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Dear Ian

Project Discovery

National Grid owns and operates the high voltage electricity transmission system in England and Wales and, as National Electricity Transmission System Operator (NETSO) we operate the Scottish high voltage transmission system. National Grid also owns and operates the gas transmission system throughout Great Britain and through our low pressure gas distribution business we distribute gas in the heart of England to approximately eleven million businesses, schools and homes. In addition National Grid owns and operates substantial electricity and gas assets in the US, operating in the states of New England and New York.

In the UK, our primary duties under the Electricity and Gas Acts are to develop and maintain efficient networks and also facilitate competition in the generation and supply of electricity and the supply of gas. Our activities include the residual balancing in close to real time of the electricity and gas markets. Through our subsidiaries, National Grid also owns and maintains around 18 million domestic and commercial meters, the electricity Interconnector between England and France, and a Liquefied Natural Gas importation terminal at the Isle of Grain. National Grid is committed to safeguarding the global environment for future generations. As part of its strategy, National Grid is committed to:

- Reducing its own greenhouse gas (GHG) emissions - an interim 45% reduction in GHG emissions by 2020, as part of its target trajectory of 80% by 2050.
- Working with legislators and regulators to reshape energy markets; and
- Helping and supporting its customers, employees and suppliers in changing their behaviours so as to be more considerate to the environment.

National Grid is committed to playing its part in addressing climate change. In order to reach the Government's target of 80% GHG emissions reduction by 2050 and 15% of energy to be supplied from renewable sources by 2020 we will need Government, industry and consumer collaboration to determine a route-map for meeting targets. A joined-up, sequential approach is essential to get the right legislative and regulatory frameworks in place and ensure necessary infrastructure investment is available in a timely manner for the connection of new renewable sources of electricity generation. We also need to support the development of new technologies.

Executive Summary

The transition to a low carbon economy will necessitate investment in energy infrastructure estimated by Ofgem to be as high as £200bn by 2020 if the UK is to meet its renewables and carbon targets. This requirement will occur against a background of intense global competition for energy-related investment and resources. The UK therefore needs to ensure that it has in place a stable investment framework to attract investment of this magnitude.

Wherever possible, in order to deliver the most efficient solution for consumers and to achieve the required stable and attractive investment framework, the market-led principle in the UK energy markets should be maintained. To ensure the market can be relied upon to deliver in the future, the following measures will be required:

- Introduction of an appropriate and stable carbon “floor” price;
- Enhanced obligations (principally) on gas suppliers;
- Sharper imbalance prices;
- Increased demand-side participation

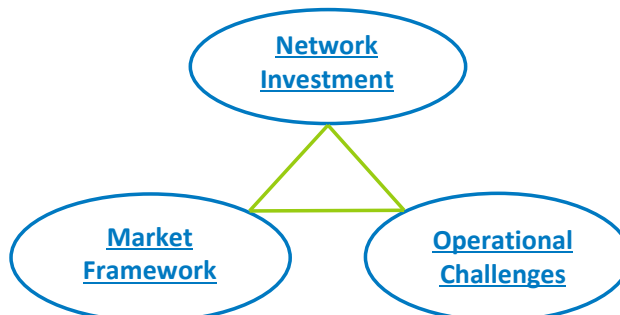
The introduction of a central renewables market, capacity auctions or a central buyer should be carefully considered; it seems more likely to us that the goal of sustainable, secure and affordable gas and electricity would be more efficiently delivered by maximising the role of the market. A central market function creates the risk that developers will not undertake any investment unless they win a contract/auction. Investment risks are thus socialised and borne by the consumer.

In addition, government and regulators should act to minimise risks and costs by:

- Ensuring a stable policy framework;
- Streamlining and improving the predictability of the process for obtaining planning permissions for major infrastructure projects;
- Providing a transparent framework and incentives for swiftly progressing new technology to demonstration stage and market readiness.

