



Institution of Civil Engineers

Institution of Civil Engineers
One Great George Street
Westminster
London SW1P 3AA
United Kingdom

t +44 (0)20 7665 2221
f +44 (0)20 7799 1325
e energy@ice.org.uk
ice.org.uk

28 February 2011

Electricity Market Reform Project
Department of Energy & Climate Change
4th Floor Area E
3 Whitehall Place
London
SW1A 2AW

Dear Sir/Madam

Electricity Market Reform (EMR) consultation response

ICE welcomes the opportunity to respond to the consultation on DECC's proposals for reforming the electricity market. Furthermore, we strongly endorse the objectives to which EMR is directed.

We have repeatedly highlighted the scale and urgency of reform and investment in the UK's electricity market. The importance of the changes required is difficult to understate: we face fundamental challenges in securing supply, decarbonising generation and maintaining competitive prices for domestic and commercial customers. This is captured in the recently published Carbon Plan.

The enormity of the challenge is greater still because of its urgency. With up to a quarter of UK generation capacity due to be retired in the coming decade, and the often-lengthy development timescales for new capacity, there is no time to lose in re-setting the policy framework. But it must be the right framework from the outset: electricity infrastructure costs huge sums to construct and has lifespans measured in decades. But the contribution of a successfully decarbonised system to combating climate change can be our legacy for generations to come.

ICE's expertise in electricity matters issues is vested in its 80,000 individual members, particularly through its expert Energy Panel. Importantly, ICE is guided by its Royal Charter, which obliges us to act for the public good.

ICE's view

In commenting on the EMR proposals, ICE is mindful that its expertise is in engineering, not in economics. We have followed the debate on EMR among economists, operators and politicians and are aware that there is a diversity of opinion among the experts and also that – as is often and justifiably said of proposals for major reform – “the Devil is in the detail”. Such is the complexity of the electricity market (even before EMR) that there is much scope for bedevilment.

EMR has huge implications for everyone in the UK and for the civil engineering profession in particular. Whatever the outcome of EMR, it will be the responsibility of many of our members to implement the investments and projects brought forward under any reformed electricity market. As such we have proposed some points which will be fundamental to the success of the reforms. DECC's proposals as outlined refer only to enabling investment input: we think that the process (with others, such as planning reform) must also have regard to the equally important challenges in the practical delivery of this infrastructure.

The market for electricity generation construction operates more slowly than many other markets. There are limited numbers of suppliers for many technologies, major planning and political barriers

to project initiation and information imperfections (including political, planning and supply-side uncertainties), which increase risks. Investors are cautious, and with good reason: unlike fast-moving consumer markets, infrastructure mistakes cannot often be quickly undone and replaced with a better effort.

The Government's role, through EMR and other energy-relevant reforms, is to clarify and reduce risk so that financial investment can be attracted, and so that a massive programme of construction can proceed promptly and efficiently.

There is a role for Government policy in enabling practical and efficient construction, as well as the investment decisions, including measures on:

- the supply chain
The availability and cost of raw materials may prove a major issue for the huge investment programme required. Steel manufacturing (capacity and cost) and ports capacity may prove major barriers to a massive expansion of offshore wind, for example.
- skills and training
Some engineering and construction skills are in ready supply, or can be quickly developed. Others cannot, are already in short supply, in heavy demand internationally, and pose major threats to the prospects of, for example, a major programme of new nuclear build in the UK.
- construction industry capacity
The UK has a finite capacity for delivery of major heavy engineering projects, schemes such as Crossrail and perhaps HS2 will be competing directly for programme delivery resources with the necessary expansion of the energy market, this could lead to over-heating and price escalation.
- phasing and timing.
The recently-published Infrastructure UK cost review (to which ICE made a major contribution) highlighted the stop-start nature of infrastructure development in this country as a major factor in relatively high development costs. Given the massive, largely private sector, investment that must be levered in a short period, we cannot afford to continue in such a manner.

These and other factors pose a significant threat to the successful realisation of a reformed energy market. Yet the current consultation does not cover these aspects, as it focuses on economic and investment enablement, and in quite a theoretical manner. We strongly recommend that Government also examines the other necessary steps for enabling construction of low carbon energy infrastructure to the same level of detail as the current EMR consultation.

