

Sustainability Committee

Inquiry into Carbon Reduction in Wales: Electricity Generation (including renewable energy)

Response from the Energy Saving Trust

March 2008

Introduction

This is the submission of the Energy Saving Trust to the fourth topic – carbon reduction from energy generation (including renewable energy) - of the Sustainability Committee's inquiry into Carbon Reduction in Wales.

The Energy Saving Trust was established as part of the Government's action plan in response to the 1992 Earth Summit in Rio de Janeiro, which addressed worldwide concerns on sustainable development issues. We are the UK's leading organisation working through partnerships towards the sustainable and efficient use of energy by households, communities and the road transport sector and one of the key delivery agents for the Government's climate change objectives. Please note that this response does not necessarily represent the view of Energy Saving Trust members.

In relation to energy supply the Energy Saving Trust's expertise lies in the role of microgeneration and small scale renewables in energy supply, and as such this is the focus of our response. Microgeneration – producing energy at a domestic level – has huge potential for CO₂ reduction. It could create a more diverse energy supply, in an age when energy security is a major worry. It creates none of the waste that happens when energy is transported long distances (centralised power stations lose over 60 per cent of their 'primary' energy as waste heat and in transmission losses). And microgeneration could also help to tackle fuel poverty, particularly in 'hard to treat' properties and is likely to become even more important as energy prices continue to increase.

In this context it is, however, important to highlight that energy efficiency has been demonstrated to be more cost effective than supply side options, and therefore should always be 'the first choice' – the less energy a building requires the fewer opportunities there are for that building to 'waste' energy.

Of particular relevance to this inquiry is our work in the following areas:

- **The Energy Saving Trust Advice Centre for Wales**, which was launched in earlier this year. This offers a significant expansion of the original Energy Efficiency Advice Centres' service, providing energy efficiency, **microgeneration** and low carbon transport advice to not just consumers but also community groups and small businesses operating in domestic properties. The service aims to deliver a three-fold increase in consumer contacts, reaching over 80,000 people a year.

- **Phase 1 of the Low Carbon Buildings Programme.** The Energy Saving Trust manages this UK-wide programme on behalf of the Department Business Enterprise and Regulatory Reform (BERR)¹. The programme began in April 2006 providing grants for microgeneration technologies for householders, community organisations, schools, the public sector and businesses. The programme is currently open to individual householders – the other streams are now closed to new applications.
- **The Scottish Community and Household Renewables Initiative (SCHRI).** The Energy Saving Trust jointly manages this programme with Highlands and Islands Enterprise on behalf of the Scottish Government². The programme provides grants, advice and project support to assist the development of new community and household renewable schemes in Scotland.
- **Fuel poverty and microgeneration.** On behalf of the Scottish Government the Energy Saving Trust is running a pilot study to explore the potential of renewable energy technology options for heating in a variety of domestic settings across Scotland.
- **Energy Saving Trust research report ‘Generating the Future: An analysis of policy interventions to achieve widespread microgeneration penetration’³.** This report was launched in December last year and builds on a model developed for the Energy Saving Trust by Element Energy⁴ which uses a simple, robust but highly flexible framework to determine which policies have the potential to enable microgeneration to achieve its full potential in terms of energy supply and CO₂ reduction. This model builds on previous modelling work undertaken the (then) DTI. The Welsh Assembly Government also provided funding to enable this earlier modelling work to be undertaken at a Wales-only level. Please note that it is the findings from our most recent modelling work which inform this response.

Our response follows the format and order of the consultation document excluding the general questions, which we addressed in our response to the first topic of the Committee’s inquiry. For ease of reference this can be found at:

<http://www.energysavingtrust.org.uk/uploads/documents/aboutest/Welsh%20Assembly%20Sustainability%20Committee%20Residential%20Carbon%20Reduction%20051007.pdf>

3. What particular challenges does Wales face in reducing carbon dioxide emissions from energy generation and how can these challenges be overcome?

¹ www.lowcarbonbuildings.org.uk

² <http://www.energysavingtrust.org.uk/schri>

³ See: <http://www.energysavingtrust.org.uk/uploads/documents/aboutest/MICRO.pdf>

⁴ See:

<http://www.energysavingtrust.org.uk/uploads/documents/aboutest/Microgeneration%20Choice%20Methodology%20Report%202007.pdf>

3.1 Challenges

Wales faces a number of challenges in relation to reducing CO₂ emissions from energy generation through encouraging the uptake of microgeneration. Many of these challenges are consistent with those faced by the rest of the UK.

