



BRITISH MANAGEMENT DATA FOUNDATION

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SYNOPSIS OF ENERGY REVIEW MEETING HELD ON 15 JULY 2009

Attached is an agreed synopsis of pertinent points made at the BMDF Energy Review meeting on '*Offshore and other Current Energy Issues*' held on 15 July 2009 at the Army & Navy Club, SW1. A list of the backing papers (which are also attached or available on the web) is also included.

A record of the debate at BMDF review meetings is not normally circulated to enable a frank and relaxed discussion. However in this case at the meeting the issue was raised that the points being discussed were particularly pertinent and that an **agreed** synopsis should be prepared to be sent on full distribution to all members and associates.

Drafts previously circulated for comment to those who attended the meeting **should now be destroyed**.



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Synopsis of points made at the BMDF Energy Review Meeting on 'Offshore and other Current Energy Issues' held on 15 July 2009 at the Army & Navy Club, SW1

Dermot Grimson (Crown Estate):

The Crown Estate is split into three distinct parts: urban, rural and marine.

The marine estate, which concerns off-shore wind and other renewable energy sources, covers the inter-tidal area and 12 nautical miles off-shore, and the continental shelf up to 200 nautical miles off-shore, therefore the Estate will cover storage, pipelines, renewable energy including and wind.

There have been three rounds of bidding for partnership deals. Rounds 1 and 2 are nearly complete, and are expected to be finalised in spring 2010. Round 3 concerns wind and will concern developments up to 2020.

In total, the three rounds will produce 6.5GW, in Scotland all energy will come from wind power, and the intention is to increase this to 40GW by 2020.

The bidding in the Round is in a zonal approach, with 9 zones.

There will be a partnership relationship between the Crown Estate and the other partner, and therefore there must be good and open competition since the Crown Estate has a monopoly on the sea bed.

There are three principal barriers to development that are being addressed:

- the development of the Grid to connect the wind turbines to the mainland,
- the supply chain for the development of the wind farms and associated infrastructure,
- the technologies for dealing with the off-shore conditions.

The aim is to reduce the level of risk on these three areas to generate the required level of energy.

There is a degree of regulatory complexity with the UK Government and the devolved administrations all having important roles.

The UK's targets are challenging but other countries, including China, are developing these technologies with more ambitious targets.

Part of the exercise in developing the fields is to look at the whole of the supply chain, including skills, the quality of suppliers and the feasibility of suppliers meeting the demands.

Offshore wind is a proved technology but **wave and tidal power is still in the development phase**; a demonstration/development area has been established in the Pentland Firth. The deployment will take place in 2011 onwards and commercially proven technologies will then be deployed in the Pentland Firth and in other suitable locations.

The situation in Northern Ireland is more complex as far as seabed leases is concerned as there are uncertainties over the marine border with the Republic of Ireland.

CCS: this is a complex issue and storage of CO₂ - the funding available is unclear.

The government is running a competition with funding support available to the winning consortium. This will be an industrial scale demonstration of CCS technology the intention is to store CO₂ depleted gas reserves with the possibility of using aquifers in the future.

There are three projects in the completion, two on the Thames estuary and one on the Firth of Forth both linking to offshore storage sites in the North Sea.

Overall, on making decisions on the award of leases for offshore renewable energy and CO₂ storage projects, the emphasis by the Crown Estate is on deliverability.

Other points:

On the carbon price, the EU ETS is the best approach and the costs are on business for reducing CO₂, although this will be passed on to the customer.

Nuclear will play a key role in the UK's energy mix but there needs to be a public debate on the siting of the plants and the disposal of the waste to ensure public acceptance. This debate needs to be led by the political parties that will ultimately be making the decisions.

The concept of "clustering" for CCS and the use of aquifers need to be tested.

On the international side, the role of the European super-grid will be important as this will help to deal with intermittency.

Load factors [the actual generation of a plant relative to capacity] - the effect on the grid: in the evidence from Rounds 1 and 2 is that this is achieving acceptable levels of performance and that there is confidence that improvements will be forthcoming.

Richard Ritchie (BP):

BP has no current plans to develop offshore wind. The issue is one of commercial intent and where the incentives are.

The difficulty facing the UK are the sacrosanct EU 2020 targets which are affecting the whole of energy policy, and there is a definite effect of this on the whole of the industry. Tony Haywood, the CEO of BP is concerned as the UK needs gas but reports such as the CBI one suggest that the role of gas will reduce, in the drive to reduce the levels of CO₂.

Potential emphasis on all technologies, but there is a growth in regulation and quangos, in general there is political intent to reduce quangos and the role of the state. However, this does not seem to apply to energy and all the differing technologies are lobbying for their own technologies to have priority. However, all technologies have to present their case and be justified on a commercial basis.

