EMR and The Energy Bill: A Critique

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1. After 12 years of energy policy reviews, the government has brought forward a draft energy bill setting a framework for the introduction of new market arrangements, within which Feed in Tariffs (FiTs) and a capacity mechanism are to be core components. The government has also launched a review of gas policy, and is about to launch the Green Deal. Other initiatives include the smart meter programme, the CCS re-launch, the Emissions Performance Standards (EPS), the floor price of carbon mechanism, and consultations on plutonium and further work on the development of a potential deep storage facility for nuclear waste. The government has set out its relationship with Norway for North Sea cooperation and long-term energy supplies. A whole host of other policies and interventions are either being developed or being implemented.

2. Whilst all this has been going on, the European Commission has published its 2050 Energy Road Map, and come up with proposals in respect of 2030 carbon targets, a renewables target for 2030 and a proposed energy efficiency directive. The Renewables Directive maintains pressure to invest on a large scale in a small number of selected technologies by 2020.

3. Despite so many initiatives and proposals, the British energy market is no nearer to having a stable long-term energy and climate change policy in

place, and there is very considerable uncertainty about onshore wind, offshore wind, nuclear and gas in the energy mix, together with concerns about security of supply and fuel poverty.

4. This short paper provides a critique of the mass of policy initiatives and interventions that have emerged and sets out first the serious problems embedded in EMR and the Gas Review and then how progress might be made towards a more robust and efficient policy framework. The starting point is the objectives.

What are the questions to which EMR and the Gas Review are supposed to provide answers?

5. The case for EMR is based upon the claim that there are significant market failures, which will not be addressed under the current energy market arrangements. The claim is not only that these market failures exist, but that the interventions proposed in EMR will address them, and without significant offsetting government failures.

6. There are two key market failures:

   (i) There are inadequate incentives to ensure security of energy supply; and

   (ii) Decarbonisation is not incentivised because there is no explicit or implicit price of carbon.

7. The security of supply argument is about the *quantity* of capacity. Security of supply is a system property, and in the absence of storage and demand side responses, it requires excess supply. No rational profit-seeking company will deliberately create conditions of excess supply, since it would thereby force the marginal cost below the average cost. On the contrary, having deficient capacity on the system increases profits for existing power stations.

8. Why then have there not been serious problems to date? The answer is fortuitous. First, there is the massive overhang of power stations built in the 1960s and 1970s (when 3% GDP growth led to 7% increase in electricity demand). Then the 1980-82 recession fundamentally changed the composition of the economy and begun a process of relative deindustrialisation. Hence the capacity built in the 1970s was in great excess to actual demand for electricity in the 1980s and 1990s. Next there was the first dash-for-gas—partly encouraged by the regulator in the name of "competition" (financed by the Regional Electricity Company monopolies up to 1998)—and partly for environmental reasons. Finally the great economic recession since 2007 has left GDP in 2012 almost 20% less than might have been expected back in 2005. So Britain has in one respect been lucky.

9. It should also be noted that demand and supply are always *ex post* equal: there is always a price or rationing system that balances the market. The important point here is that security of supply is ultimately about price, and the system capacity requirements are about meeting reasonable demands at reasonable prices.

10. The provision of excess supply will not happen without an incentive, and the appropriate intervention is one that sets the required quantity and then looks for the lowest price to meet this quantity of investment.

11. A complication is the diversity of capacity. Some argue that the market will fail to deliver an appropriate portfolio of technologies and hence the portfolio risk will be excessive. This is far from obvious, and depends upon the risk hedges available and the nature of the risks that face those supplying fuels. It has for example never been a convincing argument in respect of the supply of oil and oil products for transport. To the extent that it is a "problem", diversification needs incentives in addition to fixing the quantity.

12. The decarbonisation objective is based upon the fact that Britain has adopted *unilateral* carbon production reduction targets (notwithstanding

that its carbon footprint is best measured by carbon consumption, which is not subject to targets and has been rising very sharply since 1990).

