



University of
St Andrews



Assessing Subsidies in the UK Energy Sector

Seminar Report 3:

**Going Nuclear: Exploring the multi-level
politics of nuclear energy**

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The 3rd Seminar on subsidies in the UK energy sector took place in Cambridge for one day and comprised presentations from 12 both national and international speakers from within and outside of academia. The main topic of subsidies was effectively put into context by the various speakers and key ideas and outputs will be summarised below.

All speakers agreed that energy is essential to our societies and economies and is therefore both a major driver and concern for current and future generations. Next to the significant contribution of energy to foster the development of societies and economies, different sources of energy have different, mostly negative, environmental effects. The awareness of the negative impacts on the environment and world climate grew over recent year which is why *Professor Kim Talus*¹ depicted a change in the approach of the economy and governments to Energy: Europe transitioned from a wholly market driven approach to Energy production in the 80's and 90's to the realisation that competitive, sustainable and secure energy will need rules and investments the market cannot deliver alone. He points out that the goal of the market is efficiency whereas the goal of government is stability and long-term vision. Here the energy policy triangle delivers a framework which was used by several speakers (*Liz Keenaghan-Clark*², *John Miles*³):

¹ University of Eastern Finland, Finland, Author of *EU Energy Law: A Critical Account*, OUP (2013).

² Deputy Director, Head of Geological Disposal Facility Project, Office for Nuclear Development, Department of Energy and Climate Change, UK

³ Royal Academy of Engineering Research Professor in Transitional Energy Strategies, Department of Engineering, University of Cambridge.

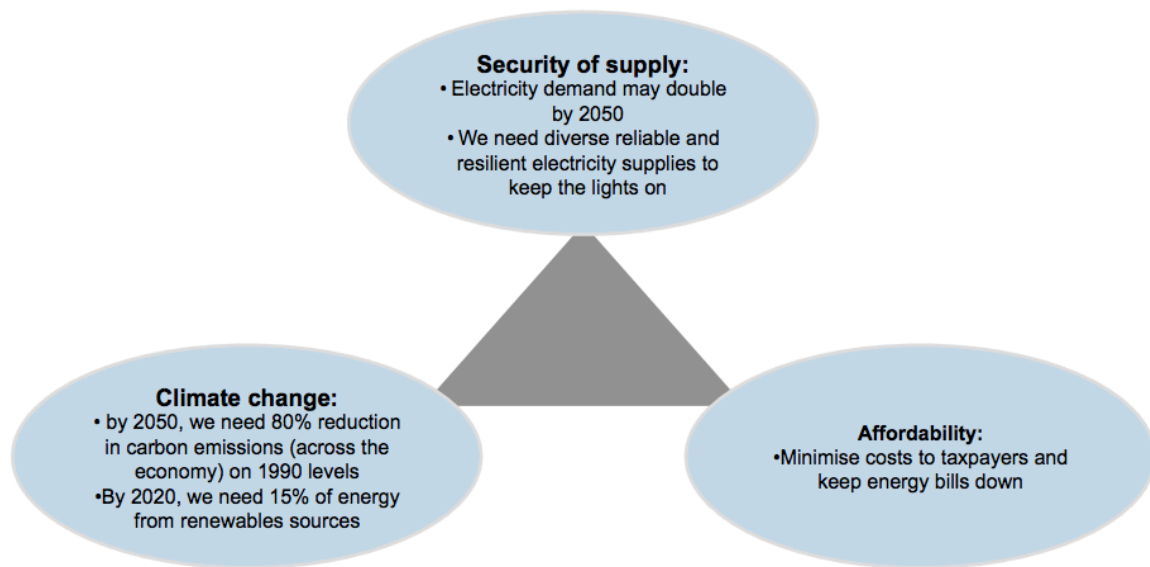


Figure 1: Energy Policy Triangle

The above dimensions are the maxims on which energy policy decisions should act. Like others, *Liz Keenaghan-Clark* points out that the difficulty at present and especially in the future. Just like on the global scale, the UK is subject to growing energy demand while 20% of installed power plant capacity will be closed by 2020 for reasons of ending lifetimes, security, etc. Thus there is a high need for new build capacity. To secure electricity supply at all times the emphasis has to be put on a mix of different and complementary technologies. In order to achieve this the UK the government uses an stepwise approach between now and 2030: After reconciliation of existing capacity and their administration there will be a stepwise increase of capacity through auctions, initially technology specific and subsequently technology neutral. As part of this an increase of nuclear capacity is planned from currently existing 9 GW to about 17 GW by the end of the 2020s as in figure 2 below:

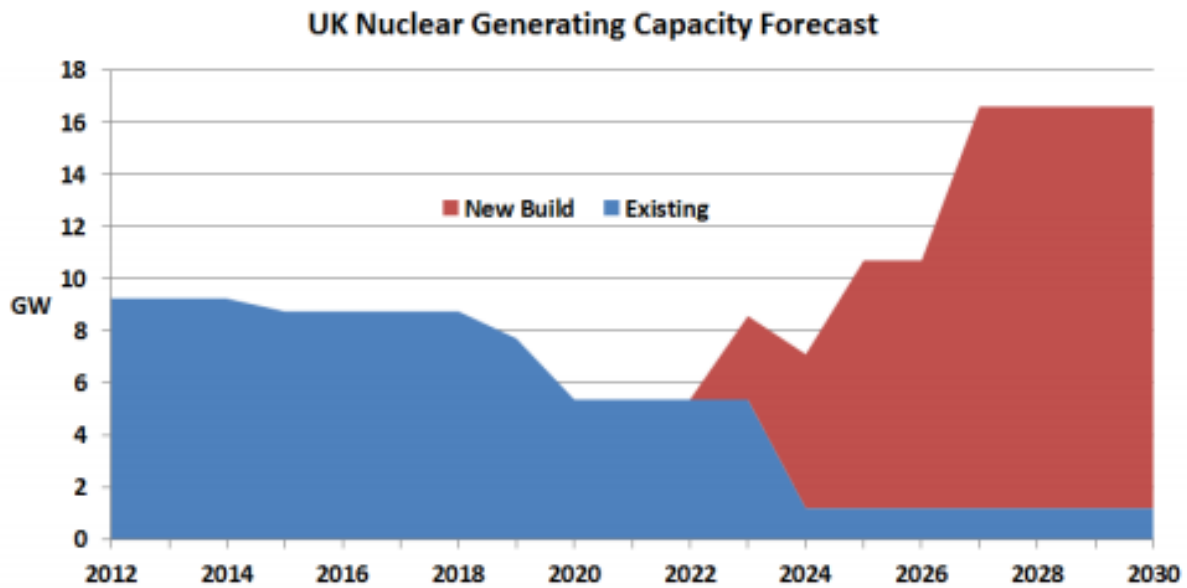


Figure 2: UK Nuclear Generating Capacity Forecast

According to *Liz Keenahjan-Clark* the future challenges for nuclear in the UK can be summarised as follows:

- Third party financing needed for all consortia
- Maximising UK economic benefit (localisation)
- Building to time and budget (cost reduction)
- Progress on long-term waste disposal
- Wider global and EU policy drivers: role of shale gas, post 2020 renewables target

Subsidies

A central tool for governments to support certain technologies are subsidies. “The IMF estimates that energy subsidies (oil, gas, coal and electricity) amount to a staggering \$1.9 trillion worldwide — the equivalent of 2½ percent of global GDP, or 8 percent of government revenues. Over 75% of energy project support from international financial institutions (IFI) to India, South Africa, Saudi Arabia, Indonesia, Brazil, Thailand, Kazakhstan, Egypt, Venezuela, Uzbekistan, Algeria, and Nigeria was to fossil fuel projects. These are 12 of the top developing country GHG emitters. A basic analysis by ODI of UK finance to energy projects through IFIs identified more than USD 3 billion (or GBP 2 billion) in support between 2008 and

2011. Support to fossil fuel projects through IFIs was twice as large as support for clean energy projects”. (*Shelagh Whitley*⁴)

With regards to nuclear energy in particular, *Tony Roulstone*⁵ points to the fact that for new build nuclear capacity there was supposed to be no subsidies at all. At the same time operators must fully cover for waste and decommissioning costs. Subsequently the former was softened and the state’s subsidy stance turned into “no specific subsidies” for nuclear. Historically there were a number of subsidies, which supported the generation of nuclear electricity:

- Initially electricity from nuclear was a state monopoly and thus could charge whatever price was necessary to recover costs
- After privatisation there was a top-up of 10 Punds per MWh produced.
- About 200m Pounds went into R&D for nuclear technology which was never used