There are a number of barriers to microgeneration which mean that the public's enthusiasm for these technologies does not translate into action. The key barriers to microgeneration are well documented⁵ and summarised below:

- **high capital costs** – many technologies currently rely on grant support to achieve even small markets
- **regulatory issues** – planning permission, the low value of exported electricity and high transaction costs for accessing rewards for renewable generation
- **lack of long-term incentives for renewable heat**
- **lack of awareness, independent information and advice, negative perceptions about the technologies or installers**
- **inadequate skills base**
- **lack of targets and framework for positive environment for investment**
- **lack of long-term rewards and carbon price signal**

Our recent report (referenced above) analyses the most effective strategies for overcoming these barriers and provides a policy framework that encourages a high uptake of microgeneration across the UK. The report is written from a UK perspective, but the findings are relevant to all of the countries within the UK. It is important to note that a number of the policy levers that could be introduced or altered to promote microgeneration uptake in Wales, for example CERT, a potential Microgeneration Obligation, and the provision of a kWh subsidy, may require action at a GB/UK level. Where a policy lever is reserved we believe that the Welsh Assembly Government has a key role to play in influencing the UK Government. For this reason we consider below both devolved and reserved policy areas, and for clarity we highlight which policies are relevant to which government.

3.2 Overcoming the challenges

The detailed modelling that underpinned our report shows that no single policy will encourage the kind of mass adoption of microgeneration that is needed to get results. However, our research shows that a combination of different policies, providing incentives to both consumers and providers, could drive massive carbon savings from microgeneration. A successful policy scenario would:

⁵ See, for example, Energy Saving Trust, E-Connect and Element Energy, 2005, Potential for Microgeneration Study and Analysis: <http://www.dti.gov.uk/files/file27558.pdf>

- Mandate for one heating microgeneration technology to be installed (instead of a conventional boiler) at time of replacement
- Make wind, solar or PV compulsory on new builds
- Offer a 30 per cent grant to retrofit renewable technology into existing buildings
- Provide 10-year, low-interest loans on all microgeneration technologies
- Make sure that electricity from renewable sources can be sold back at the same price consumers pay for grid electricity
- Apply a carbon tax of £20 for each tonne of CO₂

When this combination of policies is applied, micro-CHP (combined heat and power), currently an emerging technology, becomes the heating system of choice by 2050. Air-and ground-source heat pumps would be installed in large numbers, along with biomass boilers and solar thermal, wind and PV. All of which would add up to national CO₂ savings of more than three-quarters of the way to the 80 per cent target suggested by the Intergovernmental Panel on Climate Change (IPCC).

Our key recommendations to encourage mass-market uptake of microgeneration in Wales are outlined below. It is important to see these as a package of measures as the results of the modelling show that one policy measure alone cannot easily encourage significant uptake.

3.2.1 Actions for the Welsh Assembly Government:

1. Regulation – As microgeneration technologies approach conventional technologies in cost-effectiveness the least efficient heating products should be taken off the market and make low-carbon replacements compulsory. This could be regulated in much the same way as currently for condensing boilers through Building Regulations. We note the Welsh Assembly Government's proposals for devolving Building Regulations and would therefore welcome a commitment to use these new powers to mandate the installation of low-carbon heating technologies at the point of heating system replacement in the future. Our research suggests that regulation has huge potential to encourage microgeneration. It is the only policy that would work on its own and the most effective way to apply it is at specific points in the life of a building. In the longer term, more radical measures mandating installation at sale or re-roofing should be applied.

2. Change consumer's economic evaluation of microgeneration technologies – provide 'soft loan' purchasing options that offer real savings to consumers. These could apply to equipment bought directly or via energy supply companies.