ICE will continue to monitor EMR developments in the coming months, including through the submission of written evidence and collaboration with others. We look forward to seeing the outcomes of the consultation. If we can be of further assistance to you, I would be pleased to hear from you and can be contacted via energy@ice.org.uk.

Many thanks for your attention.

[REDACTED]

[REDACTED]

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?

Infinis recognises the need to reform in order to encourage the development of new nuclear and Carbon Capture and Storage ('CCS'). However we strongly advise government to acknowledge how successful the Renewables Obligation ('RO') has been in incentivising new renewable generation over the last decade, against a challenging backdrop of a disjointed planning system and a grid system which is not fit for purpose.

Feed-in Tariffs

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

No, for the following reasons:

- the consultation document fails to consider the risk and impact of removing the obligation on suppliers that exists in the baseline scenario; although we appreciate the 'obligation' is really a 'quasi-obligation' in that suppliers do always have an option to pay the buyout price instead of purchasing renewable power, they can and do financially benefit from purchasing renewable power which in effect reduces the fine they would otherwise pay. Under the Premium FIT and CFD scenarios, generators will still be required to find a route to market (and manage imbalance), which in the absence of an obligation and a liquid market is likely to be very expensive
- the document states that the fixed FITs and CFDs might be more attractive to smaller independent generators but we do not believe this to be the case. CFDs are very complex and in order to participate a thorough understanding of the UK power market will be required
- the assumed hurdle rates, particularly for onshore wind in Table 4, are unrealistic and we do not see how the hurdle rates will fall so substantially under the fixed and CFD FITs as forecast. Independent generators will not proceed with developments at a <7% hurdle rate as assumed by the table. Renewable projects inevitably face significant upfront CAPEX risk, resource/fuel risk and regulatory uncertainty and for those reasons we believe it is unlikely that an independent generator will commit capital without a hurdle rate above 11%. In addition, wind generators are exposed to wind cannibalisation and rising imbalance costs under the CFD. However, the required hurdle rates are assumed to reduce at the same rate as under a fixed FIT which removes these risks entirely – this additional risk will come at a cost which is not evident in the document
- finally, it is assumed that under a CFD the generator would be exposed to short term power prices and therefore an element of market signals would remain. Our analysis suggests that the CFD can only work if calculated on a half hourly level and therefore the generators will not be incentivised to react/plan maintenance around the market prices as they will always be made whole (in theory) by the CFD mechanisms.

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

The consultation document has insufficient detail in it to enable a robust conclusion to be drawn. However, with the information available we have major concerns over how a CFD can be made to work for intermittent generation. Ideally for the CFD to work perfectly the mechanism needs to be settled on a half hourly basis against the power prices realised in each individual PPA. However, we appreciate this is not practical and hence why a market index is proposed. Wind generators will not achieve the market price, due to the cost of imbalance and variability of output. This risk is significant and any strike price

would have to be sufficiently high to offset this cost – no mention is made of this additional cost in the consultation document.

Two further areas concern us, (a) the unknown cost to the consumer under the CFD mechanism if power prices were to fall and (b) the sheer disruption and associated investment hiatus of moving to a scheme very unfamiliar to developers and banks in the UK

Only the premium FIT truly preserves an element of market dynamics, whereby developers/generators are able to differentiate themselves by optimising their assets in the market, through for example:

- provision of accurate generation forecasts which will reduce imbalance charges on PPAs; and
- negotiation of strong commercial terms in PPAs

It is our fundamental belief that all participants should be exposed to an element of market price signals. Without the ability to differentiate, developers will effectively be building out as an extended arm of the UK government, with only management CAPEX and resource/fuel risk having the ability to influence returns.

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 CFD proposal fails to remove long term price risk from intermittent generators, as they will continue to be exposed to the high risk that the index will not match the realised PPA price as previously outlined. Under the RO developers and banks are comfortable with the risk associated with long term power prices and it is for this reason we question as to whether the government is actually better positioned to take on this risk and, if so, whether it can do so at a reduced cost to the consumer

On a related note, the CFD proposal significantly increases the risk of negative power prices beyond 2020, as a large proportion of the UK generation will be immune to market power prices and will not therefore turn down generation should prices go negative. Under a premium FIT this risk would be capped at or around the value of the premium.

