ENERGY MARKET INVESTIGATION

Summary of hearing with National Grid Gas plc trading as National Grid on 14 October 2014

Background

1. National Grid managed around £35 billion of regulated assets. 65% of its business was based in the UK and the remaining 35% was based in the northeastern USA. In the UK, National Grid was the owner and operator of the electricity transmission system for England and Wales and the operator, but not the owner, of the electricity transmission system in Scotland. National Grid also owned and operated the gas transmission network for the whole of GB and operated four of the eight gas distribution networks in GB. It distributed gas to 11 million customers.

2. As the system operator for gas and electricity transmission, National Grid was responsible for ensuring that enough gas and electricity were being provided to meet demand on a day-by-day basis for gas and a second-by-second basis for electricity. National Grid also had responsibility for maintaining the networks it owned and expected to invest around £20 billion in its network over the next eight years to replace ageing assets and to adapt the networks to changes in the generation market, including the introduction of new renewables, nuclear and gas-fired electricity generation facilities.

National Grid's role in the balancing mechanism

3. One of National Grid's key roles in electricity transmission was to ensure that it could balance generation and demand. In the short term, National Grid sought to balance the system in the most efficient way possible by buying electricity at the lowest price it could, but it also had to ensure that generation did meet demand, and there were times when the technical parameters of power generation equipment, ie how quickly a power plant's production could be ramped-up or ramped-down, would limit National Grid's choices as to where it could buy energy, meaning it might have to do so at a higher price.

4. National Grid also looked at this issue from a long-term perspective. When it thought about how it should operate in the future, it considered how it could obtain electricity prices which were competitive while still ensuring that the overall system would be able to meet demand. It was noted that there was a

tension between the need to maintain competition in the system whilst centrally planning and organising it.

5. National Grid had been involved in the development of the current balancing system (previously known as NETA – the New Electricity Trading Arrangements – and now known as BETTA – British Electricity Trading and Transmission Arrangements). National Grid considered that the balancing market was competitive in terms of the energy it needed to buy to fulfil its role of balancing the network. Its experience was that there were sufficient numbers of energy suppliers offering bids and offers in the market to enable National Grid to balance the network. The current type of balancing system was introduced in 2001 (as NETA) and had further evolved since then to encourage suppliers to resolve their own imbalances as near as possible to real time, whilst allowing National Grid enough time to resolve any imbalances it needed to. Under the current version of the balancing system (BETTA) 97% of energy was now dispatched via the market while National Grid dispatched the remaining 3% needed to short-term balance the system.

6. National Grid's view was that the current balancing system worked well as suppliers' contractual and physical supply positions at the trading deadline, known as 'gate closure' (1 hour from actual delivery) normally closely matched the demand which needed to be met. National Grid continually monitored how much energy was being generated, and if it thought there might be a shortfall, would tell the market as soon as it could so that the market could address the shortfall prior to gate closure. It considered that the current gate closure deadline of 1 hour, which had reduced from 3.5 hours in previous versions of the system, gave it sufficient time to act to physically balance the market. It would need to assess whether it would be able to physically balance the market as efficiently if say the gate closure deadline was shorter, eg half an hour. Its main concern about balancing with a shorter deadline was that there might not be enough generation resources available at shorter notice. Some parties were pressing for a further reduction in the gate closure deadline. Generators, especially those with renewables, and suppliers with renewables in their portfolio would prefer a shorter balancing period as this meant they would be less likely to be exposed to imbalance and the financial costs this entailed. National Grid noted that it might be possible to decouple the commercial aspects of gate closure which gave rise to imbalance risks from the practical aspects of achieving balance.

7. When balancing the system, National Grid's primary objective was to ensure the security of the electricity supply, but it was incentivised, both internally and externally through the market, to do so in the most efficient way possible. As well as balancing the supply of energy, National Grid also had to balance a number of other ancillary services, such as reactive power, and it sought to

balance these in the most optimal way it could in conjunction with balancing the supply of energy. National Grid was comfortable with the costs it incurred in balancing the system. It was incentivised, through the regulations it operated under, against the total external costs of the actions it took to balance the system. If these costs exceeded certain levels, then National Grid would be exposed to financial penalties, but if the costs were below certain levels National Grid would receive financial benefits.

8. National Grid considered that the current balancing and dispatch system, which relied on energy generators and suppliers to do the vast majority of the balancing and dispatch themselves, was efficient and was likely to be more efficient overall than a system where National Grid conducted all the balancing and dispatch itself. There was also logic in having a clear separation between the vast majority of the market and National Grid's limited and technical balancing activities.

