

ELECTRICITY MARKET REFORM

This response is submitted by the Institution of Engineering and Technology (IET), The Royal Academy of Engineering (RAEng) and the Institution of Chemical Engineers (IChemE).

It draws on the expertise of professional engineers in the energy sector and was prepared by the IET's Energy Policy Panel in consultation with Fellows of the Academy with expertise in relevant fields. It takes into account comments from experts in the wider IET and IChemE membership and Academy Fellowship.

The IET, Academy and IChemE welcome the Government's intention to reform the electricity market. This is overdue in a world that has changed considerably since the last major reform. Change is occurring at an ever accelerating pace and will continue to do so as the UK, Europe and all markets transition to a low carbon energy system whilst maintaining a secure supply and minimising impacts on costs to consumers.

Key Issues

We have answered those questions within the consultation document where we have relevant expertise. However a number of overriding themes emerge from our response, as follows:

- **The risk of excessive complexity** – the reforms appear designed as individual 'bolt-ons' to the current (already complex) market structure to fix a series of market failures limiting deployment of different generation technologies¹. Each limits further the role of the core BETTA market and reduces its relevance. This appears likely to create a market of excessive overall complexity, with concomitant opportunities for gaming by large generators and a high chance of unexpected outcomes. There seems to be at least a case to explore more fundamental change to the market as a whole, possibly involving a more directive role by government but with the private sector continuing to build, own and operate the capacity. At the very least we would hope that the views of financiers to risk in the proposed arrangements have been tested, and the opportunities for gaming and perverse outcomes explored thoroughly.
- **Handling of demand response and storage** – we agree completely with the Government's analysis that these will be very important in the future. However it is unclear whether the proposed arrangements have given them full consideration. For example it is currently unclear over what time periods demand and storage will play a role, and how this will relate to the uncertainties in likely generation patterns. At the moment it is too early to take firm views on this, but care needs to be taken that the market arrangements do not, for example, trigger new supply capacity because demand management or storage potential has not been explored effectively.
- **Achieving the right balance between direction and market selection of the overall plant mix** – various instruments are being proposed to incentivise different generation technologies, but there does not seem to be either a policy instrument or the market freedom

¹ Broadly, Feed-In Tariffs to give greater certainty for renewables, a carbon price floor to incentivise nuclear, an Emissions Performance Standard to bring clarity for carbon capture and storage projects, and a capacity payment to deal with uncertainties in the requirements for thermal power plant or other back-up in a wind heavy electricity system

to determine the capacity mix that will result. Instead this would seem likely to emerge as an outcome of how the various instruments interact. The right capacity mix is important: firstly to allow the effective management of input fuel supply security at national rather than company level and secondly to ensure appropriate operational flexibility in the supply and demand mix. The envisaged market arrangements do not seem to place a financial or strategic value on either of these characteristics.

- **Creating an enabling environment to allow future management of infrastructure interdependencies and resilience** – considerable work is ongoing by Infrastructure UK, Engineering the Future and various research groups to better understand infrastructure resilience and interdependency of energy infrastructure with other infrastructures. The impact of this on electricity build decisions is currently less than clear, and it may be that key issues can be addressed outside of EMR. However this should be explored further.
- **Dealing with large uncertainties** – over the timescale for which we would hope and expect the EMR to operate there are a very large number of uncertainties over which individual technologies will prove to be winners and losers in a future decarbonised electricity system. It will be important to experiment and to accept that some experiments will fail. Policy coordination between all Government Departments will be important (particularly DfT, DCLG and Defra). Appropriate attention will need to be given to small and medium scale supply solutions in addition to large scale supply, demand management and storage. If not incentivised through the market additional measures may be needed to bring forward new solutions for trials, and additional incentives may be needed in the future if these are to be given appropriate roles going forward. Any potential new mechanisms will present continuing challenges to market confidence and will need to be managed with care. It would be unfortunate if the EMR was to stifle promising options because they did not fit the model.
- **Enabling the smart grid** – if the UK is to pursue a high-wind future energy system and especially if demand increases significantly owing to switching of transport and space heating to electricity, it is vital that a smart grid is deployed on a timescale commensurate with the currency of the proposed EMR. Appropriate enabling activities need to be undertaken and incentives put in place to make this happen. If this is delayed the industry will either respond piecemeal, leading to substantial investments that might become stranded after a short time, or will respond with supply side solutions – perhaps triggering capacity payments for large amounts of new fast-to-build thermal generation as an alternative to demand participation and storage

Please let us know if we can be of any further assistance.

