Appendix 7.2: Foreclosure

Contents

Page

Introduction 1
Customer foreclosure 1
Input foreclosure 14

Introduction

1. This appendix assesses the scope for foreclosure in electricity markets in Great Britain. By foreclosure, we refer to a situation where a VI firm might sacrifice some profit in one part of its business (say, wholesale) in order to distort another market (say, retail) in such a way that independent firms are made worse off, to the overall benefits of the VI firm. We consider two types of foreclosure. The first is customer foreclosure – ie that VI firms may have the ability and incentive to foreclose non-integrated generators, weakening their position in the generation market to the benefit of vertically integrated generators. The second is input foreclosure – ie that VI firms may have the ability and incentive to foreclose non-integrated suppliers by increasing their costs, thereby weakening them as competitors, causing them to exit the market, or deterring them from entering. We assess these concerns separately, but note that the framework for assessment is similar in both cases.

Customer foreclosure

What is customer foreclosure?

2. By ‘customer foreclosure’ we refer to a scenario where a VI firm (or multiple VI firms on a coordinated basis) causes harm to upstream competitors and, in turn, raises downstream rivals’ costs. This occurs when the VI firm restricts the access of upstream competitors to its retail arm, or otherwise affects the terms on which they can sell to their potential customers. Therefore, for customer foreclosure to be a concern, it must generally be the case that the VI firm accounts for a large proportion of sales in the downstream market.

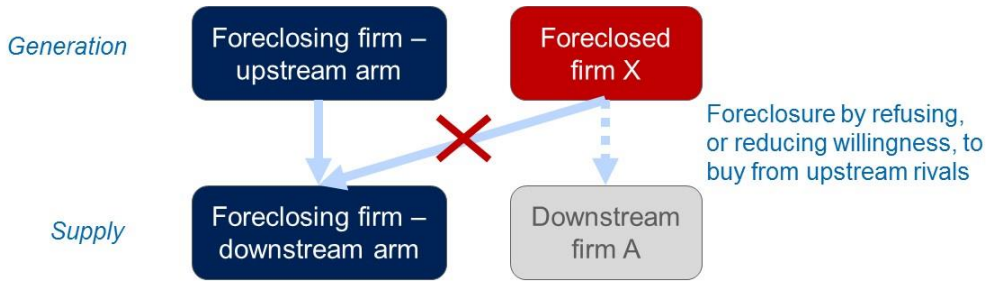
3. The aim of customer foreclosure is to reduce the revenues or increase the costs of upstream rivals, in order to make them into less profitable and efficient competitors. This could reduce their ability to compete (partial

foreclosure), or even lead to exit (total foreclosure).[1] In turn, downstream competitors may be unable to compete effectively as a result of a less competitive upstream market.

4. In order to make the foreclosed firms less efficient, their unit (or marginal) costs need to increase. This may occur if the foreclosing behaviour reduces the production volume or the range of different goods (ie due to loss of economies of scale or scope).[2] Reduced revenues and profitability could also inhibit the ability of the foreclosed firm to invest in improved production processes. Customer foreclosure could also reduce overall efficiency by deterring entry or expansion.[3]

5. In the case of electricity, independent generators[4] are the upstream competitors to VI firms. Figure 1 shows how customer foreclosure would involve a vertically integrated supplier reducing its willingness to buy from independent generators.

Figure 1: Simplified diagram of how customer foreclosure could operate in electricity



How do we evaluate customer foreclosure?

6. There is a standard framework for evaluating customer foreclosure. This uses three headings to judge whether customer foreclosure is likely (see Figure 2).[5] All three of these aspects must be met in order for us to find harm from customer foreclosure.

[1] *CC3*, p58.
[2] For an example of the use of this framework in another market investigation, see Competition Commission (2013) *Private motor insurance investigation: provisional findings*, Appendix 9.2.
[3] European Commission (2008), *Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, p15.
[4] We use the term 'independent generators' to refer to generators who are not vertically integrated, including those who have or hope to agree offtake agreements or other contracts with VI firms.
[5] See, for example, Competition Commission/OFT (2010), *Merger assessment guidelines*, paragraph 5.6.6.

Figure 2: Framework for assessing customer foreclosure

Scope of this section

7. This appendix only looks at the electricity market. We would not expect customer foreclosure to be an issue in the gas market. In particular, the addressable market from the perspective of most upstream gas producers is likely to be larger. These firms could sell into other European markets,[6] and liquefied natural gas producers could sell globally. This makes customer foreclosure by a vertically integrated gas supplier in Great Britain seem implausible. In contrast, Great Britain has only a limited amount of electricity interconnection with other countries.[7]

Structure of this section

8. First we set out possible mechanisms for customer foreclosure in electricity generation and supply. We then evaluate the likelihood of foreclosure using the three conditions described in Figure 2, paying particular attention to the ability to foreclose.

Possible mechanisms for customer foreclosure

9. This section describes a range of potential mechanisms that a VI firm could use to foreclose independent generators. We do not claim that this is an exhaustive list of all possible mechanisms, but no other mechanisms have been suggested to us to date.