Future developments for the balancing system

9. National Grid had taken part in a review conducted by Ofgem of how the imbalance price under the balancing and settlement code was calculated. The review had concluded that the way the imbalance price was calculated should be changed in a number of different ways. First, additional services would be included in the calculation. Second, the number of transactions used to calculate the imbalance price would be reduced. Third, there would only be a single imbalance price rather than the two prices there were currently. These proposals were currently going through their respective approval processes involving the Balancing and Settlement Code Panel and Ofgem.

10. The changes to how the imbalance price was calculated would see a staggered move from using an average price to using the price for the most expensive 500 megawatts, then the most expensive 100 megawatts and eventually the top 1 megawatt of balancing actions. Normally, the supply curve for the market was reasonably flat, but when there was not enough power and the system was under stress, then the curve would become much sharper.

11. The pay-as-bid nature of the balancing mechanism meant that it could be argued that the consequences of the move from the most expensive 500 megawatt hours to the most expensive 1 megawatt hour might not, under many normal conditions, be all that large, since the bids of those who are likely to be accepted should track expectations of the marginal action costs. This might not happen if the event that was causing imbalance had occurred after gate closure, when bids in the balancing mechanism could not respond to altered expectations.

12. National Grid expected that imbalance prices would rise as a result of these changes to the balancing system. The expectation was that this would increase the incentives of parties to balance. There were two effects going in different directions: the modifications that effected the calculation of price levels would tend to increase the cost of being short at times of system stress, thus encouraging balance, while the elimination of separate prices for ‘helpful’ and ‘harmful’ imbalances would tend to reduce the incentive to balance. Overall, the effect, especially at times of system stress, should be to increase the incentive on parties to balance.

13. The elimination of the dual cash-out mechanism, under which participants who were out of balance received a different price depending on whether they had too much power or too little, with a single price for both types of imbalance was intended to encourage participants to bid in a way which more accurately reflected their actual position and so better balanced their position and reduced further the amount of balancing actions which National Grid had to undertake. Sharper imbalance pricing would also encourage the market to act during times of system stress when there was not enough power.

14. The changes to the pricing and cash-out mechanism would be introduced sequentially, with changes to the calculation of the imbalance price first and then the introduction of the single cash-out price. National Grid agreed with the phased introduction of the pricing changes as moving from basing the price on 500 megawatt hours to 1 megawatt hour would be too great a change, so phasing the change over a number of years would allow market participants to make the adjustments they needed. The replacement of the dual cash-out price with a single one would take place in 2015.

15. Currently, the market was resolved on a half-hourly basis, which National Grid said was the period of time over which most imbalances accrued, so it made sense to resolve them on this basis.

16. Market participants were keen to ensure that they complied with the TCLC regulations. The regulations had had the effect of making participants bid more realistically and had made prices more consistent across the market.

17. Ofgem was implementing some changes to the transmission regulations, but it was not introducing short-run locational pricing. National Grid agreed with Ofgem’s approach.

Operation of the electricity market

18. National Grid considered that concerns about generators exploiting ‘bottlenecks’ to raise the price of electricity were allayed by the TCLC and

National Grid's ability to monitor market dynamics. There would be potentially serious consequences for any generator which appeared to be trying to exploit such a situation. [✂] National Grid would raise any concerns it had about market manipulation, even ones based on a single incident, with Ofgem if, following discussions with the generator, it thought it necessary to do so.

19. National Grid noted that small generators, particularly wind generators whose output was variable, were concerned about imbalance cash-outs and were advocating for a settled cash-out arrangement. National Grid acknowledged that imbalance issues were more of a concern for wind generators than for others since the wind could not be controlled. Despite this, National Grid was not in favour of separate imbalance arrangements for wind generators as much wind production formed part of larger generation portfolios either by ownership or through commercial relations and because having a different system could equate to subsidising wind. National Grid was, however, considering how to adapt the balancing mechanism to address some of the wind generators' concerns around settlement.

20. National Grid was proposing and implementing a number of changes to handle the anticipated increase in the amount of wind generation dealing with issues such as dispatch and ancillary services. In the medium term, it would need to resolve a number of technical issues created by wind generation by devising new ways of operating the overall system. Some of these issues might be resolved by the market through developments like smart meters.

21. It was noted that Scottish Power had decided not to enter Longannet into the capacity auction apparently because of the high connection charges it would have to pay. National Grid explained that its objectives for transmission charging were to give a clear locational signal of the cost of using and investing in the transmission network through higher charges for those generators who use more of the network. National Grid was conscious that these charges had been quite volatile over the past few years and that this volatility was of concern to its customers. This recent volatility had been caused by changes in the transmission rules, changes in generation and demand on the network which led to changes in investment requirements, and reduced demand because of the recession. It was noted that in Scotland, whilst charges paid by generators were higher, demand charges paid by domestic and other customers were lower.