13. Taking these unilateral carbon targets as given, their delivery is fixed through five-year carbon budgets. These set the (binding) constraint, and the obvious policy instrument is to set a carbon price such that the carbon budgets (and hence the targets) are met.

14. To these two main objectives a host of other objectives have been tagged onto EMR. These include: promoting R&D, creating "a new industrial revolution", and creating "green" jobs. The first is important and lends itself to an R&D policy. The second objective is shared by almost every developed country in the world, all of which aim to be "world leaders", without regard to analysis of comparator advantage, and to the obvious fact that most cannot possibly achieve this result. The third is largely nonsense based on crude analysis, which ignores the effects of higher prices on industry and consumers in general. Amongst this clutter of additional objectives, in this paper, only R&D is addressed.

The Gosplan approach versus market-based interventions

15. The approach taken in EMR is to negotiate FiTs on a case-by-case basis with each project in the low carbon domain. These FiTs are to be based upon a strike price and a contract for difference (CfD) written against this strike price.

16. The informational requirements on the government are very considerable. These include: the ability to predict the path of future prices; and the ability to pick the technologies and projects with which to negotiate.

17. Predicting the future price depends upon knowing the future path of costs, notably for gas. Amazingly ministers appear to "know" that the price of gas is going up, and that it will be increasingly volatile. Despite

claims to the contrary, this is what lay behind the public statements and interviews on the launch of the draft energy bill. The current secretary of state, Ed Davey, reinforced this apparent knowledge of the future by arguing that the FiTs would protect consumers from these gas prices, and their volatility. The previous secretary of state, Chris Huhne, claimed that the result would be *lower prices* for consumers, once the energy efficiency measures were taken into account. The Green Deal, he claimed, would lower demand so much that the higher costs of renewables would be absorbed by the lower number of units, and rising oil and gas prices (which he claimed would remain indexed) would make the renewables much more cost competitive.

18. This "knowledge" allows government to become a central buyer: the FiTs are long term contracts, and they represent central government procurement, on behalf of electricity customers who will be forced to pay for them. The central buyer can decide what to buy (which technologies), what subsidies will be paid for each "winner", based on what is in effect "strike price plus" contracts.

19. In the case of nuclear, the public statements are confusing. One view of "no subsidy" is that it will be "strike price only" contracting. There have been repeated statements in the House of Commons and elsewhere that "there will be no subsidy" for nuclear but also claims that this means that nuclear will be on a level playing field with other low carbon technologies. But, for all the other technologies in the low carbon category, subsidies are being and will be paid, raising the interesting question of how government decides the subsidy level on a case-by-case basis and how "no subsidy" can be defined as "equal subsidy" and what that means given "different subsidies" for each low carbon technology. It is far from clear how the European Commission will treat the implied state aids, or indeed how the government would treat the subsidies issues were there to be a judicial review of the nuclear FiTs. The current rebanding exercise for the ROCs reinforces the concerns about this exercise in the future under FiTs.

20. So how will the strike price be set independent of the costs of the technology (which is what "no subsidy" really means) for nuclear? The methodology should in principle be straightforward. Someone has to forecast future electricity prices, and these in turn will require forecasts of future fossil fuel prices. This is why it is disingenuous to claim that the government is not involved in predicting prices.

21. How will these forecasts be constructed? The fear must be that the government "doctors" the forecasts so that the strike price conveniently turns out to be one that just recovers the nuclear costs. This would be illegitimate on the claim of "no subsidies" and presumably would be open to serious challenge.

22. There would of course be lots of wriggle room. The record for forecasting future prices and costs is notoriously bad, and every forecast should be accompanied by back-casts to show the error in past forecasting. (Interesting this is rarely done, though it is amongst the most interesting information, since it tells us how big the errors might be—and it is in particular studiously avoided by the IEA and indeed DECC).

