Making the UK Renewables Programme FITTER

The Renewables Obligation, the general case for a feed-in tariff and the operation of a feed-in tariff for small renewables

Summary version of a submission to the Renewables Obligation reform consultation.

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Executive summary

This report is a short summary of a much longer and detailed submission to the Government's RO reform consultation. Both versions can be obtained from the World Future Council website.

The report discusses the performance of the Renewables Obligation (RO), and both the general case for a Renewable Energy Feed-in Tariff (REFIT) and the specific proposal for a small renewables REFIT (see below for definition). As we explain in this report, a small renewables REFIT can easily be harmonised with the existing RO. The RO could continue for the larger technologies in the form currently proposed by the Government, although our preference would be for a transition to be made to a REFIT system for all scales and technologies, as it is proven, when well designed and implemented, to be a more cost-effective and flexible instrument, generating higher, faster renewables deployment. This report also sets out the means by which the objectives of the report could be implemented in practice.

A REFIT sets a minimum guaranteed price for renewables using contracts that last for 15-20 years. We believe that the establishment of a REFIT, starting with small renewables such as wave, tidal stream, biomass and solar photovoltaics (PV), is the optimum reform trajectory for the renewables programme in the UK. This would increase the volume of delivered renewable capacities whilst minimising cost to the consumer. Importantly, we wish to distinguish the REFIT approach from the calls to effectively return to the inadequate 'competitive' tendering system of the 1990s which is liable to produce very low volumes of renewables, and put the UK even further from reaching its EU targets.

The RO has achieved a significant expansion of renewables capacity in the UK over the last 5 years. However, we still lag seriously behind the expansion associated with REFIT systems such as those in Spain, Germany and formerly Denmark. Moreover, the RO is an expensive way of funding renewables, compared with a REFIT, which can deliver higher levels of capacity for the same cost to the consumer. This is because REFIT systems offer much greater certainty to investors about future returns, thus lowering the risk premia payments compared with the RO. High electricity prices since the end of 2004 have been a major source of cost inefficiency in the RO for the consumer. This problem could be satisfactorily controlled under a REFIT system.

We argue that smaller renewable projects which occupy technology bands such as wave power, tidal stream, biomass and solar PV would fare much better under a REFIT than under the RO. We set out how a scheme for a small renewables REFIT could be implemented, and also how it would be possible to harmonise this with existing RO arrangements. We dispel fears that a transition for some or all renewable technologies from the RO to a REFIT would disrupt the renewables programme. Much of the machinery already exists to harmonise a REFIT with the RO via the operations of the Non-Fossil Purchasing Agency (NFPA).

A REFIT, properly designed and implemented, can create the conditions for more widespread, inclusive and cost-effective renewable energy production. As well as truly large-scale installations, many different sectors of society, including farmers, businesses, homeowners and community groups can participate, and begin to transform the way energy is produced in the UK, allowing greater energy security, job opportunities and crucially, climate protection.

Renewable Energy Feed-in Tariffs (REFITs)

Renewable energy feed-in tariffs (REFITS) involve renewable generators being paid fixed prices that are set by the Government. Each renewable generator is given a contract to supply energy which involves them being paid guaranteed amounts over a long period. In Germany and Spain this is 20 years. This includes homeowners, farmers, community groups, businesses and utilities. Generally speaking, anyone can participate in the scheme. This helps to quickly increase the deployment of renewables, as long as the tariffs are correctly set so as to allow profitable operation of the installation.

When we talk about renewable energy here and the way it is financed, we mean 'new' renewable energy. We exclude traditional large hydro-electricity schemes. We mean technologies such as onshore and offshore wind power, various types of biomass, solar PV, small hydro schemes, wave power, tidal stream technology and landfill gas and sewage gas.

The largest 'new' renewable energy programmes in Europe have been developed using REFIT schemes. In Denmark these types of renewable energy supply over 25 per cent of electricity. In Spain, wind power alone now supplies 12 per cent of total electricity. Germany supplies over 10 per cent of its electricity from 'new' renewable energy sources. Around 16 EU states currently use a REFIT system, whilst only four use a system mainly involving green electricity certificates (Rickerson and Grace 2007). None of these compare in their delivery of renewable energy to the REFIT regimes. In the UK only 4 per cent of electricity is supplied by renewable energy established under UK new renewable energy programmes. The largest share of this is actually provided by landfill gas.

The Renewables Obligation

The UK Government has a target of providing 20 per cent of its electricity from renewable energy by 2020, and the RO is backed by legislation to promote the supply of 15 per cent of electricity from renewable sources by 2015. The system works by renewable operators being given 'Renewable Obligation Certificates' (ROCs) for every MWh of renewable electricity that is generated. Electricity suppliers have to buy ROCs in order meet quotas they have been set for the supply of renewable energy – gradually increasing until they supply 15 per cent of their electricity by 2015.

