunity cost of the use of the buildings by the supply business and it would be 'double-counting', therefore, to also include the asset value on the balance sheets of the supply businesses.

Intangible fixed assets

44. Our Guidelines set out the criteria that we consider when determining whether or not it is appropriate to recognise intangible assets within the capital base of a business for the purposes of profitability analysis. These state that we may consider the inclusion of certain intangible assets where the following criteria are met:

(a) It must comprise a cost that has been incurred primarily to obtain earnings in the future.

(b) This cost must be additional to costs necessarily incurred at the time in running the business.

(c) It must be identifiable as creating such an asset separate from any arising from the general running of the business.[14]

45. We observed that there were three main categories of intangible assets recorded on the balance sheets of the firms, namely:

(a) billing systems and software;

(b) goodwill and brand value; and

(c) customer relationships.

46. We consider each of these categories of assets in turn.

Billing systems and software

47. Energy suppliers require IT systems to process energy bills, record switches and payments, and link to other businesses (eg distribution, trading, generation). All of the Six Large Energy Firms have capitalised the costs of

[14] *Market Investigations Guidelines (CC3),* Annex A, paragraph 14.

developing their billing systems and software on their balance sheets and chosen a depreciation schedule.

48. We consider that billing systems and software meet our criteria for recognition in that they represent a significant investment by the Six Large Energy Firms with the aim of generating revenues in the future, the costs of developing them are additional to those necessarily incurred in running the business and they form assets that are separable from any arising from the general running of the business. For example, small entrants to the industry are able to purchase off-the-shelf billing and IT systems as they would any other asset.

49. [✂]. As a result, Centrica put forward the view that for the purposes of a ROCE analysis, we would need to take into account the replacement cost of these assets, [✂]. In addition, the costs of [✂] be incorporated as these would be considered part of the necessary investment that any new entrant would need to make.

50. We considered that the argument put forward by both Centrica and SSE was that the amortisation profile of their IT intangible assets over the period has not matched the stream of economic benefits that they have received from those assets, ie the assets have been or are being amortised too quickly. We do not agree with Centrica's argument that we should use the full (ie undepreciated) replacement cost of those assets since, in reality, such assets depreciate in value over time due to the changing needs of the business and advances in billing systems generally (making older systems obsolete). This is demonstrated by the fact that SSE is looking to replace its existing billing system shortly. SSE's proposed approach would be to adjust the amortisation profile of the intangible IT assets over the period. We agree that this is the correct approach to resolve this issue. However, we do not think that the cost of replacing an old system with a new one is the appropriate benchmark in this case. A new system could be expected to lower operating costs through lower bad debts, improved customer service and other operational efficiencies. Where a supplier's P&L does not reflect such operational efficiencies, we believe, therefore, that the appropriate benchmark would be the depreciated historic cost of the existing billing system. Hence, even after allowing for the lower costs associated with a new system, replacement cost may not be significantly higher than historic cost.

51. Therefore our approach has generally been to include billing systems and software in the capital employed by the businesses at their net book value in the Six Large Energy Firms' accounts and we have not made any adjustments to the depreciation/amortisation schedules applied to these assets. In addition, where the Six Large Energy Firms have provided details of IT assets that were employed by their supply businesses over the period but were not

included on their balance sheets, for example because they were centrally held, we have included these in capital employed.

Purchased goodwill and brand value

52. Purchased goodwill is an intangible asset that arises as a result of the acquisition of one company by another for a price in excess of the value of net assets. [✂]. RWE told us that the goodwill that arose on the purchase of npower by RWE AG in 2002 (being the difference between the purchase consideration paid by RWE AG and the fair value of the assets and liabilities of npower at the time of acquisition) has been allocated down into the consolidated accounts of npower for the purposes of reporting to RWE AG. Centrica reported goodwill arising from various acquisitions. E.ON reported acquisition goodwill in the supply business balance sheet relating predominantly to the acquisition of assets and business of TXU in 2002. EDF Energy reported goodwill relating to costs arising on the purchase value of subsidiary companies.

53. Similarly, the brand value of a business is an asset that may be recognised in the balance sheet of an acquiring firm. Firms are unable to capitalise the value of their own (organically-developed) brand. [✂].

54. We have not included either purchased goodwill or brand value in the capital employed by the energy retailers. In the case of purchased goodwill, this is because it is not a separately identified asset but rather is a balancing figure. It is the remaining, unallocated element of an acquisition price once all tangible assets and certain (although not necessarily all) intangible assets have been fair-valued and set against the price paid. In principle we agree that, when purchasing a business, goodwill may represent the value of intangible assets not capitalised on the business's balance sheet.

55. The approach that we have taken, however, is to recognise those intangible assets that meet our criteria for recognition, regardless of whether these have been separately identified in the companies' balance sheets or are included in a balancing goodwill figure, but to exclude any remaining goodwill in line with our approach in previous market investigations. This approach ensures that only intangible assets that meet our criteria for recognition are included in the estimate of the capital employed by the relevant firms. It also avoids the risk of capitalising the value of any excess profits that the business is able to generate, which may be reflected in the purchase price and hence the

purchased goodwill. This last issue is of particular concern in a market investigation.[15]

56. We consider that there are similar risks of capitalising any excess profits (circularity) associated with recognising the value of a brand, as separate from the tangible and intangible assets (such as customer relationships), held by a business.

57. We also considered whether we needed to take account of the start-up costs that would, in theory, have been incurred by firms when entering the supply market and on which they would be entitled to earn a return. Such costs would in theory form part of the intangible asset base. We reviewed the EBIT losses incurred by new entrants in the first few years of operation. [✂] made EBIT losses of [✂] from its inception in [✂], before turning a profit in FY13. Mid-tier supplier C [✂] made EBIT losses of [✂] from its inception in FY11 to FY12, before turning a profit in FY13. In view of the relatively limited size of these start-up losses we do not consider that adjusting for start-up costs would make a material difference to our calculations, and have therefore not sought to capitalise them.

Customer relationships

58. Energy retailers incur significant costs in acquiring new customers in the expectation that these customers will purchase energy from them over a period of several years. Customer acquisition costs comprise doorstep/energy advisers' costs, telesales, commissions payable to brokers or PCWs, sales support, proposition development and other similar costs. Both UK Generally Accepted Accounting Principles and International Financial Reporting Standards require that firms expense such costs as they are incurred, such that the value of customer relationships is generally not reflected on the balance sheet of a firm except insofar as the firm has acquired the customer book from a third party. In this latter case, firms are permitted to recognise the value of the intangible asset on their balance sheet.[16]

59. We consider that customer relationships meet our criteria for recognition in that they represent a significant investment with the aim of generating revenues in the future, the costs of developing them are additional to those necessarily incurred in running the business and they form assets that are separable from any arising from the general running of the business. This

[15] OECD (2011), *Policy Roundtables: Excessive Prices*, p395.
[16] [✂].

latter point is demonstrated by the fact that customer books can be sold by one firm to another.

60. The next issue that we considered was how to value the customer relationships of the Six Large Energy Firms. The deprival value principle indicates that customers should be valued at the depreciated cost of replacing them. We observed that the basis on which customers had been valued on the balance sheets of the firms was both inconsistent due to the accounting rules (see paragraph 58 above) and could – where customers had been purchased – include some element of capitalised excess profits, if any (ie if a firm were able to charge a customer a price that was above the competitive level, it could be expected to pay more to purchase that customer).[17]

61. We decided, therefore, to estimate a value of customer relationships for each firm on a consistent basis, using information on its expenditure on acquiring customers, ie expenditures that are directly and solely attributable to acquiring customers. We excluded any other customer relationship assets on their balance sheets from capital employed. We did not include the costs of serving customers as we considered that these were necessarily incurred in the day-to-day running of the businesses and therefore did not meet our recognition criteria. Nor did we include the cost of retaining customers as we concluded that these were generally indistinguishable from the day-to-day costs of providing good customer service and, as such, also did not meet our recognition criteria for intangible assets. As we are looking at the profitability of all the suppliers' retail activities (ie domestic, SME and I&C), we thought that all acquisition costs should be included. However, we generally did not have information on I&C acquisition costs but only on domestic and SME costs. We have allowed for this in our selection of the amortisation period (see paragraph 66 below).

62. The final consideration is the period over which the value of the customer relationships should be depreciated. SSE told us that its average customer lifetime was approximately [✂] and that the CMA should depreciate the value of its customer base over this period. [✂] suggested that the CMA use the same average life for all customers in retail supply, whether newly acquired or existing customers. [✂]. EDF Energy estimated a rate of customer churn of between [✂]% and [✂]%, which is on average between six and nine years. Scottish Power gave a range of between [✂], which is between four and seven years. [✂].

[17] The accounting rules mean that some customers are attributed a value whilst others are not.

63. We also considered the evidence on switching rates in the industry. DECC data shows industry average domestic switching rates of around 12% a year for both gas and electricity.[18] Since 12% of customers switch every year, then the average life of a customer is eight years. This estimate is towards the lower end of the churn rates provided by the Six Large Energy Firms. This may be due to more frequent switching by SMEs and I&C customers.

64. We observed that the average switching rate in the industry masks a significant variation between active/engaged customers, who switch frequently, and disengaged customers, some of whom have never chosen to switch. For example, the GfK survey showed that 34% of customers had never switched energy supplier.[19] We reasoned that the customer acquisition costs incurred by operators in the industry, whether new entrants or large incumbents, will predominantly reflect the costs of acquiring customers who do switch and who are, therefore, likely to have a lower than average expected life.

65. However in our ROCE estimates, we have used the actual customer acquisition costs incurred by the firms and an assumed eight-year average customer life for all firms, which is towards the upper end of the range indicated by the Six Large Energy Firms. We considered that this was a conservative assumption in light of the overall rates of churn provided by the Six Large Energy Firms and the GfK survey. In other words, the eight-year customer life is likely to assign greater value to customer relationships than that indicated by the switching rates provided by the Six Large Energy Firms.

66. As we are looking at the profitability of all the suppliers' retail activities (ie domestic, SME and I&C), in principle all acquisition costs should be included. However, we generally did not have information on I&C acquisition costs but only on domestic and SME costs. The evidence provided by firms across their customer bases indicates an average customer life of around 6 to 7 years. Given that we have not capitalised I&C acquisition costs, we used a higher customer life (8 years rather than 6) to compensate. We recognise that this is necessarily an approximation.

Other intangible assets

67. We considered SSE's argument for the inclusion of an intangible asset to reflect its skilled workforce, with the deprival value of this asset estimated via the capitalisation of staff training costs. SSE stated that the costs of training new staff represented a one-off investment which would be recouped over the

[18] Quarterly domestic energy switching statistics, updated 18 December 2014.
[19] GfK NOP customer survey report, paragraph 63.

duration of their employment. It noted that these costs differed from the day-to-day human resources costs associated with existing staff. Our view is that staff training costs do not create an asset that is separable from any arising from the general running of the business. A skilled workforce cannot be sold to another firm separate from the business as a whole, like an IT system or a customer book can be. In addition, we note that most businesses provide their staff with some 'induction' training when they start. In general, this will be necessary to enable staff to carry out their day-to-day tasks effectively. We have not, therefore, included an asset value for skilled workforce in the capital employed by the Six Large Energy Firms.

ROCs

68. We observe that EDF Energy, E.ON and Centrica have capitalised ROCs as intangible assets on their balance sheets. Centrica told us that ROCs arose due to purchases made from either external parties or from joint venture wind farms. The accounting treatment for ROCs is as follows:

> 'Self-generated certificates are recorded at market value and purchased certificates are recognised at cost, both within intangible assets. The liability under the renewables obligation is recognised based on electricity supplied to customers, the percentages set by Ofgem and the prevailing market price. The intangible asset is surrendered at the end of the compliance period reflecting the consumption of economic benefit. As a result no amortisation is recorded during the period.'[20]

69. We observed that the value of the ROC liability would build up over the year in proportion to the electricity sold by a supplier. The ROC (asset), in contrast, would be capitalised from the time it was acquired by the firm, which could be during the relevant year, or after the year end. Alternatively, a retailer could choose not to purchase ROCs and pay the buy-out price instead. In general, therefore, the level of ROCs held for operational purposes should be fairly similar to (or slightly less than) the level of ROC liabilities.