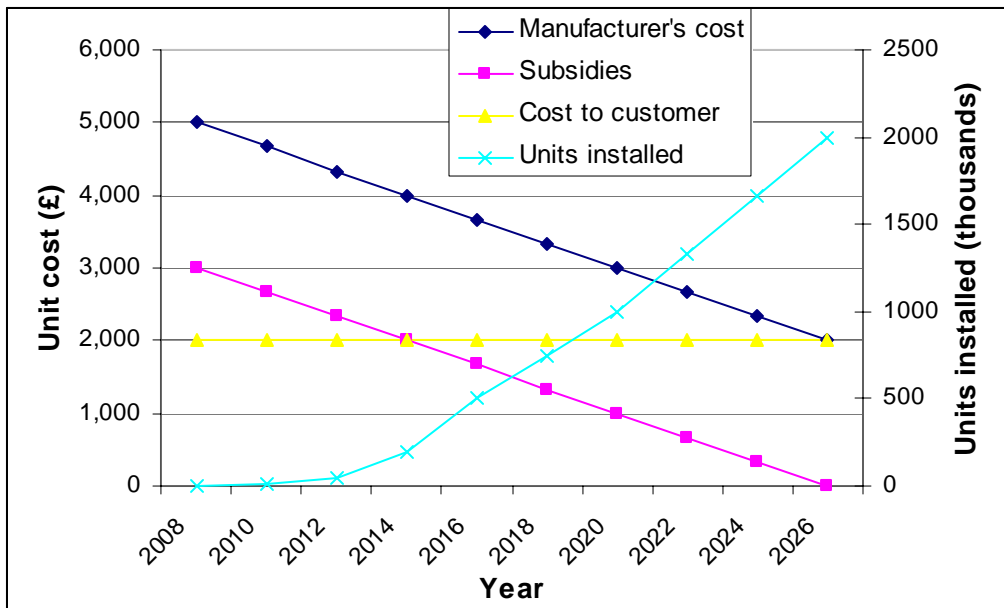
3. Raise awareness, change attitudes – run an awareness programme that motivates consumers to include environmental factors when making investment decisions. 'Forward-looking' consumers who currently buy microgeneration are prepared to invest out of concern for the environment and accept long payback times. In this context we support the

commitment within the Welsh Microgeneration Action Plan to run a public awareness campaign and look forward to it's introduction in 2008/09.

4. Provide information and advice – set up an independent advice service on microgeneration. The subject of microgeneration is fraught with technical and regulatory complexity, which frightens off potential adopters. Practical, usable guidance is needed. The development of the Energy Saving Trust Advice Centre in Wales (funded by the Welsh Assembly Government) will offer significant expansion of service, providing energy efficiency, renewables and low carbon transport advice to Welsh consumers, and as such will play a key role here. Thus the infrastructure to address this issue is already under development.

5. Subsidies – increase their value, particularly in the early years. We believe that the Welsh Assembly Government should consider introducing a separate subsidy scheme to support the uptake of microgeneration technologies in Wales (as per Scotland). Subsidies need to be at considerably higher levels than presently planned (post current grant support) to encourage mass-market take-up of microgeneration. Subsidies should then decrease over time in line with the economy of scale to keep the capital cost constant and competitive over time.

Figure 3 is a simplistic representation of decreasing Government support. It takes the example of capital cost subsidies for a given microgeneration heat technology. It aims at keeping the up-front capital cost to the customer stable over time and competitive with today's technologies. For example, let's assume a competitive price of £2,000. If this microgeneration technology was to cost £5,000 today, then Government subsidies would be expected to reach £3,000 per unit. But as more and more purchase this microgeneration technology (because it is cheaper or equivalent in price to other more polluting heating technologies), manufacturers are able to scale-up and reduce their manufacturing costs. Consequently, Government subsidies will come down. It is for Government to set the subsidy level over time as a function of unit installed and time in consultation with the industry. A flat subsidy rate will result in manufacturers not making the required cost reduction and benefiting from Government money, which is not how tax payer money should be spent. Similarly a subsidy scheme stopping abruptly in a given year could result in a steep increase in the purchase price to customer which in turn could slow down the uptake of that technology before it had reached market competitiveness.



6. Provide a clear framework for microgeneration. Without certainty of the direction government policy will take, businesses will be reluctant to commit to microgeneration technologies. To some extent this is already encompassed within the 2007 Wales Micro-generation Action Plan. However, we do believe additional support could be provided for microgeneration in Wales (as per recommendations outlined here) and ideally these should be reflected in future revisions to the Action Plan.

7. Link to grid de-carbonisation – create a unified policy for domestic microgeneration. Linking together the grid, community scale solutions and microgeneration will ensure that CO₂ savings are achieved at lowest cost. It is important to note that as the grid decarbonises the amount of carbon displaced by any electricity generating microgeneration technology will decrease – this is why it is important to consider microgeneration policy alongside grid de-carbonisation policy. This is likely to necessitate close working between the UK Government and the Welsh Assembly Government.