10. This appendix looks only at the areas below as mechanisms for customer foreclosure. Other appendices in this investigation look at other aspects of

[6] For example, Norway has gas pipelines to Belgium, France and Germany, as well as to GB (Norwegian Ministry of Petroleum and Energy (2014), *Gas exports from the Norwegian shelf*).
[7] National Grid Interconnectors (2014), *Getting more connected: the opportunity from greater electricity interconnection*, p7.

issues touched on below (eg availability of hedging products) from a wider perspective.

Option 1 – Reduce willingness to sign long-term offtake contracts

11. Independent generators often look for long-term offtake contracts[8] when building a new plant. These help to satisfy providers of finance to those generators that the plant has a secure source of income. If a VI firm (as a purchaser of electricity for its supply business) limited its willingness to sign these contracts, then this could potentially affect the ability of independent generators to invest.

12. These contracts are now a relatively common way of financing new plants. The government has carried out extensive work on routes to market for independent renewable generators.[9] Gas-fired generators have also highlighted their interest in offtake contracts.[10]

Option 2 – Reduce willingness to trade certain products in the market

13. An independent generator may want to trade certain products in the market to allow it to hedge. (This will primarily involve selling output (and buying inputs such as gas). However, it may also make the reverse trades to buy to adjust its hedged position.) For example, a generator might want to sell its output a number of years ahead, in order to provide predictable revenues. A generator might also want products other than baseload (eg peak), if it expects to be running for only part of the time.

14. If a VI firm were to reduce trading in these products, this might limit the ability of independent generators to manage their risks through hedging.

Option 3 – Reduce willingness to trade with independent generators

15. This third mechanism involves a VI firm (as a purchaser of electricity for its retail business) reducing its willingness to trade with independent generators in particular. It therefore differs from the second option, because it is targeted at specific firms.

16. A VI firm could take various steps to avoid trading with independent generators. These might include taking a long time to sign the agreements

---

[8] Tolling agreements for gas-powered plants, and power purchase agreements for renewables.
[9] For example, DECC (2012), *A call for evidence on barriers to securing long-term contracts for independent renewable generation investment*.
[10] Intergen (2014), Response to consultation on a proposal to make a market investigation reference in respect of the supply and acquisition of energy in Great Britain, p3; ESB (2014), Response to issues statement, p2.

underlying trading relationships, or offering limited credit terms. It could also theoretically refuse to carry out individual trades with independent generators or trade only at less favourable prices.

Option 4 – Dispatch own generation when cheaper options are available from other firms

17. A VI firm (as a purchaser of electricity for its retail business) could reduce its need to contract with independent generators by using its own generation, even when it was unprofitable ('out of merit'). This would reduce the revenues of independent generators.

Option 5 – Reduce willingness to buy green certificates

18. Generators receive Renewables Obligation Certificates (ROCs) and Levy Exemption Certificates (LECs) for producing renewable electricity.[11] However, these certificates have value only when they are sold to a supplier.

19. If vertically integrated suppliers are able to source certificates from their own renewable generation, then this might make it harder for independent generators to unlock the full value from their plants. Drax mentioned its concerns about the markets for ROCs and LECs in its response to the issues statement.[12]

Unilateral ability to foreclose

Market power

20. Unilateral ability to engage in customer foreclosure requires the foreclosing firm to have significant downstream market power.[13] If not, the independent generator can easily sell to other suppliers, and would therefore not be foreclosed.

21. When examining vertical issues[14] the European Commission uses a 30% market share threshold, below which problems are unlikely.[15] No supplier

[11] Not all renewable generators receive ROCs; some receive support under the small-scale feed-in tariff or under legacy arrangements (eg the Non-Fossil Fuel Obligation), and some do not receive any support.
[12] Drax (2014), Response to the issues statement.
[13] *CC3*, p59.
[14] Although not specifically customer foreclosure.
[15] For mergers: European Commission (2008), *Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, p16. For vertical restraints: European Commission (2010), *Guidelines on vertical restraints*, paragraph 178.

exceeds this threshold in Great Britain – Centrica is the largest with just over 23% of domestic supply meters.[16]

22. To evaluate whether we might still have concerns in this case, we considered two possible factors that could increase the market power of VI firms (as purchasers of electricity for their retail businesses).

Types of customers

23. Market power may increase when looking at specific types of customers, rather than supply as a whole. In order to consider the potential for customer foreclosure, we suppose that each vertically integrated supplier has some inactive customers.

24. We do not believe that a significant number of inactive domestic customers would give a VI firm (as a purchaser of electricity for its retail business) the ability to carry out customer foreclosure. From the perspective of a supplier, electricity is a commodity. This does not vary depending on whether the electricity is eventually supplied to an inactive customer or not. This means that any inactive customers do not affect the shares of suppliers or their market power as buyers of electricity, although they may make these shares more static.

Location of customers

25. For some purposes we might look at shares of supply on a regional, rather than a national, basis. Individual regions tend to have a supplier with a larger domestic share than the largest national domestic share (see Section 8).

