Friends of the Earth Cymru

National Economic Development Strategy Consultation Response, 27th November 2001

Welsh On and Offshore Renewables Targets to 2010: 30%-40% by 2010

Friends of the Earth Cymru believe that the draft NEDS renewables generation target of 10% by 2010 is unambitious and if were to become policy could damage potentially lucrative economic development in Wales. We believe that the 10% target may well be reached or exceeded by projects requiring little additional potentially leading-edge research, development or deployment expertise. This is especially so if offshore renewables in Welsh waters are included in a single target.

Yet there is a growing array of new renewable and associated technological advances which are springing up and there for the taking. Also a whole new world is opening up in terms of the need to reduce fossil fuel use globally and at a national level to address the acute need for rural economic diversification. In order for Wales to position itself on the leading edge of renewables research, development and deployment, we believe that a challenging NEDS renewables target must be set, not a relatively easy one.

A challenging target would be key to unlocking potentially significant economic and social benefits, from rural employment to export opportunities befitting a knowledge based economy.

It should be remembered that this is a 10 year strategy and much can happen in such timescales. Ten years ago global warming was hardly on anyone's lips, ten years from now fuel cells and discussions about the hydrogen economy will probably be common place.

To stimulate the development and deployment of new renewable technologies including biomass we believe that a 2010 target of 15% should be set for ONSHORE renewables. We also propose that a separate OFFSHORE target of 15-25% should also be set to take account of the combination of several significant possibilities off the Welsh coast (see Offshore section below for details). Offshore projects could easily exceed the onshore target, damaging onshore potential and distorting the NED strategy.

The main contributions to any significant 2010 ONSHORE renewables target are likely to come from windfarms and biomass. There are various other renewables that will contribute to the overall contribution including small hydro, landfill gas, mines gas, and solar PV. The contribution of the smaller renewables may be in the order of 2 - 3% of annual Welsh consumption by 2010. Generation by incineration is not regarded as renewable or resouceful, and is not supported by FOE Cymru.

FOE Cymru support the BWEAs 2010 onshore wind capacity target for Wales, which

would supply just over 7% of current Welsh electricity consumption (see Onshore Wind Contribution below for details). Hence the draft NEDS 10% onshore target could be achieved with just wind and the smaller renewables, without any contribution from biomass.

However, biomass in its various forms represents a potentially very significant resource and one which is suited to farm diversification and imcreased rural economic activity (see SEL Report 4.6.9) especially in Objective One areas. It is also a storable energy technology. The SEL Renewable Resource study estimates that biomass could generate 1.3 TWhrs/year of electricity (8% of Welsh electricity consumption) and a further 2.6 TWhrs /year of hot water (equivalent to 16% of Welsh electricity consumption). Yet biomass is not the easiest or cheapest renewable to deploy and requires political interest and support to attract commercial interest and confidence.

To stimulate biomass technology FOE Cymru believe that the Assembly should support an ONSHORE 2010 renewables target that does not cramp biomass development due to deployments of other well developed and or less expensive renewables. As the draft 10% target could be achieved by renewables other than biomass we suggest that a 15% 2010 ONSHORE target should be adopted for the NEDS strategy.

A combined on and offshore target of 30-40% renewables electricity generation by 2010 may look ambitious at first sight. However, on closer examination much of it is achievable by existing or near market technology and dependant on various site specific offshore environmental assessments proving positive. Perhaps it may be appropriate to have just a headline 15% onshore target, with additional clauses to include the potential offshore economic opportunities.

The large combined target reflects the potentially abundant renewable resources around Wales compared with its electricity consumption. However, the scale of the change in generation mix is little different to that which has occurred over the last 10 years.

Since 1991, the switch from coal to gas-fired electricity generation has entailed the connection of 25,000 MW IC of new plant and the disconnection of 23,000 MW IC of old plant. This change is over 33% of the total generation in England and Wales (National Grid, Facilitating the Future report July 2001). As it happens, the resulting increased demand for natural gas is causing concern in terms of energy security as the UK will become a net importer in the next few years. Renewables are fundamentally different to natural gas in that the resource does not run out, nor do they produce much carbon dioxide or acid gases.