3.2.2 Actions for the UK Government:

8. Help householders to understand the Energy Performance Certificate (EPC) process. The value of a house should one day reflect its energy performance, encouraging home-owners to take action. Raising awareness of EPCs will help this process along. In theory this action could be undertaken separately within Wales by the Welsh Assembly Government, but the responsibility for the implementation of the Energy Performance of Buildings Directive (of which the introduction EPCs are a requirement) for England and Wales sits within the Department for Communities and Local Government, and as such it would seem appropriate for this activity to be undertaken by the UK Government.

9. Carbon pricing – price carbon at least at £20/tonne of CO₂. A carbon price that reflects its social cost would not work in isolation but would help microgeneration as part of a package of measures.

10. Electricity measures – provide a guaranteed ‘feed-in’ tariff; or create a ‘Microgeneration Obligation’. The former gives an attractive price for microgenerators to sell at and the latter will help to incentivise technology developers and suppliers, in the same way that the ‘Renewables Obligation’ (RO) has boosted ‘macro’ renewable schemes such as wind farms.

Another option and one being pursued by the Micropower Council is a simplification of the RO for micro-generators with deemed and capitalised equivalent payment. It might be a preferred option for Government as it utilises an existing scheme (the RO) and only simplifies it rather than having to create a new type of Microgeneration Obligation (MO). But ultimately, we believe that a MO would probably be the most effective option.

In this context we also note that the Committee’s first report recommends that the Welsh Assembly Government ‘*explore mechanisms for creating a market for surplus energy generated by individual microgeneration plants such as the creation of local energy supply companies with agreed feed-in tariffs*’. We would be very interested to find out more about the Committee’s thinking here.

11. Technology development – support early commercialisation measures such as field trials. Field trials are essential to refine microgeneration technologies before they are released to a wider market.

12. Invest in peripheral technology issues – using existing technologies more carbon-efficiently, exploring energy storage and looking at ways of rewarding peak demand reduction. Investment in these areas will help to support microgeneration too.

Microgeneration has significant potential to revolutionise the way Wales produces energy and for carbon savings. But without a carefully considered policy approach, we could miss an important – and extremely cost effective – means of helping to achieve Wales’ climate change targets.

While action will be required at both a UK Government and a Welsh Assembly Government level it will be important that any potential lack of action (either perceived or actual) at a UK level is not used as an excuse for inaction at a Wales-only level.

The recent report ‘*Essential role of renewables generation in achieving zero carbon homes*’⁶ from the Renewables Advisory Board (RAB) on the new build sector, also makes some key recommendations that we include in Appendix

⁶ <http://www.renewables-advisory-board.org.uk>

1. This report was written in the context of England's 2016 zero carbon targets, and the recommendations should be read in this context. Clearly with more challenging targets for Wales the urgency for considering and acting on such policy recommendations is greater.

4. Do the current energy policies of the Welsh Assembly Government give sufficient emphasis to carbon reduction through low carbon energy generation?

The timing of this inquiry makes this a difficult question to answer. The Welsh Assembly Government is currently consulting on its 'Renewable Energy Route Map for Wales – consultation on a way forward to a leaner, greener and cleaner Wales', and as such does not yet have a formal and final set of policies on which to comment. However, there are a number of policies that we believe should be adopted in Wales in order to ensure the mass market uptake of microgeneration. These are detailed in our response to question 3 above.

We also believe that greater attention should be given to supporting the installation of microgeneration technologies, and in particular heat generating technologies such as heat pumps and biomass, in homes which are off the gas grid in Wales. Such homes make up approximately 22 per cent of the Welsh housing stock⁷.

5. To what extent has the Welsh Assembly Government been successful in utilising the powers available to it in order to reduce carbon dioxide emissions from energy generation?

