

Date: 16 January 2002
Time: 14.00 - 17.30
Venue: Committee Room 3, National Assembly Building, Cardiff Bay
Title: A place for small-scale developments in the Renewable Energy Sector?

Contribution from Andy Bull, Head of Environmental Policy, Powys County Council (WLGA)

It is not my intention to attempt to provide all of the answers or to set out a complete vision for energy production in Wales. I have some, hopefully useful, experience in the small-scale, community sector and I have, therefore, set out some thoughts that reflect a contribution that can come from that direction. I believe that this contribution has been largely overlooked or dismissed as being too much trouble. What follows is largely that which was written for the Mid Wales Committee in 2001.

A Place for the Small-scale developments in the Renewable Energy Sector?

The debate over renewable energy developments has largely concentrated on the large-scale and electricity. Much of the evidence to this Committee will inevitably concentrate on the larger scale projects most of which will be likely to include at least some element of electricity production. There is, however, huge scope for the utilisation of renewable energy at the domestic and other small-scale and cumulatively it could make a significant difference. The emphasis from Government too has been very much on the larger scale and electricity production and it has proved difficult until the last year or so to get any interest at all at UK level in the promotion of renewable energy at the small-scale (the scale at which community ownership becomes feasible) or for heat only. This paper seeks to establish that this is an area where Mid Wales can lead the UK and catch up parts of Europe where this approach is firmly embedded. I shall explore some of the potential in the various technologies and explain some of the activity of the Council and its partners in this respect.

Solar Water Heating

There is a common misconception that solar water heating is ineffective in Wales for climatic reasons. Whilst it is clearly not as effective in Wales as it is in Spain for instance, a good modern system will make a significant contribution to water heating requirements. The domestic sector is an obvious priority - a well designed system should provide 50-60% of annual domestic hot water requirements, most of this energy capture being between May and

September. The serviced holiday accommodation sector is also particularly appropriate, given the predominantly summer water heating load and the higher demands for hot water. The typical pay-back periods for solar water heating systems are such as to be deterrent for many at present and it will probably take some intervention from the public sector to stimulate up-take of the technology. "Solar Clubs" have been very effectively established in Ceredigion and the Dyfi Valley and it is proposed to widen this concept out to the remainder of Powys, and indeed Wales. These clubs provide the opportunity for interested individuals to be trained to install their own system (if that is the option that they prefer) and to take advantage of bulk purchase deals

The costs of solar water heating are significantly reduced if they are incorporated into the original building rather than retro-fitting. The County Council is closely examining the possibility of retro-fitting solar water heating at its Bro Ddyfi Leisure Centre although it currently looks as if the economics won't stand up even with the grant aid available.

The Plascrug Leisure Centre in Aberystwyth (Ceredigion CC) has a retro-fit system.

The potential of this technology should not be under-estimated.

Solar Electricity Production

Electricity can be generated by photovoltaic cells or modules (PV's) (sometimes, confusingly, also known as "solar panels"). These are becoming more common, for instance, in locations remote from an electricity line where inter-mittent lighting or monitoring equipment is required. They are sometimes installed in combination with a micro wind turbine. On a larger scale, PVs are most likely to appear as substitute roofing or wall-cladding materials for buildings. This is still most likely to be in the form of large panels or sheets but may be the relatively new modules that are designed to be near matches to traditional slates or tiles. A new Housing Association Development in Machynlleth is to have a PV roof and indeed there will be quite a concentration of PV in the sunny Dyfi Valley with 3 installations at the Eco Park, 2 at schools, 2 on houses and, of course CAT itself.

Whilst there are clearly occasions where the use of such roof or wall cladding would be inappropriate from a building conservation or townscape point of view, it is important that local planning authorities are not too conservative in decision making. Through their wider roles the Council should always consider the PV option in circumstances where a new supply is needed for a low power use. Such uses might be low level lighting at a bus stop, illuminated warning signs on the highway or the stationing of environmental monitoring equipment. Ceredigion CC has taken a lead on the roadside installations.

PV systems will continue to come down in price if the market becomes sufficiently robust to justify modern high production manufacturing facilities. There is thus every incentive to

promote the technology.

Passive Solar Space Heating

Passive solar space heating is all about good building design. It is about aspect and sensible window sizing and positioning and, if appropriate, the utilisation of glazed structures. Particularly in a well insulated building it is the windows that are the weakest part of the thermal defences, but they are also the entry points for solar heat and light. It is crucial, therefore that careful consideration is given to glazing, its area and aspect during building design. Over-heating can be just as big a problem of poor design as heat loss so the issues need to be given adequate attention.

