A response to the DTI's Microgeneration and Low Carbon Buildings consultation

This response has been collated from views expressed at a stakeholder workshop held on Thursday 29 September by the Energy Institute in association with the DTI. Chaired by Prof Martin Fry CEng FEI, the focus of this session has been on three specific subject areas from the DTI's original consultation document, that of Microgeneration on the Grid, Building a Skills Base for the Future, and the Low Carbon Buildings Programme.

Three presentations were provided to give participants an overview of these specific subjects. These were given by Dave Sowden, Chief Executive of the Micropower Council, Lindsay Gillespie, Development Director of SummitSkills, and Prof David Strong CEng FEI, Managing Director of BRE Environment. The event then divided into three parallel workshop sessions to explore each topic in more detail.

Microgeneration on the grid

The Government currently has a work programme, leading on projects concerning network connection, metering, technical standards, wiring regulations and accreditation.

Recently two Distributed Network Operators (DNOs) published their distribution charges and introduced an additional charge for domestic customers installing microgeneration. However, in research recently published by Mott McDonald, the overwhelming conclusion was that microgeneration reduces network costs.

This workshop considered the specific issues relating to microgeneration on the grid, and the following questions were used as a basis for the discussion:

i. Can the current distribution network cope with increasing levels of exporting microgeneration on the grid?
ii. What possible problems could occur?
iii. What changes, if any, will have to be made to ensure that the system can cope with growing levels of distributed generation?

Can the current distribution network cope with increasing levels of exporting microgeneration on the grid?

With regards to the local networks, technical problems already exist before microgeneration is even incorporated onto the network. This is largely because the DNOs occasionally run to the upper levels of the allowable band of the voltage profile, and this can create difficulties for other resources to be added. Incentives to reduce the typical operating voltage from 240 to 230 volts could also be beneficial for overall power system carbon emissions.

What possible problems could occur?

With regards to the development of microgeneration onto the network, it was felt that it would be a gradual process and therefore those concerned with network design, management and regulation will be able to adapt to any changes on an incremental basis. Earlier adopters of new technologies may currently be facing problems but this will get ironed out as time moves on. The bigger problems may be faced in rural areas because of the potential problems that may pre-exist with weak local networks. There is some suggestion that early adopters may include a disproportionate number of households in rural locations, and as such there may be a lack of representation of the effectiveness of microgeneration: development should not be put off by these early experiences.

To meet technical standards of networks, the high voltage problems may be eased through microgeneration installations tripping out. It is hoped that this practice is stopped, as certain technologies such as micro-CHP are not suitable for this purpose, given that their principal output is domestic heat. Recommendations were made to put constraints on how the network can affect microgeneration.

There are benefits to the ability to run units separate to the distribution network, through private wire or microgrid arrangements. Operators would be less exposed to network problems and be able to offer services back to the network and receive financial recompense. Management of such grid fragments could also be undertaken with more control, and opportunities to integrate local power storage would be improved. However, a question was raised whether local power storage was sensible or whether parts of the wider grid could more conveniently offer storage, for example via hydrogen? However, the value and costs of storage are still uncertain.

Concerning effects of microgeneration at the transmission level, issues were noted about the variability and lack of predictability of the different types of generators – but this topic was outside the immediate scope of the discussion. The issue for deep penetration of the market was the benefits of a diversity of generators, and whether diversity should be part of grant-making criteria?

What changes, if any, will have to be made to ensure that the system can cope with growing levels of distributed generation?

A fundamental issue to address is the 'stability' of the local network as microgeneration levels increase. Three ways in which to tackle this were discussed:

1. Standards should be imposed on individual generator units, requiring more sophisticated control and/or design changes to generators. This would be an additional cost to the microgenerator and thus the consumer.

2. Alternatively, additional reserves at the transmission system level could be required to allow microgenerators to be variable and affect the system but the system operators would need to ensure there were enough reserves in place and this would incur costs at the system level.

3. And lastly, the DNO could put in place more systems of control to stabilise the distribution network i.e. flywheels to help control the frequency. This point raised an additional question of whether current frequency and voltage limits are tighter than they need to be, given the end uses that are in place at the moment.