Yours sincerely,



Paul Davies
Head of Policy
The Institution of Engineering and Technology
Michael Faraday House
Six Hills Way
Stevenage, SG1 2AY

Email pdavies@theiet.org
Telephone: 01438 76 56 87

Responses to specific questions follow:

CURRENT MARKET ARRANGEMENTS

1. Do you agree with the Government's assessment of the ability of the current market to support the investment in low-carbon generation needed to meet environmental targets?

We feel that Section 1 of the document presents a fair analysis of why the market is not well equipped to address the massive challenges facing UK electricity as the sector seeks to decarbonise whilst maintaining secure and reasonably affordable supplies to customers.

It is time for the UK electricity system to move past the old paradigm of easily controlled generating technologies supplying inflexible demands to a much smarter, dynamic system. This requires new market structures and a forward looking approach from Government, regulator and industry.

However there are some issues of balance and emphasis we would wish to draw out:

- The economic downside of insufficient electricity is usually very much greater than the cost of its provision. When assessing supply security risks it is therefore usually justifiable to err on the side of over-provision. However in such an analysis it is important to understand the differing value of lost supply for different classes of demand to allow sensible decision making. We note that the consultation paper seems to imply increased levels of expected energy being unserved in the future. The opportunity to manage this through "soft" measures such as voltage reduction needs further exploration.
- The importance of long term stability in future market arrangements cannot be over-emphasised. Although the current challenges are mostly around building confidence in nuclear and gas as well as incentivising major renewables, these at least in principle are associated with a power system operated in the same way as for the last decades. In the future, variable demand, energy storage and community energy, all enabled through a smart grid, is likely to be a major direction of travel. The reforms being considered now need to take into account these future possibilities even if they do not deal with them completely. It is vital that future changes to enable new technologies and solutions do not destabilise confidence, either by making investors fear the consequences of potential new technologies on shorter term investments, or by disincentivising investment in the newer technologies as they become available.
- In the future there will be much greater technical linkages between electricity and other energy pathways, such as use of fossil or biofuels for space heating. This possibility needs to be recognised (for example at times of surplus wind power it may be worth directing this energy to heating water using domestic immersion heaters, something that might otherwise be done using gas, oil or biofuels).

2. Do you agree with the Government's assessment of the future risks to the UK's security of electricity supplies?

We broadly agree with the risk assessment to supply security. Some aspects of this issue are well understood in the planning of national power systems worldwide, such as the diversity of input fuel sources and technology types (although, the recent political situation in the Middle East serves as a reminder that there are major risks associated with the supply and price of fossil fuels on the global market). What is very much less well understood is the management of large amounts of self-dispatching generation (mostly wind) in a world where new designs of low carbon thermal generation and nuclear plant are likely to be significantly less flexible compared to the current fleet.

There is also much uncertainty. Much of the opportunity in demand response is related to electric vehicle charging and heat pumps, neither of which are currently deployed at scale anywhere in the world. It is not yet clear that these will emerge as preferred technologies or, even if they do, the rates at which they will be deployed. Likewise the opportunity presented by interconnection needs

further work. If the whole of Europe is short of wind energy on a particular day, interconnection could be more a hindrance than assistance, though this may be countered by opportunities to access solar and hydro in other jurisdictions. The underpinning systems analysis and research in this area is only beginning.

In developing a market response for this the concept of incremental development is important. Developers will understand this and prefer it to the much bigger risk of future big bang type changes.

