

PROJECT DISCOVERY: OPTIONS FOR DELIVERING SECURE AND SUSTAINABLE ENERGY SUPPLIES

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In what follows, I set out some comments on the Ofgem document of 3 February. My comments are by numbered heading. I reply by this method rather than by responses to the Ofgem list of questions since, although my headings clearly relate to the questions posed, the form of the questions sometimes constrains the answers in ways that are not always helpful.

1. Security of Supply

The term “security of supply” has two alternative - and opposing - definitions.

The first (and traditional) definition is that a country or other entity can be self sufficient in food, fuel or other resources. Hence, in this sense, security of supply means not having to rely on external sources for these commodities. The country can rely on its own resources and is not vulnerable to actions by foreign countries and suppliers that would interrupt imports. This definition was largely developed for war planning from the Napoleonic Wars onwards

The second (and more recent) definition is that a country or other entity obtains security of supply by deliberate diversification of its supplies of food, fuels, etc. Hence, the country is not vulnerable for access these resources from actions by any single supplier – foreign or domestic. Indeed, provided that there are sufficient suppliers to prevent a tight and sustainable cartel, diversification should be able to prevent vulnerability against several suppliers, at least on quantities, if not always on price.

The Options Report uses both of these definitions and this, not surprisingly, leads to an unclear exposition of the potential difficulties that the UK might face on fuel and energy security.

One particular problem with the Report is on the analysis of the risks associated with the supply of natural gas, where the Report seems to lean relatively heavily on the first definition. This is discussed in more detail below. However, the question as to whether diversification with greater use of foreign fuel and energy suppliers increases or reduces security of supply applies generally and needs to be treated more carefully.

2. Gas Supplies to the UK

The Options Report seems to see supply interruptions in gas imports as a serious potential concern, appealing to the falling self-sufficiency in UK gas and uncertainties over import security. Gas import dependency is identified as a major potential risk and three out of five the stress tests used relate to gas.

This is in considerable contrast to the Government’s March 2010 Energy Market Assessment (EMA) which states that: “Longer term risk assessments ... conclude that the risk of the market being unable to meet the demand [for gas] is very small and in all scenarios (including a

combined shock disrupting two major sources of supply), there are no involuntary disruptions to customers' supplies"¹.

The EMA view is what one would expect given the range of different types of gas and of different producing countries around the world. Currently, there seems to be a surplus of gas with falling gas prices and the outlook – particularly with shale gas developments - is that deficits in world and regional supplies are unlikely over the next decade.

There may be problems in storage capacity or similar which need attention but the Options Review seems to ignore the degree to which gas producers have powerful incentives to maintain supplies e.g. because of major concerns over exports, tax receipts and exchange rate stability in gas producing economies. It is for these reasons that the Soviet Union never imposed supply cuts on gas exports at any time during the Cold War and also why Russia-Ukraine disputes have led to only very short-lived and relative supply disruptions. Similar arguments apply to Algerian, Middle Eastern and other gas exporters. Further, disruptions from CIS and other FSU producers will increasingly be avoidable as Nordstream and other major transit pipelines come on stream thereby removing the Ukraine monopoly position over gas exports from Russia and the Caspian to Western Europe.

The issues discussed above are important not just for assessing the weight to be attached to problems but also to timescales. The more confident the UK can be on the reliability of gas supplies from other countries, the less urgent is the need for major structural change in the decade 2010-2020, at least for thermal generation.

In general, gas supplies seem to be a non-issue for the period up to 2020, particularly if one includes gasified coal. This gives opportunities for testing evolutionary rather than revolutionary generation market reforms over the next 10 years or so. I return to this issue below.

3. Option Choices, Degree of Intervention and Choice of Market Instruments

The five policy packages identified are described as a set "... involving the least reform and intervention in the market on the left ... and moving to the most dramatic move away from competitive markets on the right"².

However, this description is very odd and the instruments suggested vary across the packages by their degree of market friendliness. In general, the analysis seems to confuse means and ends. For instance, there are several elements of Packages 2 and 3 which would enhance the effectiveness of markets. Some (but not all) of the Enhanced Obligations Package seem to encourage decentralized action based on market signals and prices. It is only in Packages 3 and 4 with Centralised Tendering for all capacity and the Single Buyer model that the proposals seriously move away from competitive markets.