70. We considered that ROCs purchased and held in order to meet the liabilities of the firms represented operational capital employed and should, therefore, be included within our estimates of the capital employed by the Six Large Energy Firms, as should the provisions made for the ROC. We reviewed the information on ROCs provided by EDF Energy, E.ON, Centrica and SSE. We

[20] SSE's 2014 annual report.

observed that, in most cases, it was consistent with the pattern we would expect (as set out in paragraph 69 above). [✂].

Investments in subsidiaries and joint ventures etc

71. Another category of intangible assets recorded on the balance sheets of some of the firms were investments in subsidiaries, joint ventures or minority stakes in other businesses. We have excluded these assets on the basis that they do not represent operational capital employed but rather an equity stake in another business activity.

Working capital

72. Working capital comprises inventories, trade debtors and creditors, and other short-term debtors and creditors of the business including cash collateral. The most significant elements of working capital are trade debtors (largely outstanding receipts due from customers) and trade creditors (largely payment due for the purchase of wholesale energy costs, and other payments to suppliers).

73. There are, however, two factors that we have considered in coming to a view on the extent to which the working capital recorded on the firms' balance sheets should be included within capital employed for the purposes of our profitability analysis. The first is the extent to which specific elements of working capital represent operational capital employed in the business at the balance sheet date. The second is the extent to which the balances reported at the year-end are representative of average levels throughout the year.

74. In the first instance, we note that there are several types of current assets and liabilities that do not reflect an operational capital requirement at the balance sheet date but rather comprise either financing or relate to the timing of tax payments. For example, intercompany loans, whether borrowed by or lent to the supply businesses, are financing balances, while deferred tax assets and liabilities[21] represent future adjustments in the level of tax payable due to differences between capital allowances and a firm's chosen depreciation schedule. As our analysis is focused on the pre-tax profitability of the firms, we determined that tax balances should be excluded. We have also excluded

[21] A deferred tax liability occurs when taxable income is smaller than the income reported on the income statements. This is a result of the accounting difference of certain income and expense accounts. This is only a temporary difference. The most common reason behind deferred tax liability is the use of different depreciation methods for financial reporting and for tax accounting. A deferred tax asset is the opposite of a deferred tax liability. Deferred tax assets are reductions in future taxes payable, because the company has already paid the taxes on book income to be recognised in the future (like a prepaid tax).

hedge derivative assets and liabilities, which represent interim mark-to-market adjustments on the expected loss/gain resulting from a hedging transaction. These assets/liabilities do not represent capital employed by the group at the balance sheet date but temporary holding gains/losses on contracts that will be settled at a future date.[22]

75. In contrast, we have included provisions relating to ROCs in the total capital employed by the Six Large Energy Firms. We have not included any other provisions. We reasoned that the majority of provisions were made to recognise costs arising other than in the normal course of business, such as reorganisation costs, specific legal expenses etc. Although these represent current liabilities at the balance sheet date, they do not reduce the capital that the firm is required to employ as other current liabilities (such as trade creditors) do. However, we reasoned that ROCs represented an exception to this general position. As RWE explained, 'the ROCs provision is the amount held to cover payment of the annual ROC obligation; this is based on the obligation level and buy-out rate as provided by OFGEM multiplied by supply volumes.' We considered that this provision was similar in nature to a trade creditor to the business and therefore we have included provisions for ROCs in working capital. This is consistent with our treatment of ROCs as intangible fixed assets (see paragraph 68 above).

76. Second, working capital figures that the parties gave fluctuate significantly not only year on year, but also on a quarterly basis. We recognised that the supply of electricity and gas is likely to result in working capital swings due a number of factors. These include:

    (a) Seasonality. As demand is significantly higher in winter than in summer, leading to a build-up of debtors over the winter months.

    (b) Unexpected weather patterns. For example, a colder winter than expected may prompt an energy supplier to procure energy at short notice, and possibility at higher prices, causing an increase in trade creditors.

    (c) General cash management policies such as credit control and payment policies including frequencies. For example, poor credit control could result in a build-up of aged debts.

77. In order to ensure that our measure of working capital gives a reasonable reflection of the actual working capital that is required of the Six Large Energy

[22] We observe that hedging contracts are an agreement to buy.

Firms, we took into account the average working capital position rather than the year-end balance, with two exceptions:

(a) EDF Energy told us that the most significant movements in working capital were due to changes in debtor profiles and provided monthly aged debt information for 2011 to 2013. However, EDF Energy did not provide us with average working capital information. Therefore, we have used year-end balances in estimating its ROCE.

(b) SSE could not produce a balance sheet for its supply business, however it provided average debtor days for the period of review and creditor days for the FY 2012/13 and 2013/14. We have used these numbers to calculate SSE's working capital.

Cash

78. For most firms, working capital will fluctuate over the course of a year and also within months as cash flows into and out of the business. In order to avoid liquidity problems, firms must be able to meet their liabilities as they fall due. Firms have a choice as to how they manage these movements in working capital. On the one hand, they can hold a cash balance in order to meet peak working capital requirements, or they can arrange an overdraft facility, which they draw on as required. The approach taken by a firm will depend on the relative costs and availability of each of these types of financing. We observe that the supply balance sheets of the Six Large Energy Firms reflect both of these approaches, with [✂] having a significant overdraft facility, while several of the others hold (positive) cash balances.

79. Our analysis seeks to reflect the operational capital employed by the businesses and we consider that, in general, the use of the average working capital position of the businesses should do this adequately. In this sense, any additional cash balances or overdrafts should not affect capital employed. However, we recognise that a stand-alone energy retail business may face certain constraints on the availability of an overdraft facility which is sufficiently large to cover peak working capital needs, such that it may be necessary for such a firm to also hold a limited quantity of cash as a buffer against such requirements. Therefore, we have included a limited cash balance to reflect these needs.

80. [✂].

81. Therefore, we estimated a typical cash balance with reference to that held by the supply business of RWE and Just Energy Inc. RWE held a cash balance, which averaged [✂]% of the total cost of sales in each year, although this

fluctuated from year to year. Just Energy Inc held a cash balance including for collateral and trading purposes at 2.39% (FY 2015) and 0.67% (FY 2014).[23] We have therefore taken what we consider to be a reasonable approach of using a cash balance for each firm of 2% of its annual cost of sales (defined as total revenues less gross profit).

Notional capital (for business risks)

82. We have received submissions from some of the Six Large Energy Firms on the levels of 'notional capital' that their supply businesses would require in order to operate in the industry on a stand-alone basis. We have also received submissions from independent energy suppliers and trading intermediaries. In Annex A, we set out these views and evaluate the issue in detail.

Summary of parties' views

83. SSE, [✂], EDF Energy, [✂] and [✂] argued that their supply businesses benefited from being part of a financially strong group with an investment grade credit ratings; an important signal of credit worthiness for trading on the wholesale energy markets and also for providers of debt finance. This benefited their supply businesses in the following ways:

(a) [✂]; and

(b) [✂].

84. The Six Large Energy Firms state that if their supply businesses were stand-alone, they would lose these benefits and would have significant collateral calls that would have to be met in cash or cash equivalents. Therefore they argued that their stand-alone supply businesses would require risk/contingent capital (which we refer to as 'notional capital') to manage their 'business risks'.[24] This capital base would need to be held largely in cash or cash equivalent assets,[25] as a stand-alone firm would not have access to lines of credit and debt finance, and shocks from business risks could not be solely funded through EBIT. Therefore the only possible source of notional capital would be from equity investors. In addition Centrica argued that a stand-alone supplier, no longer benefiting from the economies of scale enabled by being

[23] Just Energy group: Management's responsibility for financial reporting.
[24] Please refer to Annex A of this appendix, paragraphs 9-12 for a full list of business risks listed by the parties.
[25] As liquid as cash and be able to hold its value similar to cash.

part of a vertically integrated (VI) group, would incur additional costs relating to energy balancing and corporate centre overheads.

85. The Six Large Energy Firms[26] therefore argued for the inclusion of notional capital in capital employed for the purposes of our retail supply profitability analysis in order to reflect the economic profitability of a financially sustainable stand-alone supplier.

86. [✂],[27] estimated their notional capital at [✂] respectively for their supply businesses.

87. Scottish Power did not model any numbers for notional capital and told us that it would be speculative to assess the exact levels of collateral. In addition, E.ON told us that due to the highly subjective nature of calculations, and its existing operating structure, it did not calculate a figure for notional capital.

Our assessment

88. We recognise that energy suppliers are exposed to business risks and need to find means to manage these risks. However the evidence that we have collected does not support the contention that a large stand-alone energy supplier would manage this risk by holding a large 'notional capital' reserve. The primary driver for this view is the significant costs of holding notional capital compared to alternative risk management strategies, which are more cost effective.

89. First, we sought to understand how firms currently active in the sector seek to manage these risks in practice.

    (a) [✂].

    (b) Furthermore, we observe that stand-alone independent suppliers in UK such as [✂] do not hold notional capital either. Instead they have opted for a fee arrangement under which they access the wholesale market by paying a fee to a trading intermediary. In return for this fee the intermediary assumes the counterparty credit risk and price risk on contracted volumes. In addition, the energy supplier avoids the need to post collateral, and gains access to a significant credit facility.

[26] In SSE's case it includes its economic adviser.
[27] [✂].

(c) As with 'Independent A' and 'Independent B', we observe that Just Energy Inc, a stand-alone supplier of scale[28] operating in the North American market does not hold notional capital – its cash balance including for collateral ranged from 0.7% (FY2014) to 2.39% (FY2015) of its cost of sales.[29] It used Shell's structured trading agreement, and has grown substantially. Currently it sources its wholesale energy supply from commodity partners such as BP, Bruce Power, Constellation Energy, EDF Energy, Shell and three financial institutions [30] and is able to access the wholesale markets directly. This case study highlights that a stand-alone supplier of scale can be deemed to be creditworthy by accessing the wholesale market on its own account and with alternative forms of finance such as lines of credit, and debt and equity capital markets.

(d) Independents manage other business risks by efficiently managing their working capital and controlling costs, and thus managing any volatility from peak ('at the margin') working capital requirements with the credit facility offered as part of the fee arrangement.

(e) Lastly, suppliers can access capital markets to get access to a range of products such as lines of credit, weather derivatives and insurance products to complement the above mentioned tools.

90. We recognise that the fee arrangement does not lay off all business risks. However a supplier can use this approach coupled with other measures mentioned in paragraph 89 above and Annex A, paragraphs 59 to 68 to manage to business risks.

91. We also compared the costs associated with the fee arrangement used by the independents, to that of holding notional capital (as proposed by the Six Large Energy Firms) at each firm's WACC. Our analysis indicates that it is significantly more cost effective to adopt the fee arrangement. For example, the opportunity cost of holding a notional capital balance of between £2.7 billion and £4.5 billion, as estimated by Centrica is between £270 million and £450 million per year. In contrast, we estimate that the payment of a [✂] of wholesale energy costs would cost Centrica's supply business approximately [✂], which is several multiples cheaper than the cost of notional capital. Please refer to Annex A, Table 1 for details.

92. We considered whether such large differences in cost should be expected when comparing these two approaches to managing business risks. We noted

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[28] It has 4.7 million customers (both domestic and commercial).
[29] Just Energy's 2015 Financial Statements.
[30] Just Energy's 2014 Financial Statements.

that the approach put forward by some of the Six Large Energy Firms required the (constant) holding of large capital reserves in the form of cash (or extremely liquid cash equivalents), the majority of which would be required to meet relatively infrequent cash needs at the margin, eg working capital peaks arising at times of volatility or significant divergences between forecast and actual demand. This has a significant opportunity cost for a firm.

93. However we noted that the trading intermediaries used by the independent suppliers have strong balance sheets and investment grade credit ratings, factors that are likely to be taken as signals of credit worthiness by trading counterparties. We considered that these intermediaries are able to trade on the wholesale markets on a similar basis to the Six Large Energy Firms, ie without posting significant quantities of cash as collateral. As a result, the service they are providing does not require them to tie up significant quantities of capital on behalf of their clients.