OPTIONS FOR DECARBONISATION

Carbon Price Support

This is the subject of a separate HM Treasury / HMRC consultation. Readers of this consultation with specific comments on the carbon price support mechanism should cover these in a separate submission to the HM Treasury / HMRC consultation, which can be found at http://www.hm-treasury.gov.uk/consult_index.htm

In a letter responding to the Treasury's inquiry on a carbon price support the Academy, the IET, ICE and IChemE were generally supportive of the Government's plan to introduce a carbon price floor as part of wider proposals to reform the UK's electricity market. There were several specific points made about the proposal. These are repeated below.

Increased confidence in a mechanism to support the price of carbon is essential to encourage investment in low-carbon generating technologies. It is clear that the EU Emissions Trading Scheme (ETS) is not providing a sufficiently robust carbon price signal and additional support is required. There are, however, several issues worth highlighting:

- The final mechanism must provide long-term confidence for investors in low-carbon technology. Previous Government support mechanisms or penalties have, on occasion, been subject to unexpected revisions. This increases the financial risks and has a detrimental effect on the Government's credibility with investors.
- The mechanism must be compatible with the complete raft of proposals to reform the electricity market.
- With the carbon support mechanism only being applied to the electricity market there is a danger that it could have unintended consequences in the heat and transport markets which are inextricably linked via their reliance on fossil fuels.
- The UK unilaterally introducing a carbon price floor may have unwanted effects if the marginal price difference with the wider EU ETS price becomes significant. It could have a direct effect on electricity interconnections with Europe and could also have knock-on effects for UK industry due to relatively higher energy prices compared to EU competitors.

Clearly, the final details of how the scheme will function will be crucial. However, the scale of investment required in the UK electricity sector is so huge that any mechanism that increases confidence for investors and aids delivery of the required infrastructure is to be supported. This is particularly true for low-carbon technologies which are generally capital intensive and long-term.

FEED-IN TARIFFS

Feed-in tariffs can be highly effective at bringing forward new capacity of the type targeted, but introduce distortions into the wider market. They create incentives to generate whenever possible, which could force negative pricing in the wider market (e.g. forcing nuclear to reduce output which would be technically difficult). This problem can be handled if the scale-up of renewables under a FIT runs hand in hand with the full development of demand participation in the market, which in turn will need a smarter grid.

3. Do you agree with the Government's assessment of the pros and cons of each of the models of feed-in tariff (FIT)?

We would agree in general with the assessment of each of the types of feed-in tariff. However, a note of caution needs to be sounded regarding the assumptions made in the models used to assess performance. The consultation document is very clear in listing the limitations of the modelling, some of which are relatively serious such as assuming no financing constraints and liquid markets. This is unavoidable but does lead to a difficult situation whereby any new market arrangements need to be predictable in the long-term to provide investment certainty but also flexible enough to adapt to unforeseen situations. Obviously, no amount of modelling will eliminate uncertainties completely but the greater the range of future scenarios considered, the better the chance of at least highlighting situation where the new market mechanisms would fail and need to be amended.

4. Do you agree with the Government's preferred policy of introducing a contract for difference based feed-in tariff (FIT with CfD)?

As noted in the consultation document each of the mechanisms for low-carbon generation support have their good and bad points. The most worrying aspect of the proposed FIT with CfD is the fact it would favour established, large-scale generators and potentially fail to attract new entrants into the market. This is essential to encourage a diverse and responsive generating market able to attract new low-carbon technologies. The extent to which this would be a problem will depend on the details of how the CfD would be implemented but the most serious barrier for small-scale, new market entrants would be the level of complexity in administering the scheme and the length of contracts they would be tied to.

5. What do you see as the advantages and disadvantages of transferring different risks from the generator or the supplier to the Government? In particular, what are the implications of removing the (long-term) electricity price risk from generators under the CfD model?