22. National Grid preferred to use a shallow connection methodology for new entry generation as this encouraged third party access, particularly for wind power. This meant that new power stations could be located in remote areas and the costs of this would be reflected in higher transmission charges for those generators.

23. National Grid was obliged under its licence to develop transmission charging which was transparent and non-discriminatory whilst providing revenue. Transmission charges were approved by Ofgem following consultation with the industry. The current charging regime was designed to send a clear signal to generators to minimise the amount of transmission infrastructure that would need to be built to accommodate new generation capacity, which would reduce overall costs to consumers. Other charging regimes were possible, including nationally standardised transmission charges, but these might lead to cross-subsidisation or required greater investment in transmission infrastructure. National Grid considered that the current charging regime allowed it to fulfil the requirements of its licence and gave the right message to the industry.

24. National Grid's licence required it to ensure that modifications to transmission charges facilitated transparency, were non-discriminatory and facilitated competition mainly through sending long-term cost signals to the market.

25. National Grid operated a scheme designed to assist bringing new generation online quickly called 'Connect and Manage'. Under this scheme, if a generator was able to connect to the network, so long as it would be economically beneficial, then National Grid would undertake the system reinforcements necessary to accommodate the new generation. So far, around 1.2 gigawatts of generation had been added to the network under the Connect and Manage scheme, and the scheme would be more important in future as a number of older coal-fired power stations were planned to close.

26. National Grid was broadly supportive of the harmonisation of the rules for European power markets which would potentially provide it with more access to balancing services and interconnection across Europe. National Grid considered that by doubling the amount of interconnection with Europe from four to between eight to ten gigawatts there was a potential total benefit to consumers of £1 billion, or around £13 off individual customers' bills. Increased integration should help to reduce the costs involving in balance settlement. It was currently possible to transfer energy across Europe, but there was further work to be done in aligning products, balancing period and approaches at boundaries in order to make a pan-European market work efficiently. There were also a number of other issues, such as connection rights and generation standards, which would need to be addressed in order to achieve a pan-European market. The harmonisation of balancing systems would require trade-offs between the various requirements across Europe, where each country had different arrangements. There were similar developments in the European gas market, which it was hoped would bring benefits both to the industry and consumers.

27. National Grid cooperated with its counterpart system operators in France, Belgium and Italy in a body known as Coreso, which shared information and coordinated outage planning. There were other such bodies elsewhere in Europe. In future the current system operators' market areas might be re-aligned. National Grid regarded its work with other European operators as significant and important.

28. National Grid modelled and forecasted long-range demand. Its preferred long-term forecast looked at the next ten years. When forecasting, it took into account factors such as economic growth and levels of peak demand. More recently, it had started to look at increased appliance efficiency. Since 2008, the recession and more efficient appliances had made long-term predictions more difficult and this would be the case until there were a few years of sustained economic growth. National Grid expected that demand would be flat until around 2020. In the meantime, decarbonisation of the economy, which included greater use of electric-powered transport and electric heating appliances, would lead to an increase in the load on the system.

29. National Grid was involved in the design and operation of the new capacity mechanism. It provided advice to the Government about capacity requirements and would also administer the capacity market. The first year of the capacity market was 2018/19. Currently, there was little apparent need for much greater overall capacity, but how much of the market in 2018/19 would be served by current generation and how much from new generation. National Grid noted that its demand forecasts focused on peak demand, which had fallen relative to overall demand over the last ten years.

30. National Grid did not forecast which power stations would close or open over the next ten years. Instead it ran a number of scenarios to gauge the effects of various changes in capacity. It was expecting some coal-fired stations to close over the next ten years, but how many would shut down depended on the implementation of various regulations and whether these stations could convert to greener fuels, such as biomass. The underlying economics of coal- and gas-fired plants would also determine how many of each type of station would remain in ten years' time.

31. The unpredictability of the overall economic situation had affected the amount of new generation entering the market over the past few years. A significant amount of generation had deferred its entry while waiting to see how the economy performed. The last 18 months had been a period of huge uncertainty for the industry, and the market was waiting to see what would happen in respect of energy bills.

32. National Grid explained that a few years ago in order to respond to concerns about the 'lights going out', it had conducted with DECC and Ofgem various analyses as to what the country's power requirements would be in the middle of this decade. Having found that margins would be tighter, it worked with DECC and Ofgem to develop new balancing services and procure strategic balance reserves to cover 2014/15 and 2015/16. After 2015/16, new generation would come online and the capacity market would start, both of which would ease these margins.