94. Trading intermediaries aim to hedge their positions to minimise exposure to one side of the market, thus reducing their net exposure and the requirement to hold contingent notional capital. This efficiency is passed onto independent suppliers from trading intermediaries. As a result, we would expect the fee arrangement to be less costly for an independent supplier than it holding large cash or cash-like balances as notional capital.

95. Finally, we considered the scalability of the fee arrangement under the intermediary model. Whilst the size of the GB markets for such services are currently limited, we consider that this is due to a lack of demand, given that the Six Large Energy Firms have their own internal trading businesses. Therefore it is reasonable to assume that if the Six Large Energy Firms' supply businesses were stand-alone, and wanted to trade via intermediaries, then intermediary capacity would enter the market to meet this demand. In addition, a market with stand-alone suppliers would by default have stand-alone generators (or generators without supply businesses). Therefore trading intermediaries would be able to hedge their positions adequately.

96. In our view, the fee arrangement provides a reasonable benchmark to assess the level of fees because it represents an arm's length market price. The risk has been priced by the market and the operating model has been in existence in the UK for a number of years, and for over 15 years in the USA. In addition, we saw no reason for trading fees to increase with scale; rather we observe that the intermediaries offer a lower trading fee at higher volumes.

97. Therefore we considered that the trading fees paid by the independent suppliers provides a benchmark for the arm's length cost that would face a stand-alone supplier of scale in effectively managing business risks

associated with trading on the wholesale market without the requirement for significant notional capital.

Our approach

98. Our view is that the more cost-effective approach to managing business risks would be via the fee arrangement rather than through holding notional capital. Therefore we have not made any adjustments to capital employed of the Six Large Energy Firms in relation to notional capital. However, we considered whether it would be necessary to make adjustments to EBIT to account for the trading fee.

99. In order to form to a view on this, we considered the extent to which the financial information provided by the Six Large Energy Firms on their supply businesses already reflected the costs for services similar to that provided by Shell to Independent A and Independent B. We noted that:

    (a) if these costs/risk premiums were not already reflected in the supply financials, then it would be necessary to deduct a fee/premium from their EBIT figures; and

    (b) alternatively, if these costs/risk premiums were already reflected in the cost base of the supply businesses in the form of transfers to the trading or generation businesses, then we would not deduct a trading fee/premium from their EBIT figures.

100. To this effect, we note that some of the supply businesses of the Six Large Energy Firms already pay a trading fee/premium to their group's trading business in relation to laying off certain wholesale market risks and recharging administration fees. On this basis, including the [✂] within EBIT may result in double counting for the purposes of the ROCE analysis. In order to reduce the potential for such double counting, we reversed the risk premiums for Scottish Power and SSE, before applying the benchmark trading fee. However, we acknowledge that there may nevertheless be an element of double counting in relation to recharges of trading costs and administration fees.

101. We applied the benchmark trading fee as a percentage uplift to wholesale energy costs. This related to trading on a collateral-free basis (including laying off of price and counterparty risk on the full value of wholesale energy purchases) and also to accessing a contingent credit facility.

102. Lastly we considered regulatory collateral, which some of the Six Large Energy Firms have argued for inclusion within notional capital, and capital employed. In terms of quantum, EDF Energy said its stand-alone supply

business would require around £400 million of regulatory collateral. [✂]. RWE quoted [✂] million of regulatory collateral.

103. We observed that the independent suppliers post minimal amounts of regulatory collateral in relation to Elexon, Xoserve and metering, and avoid it on other codes due to their sound payment history and financial management. Therefore, there may be some justification for the inclusion of collateral held with Elexon and Xoserve, and metering collateral. However, given the relatively insignificant sums for [✂] as noted in paragraph 102 above and we consider that regulatory collateral in relation to Elexon, Xoserve and metering is likely to have already been allowed for in the 2%[31] cash balance, which we have modelled for the firms.

Results of our analysis

104. In this section, we set out the results of our analysis for the Six Large Energy Firms, based on the approach to measuring capital employed set out above. The significant adjustments to the reported EBIT relate to the deduction of the [✂] and customer relationships (reversal of related costs and deduction of amortisation over eight years). In addition, we have reversed the significant risk premiums for SSE and Scottish Power. The significant adjustments to reported balance sheet items include the capitalisation of customer relationships, 2% cash assumption and taking the average working capital during the financial year.

105. Table 1 shows the ROCE earned by each of the Six Large Energy Firms over the relevant period, as well as the (weighted) average return in each year. Centrica, SSE, Scottish Power and E.ON earned profits substantially and persistently in excess of WACC over the period. RWE's returns on average have been below its WACC. EDF Energy's negative ROCE is a reflection of it making losses.

[31] Just Energy Inc's trades on the wholesale market and posts collateral. It does not have the 'fee arrangement' that the UK independents do. Its cash balance including for collateral purposes is 2.39% of its cost of sales. Therefore our application of the 2% of cash of sales in addition to the 'fee arrangement' is reasonable.

Table 1: ROCE, FY07 to FY13

%

ROCE	2007	2008	2009	2010	2011	2012	2013	2009-13 Average	2007-13 Average
Centrica	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
SSE	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Scottish Power	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
E.ON	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Subtotal average	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
RWE	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EDF Energy	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Subtotal average	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Average	**13**	**11**	**23**	**46**	**23**	**29**	**24**	**28**	**24**

Source: CMA analysis.

106. The variability of the returns arose at least in part from weather related factors that impact revenue, cost of sales, debtors and creditors from one year to the next. First, the actual level of profits earned by the Six Large Energy Firms fluctuated significantly from year to year, as shown in Figure 21.

Figure 21: EBIT (£'m) of the Six Large Energy Firms, FY07 to FY13

[✂]

Source: CMA analysis.

107. Second, the level of capital employed by the Six Large Energy Firms also fluctuated substantially from one year to the next, primarily due to swings in working capital as shown in Figure 32.

Figure 32: Capital employed (£'m) by the Six Large Energy Firms, FY07 to FY13

[✂]

Source: CMA analysis.

108. Given these fluctuations, it is more meaningful to consider average returns over the period and assess economic profits (and losses) for the Six Large Energy Firms. Our assessment indicates that four of the Six Large Energy Firms ([Centrica, SSE, Scottish Power and E.ON]) generated combined economic profits over the period. This contrasts with two of the Six Large Energy Firms ([RWE and EDF Energy]) that made combined economic losses.

Table 2: Economic profits, FY07 to FY13

							(£'m)	2009-13 average and totals (£'m)			2007-13 average and totals (£'m)		
Economic profits	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*Average*	*Total*	*%*	*Average*	*Total*	*%*
Centrica	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
SSE	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Scottish Power	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
E.ON	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Excess profits	**522**	**394**	**979**	**1,517**	**926**	**1,062**	**874**	**1,071**	**5,357**	**100**	**896**	**6,272**	100
RWE	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EDF Energy	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Economic losses	**(399)**	**(359)**	**(362)**	**(162)**	**(205)**	**(142)**	**(131)**	**(200)**	**(1,001)**	**100**	**(251)**	**(1,759)**	**100**
Net	**124**	**35**	**617**	**1,355**	**721**	**919**	**743**	**871**	**4,355**		**645**	**4,513**	

Source: CMA analysis.

Figure 4: Economic profit (£'m) by the Six Large Energy Firms, FY07 to FY13

[✂]

Source: CMA analysis.

Annex A: Business risks and notional capital

1. This annex sets out our assessment of the capital that a large stand-alone energy supplier would need to employ to manage the risks of operating its business. It is structured as follows:

   (a) Definitions.

   (b) An overview of the business risks faced by energy suppliers.

   (c) An overview of how the Six Large Energy Firms manage these risks.

   (d) An overview of how independents manage these risks.

   (e) Our assessment of the arguments for notional capital.

   (f) Our proposed approach.

   (g) Supplements 1, 2 and 3.

Definitions

2. For the purpose of this appendix and supporting annexes, we use the following definitions:

   (a) 'Six Large Energy Firms' refers to Centrica, EDF Energy, E.ON, RWE, Scottish Power and SSE.

   (b) 'Independents' refers to fully stand-alone UK energy suppliers that are starting to achieve a level of scale such as Independent A and Independent B. We will use independents, and specifically Independent A and Independent B given their relative scale, as the benchmark in our analysis.

3. We note that some relatively smaller suppliers are not fully 'stand-alone suppliers'. Extraenergy and Co-operative Energy are part of wider groups, who are able to offer them parent company backing and guarantees. Haven Power is owned by Drax, thus making it part of a VI company. Ecotricity owns generation assets. Utility Warehouse has strong commercial and operational arrangements with RWE.

4. 'Trading collateral' is used as security in wholesale energy markets to protect market participants and exchanges from counterparty credit risk. For example an energy supplier that wants to purchase energy may be required to post collateral to protect the seller of energy in the event that the supplier is unable or unwilling to pay for the contracted energy.

5. Collateral can be in cash and non-cash form. 'Cash collateral' refers to physical cash that is held as security by the collateral taker (the counterparty or exchange). Non-cash securities refer to non-cash forms of guarantees or funding arrangements such as parent company guarantees (PCGs) and letters of credit (LCs). The former is 'on balance sheet', and the latter is usually 'off balance sheet', unless a credit facility is drawn down on the balance sheet date.

6. Wholesale market trading can be done over the counter (OTC) or on exchanges. However most trading in the GB wholesale energy markets is done OTC, compared to on exchanges. In OTC trading, the credit risk lies directly with the counterparty. However on exchanges, credit risk resides with the exchange.

7. We note that OTC trades have bespoke contractual terms, which gives the counterparties the flexibility to agree on the calculations of initial and variation margin and margin call rules. In contrast, exchanges tend to have uniform rules on the management of margined trades. For example, N2EX sets out clear rules on its margining methodology and collateral requirements.[32]

8. Energy supply firms also have collateral requirements relating to balancing, transmission, distribution, and the SEC. In the future, suppliers will also have obligations in relation to Contracts for Difference (CfDs), and the Capacity Market.[33] We term these requirements collectively as regulatory collateral.

Business risks faced by energy suppliers

9. The main tariff types in the energy supply market are the SVT and fixed-term contracts. In both of these contracts, suppliers are constrained in their ability to immediately change prices in line with movements in the wholesale energy prices. For example, SSE told us that sometimes, it could take up to six months to change prices on its SVTs. In addition, energy customers are free to consume as much energy as they like. Therefore, energy suppliers have to estimate the forecast demand.

10. Hence, procuring energy on the wholesale markets exposes a supplier to price and volumetric risks:

    (a) A supplier can either purchase energy on the spot market or forward market. If it purchases energy on the spot market, it is exposed to short-term price volatility, which it cannot immediately pass onto consumers.

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[32] Section 8 N2EX General Clearing Rules.
[33] Cornwall Energy (2014), *Credit and collateral in the GB Energy Markets, Phase 1 Volume 1: Main Report*, pp10–11.

Therefore a supplier can mitigate price risk by entering into forward contracts that fix the energy input price.

(b) However the supplier may still be exposed to weather related volumetric risk. This is the risk that contracted volumes are different from actual demand or volumes consumed in the short term. For example, a milder winter than expected would result in the energy supply firm having to sell excess volumes at lower prices (than those contracted). This would negatively impact its profitability. Therefore volumetric risk has a price risk element to it as well.

11. In practice, large and small energy suppliers hedge a majority of their energy purchases on the forward markets. A longer term hedging strategy has the benefit of locking in the energy input cost on hedged trades over the contracted period, thus reducing uncertainty from price volatility and potentially smoothing costs (it would still be exposed to volumetric risk). However, this requires more collateral than a shorter-term hedging strategy, if the energy firm is trading on its own account.

12. In addition to price and volumetric risk, parties also identified other risks such as operational leverage, imbalance, shape, counterparty credit, customer churn, commodity cost disadvantage, non-energy (eg network charge fluctuations), competition, settlement, regulatory, industry transformation (systems upgrades, smart meters and digital platforms), political and changes in government policy. We term these risks collectively as 'business risks' and it includes 'regulatory collateral'[34] requirements.