26. However, for the purposes of this analysis, the geographic 'market' (for the purchase of electricity) is national. Electricity is bought and sold on a national basis; a generator will not know where its output will be consumed; and its revenues will be identical in any case.[17]

Other points on ability – general

27. For foreclosure to be effective, a foreclosed firm needs to be unable to compensate for the loss of business from the VI firm's retail business by

---

[16] See Section 8: Nature of competition in domestic retail energy markets, table 8.3.

[17] A small exception is for embedded generation (connected to the distribution network). These plants produce 'embedded benefits', which cover avoided transmission charges, balancing charges and transmission losses (ELEXON (2013), *Embedded generation and embedded benefits*, version 6.0). The split of these embedded benefits between a generator and a supplier is negotiated (National Grid (2014), *Review of the embedded (distributed) generation benefit arising from transmission charges*, p16), and so may be affected by any market power of a supplier in that specific region.

selling to other downstream firms instead.[18] Most of the Six Large Energy Firms (all of which are vertically integrated) are net purchasers of electricity and therefore likely to offer a potential alternative route to market (in the absence of a coordinated foreclosure strategy). In addition, independent suppliers represent 22% of volumes in non-domestic supply,[19] and just over 13% of domestic meter points.[20] This means that they provide a significant alternative route to market. Independent suppliers have been growing recently, so may form an expanding sales channel for independent generators.

28. The proportion of generation receiving government support, in the form of Contracts for Difference (CfDs) and through the capacity mechanism, will increase in the next few years. This could help to limit the possibility of successful foreclosure, as some independent generators would have an additional, guaranteed revenue source outside the energy market. However, generators will still consider their forecast energy market revenues when bidding to receive support.

Other points on ability – specific to particular mechanisms

29. In addition to the general points made above, there are also specific factors relating to ability for each of the possible foreclosure mechanisms identified.

Option 1 – Reduce willingness to sign long-term offtake contracts

30. The government is introducing an Offtaker of Last Resort (OLR) Scheme that will compel vertically integrated suppliers (as purchasers of electricity for their retail businesses) to offer backstop offtake contracts to renewable generators with CfDs.[21] While this is designed as a backstop, it will limit the ability to foreclose independent generators with CfDs (unilaterally or collectively), partly because the existence of a backstop will allow generators to sign higher-risk contracts with a wider range of counterparties that they might not otherwise have contemplated.[22]

31. Other suppliers may also be more likely to provide offtake agreements under a CfD. A CfD will remove most price risk from renewable generators, meaning that they will not need protection through a floor price in offtake contracts.

---

[18] MH Riordan (2005), *Competitive effects of vertical integration*, Columbia University Department of Economics Discussion Paper Series, p51.
[19] Ofgem (2014), *Energy market investigation: initial submission to the CMA*, p62.
[20] See Section 8: Nature of competition in domestic retail energy markets, table 8.3.
[21] DECC (2014), *Supporting independent renewable investment: Offtaker of Last Resort – government response*.
[22] For example, one independent generator told us that the OLR should allow it to seek offtake contracts with counterparties with lower credit ratings.

This may reduce the risk to the offtaker (ie purchaser of electricity) of offering a long-term contract.

Option 2 – Reduce willingness to trade certain products in the market

32. The Secure and Promote generation licence condition[23] requires some firms to offer to buy or sell certain key baseload and peak products at certain times of the day. However, this does not prevent VI firms (as purchasers of electricity for their retail businesses) from reducing their willingness to trade products outside the obligation. A VI firm's ability to foreclose independent generators would therefore depend on whether the mandated products that it is forced to offer and sell are reasonable substitutes for any other products independent generators might want to trade.[24]

33. Unilateral action might have a larger effect using this mechanism than the other mechanisms. This is because one firm reducing trading in products could reduce the willingness of other market participants to trade these products, so augmenting the effect of one firm's actions.[25] However, this reaction from other firms may also increase the costs of the original firm, to the extent that it benefits from liquidity.

Option 3 – Reduce willingness to trade with independent generators

34. On a day-to-day basis, a VI firm (as a purchaser of electricity for its generation business) may have little ability to refuse to trade with an independent generator. This is because a large majority of electricity trading is anonymised (including over-the-counter (OTC) trading and trading on exchanges, which between them account for approximately 95% of trading in the market);[26] therefore, firms could not target any supplier with whom they have a Grid Trade Master Agreement (GTMA). Any attempt to foreclose would have to be a long-term refusal to trade, by refusing to sign a GTMA or offer credit terms.

Option 4 – Dispatch own generation when cheaper options are available from other firms

35. A VI firm (as a purchaser of electricity for its retail business) has the ability to foreclose by dispatching its own generation only if the independent generator

---

[23] Generation Special Licence Condition AA.
[24] We look at this in more detail in our work on liquidity, beyond the scope of this appendix.
[25] Ofgem (2013), *Wholesale power market liquidity: final proposals for a 'Secure and Promote' licence condition*, paragraph 1.4.
[26] This is an estimate based on our sample of market participants. See Appendix 7.1: Liquidity.

is marginal (and therefore pushed out of the market). If not, the independent generator will be able to sell to another supplier.

36. A VI firm's ability to foreclose is also limited because it cannot be sure which generator would be at the margin. This means it cannot target its foreclosure efforts on independent generators (individually or as a group).