Introduction

We welcome the opportunity to respond to Ofgem’s ‘Project Discovery’ consultation. At National Grid we have undertaken a significant amount of work over recent months, focusing on the action which must be taken in three key areas if the UK is to achieve its transition to a low carbon economy successfully. These areas are:



- Network Investment – ensuring that new low-carbon and renewable generation can be connected to the electricity networks, for example, by the measures which we have identified at the Electricity Networks Strategy Group (ENSG). On the gas networks, ensuring the system is sufficiently flexible to meet new flow and usage patterns as the transition to a low carbon energy system progresses.
- Operational Challenges – the necessary changes to ensure the continued economic and secure operation of the electricity networks were explored in our consultation “Operating the Electricity Transmission Networks in 2020”. As part of this we continue to engage with electricity consumers and service aggregators in exploring the potential for growth in demand side Balancing Services. On the gas network, an increased reliance on operational measures will be important in addressing future needs.
- Market Framework – market behaviour with a low carbon generation mix as explored in Poyry’s “impact of intermittency” study, to which we contributed. On gas, we are improving network commercial arrangements to facilitate market-led developments of storage and other flexibility.

We are pleased to see Ofgem’s timely ‘Project Discovery’ exercise taking forward further consideration of the current market arrangements and whether they are capable of delivering secure sustainable energy supplies.

The question being asked is how to ensure that the market is sufficiently reactive to make the necessary investment to deliver a pre defined level of energy security of supply and decarbonisation. The options set out look at whether it is more efficient to reinforce the current market-based environment by driving markets signals more vigorously, or to attract the required investment with some form of single/central buyer.

The consultation also raises the question of which body should be responsible for the definition, agreement and implementation of strategic energy policy since many of the proposed ideas (such as the unwinding of a decentralised approach in favour of a centralised single buyer) would need to be taken forward by Government rather than the regulator.

National Grid views on options set out in Discovery

We favour an approach based on maintaining and further developing an effective competitive energy market (because it is most likely to discover the services consumers want and the most efficient way of delivering them). Where an effective market is not achievable (for example, in the case of monopoly network functions) regulation should safeguard consumers by implementing incentives that as far as possible replicate those that would exist in a competitive market. Government and regulator interventions in the market should be directed at addressing:

- failures to value and internalise externalities (such as the effects of greenhouse gas emissions)
- inaccuracies in signals derived to inform the market concerning balance and network capacity
- barriers to market entry or barriers to effective participation by the demand side.

In addition to avoiding barriers to new technologies, policy makers will also want to encourage the development of technology options that could bring benefits in the future. Such support should be provided in a manner that minimises distortions to the effective operation of the market.

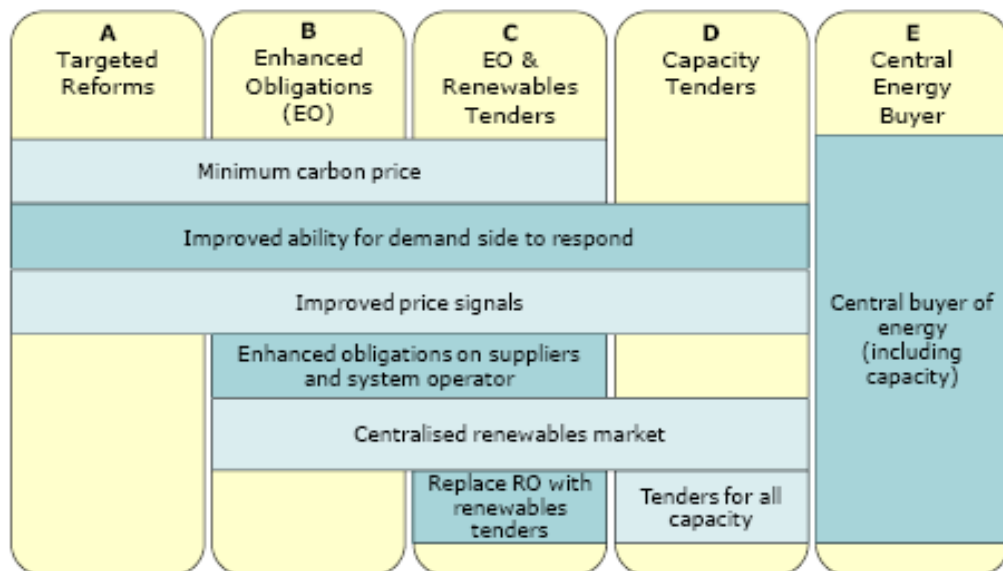
The Project Discovery assessment correctly identifies 5 concerns: (i) delivering unprecedented investment in an uncertain financial environment; (ii) decarbonisation; (iii) the risk that short-term price signals are insufficiently accurate to inform the correct long-term investment decisions; (iv) security of supply risks; and (v) the threat of higher bills. Most of these issues are not new - indeed, they could

