

Strategy for energy policy in the UK

T. Stone¹

UK Energy Policy is leading the world in showing how governments can effectively respond to the now widely accepted challenges of security of supply, low-carbon generation and pragmatic implementation. Confidence in the UK as a place to invest in new nuclear is very high – there are already 3 developers who have between them already invested over £1billion, 5 sites are planned to be developed and between 10 and 12 new reactors are planned to be built. To be clear, this is by far the largest commitment to new nuclear in the Western World and swamps new nuclear plans in other countries. This achievement is a combination of vision, continuity, political consensus and a group of ministers and officials who are clear in their goals for the long-term sustainability of an energy policy that will dramatically affect the lives of many generations to come. Recognising the multi-generational obligations and consequences of government policy is key to ensuring that this investment continues, together with the maintenance of the trust that investors have developed in the management of energy policy by the UK government. There is no doubt in the commitment of the UK government to delivering the safe, secure and low-carbon energy future of the UK. The opportunities for businesses and high-quality job creation are undoubted – all that now has to happen is for developers, reactor vendors, construction companies and communities to show how they can together deliver the cheapest form of low-carbon baseload to time and to cost and to the benefit of local communities and the UK economy. The world is watching for the UK to show how it can be done.

La Política Energética del Reino Unido lleva la delantera en el mundo a la hora de demostrar cómo los gobiernos pueden dar una respuesta eficaz a los ya ampliamente reconocidos retos de la seguridad del abastecimiento, la generación baja en carbono y la implantación pragmática. Existe una alta confianza en el R.U. como un buen lugar para invertir en los nuevos proyectos nucleares. Ya hay 3 promotores que entre ellos han invertido ya más de un billón de libras, está previsto desarrollar 5 emplazamientos y hay planes para construir de 10 a 12 reactores nuevos. En otras palabras, es con mucho la apuesta más firme en la nueva construcción nuclear en Occidente, superando los planes nucleares de otros países. Este logro se debe a una combinación de visión, continuidad, consenso político y un grupo de ministros y altos cargos que tienen muy claros sus objetivos para la sostenibilidad a largo plazo de una política energética que va a afectar de forma dramática a las vidas de muchas generaciones venideras. Es imprescindible reconocer las obligaciones y consecuencias multi-generacionales de la política gubernamental para garantizar la continuidad de dichas inversiones, junto con el mantenimiento de la confianza que tienen los inversores en la gestión de la política energética por parte del Gobierno británico. No hay duda alguna de que éste está comprometido a garantizar un futuro energético seguro y con bajas emisiones de carbono. Nadie duda de las oportunidades para el negocio y para la creación de empleo de alta calidad; todo lo que hace falta ahora es que los promotores, los suministradores de reactores, los constructores y las comunidades demuestren que juntos pueden suministrar una carga base baja en carbono de la forma más económica y en beneficio de las comunidades locales y la economía británica. El mundo estará pendiente del Reino Unido para comprobar cómo se puede hacer.

The UK is, in many respects, leading the way in 21st century energy policy and has one of the most vibrant energy investment economies in Europe and the Americas. The UK faces a huge investment challenge to meet our targets for elec-

tricity decarbonisation, while ensuring security of supply, and keeping electricity bills affordable. Ofgem has estimated that we need at least £110 billion¹⁶ of new investment in electricity generation and transmission in the period to 2020. To put this in context, in the last decade the market invested less than half that amount. In a world of global competition for capital, this means both significantly increased investment by existing market



TIM STONE

Dr Tim Stone CBE is the senior adviser to the Secretary of State for Energy and Climate Change on nuclear new build and the Expert Chair of the Office for Nuclear Development. In this role he was asked by the Secretary of State in 2008 to work with the regulators to explore ways of enhancing their efficiency in dealing with the challenges of a nuclear new build programme and the recommendations of his review were accepted by the government and are now being implemented.

In addition to his role as an expert non-executive director of the European Investment Bank, Tim holds two visiting professorships, one in infrastructure investment and finance at University College London and the other at UCL's International Energy Policy Institute in Adelaide.

Until September 2011, Tim was the chairman and founder of KPMG's Global Infrastructure and Projects Group. He is also the independent Advisor to the Deputy Premier and to the Finance Minister of one of the Australian states on their entire infrastructure program and he holds a number of non-executive directorships.

participants and attracting investment from new sources of capital.