The only way they can legally avoid this is to pay a 'buy-out' penalty for the amount of renewables that they are failing to supply. This buy-out penalty set at £30 for each MWh (2002 prices, indexed with inflation) that they fail to supply to meet their target for a given year. The penalties are 'recycled' as payments to the people who actually submit ROCs by way of compliance (whether in whole or in part). This means that in practice the value of ROCs has been around £45 per MWh which coincides with an RO that has been fulfilled to about two thirds of its target. It should be mentioned at this stage that a large part of income for renewable energy generators comes from other streams in addition to the value from ROCs. The market value of the so-called 'brown' rate for electricity is also paid to renewable generators, and this value, plus some other small exemptions has, since 2005, been worth more than the ROCs.

The extra costs that this system involves are passed onto consumers in the form of higher prices for their electricity. While opinion research suggests that there is overwhelming public support for generating as much as is possible from renewable

energy sources, there is also consumer interest in keeping down the cost of doing this. The Government has made proposals to reform the RO to fund more expensive renewables including offshore wind, wave, tidal stream, various types of biomass and also solar PV. These technologies will be given more ROCs per MWh produced. However, this will be inefficient compared to the use of a REFIT since the future value of the ROCs is uncertain. A fixed, guaranteed price through a REFIT will allow much more confidence and give the projects access to low-interest bank loans that are less available now under the RO due to the perceived risk of the future income streams.

How a REFIT is better than the RO

A range of reports published by bodies including the Carbon Trust and the European Commission have concluded that the RO delivers renewable energy at a much higher price for the consumer compared to REFIT systems working in other countries (Butler and Neuhoff 2004, European Commission 2005a, Toke 2005, Toke 2007, Mitchell et al 2006, L.E.K. Consulting 2006). We have done our own analysis of the income earned by renewable operators and we have compared this with the income received per installed MW of capacity. It is clear that the returns have been much higher in the case of the RO compared to the biggest REFIT systems currently operating in Europe, namely in Spain and Germany. Returns are around twice as high as in the case of Germany and 20-25 per cent higher than in Spain.

There is a simple, underlying reason for this. This is that the future prices of both ROCs and also electricity are uncertain, while under a REFIT system like that in Germany there is absolute certainty about the future price commanded by each MWh of renewable electricity. This has major implications for the relative costs of raising capital under these different arrangements. In practice, under the RO, renewable operators are receiving much higher returns per amount of money invested compared with what they receive under REFIT schemes. Yet, however remunerative this may be, it is still perceived as risky by investors, who consequently demand a 'risk premium' for the uncertainty over future returns, the costs of which are passed on to the consumer.

In addition, if a REFIT was used, considerably more renewables could be brought on line for the same cost to the consumer, but this would be done much more effectively using a REFIT system, and be open to more participants, opening up possibilities for more decentralised, democratised energy production.

A Small REFIT reform?

This report proposes having a REFIT system for smaller renewables. We favour changing the whole system over to a REFIT, but the Government is less likely to agree to this sort of change. Nevertheless, as we explain below, whether we move partly or wholly towards a REFIT, there are no problems of transition from a RO to a REFIT. This is a frequently expressed fear that the renewables programme would be disrupted, but we can show that if the reforms that are suggested in this paper are followed, this would be a groundless fear.

We propose that the small renewables FIT would apply to schemes involving emerging technologies that are generally likely to be under 5 MW in the next few years as well as schemes below 5 MW in other technologies. Emerging technologies include wave power, tidal stream, biogas and solar PV. Other technologies where schemes under 5 MW would be supported by FIT include biomass and small wind systems. In order to

prevent artificially splitting up larger wind power projects to obtain the small FIT, wind projects should consist of units of less than 300 KW each. We would also include micro-hydro schemes that are no larger than 1 MW.

It is also necessary to point out that there has been some confusion about what constitutes a REFIT. Some believe that this has something to do with returning to the sort of Non-Fossil Fuel Obligation (NFFO) system that was run during the 1990s. This is not the case. Last year Ofgem suggested such a system. This involves companies making bids to supply renewable energy for the lowest price. Although this does produce lower prices it is associated with low volumes of renewable energy take-up, with a lot of the successful contracts not being economic to put into practice (Mitchell 2000). This type of scheme has a number of serious shortcomings to which there is no remedy if the policy aim is the generation of large volumes of renewable energy.

