

RENEWABLE ENERGY MARKET POTENTIAL IN U.K.

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ABSTRACT

Energy is crucial to our daily lives and to the needs of business and industries. Affordable, sustainable and reliable energy supplies are key objectives of the government's energy policy. But now a days Green electricity (GE) is a generic term for electricity generated from clean, environmentally preferable energy source. Over the last twenty years following privatisation the current energy policy frame work combining competitive energy markets and effective, independent regulation has been serendipitously successful in meeting the government's goals in terms of the environmental policy as carbon and other emissions were reduced as cleaner, more efficient gas-fired generation replaced coal generation and investment were made to reduce emissions from remaining coal-fired plant. But recent experience has led to questions as to whether we can continue to rely on a policy based on energy markets. Because, wholesale and retail energy prices have risen significantly and remain high and volatile, impacting on industrial competitiveness and fuel poverty. Carbon emission has started to rise as generators increase output from coal fired station in response to rising gas prices [1].

Since 1999 GE has been available to all customers in the UK. The market has had positive beginnings with almost all electricity suppliers offering a green electricity product. Marketing has been launched and consumers are beginning to make the switch to green electricity despite the premium charged. An accreditation scheme guarantees that the green purchases match power entering the grid. For supply side, the government also introduced the Renewable Obligation in 2002 as part of its strategy to cut carbon dioxide emissions. This places an obligation on energy suppliers to source an increasing proportion of their consumer demand from renewable energy however the demand side of the sector also has a significant role to play in reducing emission. For business customers, the Climate Change Levy on gas and electricity bills in 2001 has been introduced and companies were allowed an 80% discount on the levy if they signed Climate Change Agreements. The government estimates that these two programmes working together will save 6.2MtC per year in 2010. For domestic customers, the government also introduced the Energy Efficiency Commitment (EEC), an obligation on gas and electricity suppliers to increase the efficiency of the energy use of their domestic customers [2]. The UK government has committed to a number of international and domestic targets and goals to reduce emissions of greenhouse gases which contribute to a climate change. In international agreements, the UK has made two ambitious commitments, which are not legally binding: To reduce emissions of carbon dioxide to 20% below 1990 levels by 2010 and to put the UK on a path to reduce carbon dioxide emissions by 60 % compared to 2000 levels, by 2050 with real progress by 2020. With the present energy markets, Utilities Bill and Climate Change Levy, despite aiming to support renewable energy are introducing a number of uncertainties to the market. In this paper we will try and discuss as to how barriers to this potential markets renewable energy can be overcome through government policies.

Author Keywords: Renewable energy; policies; Barriers; potential market

1. INTRODUCTION

Energy is essential in almost every aspect of our life and for the success of country economy. Now a day, we face two long term energy challenge: one of them is tackling climate change by reducing carbon dioxide emission both within the UK and abroad and the other one is ensuring a secure clean and affordable energy as we become increasingly dependent on imported fuel. The scale of the challenge is daunting. If CO₂ emissions are to be reduced and in particular, if they are to be reduced along the lines suggested by the

Royal Commission on Environment Pollution (RCEP 2000) of around 60% by 2050, then most of the existing electricity generation capacity in Britain have to be replaced.

2. POLICIES AND POTENTIAL FOR GE

Beginnings with NFFO (The Non Fossil Fuel Obligation) in 1991, by 1998 five rounds were ordered. Although projects may be built until 2013. NFFO contracting has come to an end. Through the 1990s the UK electricity industry was privatized and by 1999 the market was fully liberalized. This means that all the

consumers in UK could now pick and choose their electricity supplier. Under NFFO schemes renewable generating companies bid for competitively let, long term contracts to provide electricity at premium rates. The scheme had mixed success. It was partly responsible for reducing the cost of renewable generation, but a number of contractors experienced planning, technical and commercial problems in developing sites and generating capacity remains 25 percent short of the policy target of 1500 MW.