Many of the aspects of the policy and implementation are groundbreaking and reflect the fact that the energy economy in the UK is not, and has not been for some time, a balanced equilibrium of asset formation and decommissioning. Major changes have had to occur and will continue to be needed for the coming decades.

¹Expert Chair, Office for Nuclear Development, Department of Energy & Climate Change, London.

Sustainable, safe, cheap, low-carbon energy

What has driven this? First, the long-signalled need to replace old or particularly polluting generation equipment. The Large Combustion Plant Directive² forces much of the existing coal-fired power stations to be switched off before 2016. All but one of the existing nuclear power stations are due to be switched off by 2023 (and the remaining facility, Sizewell B, is only due to last until 2034).

Secondly, the last decade has seen a radical shift in the understanding of the need to deal with the effects of climate change and the contribution that CO₂ emissions make to this. Under the deal agreed at an EU summit in March 2007, the UK is committed to sourcing 15% of energy from renewable sources by 2020. This was the first legislative force to drive a very different direction in energy policy. That was followed by the decision in the Climate Change Act³ to create a legally binding obligation to reduce the CO₂ emissions in the UK by 80% of the 1990 levels by 2050. Indeed, it is clear that the Committee on Climate Change now has more influence on the direction of energy policy than the regulator, Ofgem.

Energy efficiency and personal responsibility

The work by DECC to see how the UK economy and its citizens might achieve this scale of reduction was the work on 2050 Pathways⁴ which identified a number of challenges. To achieve this scale of reduction of CO₂ emissions, the electricity generation sector has to be decarbonised by 2030. Without that, the 2050 target is unachievable. This statement is even more profound than may be obvious; it means that virtually all the existing electricity generation capacity has to be replaced by low-carbon sources by 2030. The separate challenge of largely decarbonising transport is something that will create massive opportunities for the UK and European economy over the latter part of this decade. The scale of this is more obvious when considering that 92% of the UK's freight travels by road.

But just as challenging is the clear need to drive significant levels of be-

haviour change in the UK in both a personal context as well as in all the industrial sectors (including the need to tackle methane emissions from agriculture). Individual citizens will need to take responsibility for their own contributions to climate change in a social change whose impact will mirror the now complete lack of tolerance for drink-driving and the elimination of tobacco smoking in public places. The "Green Deal"⁵ currently being pursued by the UK government is an important step in this direction but the social challenge still has some way to go.

Private sector choices, delivery and operation

The UK has, however, been entirely consistent and clear that the implementation of all these changes in the energy sector must, and will, come from the private sector both in driving investment and in the construction and operation of safe, cheap low-carbon generation facilities. Government has been clear that there is no single simple solution capable of meeting the challenges. Renewables, nuclear, carbon-capture and storage and energy efficiency all have important parts to play and there is a sense that new nuclear could be the lowest cost low-carbon baseload option for the UK – which has very limited opportunities for hydro generation, most of which has already been exploited.

THE CAUSES AND BACKGROUND THAT HAS LED TO THIS ENERGY POLICY

Privatisation and pre-history

Focusing now on nuclear, in 1979, the then Energy Secretary, David Howell, announced to Parliament that the UK would build a fleet of 10 new nuclear power stations. The first new station was due to start construction in 1982 with one a year starting in each subsequent year. Sizewell B was the only new nuclear power station to be built and then after a drawn-out public inquiry that lasted for three years with less than one-tenth of its time being spent on truly local issues. The subsequent break-up and privatisation of the CEBG and the market liberalisation that followed effectively ended any prospect of the 1979 plan going any further and nuclear entered a period of decline with lack of investment in nuclear related engineering businesses and a lack of recruitment

of new skills into the industry. Nuclear new build was reviewed in 1994 by which time the "dash for gas" was in full swing. With new gas stations being built, generating capacity was not an issue and the system was becoming more diverse as coal's former dominance was reduced. The 1994 review found "no compelling reasons for supposing the market will not of its own accord provide an appropriate level of diversity". While the review accepted that nuclear power was a low carbon source of energy, it concluded the "full extent" of the climate change threat was yet to be established and that "at present" there was no evidence that new nuclear was needed for carbon abatement reasons.

As late as 2003, an energy review barely mentioned nuclear power and it was not until another energy review in 2006 that nuclear power once again figured in emerging policy.