23. What factors might influence the forecasting now of future prices—and in particular future gas prices? Presumably the game-changing developments in the world gas markets might have some relevance—though both Huhne and Davey have been skeptical? Might the withdrawal of the US from gas importing be relevant? Might the enormous shale gas deposits around the world be relevant? Might the fact that US gas prices are around 2 MMBTU—and the future gas price in the US out to 2018 of around 4MMBTU be relevant? Might the projected rise of Australia with its coal-bed methane to the world's largest LNG exporter (ahead of Qatar) by 2020 be relevant? Then there are the natural gas finds off East Africa, Israel and so on to take into account.

24. At any time, forecasting future gas prices is a hazardous, but it is much more so when there are major changes in the structure of world gas supplies. Yet this is what setting the strike price requires. Furthermore

since the circumstances will change, the forecasts will change too, and therefore so will the strike price. Before we consider the alternative to this hazardous forecasting exercise, we need to include the further complication of the capacity mechanism.

25. The capacity mechanism is in *addition* to the FiTs. Thus the government, on behalf of the customers, will be procuring not just new capacity via the FiTs but also capacity via the capacity mechanism. So we will have two different capacity mechanisms. The assumption is that these mechanisms address different market failures, and in principle if the two failures are different, unless they uniquely accrue to specific technologies, new investments should be amenable to both.

26. Just what these two different market failures are supposed to be is made all the harder to work out by the origins of both the mechanisms. The FiTs are really glorified ROCs, howbeit limiting the ability to get paid twice. The FiTs get round the fact that the ROCs exclude nuclear – so the FiTs enable nuclear be procured alongside renewables. The capacity mechanism arises out of two problems: the need for predominantly gas-fired power stations to back up wind; and the fact that wind makes the gas power stations (and their gas supply contracts) intermittent and hence means that the investors cannot be sure when they will run. So the FiTs are the answer to a nuclear problem, whilst the capacity mechanism is the answer for gas. Each technology has its own special "sticking plaster".

27. The *general* argument DECC advances is that the capacity market is the special answer to intermittency (rather than capacity). But immediately this can be seen for what it is—nonsense. For wind is intermittent, and indeed *all* power stations are intermittent in respect of price. What we end up with is two different procurement mechanisms to solve a general problem—*not enough capacity*. This is made worse because the wind farms escape paying for the system costs they so obviously cause—they do not provide (or pay for) firm capacity.

28. The capacity mechanism issue is further confused by the separate and important requirement to balance the system at each point in time. Thus the system operator needs to enter into short-term contracts. It will also have a view about the need for investment in particular types of capacity. But as we shall see, in offering to pay for these services, the values can be integrated into a single capacity auction without the need for a separate capacity mechanism.

Decarbonisation

29. Decarbonisation can be achieved in a variety of ways. If the government chooses to go down the public procurement route, it can decide which investments should be made and go through a public procurement negotiation. This is, in effect, what FiTs are all about. So the government can claim that it "knows" that wind is the best bet, especially offshore wind, and just contract for it. It needs to know a lot about the future, and it needs to forecast, but this is one coherent approach.

30. The trouble with picking winners in this way is that it is wide open to lobbying and capture by the rent-seeking companies who have every incentive to bias the outcomes to meet their narrow commercial interests. And indeed this is already what has happened in Britain—and across Europe—in a spectacular way. The sheer scale of the wind lobbies is staggering, as is their great success in propaganda and capture. As a result some of the most expensive ways of making marginal reductions in British carbon *production* have been adopted *first*, whilst contributing in the process to *raising* carbon *consumption*. As the government moves towards more general public procurement, this can only be expected to get worse as the "climate change pork barrel" leads companies to increase their lobbying power and locate ever closer to government. Ex-ministers will no doubt start cropping up on company boards and all the usual lobbying behavior will be exhibited. This is the entirely rational response.