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?

In addition to those points already raised in our answers to prior questions, we believe that the reduction in hurdle rate in offshore wind relative to onshore wind appears overstated. Only around one third of the revenue of an offshore wind farm comes from the power it sells, compared to around half for an onshore wind farm, therefore it would seem sensible to assume that the reduction in hurdle rate would be less for offshore wind

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 existing the investor base?

To achieve the levels of investment required, the UK will need to attract capital from outside of the UK, for example from sovereign wealth and pension funds. To do so, the UK will need to not only provide a stable policy backdrop but also rates of returns equal to (if not better than) many other European countries.

The table below summarises our thoughts on the main advantages and disadvantages from an investors perspective:

	Advantages	Disadvantages
--	------------	---------------

Fixed FIT	Investor familiarity as used widely in Europe	Policy risk, as shown in Spain and now more recently with PV in the UK
CFD FIT	Provides long term price certainty to non-intermittent generators	Complex and unfamiliar to investors
		Intermittent generators incur additional cost associated with balancing risk
		Lack of obligation will worry investors without a very liquid market within which to sell output
		Credit risk, particularly if CFD is two way. Likely to increase cost of financing if generator is required to post credit
Premium FIT	Similarity to RO will provide investors with relative comfort. Lending process likely to be quicker and viewed as less risky by lenders	Limited hedge against long term power prices (as per the Baseline scenario)

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?

We believe increased market liquidity to be vital under all FIT scenarios, including the CFD. If the liquidity is not increased, low carbon generators will continue to be exposed to high transaction costs for accessing the market.

The review currently being undertaken by Ofgem should in our opinion be absorbed into this EMR consultation, as it is likely that structural changes (i.e. primary legislation) will be required for the UK power market to achieve the desired liquidity levels.

The chosen index needs to be settled at close to gate closure to ensure balancing risks are minimised (i.e. within four hours prior to delivery a wind farm will, with a degree of certainty, know the volume of power it is likely to generate).

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

FITs should only be paid on output, after all the Renewable Energy Directive targets are output based. Payment on availability further increases the complexity, which will inevitably increase the cost and defer further any new entrants from entering the market

The political backlash is also likely to be severe, with end consumers appearing to be paying for something even when it is not in use

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?

Yes, our only preference within this package is that premium FITs are favoured to CFDs for the reasons previously outlined.

The introduction of the Carbon Floor Price by HM Treasury will be a crucial part within any agenda to decarbonise the UK power sector and we look forward to a swift and robust introduction of this regime to compliment the decisions taken through this EMR process

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

Notwithstanding the issues around offtake/liquidity, we believe that the premium FIT proposal is the package which will lead to the smoothest and most cost effective decarbonisation of the UK power sector for the following reasons:

- the risk of capacity overshoot is limited, unlike fixed FITs and CFDs;
- the government wouldn't directly be picking schemes, technologies or levels of capacity to develop, the market would deliver these in order of the competitiveness (taking into account returns, policy risk, capital costs, banking terms etc);
- premium FITs are most similar to the current regime and should lead to the smallest investment hiatus;
- the scheme would be more simple than the CFD and hence would encourage more new entrants;
- the cost to the consumer is known irrespective of what happens to power prices;
- the simplicity/familiarity should feed through to banks lending on competitive rates and terms, which cannot be said of the CFD scenario

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?

Any delays in putting the proposed package through legislation will severely impede any assumed success from introducing the changes. The timeline is very tight and consideration should be given as to whether or not pushing the introduction back a number of years would be more achievable.

The volume and scale of changes under a potential CFD FIT set by auction are huge. The associated uncertainty and lack of understanding will result in nervous investors/developers who will ultimately delay investment decisions until they are comfortable with the new regime. Whereas with a premium FIT these delays are likely to be a number of months, the associated CFD delays would be in the order of years.

Long term PPAs are already now difficult to source because of the post 2017 ROC issue raised in this consultation and we advise DECC to act swiftly to address this situation

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?