We believe that the Welsh Assembly Government should be congratulated for the recent use of the powers available to it – particularly in relation to:

- funding for the Energy Saving Trust Advice Centre in Wales
- a zero carbon new build commitment for Wales
- Welsh specific targets for microgeneration uptake
- planned changes to the planning regime to make it easier for people to install microgeneration technologies – giving many technologies permitted development status
- the inclusion of relevant issues within the curriculum for Wales
- changes to the HEES regulations which allow for pilot schemes for renewable technologies within the programme

⁷ Source: Welsh House Condition Survey 2007, see: <http://new.wales.gov.uk/docrepos/40382/40382313/statistics/housing/housing-2001/whcs98/whcs98-ch3-e.pdf?lang=en>

However, given the substantial powers available to the Welsh Assembly Government in relation to carbon emissions reductions from energy generation, we believe that more could be done in terms of using the Assembly's existing powers to deliver a low carbon Wales (although as noted above – there are timing issues associated with making these comments). Specific examples are discussed in greater detail in our response to question 3 above.

6. Could alternative targeting of Welsh Assembly Government financial resources lead to greater emissions reduction from energy generation than is currently being achieved? If so, where could additional resources lead to greatest impact? (please provide detail to support your evidence)

We believe that alternative targeting of Welsh Assembly Government financial resources could lead to greater reductions in emissions from energy generation than is currently being achieved. Our thoughts on where we believe additional resources are required are outlined in our response to question 3 above. To avoid replication we do not duplicate these here.

7. What examples from other administrations (devolved, UK, and overseas), where other means have been used to achieve reductions in carbon dioxide emissions from energy production, could be adopted in Wales under current powers?

There are a number of good examples of activities that have been undertaken in other administrations and overseas to encourage the uptake of microgeneration technologies in Wales. Many of these would benefit Wales and could be adopted under current powers, in particular:

- **A separate grant support fund for microgeneration as exists in Scotland**, the SCHRI (details of the programme can be found in the introduction above).
- Depending on the outcomes of the Scottish pilot, **a programme or sensibly scaled pilot programme to install microgeneration technologies in hard to treat fuel poor homes in Wales**. Whilst we are very pleased that the new regulations for HEES allow for renewables pilots within the HEES scheme, we note that those pilots currently underway are at a very small scale. We believe that ring-fenced funding from the Welsh Assembly Government for a larger scale pilot in Wales would be beneficial.
- Planning requirements, along the lines of those in place in **Scotland**. In Scotland SPP6 requires SPP6, set out an expectation that *'all future applications proposing development with a total cumulative floorspace of 500 sq metres or more should incorporate on-site zero and low carbon equipment contributing at least an extra 15% reduction in CO₂ emissions beyond the 2007 building regulations CO₂ emissions standards'*.

- **Spain, Italy and Israel** all have building obligations for solar hot water. Israel has required solar hot water systems to be installed on new buildings for 20 years. Spain and Italy have recently introduced their own regulations. Industry growth in Israel has led to large cost reductions and increased public awareness. Today over 90 per cent of sales are to the retrofit market. Building regulations can lead to rapid growth of new technologies at low cost to governments, but imposing technologies on developers and homeowners while costs are high can be politically challenging. In the countries where regulation has been successful, the technology is naturally suited to the market and additional costs are relatively small.
- **Sweden:** procurement programme for Ground Source Heat Pumps (GSHPs). Heat pumps were supported by capital subsidies in Sweden during the 1980s, which led to sales of over 25,000 units per year. The market being dominated by air-source/exhaust-air systems. Subsidies were abandoned in the late 1980s, causing a slump in the market. A procurement competition in 1995 promised a purchase order for 2000 units to winners. The key challenge was to lower costs by 30 per cent relative to contemporary designs. Public awareness grew as a result of the competition, won by GSHP designs, and these now dominate the heat pump market and compete without subsidies. There were nearly 300,000 GSHP installations in Sweden at the end of 2005.
- Germany and Spain both have feed-in tariffs for microgeneration. A national feed in tariff programme is likely to best be introduced at a UK level, and as such we do not provide further information about these programmes here. Although we would be happy to provide further details if the Committee would find it useful.

8. In the context of the Government of Wales Act 2006, which further means of reducing carbon dioxide emissions from energy production could only be achieved with the introduction of further legislative competence for the National Assembly for Wales?

It is our strong belief that the majority of actions needed to deliver significant carbon emissions reductions in the household sector can be undertaken within the existing powers of the National Assembly for Wales (for example through planning regulations, the provision of loans and grants, awareness raising and information provision etc).