31. DECC argues that the public procurement route is "temporary", and that all the renewables technologies are on their way to being competitive. Hence the FiTs can and will be auctioned competitively *in due course*. This shows a breathtaking ignorance of how policy actually works. As the subsidies get established, a coalition of interests will resist auctions. Those benefitting from subsidies are obviously not going to want to kill the golden goose. But those too who have negotiated the FiTs will not want their mistakes exposed. Imagine if the early nuclear FiTs turn out to be very expensive, and the forecasts that lie behind those strike prices are revealed as generous. This could be very embarrassing. Though not impossible, there is nothing in political economy that suggests optimism about a transition to a competitive outcome.

32. This process is well illustrated by the policy complexity that DECC has already developed. As each problem comes along, DECC and its ministers try to solve it. EMR developed this mission creep early on. To the FiTs was added the capacity mechanism. Then there is the EPS and the debate about whether to apply these EPS standards to gas in respect of CCS. Smart meters are another programme. Then there is the Green Deal. There are now so many interventions that it is doubtful whether anyone in DECC could list all the main ones.

33. In addition to the many failures with each (and smart meters and the Green Deal are already, at best, chaotic), each has an effect on the other. These "unintended consequences" are notorious in public policy, and by their nature hard to predict—but almost always negative.

34. There is one further incidental effect: the scale of bureaucracy involved. Each scheme needs to be administered. Some are dumped on agencies, and in the energy case, many on Ofgem. Ofgem now employs a large number of people just for these purposes. Then there are the regulatory and policy departments each company now needs to run, supported by lawyers and consultants. In one sense, 'Green" jobs have been created—in the new regulatory and policy services industry. There are even

companies whose prime purpose is to support this industry, and head hunters are busy as a result. All of this amounts to a significant deadweight welfare loss. They all have a vested interest in complicity.

A better way forward: the virtues of simplicity

35. It does not need to be like this. The market failures are not that complicated, and each failure needs its own instrument. Since there are three—security of supply, carbon, and R&D—in principle, three instruments should do the job. This would be the first best solution. In practice there may need to be a bit more intervention, but it is best when designing policy to start simple. Civil servants and politicians will almost always complicate interventions: it is in the nature of the process. But there is an enormous premium in not starting off complex—unlike the current state of affairs.

36. Taking each failure in turn, what is the simplest intervention that can be designed to achieve the objective?

The security of supply problem.

37. Security of supply is about having sufficient investment such that the system has a margin of excess capacity—say 20%. In order to ensure this capacity is available, the quantity can be fixed and then capacity slots can be auctioned in a single unified long-term contract market.

38. Fixing the quantity requires someone or some agency to fix the margin of excess capacity and to identify slots as and when they are required. This is a rolling process, adjusted as time passes and as conditions of demand and supply vary.

39. Those bidding in the auction bid *firm* capacity. However, bidders will be uncertain when the plant will come onto the system (for example nuclear)

and in some cases will be uncertain about how much electricity they will generate (for example wind farms). In a simple auction, they will need to enter into secondary contracts. So the nuclear plant will need an option on alternative generation if for example it is some months late to completion. The wind farm will need to contract with some other party—such as a peaking gas plant—to provide back up when the wind either blows too little or too much.

40. The need for secondary contracting solves the problems of late delivery and intermittency by *placing the onus to contract on those who cause the intermittency*. It will of course make a nuclear bid more expensive—but this reflects the costs on the system caused by the uncertainty about its delivery date. In the wind farm case, its intermittency *causes* system costs, and by forcing it to cover these by contracting for back up, its bid price will be higher too—again reflecting the true costs of wind generation.

41. There would need to be penalties for non-delivery, and these would in effect be equivalent to the costs of short-term standby capacity.

42. Note that, having allowed for the secondary contracting, this is a pure capacity auction, and hence there are no reasons to have both FiTs *and* a capacity market. There is just one sort of long-term contract auctioned.

43. The auctioning of the contracts avoids most of the Gosplan problems identified above. The bidders take the risk of future fuel prices, and hence the government does not need to forecast gas or electricity prices. The strike price is the outcome of a market process not an administered one. The bids will reflect changes in expectations over time—and therefore the prices will vary from time to time. All the government needs to do is to have a rolling estimate of the required capacity.