2008 White Paper

The arrival of John Hutton⁶ in June 2007 as the Secretary of State, responsible for energy policy saw the beginning of a new, more pragmatic approach to energy policy. After 6 months looking at the outcomes that were needed to be delivered and a great deal of political hard work across government and the opposition, a White Paper was presented to Parliament on 10th January 2008. The White Paper set out a clear view of the range of actions that were needed if the UK were to address the challenges of security of supply, climate change and the existing legal constraints of the Large Combustion Plant Directive and the 2020 Renewables target. Importantly it recognised that the investments would have to come from the private sector and set about creating a context to enable this. In so doing, the government recognised that the scale of what needed to be done would require support from across the widest reaches of industry, much of which was supported by equity bases in other European countries. Though never formally articulated as such, an important theme pervaded the White Paper and the actions in government to implement it – that government was responsible for political and many aspects of regulatory risk and that where these were counter productive in terms of the delivery of safe, cheap, low carbon

²LCPD - was introduced by the European Parliament and Council on the 23rd October 2001 and broadly requires the large polluting generation equipment to be switched off by the end of 2015.

³Received Royal Assent in November 2008

⁴<http://www.decc.gov.uk/en/content/cms/tackling/2050/2050.aspx>

⁵ http://www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx

⁶John Williams was the Secretary of State's Special Advisor with particular involvement in energy policy and who was very effective in helping deliver the new energy policy.

energy, those risks should be minimised or eliminated. There was a clear understanding in many quarters that governmental actions create obligations and consequences that flow for many generations and that in implementing 21st century energy policy, the government and officials had to try hard to drive the implementation in a way that recognised these consequences.

The immediate practical consequence of the White Paper for new nuclear was the establishment of the "Facilitative Actions" in which as much as possible from the new build process that had governmental involvement was brought forward and done once, up front, before serious investment was ready to happen. The facilitative actions included:

- The decision on Regulatory Justification
- The National Policy Statement, including the designation of sites for new nuclear build
- The Generic Design Assessment and
- The Funded Decommissioning Program
- Insurance issues arising from the Paris/Brussels convention and the updating of this for use within the UK

This was underpinned by a realisation that new nuclear had to be a fleet of standard designs, with safety a common feature across those designs and that construction should never start until the designs had been reviewed by the appropriate regulatory and environmental authorities and cleared on a generic basis. This would leave only site-specific issues for individual construction, again streamlining the process, reducing the costs to the national economy and the risks to the wider investor base.

UK POSITION AND STRATEGY IN NUCLEAR ENERGY

UK to be a serious nuclear nation - but without public subsidy

Following the 2010 General Election, the coalition government reaffirmed the place of nuclear in the future energy mix – not just as a general statement but, importantly, enshrined in the Coalition Agreement⁷ between the two political parties. The Conservative Party, one of the two coalition partners, has held for some time that new nuclear should be built without public subsidy but ministers have been clear that significant amounts are needed. To quote the current Energy Minister, Charles Hendry⁸ in a speech in July

2011, "We must go forward with new nuclear and we would be a darker and less prosperous nation without it. After more than a decade since we built the last plant, there should be no doubt that UK wants to be a serious nuclear nation once again" and in the same speech the Minister emphasised further the amount of new nuclear required, "We don't just need one nuclear power station, we need a fleet of them which can help to provide secure energy and meet our climate change targets up to 2050"

NEW NUCLEAR CAPACITY TO BE BUILT IN THE UK

Generic Design Assessment and Sites

The Generic Design Assessment process began by asking potential developers to identify the reactor designs they may want to build and to support, as "requesting parties" vendors in putting those designs through the GDA process. While four designs were initially submitted, one withdrew, one suspended work to focus on design certification in the USA⁹ and Areva's EPR and Westinghouse's AP1000 subsequently completed the main part of the GDA process in December 2011, ensuring that all issues of actual or potential regulatory concern have been identified and are either resolved or are subject to an agreed programme of action to resolve them.

Meanwhile the National Policy Statement was created as part of the radical reform of the planning process for nationally significant infrastructure. This, for energy, consisted of an over-arching energy policy statement with separate statements for each form of low-carbon energy. The Nuclear National Policy Statement included within it the Strategic Siting Assessment that identified 8 sites suitable for construction of the first wave of new nuclear power stations. The major point of this reform of the planning system was to ensure that issues of national significance had the needs established by parliament leaving the local planning process to focus, unlike the Sizewell inquiry, on truly local issues thereby restoring proper local democracy and reducing the risks of the planning process to

the development of national energy supplies.