One obvious exception here however is building regulations. Clearly, having legislative control over building regulations in Wales would be of considerable help in terms of delivering Wales' challenging new build carbon targets. In addition, and as noted above we would very much welcome commitment to use any new powers in relation to building regulations to mandate the installation of low-carbon heating technologies at the point of heating system replacement in the future.

In the future more regulation might be necessary – for example requiring the installation of certain technologies at the point of house sale – and, as far as we are aware, the Welsh Assembly Government does not have the relevant powers to implement such requirements. If the Welsh Assembly Government wants to ensure such policies are introduced in the future it will need to seek additional powers, or work to influence policy at a UK level.

9. If specific carbon dioxide emissions targets are to be set for Wales, should those targets be subdivided into shares by sector? If so, what share of the total should reductions as a result of energy generation comprise?

We believe that sectoral targets would be useful. Without detailed modelling work it is difficult to suggest what the target for the energy generation sector should be in relation to that of other sectors. However, as noted in our earlier submissions to the Committee we believe that it would be sensible to expect households to make at least an equitable contribution to overall targets, although we note that it is more cost-effective to deliver carbon savings in the household sector than in any other. In this context we believe that it might be sensible to include the savings that will result from microgeneration within overall targets for the household sector. However, it would obviously be important to ensure that it was clear where the savings within this sector should come from (for example from microgeneration, from energy efficiency measures, from behaviour change etc).

As noted in our earlier submissions to the Committee we believe that carbon emissions from the household sector should be addressed as a first priority. Action in this sector also meets a number of other energy policy objectives, such as security of supply, and tackling fuel poverty.

Appendix 1 Key recommendations from the Renewables Advisory Board (RAB) report 'Essential role of renewables generation in achieving zero carbon homes'

1. There is a need to create strong, early stimulation to the onsite renewables sector to avoid the high risk of a supply gap in 2016.

This is considered to be the biggest risk to the success of the zero carbon policy. The policy creates a very large new market for on site renewables, but the proposed approach to its implementation creates a steep ramp up in demand in 2016 which the renewables sector is unlikely to be able to meet without strong and consistent stimulation over the next eight years. Specifically, the transition from code for sustainable homes (CSH) level 5 to level 6 introduces a substantial additional demand for renewable electricity and as such could create an unsustainable spike in the demand for on-site electricity generation. These electricity-generating technologies would not be significantly stimulated by the gradual introduction of the code in the preceding years.

Without sufficient on site renewables supply some homes would not be able to comply with building regulations and the rate of house building would slow. Current proposals will require the industry to grow to supply a UK market of over £2 billion pounds per annum from a very low base in the years before 2016. Early demonstrators from the social housing sector will help but are unlikely to stimulate the scale of investment needed in the supply chain.

RAB recommends that further work be carried out with the finance community and on site renewable sector to look at what would be needed to trigger the levels of investment needed to meet the demand created by this policy.

Secondly, RAB recommends that CLG urgently explore ways of changing policy to stimulate demand for on site renewables in advance of 2016. E.g. mandating a minimum percentage of renewables for developments over a certain size, or encouraging local authorities to require CSH level 6 through planning regulations for the largest urban extensions and new towns in advance of 2016. Whilst the largest developments constitute a small proportion of the homes built they are generally the easiest and most cost effective sites in which to achieve zero carbon standards.

2. The need to accelerate the technological and commercial development of biomass CHP

For the zero carbon policy to be achievable it is essential that sub 1MW biomass CHP is technically proven and commercially deployable by 2016. This requires a huge technology acceleration effort at UK and European levels.

RAB recommends that R&D into sub 1MW biomass CHP is made the priority for the new Energy Technology Institute, and that the deployment of biomass CHP is a priority of the new Environmental Transformation Fund.

3. The desirability of minimising the use of offsite energy generation in meeting zero carbon standards

The use of off site renewables generation is likely to be required if the Government wants to meet CSH level 6 in all new homes, but the way this is allowed will have a huge impact on technology innovation and deployment. If off site generation is allowed on a large scale and with a low 'buy out' price it could undermine one of the Governments objectives for the policy that is 'to encourage the development of new technologies'. CLG has said that it will decide on its approach to off site generation at a later date.

RAB recommends that CLG clarifies the role of off site generation within the next year, to provide early certainty to the construction and the on site renewables sector; and that the use of off site generation is kept to a minimum by setting tight limits to its use, and a high buy out price for any offsite generation fund.