Option 5 – Reduce willingness to buy green certificates

37. The design of the Renewables Obligation (RO) includes a 'headroom' mechanism, which sets the ROC sourcing obligation (ie overall demand for ROCs) 10% above the expected annual volume of RO generation.[27] The headroom mechanism tries to ensure that there will be excess demand for these certificates,[28] which should increase the chances of an independent generator being able to find a buyer. This may limit the ability of a VI firm to foreclose in this way.

Our assessment of unilateral ability to foreclose

38. Taking into account the factors explained above, we have not identified a plausible mechanism that would permit a single vertically integrated supplier to foreclose one or more independent generators.

Collective ability to foreclose

39. This section considers whether customer foreclosure could be achieved through some form of tacit coordination among vertically integrated suppliers, which might mean that one or more independent generators were unable to access a sufficiently large proportion of the customer base, and could therefore be effectively foreclosed.

40. While this section focuses on the ability to coordinate to carry out customer foreclosure, there would need to be a reason why the coordinating firms would want to foreclose (eg to create or maintain a barrier to entry at the generation level). We also note that this analysis looks only at the ability of VI firms (as purchasers of electricity for their retail businesses) to coordinate when dealing with independent generators; it does not cover any potential ability to coordinate in supply to retail markets.

[27] DECC (2013), *Calculating the level of the Renewables Obligation for 2014/15*, p1.
[28] Although we note that there have been concerns that there may at some point be an oversupply of ROCs. If this were to occur, it might leave independent generators more exposed.

41. In order for there to be coordination, firms need to be able to reach and monitor a coordinated outcome, and the coordination needs to be internally and externally sustainable.[29] The likelihood of these conditions being satisfied will vary depending on the foreclosure mechanism.

42. As a general point, most VI firms supply more electricity to customers than they generate.[30] This means that most VI firms need to buy some electricity externally, and collectively the Six Large Energy Firms are net purchasers from independent generators. This appears to limit their ability to foreclose in aggregate.

43. In relation to reaching and monitoring coordination, we note these points:

- Some mechanisms operate on a day-to-day basis (eg options 2 and 4), and would therefore be affected by changes in system conditions and fluctuating demand. This lack of stability could make it difficult to reach a coordinated outcome.

- VI firms have different amounts and types of generation, and different supply volumes,[31] meaning that they are somewhat asymmetrical. This will affect their individual need to buy from other firms (option 3), their individual costs of dispatching their own generation (option 4) and their individual ability to produce ROCs from their own plants (option 5). The costs and benefits of a coordinated strategy would therefore vary among VI firms, making it more difficult to reach (and sustain) a coordinated outcome.

- Long-term offtake contracts are reasonably complex, because there are a variety of terms that could be varied (option 1), and these are typically tailored to each offtake agreement. This would make it difficult to monitor any coordinated outcome.

44. The internal sustainability of coordination is also doubtful:

- In some cases, there is limited transparency to allow firms to monitor deviations. This applies in particular to the terms of offtake agreements (option 1), the existence of trading agreements (option 3) and the market for ROCs (option 5).

---

[29] *CC3*, paragraph 250.
[30] See Section 4: Nature of competition in wholesale energy markets, figure 4.17.
[31] Ofgem/OFT/CMA (2014), *State of the market assessment*, p95.

- Even if VI firms could monitor deviations, there may be a limited ability to retaliate. For example, contracting for offtake agreements occurs on an occasional and irregular basis (option 1).

45. In addition, the external sustainability of coordination does not appear likely:

    - As noted above, there are active independent suppliers, and these firms have grown recently. Most of the mechanisms would present opportunities for independent suppliers if VI firms were deliberately incurring extra costs. For example, there is some evidence that firms other than vertically integrated suppliers have provided offtake agreements to renewable generators (option 1).[32]

    - Any barriers to entry or expansion may, however, limit the ability of external parties to challenge the coordinated outcome. We do not assess that in this appendix.

46. It appears that the ability of coordinating VI firms to foreclose one or more independent generators is relatively weak, even if there were to be a clearly sustainable mechanism for reaching and sustaining coordinated behaviour, which does not appear likely in this context. We therefore do not consider that coordination for the purpose of carrying out customer foreclosure is likely, even before considering incentives and effects.

Incentive and effect

47. As noted previously, customer foreclosure requires each of **ability**, **incentive** and **effect** to be met. The sections above show that it is unlikely that VI firms have the ability to foreclose independent generators (either unilaterally or collectively).

48. However, we have also considered whether these firms would have an incentive to carry out customer foreclosure, and the potential effect on consumers. This section provides an overview of our thinking in these areas. In summary, we do not think it likely that either of these conditions is met.

Incentive

49. A foreclosing firm might look to receive benefits in various areas:

[32] Baringa (2013), *Power purchase agreements for independent renewable generators: an assessment of existing and future market liquidity*, Table 7.

- increased wholesale prices (and therefore increased generation profits for its own generation arm);
- reduced retail competition (by increasing wholesale costs for independent suppliers);
- increased support through the Capacity Market or CfDs; and
- ensuring that its generation remains in merit and can continue to act as a structural hedge.[33]

50. We note that for each of these potential areas of benefit, there are underlying assumptions required for the benefits to materialise in practice. For example, higher wholesale prices will benefit a VI firm as a whole only if it is able to pass them on to consumers,[34] which should tend to encourage entry upstream.

