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Project Discovery
Energy Market Scenarios

Dear Ian,

Thank you for the opportunity to comment on the above consultation. This response is provided on behalf of the RWE group of companies, including RWE Npower plc, RWE Supply and Trading GmbH and RWE Innogy GmbH.

We provide high level comments in section 1. In section 2 we provide comments based on modelling work we have carried out. In section 3 we provide comments on the scenarios and in section 4 we provide comments on the stress tests.

1.0 High level points

1.1 RWE concurs that energy markets are likely to be tested in the coming years. In particular the investment required to deliver the government's low carbon objectives is considerable, therefore a figure of £100-200bn over the next 20 years is not an exaggeration in this respect.

1.2 At the same time, some of the other issues mentioned, such as commodity price volatility, changes in economic conditions or environmental legislation are not new and not, in themselves, a reason to review market or regulatory arrangements. It is the combination of issues that give validity to this project.

1.3 The various changes will happen incrementally and there will be time to for market participants to change behaviour in anticipation of expected market conditions. The current investments being made to replace stations that will close as a result of LCPD is a good example of this, and, depends on the current market framework remaining. The scenario approach in Project Discovery does not always reflect the likely reactions of market participants as the scenarios progress over time. These reactions are likely to push the market away from more extreme outcomes provided that normal market incentives remain in place.

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1.4 Potential new interventions in wholesale electricity markets, such as the proposal to introduce a Market Power Licence Condition (MPLC) into generators' licences, changes aimed at improving so-called insufficient liquidity, re-introduction of capacity mechanisms or strategic reserves will damage investment incentives and increase the likelihood of involuntary interruptions in supply. RWE believes that changes such as these can have a more damaging effect on investment rather than the positive effect intended.

1.5 Technological developments now mean there is excellent scope for the demand side and for storage to play an important role in the solution to intermittency and temper the effects in tight market conditions. Extensive administrative interventions on the generation side of the market would stymie this potential.

2.0 Comments on the development of the market going forward

2.1 Investment needed

2.1.1 Increased volatility in wholesale prices in day-ahead and balancing markets must not be diluted. It is this volatility which will provide market participants with the incentives to maintain or build flexible peaking capacity and to develop demand response capabilities. This will be critical to remunerating the investment decisions that are now being made and that will have pay back periods of up to 40 years in some cases.

2.2 Drivers for change

2.2.1 There are many initiatives looking ahead in varying timescales, such as the recent call for evidence from DECC, the recent report from the CCC, Project Discovery, National Grids forward looking consultation, the LENs project, RPI-X@20. These all call for a massive amount of input from industry, so it would be helpful if these initiatives were coordinated such that the output can be maximised.

2.2.2 One of the reasons for establishing competition in the energy sector in the first place is for market participants to manage the various risks that emerge. Many of the items identified in, for example, paragraph 1.17 of the consultation are also pre-occupations for energy companies. Just because these risks have emerged or increased, does not mean that it is necessarily desirable to address these through a change in regulatory policy. In many cases it would be more effective to allow market participants to continue to deal with these as part of their commercial strategies.

2.2.3 RWE strongly shares the view that an expansion in the use of electricity, into both the heat and transport sectors, has to be a major element of achieving government targets. This will be a challenging task not least because it will require a behavioural shift, but also because it may imply a cost increase. To this end it was useful to see more realistic cost increases presented in the results which should provide the signals for a demand-side response.

2.2.4 In terms of the mix of low carbon technologies, it is a strong belief of the RWE Group that the electricity system by 2050 needs to have a balanced mix of low carbon technologies – including major contributions from renewables, nuclear and fossil fuel generation with carbon capture and storage.

2.3 Ability of market to react

2.3.1 Significant new generation capacity is already under construction to replace plant expected to close as a result of LCPD requirements. The current market and regulatory framework has been

successful in giving strong financial incentives to electricity companies to invest in new projects. The current draft of the IED means that it is unlikely that there will be further coal station closures before 2020 beyond those already implied by the LCPD.