Another issue for participants was the degree of management regarding the evolution of microgeneration. There was a feeling of incremental development so limited management is required to support its evolution. The market should be led by regulators, DNOs etc to respond to problems as they arise, although some forward thinking is still required.

In relation to homeowners, it was felt that an 'idiot's guide' is needed to guide customers through domestic installation, connection and contracting of microgeneration as it is currently too complex. This also concerns metering as well. There are currently multiple arrangements needed and responsibilities which need to be reconsidered. Participants also felt that a recent trend towards payment for total generation from microgeneration (rather than for net export) was influenced by the value of Renewable Obligation Certificates (ROCs), and this trend may act as a disincentive for home energy efficiency.

Many are currently working on the specification for meters to get this up to standard, and there are lots of benefits attached to this from a data collection and system management point of view.

Longer term solutions considered briefly included moving to an energy services model. This would streamline responsibilities, assisting with balancing and breaking up the grid into smaller fragments with local energy management.

Building a skills base for the future

The development of skills needs an integrated approach. For instance, if promotion of new technologies to stimulate demand was done too far in advance, there would not be the skills to install and maintain the equipment.

Some work has already been achieved in occupational mapping, and identifying the skills set required. In addition, training programmes have already been developed for solar, photovoltaics and ground source heat pumps.

This workshop considered the skills issue further, and the questions addressed to focus the debate were as follows:

i. Where are the existing skills gaps?
ii. Why do these gaps exist? (lack of interest in developing skills, lack of work for skilled people etc)
iii. What actions should the Government take to develop the skills base in relation to microgeneration technologies?
iv. How can we ensure we are developing the right skills?

Where are the existing skills gaps?

The workshop began by identifying that the issue of a skills gap may be an overstated problem. Microgeneration is still in its infancy so there is no current sense of drastic step change and so it was felt that industry could adapt to the incremental increase in demand.

It was felt that in order to make microgeneration more mainstream, the current gap in skills was marketing in which to sell the concept. There is an additional need for installers to be educated to advise and sell alternative options for future use to the public, and knowing when and where to sell the right option in right place, considering localized factors.

Once this is developed, this will assist in creating public demand, thus stimulating manufacturers to react to market forces and develop the technologies, in turn stimulating training and development of the required skills. The market could be additionally stimulated through Government review and legislation to stimulate manufacturers to develop these technologies.

Why do these gaps exist? (lack of interest in developing skills, lack of work for skilled people, etc)

Accreditation schemes appeared to be daunting and an obstacle to integration and diversification of skills. Participants identified the need to change the approach from demonstrating competence to capturing incompetence. What's important is to identify those who claim to have the relevant skills against those who have the skills.

Additional work is needed to support promotion of vocational skills against academic careers, and to remove the stigma from vocational skills.

What actions should the Government take to develop the skills base in relation to microgeneration technologies? How can we ensure we are developing the right skills?

In terms of securing the right mix of skills, this will be predominantly driven by market forces, however, Government should have a clear long term policy to focus manufacturers to develop long term planning to develop the right mix of skills in support of the development of new, emerging and existing technologies.

The issue of multi-skilling was also raised, as to whether plumbers/roofers/electricians would have or could develop fairly easily the relevant skills to install micro-CHP? An example of a CORGI initiative was provided in that in addition to gas safety, CORGI now also provide a grading system for their accredited installers to advise on energy efficiency.

Low carbon buildings programme

As part of this DTI consultation, the development of the Low Carbon Buildings Programme is being considered. Currently the programme is predominantly concerned with promoting the adoption of a more holistic approach to designing new build, and integrating energy efficiency and micro-renewables. In addition, greater engagement with the construction industry must be achieved, whilst increasing public and industry awareness of the schemes and technologies available.

This particular workshop discussed the low carbon buildings programme, specifically addressing the following questions:

i. Were any technologies missing from those listed in the consultation document?
ii. Should there be a variable rate for different technologies under Stream 1, if so, how should the varied rates be arrived at?
iii. How can the energy efficiency elements under Stream 1 best be assessed?
iv. What would be the best way to manage a limited pot of funds for Stream 1 – competitive, first come/first serve etc?
v. What standards should be used to assess the large-scale projects?