51. Against these potential benefits, a VI firm would need to consider the potential costs of each strategy. The European Commission notes that a VI firm's costs of reducing purchases from upstream rivals are higher if upstream rivals are more efficient, or if its own upstream arm is capacity constrained.[35]

52. The incentive to carry out behaviour that could foreclose may be limited (and foreclosure considerations may not affect incentives):

- There are clear opportunity costs from foreclosing. These occur when refusing to buy from the cheapest sources of generation (options 3 and 4) or when contributing to the RO buyout fund rather than receiving a share of it (option 5).
- Foreclosing could also reduce the ability of a VI firm to manage its risks (option 2). However, this may be mitigated to the extent that it has a natural hedge between its generation and supply.

Effect

53. Customer foreclosure could potentially affect consumers through higher wholesale prices, retail costs or support costs. However, depending on the

[33] There are potential benefits from vertical integration, such as the natural hedge against power prices, lower credit requirements or mitigation against imbalance costs. These benefits will be achieved when a firm's generation and supply volumes match. A VI firm may therefore want to ensure that this is the case. See Section 7: Vertical Integration.
[34] Otherwise, the benefits to its generation arm would be offset (or outweighed) by the losses to its supply arm.
[35] European Commission (2008), *Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, p16.

mechanism, there are reasons to consider that the effect of any customer foreclosure strategy on consumers may be limited.

54. Wholesale costs form the largest single component of a customer's electricity bill,[36] and so would be an obvious way for customer foreclosure to affect consumers. However, foreclosing any one generator is likely to have little impact on the wholesale price, as the new marginal generator will often have a similar marginal cost to the previous one.

55. Independent firms have continued to invest in new plants in recent years.[37] This indicates that widespread total foreclosure is not occurring.

56. Even a successful foreclosure strategy would have limited impact on consumers if it affected only a proportion of independent generators. For example, option 1 focuses on investment, meaning that it may mostly affect new generation capacity rather than existing capacity. Another example is option 5, which would affect only generators under the RO.[38]

57. Independent generators would also be harmed only if they were unable to implement counter-strategies, such as vertically integrating themselves or signing long-term wholesale contracts. Some independent generators have already done so,[39] although there may be costs and risks involved.[40]

58. To have an effect on consumers, the product must be a significant proportion of the overall downstream cost, otherwise higher costs for foreclosed firms would have little impact on the prices paid by consumers. This may not apply to some of the mechanisms in question. For example, the RO represents only around 5% of an electricity bill.[41]

59. Finally, even if there were a suggestion that strategies followed by VI firms were causing harm, there would need to be consideration of any offsetting efficiencies for consumers. We consider this in Section 7 of this report.

---

[36] For domestic customers, see Ofgem (2014), *Chart data as of October 2014*, 'Breakdown of an electricity bill over time'.
[37] For a list of power plants in GB, including owners and construction dates, see DECC (2014), *Electricity: chapter 5*, Digest of United Kingdom energy statistics (DUKES), 5.10: Power stations in the United Kingdom.
[38] This will be particularly limited once the RO is replaced by the CfD for new renewable generation.
[39] For example, Drax and ENGIE.
[40] This could include any reasons for not wanting to participate in the retail market (eg due to limited profitability, complexity or regulatory uncertainty), or any capability gaps relative to those needed to be a generator. Potential entrants might also be dissuaded by difficulty of simultaneously entering the upstream and downstream markets.
[41] Calculated from Ofgem (2014), *Chart data as of July 2014*, using the estimated figures for 2013.

Summary on customer foreclosure

60. We consider that customer foreclosure is unlikely to be an issue in this market. In particular, this appendix has shown that VI firms do not have the **ability** to foreclose independent generators. We have also indicated that it is questionable whether there is an **incentive** to foreclose, or whether there would be an **effect** on end consumers. Given that all three conditions must be met for customer foreclosure to be viable, we do not consider that customer foreclosure is a credible issue.

Input foreclosure

61. In this section of the paper we consider whether input foreclosure may be an issue in electricity markets in Great Britain. We explain what we mean by input foreclosure and consider two different forms that it might take. We evaluate each of these separately.

What is input foreclosure?

62. By input foreclosure we refer to a scenario where a VI firm (or multiple VI firms on a coordinated basis) uses its vertically integrated position to cause harm to downstream competitors and benefits from this at the retail level. In practice, this is likely to involve finding a way to increase the cost of wholesale electricity to suppliers.

63. We considered what possible mechanisms a VI firm could use to achieve this goal and identified two. First, if a firm has any market power in generation, whether unilateral or coordinated, it could increase wholesale electricity prices across the board by generating less at any given price, which would increase input costs for independent suppliers. Second, it could try to restrict trading or otherwise worsen liquidity, which might either raise traded prices or impose a risk premium on independent suppliers.