2.3.2 Overall it is reasonable to expect a moderate tightening of the supply-demand position around 2016-18, i.e. between the closure of LCPD affected stations in 2016 and the possible advent of new nuclear production. Such an outcome would not be unprecedented and does not imply a concern for security of supply. Furthermore, given that this is six years away, it would be reasonable to expect companies to take measures to avoid being exposed to such a development by, for example, investing in new capacity or upgrades to improving efficiency and reliability in preparation for period in question. This has been the experience to date of how the market responds to price signals.

2.4 Investment Incentives

2.4.1 In this respect it is vital that the potential changes identified in 1.4 above, are fully evaluated such that we do not damage the investment required.

2.4.2 With respect to developments after 2020, RWE Group considers that the modelling carried out by Redpoint in terms of de-rated capacity margins and 'expected energy unserved' overstates the risks to energy security. RWE believes that the current market design provides strong incentives for market participants to justify investment in extending the life of existing coal and CCGTs to comply with IED post 2020 or to invest in new plant specifically targeted at the peaking sector. The recent purchase of Uskmouth power station by Scottish and Southern is evidence that companies still see value in such assets.

2.5 Demand-side impact

2.5.1 It is also likely to be the case that, by 2020, there will be much more scope for the shape of consumption managed via smart metering and that the demand-shape during the day could be much flatter meaning that less capacity in total is needed. This however is dependent on maintaining the current market design which will allow price signals to take effect on the demand side.

2.5.2 Smart demand can play an important role in providing security to the electricity system and can have a direct and indirect impact on reducing carbon emissions. The commissioning of more nuclear power stations and wind turbines will displace older flexible and controllable plant. This will impact on the services that the System Operator needs to procure, which can either come from generation or demand.

2.5.3 Smart demand can compete in this balancing activity by controlling demand at customer premises by reducing, or time-shifting demand in response to inputs such as price, frequency or time of day.

2.5.4 In acting to smooth prices, smart demand should have an impact on customer's bills, either directly through payments for response or indirectly through reduced volatility in prices. Smart demand may have an impact in reducing carbon through smoothing demand prompting a lower need for less efficient peaking plant and also less need for fossil plant running as spinning reserve. It may also avoid the need for expensive network upgrades. Smart meters can be developed to have the capability to control demand in the household or in commercial or in industrial applications.

2.5.5 To avoid the conflict between price driven response and negative social impact, there should be greater attention to heat load shifting (and hence to the electrification of heating) than to overall

demand reduction in response to higher prices. The measures that lead to more effective intraday load shifting will lead to more effective response of average consumption to average prices.

3.0 Scenario Analysis

3.1 Scenario analysis is a sensible way to consider the future development of the electricity industry, as are stress tests. However some care is needed in that these should be internally consistent and should avoid combinations of circumstances that are conflicting. Construction of scenarios must therefore include the various dynamic correction and feedback mechanisms that are a key aspect of any market – including electricity and gas markets; otherwise they are not particularly helpful.

3.2 In addition, it should be remembered that small changes in assumptions and parameters can radically change the results, particularly on calculations of "residual" values such as effective capacity margin.

3.3 For example the assumption made about closure of existing stations (after only one year of negative returns) is probably unrealistic and may lead to some extreme results. In practice, closure decisions would be based on a forward looking NPV-type calculation. The expectation of lower capacity margins and therefore higher peak prices would give an incentive to keep stations open, even if they were loss making for a year or two. This would particularly be the case for those which are flexible enough to capture this value.

3.4 In general, the demand side is neglected. This is inconsistent with smart metering policy and needs to be addressed in further work if this process is to lead to sensible conclusions.