be summarised as the risks of security, sustainability and affordability. However, to the list of identified concerns we would also add:

- regulatory risk: in order to commit to unprecedented levels of infrastructure investment, developers will need a stable regulatory environment based on well-understood and proven market arrangements rather than radical, untested interventions;
- public acceptance risk: the ability to gain consumer and public acceptance of carbon mitigation costs and impacts will be essential if projects and developments are to go ahead in time to meet 2020 targets;
- planning risk: we welcome the recent introduction of the infrastructure planning commission to provide centralised planning consents for infrastructure projects deemed to be of importance to the UK for security of energy supply, and we hope that this will be a major factor in the timely future delivery of critical infrastructure.

These concerns are common to both the electricity and gas market, and they are also generally shared by markets in Europe and elsewhere.

The consultation suggests five policy “packages”, each consisting of a number of elements (some of which are common to two or more packages). The packages range from minimal action (Targeted Reforms) to significant intervention (Central Energy Buyer) – only “do nothing” and “full re-nationalisation” could be considered more extreme. In our response, we have considered the individual elements of these packages rather than the packages themselves.



Minimum carbon price

It is important to provide certainty of returns for investment. Discussions with energy infrastructure investors indicate that this certainty does not currently exist and so investment, particularly in sufficient low carbon infrastructure, is unlikely to be delivered with the current regime. It is also important to take into consideration the global competition for capital. Most investors are able to choose between investment in the UK and elsewhere which means that the UK commercial environment must be at least as attractive as that in other countries around the world.

This stability can best be achieved through a robust carbon price. A secure long-term carbon price will provide broad based support for the deployment of mature low-carbon technologies such as nuclear and wind, allowing the phase-out of the renewables obligation. The broad, general signal that would be provided by a stable carbon price would be more likely to deliver efficient investment decisions across all sectors (e.g. generation and heat) than technology-specific interventions. We note recent claims that further support is necessary to bring forward nuclear generation and these ought to be carefully scrutinised before they are accepted.

The market-based options for achieving a robust carbon price are a carbon tax or carbon cap-and-trade (as already implemented in the EU Emissions Trading Scheme (ETS)). The former fixes the price of carbon emissions and allows the markets to determine the volume, and the latter fixes the volume of emissions and allows the market to determine the price. The choice between the two is essentially a political one. Of the two options, a carbon tax would be the most certain way to set a robust price, but would result in opposition from tax-payers and polluters, and might be difficult to instigate in a manner compatible with EU legislation. On the other hand, a more robust UK carbon price might be delivered by modifications to the current EU ETS. The extent to which the UK could proceed unilaterally with such modifications would depend on both legal and practical issues.

Only if these other mechanisms prove impossible would we recommend strengthening and extending the renewables obligation on suppliers to include low carbon generation such as nuclear and CCS. This “low carbon obligation” on suppliers would build on an existing framework, could be linked to carbon budgets and could be delivered unilaterally by the UK government without need for a European or global consensus or deal.