64. As with customer foreclosure, input foreclosure is generally addressed by considering ability, incentive and effect.[42] In other words, for it to be a concern, all three conditions must hold:

    (a) **ability** – the VI firm must account for a large proportion of the upstream market or must be able to act in a coordinated fashion, so that it can influence rivals' costs downstream;

[42] *CC3*, p59.

(b) **incentive** – the VI firm must gain enough in the retail market as a result of the strategy to more than offset the costs to it of carrying out the strategy; and

(c) **effect** – the result of the foreclosure must cause harm to end consumers.

65. It might not be necessary to look at all three conditions if at least one clearly does not hold.

Market power in generation as a tool for input foreclosure

66. In this section we consider the ability and incentive for a VI generator to withhold capacity unilaterally as a tool for input foreclosure. Under this mechanism, the firm would foreclose downstream rivals by increasing wholesale prices, thus raising their costs. We investigate generators' incentives and ability to withhold capacity in our market power in generation appendix, and we observed that there is insufficient incentive for any generator to do so. In reaching this view in that appendix, we did not take into account vertical structure or the effects on the retail market – we looked only at the incentives for generators as if they had no retail interests. Here, we consider whether the effects on rival suppliers might give a vertically integrated generator an **additional** incentive to withhold capacity.

Ability to foreclose

67. Due to the shape of the supply curve, generators with relatively low market shares may nevertheless be able to influence wholesale prices by withholding generation capacity (see Appendix 4.1: Market power in generation).

68. We found that, in practice, the ability to affect wholesale prices significantly generally occurs when demand is close to the point at which there is a shift between technology types of the marginal unit of generation, and withholding can change the price-setting technology – for example, shifting it from coal to gas. Beyond that shift, any further price rises are relatively small and require withholding relatively large volumes; therefore, we found that they were generally unprofitable for the generator. We also considered in our market power in generation appendix whether a collective withholding strategy was plausible, and concluded that it did not seem likely. For completeness, we consider here whether an increase in wholesale prices would act to foreclose independent suppliers.

69. Suppliers will generally contract forward large proportions of their forecasted demand. Therefore, in order to have a significant effect on their actual input costs, the VI firm would have to withhold capacity sufficiently frequently to

affect future price expectations. Those expectations would then incrementally begin to affect wholesale costs, because a supplier setting its retail prices today will base them partly on the volume it has already hedged and only partly on forward prices for the volume it is trading today. So there is effectively a double lag for the VI firm between incurring the cost and achieving the benefit.

70. The effect on independent suppliers will be affected by other components of customers' bills and their consequences for choice of supplier. Wholesale electricity costs make up around half of retail electricity bills. Consider a hypothetical example of a 5% increase in wholesale prices. If this were fully passed through to retail prices, it would represent a 2.5% increase in retail electricity prices. Then consider that VI firms are unlikely to be able to affect wholesale gas prices. If customers are primarily seeking dual-fuel tariffs (or a single supplier), then for a customer paying similar amounts for gas and electricity, the effective price rise might be only around 1.25%. This means that a relatively large wholesale price rise would be necessary to have a significant effect on customers' overall energy bills, and therefore to cause large numbers of customers to switch supplier.

71. We also note that it is not possible for VI firms to target specific independent suppliers using this mechanism: they can increase the price of wholesale electricity only in general.

Incentive to foreclose

72. The incentives to raise rivals' costs depend on the relative sizes of the cost from foreclosing (ie lost generation margin) and the gain from withholding – namely, the gain of downstream retail customers or higher retail prices.

73. The size of the cost depends on the lost margin of the plant being withheld and the gain in revenue for other generation assets. Our results in the market power in generation appendix show that withholding generally leads to a net loss for the generator, especially when the additional costs of withholding, such as the start-up costs for a power plant and opportunity costs, are considered.

74. The size of the gain depends on how many customers switch to the foreclosing VI firm (or are deterred from switching away from it) and the margins earned on those marginal customers.

75. We observed three reasons why the costs of a withholding strategy to the generation arm may be large in practice. First, as noted in our market power in generation appendix, the ability and incentive to exploit the opportunity is

hampered by uncertainty about demand and wind output. If a generator does not know with certainty when it will have the ability to shift price significantly, it will have to withhold capacity more often in order to achieve price effects, and will incur a loss when the price does not shift significantly. Second, in order to have the ability to withhold, the generator either will have to avoid forward contracting the relevant output, thus incurring risk that could have been avoided, or will have to acquire a costly reputation for withholding even when its forward position would incentivise it not to do so.[43] Third, as noted above, there is a substantial lag between introducing the strategy and seeing an effect on independent suppliers, and therefore a degree of risk which reduces the profitability of the strategy – because market circumstances may change between the period in which the generator withholds and the period in which expectations affect forward prices.

76. We also considered the costs imposed on the retail arm of the foreclosing firm. In the standard economic model of input foreclosure, the VI firm will sell to other firms at the raised price while its retail arm continues to purchase the upstream arm's output, so the retail arm does not face higher costs. However, in the electricity sector, the VI firm's upstream arm is capacity constrained, and in practice the retail arm of each of the Six Large Energy Firms purchases from other market participants.[44] Therefore, the retail arm cannot entirely avoid the increase in wholesale prices, so its costs increase and the retail margin available (ie the gain from foreclosing) is consequently reduced.