At the very least, even where there is no conscious attempt to optimise passive solar heating, obviously poor practice should be prevented. Planning applications that indicate, for instance large areas of glazing in the north elevation of a building with a significant space heating load (eg a dwelling) should be rejected. Developers should be encouraged to give proper consideration to the opportunities for passive solar gain and the avoidance of unnecessary heat losses within their proposals. For instance, housing estate layouts where standard house types are arranged with no reference to aspect and over-shading should no longer be considered acceptable.

Small-scale Hydro

Small scale hydropower was a widespread feature of rural Wales until the National Grid encouraged the abandonment of most of the sites. They were generally of a small-scale and inconspicuous in landscape terms. The works involved are typically a weir at the upstream end of the operation, an open leat or more usually a pipeline into a turbine house (which may be something around the size of a domestic garage or even smaller) and then another channel or pipeline transferring the water back into the stream. There would need to be overhead or underground power lines out of the turbine house. The planning issues will rarely be landscape related unless a prominent waterfall is affected though schemes could have significant impact if pipelines or cables are above-ground. It is far more likely that the issues will be ecological in nature particularly where clean upland environments are concerned. Water will be taken out of a watercourse for part of its length and this may be critical to animal and/or plant life, including fish. There may be ecological issues arising from the civil engineering works but these may be overcome through appropriate conditions requiring, for instance, the careful treatment and relaying of turfs over the pipeline.

The Environment Agency Wales play an important role in the regulation of hydropower through the abstraction licence regime. The Dyfi Eco Valley Partnership has been working on the development of community owned small-scale hydro schemes for three and a half years now and has only just seen the first project completed. The process has been slower than

anticipated and the abstraction license issue has played a major part in that process. The Council would not wish to suggest that there are not legitimate areas of concern for the EA but the very tight regime in Wales has proved difficult. It appears somewhat ironic that the legitimate concerns of the EA and CCW revolve around plant communities that would be likely to be severely impacted climate change!

Small-scale Wind

The public perception of a wind power development will depend on several factors. The fairly obvious issues of scale and siting are a large part of the equation but the perception of the development in the local community will also be affected by the extent to which it is seen as being of local advantage. Is the development one that the local residents are simply expected to accept for the common good of the entire country and the particular good of the commercial developers or is there a direct link that gives them a particular interest? In land-use planning terms there is no difference and the identity of the developer is largely irrelevant but, in practice, there can be a huge difference in terms of public reaction and, therefore, political sensitivity.

Wind turbine generators can be at a very small-scale and hardly noticeable in the wider landscape and can, like, or in combination with, PV systems provide good small power demand solutions to off-grid locations. In addition they are relevant to grid-connected locations where most of the generation would be used on site. There are several bodies interested in the concept of medium scale production specifically linked to industrial/business locations.

Biomass (Largely Woodfuel) Heating

Whilst there are opportunities for the utilisation of a variety of biomass products at large or small-scale by far the greatest opportunity in Wales is the utilisation of the existing hardwood and softwood forest and woodland resources. The thinnings and forest residues resulting from woodland management and felling operations is a considerable resource which could easily be increased further through the exclusion of livestock from woodland areas (thus allowing natural regeneration) and developments in extraction methods. Timber can be utilised as a fuel in log form, as chips or in the form of pellets. Whilst it is possible to process the timber to produce a gas or oil combustion product this will not be the norm for the smallest and heat only projects. It is these space and water heating projects that have by far the greatest potential. District heating or Combined Heat and Power (CHP) projects also have potential particularly for establishments such as hospitals where there are year round heating and electricity requirements. The technology now exists for relatively small-scale electricity generating engines run on the wood derived gas or oil and these may come on stream in Wales in the near future.

The planning implications for these small-scale projects are relatively minor. The vehicles

involved need not be large and deliveries not so frequent as to usually be classed as significant. Buildings, if in indeed any are required, need not be large. Engine generators clearly need to be adequately sound-proofed.

The utilisation of wood fuel is largely carbon neutral so long as large quantities of diesel are not consumed in transporting the fuel around. The most efficient utilisation of this potentially huge resource is in a large number of relatively small units each of which takes fuel from its local area. Extra climate change benefits are gained where wood-fuel displaces fossil fuel. The key opportunities for Local Authorities are in circumstances where there is a year round, long-hours heat load (eg leisure centre or residential care home) although experience thus far has been in projects such as that at Weobley School in Herefordshire.

Powys Council has joined the EC's Renewable Energy Partnership and has made a series of commitments in respect of various RE technologies. By far the greatest area of commitment is with heating from woodfuel. Powys Energy Agency (in partnership with the Dyfi Eco Valley Partnership, the Forestry Commission and others) has successfully applied to the EC's "Altener" programme for funding for a major project to promote this sector. The Leader + programme for Powys also involves a significant element that revolves around energy from waste at the very small-scale.