Were any technologies missing from those listed in the consultation document?

In terms of missing technologies, some participants in this session suggested that fossil fuel fired CHP should be included, however, this was a minority view. Most delegates felt that new technologies should only be included if they offered cost effective carbon savings in the medium to long-term. Grants should be based upon limiting dead-weight associated with established technologies i.e. solar-thermal in favour of providing support to new technologies which offer significant national carbon saving potential.

There was a concern that schemes may compete with the Energy Efficiency Commitment (EEC) and therefore there must be some compatibility. Indeed under current EEC rules any technologies supported under the LCBP programme would be ineligible for EEC support. Schemes must not be too complex. It was felt that the complexity over the delivery of the grant scheme could act as an inhibitor in some instances. The proposed programme is technology blind so there is no particular technology focus, this is welcomed by delegates since it provided flexibility for architects and developers, and provides support for existing technologies and emerging technologies.

Energy storage technologies should also be considered as part of the equation N.B. not just hydrogen. There were some additional external issues raised, that of transport, district heating and local networks as part of the low carbon buildings initiatives.

Should there be a variable rate for different technologies under Stream 1, if so, how should the varied rates be arrived at?

In terms of variable rates for variable technologies, the different rates of development and cost savings also need to be considered; otherwise this could skew in favour of some technologies over market ready products. These same products also need Enhanced Capital Allowances (ECA) and other tax breaks to encourage the uptake, not just to support the product development.

Participants also felt that consideration should be given to separate domestic from community schemes.

Support for research and development should be limited to new or where the UK has strategic advantage, or import existing proven technologies.

How can the energy efficiency elements under Stream 1 best be assessed?

Impact assessments currently take place after 5 years. Participants felt that this should be done much earlier on, some suggesting from the start of the programme possibly with payment of a grant

being linked to carbon savings actually achieved (it was however recognised that this might introduce unwelcome administration costs).

In assessment of energy efficiency elements, the benefits must be quantified, and this is where product accreditation and monitoring installation can be important. Impact assessment could take place at the start, and therefore there needs to be a baseline metering and management system to measure the impact. There should be pre-conditions to receiving grants on those providing effective metering systems. This also highlights that there is a clear need for education of occupants and users.

A discussion ensued over whether a building should demonstrate its energy efficiency before funding is provided and whether additional grants could be available to zero buildings.

What would be the best way to manage a limited pot of funds for Stream 1 – competitive, first come/first serve, etc?

Considering the best way to manage a limited pot of funds, participants felt that a competitive element acts as a disincentive to apply. Could applicants be prioritized by the level of carbon saving?

Some felt that technology development should be funded rather than installation but this may favour schemes or technologies over others. A point was made that funding should not be provided to schemes that would still be implemented without the funding.

In terms of costs, maintenance as well as installation must be considered, and a point was made as to whether the lifecycle costs vs. the lifecycle carbon saving could also be considered.

If programme funding is severely limited or constrained some participants suggested that grants for Stream 1 and 2 should only be given to exemplar schemes which aimed to deliver either very low or zero carbon buildings. This would ensure that these schemes acted as major exemplars of what could be achieved. This might be the best way of delivering value for money, whilst stimulating maximum consumer and construction sector awareness

What standards should be used to assess the large-scale projects?

Tools currently exist to assess large scale projects, but there is an additional need to pull these standards together, and consider whether large projects should be visible and demonstrated to the public. The spread of projects to just a few builders and contractors should be avoided and customers must be educated regarding buildings and their expectations.

Additional comments

Following the parallel workshop sessions, participants were keen to ascertain how much funding is actually available and whether the priority should be given to those who can achieve nearest to zero carbon.

One other point was made that in terms of value for money, these technologies can not be considered at today's prices because they are not currently being mass produced. Investment will not be made to mass produce the technologies until the demand is there.

And lastly, participants felt that the UK should be looking overseas, particularly in regards to progress made in buildings and on the skills issues, and what additional lessons have been learned that can be applied to this country.

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