It should, however, be noted that this system, as used in five NFFO rounds in the 1990s, did involve giving the generators who made successful bids secure, long term contracts at fixed (inflation adjusted) prices. It gave greater certainty to generators, a common feature with feed-in tariffs. However, because of the system's inability to deliver more than a small fraction of the needed capacity, and we are interested in high volumes at low cost, we would not pursue this option.

Instead, we are proposing a REFIT system whereby different levels of tariffs payable for electricity, are set according to the needs of different technologies. For example, there would be different tariffs for onshore wind, offshore wind, wave, tidal, biomass from energy crops, biogas from anaerobic digestion, sewage gas, small hydro, solar PV, etc. As in Germany, onshore windfarms at lower windspeeds could be paid at a higher rate per MWh than high-windspeed windfarms. These tariffs would be available on contracts of 20 years. The levels payable for new schemes could be reviewed every few years.

A REFIT for offshore wind may bring forward the day when offshore windfarms can be funded at least partly by finance from bank loans. This, in turn, would allow a REFIT to be set at a level for these windfarms that would reduce the costs of consumer cross-subsidies.

Our central set of ideas, however, focuses on the way that a REFIT could improve delivery of smaller renewables. These include the wave, tidal stream, biomass, small hydro and solar PV technologies. All of these will be deployed in units of less than 5 MW.

All of these technologies need to be established. They need confidence, and a REFIT will contribute to that. This is especially the case at the smaller end of the technologies in the case of biogas and biomass CHP/electricity units of a few hundred kWs and also wave power and tidal stream technology.

Ernst and Young (2007) have calculated, using their central estimate, that wave power will have a levellised cost of around £200 per MWh. Yet there is no certainty that this level of funding will be available under the Government's offer of 2 ROCs after the first seven years. The Government is offering a mixture of incentives, yet it would be simpler and create more confidence if this were rationalised into one single instrument in the form of an initial REFIT of £200 per MWh plus some initial grant support from the MRDF. After the first 7 years, wave and tidal technologies, as with all renewables

earning 2 ROCs, may be receiving a total income stream of around £130 per MWh (at current electricity prices). However this only has a 'bankable' value of £80 per MWh. Hence it is likely that wave and tidal stream technology would be much more securely helped, at no greater expense to the consumer, by paying them £130 per MWh in the form of a REFIT. The same logic will also apply to biomass schemes, which we discuss next.

Biomass energy crops have been assessed at being viable at around £130 per MWh. It should be noted, however, that the 'bankable' value of the 2 ROCs plus electricity price is a mere £80 per MWh. This means that banks are unlikely to lend money to projects that do not make a profit on what is judged to be a relatively secure level of £80 per MWh. This means that once more, farmers will find it difficult to find sufficiently cheap finance for the projects of, say, 200-300 kW. A REFIT payment of around £130 per MWh should serve as an initial basis for kick-starting some projects at this level. A very similar story will be the case for farmers starting biogas projects of 100-300 kW in size. A REFIT system that encompasses small hydro will make these schemes more economical and affordable, especially for incumbent landowners, because of the increased certainty in income stream that a REFIT brings. A REFIT should also be applicable to small wind systems. This could be set at the same level as the price that they would receive in total from the market, of around the £90 per MWh that was available in the 2005-2006 period.

Small hydro is, under the RO reform proposals, to be supported by 1 ROC. However the smallest small hydro schemes, up to around 500 KW and most of all, up to 100 KW, would clearly benefit from a REFIT of the same value (around £90 per MWh at current electricity prices) that would potentially be available as total income under the RO. This would increase the ease with which money could be raised and would reduce the cost of borrowing money for the schemes – the same principle as applies to other renewable technologies.

Solar PV would clearly benefit greatly from a REFIT. Although small amounts of funding are available from the Low Carbon Buildings Programme, the solar power industry recognises that these funds are going to be spread thinly and that not too much reliance should be placed on grant funding, useful though it may be.

As we have already discussed, the current tariffs on offer from electricity suppliers for solar PV are confusing. Merely rationalising the total value of the income (assuming 2 ROCs for solar PV) would involve paying around 12 p/kWh (£120 per MWh). However, to achieve anything like the sort of growth achieved in Germany would require something a great deal higher than this. German solar capacity is now well over 2 GWp, with solar companies turning over €4.8bn annually in 2006, and the sector now employing 54,000 people (BSW, 2007). In order to equal the incentives for solar PV in Germany we would need a REFIT of around 45 p/kWh. However, this should be put in context, because:

> In Germany, the global leader in wind and solar PV power, the total additional cost of supporting the German feed-in tariff scheme was 0.56 Euro cents per kWh in 2006. For a typical German household consuming 3500 kWh per year, this adds up to a monthly bill of 1.63 Euros for *all* renewable energy technologies and a tariff where there is no capping of system size. (Berry 2006)

We should remember that in addition to the solar PV, Germany boasts 20,000 MW of wind power and also other renewable technologies contributing over 10 per cent of electricity supply. This is all included in the above mentioned additional cost per kWh for the electricity consumer.