How the Six Large Energy Firms manage business risks

13. First, the Six Large Energy Firms have informed us that a majority (and in some cases a significant proportion) of their trades are uncollateralised and done OTC. In the minority of overall trades, where they do post collateral, they do so in non-cash form. Centrica told us that [✂]. However we observe that the actual amount of cash collateral held is insignificant compared to the wholesale energy costs, and cash balance on their balance sheets.[35] Please see Supplement 1 for detailed responses on cash collateral and the actual trading arrangements of the Six Large Energy Firms.

[34] Please refer to Annex A of this appendix, paragraph 132 for a definition of regulatory collateral.
[35] Annual reports of Centrica, SSE, and Scottish Power from FY 2007 to 2014.

14. Additionally, the Six Large Energy Firms use non-cash securities as a substitute to posting cash collateral where possible. For example, [✂].

15. The Six Large Energy Firms[36] told us that they were able to conduct such 'collateral light' (ie [✂]) trading principally due to their investment grade credit ratings. All have unequivocally stressed the importance of credit rating in not posting collateral, but also in using non-cash forms of collateral, where security is required.

16. A credit rating is provided by a credit rating agency. The three large agencies in the UK are S&P, Moody's, and Fitch. Whether an energy firm (or any other firm) is rated or not depends largely on its capital structure and whether it wishes to issue traded debt securities. Therefore credit ratings are mostly sought to provide investors with an informed analysis of the risk associated with debt securities. Unlike the Six Large Energy Firms, we understand that the independent suppliers do not have debt, and therefore do not need to have a credit rating. However, credit ratings are also taken as an important signal of credit worthiness by counterparties trading on the wholesale energy market.

17. Moody's told us that the ability of a VI firm to achieve a strong credit rating arises from several factors. An important factor is the ownership of generation, transmission and distribution, and retail supply, and also in some cases being part of the wider global group. This smoothes and diversifies earnings.

18. Second, VI firms are able to 'net off' offsetting trades to a great extent,[37] and thus reduce their net exposure, which significantly reduces the requirement to hold ring-fenced risk capital on the balance sheet. For example RWE told us that its trading business had [✂]. Given RWE's trading activities, it said that it was not efficient for it to pay a fee to a third party (trading intermediary). This is because RWE had greater [✂]. SSE added that the Six Large Energy Firms' ability to net off and obtain group backing from parent companies with strong balance sheets reduced the collateral requirements in terms of quantum (actual amounts demanded by counterparties), quality (post lower quality collateral such as unsecured credit allowances), and cost (hold

[36] In SSE's case it includes its economic adviser.
[37] It may not be possible to achieve a 100% perfect hedge due to timing differences. However, the aim of a well-managed trading business is to be hedged. In the current market structure, the Six Large Energy Firms are able to be on both sides of the market due to the ownership of generation and retail supply businesses. Additionally proprietary trading may allow further fine tuning to the hedge profile.

relatively less cash collateral, which is more expensive to hold and use than non-cash securities to a greater extent).

19. Third, SSE said that the Six Large Energy Firms[38] were able to internalise and thus absorb shocks arising from business risks. They were able to do so by accessing internal and external sources of finances, which could range of from PCGs to lines of credit. SSE also said that its investment grade credit rating allowed it to access contingent lines of credit.

How a large stand-alone supplier would manage business risks – views of the Six Large Energy Firms

20. SSE, Centrica, EDF Energy, RWE and Scottish Power argued that their supply businesses benefited from the financially strong wider group. The group included vertical integration with their generation businesses. Some of these companies also had assets such as transmission and distribution or exploration and production with their group, which could sometimes be located outside Great Britain. These factors resulted in them securing investment grade credit ratings, which was an important signal of credit worthiness for trading on the wholesale energy markets. This benefited their supply businesses in the following ways:

(a) [✂].

(b) [✂].

21. [✂].

22. Based on the evidence in paragraph 21 of this annex, the parties have argued that a stand-alone supplier of scale would not have access to debt finance or lines of credit. Additionally, collateral would have to posted in cash, cash equivalent form or be backed up by cash deposits. Therefore the only possible alternative to manage business risks would be largely through a cash (or cash equivalent) reserve, which we refer to as notional capital.

23. We infer that notional capital would have to be largely held in cash or cash equivalent based on the responses from the Six Large Energy Firms,[39] who argued that a stand-alone supplier of scale would not have an investment grade credit rating, and would thus have limited access, if any, to lines of credit. Moreover, SSE told us that any access to LCs would likely need to be backed up by cash deposits. In addition, Centrica also confirmed that access

[38] In SSE's case it includes its economic adviser.
[39] In SSE's case it includes its economic adviser.

to lines of credit along with PCGs were not consistent with the stand-alone model. Furthermore, we have assumed no debt gearing in our WACC for retail suppliers.

24. SSE argued that a large stand-alone supplier would require access to notional capital to act as a buffer to manage business risks, and be financially sustainable. Furthermore, it said that the size of this notional capital should be determined by the peak requirements that might be required in a plausible or worst case scenario. In addition Centrica said that notional capital would be required given the difficulty of finding interested counterparties at the required scale based on its US experience.

25. In relation to the risks that are covered off by notional capital, the Six Large Energy Firms argued that it would be required to cover business risks, the most significant of which related to the posting of cash collateral. RWE's statement best summarised the views of the Six Large Energy Firms – 'notional capital would be required to meet almost all liabilities caused by uncertain events in order to remain solvent in the long run.' SSE argued that notional capital would also be required to meet business risks such as changes in customer churn rates and government policy. In addition, SSE and Centrica stated that notional capital would also be required during benign and more volatile periods to act as a buffer against price and volumetric risk.

26. The Six Large Energy Firms therefore argued for the inclusion of notional capital in capital employed for the purposes of our retail supply profitability analysis in order to reflect the economic profitability of a financially-sustainable stand-alone supplier. As such it would provide a meaningful measure of the capital that the business would have to employ, noting that business risks that a stand-alone supplier of scale faced could only be managed by holding notional capital. They noted that notional capital was not included on their supply or trading businesses' balance sheets, as an energy supplier that is part of a larger group does not need to hold such a capital balance separately from its other assets. However they argued that it was employed (implicitly)[40] within the group structure. For example, Centrica told us notional capital was in the form of access to finance/lines of credit from the group such as pooled group cash reserves and committed undrawn facilities. We note that Scottish Power told us that the Six Large Energy Firms didn't hold and didn't employ notional capital in their current VI group structure.

[40] Centrica disagreed risk (notional) capital was employed implicitly.

27. [✂] estimated their notional capital at [✂]. The numbers have been modelled on the period from 2007 to 2013. [✂]. Please see Supplement 2 for detailed responses from the parties on notional capital.

28. Scottish Power did not model any numbers for notional capital and told us that it would be speculative to assess the exact levels of collateral. In addition, E.ON told us that due to the highly subjective nature of calculations, and its existing operating structure, it did not calculate a figure for notional capital.[41]

29. To summarise, the Six Large Energy Firms argued that the quantum of notional capital must take into account the peak, not average, requirements that the stand-alone supplier would require. In addition, a stand-alone supplier would need to hold notional capital in cash (or extremely liquid cash like reserve that is readily available) permanently and constantly to give it headroom during highly volatile periods such as those experienced in 2004/05 and 2008/09. It would need to be held constantly because the cash flow impacts from business risks were uncertain, and collateral margin calls were required to be made at very short notice.

How independent suppliers manage business risks

30. Independents that have started to achieve a degree to scale such as Independent A and Independent B have entered into a fee arrangement with trading intermediaries, which act as a route to market. This arrangement allows them to avoid posting collateral, gives them access to a significant credit facility and also lay-off price risk and counterparty credit risk on all volumes contracted through the trading intermediary. The fee arrangement accounts for an overwhelming majority of their energy purchases, except for trades on the spot market. In addition to the fee, they may also grant a charge over certain assets to a trading intermediary. They are able to manage other business risks through net cash flow generated through operations/EBIT during benign times, and access the credit facility offered under the fee arrangement during volatile periods.

31. We note that the fee arrangement does not lay off all business risks. However they are able to use this arrangement coupled with sound financial and operational management to manage their business risks. We acknowledge that all firms face business risks and investors are compensated for these in the WACC (which recognises the need for a risk premium rather than just being a risk-free rate). Equity (and debt) investors risk their investment in a limited liability firm. In addition, we observe that independents do not hold

[41] E.ON's initial submission.

notional capital – large cash balances or ring-fenced equity reserves on their balance sheet.

32. We also observe that other small suppliers rely on support from other divisions with their company to aid their wholesale market purchasing requirements. For example, [✂] and [✂] use parent company support. Similarly [✂].

Independent A

33. [✂].

34. [✂].

35. [✂].

36. [✂].

37. [✂].

38. [✂].

39. [✂].

40. [✂].

41. [✂].

Independent B

42. [✂].

43. [✂].

44. [✂].

45. [✂].

46. [✂].

47. [✂].

48. [✂].

49. Please refer to Supplement 3 for details on the services provided by the trading intermediaries.

Our assessment on notional capital

50. First, the parties had differing views about whether they currently employ notional capital within their VI structures. Centrica told us that its supply business employed notional capital, which was held within the group. However Scottish Power said that the VI Six Large Energy Firms didn't hold ring-fenced capital and that balance sheet strength made the holding of notional capital unnecessary. It added that riskiness from supply was reflected in the group WACC.

51. We agree that the supply businesses of the Six Large Energy Firms benefit from an investment grade credit rating that offers various benefits such as access to lines of credit, which allows the posting of non-cash forms of collateral. More significantly, it allows the Six Large Energy Firms to conduct the majority of their trading on a collateral free basis. However, we hold the view that access to debt finance or the ability to conduct collateral-light trading are not indicators or proxies of capital employed. Neither is notional capital a separable or identifiable asset that the VI firms actually employ. We observe that neither the group nor the supply businesses of the Six Large Energy Firms currently hold separate large cash/equity reserves that resemble notional capital.

52. Parties have advanced widely divergent figures of notional capital that range from £350 to £4,500 million. This is driven by differing views as to which business risks and the levels of risk notional capital ought to cover.

53. We had concerns about the validity of the framework used by one party to estimate notional capital (the virtual capital framework for the calculation of notional capital prepared by [✂] on behalf of Centrica) as follows:

    (a) First we note that the stand-alone supply arm of Centrica is not a bank or a financial institution, which face different sets, magnitudes and sources of risk,[42] even though some risks may overlap. For example, weather related volumetric risk can have a significant impact on energy suppliers' profitability, but is unlikely to significantly impact the banking sector. We also observe that certain wholesale market risks can be laid off by the supplier under the fee arrangement.

    (b) Second, the capital requirements set under the capital requirements regulation (CRR) and capital requirements directive (CRD) frameworks are based on the business models including the assets and liabilities of

[42] Please refer to Annex A of this appendix, paragraphs 9–12, for a description of the risk that energy suppliers face.

banks, which are different from those of energy suppliers. For example, the largest balance sheet liability for retail banks is customer deposits, but for energy suppliers it is trade creditors, which relates to energy purchases.

(c) Third, the purpose of the CRR and CRD frameworks is to ensure that financial institutions and banks, who unlike energy firms accept customer deposits or those who are systematically important hold enough capital so that at times of distress or insolvency, any shortfall between assets and liabilities are first picked up by banks' shareholders.

(d) Lastly, the CRR and CRD frameworks are regulatory driven (not market driven) capital requirements for banks to manage their leverage. However we are assuming nil long-term debt in our stand-alone model. Also the intermediary model[43] is based on the intermediary's ability to hedge its positions, thus reducing net exposure and the requirement to hold significant amounts of capital.

54. Energy suppliers, whether part of a VI group or stand-alone are exposed to business risks as noted in paragraphs 9 to 12 of this annex. These business risks include:

(a) wholesale market risks such as price risk (requirement to post collateral) and counterparty credit risk;

(b) weather related risks such as volumetric risk;

(c) operational risks such as bad debt collection/cash management, imbalance, shape and customer churn risk; and

(d) industry wide risks such as network charge fluctuations, regulatory risk, competition risk, settlement risk, commodity cost disadvantage, industry transformation, political risk and changes in government policy.

55. However the evidence that we have seen does not support the contention of the Six Large Energy Firms that a large stand-alone energy supplier would seek to manage this risk by holding large capital balances.