77. Next we considered the benefits to the VI firm of withholding. There may be two effects of higher wholesale prices. The first is that they are passed through into higher retail prices for **all** retailers. To the extent that this is the case, the effect on a VI firm is exactly the same as that on a generator, so we do not need to consider it here. The second is that independent retailers' prices rise relative to those of VI firms (because the latter have generation assets that mitigate, but do not avoid, the cost increase), and customers switch away from independent retailers and towards VI firms.[45]

78. The benefit to the withholding firm depends on two factors. First, how many switching customers does it gain? Second, what margin does it earn on those customers?

---

[43] Generators, including generation arms of VI firms, typically contract forward or 'hedge' a substantial proportion of their expected output. See Appendix 7.1: Liquidity.
[44] The overall effect on the VI firm is likely to be on net, rather than gross, purchases, because the generation arm will earn a higher margin on its remaining external sales. Therefore, this may not be a cost for EDF Energy, which is net long. See Section 3: Market definition.
[45] Or the current rate of switching from VI firms to independent retailers is reduced. The effect is equivalent.

79. The diversion of customers from independent suppliers will generally not be wholly to the foreclosing VI firm. As a rough guide, we might expect it to be in proportion to market shares among vertically integrated suppliers. Centrica has the largest share of electricity accounts among the Six Large Energy Firms, with just over 23% of electricity meter points.[46] However, our market power in generation appendix found that Centrica had the least ability to influence price. The next-largest supplier is SSE, with just over 15% of electricity meter points. Consider a hypothetical example where a foreclosure strategy caused all domestic customers to leave independent suppliers. (This would be the upper limit on gains for vertically integrated suppliers, rather than a scenario we consider likely.) Independent suppliers have a share of domestic supply of just over 13%. Therefore, the maximum gain to SSE, if all customers left all independent suppliers, would be 2.3% of domestic electricity accounts.[47] The actual gain from a foreclosure strategy is likely to be significantly smaller: based on our comments on ability to foreclose, we do not think it plausible that a foreclosure strategy would be able effectively to force all independent suppliers out of business.

80. We would expect the customers who are diverted to be primarily the most price-elastic customers, and that margins on those customers will be low. Therefore, the gain from foreclosure will not be large.

81. Finally, we noted in our market power in generation appendix that existing regulations – including REMIT and the Transmission Constraint Licence Condition (TCLC) – and potential future changes to licence conditions can have a powerful effect on incentives to exploit market power.[48]

Our assessment of input foreclosure through market power in generation

82. Given the considerations above, it seems to us unlikely that VI firms would have clear incentives or the ability to disadvantage independent suppliers through this mechanism. Therefore, we have not found it necessary to investigate in detail the possible effects of foreclosure.

Liquidity as a tool for input foreclosure

83. The second mechanism we assessed was for a VI firm or several VI firms to reduce liquidity, thus increasing independent retailers' costs. Under such a

---

[46] Calculated as Centrica's share of accounts divided by the combined share of the Six Large Energy Firms. Data taken from Cornwall Energy data submitted to the CMA – see Section 8: Nature of competition in domestic retail energy markets, table 8.3.
[47] Calculated as independent suppliers' share of accounts multiplied by SSE's share of accounts among the Six Large Energy Firms.
[48] Competition law may also deter abuse of a dominant position.

theory, the VI firm(s) involved would bear some costs from reduced liquidity but would hope that the benefits at the retail level from reduced competition would outweigh these costs. In practice, this harm would be likely to manifest through an increased cost of hedging or increased risk through being unable to hedge in the desired way.[49] In this section we consider whether this is a realistic concern. We refer to the evidence set out in Appendix 7.1: Liquidity, but do not repeat all of that evidence here.

Ability to foreclose

84. First, we considered whether a VI firm could target specific suppliers and refuse to trade with them. We do not think this is likely, because (as noted above) a large majority of electricity trading is anonymised, and therefore firms could not target any supplier with which they have a GTMA.[50] Ofgem's Secure and Promote generation licence conditions also make it easier for small suppliers to secure GTMAs with the Six Large Energy Firms.

85. We therefore considered whether VI firms might instead take actions aimed at worsening liquidity in general, either by trading less in aggregate or by trading less in specific products that are valuable to independent suppliers.[51] We focused on their ability to foreclose.

86. First, we do not believe that a unilateral strategy by one firm is likely to have significant effects on overall liquidity. The total amount of open trading in GB wholesale electricity in 2013 was 940 TWh. The largest amount of external trading by any of the Six Large Energy Firms was by RWE, which sold on average 188 TWh per year,[52] or 20% of the total. It is possible that an individual firm has a larger share of trading in particular products, but since a very large share of trading takes place in relatively few products (focused on baseload and seasons ahead of delivery), we consider it unlikely that either *(a)* any one firm has a large share of those widely traded products, or *(b)* worsened liquidity in an individual product with relatively little traded volume would have a significant effect on independent suppliers.

