

Fells Associates' response to the 2009 OfGEM Consultation 'Project Discovery – Energy Market Scenarios'

Professor Ian Fells, CBE, ian@fellsassociates.com

Alastair Fells, MEI, IEng,alastair@fellsassociates.com

Scenario Planning

We have are some concerns with the assumptions for the scenarios summarised at page 7.

The Green Growth scenario appears to be internally inconsistent in that it is difficult to understand how we are likely to have reduced gas demand by shifting a large proportion of heat and transport energy use to heat pumps and electric vehicles. This would cause a massive increase in demand for electricity over and above our current levels; in this case such a massive increase in demand would almost certainly require a major increase in gas demand for power generation. Low carbon/renewable electricity generation is struggling to make anywhere near the contribution expected and needed to meet our current demands let alone a large additional demand.

Our view regarding the key factors affecting major power generation technology development is that:

The UK economy will be slow to recover from recession; available capital for investment will be constrained with investment only coming forward where the private sector can see a reasonable return, most likely with new gas-fired capacity which can be relatively quickly installed.

The UK's carbon sequestration development programme has had difficulties with major players delaying projects and currently only two projects involved in the final phase of the demonstration competition. The government now seem only able to attract more developers by promising a new clean coal levy likely to cost consumers at least 2 to 3% over coming years on their electricity bills. There is a danger that delays to development of CCS technology will push investors towards alternative technology, most obviously gas-fired generation.

There is unlikely to be a significant contribution from new nuclear before 2020.

Major investment in tidal barrage power at more than one location could make a difference before 2020 and would have the advantage of being based on established technology.

The key support mechanism for new investment in power generation is the Renewables Obligation which is in effect an intervention in the market aimed at skewing investment towards renewables and in particular wind. If we continue to rely on the obligation as the key market based mechanism for encouraging investment then it should be broadened to include all low carbon generation technologies including cleaner coal/CCS, new nuclear and tidal barrage. Relying on carbon pricing as a key driver to direct investment is risky with carbon prices remaining low due to weaknesses in the trading scheme. An important stabilising stimulus would be a guaranteed floor price for electricity; this would be good for nuclear power and tidal barrage investment.

Gas prices are likely to remain volatile and dependent on not only the demand/supply balance over the longer term but also on possible deliberate intervention in supply on key pipeline networks.

In our view we are likely to develop somewhere between the "slow growth" and "dash for energy" scenarios, probably closer to the slow growth scenario with a difficult economic recovery, constrained private investment and little if any direct support from government for key technologies such as cleaner coal, CCS, nuclear and tidal barrage, although this could of course change with a new government. The newly proposed clean coal levy, designed to provide funds in order to attract investors to CCS, is a little late in the day and

will of course hurt consumers for years to come. It is a shame that energy policy has developed in such a confused and piecemeal fashion over the last few years; often it seems in a panic as ministers realise we are running out of time to deal sensibly with such matters. Agreement on a legally binding, global framework for reduction in climate change emissions post-Kyoto is likely to take longer than hoped for and may not actually be achieved in the near future.

Risk Analysis

The five stress test scenarios are certainly possible as independent events but the most serious risks could be due to a combination of scenarios for example; disruption to gas supply, cold winter and low wind output due to a persistent UK wide anticyclone (which does usually accompany very cold conditions in winter). Also stress testing conditions such as supply risks over very high summer temperatures with low availability of generators due to planned maintenance or unplanned outage over the summer; such a situation occurred recently with London affected by power shortages. Coincidentally if Europe is affected by prolonged high temperatures we can be exposed to very high demand from European countries as they struggle with cooling load; France can be particularly exposed due to low river flows which in turn limit the output of their nuclear fleet, which rely on river water for cooling. Again this situation has occurred over recent years.

Other risks that could be looked at include sabotage of key sites on the gas and electricity distribution system and the risk of investment not coming forward to enable us to meet binding commitments to Europe on overall renewable energy provision and retirement of fossil fuel fired plant. The latter situation could have serious ramifications for the UK in terms of reputation and perhaps sanction by the EU. On this issue there is also the question of obligation to supply; this used to be the responsibility of the regional electricity companies or RECs. There is a danger of confusion over where this responsibility lies in the liberalised open market structure we now have. Most of our electricity supply sector is now owned by foreign companies whose primary responsibility is to their shareholders and not the UK government or indeed to support our economy through development of our energy infrastructure. The private sector of course will respond if sensible returns can be achieved through investment but not just because we have a structural issue with our energy supply system. The stress test analysis might benefit from Bayesian analysis, which examines multiple stress situations.

The overall position we find ourselves in serves essentially as an example of what can happen when we rely on an open market policy to supply energy at the lowest price without the intervention or mechanisms necessary to maintain timely investment in essential infrastructure. The market operates in the short term whilst investment is for the long term; the market provides short term price signals but infrastructure investment requires long term stability. The commoditisation of energy and the driving down of prices has provided a decade of unsustainably low energy prices which did not reflect the investment needed to develop new capacity. Essentially the market has failed and we are left playing catch up; there needs to be much more direct intervention to generate the investment needed.

To address some of these concerns we could look at, for example, the regulatory position with regard to capacity margin with responsibility placed on generators to invest in sufficient capacity to adequately maintain supply relative to their market share of supply. We could also look at creating a electricity supply technology framework within which the market could be allowed to work, for example 40% nuclear, 15% renewables, 25% gas, 20% cleaner coal by 2030; this would certainly help electricity supply companies to understand how we would like the supply sector to develop. This is not a new idea, we proposed a similar framework of one third nuclear and renewables, one half split between gas and coal and a one sixth swing element to balance the equation (“Energy for the Future” Ian Fells and John Horlock p205-214, Royal Society, E and FN Spon, 1995, ISBN 0 419 20050 9). A similar mix but with a higher nuclear component would be suitable now.

IF and ARF November 2009