[43] A fragmented market of stand-alone suppliers and generators, where trading intermediaries would be ideally placed to provide the fee arrangement to independent suppliers and generators. Please see Annex A of this appendix, paragraph 92 for a further description.

Costs of holding notional capital

56. There is a cost for holding notional capital on the balance sheet, equivalent to the notional capital multiplied by the WACC. If there is a cheaper substitute to notional capital, then the capital intensive route of holding notional capital is not efficient. An efficient firm in a competitive market would choose the least costly means to protect itself against business risks. The approach taken by the independents indicates that the payment of a fee (fee arrangement) to avoid risks is less costly than holding large cash or cash-like instruments.

57. Therefore, we next considered which approach would be most efficient for a large stand-alone energy supplier, ie of a similar scale to the Six Large Energy Firms.

(a) First, we compared the annual opportunity cost of holding the notional capital balances put forward by Centrica, EDF Energy and SSE, with the cost of paying a fee similar to that paid by independents on their energy input costs. This analysis is set out in Table 1.

Table 1: Comparison of opportunity cost of notional capital and payment of a trading fee of [✂]% of wholesale energy costs

Firm	*Estimated notional capital (£'m)*	*Annual cost (at WACC of 10%) (£'m)*	*Trading fee at [✂]% of wholesale energy costs*	*Difference*
Centrica	[✂]	[✂]	Several times cheaper than the cost of notional capital	Significant
EDF Energy	[✂]	[✂]		Significant
SSE	[✂]	[✂]		Significant
RWE	[✂]	[✂]		Significant

Source: CMA analysis

(b) Table 1 shows that it is significantly more cost effective to pay a trading fee of around [✂]% of total wholesale energy costs, rather than to hold a large notional capital balance.

58. Therefore, we consider that, based on the evidence presented above and also the analysis that notional capital is not the least cost means of managing business risks and does not therefore represent an efficient capital structure.

How independents manage and a stand-alone supplier of scale can seek to manage business risks without notional collateral

59. We sought to understand how stand-alone independent energy suppliers, who are achieving scale and currently active in the sector manage business risks in practice and how a stand-alone supplier of scale could employ similar strategies and practices.

60. Independent suppliers in the UK such as Ovo Energy and First Utility do not hold notional capital – we do not observe large cash or ring-fenced equity reserve on their balance sheets. In relation to the most significant business risk, which is wholesale market risk, they have opted for the fee arrangement with a trading intermediary. It allows them to avoid posting collateral on all volumes contracted through the trading intermediary, which in practice accounts for all of their purchases in the forward markets and a significant majority of their overall purchases. Given that the trading intermediary acts as a route to market, the independents are able to lay off price and counterparty credit risk on volumes contracted. The fee arrangement also offers a committed and significant credit facility.

61. In addition independents focus on efficiently running their business and controlling costs. For example, Independent A uses active near term trading to manage shape and imbalance risk, credit control to manage bad debt risk and demand forecasting to manage payments/creditors. In addition it engages in active hedging and wholesale risk management along the forward curve, credit control to manage bad debt risk and demand forecasting. It uses a combination of these tools to effectively manage weather related, and operational risks. It also provides a buffer against industry wide risks. For example, Ovo Energy told us that despite it investing in growth (office space, billing systems), it focused on controlling its costs, and hedging as accurately as possible to meet demand.

62. Suppliers can also focus on managing their working capital carefully and using the credit facility offered by the fee arrangement to manage working capital peaks and business risks. For example, [✂]. Therefore volatility at the margin can be managed with the credit facility coupled with sound financial and operational management, and business risks during benign times can largely be managed through net cash flow generated through operations/EBIT during benign times.

63. Operational risks such as bad debt collection can be managed by effective credit control procedures such as credit checks, prompt billing and direct debit payments from customers. Cash flows can be managed by effective cash management techniques such as obtaining visibility over cash, preparing accurate forecasts, monitoring cash and implementing cash improvement initiatives. We also note that a stand-alone supplier of scale would not be highly leveraged with long-term debt, thus giving it further headroom around working capital peaks or shocks that impact cash flows. In addition, customer churn can be managed by closely monitoring forecast churn rates, providing excellent customer service or competitive tariffs, either of which would give customers less incentives to switch, or bring churn rates to reasonably manageable levels. Furthermore we note that each of the Six Large Energy

Firms have their views on customer churn rates, which they have shared with us, and can thus use this data to manage customer churn risk. In addition, the commodity cost disadvantage risk can be managed by purchasing energy in blocks over a time period, and active near-delivery trading.

64. The period since late 2009 has been relatively benign in the UK energy market with falling wholesale prices, allowing independent suppliers to enter the market and collectively gain market share. Drawing on its experience from the market, Shell assessed that independent suppliers could cope in a market with rising wholesale energy prices over the long term – suppliers would have to price the rise in wholesale energy costs into the tariffs when they took on new customers and incrementally phase out unprofitable tariffs. Shell thought this would be possible provided those suppliers adopted a suitable hedging strategy. In addition, suppliers can also be proactive by seeking to renegotiate wholesale energy market trading contracts to cope with a downward or upward trend in energy prices.

65. Where relevant financial market products are not available, the volume, imbalance and shape risk can in part be managed by demand forecasting and active near-delivery trading. Where products are available and it's commercially feasible, volume risk can also be mitigated via wholesale market products such as weather derivatives. Centrica, E.ON and RWE told us that they used weather derivatives to manage some of the risks associated with unexpected variations in the weather. SSE said that it traded a very limited number of weather derivatives, but had not used them after 2010. In addition [✂]. Additionally, suppliers can access capital markets to get access to a range of products such as lines of credit and insurance products.

66. SSE told us it was concerned that profitability analysis should consider the adequacy of the Supplier of Last Resort (SoLR) and the Energy Supply Company Administration arrangements in the context of events such as systemic failure. We do not consider that it is necessary to incorporate additional capital in relation to potential liabilities under the SoLR and/or special administration regimes because we understand that these would generally be voluntary arrangements under which the SoLR is able to recover its additional costs through mechanisms such as the ability to raise prices and/or recover additional costs from other industry participants.[44]

[44] Ofgem (December 2008), *Supplier of Last Resort: Revised Guidance*.

67. In addition, systematic risk is incorporated in the WACC and investors expect to earn a return on the actual capital they put at risk, which is limited to their equity (or debt) holding in a firm with limited liability.

68. A combination of the measures discussed above suggest that a well-managed stand-alone supplier of scale should be able to manage its key risks without the need for additional substantial risk capital.

How a stand-alone supplier of scale has managed business risks in a more cost effective way other than the fee arrangement and notional capital

69. The Six Large Energy Firms have told us that a stand-alone supplier of scale would need to hold notional capital for reasons outlined in earlier sections. In addition, Centrica told us that wholesale market risks (price and liquidity) are far greater for large suppliers, implying that notional capital is the only available way of managing these risks at scale. The Six Large Energy Firms have specifically emphasised scale. Therefore we sought to understand how stand-alone suppliers of scale actually manage their business risks.

70. We noted that the UK independents are growing rapidly and starting to achieve a level of scale. However they still significantly lag behind in customer numbers compared to the Six Large Energy Firms' supply businesses. Therefore, we looked at other deregulated markets, and we take the case of Just Energy Inc. It operates in the North American market and has approximately 4.7 million customers from the domestic and I&C sectors. Just Energy is similar in scale to some of the Six Large Energy Firms' supply businesses.

71. We observe that Just Energy[45] does not hold a large notional capital balance. Its cash (and cash equivalent) balance, which it uses for wholesale market trading, collateral and other business activities was 0.67% in FY 2013/14 and 2.39% in FY 2014/15 of its cost of sales.[46]

72. Just Energy has been one of Shell's long-standing clients in the US. Shell began providing trading services to this customer when it was relatively small in scale. At that time, its arrangement with that customer had similarities to the structured trading agreements Shell has with certain independent UK energy suppliers. As the customer grew in scale, it went through a successful IPO. Shell currently provides this customer with trading services and energy alongside other suppliers. Today Just Energy is able to draw on alternative

[45] It has 4.7 million customers (both domestic and commercial).
[46] *Just Energy annual report 2014.*

sources of finance from equity and debt capital markets.[47] In addition, Just Energy is able to trade on its own account. Centrica also confirmed its understanding that Just Energy did its trading in-house and undertook its own commodity procurement.

73. Shell told us that it considered itself as offering a 'route to independence' for independent retail suppliers – it recognised that once suppliers reached a certain scale and gained balance sheet strength, they could get access to alternative sources of finance, and therefore might no longer require or desire its trading services through an uncollateralised structured trading agreement, including a working capital facility. The case of Just Energy highlights that once a stand-alone supplier achieves scale, it may find more cost effective ways to manage wholesale market risks other than by adopting the fee arrangement – through an uncollateralised structured trading agreement including a working capital facility.

74. However we note that Just Energy (or any large stand-alone supplier of scale with a strong balance sheet and access to multiple sources of finance) could find it more cost effective to undertake its own commodity procurement rather than opt for a fee arrangement. This is illustrated in simple terms from Table 2 below:[48]

Table 2: Cost of trading on own account compared to the trading fee

Firm	*Total cash including for collateral (higher of 2013/14 and 2014/15 YE)*	*Annual cost (at WACC of 10%)*	*Trading fee at [✂]% of annual FY 2014/15 COGS of $3 billion*	*Difference*
Just Energy	$80 million	$8 million	Several multiples higher than $8 million	Significant

Source: CMA analysis.

75. Table 2 demonstrates that a stand-alone supplier of scale could adopt more cost-effective means of accessing the wholesale market than the fee arrangement that we have assumed.

76. However, for the purposes of our ROCE and economic profit analysis, we have assumed that the Six Large Energy Firms incur the trading fee of [✂]%. This represents a market reference price paid by stand-alone independent suppliers in the UK.

77. Centrica said that the Six Large Energy Firms faced far greater price and liquidity risks. However the evidence that we have seen suggests that stand-alone suppliers can manage business risks in a cost effective manner even at scale. For example:

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[47] *Just Energy annual report 2014.*
[48] See www.bloomberg.com and Just Energy Group, Management's responsibility for financial reporting.

(a) The case of Just Energy indicates that a stand-alone supplier of scale is able to manage its business risks effectively without holding notional capital.

(b) In addition, stand-alone suppliers of scale can also use a range of options to manage their business risks including adopting the fee arrangement to lay off a significant proportion of wholesale market risk, as we have highlighted in paragraphs 59 to 68 of this annex.

(c) Shell told us that its experience in this sector showed that scale tended to increase the balance sheet size and strength of energy suppliers. This gave them greater options to manage business risks, and that these factors could contribute to a lower cost per unit of energy contracted (but not necessarily to a higher return on equity). This gave intermediaries the ability to:

(i) trade with suppliers on an unsecured/uncollateralised basis; and/or

(ii) provide suppliers with certain standard securities (eg bank guarantees). Suppliers may no longer require or desire a working capital facility.

Strengths and resilience of the fee arrangement

78. We highlight the strengths and reliance of the fee arrangement that has been adopted by independent suppliers who are achieving a degree of scale, noting that a large stand-alone supplier of scale could also seek to manage its business risks in similar ways. The fee arrangement allows suppliers to offload wholesale market risk and offers a buffer against weather related and other business risks. Specifically, the fee arrangement offers several benefits, whereby suppliers are able to:

(a) not post collateral for wholesale market trading activities, as the trading intermediary acts as the route to market;

(b) offload price risk completely on contracted trades – independent suppliers contract all their energy via this mechanism;[49]

(c) offload counterparty credit risk, which is assumed by the trading intermediary;

[49] Except for very near term energy requirements, which they manage via active near term trading to manage shape and imbalance risk.

(d) access to a significant credit facility, which provides extra headroom in the short to near medium term to meet day-to-day cash flow requirements from adverse shocks; and

(e) avoid the costs of having an internal trading function. However independents forecast demand and place orders for energy with the trading intermediary.