In January 2000 the first new policy to affect renewables became official and the Climate Change Levy (CCL), after much consultation, was finally adopted with effect from April 2001. The CCL is an energy tax applied to most non-domestic users on energy to encourage a reduction in electricity and gas use ultimately carbon emissions. So non domestic consumer are charged 0.43pence/KWh on electricity unless it comes from renewable energy sources or combined heat and power generation [3]. And that is the way of increasing the demand and ensuring market pull for renewable energy. At the same time the other development taking place. For example, with in the Renewables Obligation, will require supplier to generate 10% of their supply from renewable sources by 2010. Here the question is how the supplier will meet the obligation and who will bear the cost of new projects for Renewable generations [4]. Although the price cap will ensure consumers are not burdened excessively, but some price increases are expected. So customer may not save money by buying green tariffs, as the value of Levy and premium price have many cases, a cancelling out effect, buying GE does earn enterprises and companies some 'green' credentials. For this reason many suppliers and others believe demand for electricity will outstrip supply.

In 2003-04 the second year of the Renewable Obligation, eligible renewables accounted for 2.4 percent of great Britain's electricity generation, significantly lower than the Obligation level of 4.3 percent. A 4th report from 'Renewable Energy' Practicalities of session 2003-04 conclude that the Renewable generation will likely to achieve not more than 7.5 percent by 2010, comparison with its target of 10 percent.

Reinforcement of the Grid Network: Electricity is transmitted long distance in Britain via transmission network and is supplied to users through local distribution network. Future renewable energy projects will connect to these networks, affecting the flow of electricity across the system. This will require parts of networks to be upgraded. Also there is uncertainty as to exactly how much network enforcement will be necessary to meet the 10 percent of target. The cost of network enhancement are initially met by the owners of the transmission network and then on to generators and supplier through use-of-system charge.

Wholesale electricity market is a determinant of investor confidence: Changes to the arrangements of trading electricity in 2001 contributed to a fall in wholesale electricity prices which reduces the confidence of investors in renewable sector at the time. But wholesale electricity prices have risen recently and likely to remain high because of driven by factor like higher fuel cost for coal and gas and effective introduction of carbon pricing. Although the Renewable Obligation does not provide the guaranteed long-term prices enjoyed under the Non-fossil fuel Obligation, higher wholesale electricity prices give some measure of comfort.

Some renewable technologies are not commercially viable under the Renewable Obligation alone. In response the government has to provide capital grants to enable the bioenergy and off shore wind sector to reduce their unit cost of generation. Moreover, developers found it hard to sign long-term power purchase agreements with an electricity supplier for the electricity they propose to generate, at prices which would make the Further NETA, the New Electricity Trading Arrangement may provide one interesting aspect for renewable energy. Because electricity is traded far in to the future (present trading is occurring two years in advance, it may provide renewable generation with the kind of contract guarantees required for secure investment projects commercially viable.

So this uncertainty in policy gives more questions than answers in market.

3. KEY FACTORS FOR FUTURE POLICY SUCCESS

UK government made a number of changes to the Renewable Obligation (RO) to improve its effectiveness following the 2005 RO Review. Further changes to the RO were proposed in the 2006 Energy Review Report⁵, which set out our ideas on strengthening the performance of the RO. One of the principal changes proposed was to adapt the RO to provide greater support to emerging technologies and less support for established technologies.

The Government's preferred option for achieving this was through a "banding" system. DTI published a consultation document – Reform of the Renewable Obligation and Statutory Consultation on the Renewable Obligation Order 2007. In October 2006 seeking views from the renewable sector on the above proposals, the consultation proposed a number of administrative changes, in particular, proposals to make it easier for micro generators to access the benefits of the RO[5].