Institutional reform

There are various combinations of possible ways of organizing the REFIT. It may be convenient to divide up the discussion of this into two sections, one describing the role of a 'Public Service Obligation' (PSO) approach to funding the REFIT, and secondly, the idea of harmonizing the REFIT with the RO arrangements. Along the way we shall discuss how issues such as the needs of micro-renewables are specifically affected by these approaches.

(A) Public Service Obligation. The first, and simplest way of paying for a REFIT, is to fund all of it out of what is called (in the case of the REFIT run in Ireland), a 'Public Service Obligation' (PSO). This consists of a precept which is added to all electricity bills and which funds the payments made to renewable energy schemes in payment for their electricity production. Precepts have been common in the UK electricity system since privatization, being used during the 1990s to pay for energy efficiency schemes.

Ofgem would be responsible for regulating the system and it would build on existing practice for the Non-Fossil Purchasing Agency (NFPA) to have the job of administering the renewable energy contracts and administering the income flows. The NFPA would issue contracts to renewable energy generators for electricity supply who fulfilled some basic criteria (as set by law and Ofgem). The NFPA would later pay renewable generators for the electricity they produced under a monitoring system agreed with Ofgem. The financial outlay for this would be recovered from the aforementioned PSO that would be levied on all electricity consumers. Of course the NFPA would still have the task of selling the electricity for as good a price as possible, and this could be achieved through the process of regular auctions which the NFPA has been conducting in recent years.

Micro-renewables. Slightly separate arrangements would be needed for micro-renewables such as micro-wind and solar PV that were under a minimum size, say 50 kW (i.e. domestic renewables). It would be administratively cumbersome for these to be contracted by the NFPA. Instead the Public Electricity Suppliers (PESs), i.e. the electricity supplies, would have the duty (as part of their licenses) to pay a REFIT to micro-renewables of at least the value of a minimum rate set by the Government for a particular technology. The PES would then reclaim the funds they had paid out to the micro-generators from the PSO up to the level of the minimum rate, minus an allowance made for the value of the electricity that the microgenerators had given to the electricity supplier.

(B) Harmonising the REFIT with the RO. The mechanics of achieving harmonization between a co-existing REFIT and the RO are surprisingly simple. They would consist in large part of merely replicating the arrangements whereby the old renewable NFFO contracts are harmonised with the RO. This harmonization task is performed by the NFPA, which holds regular auctions for NFFO contracts, effectively turning 'water into wine' by converting the electricity generated by NFFO schemes into ROCs and electricity that is sold to the grid. The money raised more than pays for the cost of

remunerating the renewable generators, and the (significant) balance goes into Treasury coffers. This has been a source of controversy.

The same procedure could be adopted for turning the production from generators with REFIT contracts into ROCs. The existence of a PSO would still be required. Because the REFIT system would be oriented to producing an increased volume of (in the case of a small REFIT) higher cost renewables, it is unlikely that there would be a surplus generated for the Treasury.

It does not appear that the Government currently has the sort of reserve powers necessary to organize a REFIT, so new primary legislation would be needed to introduce a REFIT of whatever shape or size. It is not clear whether the Government will introduce a new piece of legislation to enact reforms of the RO or whether it will use powers under the Sustainable Energy legislation.

Primary legislation would be needed to establish the REFIT principle. It would follow from UK practice to give the Secretary of State reserve powers (actioned through statutory instruments or orders in council) to set REFIT rates. The system would be regulated by Ofgem, with much of the administration being performed by the NFPA.

Conclusion

Significantly greater volumes of the renewable technologies that we have discussed will be deployed for a given consumer outlay in a REFIT, compared with the RO arrangements. Fears, sometimes expressed, that it would be difficult to move to a REFIT system without seriously disrupting the implementation of schemes in the pipeline are groundless. This is because REFIT contracts could be harmonised with the RO in much the same way as NFFO contracts are absorbed into the RO at the moment. Regardless of whether we should move quickly to a REFIT for the larger-scale technologies, there are excellent reasons and tremendous possibilities for starting REFITs for smaller renewables. These include wave, tidal, solar PV, small hydro and types of biomass. We have discussed how this can be implemented using the NFPA to administer the non-domestic renewables and how the micro-renewables can be given support which maintains the ability of electricity suppliers to use them as a marketing tool. It seems clear that until renewables are deployed with greater value under a REFIT system, the sector will continue to embarrassingly under-perform in contributing to expansion of UK industry, job creation, energy security and climate protection.

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