Anaerobic Digesters

The anaerobic digestion of vegetable and animal wastes is a means of producing methane which can subsequently be used for energy generation (heat and/or power) either on the same site or at a remote location. It is a technology quite frequently utilised at larger sewage treatment works but could be much more widely used particularly where livestock (including chicken and turkey litter) wastes are in concentrated. The process renders the wastes less polluting and has significant advantages apart from the energy generation. The digester is usually a low cylindrical structure that would not appear out-of-place in a modern farm setting.

There are usually likely to be few significant planning issues surrounding the construction and running of a small to medium scale digester utilising local wastes. The Energy Agency has recently completed a report on the potential for AD in Powys and is looking to see the development of new projects. There is already one successful plant at Churchstoke which has been operating for 10 years and its owner wants to develop a second plant.

Local/Community Energy Strategies

It is important that the energy issue is seen in an holistic way. A concentration solely on the production of energy (even if it is renewable energy) is not going to lead to the sort of changes that are necessary if society is to seriously address climate change issues. The rational use of energy is a vital component and must not be ignored.

Understanding the local renewable energy resource, communicating it effectively to the local community and providing links between the capacity to generate and the need for energy conservation, are important issues if the nation is to tackle carbon emissions targets effectively. "Local" in this context could be the administrative boundary of a local authority or it may be something much smaller. Whilst there is an obvious role for local authorities, local voluntary initiative may also prove welcome and important. The three Energy Agencies in Wales (Swansea, Pembrokeshire and Powys) could take a lead role in providing the expertise to advise on process, financing, projects, "signposting" and technologies. Advice could also be given on the establishment of new Agencies.

Local authorities have traditionally had little involvement in energy issues and most still don't. The advantages to be gained through energy strategy work and the input that this would have into their sustainable development/Local Agenda 21/community planning work could be encouraged by the Assembly. The work of the Dyfi Eco Valley Partnership, Awel Aman Tawe and others in the field of community renewables is providing some lessons and can provide pointers on the generation side of the equation. There is much work being undertaken in the various sectors by the Local Energy Efficiency Advice Centres (domestic), Arena Network Wales and the NafW's Energy Advisers (business), Carbon Trust Wales and others but there is potentially valuable work to be done in co-ordinating these efforts and putting them into the context of the opportunities for renewable generation.

The Mid Wales Potential

The County Council, in common with others, including the WDA, are convinced that RE holds huge potential for the economy of Mid Wales. We have the reputation through CAT. We have the skills in companies like Dulas. We have agencies, including my own County Council and the Energy Agency that it helped to establish, that are prepared to grab the opportunities and take a lead on these issues. We have the resource and we have a population that is, I believe, willing to embrace RE. We need to present those opportunities properly and not to impose much more, simply on the basis of national or global interest. We need to accept that it is harder work and more expensive to develop RE projects at the smaller scale but we can do so in the knowledge that the potential is enormous and the technology will be likely to be welcomed. We could really do with some more help. Net metering would be wonderful as would be the greater willingness of electricity distribution companies to accept new grid connections. The EA Wales could certainly help on the hydro front by taking a leaf out of the book of their colleagues in Scotland. The barriers to development need to be overcome but they don't all, by any means, lie at the feet of the NIMBY's. The potential for RE production in Mid Wales does not rest solely with wind and we are not only talking about electricity.

Some Additional Issues

Wind Turbines (and other large projects) and "Designated" Landscapes

There would appear to be a view (particularly in Whitehall) that if a landscape has no formal designation then it is has little value and is open to receive more-or-less any development. Those of us that know Wales well are aware that the "lines on the map" that define National Parks and AONBs are not so obvious on the ground and the majority of the Principality should not be regarded as "open-house" for any development that needs to be found a home. This pre-occupation with "designated areas" should be challenged as simplistic and crude. It is a particular issue for the onshore wind industry.

When the Large Scale is Appropriate

There clearly are occasions when the larger scale projects (RE or Fossil Fuel) are deemed to be appropriate. Such schemes may be processed by through the "normal" town and country planning system or by DTI consent procedure. It is now usual for such larger schemes to offer "community benefits". May I suggest that appropriate benefits may include funds to provide domestic energy saving to the local population at no or very little cost, grants to assist the development of small-scale renewable energy projects and, in the case of wind turbines, the opportunity for one or two of the turbines to be open to purchase by a cooperative of local people. The Energy Agencies or Local Authorities could used (paid) to administer such funds.