The Energy Review Report stated that the Government was committed to introducing fundamental change to the planning system for major energy projects; this will include large onshore wind projects. In December

2006, in his Pre-Budget Report, the Chancellor welcomed the Eddington and Barker reviews which both made recommendations for the UK planning system. These recommendations on planning for infrastructure can play a significant role in ensuring the UK's competitiveness and delivering our objectives on climate change, the environment and energy security. Furthermore, government has to provide a large amount of funding for research in to renewable energy. The government should develop a proper project plan, bringing together with the various elements of its on-going programme of work. They need to establish a 'critical path' for the project and monitor key milestone, and taking an action for the matter involving the electricity grid network or planning changes are measured in years rather than months. Government

The stability of government renewable energy policy is important to encourage investment. Rapid growth in renewable energy generation depends up on having a policy frame work which provides a stable environment for investment, secure returns on investment, and has clear long term goal. One of the aims is to develop technologies and the industry as a whole so that they make a growing, sustainable and competitive contribution to energy supply. To achieve this, government has to put a range of support mechanism, such as the capital grant programmes research and development programmes.

4. INCREASING GE

The Government has a target of 10% of electricity coming from renewable sources of energy by 2010, with an aspiration for this level to double by 2020. Recent action includes [6]:

- With the opening of the Braes of Doune wind farm in February 2007, the UK became one of only eight countries in the world to achieve more than 2GW of wind generation. It took 14 years to reach 1GW and only a further 20 months to reach 2GW.

- Between March 2006 and February 2007, DTI granted consent for: – a combined offshore wind farm and gas generating station – the Ormonde project. This innovative hybrid project will be sited around 10km from Walney Island (off the North West coast of England) and has the potential to generate a total of up to 200MW of electricity, with around half coming from the wind farm.

In April 2006 the Scottish Executive gave consent to the Whitelee wind farm project, with a capacity of 322MW and August 2006 saw the first of two 5MW offshore wind turbines installed in the Moray Firth – the furthest from shore and deepest in the water of its kind in the world. Scottish Executive has committed £3 million to the project.

- In June 2006, the 19MW Callagheen wind farm was opened in Co. Fermanagh bringing total large scale

wind generation capacity in Northern Ireland to 106MW. In addition some 1,200MW are the subject of planning applications in Northern Ireland.

- The UK has seen planning approval in 37 small and large Renewable Obligation eligible projects with a total capacity of 2676MW, including 15MW landfill gas and 9MW biomass.

5. CONCLUSION

As we seen in these policies it is clear that the Renewables Obligation stand for an opportunity for renewable energy in the UK. So far this new policy instrument alone could conflict to deliver a break from past trends and deliver a transformation in electricity supply system. Nor should we expect it to. A case of competitive renewable technologies is not sitting waiting to be taken off the shelf, plugged-in and put to use like a new refrigerators. If the UK wishes to move a significant proportion of the current system of large, centralised, fossil-fuel and nuclear electricity generation with renewables, then it will need a range of well-developed renewables technologies. Even when sufficiently well developed, any expansion in renewables technology will have to interact with planning processes, electricity markets, and transmission issues. The Renewables Obligation market will provide welcome support for the renewables industry in the UK, but policy-makers must maintain their alertness over any bottlenecks and uncertainties that might block progress towards the 10 per cent target and beyond [7].

6. REFERENCE

1. Andy MacFaul, Ofgem, Our energy challenge, Ofgem's response, All-energy conference may,2006, U.K.
2. CCPR document 2006, page 47 and page 49 for CCAs (quoting "CCA Target reviews")
3. http://www.nao.org.uk/publications/nao_reports/04-05/0405210es.pdf
4. UK RE Policy : More questions than answers? Refocus, Volume 2, Issue 6, July-August 2001, Pages 10-12
Judith Lipp
5. <http://www.dti.gov.uk/energy/review/page31995.html>
6. energy white paper : meeting the energy challenge- 23may 2007
7. Hughes, T. P. 'The Evolution of Large Technological Systems' in Bijker, W.E., Hughes, T.P. and T.J. Pinch (eds) *The Social Construction of*

Technological Systems, MIT Press, Cambridge
(1987).

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