The most obvious example of a market enhancing reform is the proposal for centralized tenders (presumably auctions) for renewables to replace ROCs and/or feed-in tariffs. This seems to be a

¹ See Energy Market Assessment, March 2010, Para 2.12.

² See Ofgem Project Discovery Options Report Para 4.14.

very appropriate policy instrument for maximizing the static and dynamic efficiency benefits from a large-scale renewables programme³. But, this is considered as a medium-interventionist package. The example of centralized tenders for renewables shows well how new instruments can be introduced to improve the operation of existing markets as well as demonstrating the problems with the Options Paper's classification.

Options 4 and 5 – present more radical options: respectively (a) capacity tenders for all generation (and some other energy infrastructure); and (b) centralized energy purchasing (usually known as the Single Buyer model). One or other of these would effectively replace much or all of the existing generation market.

There is considerable experience with the Single Buyer model in Central Europe and in many developing countries – the results have been poor. The SB model tends to create at least as many problems as it solves. (See Annex attached for a fuller exposition.)

I note that the Government's March 2010 EMA explicitly rejects the Single Buyer Model (Para 4.66) and the arguments expressed in the EMA would also seem to rule out the general capacity tendering option. I think that the arguments as set out in the EMA on these issues are more strongly based than those in the Options Report. There are also timing issues which mean that the more radical centralizing and planning-based models are almost certainly unnecessary for the next decade. These are discussed in the next section.

4. Timing of Changes

The economics of climate change are best approached via the economics of uncertainty⁴. There are major uncertainties over:

- (i) The build-up rate of Greenhouse Gases (GHGs);
- (ii) The impact on temperatures of any given build-up rate and emissions level of GHGs;
- (iii) The impact of any temperature change on climate, agriculture, biodiversity, demand for energy, river flows, etc; and
- (iv) The impact of UK and other measures already taken to reduce GHG emissions and substitute clean energy.

To this list we must now add *uncertainty about the impact of any chosen set of UK energy market reforms on emission levels and investment*.

It is in this context, that timing becomes crucial. Were it correct that the UK needs major energy market reforms over the next decade, then there would be a very difficult choice over whether to adopt a package with risks of undershooting on investment that threaten future levels of supply

³ See, for instance, M. Pollitt EPRG Working Paper 1002, (2010).

⁴ See M. Weitzman (2007) and his subsequent papers.

and emission levels. In those circumstances, the Government and Ofgem would face the dilemma of risking a possible undershoot on those targets relative to options that appeared to offer more certainty but which had very clear and potentially seriously adverse risks on consumer prices and on efficiency (static and dynamic).

However, the above is not the choice faced. It is clear both from the position on gas as well as from other arguments set out in the March 2010 EMA that there is still time over the next decade, firstly to pursue market-related changes; and, secondly, to evaluate their impact on investment, efficiency, GHG emissions, consumer prices, etc *before* needing to decide whether the UK needs a more radical option that effectively replaces competition in upstream electricity (and gas?) markets with a much more centralized approach.

One important point to note is that decision making under uncertainty clearly favours an approach based on limited and market-based reforms over the next few years with the *option* of more far-reaching changes later if necessary. That would give time to assemble more evidence on factors (i) – (iv) above as well as on the impact of the chosen reforms. It would also give more time to design less radical intervention strategies with less in the way of adverse effects.

5. Concluding Comments

The conclusion that I draw from this is that the optimal package over the next few years is likely to be Package A but with centralized renewable tenders and maybe some enhanced obligations (eg on the System Operator) – and definitely not Option 4 let alone Option 5. This package also seems to me very much in the spirit of the Government’s March 2010 EMA.

The package I advocate would, unlike Options 4 and 5, firstly, balance Ofgem’s obligation to consumers as well as its sustainability obligations; and, secondly, keep open future options if they were needed. It would also (a) allow the time and (b) yield the information necessary for a proper evaluation of the impact of the reforms undertaken and useful information for a proper assessment of these and other potential more centralizing options.