3.5 It is curious that the figures for "total investment costs" are not reflected in the expected movements in prices and customers bills. "Slow growth" has the lowest total investment costs and the highest bills. This cannot be right. It implies there should be some kind of consistency check in terms of whether and how the projected investments recover their costs on an ex-post basis. If there is systematic under or over recovery, the scenario is unlikely to be a realistic long term outcome.

Comments on the Scenarios

3.6 **Dash for energy**

This scenario does not seem to be internally consistent. A combination of rapid electricity demand growth and rapidly increasing prices over a 5-10 year plus period seems implausible both in policy and economic terms. The fact that investment does not seem to keep pace with demand appears to be a function of the modelling assumptions made. If such a scenario were to start to emerge, there would inevitably be some adjustment in behaviour or policy during this time; for example the higher price levels would constrain demand more quickly than is implied by the results here. Furthermore, the scenario implies a high level of CCGT build, while at the same time there are greater risks of interruptions to gas supply. It is not clear why nuclear output falls in this scenario.

3.7 **Green transition/Green Stimulus**

It is not likely that coal stations will close as assumed in green stimulus. IED allows opt out and it is not clear that coal stations would necessarily be non-economic in this scenario. In general the two green scenarios are not sufficiently different to tell us anything useful. This is a consequence of a projection period that is too short and does not allow enough time for any other substantial low carbon generation beyond renewables to be developed.

3.8 **Slow growth**
It is not clear to us why this scenario has the worst outcome for capacity margins. Why do nuclear and coal close so rapidly and get replaced with CCGTs, this seems rather perverse since slower growth would imply that new investment is less profitable?

4.0 Comments on the stress tests

4.1 The stress tests to us seem to cover a reasonable sample of individual events. We believe that the market will cope with individual events as has been demonstrated in the past. What might be useful is to combine two of the events and look at the results that these show. History has shown that it is when a number of events come together, that the market is stretched.

4.2 It is not clear how long the individual events are supposed to last; it is unlikely that a single event will impact over the entire winter.

4.3 As for the scenarios in general, there would be some market response that would reduce the need for administered curtailment for all of the stress tests. For example in the event of reduced gas supply, CCGTs would burn distillate or there would be increased production from coal. This would probably happen before curtailment of industrial users. Also electricity and gas exports would switch to import ahead of all other responses. Similarly, we are not convinced by the LNG stress test, we believe that UK prices would also shift upwards resulting in some flows to the UK.

4.4 Stresses can be made worse by regulatory failures as demonstrated by the events on the gas market in 2005-06. The lack of inflows into the UK, even when UK prices appeared higher, can partly be explained by the lack of integration of balancing mechanisms between the UK and neighbouring countries.

4.5 Looking forward the current discrepancy between UK and continental gas specifications, particularly Wobbe number, could exacerbate stresses as could the expectation of near universal firm industrial gas load from 2011.

4.6 It is notable that the electricity stress tests don't seem to produce any significant issues and that is before assuming a price response.

5.0 Conclusions

5.1 In summary RWE believes that the current market design framework, which has successfully delivered secure electricity and gas systems since 2001 along with substantial investment, can deliver the infrastructure needed to meet government targets for low carbon energy.

5.2 The energy industry is in a period of unprecedented change that will define the way we generate, transmit and use energy for the next 40 years. It is right that we should review whether the present market arrangements have the capability to deliver this, but our starting point should be that it can and we should think very carefully before we start to make changes, as it is likely that this will lead to further changes.

5.3 The risks to security of supply in the short to medium term are overstated. To a large extent the closures related to LCPD are covered by new capacity. The current draft of the IED allow for the remaining coal stations to continue beyond 2020, and possibly further.

5.4 Interventions in the market, such as MPLC, capacity mechanisms and mandated gas storage will

dampen the market response and will lead to further interventions in the future.

5.5 It is critical that the demand-side is allowed to develop if we are to meet government targets, this will only happen if price signals are not allowed to develop.

Yours sincerely

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