The extent to which Government should bear risks currently taken by generators depends substantially on how the investment climate for new generation is seen in the UK compared to other countries. Although, for example, the Renewable Obligation could be seen to present a favourable investment model for some renewable technologies, its inherent complexity and the existence of downside scenarios compared to simpler FIT schemes elsewhere in Europe have resulted in much more limited deployment in the UK than in some other countries employing similar but simpler mechanisms. If the Government wishes to incentivise massive deployment of renewable or other generation in the years ahead, the incentives will need to be seen by generators as both sustainable and reasonably generous – though setting the defined level of reasonableness here will inevitably be challenging. FITs will need to be presented with commitments to their long term sustainability.

6. What are the efficient operational decisions that the price signal incentivises? How important are these for the market to function properly? How would they be affected by the proposed policy?

Not answered.

7. Do you agree with the Government's assessment of the impact of the different models of FITs on the cost of capital for low-carbon generators?

Not answered.

8. What impact do you think the different models of FITs will have on the availability of finance for low-carbon electricity generation investments from both new investors and the existing investor base?

We would again emphasise the international nature of most power sector investors and the need not to appear more risky for investors than other comparable global opportunities. But any financial mechanism that promises greater certainty in the level of returns should help to attract investment to the UK energy market. As mentioned above there needs to be well communicated intent for the regime to be stable for an extended period (or at least grandfathered for those who invest on the basis of it). Likewise, technology banding needs also to be grandfathered.

9. What impact do you think the different models of FITs will have on different types of generators (e.g. vertically integrated utilities, existing independent gas, wind or biomass generators and new entrant generators)? How would the different models impact on contract negotiations/relationships with electricity suppliers?

It is inevitable that large, vertically integrated energy companies will fare better in negotiations. They have the personnel, resources and experience to get the most out of whichever mechanism is put in place. The UK energy market is already complex and even large, non-energy businesses can find it difficult to break into the market and employ experienced energy companies to carry out the administration duties. Fixed payment FITs would clearly offer a level of simplicity that would eliminate some of the potential barriers to small, new entrants.

10. How important do you think greater liquidity in the wholesale market is to the effective operation of the FIT with CfD model? What reference price or index should be used?

Not answered.

11. Should the FIT be paid on availability or output?

Payment of FIT should be on the basis of output otherwise there is no incentive on the generator; there should be a separate mechanism for dealing with availability, for example through capacity payments (see response to 19). Payment of FIT on availability effectively transfers the renewable resource risk from generators to electricity customers (or perhaps Government). There is plenty of evidence that investors have become comfortable with resource risk in wind and solar and there would seem to be no case for that to be borne by others. However, if the amount of wind and solar capacity increases by the levels expected there could be a situation in the future when, for example on a warm, windy summer day, there is a surplus of generating capacity and some wind and solar power is not required. This would be an additional risk generators do not currently need to consider. This risk either transfers to other generators who are knocked off the bars, or remains with the FIT generators with their energy being spilled.

In the case of bioenergy there remain issues of securing long term feedstock supply agreements at predictable prices and with acceptable environmental impact. There is potentially a role for Government here, perhaps via the Green Investment Bank, in helping generators manage this risk such that projects become bankable. Other constraints on output, such as network limitations, should also be handled outside the FIT – i.e. network constraints should be a generator risk as far as the FIT is concerned.

Emissions Performance Standards

Questions 12-16 are answered together:

12. Do you agree with the Government's assessment of the impact of an emission performance standard on the decarbonisation of the electricity sector and on security of supply risk?

13. Which option do you consider most appropriate for the level of the EPS? What considerations should the Government take into account in designing derogations for projects forming part of the UK or EU demonstration programme?

14. Do you agree that the EPS should be aimed at new plant, and 'grandfathered' at the point of consent? How should the Government determine the economic life of a power station for the purposes of grandfathering?

15. Do you agree that the EPS should be extended to cover existing plant in the event they undergo significant life extensions or upgrades? How could the Government implement such an approach in practice?

16. Do you agree with the proposed review of the EPS, incorporated into the progress reports required under the Energy Act 2010?

When looked at in the context of the complete raft of measures proposed in the EMR it is difficult not to consider the EPS as an excessive layer of regulation that will do little to help reduce the carbon intensity of the grid and could have a detrimental effect on security of supply.