Demand side response

Responses to our “Operating the Electricity Networks in 2020” report indicated that flexibility within this time scale is likely to come predominantly from electricity generation, rather than demand. Nevertheless, by keeping supplier obligations more generic, innovations in demand side management and other options such as storage should have opportunity to develop

To facilitate demand side response solutions, a coordinated plan for Smart-meter roll-out in tandem with a move towards time-of-use pricing signals for all consumers should be a priority. This would be a necessary condition for effective participation by small consumers, and would enable significant demand-side developments (e.g. charging of electric cars) to be introduced without risk to the secure operation of the system. The Smart-meter roll-out should be integrated with development of a smart grid in order to maximise the potential benefits.

It must be remembered that a significant proportion of demand-side participation in the gas market will be provided by Combined Cycle Gas Turbine (CCGT) generators, and this could have serious ramifications for electricity security of supply. The consultation suggests the possibility of introducing additional requirements for dual-fuel capability on all CCGTs and we consider that this and the interrelationship between gas and electricity security would merit further investigation.

Improved price signals

Among the measures proposed in the consultation to address near-term and ongoing issues are sharper imbalance prices. However, particularly in electricity market terms, sharper short-term signals are unlikely to be sufficient on their own to encourage investment in either the near term or the longer term. Therefore, market improvements should involve both sharper imbalance prices as well as increased supplier obligations. Without such obligations, the market might contract for supplies which won't necessarily be delivered in tough conditions: the solution needs to ensure the market considers both supply and deliverability.

Deliverability will be increasingly important as the connection of more intermittent generation will place more volatile demands on other (e.g. CCGT) generating plant. The revenue risks experienced by this other generating plant will become more volatile meaning that the market signals will need to reflect the value of having this flexible generation on the system.

Enhanced obligations on suppliers and system operator

On enhanced supplier obligations, particularly in light of the potential for the introduction of EU-wide Public Service Obligations, there would be merit in considering similar Compulsory Stockholding Obligations in the gas market as those that exist in the downstream oil market. This would require suppliers to hold or have access to a proportion of their domestic gas in storage (or via long term contracts for supply or demand-side response). As highlighted above, such a mechanism would not be effective on its own because it is important that the supplier contracts to energy supplies which would be deliverable in extreme, high demand circumstances. However, in combination with sharper price signals, enhanced obligations on suppliers could provide a mechanism for clarifying the level of security of supply “insurance” to be delivered by the market. A clear supplier obligation would encourage the market to place an accurate value on the risk of loss of supply. This, in turn, would provide a greater degree of certainty for investors to assess the economics of infrastructure such as strategic gas storage, as well as fast-cycling storage (which the market has delivered with reasonable effectiveness). The enforcement of the enhanced obligation could be left unmonitored – leaving the responsibility with individual suppliers to comply with subsequent enforcement in the event of failure but we would recommend that suppliers should be obliged to report to Ofgem annually on their plans to meet peak demands. Ofgem could also undertake detailed scrutiny of market participants’ balancing plans.

In terms of networks and the System Operator function, the regulatory regime must also recognise that network flexibility will become increasingly valuable. There is, therefore, a careful balance to be made between network flexibility, which keeps options open, and assets that in hindsight appear to be stranded. (In the UK, Ofgem have already recognised this issue in their RPI-X@20 emerging thinking consultation). We believe it is important to develop a regulatory regime that enables efficient anticipatory investment, appropriately values network flexibility/‘optionality’ and adequately supports research and development. The Low Carbon Network Fund for distribution networks is a positive step and this could be usefully extended to the TO and SO functions.

The consultation proposes some specific enhanced obligations on System Operators, such as an obligation on the Electricity SO to contract forward for back-up and flexible generation, and on the gas SO to buy imported gas in an emergency (which confuses the roles of gas SO and Network Emergency Coordinator, currently two discrete functions). It is our view that placing such obligations on the SO would undermine the incentives on suppliers and shippers who are best placed to understand the impact of a changing generation mix to make their own arrangements to cover emergencies (as described above). This would be particularly problematic in the absence of clear definitions of what differentiates “emergency” gas from gas in general, or “peak” electricity from electricity in general. Ofgem themselves acknowledge in the consultation that sterilisation of capacity would only work in theory.