33. The Government's security standard for energy supply which was included in the capacity mechanism was consistent with previous standards and National Grid's policy and practice. While the system had experienced reductions in load due to severe system incidents in the past, there had been no overall shortage of supply problems. If faced with a sudden loss of load due to a system incident, there were a number of emergency measures National Grid could take including assistance from the Continent.

34. National Grid considered that DECC's Energy Market Reforms were necessary and prudent. They would address supply uncertainties and underpin the business case for keeping existing plants running and bringing on new capacity. National Grid believed that the generators which were currently deferring entry were waiting to see how the capacity auction worked out.

35. The new imbalance pricing mechanism should support the capacity auction system because sharper imbalance prices should help to motivate generators that did not have enough capacity to meet their demand to build new plant. However, these incentives might not be great enough to justify investment on their own.

36. Generators that were successful in the capacity auction would need to have their station in place in time to produce the power they had agreed to supply. There were heavy penalties in place if a plant did not produce the required amount of power, so some generators might put in lower bids in order to manage this risk. In developing these rules, National Grid had relied on its own experience of procuring balancing services.

37. National Grid was developing new ways of managing the system in order to handle increasing amounts of generation from nuclear, solar and wind, which was less flexible than other sources. It was also having to install new voltage management equipment to suppress voltage when there was too much power. There were similar challenges for gas arising from more flexible storage resources.

Regulation

38. Since 2012, the regulation of National Grid's pricing and activities had changed. National Grid was supportive of the new regulatory regime (known as RIIO) with its focus on engaging with stakeholders and customers and on setting and achieving targets. National Grid did note that the new process had involved much greater scrutiny and transparency of its actions which required more reporting to Ofgem. National Grid had challenged Ofgem about the amount of data reporting it now had to do on behalf of the industry and the burden this placed on the industry as a whole.

39. National Grid was currently involved in a constructive dialogue with Ofgem about its incentives as a network operator. National Grid hoped that this dialogue would result in a clear and consistent approach over the medium term as much of National Grid's expenditure was concerned with measures which would only pay off in the longer term. The energy industry was operating in an uncertain environment in the longer term, so incentives and targets needed to be set with this in mind. Stability was important if the industry was going to attract the investment it required.

40. National Grid had held discussions with Ofgem about the volatility and predictability of transmission charges. National Grid approached its customers' concerns about this issue by trying to better forecast changes over a longer period in transmission charges and make these forecasts more visible and to its customers. The quality of its forecasts was largely dependent on that of the data its customers supplied about their levels of demand. The way that National Grid reconciled and recovered overpayments and underpayments from customers was now done in a way which gave more visibility and time for suppliers to handle the effects of these reconciliations. National Grid also provided its suppliers with more granular detail about the individual costs which made up these charges.

41. As far as small suppliers were concerned, National Grid tried to act as a 'critical friend' in assisting them to understand the market and navigate a complex regulatory framework, some of which was operated by National Grid itself. Engaging with all the regulatory changes was challenging for a large supplier, so it would be especially difficult for smaller ones. As well as supporting smaller suppliers individually, National Grid also worked with various small supplier industry groups and representative bodies. National Grid considered that small suppliers' voices were heard in the various regulatory processes, eg code modification, and that in its experience, when changes were made to regulations it was the right arguments which won out rather than just those supported by the major participants in the industry. National Grid cited a recently proposed code modification relating to

interconnectors and which Ofgem had rejected about which small suppliers had raised concerns.

42. National Grid had debated with Government whether the subsidy for the power to be generated by the new Hinkley Point C nuclear reactor should be handled in the balancing mechanism, ie whether it should be paid by National Grid or paid separately, and what the most efficient way of doing this would be. National Grid had also discussed with DECC whether the arrangements for CfD payments would give an accurate signal of market prices to generators.

43. National Grid considered that stability of regulation and energy policy was very important for the industry and for encouraging the investment the industry required.

Gas

44. The balancing mechanism for gas supply operated on a day-before basis and was much less complicated to balance than electricity.

45. Domestic gas bills and payments to suppliers were not calculated by meter-reading, but through a mechanism of annual demand profiling National Grid's role was to provide the daily end-of-day demand information and submit it to the allocation agencies and XOServe

46. Some energy suppliers had raised concerns about how they paid a monthly charge to National Grid, as the owner of the gas transmission system. The suppliers argued that as the charge was level throughout the year, during the summer months they were paying National Grid too much, and effectively subsidising it. National Grid noted that there was a similar capacity-based charging system for electricity, although changes in electricity use were less seasonal than those for gas. It also noted that the costs of its assets that these charges related to were constant throughout the year and having a consistent monthly charge meant that suppliers knew how much collateral they would need to have in place to cover this cost.