Infinis is strongly opposed to the idea of introducing auctions to set the level of support for low-carbon generation. Furthermore we believe it would act as a major barrier to investment in the UK

Experiences in Europe, namely France in 2004 and later those in the Netherlands, show that auctions are fundamentally flawed as a price discovery tool with the following issues in particular worrying us most:

- delays between auctions will delay renewable deployment in the UK. A major positive for the RO is that it is 'open' continuously and removing this should only be undertaken after careful consideration;
- it is difficult to see how any future auctions will differ from the NFFO experience, which in the later rounds led to less than 30% of the awards contracts being built out as bidding prices collapsed due to overeager/misinformed developers. Introducing penalties for non-build-out will only further deter participants and hence the 'empty auction room' becomes a real danger;
- the government will be forced to differentiate by technology, otherwise only nuclear will be built out. However, picking technologies, capacities and/or price is dangerous as experiences around the world have shown. Governments are historically not good at performing this act;
- depending on the criteria for bidding, developers will wear a potentially large cost (such as those associated with planning and environmental surveys) prior to knowing whether it has been successful and indeed the price that it will be paid for the output. This additional cost will be reflected in the bid price. Particularly if unsuccessful, the next bid will be even higher to claw back the investment written off in the previous attempt

The banding review process of the RO has worked well to date and we advise such practices are maintained in any price-setting exercises going forward

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?

Yes - Infinis recognises the benefit of accelerating the banding review and keeping the RO open until 2017 in terms of maintaining certainty and therefore investor confidence. Equally the option of remaining in the RO or moving to the new support mechanism between 2013 and 2017 gives certainty whilst also giving generators the time to decide on the optimum regime for their assets and investments. Finally, the new support mechanism generally is recognised as a means of encouraging the development of new nuclear capacity and carbon capture and storage technology.

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:

- **All new renewable electricity capacity accrediting before 1 April 2017 accredits under the RO;**
- **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.**

Our preference would be that all new capacity is accredited under the RO until 2017. This prevents against any gaming and the associated dangers of running two schemes concurrently. This would also provide further certainty on the ROC price between 2013 and 2017 as forecasting the headroom mechanism would be simpler. Adopting this approach would also facilitate the post 2017 issue, as more capacity will be operational in the RO towards 2037 hence adding stability to the ROC price around this time.

Any delays in enacting legislation can easily be absorbed if the scheme does not go live until 2017. The only issue that remains is that for long lead time projects (such as offshore wind) there may need to be a landfill gas grandfathering type mechanism introduced to ensure that if they miss the 2017 date they will still receive ROCs at the band they expected at financial close and not forced into the CFD or premium FIT schemes.

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:

- **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?**
- **Carry out an "early review" if evidence is provided of significant change in costs or other criteria as in legislation?**
- **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?**

It is our opinion that the affected technologies (energy crop uplift, CHP uplift, co-firing and bioliquids) should be grandfathered. If not then they should be given the option to move into the new scheme

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

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

Calculation B is our preferred choice, primarily because the first option is not realistic as ROC prices would go exponential in the later years and the third option would involve mass upheaval of current PPAs and seriously erode investor confidence in the market

Grandfathering of the RO by headroom from 2017 should take exactly the same shape as it does currently, i.e. to preserve the buyout price, the recycled price and headroom percentage – changes to any of these could trigger a default under most long term PPAs and therefore defaults under the associated project finance facilities. Amending PPAs to cater for any different scenario would be expensive and very problematic.

Questions not answered:

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

Emissions Performance Standards

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?
17. How should biomass be treated for the purposes of meeting the EPS? What additional considerations should the Government take into account?
18. Do you agree the principle of exceptions to the EPS in the event of long-term or short-term energy shortfalls?

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?
20. Do you agree with the Government's preferred policy of introducing a capacity mechanism in addition to the improvements to the current market?
21. What do you think the impacts of introducing a targeted capacity mechanism will be on prices in the wholesale electricity market?

22. Do you agree with Government's preference for a 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.

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?

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

- Last-resort dispatch; or
- Economic dispatch.

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

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?

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

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

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?

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