Climate change needs to be assessed and a price placed on it, and therefore get back to a neutral view on the correct balance of sources of energy. Therefore a carbon price is essential.

An interesting comparison is between the development of off-shore wind generation now and the development of oil in the 1960s -1970s. Was there as much subsidy as there is now or did the government merely give the political support, in the form of licences and agreements. The general understanding is that the extraction of oil and gas was a commercial operation and the companies had to perform to produce revenues.

The other issue is how to deal with the 2020 targets. Is the technology or funds available or are the requirements a mixture of both? At the moment, it seems to be a dishonest debate with the Stern Report giving the costs too low. This will be particularly the case if in ten years or so time, the impact of climate change is not as great as thought of now.

Dr Simon Skilling (Trilemma UK):

In relation to off-shore wind, there are different views coming from different starting points.

Climate change targets are too important to miss given national security issues and the costs/security of supply concerns of fossil dependence.

We are moving into a low CO₂ world, with the use of smart grids, nuclear power, etc. and this has been clearly laid out in White Papers and by the EU. However, there is a

disconnect between these aspirations and the reality of implementation, and on present expectations, these targets will not be met.

There might be a case where if Member States are seen to be making a clear attempt at reaching the EU 2020 targets, then legal proceedings will not take place, in the same way that the Single Currency obligations were suitably manipulated for certain countries to join.

There are three principal areas of market failure:

- there are no-brainer investments required under most scenarios of the future which need to be brought forward quickly;
- optionality: there is significant technology risk associated with all low carbon technologies including nuclear – we need to plan for more capacity than we need to cover this ‘delivery failure’ risk;
- innovation: this is essential, particularly on the demand side.

The market cannot be left to deal with this issue, because there is too much technology risk.

Off-shore wind: there is a national solution, but there is also an international dimension with the North Sea ring, covering North West Europe as well as the UK and this could be developed and become very important in reducing intermittency risks from wind power.

CO₂ storage: there could be “clustering” of emitters so that the pipelines run off-shore in a concentrated area from a small area on-shore. Therefore a key question is ‘pipes before power stations’ or ‘power stations before pipes’?

Tim Morris (Corus):

There is a real need for clear leadership from the UK government for the development of technology.

Corus is one of the biggest users and buyers of electricity in the UK and therefore the increase in cost is potentially a very serious issue for competition.

Professor Michael Laughton (Royal Academy of Engineering):

The purpose of the paper that has been presented for this meeting is that there is a target of 35-36% for renewables by 2020; and this amount should be examined.

There needs to be 147TWh from renewables by 2020 and the engineering and technical difficulties of this process needs to be understood.

For wind generation the intention is to have 13 GW on-shore and 20 GW off-shore capacity. These will need a high load factor on average that is higher than achieved todate. Therefore there is a need to have data on the assumptions. Concerns also include the role of National Grid, the use of the capacity to connect to the mainland and the effect that this will have on the grid.

In addition, there are non-wind renewables, to be included in the total energy demand of 49Twh, and this has to be generated at the same rate of growth as in the last five years. Only if the (large) Severn barrage is in operation can this target be achieved.

The grid is in essence, a “big fly wheel” balancing supply and demand. Energy on has to be balanced by energy off, so the grid has to be balanced and is a frequency adjuster. Plant output has to be adjusted up or down accordingly by the National Grid as system operator implying the use of controllable resources of energy.

There has to be realism on the role of renewables and there is a real concern that the UK could suffer from a catastrophe in the next few yeas if the energy issue is not resolved.

On a global scale there is question of the level of carbon dioxide rising to a tipping point, when changes that are far-reaching happen over a very short time and the impact of this must be understood.

Professor Ian Fells CBE (New & Renewable Energy Centre):

Agree with everything that Michael Laughton has said, the 2020 targets are unachievable.

The environmental assessment is essential for the off-shore issue to be developed – Scotland: this will be completed by next spring; for England, some areas have been completed. This environmental assessment has been built into the whole procedure and the results might delay the off-shore development.

The penalty for failing to meet the 2020 targets is €100 per Mwh, and this can escalate into huge costs.

These costs go onto customers’ bills and this includes the huge subsidy, either through taxes or directly onto the energy bills.

Wave power and tidal stream – should be developed over the next ten years, but this will only be for a demonstration exercise, there is no likelihood of these being ready for industrial use for a long time yet.

A feasibility study is being performed on the Severn barrage and this will take time. The real problem is that the generation from tidal stream is very difficult although the first 1.2MW plant has just been registered for ROCs. Therefore the plant is expected at the moment to have a ten year life, but the assets are being amortised over 25 years, so the costs are very high, to the point of being uncommercial. The Severn Barrage will last for 120 years.