However, if the Government is committed to the EPS there is a need to review how it is intended to work on gas fired plant, which is not mentioned in the relevant part of the consultation. The proposals seem to only consider coal with partial CCS. No mention is made of gas fired plant with or without possible CCS. The problem could be more acute for CCGT plant or especially OCGT plant. This latter type of plant seems likely to play an ever increasing role in the UK as back-up to wind and load factor limitations imposed by an EPS may be unhelpful to supply security.

The issue of existing plant is interesting, especially given that retrofit solutions for CCS have considerable potential in that they avoid the need to obtain planning consent for new coal fired plant and instead tend to be seen as clean-up measures. Government needs to decide where it wishes the balance of incentives to lie. If an EPS is applied to all of an old coal station that has been partially fitted with CCS then this imposes additional limitations on the operation of the unabated units at that site. Given that we seem likely to have to rely on old coal units for some while longer this then presents a supply security concern in the short to medium term.

17. How should biomass be treated for the purposes of meeting the EPS? What additional considerations should the Government take into account?

It is not clear how biomass should be treated in relation to an EPS but the co-firing of biomass needs to be encouraged, particularly when done in conjunction with CCS.

18. Do you agree the principle of exceptions to the EPS in the event of long-term or short-term energy shortfalls?

There are many uncertainties in the future development of the electricity system. Exceptions to the EPS in the event of short term energy shortfalls provide a low cost flexibility which we would encourage, though care needs to be taken that this does not discourage innovation in demand management or storage. Longer term exceptions seem less helpful as, amongst other things, they dilute incentives to build new plant.

OPTIONS FOR MARKET EFFICIENCY AND SECURITY OF SUPPLY

19. Do you agree with our assessment of the pros and cons of introducing a capacity mechanism?

Given the long term nature of generation investments and the huge uncertainties in the next 20-30 years of evolution of the UK electricity and energy system it would seem important to move away from the current system where generators take full dispatch risk. Future load factors for CCGT and coal plant are very difficult to predict. This will either mean heavy risk pricing by investors or, perhaps more likely, investment not coming forward at the required scale and creating a risk to supply security. In addition the likelihood of sustained anticyclone conditions, as seen in December 2010, could mean there is a need to maintain fossil fuel generating capacity that, by traditional standards, would be counted as uneconomic. We would therefore see a capacity mechanism as important to future supply security. However this needs to be implemented with care to avoid disincentivising intermittent renewables such that renewables targets are imperilled.

20. Do you agree with the Government's preferred policy of introducing a capacity mechanism in addition to the improvements to the current market?

We believe that the other improvements are targeting different issues to the proposed capacity payment:

- a) FITs are there explicitly to reward renewables outside the rest of the market.
- b) An EPS is only to deal with controlling unabated use of new fossil fuel plants and is not part of an incentive package

- c) A carbon price floor should assist in removing market distortion caused by an artificially low EU-ETS carbon price, but this does not deal with the very large load factor uncertainties looking forward for high marginal cost plant

Hence we believe a capacity payment mechanism is necessary to give confidence to investors in lower load factor, high marginal cost plant, principally CCGTs and OCGTs. However a detailed exploration of the interaction of the various incentives needs to be undertaken for all relevant technologies under a range of scenarios to become confident that perverse incentives do not evolve.

21. What do you think the impacts of introducing a targeted capacity mechanism will be on prices in the wholesale electricity market?

We are not expert in market modelling but to us the answer to this question is a measure of success for the presently proposed policy package. The aggregate rewards to generators and demand/storage providers through capacity payments and wholesale power sales should be sufficient to encourage investment but not so much as to over-reward.