44. It might be an additional concern that there is too little diversity in the bids—for example, too much gas. Quite how the government would be able to decide what an "optimal" diversity level is a good question, but should the government wish to opine on diversity, the auction can take

the form of a 2-stage process. All and every technology is encouraged to bid in the first round, and then having revealed the costs through the bids, the government could decide to constrain the technology in the second round to encourage more diversity. But the crucial point is that the first round of bids would have revealed the true costs of not choosing the cheapest options. Again there is no need to forecast future prices of gas or electricity.

The climate problem

45. The climate problem with unilateral carbon production targets is in essence a constraint on the production of carbon by the electricity sector. It could be more general, covering all sectors, and the obvious way to achieve the general decarbonisation path is to set a carbon price and allow it to adjust through time to meet the target.

46. There are many reasons why a carbon tax is superior to direct interventional and technological selection. The price allows the supply and demand sides to respond, and searches out the cheapest ways of reducing emissions. For example, it would almost certainly induce a switch out of coal and into gas as a cheaper option than the selection of offshore wind and roof-top solar, which have a much higher cost per marginal carbon reduction (by an order of magnitude). A carbon tax would also incentivise the demand side.

47. Yet the political problem of a carbon tax is that it would reveal the true costs of politically favoured technologies, and hence the temptation is to provide reserved markets for these. The Renewables Obligation does precisely that. The wind lobby favours a carbon tax provided it advantages its own investments, *without* affecting its market share.

48. In principle the quantity of carbon could be capped instead of fixing the carbon price. This is what the EUETS does. This is likely to be less

efficient, but when there are fixed targets, it maps those fixed targets onto the economy. To date the EUETS has provided a short term, volatile and low price to a problem that requires a long term, stable and rising price of carbon.

49. Fixing both the quantity through the EUETS and at the same time fixing the quantities of renewables and the quantities of energy efficiency—which is what the 2020-20-20 EU package attempts to do—is not only an overdetermination, but has some nasty consequences. Since the fixed shares of renewable and energy efficiency reduce the quantity of emissions, they will consequently lower the EUETS price. This will encourage more coal to be burned. The one offsets the other, leaving no net carbon saved.

50. If the carbon tax route is forsaken in exchange for a more expensive technology-driven route, the unified auction described above provides one way of achieving the targets and the carbon budgets. After stage one (unconstrained bids), the second round of bids could be constrained to either low carbon technologies in general, or to specific technologies if this is deemed appropriate. (Note that with an effective carbon tax, the first round bids would incorporate the carbon component and no second round would be required).

A combined long-term capacity auction

51. The simplest solution to address both market failures is to merge the FiTs and the capacity mechanism into one single auction process. With a carbon tax, the government gives maximum rein to competitive bidding, and the particular characteristics of the individual technologies are addressed by internalising them in the bids. In particular, the single auction incorporates in the bid price the costs of intermittency, and the obligation to cover the system costs imposed by late or intermittent technology falls on those who cause these costs.

52. By introducing a second stage, the possibility is created to ensure that the government's preferences on diversity and its peculiar desire to pick particular winners is facilitated—but with the proviso that *the full costs of such picking of winners is exposed.*

53. The single unified auction minimises the scope for lobbying and capture. Bidders need to put their money where their mouths claim the benefits lie: there is little or no scope to engage in the rent-capturing expenditures that now plague the electricity sector. For these reasons, lobby groups for expensive technologies tend not to favour auctions.

The R&D problem

54. It is sometimes claimed that the advantage of picking winners is that it enables "immature" technologies to "mature". This is reflected in the banding of the ROCs and will be a part of the subsidies embedded in the differential FiTs.