In the current perspective and given available information, it seems to me quite wrong to choose at this stage a reform option that effectively castrates if not destroys existing generation and similar UK gas markets, with all the accompanying risks to consumers. It may be necessary but it is not yet required and it remains to be demonstrated whether it will ever be required.

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ANNEX: SINGLE BUYER MODELS IN ENERGY AND THEIR LESSONS

A General Comments

1. *Single buyer (SB) model (better described as collective purchasing agency models) come in various guises.*
 - They can be national, regional or local.
 - They can be mandatory monopolies or voluntary group buying and/or selling arrangements
 - They may own the electricity supplied or not (e.g acting as a broker or load aggregator)
 - They may buy wholesale electricity on long or short term contracts or via auctions.

Most importantly, single buyers can be vertically integrated with upstream generation or separated from it (e.g. owned by the transmission company or by the State).

For further details see Arizu, Gencer and Maurer (1986)

2. *The standard single buyer model is a national mandatory wholesale single buyer and seller.* The most usually observed case is that the single buyer is part of a national company with vertically integrated generation and transmission but with more than one retail distribution company and typically with IPP generators selling via the single buyer. This model is often known as the Asian IPP model. The vertically integrated generation plus transmission model is also the most problematic as well as the most widely used SB variant in practice.

The main alternative to the bundled single buyer is where the single buyer is attached to an unbundled transmission company. That was the initial Northern Ireland electricity model but it was dropped after a few years for bilateral trading between generators and retail supply companies.

There are various reasons (good and bad) as to why the unbundled SB model is rarely found in practice. The bad reasons are usually to do with the desire of companies and or governments to preserve ‘national champion’ utilities and to bring in limited generation competition without wider or deeper reform. The good reasons are that transmission companies rarely have sufficient assets or revenues with which to back contracts with both generators and retailers.

3. *The practical disadvantages of the ‘standard’ SB model as found in practice are*
 - a) Failure of SBs to be good buyers e.g. planning more capacity and signing more generation Power Purchase Agreements (PPAs) than necessary;
 - b) Lack of transparency (e.g. via non-bid PPAs, confidential PPAs);
 - c) Rigid contractual and institutional arrangements that adversely affect the possibilities for further liberalisation (e.g. take-or-pay generation contracts,

inability to modify PPAs to extend wholesale competition without creating major stranded asset problems.);

- d) Creation of long-term contingent liabilities (mainly a developing country problem but not always viz. post reform crisis California); and
- e) Inability to eliminate risks for developers (upstream investors still face risk arising from credit-worthiness of SB).

(Source: Arizu, Gencer and Maurer.)

Kessides (2004) adds the following to this list:

- f) Strong discouragement of upstream entry into generation – and, to a lesser extent, of availability and supply by new entry generators.
- g) Disincentives on retail supply companies to develop demand forecasting and procurement processes.

Of the problems identified above, a), c) and f) are particularly important and damaging.

In general, the mandatory ‘classic’ SB model is wholly inimical to new upstream entry.

4. *In OECD countries, the ‘standard’ SB model has consistently rejected for both electricity and gas by governments, not least for the problems set out above.*

- The SB model with tendered generation was (at the insistence of France and its allies) made an option in the 1st EU Electricity Directive 1996. However, neither France nor any other EU country adopted it.
- Before mandatory retail competition, Germany and Austria had local SBs for electricity and gas (Municipal Stadtwerke in Germany and, in Austria post -1997, non-mandatory regional and municipal aggregator/brokers.)
- Central European (CE) countries adopted ‘standard’ SB models for electricity after 1989 so that the future expected revenues from PPAs could be used as collateral for refurbishing rundown generation. This caused major stranded asset problems when the CE countries had to introduce retail competition on joining the EU. But, there seems to be no desire to return to SBs by any of the CE EU acceding countries.
- In the US, there are various voluntary collective purchase and brokering arrangements (e.g. in New Jersey) but, as far as I know, no ‘standard’ SB other than the disastrous post-crisis California example.

REFERENCES

Arizu, B. Gencer, D., and Maurer, L., (2006), 'Centralized Purchasing Arrangements: International Practices and Lessons Learned on Variations to the Single Buyer Model' *World Bank Energy and Mining Sector Discussion Paper No 16*.
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