79. The scale of the credit facility offered by Shell, the trading intermediary, is significant. The primary credit facility allows suppliers to carry forward the full value of the purchase amount for a [✂] day credit period. The primary credit facility equates to approximately 1.5 times the annual wholesale energy costs (see calculation below). In addition, suppliers also gain access to an additional top-up credit facility, which is approximately 7.5 times the energy cost, taken on a like for like basis on the number of days of the credit facility.[50] Another way of assessing the scale of the top-up credit facility is by comparing it to the annual wholesale energy cost, of which it equates to approximately 15%. Specific details from Independent B and Independent A include:

(a) Independent B told us that its [✂], which it could [✂], was at [✂]. This compares with approximately £[✂] of Independent B's annual wholesale energy costs in FY 2013. Based on these numbers, this credit facility is approximately 1.5 times its annual wholesale energy cost, and at the very least is enough to cover the full value of the purchase amount.

(b) Another quantum of assessing the credit facility is by looking at the top-up credit facility. [✂].

80. The trading arrangements and the credit facilities offered by Shell are committed for generally between five and ten years [✂] Shell recognised that given the nature of retail supply, firms might face short-term shocks arising from external factors such as adverse weather. These can at times be significant shocks such as those experienced in 2008/09, a period that included extreme weather, global financial crises and highly volatile wholesale energy prices. In such circumstances or others, Shell said that it differentiated between external factors and internal factors.[51] Therefore, Shell would work

[50] For example, if the credit facility is valid for X number of days, then the multiple is calculated as follows: £ value of credit facility for X days / pro-rated annual wholesale energy costs for X number days.
[51] Energy suppliers have no control over external factors such as adverse weather or financial crises. However, internal factors are those that relate specifically to an energy firm's ability to manage risk by means of good management of working capital, cash generation, efficiency and commercial judgement.

with its clients to try and find mutually acceptable solutions to achieve a recovery.

(a) Shell said that it took on well-managed clients (suppliers) which it monitored closely as part of its performance review process. Therefore liquidity/funding shortfall scenarios that had arisen in North America, for example from extreme weather, tended to boil down to external factors.

(b) Therefore on the cost side of the equation, if the supplier was hit by an unforeseen circumstance (negative shock), Shell might consider agreeing amendments to its structured trading agreements to address a funding shortfall, as long as any additional exposure could be recouped later from the supplier and Shell could negotiate acceptable terms with its client. The objective would be to provide solutions to achieve a recovery, subject to it being beneficial to Shell and its clients.

(c) If Shell agrees to amendments to its structured trading agreements, Shell did not seek to exacerbate the cash-flow issues that the supplier might be going through during that short interval.

(d) Shell told us that in advance of entering into structured trading agreements and, as required, it stress-tested the supplier's volumetric and other business risks, to establish if liquidity shortfalls could be met by the supplier including under the credit facility offered by the structured trading service.

81. Shell noted that the USA experienced very cold weather in 2014. In addition the UK also had a few cold snaps since 2013. Shell's retail supply clients did not go insolvent as a result of, or during, these specific weather events. In addition to sound financial management by retail suppliers, Shell monitors the financial health of its clients as required and works with its clients to try and find mutually acceptable solutions where clients have found themselves in situations of distress, and especially so when the underlying business is sound.

82. As evidence Shell pointed out that none of the independent suppliers in Europe and North America that had had the structured trading arrangement with Shell had gone into insolvency (ie Chapter 11 insolvency) during the highly volatile period of 2008/09 and the cold weather periods since 2013.

83. [✂]. We disagree on the following counts:

(a) First, the credit facility is only one element of the overall risk management tools that an energy firm can employ. For example, the fee arrangement lays off wholesale market risk, which has the potential to be the most

significant of business risks. In addition, efficient management of working capital and the overall business by controlling costs can provide a further buffer that extends beyond the validity of the credit facility.

(b) Second, at times of distress, which are often caused by a cash crisis, asset-light businesses may be no more likely than a fixed asset heavy business to go into insolvency. What matters most during a cash crisis is immediate access to cash to pay creditors. We note that it may take time for a business to realise the cash inflows from the sale of assets such as generation assets. What lenders of short- and long-term finance or creditors look for most in distressed situations is a firm's ability to generate adequate cash flows to meet its obligations, and having fixed assets may not always be enough to have a turnaround following distress. Furthermore, capital intensive businesses that have long-term debt would have less headroom to generate positive cash flows after operations and interest payments (ie a lower interest cover), than an asset-light business without debt or limited debt. As noted in paragraphs 30 and 59 to 68 of this annex, independent energy suppliers are able to manage their cash flows efficiently, which makes them likely to receive further funding at times of distress, if they can demonstrate that the business fundamentals are sound. Therefore asset-light businesses are not intrinsically prone to insolvencies, compared to asset-heavy companies.

(c) In relation to the long-term risks highlighted by RWE, we note that in the long run suppliers have a number of strategic and operational options to enhance revenue, reduce costs and shore up the balance sheet. We do not agree with the argument that notional capital is the only and most cost effective way to manage long-term decline or risks.

Scalability of the fee arrangement

84. Currently, only stand-alone independents, who are achieving a degree of scale use the fee arrangement offered by trading intermediaries in GB. However this amounts to a fraction of the overall GB energy supply and wholesale energy market, which are dominated by the Six Large Energy Firms. This raises an important question about whether the fee arrangement is scalable to meet the needs of the Six Large Energy Firms' stand-alone supply businesses.

85. Some of the parties argued that the trading arrangements were not scalable:

(a) Centrica told us that the intermediary model used by independents did not exist at scale in deregulated UK and US markets. It added that the Six Large Energy Firms, who had strong balance sheets and credit ratings,

had found it economic to operate in-house trading functions. It argued that portfolio benefits allowed trading intermediaries to offer what appeared to independent suppliers at small scale to be cost effective, but that at larger scale the risks could not be absorbed except at increasing cost. It said that the trading fee was not the sole source of margin for the trading intermediary, who would use that supply position in its portfolio to provide a position to trade around other contracts or assets in order to more effectively utilise its risk capital, as well as other potential margin opportunities (bid-offer spreads, fees for illiquid products). It added that in its experience there were a limited number of trading intermediaries in the market willing to take on such risks and a limited amount of correlated risk each would be willing to take on, even for a counterparty with a strong credit rating.

(b) SSE said that given the absence of fee arrangements for large suppliers (scalability) in the market today, it was unlikely that the fee arrangement would be scalable. In addition, it said that intermediaries operating at scale would hold correlated positions (exposures in the same direction), and would thus be exposed to market wide shocks, or risks too large to diversify.

86. However Scottish Power contradicted Centrica's and SSE's assertion by arguing that the fee arrangement does not cover the full range of risks to which a supply business is exposed.. For example it said that a supply business of its size would potentially be in a better position than some existing smaller suppliers to negotiate favourable collateral requirements with trading intermediaries.

87. We consider the reasons for the different arrangements of the stand-alone mid-tier suppliers and the other mid-tiers and Six Large Energy Firms as follows.

88. First, as mentioned in paragraph 32 of this annex, other small suppliers that are not stand-alone are able to use PCGs and/or group structure to access the wholesale market and do not therefore use the fee arrangement or the notional capital approach.

89. Second, the Six Large Energy Firms have found trading directly on the energy wholesale market through their trading businesses to be beneficial in terms of cost effectiveness, compared to using a trading intermediary. This is due to a number of reasons such as, but not limited to, their strong group balance sheets, and associated credit ratings, both of which give them the ability to conduct collateral-light trading. Most significantly, the Six Large Energy Firms are able to hedge offsetting positions, thus reducing overall net exposure,

which significantly reduces their requirement to hold notional capital or ring-fenced equity risk capital on their balance sheets – as evidence we observe that neither the supply business balance sheets nor the group balance sheets show such capital. In addition, the Six Large Energy Firms' trading divisions are able to secure the most appropriate price of energy to suit their hedging strategies without them having to pay a trading fee to a trading intermediary.

90. Third, given that the Six Large Energy Firms have their own internal trading businesses, they currently do not demand services such as the fee arrangement from trading intermediaries. This is compounded by the fact that the GB energy market (including supply, generation and trading) is dominated by the Six Large Energy Firms. Therefore, demand for the fee arrangement is primarily coming from stand-alone retail suppliers.

91. Therefore we do not agree with SSE's assertion that the absence of such a market calls in question the scalability of the fee arrangement. We have good reason to believe that the intermediary model is scalable. That is, if the supply businesses of the Six Large Energy Firms were stand-alone, and had to adopt the fee arrangement,[52] thus creating demand, then the market would be able to absorb the demand, leading other players to enter the market and thus increase supply. With supply largely matching demand at higher volumes and with a greater dispersion of risk among market participants, we would expect trading fees to decline with scale.

92. The reasoning is as follows. In our supply ROCE analysis, we are taking the retail supply businesses of the Six Large Energy Firms to be stand-alone. Therefore by implication, the generation businesses of the Six Large Energy Firms would also be stand-alone, or at least would not have the retail supply business. In such a fragmented market of stand-alone firms, trading intermediaries would be ideally placed to provide the fee arrangement to independent suppliers and generators. We refer to this as the intermediary model. Specifically, compared to the current market structure that is dominated by the Six Large Energy Firms, in the intermediary model the trading intermediaries would be able to hedge their positions to minimise unidirectional risk (overall net exposure to one side of the market) to a greater extent than they currently are able to do under the existing market structure. Therefore, under the intermediary model they would be able to significantly reduce their net exposure, even at scale. Hence, this market structure would not add to the riskiness of the intermediaries at scale, and would thus negate the requirement for them to hold significant levels of risk/notional capital. This

[52] We observe that the fee arrangement is significantly more cost effective than adopting the notional capital approach.

would make the intermediary model cost effective, even at scale, with the trading fee likely to be lower than in the current market structure. This reflects the trading intermediary risk management strategy of hedging exposures on both sides of the market, which would be facilitated in a market with a breadth of independent suppliers and generators.

93. We note that RWE acknowledged that paying a fee to a trading intermediary in relation to wholesale market trading would likely be more efficient for an energy supplier if the intermediary had greater potential to offset credit exposures and some of the reduced cost was shared among the parties, or if the cost of collateral and counterparty credit risk was lower overall with the trading intermediary, relative to the cost of collateral for a stand-alone business. [✂] However, the potential of intermediaries to offset credit exposures would be far greater in the intermediary model than under the current market structure, thus making the fee arrangement scalable.

94. We observe that deregulated markets such as those in Europe and North America are currently dominated, albeit with varying degrees, with VI energy firms. Therefore we are limited in our ability to find empirical evidence for full scalability for the intermediary model.

95. Based on our discussion with Shell, we note the following:

(a) Some segments of the North American energy market are more liquid than in the UK, in part due to a higher number of independent generators and suppliers.

(b) There are also a greater variety of wholesale traded products available and trading arrangements observed, which makes it easier for trading intermediaries and non-integrated energy companies to fully hedge their retail shape.

(c) North American independent generators and suppliers are diverse in terms of size, and also collectively account for far greater market share (in the respective markets) than in the UK.

(d) The presence of independent generators and suppliers in a market plays an important role in enabling a trading intermediary's ability to offer greater access to non-standard products and, in Shell's experience, at more competitive prices. Shell considered this highlighted the importance of continued access of trading intermediaries to independent generators and suppliers.

96. In relation to the market's ability to absorb the higher levels of volumes from the stand-alone energy suppliers of scale in the intermediary model and thus

gain depth, we highlight the following evidence from the current market structure, which demonstrates the elasticity of supply to demand:

(a) Despite the significant growth of the independents, they have found trading intermediaries, who offer services that meet their requirements.

(b) The existing market size of trading intermediary services for independents has capacity to grow further to meet the high growth trajectory of independents. For example, [✂].

(c) Furthermore, Shell told us [✂]. Shell was also in the process of structuring new products. [✂].

(d) Shell was also [✂]. It said that energy suppliers could choose to offload volume risk with it or in the market, thus demonstrating that volume risk could be offloaded for a price. It said that it sold gas products to its clients in Germany that offloaded volumetric risk. In addition, it said that weather derivatives were more widely used in North America than in European markets. However its clients for structured trading services in the UK had not widely used weather derivatives. Shell thought this could be because its clients had instead chosen to rely on active near-term trading that required good quality demand forecasting skills and access the credit from Shell to manage volumetric risk. [✂]. It noted that weather derivatives were more widely used for gas than for electricity.