55. This is a serious misunderstanding of the R&D market failure. R&D is a public good and will be underprovided by the market. It therefore needs to be subsidised, and there are various well-known policy instruments for achieving this. It is separable from the climate change market failure and separate from the security of supply problem. Instruments include a specific R&D levy, state subsidy and the awarding of prizes. By trying to blend the R&D problem into the carbon one, the consequence is to seriously distort R&D, and in particular focus it all on specific technologies. In the current context, this means the capture of the R&D expenditures by *current* renewables like wind, to the serious detriment of *future* renewables. It also undermines the development of new industries, by promoting existing ones, and where the existing technologies are being developed and manufactured by overseas countries (like China) the net jobs effect is likely to be negative too.

How to make EMR simpler and more effective

56. The steps needed to rescue the current policy mess are fairly straightforward and the draft energy bill could be amended to effect a stable energy market framework.

57. The steps are:

    (i) Merge FiTs and the capacity mechanism into a single quantity instrument.

    (ii) Auction firm capacity contracts.

    (iii) Provide for government intervention to restrict the second stage of the auction for specific purposes (if necessary).

    (iv) Establish a separate R&D levy.

Objections to the single unified auction approach

58. The various vested interests and lobby groups will object to the simpler approach, and particularly auctions—for the obvious reason that the scale of their costs and the scale of their subsidies will be revealed. In order to try to protect their vested interests, a number of arguments have been put forward to undermine the auction approach.

59. These objections include:

    (i) There will not be enough bidders.

    (ii) The winners will be gas.

    (iii) The intermittency problem requires a separate capacity mechanism.

    (iv) The auction will lead to the Renewables Directive not being met.

    (v) It will take too long to set up an auction mechanism.

(vi) The bidders will get paid twice (with the wholesale price and the long tem contract) whereas the CfD avoids this.

60. The number of bidders is a particular problem with nuclear, since at present only EDF/Centrica are in the game, and the sites have been earmarked in an earlier auction. This is correct provided the bids are confined to nuclear only—as in the specific FiT negotiations. But in round one of the unified auction, all technologies bid.

61. The prediction that the winners will be all gas depends upon the carbon price and the investors' assumptions about gas prices. But suppose it turns out like this. There are two solutions: accept that this is indeed the best option; or restrict gas in the second round.

62. The intermittency problem is not special to wind and solar: indeed the intermittency of wind *causes* intermittency of gas and other technologies as it drives the marginal cost to zero when it runs and has reached a critical mass on the system. Intermittency is a cost and someone has to pay for it. In the unified auction, those who cause it have to contract for back up power. This should create a deep and liquid secondary market in due course.

63. The RO can be met by labelling the second round of bids.

64. Setting up the auctions will not take any longer than setting up the detail of administratively set FiTs, and separate capacity contracts. Indeed, the problem with the negotiated FiTs, especially for nuclear, is not only that they require the same information as auctions (indeed arguably more) but also that they are potentially wide open to legal challenge if the strike price is based on questionable forecasts and indeed to the challenge that strike prices include subsidies to nuclear. Negotiated FiTs are more vulnerable to state aid challenges at the European Commission. It is also likely that negotiated FiTs will be more vulnerable to *ex post* interventions than auctioned contracts.

65. The claim that a CfD is needed to avoid double payment is nonsense. The double payment arises in the RO/ROCs case precisely because it is explicitly provided for. In the single unified auction, the bidders will bid *net* of the expected wholesale price and the revenues it provides, so there is no double payment.

Conclusions

66. The EMR proposals have reached a turning point. Their sheer complexity militates against success in achieving the objectives at least cost. The likely outcome is one that customers may not be able to afford, and a string of challenges over the "subsidies".

67. It does not have to be like this, and it is not too late to change tack. What is needed is a major simplification, and the reinjection of competition and competitive bidding to replace the picking of winners. The current EMR proposals are a lobbyists delight, and this bodes ill for the future.

68. A simple 2-stage long term firm capacity auction would achieve all the objectives, at lower costs and without the need for a "Gosplan" for the electricity industry.