National Policy Statement enacted

In July 2011, parliament approved the National Policy Statements paving the way for planning applications. EdF subsequently submitted their full application on 31st October 2011 for planning for two EPR reactors to be built at Hinckley. The application has been accepted by the Infrastructure Planning Commission and is being examined – meanwhile EdF were granted planning permission for preliminary site works and are currently moving over 1million cubic metres of material to level the site ahead of construction work.

THE MAIN AGENTS IN THE DEPLOYMENT OF NEW NUCLEAR CAPACITY

Three developers

There are currently three developers active in the UK – EdF (through NNB Generation Company), Horizon Nuclear Power (with Eon and RWE as shareholders) and NuGeneration (with GdF and Iberdrola as shareholders). Between these very active developers there are 5 sites at various stages of development – Hinkley Point in Somerset (EdF), Wylfa on Anglesey (Horizon), Moorside Cumbria (NuGen), Sizewell in Suffolk (EdF) and Oldbury in Gloucestershire (Horizon). Of the developers, EdF have already selected Areva's EPR technology for their Hinkley Point sites while Horizon have been conducting an appraisal of both Areva and Westinghouse technology for their Wylfa site and at the time of writing, NuGen have not made any decisions around technology.

These developers are currently all funded on the balance sheets of their parent shareholders and a working assumption is that external finance, whether through export credits or external equity investment will be brought into all these developments over time.

The Office for Nuclear Development

The Office for Nuclear Development was created in 2009 as a formal part of the department responsible for energy policy. Today it continues with its mission to make the UK the best place to invest in new nuclear globally with overall responsibility for the UK's nuclear program and the legislation needed to provide the setting for future investments. The officials in the team have guided all the Facilitative Actions through official development and the parliamentary processes and work closely with the local communities within

⁸Charles Hendry was also the Shadow Energy Minister whilst in opposition and whose continuity has provided much reassurance to international investors.

⁹General Electric stated that while they were suspending work on their ESBWR design in GDA, they viewed this as a temporary measure and fully intended to return in due course.

⁷<http://www.cabinetoffice.gov.uk/news/coalition-documents>

which new nuclear investments are planned to take place.

More importantly, the OND has been focused, since inception, on the creation of an industrial market in the construction, finance and operation of new nuclear power stations and is also working closely with the finance and investment communities to ensure that nuclear power stations are ultimately as attractive as possible to infrastructure finance, construction finance, external equity investors and future developers. The work of the team also encompasses ensuring cross-government effectiveness in the development of the nuclear supply chain in the UK and the development of nuclear-related skills in the UK. All of this work is outcomes directed with a clear mission to enable new nuclear to happen with the best safety standards anywhere and at the lowest reasonable cost to consumers.

The other area where the OND has been particularly effective has been in the support of the independence of the safety regulator and in driving

through structural reforms¹⁰ to ensure that the regulator (now the Office of Nuclear Regulation) has all the resources it needs to support the nuclear renaissance and is able to act at all times in the best interests of the UK citizens.

REGULATORY REFORM OF THE ELECTRICITY MARKET

Fundamental need

The need to reform the electricity market to support investment in all forms of low-carbon electricity on a major scale was recognised by government and consulted on between December 2010 and March 2011 and resulted in a white paper in July 2011.

The existing market, initially created to support the privatisation process and then amended to drive costs ever lower, did not support the levels or types of investment required by the 21st century low-carbon era. Like many markets created around privatisation, the long-term sustainability of assets, capacity and investment attraction was not assured as external constraints altered; the markets work well in a context of relative equilibrium but were never designed to cope with sudden and significant change. The European Emissions Trading Scheme, while important in the long

run, has not been sufficient to incentivise anything like adequate levels of low-carbon investment in the UK and so a significant change was needed.

Four pillars

The new electricity market is being created with the overly constrained nature of the energy needs in mind. It consists of four pillars – a carbon price floor designed to reinforce the Euro ETS scheme, an emissions performance standard to ensure that no generation facilities which would be significant emitters of CO₂ are ever built in future, capacity payments and contracts for differences. The details of the latter two are now being worked out ahead of major investment decisions in 2012/13 by low-carbon generators – but with the investment decisions by a range of low-carbon generators firmly in mind.

The implementation of the fine details of this new market will take some time to work through but again it is clear that in this area too, the UK is leading the world and there are already signs of strong interest from electricity regulators in other countries who can foresee similar issues developing in their own markets over the coming years.■

¹⁰See in particular the Stone Review and the implementation of the recommendations http://www.decc.gov.uk/en/content/cms/meeting_energy/nuclear/new/reg_reform/reg_reform.aspx