(e) Shell noted that an important driver behind providing trading services in the UK under the structured trading arrangements was the increasing scale and growing market share of independent suppliers in the UK, who sought uncollateralised trading services as a way to manage business risks and to grow.

(f) Independent A held discussions with a number of trading intermediaries such as [✂], thus demonstrating choice in the market for independents. However, [✂].

(g) [✂] This increases the product offerings for independent suppliers.

(h) Shell noted that the scale of its clients was not a barrier to providing structured trading arrangements. On the contrary, it preferred that its clients grew in scale, increasing profitability and retained earnings, thus strengthening their balance sheets. It would be concerned if balance sheet strength did not increase with scale, and that [✂].

(i) Shell told us that it would be able to supply trading services to large suppliers in the UK (giving the example of one of its North American

clients, [✂], which had a similar number of customers to that of some of the Six Large Energy Firms), the key factor would be that Shell's positions would need to be hedged. So as long as Shell could find offsetting positions to remain hedged, scale was not a barrier to expansion.

(j) Shell [✂] It said that an important element of its service was the provision of a working capital facility for independent suppliers. [✂] Based on the evidence we have seen, we considered that it would be possible for independent suppliers to access alternative sources of funding, including, but not limited to, commodity trading houses, and from banks through a working capital facility.

(k) Additionally, we note that the insurance markets are able to insure far greater levels of risk than that posed by performing the role of a trading intermediary for the stand-alone energy suppliers of scale in the UK energy market.

Pricing of the trading fee in the intermediary model

97. In relation to the pricing of this risk, we note that the market has already been able to price this risk on a per MWh/Therm basis for the independents in the UK and US markets.

98. There is some evidence to suggest, were the intermediary model to be adopted by larger suppliers, the trading fee could be lower than that currently paid by the independents. A market with depth would not only be larger, but also have a greater number of participants, thus spreading the risk and reducing the trading fee per unit of energy. For example, an energy supplier would be able to enter into favourable arrangements with different trading intermediaries, thus reducing its exposure to a single firm, or get favourable terms from firms that are able to absorb the risk for a fee. These benefits would be compounded in the intermediary model, whereby trading intermediaries would be more able to find offsetting positions, and thus significantly reduce their exposure, which would give them further scope to reduce trading fees and also grow their business.

99. To support this point, Scottish Power told us that a supply business of its size would potentially be in a better position than some existing smaller suppliers to negotiate favourable arrangements with trading intermediaries. In addition, [✂]. Furthermore, [✂]. Therefore our benchmark trading fee, which is used by the independents, would reflect an upper bound.

100. In contrast, Centrica argued that the trading fee would be higher at scale if all domestic suppliers were using the intermediary model. It said that according

to the financial literature, it was likely in a hedging market that the cost of hedging rose as demand rose and the financial markets were consequently required to absorb more risk. This effect was closely related to the supply of capital required to support risk-bearing; and the effect was greater when financial intermediaries were substantially on one side of the market. It added that as demand for risk bearing services increased supply would match it – but only once price had risen sufficiently to attract that additional supply of risk-bearing (and the capital position backing it) into the market in question.

101. We observe Centrica conceded that as demand increased, supply would match it, but only once prices had risen. We consider that prices would not rise, as an equilibrium would be reached when more intermediaries entered the market, and risk was spread across strongly rated and credit worthy intermediaries.

102. Additionally, Centrica's argument hinged on the assumption that significant levels of capital would be required as demand increased. However, the intermediary manages risk not so much with capital but by remaining hedged so that it is not significantly exposed to one side of the market. We recognise that it may not be possible for intermediaries to achieve and maintain perfectly correlated hedged positions all of the time and our analysis does not rest on this extreme position. However, in the intermediary model of stand-alone firms, trading intermediaries would be better placed to operate and remain largely hedged, and more so than in the current market structure. More significantly, any capital requirements of the intermediaries is and would be at the margin/peak, ie in a worst case scenario that cannot be fully covered by hedging of positions. However this does not warrant the holding of significant sums of notional capital on a permanent basis. Instead, strongly rated trading intermediaries such as Shell would be to draw on their strong balance sheets and access finance. Therefore in addressing Centrica's point, we note that the trading fee would represent WACC times average capital, not WACC times peak capital. As average capital would be significantly lower than peak capital, the fee is significantly less than that implied by Centrica's notional capital of [✂] times WACC at 10%.

Strengths of the intermediary model

103. Centrica told us that the intermediary model at scale would be more risky because it would lack the stability that the Six Large Energy Firms' strong balance sheets and credit ratings provided. Therefore even if sufficient intermediaries could be found who were willing to offer risk management services at sufficient scale, the trading fee would have to increase and the market would become inherently less stable. We believe that the intermediary

model would not be more risky or fragile than the current market structure dominated by the Six Large Energy Firms, because they both rest on similar foundations.

(a) First, we note that the Six Large Energy Firms do not hold significant sums of separate or ring-fenced notional capital that is observable on their balance sheets. We point out that Scottish Power told us that the balance sheet strength of the Six Large Energy Firms made the requirement to hold notional capital unnecessary in the current market structure. One important reason why the Six Large Energy Firms do not have to hold notional capital is because they are able to effectively find offsetting positions to hedge their overall net exposures. For example, [✂]. We note that in the intermediary model, trading intermediaries would be able to operate in a similar way by offsetting their positions, thus reducing their net exposure and therefore their requirement to hold notional capital.

(b) Second, we note that the Six Large Energy Firms have balance sheet strength and corresponding investment grade credit ratings. Similarly, trading intermediaries such as Shell that are operating in the current market also have strong balance sheets and credit ratings. We would expect trading intermediaries find it easier to hedge their positions in the intermediary model and thereby manage risks effectively in a similar fashion to the Six Large Energy Firms in the current market.

104. Centrica told us the intermediary model with stand-alone suppliers and stand-alone generators without investment grade credit ratings would be more risky than a VI model because it would face credit risk from both parties. The implication of the higher risk would be a higher trading fee. We disagree because of the following reasons:

(a) The credit ratings of stand-alone suppliers and generators are irrelevant, relative to that of the trading intermediaries, who are the conduits through which stand-alone suppliers access the wholesale market. Trading intermediaries would manage their risk arising from stand-alone generators and suppliers by taking security over certain assets, as they currently do. In addition, they would aim to hedge their positions and reduce their net exposure.

(b) Following on, stand-alone suppliers of scale may be creditworthy trading counterparties with strong balance sheets. We observe that Just Energy, a stand-alone supplier of scale, counts as good evidence. As it gained balance sheet strength, it was able to grow out of the fee arrangement, and to trade on its own account without large sums of notional capital.

(c) Another reason the intermediary model is no more risky than the current market structure is that the trading intermediary is primarily concerned with matching its cash flows – between when it pays for the energy on the wholesale market (cash outflow), and when it receives the payment from the intermediaries (cash inflow). In this way the intermediary is essentially a provider of finance and a route to market for the intermediary, thus earning its returns on this financing arrangement and exposure to the wholesale market, which is minimised with hedging offsetting positions.

105. Shell also noted that the scale of its clients was not a barrier to providing structured trading arrangements. On the contrary, it preferred that its clients grew in scale, increasing profitability and retained earnings, thus strengthening their balance sheet. It would be concerned if balance sheet strength did not increase with scale, [✂]. Therefore debentures and charges were not a barrier to expansion in relation to the intermediary model.

106. Therefore Shell said it would be able to supply trading services to large suppliers in the UK (giving the example of [✂]), the key factor being that its positions would need to be hedged. So as long as it could find offsetting positions to remain hedged, scale was not a barrier to expansion.

Our proposed approach

107. Our proposed approach to account for business risks is to adopt the fee arrangement, which is taken off EBIT rather than a notional capital that is added to capital employed. In essence, this approach recognises that suppliers are exposed to business risks. It then prices the risk, using the actual market based arrangements of independents as the reference point, which we use as our benchmark. Most importantly, the benchmark trading fee is a more cost effective way of managing business risks rather than holding notional capital.

108. This approach also recognises that a supplier cannot lay off all of the business risks that it is exposed to. Instead, it takes account of how a well-managed supplier making sound commercial and operational decisions can use the fee arrangement to lay off wholesale market trading related risks and use the associated significant credit facility to act as a buffer against other business risks. We have outlined such approaches to managing business risks in paragraphs 59 to 68 of this annex.

Determining the appropriate fee for the commensurate level of relevant business risks

109. There is a range of applicable trading fees, which will vary based on factors such as the energy supplier's scale, financial health and future growth. We have chosen a benchmark trading fee for the purpose of our analysis, which is based on what may be expected of well-managed independent suppliers (including those in the UK and overseas markets). These arrangements have the benefit that the risk has been priced by the market, and are arrangements between separate arm's length entities. Additionally, we consider that the risk can be priced and applied at scale and the trading fees would likely be lower at scale as noted in paragraph 91 of this annex. Therefore we regard our benchmark trading fee of [✂].

110. RWE argued that white label arrangements provided an alternative benchmark to assess the fee. We disagree because white label arrangements do not reflect a full function stand-alone energy retailer and many risks reside with the Six Large Energy Firms

111. Centrica pointed out that our benchmark was based on a shorter term hedging strategy used by independents and their different customer base, and that more smoothed or longer term hedged products would no longer be offered given the cost base under the intermediary model. It said that intermediaries supporting a longer term hedging strategy or a more gas focused customer base, for example, would require a higher trading fee. In addition, it said that it would be wrong to calculate competitive returns for a well-managed stand-alone supplier based on a hypothetical efficient hedging strategy that was not the one actually in place, as judgements around what hedging strategy would be the most efficient were impossible to assess ex-ante. We disagree for the following reasons:

(a) First, the fee arrangement on which our benchmark is based allows independents to hedge out longer than they currently do. For example, Shell pointed out that its clients could procure energy in tenors that were in alignment with its client's customer offers, eg for a period of six seasons ahead. Furthermore the Six Large Energy Firms buy their energy in blocks rather than purchasing all their energy at the furthest hedging horizon at one time. So even if our benchmark has a shorter hedging time period (by a few months) than that used by the Six Large Energy Firms, it would not significantly alter the results.

(b) Second, as noted in paragraph 102 of this annex, the intermediary model does not require significant amounts of peak capital, which makes it cost effective. This would also make it possible for the trading intermediary to

offer longer term hedged products at prices not significantly higher than the current level.

(c) Lastly, we have given the Six Large Energy Firms the benefits of their hedging and purchasing strategies on price and volumes contracted. We have done so by using their reported wholesale energy costs (which includes balancing charges) and then applying the benchmark [✂] trading on their reported wholesale energy costs. In addition, we have also given the Six Large Energy Firms the benefits of their customer mix and other revenue drivers by taking the reported revenue numbers from their supply P&L.

112. Centrica said that a trading intermediary would charge fees at or above its WACC for risk capital and that it would effectively rent out to support a material supplier. We disagree with the concept of renting out risk capital. In addition to our defence of the intermediary model as an appropriate tool to price the risk, we observe that trading intermediaries are largely concerned with hedging their positions, and managing their cash flows. Therefore they are employing limited amounts of working capital for short periods, and not significant amounts of notional or risk capital, if at all. The trading intermediary aims to earn a return on its working capital (cash flow timing), and exposure that is based on the risk posted by the supplier. So a risky supplier would attract a higher fee than a less risky one.

113. Additionally, in the supply financials supplied by the Six Large Energy Firms, we don't see any fees in the supply P&L statements of the Six Large Energy Firms to reflect a charge for the notional capital held at group level at their WACCs.

114. Two factors clearly demonstrate that risk of distress and insolvency are priced into our benchmark, which leads us to form the view not to allocate additional premiums for credit and insolvency risk:

(a) Shell said that it priced the fee based on its return aspirations, as appropriate for the product offered and the risk taken, which included:

(i) [✂].

(ii) [✂].

(iii) [✂].

(b) Shell told us that it assessed its risks against a number of scenarios the retail energy supplier might be faced with during the lifetime of the structured trading agreement, and [✂].