Centralised renewables market

The centralised renewables market seems to comprise two components: 1) the establishment of streamlined market arrangements that reduces the transaction costs that would be incurred by certain technologies (for example with variable output characteristics); and 2) a degree of socialisation of costs by adjusting SO balancing charges and imbalance calculations for certain favoured technologies.

Benefits associated with the first component can be delivered by existing market participants (for example, within power exchanges) without extending system operator functions. Indeed, to avoid any perceptions of biased operation, implementation by means other than via the system operator’s systems would be beneficial. The second component, in so far as it deliberately favours operation for certain participants, risks increasing expectations that the system operator will undertake a still greater

range of functions and undermine incentives for participants to invest and operate appropriately. For this reason, if additional support is required for certain technologies it should be provided transparently as part of defined support mechanisms rather than through biased system operation. In general Ofgem's thinking does not distinguish adequately between the different measures needed to encourage mature and immature technologies.

Capacity tenders

The key consideration for capacity tenders is whether a workable and unbiased separation of capacity and utilisation aspects of energy production and delivery can be achieved. While there is some international experience that suggests there is scope for improvement on those arrangements that were implemented in the England & Wales Pool, nonetheless it is for consideration whether the risks of introducing a hard to verify capacity product (i.e. payments for power stations that are not able to deliver) are justified given any residual "missing money" effects following improvements to short-term market signals.

It would also seem odd to expend considerable effort to introduce a measure which is "carbon blind" when there are so many technology support measures needed to establish viable options to better facilitate the transition to low carbon.

Central energy buyer

The market is best placed to efficiently deliver a secure energy supply. Against the backdrop of the enormous energy infrastructure investment required consumers will not be able to afford, over the coming decades, to pay for an inefficient solution. The lower costs of capital which the consultation suggests would arise from a central buyer approach are unlikely to be realised. The central buyer approach does not reduce the undiversifiable risks of developing the power system. Costs and risks are socialised and passed to the consumer (who can't control them) instead of leaving them with industry parties (who can control them). In this respect, a market-based solution is more cost effective.

Other considerations

There are a number of other factors which should be taken into consideration:

- Regardless of the details the final solution, any changes must not in themselves undermine certainty by creating the perception of additional regulatory or political risk factors.
- In terms of policy measures beyond those contained in the consultation document, we think that the road map to 2050 should also be considered, to ensure that policy decision-making supports that path. For example, it may be desirable/necessary to store renewable gas to support peak capacity requirements and so storage capacity may need to be broadened to local as well as large strategic facilities. Similarly, if seasonal storage of gas is to be encouraged, then the introduction of a seasonal element to imbalance prices might be appropriate.
- The acceleration of emerging technologies such as CCS should be encouraged with targeted incentives to facilitate commercialisation. The demonstration of new network technologies is urgent and requires early investment. Once the technology has been developed and demonstrated, the transition to market-based arrangements can be pursued.
- Many of the measures identified, (but especially demand-side response and improved price signals) would benefit from a programme to encourage customer awareness, acceptance and home efficiency. General measures to encourage public acceptability of national infrastructure might also ease consenting issues.
- The various proposals would all generate significant implementation costs. For example, the consultation does not appear to take account of the IT development costs, and these should be taken into account when assessing cost-benefit of proposals (whether considering the "packages" or the individual measures).

- Project Discovery's proposals for UK security of gas supply over the medium term fit well with the anticipated EU security of supply priorities. However, the provisions of EU security of supply and the 3rd Package seek to provide common gas quality standards which would require a UK market response, possibly involving establishment of a centralised role to resolve gas quality issues.
- Renewable gas has the potential to become a significant contributor to environmental targets and also a new indigenous supply source to supporting supply security on gas. Blending of natural gas with biomethane, coupled with energy efficiency measures such as insulation, would enable continued use of this existing gas infrastructure to supply heating loads whilst keeping within GHG targets in the longer term. It will therefore be important to facilitate commercial and gas-quality arrangements to enable the connection of renewable gas sources, for example by ensuring that gas quality specifications are not more onerous than they need to be to safeguard consumers.