Reality looks a little different according to *Tony Roulstone*. Taking the example of the plant which is under construction at Hinkley C, costs would translate into a generation price of about £92 per MWh which is significantly above the market price (currently at about £50 per MWh⁶). Lacking development of nuclear technology in the UK in the past years is identified to be a significant part of the problem. The last nuclear plant constructed was in 1990 (Sizewell B) but thereafter the focus of the industry shifted to “dash for gas” and investment in renewables. R&D in nuclear decreased, resulting in little improvements with regards to price efficiency of nuclear power plants (NPP). At the same time countries like Korea and Japan could significantly improve efficiency at all levels of the life-cycle and of their nuclear plants resulting in a steeper learning curve and thus about almost 50% less investment per kWe needed in NPPs. The aim of private financing of the plants seem to be unrealistic due to the significant costs and risks implied. Therefore, subsidies are likely to be necessary in order to allow operators to run NPPs.

⁴ Research Fellow, Overseas Development Institute, UK.

⁵ Director for the MPhil in Nuclear Energy, Department of Engineering, University of Cambridge, UK.

⁶ Source: <http://www.energybrokers.co.uk/electricity/historic-price-data-graph.htm>

Speakers were also concerned about other energy sources which are or should be subsidised. Professor *David Newbery*⁷ expressed that we are already locked in to high carbon emissions from past fuel choices, which resulted in path dependency to some extent as past electricity choices and strategies influence future choices. Zero carbon generation faces more financial risk than fossil production because the return of renewables heavily depends on the electricity price which is set by the electricity produced from gas or coal. For these reasons a de-risking of RES investment needs to occur. One approach would be a reform in the EU-ETS market, which currently is ineffective for the purpose of reducing carbon emissions. Due to the high number of certificates on the market, market prices for certificates are very low. These low prices don't give carbon emitters sufficient incentive to avoid or reduce their emissions. *David Newbery's* suggests a price floor for certificates which would linearly increase over time which would make investments into RES more attractive.

In addition FiTs look like an effective solution based on the example of Germany (while cheaper than CfD) to increase attractiveness of RES. However, with regards to the funding of these subsidies *David Newbery* suggests a different approach than the one used in Germany for example. Because FiTs reduce carbon and create learning and knowledge, which has to be considered a public good, they should be financed from public funds, rather than from levies on electricity bills. By using levies and exempting certain industries from these, countries deploying these mechanisms are discriminating against certain industries which are not exempted for these levies. Instead, all industries should be exempted and the financial responsibility should fall on all final consumers in the form of VAT.

Subsidies in light of Energy Justice

A reoccurring theme within the talks was the finite nature of fossil fuels as well as the risk inherent in the technologies employing these fuels (Oil spills/Nuclear melt-

⁷ CBE, FBA, Emeritus Professor of Economics at the Faculty of Economics, University of Cambridge, UK.

downs). Subsidies for fossil fuels encourage and accelerate the extraction of these finite resources. Additionally “subsidies create larger budget deficits and higher taxes, diverting funds from potentially better options for fiscal support and programs such as healthcare and education.[...]By lowering the end price of energy, subsidies therefore lead to higher energy use, and they also reduce the economically rational incentives to properly maintain or meter energy systems and products. [Additionally], by inflating the cost of energy, subsidies also erode motivations to promote energy efficiency or to conserve energy. They artificially lower the costs of innovation in mature industries, increase barriers to entry for newer, cleaner, and emerging technologies, and obscure costs and risks of conventional fuel cycles” (*Benjamin Sovacool*⁸). Due to these negative effects of subsidies on energy products, *Benjamin Sovacool* advocates the removal of subsidies which harm both the economy and the environment. In an effort to do so “Governments and communities could conduct subsidy impact studies to better determine the costs and benefits of particular subsidies, and which ones could be revised or repealed. Such subsidy studies, apart from revealing financial flows, could include standardized ways of defining subsidies, tracking them and publishing data about them, and creating an international framework of independent monitors to continuously evaluate [those subsidies]” (*Benjamin Sovacool*).

⁸ Aarhus University, Denmark, Director of the Danish Centre for Energy Technology, and Visiting Associate Professor at Vermont Law School, Author of *Global Energy Justice: Principles, Problems, and Practices* (Cambridge: CUP, forthcoming 2014).