115. Centrica and SSE also said that the covenants and charge over assets granted by the independent to the intermediary was a form of collateralisation that would need to be included in capital employed. Centrica added that the alternative would be for it to be costed into the fee. We disagree because of the following reasons:

(a) The charge over assets is not used by the trading intermediary for collateral in the wholesale market. Instead the trading intermediary uses its strong credit rating and balance sheet to trade.

(b) The fee incorporates the riskiness of the supplier and therefore encapsulates default/insolvency risks, and has therefore already been costed in the fee. For example, a less risky independent supplier attracts a lower fee.

(c) The purpose of the covenants is for the suppliers to maintain a healthy business and [✂] to be able to monitor the businesses, so that a distress scenario can be avoided whereby [✂] has to take charge of assets. Additionally, [✂] uses a charge over assets as security in the circumstances that the independent supplier was unable to make payments, such as in the case of insolvency. These mechanisms have been put in place because [✂] is providing finance to the intermediary. Such covenants are commonly included in bond and loan agreements. In such cases, the finance theory would dictate that the interest rate be included in the WACC as the cost of the term loan, and not to value the security or covenants in the WACC. The implicit cost of the security and charge offered by the fee arrangement is that the independent supplier's debt capacity is limited, and we have accounted for this by assuming 100% equity financing in the WACC.

116. [✂]. For example, we noted in paragraph 80 of this annex, that Shell would work with its clients to try and find mutually acceptable solutions to achieve a recovery in the event of negative shocks.

117. In addition, the contracts are generally for a fixed [✂] period with [✂], thus offering it [✂]. Therefore if one of the financial targets such as gross margins falls below the stipulated amount in a particular month, does not trigger a breach, and the intermediary is obliged to supply the independent supplier for a fixed term of the contract, which is several years. Therefore the arrangements of the independents on which our benchmark trading fee is based has a certain degree of resilience.

118. Centrica modelled the hypothetical trading fee that its stand-alone supply business would pay a trading intermediary if such intermediaries could be

found. It estimated the fee to be between [✂] of its wholesale energy costs using 2014 as an illustrative example (as costs will vary with market conditions). This fee included managing trading risk capital, credit risk, shape risk, weather risk and the risks associated with balancing and operational costs. It added that its experience in the US market also suggested that such an agreement might also incur additional costs through a widening in the bid/offer spread. Such arrangements appear to cover additional services and fees than those we observed for independents operating in the GB markets. As noted in paragraph 61 of this annex, shape and balancing risk can be managed by active near-term trading and effective demand forecasting. We were not persuaded that this illustrative example provides a guide to the appropriate arm's length price for a GB independent supplier using an intermediary to perform trading services on its behalf.

119. We consider that our benchmark trading fee covers the lay-off of wholesale market risk and getting access to a significant credit facility that would allow a well-managed supplier to manage its business risks.

Existing risk premiums paid by supply businesses of the Six Large Energy Firms

120. We considered the extent to which the financial information provided by the Six Large Energy Firms on their supply businesses already reflected the costs of trading on a stand-alone basis.

121. The parties provided us with the following information about the fees paid by their supply businesses to the rest of the group.

SSE

122. [✂].

Centrica

123. [✂].

124. [✂].

125. [✂].

Scottish Power

126. [✂].

127. [✂].

128. [✂].

EDF Energy

129. EDF Energy told us its supply business did not pay the trading businesses (EDF Energy or EDF Trading) any premiums for the offloading of market, credit, liquidity or volume risk.

RWE

130. [✂].

E.ON

131. [✂].

Regulatory collateral

132. Energy supply firms have collateral requirements relating to balancing, transmission, distribution, and the SEC. In the future, suppliers will also have obligations in relation to CfDs and the Capacity Market. We term these requirements collectively as regulatory collateral.

133. Some of the Six Large Energy firms argued for the inclusion of regulatory collateral within notional capital, and that therefore it ought to form part of capital employed for the purposes of our ROCE analysis. In terms of quantum, EDF Energy said that [✂]. Similarly SSE quoted [✂]. RWE [✂].

134. However, we note that the independent suppliers post minimal amounts of regulatory cash collateral:

(a) [✂].

(b) [✂] told us that it posted a minimal amount of cash collateral with Elexon, Xoserve and Smart DCC. For electricity distribution, balancing and transmission costs, it was not required to post collateral because of its good payment history for the last two years. For gas distribution and capacity charges, it did not post collateral based on its credit score. It had not posted any collateral in relation to CfDs or the Capacity Market as this had not yet started.

135. This indicates that a well-managed and efficient stand-alone supplier of scale should be able to manage its cash flows, have a good payment history with the code authorities and have a sound credit score. This would negate the requirement to post cash collateral for these codes.

136. We noted that cash collateral held with Elexon and Xoserve and collateral in relation to Smart DCC (where parties have provided this figure separately and confirmed that it is not included in the cash[53] balance on the balance sheet) was not significant, so that it should be adequately covered by our allocated cash balance of 2% of annual cost of sales. For example, [✂].

[53] We deem regulatory collateral posted in non-cash forms such as PCGs (internal financing) or lines of credit (external financing) as financing arrangements. Since financing costs are reflected in the WACC, we do not deem it appropriate to include it within capital employed.

Supplement 1: Actual trading and collateral arrangements of the Six Large Energy Firms

SSE

1. [✂].

2. [✂].[54]

3. [✂].

4. SSE noted that credit rating agencies did not ask for specific information on individual trades or counterparty relationships. [✂]. Its exposures under PCGs and other forms of non-cash collateral were included within the financial statement in the group's annual report, which may be then taken into account [✂].

5. [✂].

Figure 1: SSE cash collateral (held on exchanges)

[✂]

Source: SSE.

6. [✂].

7. [✂].

Centrica

8. [✂].

9. [✂].

10. [✂].

11. [✂].

Figure 2: Centrica cash collateral

[✂]

Source: Centrica.

[54] The growth of collateral backed trades in power from 2012 onwards represents the day-ahead auction trading that requires collateral posting.

12. [✂].

13. [✂].

14. [✂].

Scottish Power

15. [✂].

16. [✂].

17. Scottish Power provided total net cash collateral held by the group and supply. Collateral has been allocated to supply on the following basis:

    (a) [✂].

    (b) [✂].

Figure 3: Scottish Power cash collateral

[✂]

Source: Scottish Power.

18. The average total cash collateral figure and that relating to UK supply as disclosed in Figure 3 between FY 2007 and 2013 amounted to [✂] and [✂] respectively. In relation to UK supply, [✂].

19. Scottish Power said that cash collateral was ‘on-balance sheet’, with a receivable recognised and cash derecognised. [✂].

20. [✂].

EDF Energy

21. [✂].

22. [✂].

23. [✂].

24. [✂].

25. [✂].

26. [✂].

27. [✂].

28. [✂].

29. [✂].

30. [✂].

RWE

31. RWE estimated that [✂] of its UK power wholesale trades were fully unsecured; [✂]. All uncollateralised trades were conducted OTC.

32. RWE noted that data on uncollateralised trades and non-cash securities such as PCGs were not provided to credit rating agencies on an item-by-item basis. Instead it adhered to generally accepted principles and therefore disclosed them in its annual report where required. It could not confirm whether it provided details of uncollateralised trades to lenders because providing specific data to individual lenders was out of scope for insider dealing reasons.

33. [✂].

34. [✂].

35. [✂].

36. [✂].

E.ON

37. [✂].

Figure 4: Supply cash collateral (quarterly)

[✂]

Source: E.ON.

38. [✂].

39. [✂].

40. [✂].

41. [✂].

42. [✂].

Supplement 2: Methodology and detailed explanation from the parties on the collateral element of notional capital

SSE

1. SSE presented to us the case of a stand-alone supplier the size of SSE operating in 2008/09, which was a volatile period, and said that it was also reflected in the current period of 2014/15. Other key assumptions in this analysis were that all trading was done on exchanges and that the collateral exposures would have to be **met with cash**.

2. SSE said that a stand-alone supplier would require network, operational and trading collateral; and risk capital. It would require collateral to reduce systematic risk and manage volatile energy markets, taking note that several energy market players such as Enron and TXU went through an insolvency process. It highlighted the importance of cash management in the industry, specifically that network collateral needed to be deposited within strict deadlines to the code authorities.

3. [✂].

4. [✂]. This fall could arise from multiple sources of volumetric risk such as actual weather being different from expectations, actual consumption being different from forecast, and customer churn. It noted that an actual mild winter compared to forecast could have a severe impact on profitability as the supplier would have to offload the surplus purchased at depressed prices. Risk capital was required to give balance sheet strength to an asset-light business, so that it could get a credit rating.

5. SSE said that the stand-alone supplier would have to hold enough risk capital to cover EBIT losses. Therefore its proposed method to quantify risk capital was to

   (a) quantify the short-run volumetric risks to a stand-alone supplier's domestic retail profits over a four- to six-month period;

   (b) calculate a supplier's expected EBIT profits; and

   (c) calculate the worst case scenario EBIT loss that a supplier could make over a four- to six-month period.

6. [✂]. It qualified this methodology by saying it was a conservative estimate as a supplier would also need to cover interest payments and other unexpected risks arising from changes in government scheme costs or network codes, which the above figures don't account for.

Centrica

7. Centrica drew a distinction between accounting capital, contingent capital and risk capital. Accounting capital included fixed assets and working capital, which was on balance sheet.

8. Contingent capital was a function of market risk, credit risk, and liquidity risk. It was required for price risks arising on margined trades, which could deplete cash reserves, and was ultimately needed to keep the company solvent. [✂] for a stand-alone supplier of scale.

9. Risk capital was required for volumetric risks arising from weather and customer numbers, and also settlement risks. Risk capital was not quantified.

10. Centrica argued that [✂].

11. Centrica also commissioned [✂] to create a framework to assess the virtual capital required if it were a UK bank or an investment firm. [✂] used the CRD and CRR framework, which form part of the BASEL capital requirements.

EDF Energy

12. EDF Energy said that based on its modelling, a comparable stand-alone supply business would be expected to face collateral calls up to £1.2 billion in the current low volatility environment, assuming it needed to provide full collateral for all trades. If volatility were to return to 2008/09 levels, collateral calls could reach up to £1.5 billion. In addition to trading collateral, a stand-alone supply business would face network code related collateral requirements in the region of £400 million. It noted that a stand-alone supply company would no longer have the financial backing of the EDF Energy group and as such would probably no longer have access to lower cost collateral funding sources.

Scottish Power

13. Scottish Power estimated (based on modelling from first principles and analysis of the published segmental statements) that the contingent (risk) capital requirements for a stand-alone supply business of a similar scale to its own supply business could be in the order of hundreds of millions of pounds.

E.ON

14. E.ON did not comment on the levels of notional capital that its stand-alone supply business would require. It told us that due to the highly subjective

nature of the calculations, and the existing operating structure of its businesses, no calculation methodology had been developed.

Supplement 3: Role of trading intermediaries

Shell

1. Shell provides trading intermediary services to energy suppliers such [✂]. An energy supplier can directly contact Shell's natural gas and power trading desks to obtain and secure fixed priced quotes for standard OTC energy products, [✂] and with physical delivery taking place at the respective UK hub as scheduled by Shell. In addition to blocks, Shell also currently supplies shaped [✂].

2. The energy supplier offloads a significant part of its price risk to Shell. Therefore Shell is also exposed to the movement of wholesale natural gas and power prices versus the fixed priced transactions agreed with the energy supplier. [✂]. Therefore Shell manages its exposure in relation to the energy supplier via:

   (a) [✂];

   (b) [✂];

   (c) [✂]; and

   (d) [✂].

3. Shell does not own equity in the energy supplier. [✂].

4. [✂].

[✂]

5. [✂] provides uncollateralised trading arrangements in relation to shaped products to [✂].

   (a) The energy supplier buys shaped gas and power from [✂] not only to protect itself from seasonal base and peak price movements but also hourly and daily price movements.

   (b) The energy supplier is not required to submit cash collateral to cover its mark-to-market risk on trades executed with [✂].

   (c) [✂] takes a [✂] senior secured position over the assets of the energy supplier.

   (d) The energy supplier agrees to operate within defined financial covenants in order to protect the value of its assets given as security to [✂].

   (e) [✂] charges a fee per MWh to cover its market and credit risk.