22. Do you agree with Government's preference for the design of a capacity mechanism:

- **a central body holding the responsibility;**
- **volume based, not price based; and**
- **a targeted mechanism, rather than market-wide.**

We understand why the Government wishes to restrict capacity payments to capacity provided in response to market failures, but believe this would be difficult to achieve in practice. We would expect generators to game this arrangement, withholding capacity until the central body decided a shortfall was imminent and triggered the payment. Given that at this point there would be an urgent need for plant it would then be likely that the wrong sort of capacity was built because it was needed quickly. There would also be market uncertainty over the future use of this capacity once built and potentially markets may anticipate triggering the capacity mechanism months or years in advance. The solution to this issue is not obvious, but we wonder if a solution might lie in applying capacity payments to all new flexible plant (i.e. not nuclear, not most renewables). The flexibility of coal CCS and gas CCS has yet to be determined. The capacity mechanism is likely to bring forward build of OCGT and CCGT plant leading potentially to an over-dependence on gas. Scenario planning around that risk should be part of the process of setting the mechanism.

23. What do you think the impact of introducing a capacity mechanism would be on incentives to invest in demand-side response, storage, interconnection and energy efficiency? Will the preferred package of options allow these technologies to play more of a role?

We would agree there is some potential for demand control, storage and interconnection to play a role in capacity provision. However this needs very careful further analysis. For example – can an interconnector really guarantee capacity when wind in UK is short (as it is quite likely that wind elsewhere in Europe will be short at the same time) and how much capacity could it realistically carry? Demand response is very complex. Some might be available on demand, but only for limited periods. Other demand response will only be available at certain times of the day. The situation is likely to get even more complex with the electrification of heat and transport with the potential to manage an even greater proportion of the country's energy usage but an increase of pressure on the capacity of electrical generation. We very much encourage demand, storage and interconnectors to be included in the thinking, but are not sure enough is known yet to determine whether the proposed measures will incentivise them.

A further consideration is ensuring that demand is both incentivised and equipped to play its part. In particular supply chains in this area are fractured and work (perhaps at EU level) to set appropriate protocols and standards will be important to enabling this aspect. Other issues around demand are the relative immaturity of developments in energy services provision by supply companies; better incentives through the market would help to kick start this.

24. Which of the two models of targeted capacity mechanism would you prefer to see implemented:

- **Last-resort dispatch; or**
- **Economic dispatch.**

For reasons stated in the answer to Q22 above we believe that capacity payments will be needed for flexible plant in future, and since this plant participates in economic dispatch that they should apply on an economic dispatch basis.

25. Do you think there should be a locational element to capacity pricing?

We believe that National Grid's locational pricing mechanisms have been effective in rationing generation connections to areas where networks have capacity for thermal plant, but this approach has failed for wind plant owing to considerations of available land area and good wind resource tending to override. Going forward there will be even more constraints on network capacity and on the siting of generating stations (e.g. access to carbon storage locations). Likewise some areas may become very renewables-heavy and need back-up plant fairly close to the renewable generators to allow the system to remain operable. On this basis we see a case for capacity payments to be needed more in some areas than others – but this needs to be linked to incentives to invest in transmission capacity if this is a more effective means to solve the problem, and designed in such a way to avoid over-complexity.

There is opportunity in considering locational issues to find ways to reward customers for accepting generation such as wind farms in their locality, which Government may wish to consider in tandem with its planning system reforms.

ANALYSIS OF PACKAGES

26. Do you agree with the Government's preferred package of options (carbon price support, feed-in tariff (CfD or premium), emission performance standard, peak capacity tender)? Why?

We understand completely why Government wishes to maintain some level of continuity with the current market whilst addressing the range of issues that currently limits investment. However we are concerned that the resulting market structure will be over complex, will lack transparency, may encourage gaming and has a high chance of perverse or otherwise unintended outcomes.

These are likely to be manageable or even advantageous for larger generators but potentially more difficult for new entrants, or other small players such as community energy schemes. From a policy perspective there is a risk of the package not producing the desired outcomes and for the level of liquidity in the market reducing even further.

We would recommend some extensive scenario-playing be undertaken to explore these issues, including consideration of how gaming might arise, the actual steps to be taken and market behaviours experienced by smaller generators entering and participating in the market. It is important that such scenario playing is pushed to breaking point as the worst outcome would be for the revised market to fail in the short-term and require another radical overhaul. Indeed, some companies may even be expecting this to happen.