We would be happy to expand further on any of these comments.

Yours sincerely

[By e-mail]

Paul Whittaker
UK Director of Regulation

Appendix: Responses to Questions Raised in the Consultation

Q1: Do you agree with our assessment of the current arrangements?

Broadly the assessment represents a fair reflection of current arrangements. Most of the issues identified are not new, and many are surmountable, especially given ongoing technology and regulatory developments. Clarification of the responsible body for definition, agreement and implementation of strategic energy policy is needed.

Q2: Are there other aspects of the current arrangements which could have a negative impact on secure and sustainable energy supplies, or costs to customers?

The issue of regulatory risk is understated, as are the risks associated with consumer and public acceptance of carbon mitigation costs and impacts, and the risks of uncertainty and delays in the planning consent process.

Q3: Do you agree that the five issues we have highlighted are the most important?

Yes, but government and regulators should also act to avoid unduly increasing the cost of capital to the sector and minimise other risks and costs by: ensuring a stable policy framework; streamlining and improving the predictability of the process for obtaining planning permissions for major infrastructure projects; and providing a transparent framework for swiftly progressing new technology to demonstration stage and market readiness..

Q4: Do you have any comments on our description of what might happen if no changes are made to the current arrangements?

It could be simplified to a risk of insecurity, missed environmental targets and unacceptable prices. The market's ability to deliver investment in seasonal gas storage should also be considered.

Q5: Do you believe that our policy packages cover a sufficient range of possible messages?

Yes, but the sustainability of each set of measures should be assessed.

Q6: Do you have suggestions for variants to these policy packages?

We believe the optimum solution would incorporate an appropriate and stable carbon floor price, sharper imbalance prices, some elements of demand-side response and enhanced obligations principally on suppliers. The introduction of a central buyer or central capacity market (for renewables or other) is unnecessary, because the benefits of such an approach should be deliverable by market participants without creating a central market. It also introduces the risk of increasing expectations that the system operator (or other central agency) will undertake a still greater range of functions and undermine incentives for participants to invest and operate appropriately.

Q7: What other policy measures do you believe should be considered and why?

All proposed measures would benefit from a programme to encourage consumer awareness, acceptance and home efficiency. Carbon contracts for difference could complement a minimum carbon floor price and sharper imbalance prices to facilitate the development of low carbon technologies.

Q8: Do you agree with the assessment criteria that we have used to evaluate the policy packages?

Yes, but a cost-benefit analysis framework could be incorporated.

Q9: Do you have any comments on our initial assessment of each of the packages?

Timescales and implementation costs have been underestimated. IT development costs do not appear to have been included. Delivery of infrastructure and IT projects will depend of having an adequate pool of skilled engineers.

Q10: Do you agree with our summary of the key benefits and key risks of each policy package?

Yes.

Q11: Do you have a view on which package is preferable, or alternative policy measures or packages that you would advocate? We are particularly interested in any analysis you may have to support your views?

Solutions should maximise the role of the market. The optimum solution would incorporate a minimum carbon floor price, sharper imbalance prices, some elements of demand-side response and enhanced supplier obligations. This combination does not match any of the “packages”.

Q12: Do you agree with our assessment of the timing for important investment decisions?

Planning timescales may be more onerous, particularly if there is poor public acceptance of the need for the measures/technologies. Timescales might also be lengthened by the necessity for changes to primary legislation and development/implementation of IT systems and processes.

Q13: Do you believe that early actions should be considered?

Yes. Early start on new technology options should be encouraged.

Q14: Do you think that the issues are such that policy measures should be considered as a package or should they be considered on a case by case basis?

Necessary measures should be identified individually but implemented as a package, particularly since many offer complementary benefits. The root issue of whether to unwind a decentralised approach and adopt a centralised single buyer for key areas should be addressed by government.