87. In any case, Ofgem's Secure and Promote generation licence conditions[53] would make it difficult for any of the Six Large Energy Firms to reduce liquidity

[49] See Appendix 7.1: Liquidity for our definition of 'hedging' and further discussion of its effect on competition.
[50] See paragraph 34, above.
[51] We discuss the range of products traded, and their role in reducing risk via hedging, in Appendix 7.1: Liquidity.
[52] Over the period January 2011 to July 2014. See Appendix 7.1: Liquidity.
[53] The Secure and Promote generation licence conditions would make it difficult to refuse to trade with particular small suppliers, and the market making licence conditions require the Six Large Energy Firms to post bids and offers for a range of products in two daily windows, with a prescribed maximum spread for each. The effect of the spread is that any attempt to post an unattractive sell price will make its buy price extremely attractive.

significantly in the most traded products,[54] which are covered by those conditions. All of those firms are required to offer to sell each of those products throughout two hour-long windows each day. We found that most of the Six Large Energy Firms appeared able to carry out the majority of their hedging strategies using these products. Since Ofgem has mandated good availability in these products, it seems unlikely that the Six Large Energy Firms would be able to place rival suppliers at a significant disadvantage.

88. Second, we did not think it likely that VI firms would be able to coordinate a joint strategy to reduce liquidity. In order for there to be coordination, firms need to be able to reach and monitor a coordinated outcome, and the coordination needs to be internally and externally sustainable (ie firms need to be able to punish any deviations from the strategy).[55] These conditions are unlikely to be met for at least three reasons:

(a) Since the VI firms have a range of different net positions, and differ greatly in terms of their internal organisation and need for liquidity, the costs to them of such a strategy would vary widely, and so a coordinated outcome may be difficult to reach.[56]

(b) VI firms are likely to have an individual incentive to deviate (ie to trade externally), but any deviation would be difficult to monitor, because the majority of trading takes place OTC and over exchanges where counterparties are anonymised and trading is not published.[57]

(c) Any punishment would be difficult to target at the firm which deviates, and a broader attempt to punish would be constrained by the Secure and Promote generation licence conditions.

89. Third, we note that there is a considerable amount of generation output outside the Six Large Energy Firms that generators sell on the wholesale market. This includes output from both independent generators and other vertically integrated firms that are 'long' in generation, such as [✂] and generates considerably more than its retail arm's supply volumes).[58] Therefore, at a minimum, we would not expect independent suppliers to be in a position where they had no purchasing options. This would limit the effect that even a coordinated strategy could have. The amount of trading that any

[54] We estimated that these products accounted for 64% of all trading, or 83% of all products traded a month or more ahead of delivery. See Appendix 7.1: Liquidity.
[55] *CC3*, paragraph 250.
[56] See Table 2 of Appendix 7.1: Liquidity.
[57] See Appendix 7.1: Liquidity.
[58] See Section 4, table 4.17.

independent supplier requires is very small relative to total generation and to total trading in wholesale electricity in Great Britain.

90. Fourth, we have seen no evidence that such a strategy is occurring on a unilateral or coordinated basis. Our evidence suggests that the Six Large Energy Firms are generally trading externally in sufficient quantities to cover their own hedged positions (for both generation and supply), and also trading enough specialised products to achieve their 'shape'.[59] If one or more of them were engaging in this type of input foreclosure strategy, we would expect them to limit external trading to a minimum and try to reach hedged positions through internal trades as far as possible.

91. In addition, our investigation of broker data found that just over 70% of offers to trade OTC are posted by the Six Large Energy Firms; and more than two-thirds of the best prices we observed were posted by those six firms.[60] This does not seem prima facie consistent with either a refusal to trade or trying to trade on poor terms.

92. For these reasons, we think it is unlikely that any party is, or could, either unilaterally or collectively, foreclose independent suppliers by acting to reduce liquidity in wholesale electricity in Great Britain.

Incentive and effects

93. Given the considerations above on the ability of VI firms to foreclose independent suppliers by reducing liquidity on the wholesale electricity market, we have not found it necessary to investigate in detail the incentive to foreclose, or the effects of foreclosure. However, we note that incentives to foreclose are far from clear. All of the Six Large Energy Firms are reliant on external trading to some extent, since their generation and demand will not balance (either in volume or in 'shape'). A firm that reduces its external trading sufficiently to have any effect on liquidity is likely to increase its own supply arm's wholesale energy costs for externally sourced electricity, and in principle we see no reason why this increase should be smaller than that suffered by other suppliers. If that were the case, it is unclear what competitive advantage it would derive at the margin, unless the change were sufficient to drive independent suppliers out of business completely.

---

[59] See Appendix 7.1: Liquidity.
[60] We are unable to identify all of the traders in our dataset because of broker requests to anonymise party names, so a subset of our data shows the type of firm but not its identity. Therefore, we cannot conclusively say whether all Six Large Energy Firms consistently offered good prices; but we can say that there is no sign of systematic behaviour among them.

Summary on input foreclosure

94. We consider that input foreclosure is unlikely to be an issue in the GB electricity sector. In particular, it seems unlikely that firms would have an incentive to try to foreclose by withdrawing generation, or an ability to foreclose by reducing liquidity. Given that all three conditions – ability, incentive and effect – must be met for input foreclosure to be viable, we did not find an AEC in this area.