27. What are your views on the alternative package that Government has described?

Not answered.

28. Will the proposed package of options have wider impacts on the electricity system that have not been identified in this document, for example on electricity networks?

If one purpose of the proposed reforms is to enable the future development of demand response, storage, community energy and mass deployment of renewables, nuclear, new coal and gas CCS, etc then there will be major impacts on power networks. These have been implicit in much of UK energy policy for the last few years but are only recently being considered and explored at the policy level. Issues include:

- Smart grids at both transmission and distribution level,
- Major transmission reinforcement,
- Some areas of major distribution reinforcement, especially in the event that new loads such as electric vehicle charging and heat pumps start to deploy rapidly,
- Major new issues of system operation and balancing as the availability of flexible plant decreases whilst self dispatching and inflexible plant increases.

All of these are solvable engineering problems but they do need forethought, planning, and consideration as engineering systems at least as much as packages of economic incentives. We would strongly urge comprehensive analysis of the engineering issues before final decisions are taken on the package to be implemented.

There are also issues of wider impacts through greater linkage to other energy carriers. DCLG policy is strongly driven towards community energy solutions, combined heat and power, and potentially district heating. Smart metering and smart grids catalyse the potential to integrate building energy solutions. The consultation paper does not really explore these areas, and we would urge they are considered in designing the market reforms.

Coupled to these issues is the question of how the customers will react to radical changes in the market. Whichever package of measures is chosen, electricity prices are almost certainly going to increase. There will be a great deal more information available and probably more and more tariffs to choose between. In recent years consumers have become used to a robust supply of relatively cheap electricity available when they want it. The new, smarter system will be very different and the way the public are introduced to it is crucial as it will not work without their approval.

One possible conclusion from this is that the GB energy value chain is too disaggregated to allow the radical changes proposed to take place, which as many have stated are in the aggregate one of the largest ever peacetime change programmes. We would not wish to state that the current industry structure cannot deliver but would recommend that serious analysis is undertaken around this issue and that Government thinking is not constrained by current structural arrangements.

29. How do you see the different elements of the preferred package interacting? Are these interactions different for other packages?

Not answered.

Implementation Issues

30. What do you think are the main implementation risks for the Government's preferred package? Are these risks different for the other packages being considered?

There are a number of risks, most of which would be the same for any major market reform:

- Temporary hiatus in industry activity while everybody waits to see what will happen. We are seeing this now – it is important that we move rapidly out of this phase, meaning that signalling needs to be done well and investors have become confident in the new arrangements;

- IT and institutional systems need to be in place on day 1 of the change and work on day 1. This aspect needs to be developed as soon as the proposals are clear;
- Generators see the system as over complex , lacking in transparency and favouring incumbents and do not come forward;
- Demand offerings are not catalysed;
- Levels of incentives are set too low to give enough confidence to investors, who will be looking across Europe and more widely and will take their scarce capital to the best location.

31. Do you have views on the role that auctions or tenders can play in setting the price for a feed-in tariff, compared to administratively determined support levels?

- Can auctions or tenders deliver competitive market prices that appropriately reflect the risks and uncertainties of new or emerging technologies?**
- Should auctions, tenders or the administrative approach to setting levels be technology neutral or technology specific?**
- How should the different costs of each technology be reflected? Should there be a single contract for difference on the electricity price for all low-carbon and a series of technology different premiums on top?**
- Are there other models government should consider?**
- Should prices be set for individual projects or for technologies?**
- Do you think there is sufficient competition amongst potential developers / sites to run effective auctions?**
- Could an auction contribute to preventing the feed-in tariff policy from incentivising an unsustainable level of deployment of any one particular technology? Are there other ways to mitigate against this risk?**

Auctions have been used very effectively in some countries to find the least cost build-own-operate solution to generation needs. The parameters of the auction need to be considered very carefully, for example:

- Selection of developers needs to focus on those who can deliver rather than those who bid cheaply.
- Competitions have to be structured to recognise the reality of deployment (for example, a low bid tariff relating to a site where planning consent will be difficult to obtain is hardly a good solution).
- The right balance needs to be struck between pre-work expected before developers can bid and evidence that developers have taken projects seriously. Prequalification processes can assist here.
- Over-deployment under feed-in tariffs has been an issue in the UK and many other countries. They are usually a consequence of poor policy design in the first place and can be overcome by effective design and market signalling.
- If auctions are technology neutral and require adequate evidence that key barriers have been overcome then deployment will tend to follow a technology cost stack, meaning that onshore wind and some biomass projects come first and expensive technologies such as offshore wind and solar PV follow later. This will be economically rational but will probably limit the extent to which the expensive technologies can be deployed quickly enough to have a chance to meet or approach the EU's 2020 targets. Hence if these remain important, different support levels for different technologies are probably necessary and Government will have to decide how much of each technology it wants to see.
- We would encourage a fuller public debate about the costs and benefits of different renewable (and other) solutions. DECC has made great strides in this area on its website, but this should be widened.

A factor to include in the analysis is the impact on and opportunity for UK industry and UK exports within the different technologies.

32. What changes do you think would be necessary to the institutional arrangements in the electricity sector to support these market reforms?

This may be beyond the scope of this current consultation but the planning system will continue to play a major role in the development of the new electricity system, especially in terms of renewable generating infrastructure and the transmission system.

33. Do you have view on how market distortion and any other unintended consequences of a FIT or a targeted capacity mechanism can be minimised?

Not answered

34. Do you agree with the Government's assessment of the risks of delays to planned investments while the preferred package is implemented?

This question is part of Appendix A of the document, which relates only to renewable energy, however we believe the risks of delays to investment relates to other supply sources just as much as to renewables.

For onshore renewables we agree that explicit certainty of RO levels for projects accredited up to 2017 coupled with clear commitments on grandfathering will be helpful for most onshore projects, but that some flexibility relating to construction delays that took accreditation dates beyond 2017 through no real fault of the generator would help increase confidence even further. For offshore renewables, with much longer development times, higher risks generally, and additional risks associated with construction delays, we wonder if this provision will be sufficient. Clear signals about the new support mechanism sufficient to leave developers confident to invest in development costs at least will be essential.

For other (non renewable) plant there is likely to be a continuing hiatus in decisions to build CCGT, nuclear and perhaps other technologies until the revenue streams and risk allocation are completely clear. There is probably not too much that can be done about this other than to expedite the process and to provide maximum clarity in signals to the market.

35. Do you agree with the principles underpinning the transition of the Renewables Obligation into the new arrangements? Are there other strategies which you think could be used to avoid delays to planned investments?

Not answered

36. We propose that accreditation under the RO would remain open until 31 March 2017. The Government's ambition to introduce the new feed-in tariff for low carbon in 2013/14 (subject to Parliamentary time). Which of these options do you favour:

- a) All new renewable electricity capacity accrediting before 1 April 2017 accredits under the RO;
- b) All new renewable electricity capacity accrediting after the introduction of the low-carbon support mechanism but before 1 April 2017 should have a choice between accrediting under the RO or the new mechanism.

Not answered

37. Some technologies are not currently grandfathered under the RO. If the Government chooses not to grandfather some or all of these technologies, should we:

- a) Carry out scheduled banding reviews (either separately or as part of the tariff setting for the new scheme)? How frequently should these be carried out?
- b) Carry out an "early review" if evidence is provided of significant change in costs or other criteria as in legislation?

- c) **Should we move them out of the “vintaged” RO and into the new scheme, removing the potential need for scheduled banding reviews under the RO?**

Not answered

38. Which option for calculating the Obligation post 2017 do you favour?

- a) **Continue using both target and headroom**
- b) **Use Calculation B (Headroom) only from 2017**
- c) **Fix the price of a ROC for existing and new generation**

Not answered