For off-shore wind, there is a need to build 7,000 turbines in 10 years, but there are only 60 working days in the North Sea a year and there are two barges capable of operation so this means 10 machines every working day until 2020. There is a high level of subsidy required and this should be compared to the development of oil in the 1970s. This was more commercial, with government support.

In a recent conversation with Malcolm Wicks, he stated that he did not think that the markets could deliver and the driving force for this will come from EU and national government.

Therefore a carbon price on its own would not work and should be part of the approach to develop the appropriate technological development that will generate the required energy.

As a final point, Stern is an economist and stated that before he started on the Report he had no understanding of energy matters at all, in consequence the report is largely economics based without the necessary input from the engineers who will have to implement it.

Sir Eric Ash CBE (Tata Consulting Engineers):

The chances of wave power making a significant contribution by 2020 are remote. So far no one has been able to extract significant energy from waves – the sea is a tough! It will happen – but not soon.

What is the cost of decarbonising the planet? The prevailing view of economists over the last 30 years, reinforced by Lord Stern's report is that *if it's done right* the cost could be very low, according to Stern, 1-2% of GDP. But even if it turned out to be 10% of GDP it still would only cancel 3 or 4 years growth of world affluence over the next few decades. Ministers seem to be unaware of this view – even though Stern was blessed by government.

What is needed is an appropriate carbon price – probably in the range \$50-\$100/t. This could be achieved by auctioning all permits and recycling the revenue from this operation to the economy.

Graham Mather (European Policy Forum):

On the EU level, the new Nabucco pipeline needs to be developed. At the moment, although an intergovernmental agreement has just been signed, the ink is flowing but the oil is not yet!

In the UK planning procedures for the infra-structure of the various projects will be fast-tracked by the new Infrastructure Planning Commission. Will this be maintained? The Conservatives plan to change this and return ultimate decision making power to ministers.

Economic regulators like Ofgem may also be subject to review if there is a change of government.

Malcolm Edwards CBE (Edwards Energy):

What can the BMDF do in this situation? Perhaps a paper should be produced setting out the concerns and some questions to ask both political parties on what should be done. In addition, perhaps there should be a quiet BMDF session to come to some conclusions on what the concerns are.

The potential problems are

- the expense of the projects and the consequences of this;
- the possibility of missing the targets and the effects of this;
- stranded assets and how to prevent this and to minimise the possibility

At the moment, there is a war of the lobby groups, all pushing their own projects, hence there is a lot of conflict which is substantial as the results will affect the security of supply.

Cross-subsidies between sources of electricity should be clearly identified and agreed by consumers and their representatives.

Robert Hull (Ofgem):

Ofgem has been working with Government to put in place a regulatory regime for the major new investment in offshore transmission needed to connect the proposed vast increase in offshore wind. Ofgem's primary duty is to protect consumers through competition where possible. The new competitive tenders for offshore transmission licences protect consumers and also play an important part in delivering government policy.

The estimated cost off-shore transmission investment for some 25 GW of offshore wind capacity is £15 billion, compared with the current onshore transmission asset value of some £7 billion. The regulatory framework applying to on-shore transmission has been extended to off-shore, and there is a need for close liaison with the off-shore generators.

A key feature of offshore transmission is that there are fewer planning issues, given that subsea routes are made available by Crown Estates. Onshore, planning consents for the development of new transmission lines is very difficult, e.g. a transmission line in North Yorkshire took 13 years before construction was completed and the Beaulieu-Denny transmission line in Scotland has taken 5 years to date.

Transmission networks exist to move electricity from generation to demand centres, and capacity requirements will change as demand changes. Energy efficiency is increasing in emphasis; increased levels of efficiency are important for conservation of energy and this, together with the impact of the recession, may reduce demand.

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BMDF BACKING PAPERS ISSUED

Attached:

- Memorandum on '*Renewable Electricity Generation Capacity by 2020*' by Professor Michael Laughton FREng - 12 June 2009
- Cuttings from the FT '*Renewable energy plans spark cost fears*' – 11 July 2009; '*CBI urges shift to Nuclear from Windpower*' – 13 July 2009
- Cutting from 'The Times' '*Tilting at Wind Farms*' - 13 July 2009

Available on the Web:

- '*A Prevailing Wind, Advancing UK Offshore Wind Deployment*' - Report by Department of Energy and Climate Change - 24 June 2009 [www.decc.gov.uk]
 - '*Decision Time: Driving the UK towards a sustainable Energy Future*' – Report by CBI - July 2009 [www.cbi.org.uk]
 - First Report of the Committee on Climate Change December 2008 '*Building a low-carbon economy – the UK's contribution to tackling climate change*' [www.theccc.org.uk] See: Part IV Chapter 13 '*Technical Security of Electricity Supply*'
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