For the above reasons FOE Cymru propose a 15% ONSHORE and a 15%-25% OFFSHORE renewable electricity generation target for Wales by 2010 for the NEDS strategy.

Yours sincerely,

Neil Crumpton

Transport & Energy Spokesperson, Friends of the Earth Cymru

Onshore Wind Contribution

There are about 363 turbines in Wales, including the recent Parc Cynog scheme, mostly in the 330kW to 600kW size, with a total installed capacity (IC) of 153 MW. These wind turbines supply about 389 GWhrs/year (0.389 TWhrs/year) or about 2.4% of current Welsh electricity consumption (annual consumption assumed at 16TWhrs/year).

The BWEA regional target for Wales (Planning for Wind Energy published in 2000) is for an additional 290 MW of installed capacity above the capacity installed at the time, about 151 MW IC. The BWEA 2010 target is therefore for about 440 MW IC. This additional capacity could well comprise any combination of turbine ratings from say 439 turbines all of 660 kW rating to 193 turbines all of 1.5 MW rating. Meeting this target would increase the number of turbines deployed in Wales from 363 turbines to somewhere between 550 and 800 turbines depending on the mix of turbine sizes. This would represent a percentage increase of between about 52% and 120% over current turbine numbers. The average annual output for a target total of 440 MW IC would be about 1.16 TWhrs/year which would represent 7.2% of annual Welsh consumption.

Offshore Renewables Possibilities to 2010

Offshore Windfarms

Three windfarm schemes are currently being developed off the Welsh coast the probable output, based on the limit of 30 turbines per scheme, is:

North Hoyle 60 MW - 30 * 2 MW turbines
Rhyl Flats 90 MW - 30 * 3 MW turbines
Porthcawl 90 MW - 30 * 3 MW turbines

If all schemes are built according to plan and timescale then the first round of offshore turbines would represent 240 MW of installed capacity. Assuming a load factor of 33% this would represent about 80 MW of average annual output, which is about 4% of Welsh electricity consumption.

Future tranches of offshore wind are possible in the period to 2010. If three more similar windfarm developments were deployed in further tranches, this may represent an additional 300 MW of capacity assuming slightly larger turbine output (3 MW plus) currently under development. This would represent an additional 5% of average annual consumption.

Marine Current Turbine Arrays

Marine Current Turbines Ltd have suggested a likely installation rate for underwater turbines in the fast flowing marine currents off the north Anglesey coast is:

First deployments would occur in 2005/6 at I0 MW per year, rising to 100 MW per year by 2010. Further substantial deployments may occur after 2010 depending on the scale of resource which is potentially many hundreds of MW. Large scale deployments around the UK would reduce the cost to possibly 2 - 3 pence per Unit (per kWhour) down from 4 - 6 pence initially (recent Dti funded study). Such favourably low costs suggest that a larger degree of the resource could be tapped.

If 2006 is assumed to be the first deployment year then the following installation rates may be feasible:

2006 - 10 MW of installed capacity
2007 - 20 MW
2008 - 40 MW
2009 - 70 MW
2010 - 100 MW

Hence by 2010 there could be 240 MW of installed capacity. The Load Factor for such turbines is about 33% so the avaerage annual output by 2010 may be 80 MW, which is about 4% of Welsh electricity consumption.

Both the wind-turbines and marine current turbines could bring significant employment opportunities to the strategically well located port of Holyhead. Cambrian Engineering in Bangor who make turbine towers and potentially monopiles have suggested Holyhead for future expansion.

Tidal Lagoons

Two proposals for tidal lagoons are currently being developed off the Welsh coast by Tidal Electric Inc. A 30MW scheme is proposed in Swansea Bay and a potentially 400 MW scheme on Rhyl Flats. The load factors for lagoons are about 60% - 65% depending on several factors including pumped storage enhancement. Hence it is possible that by 2010 if both the Swansea and the large Rhyl Flats lagoon were built there may be 250MW of average annual output, representing about 12.5% of Welsh electricity generation.

There may also be some other tidal and wave energy developments.

Offshore Renewables Summary

Hence if all the planned or potential offshore wind, marine current and tidal lagoons are developed then by 2010 they would collectively represent an installed capacity of 1210 MW with an average output of 520 MW, which represents 26% of Welsh electricity consumption. If the large tidal lagoon was not progressed then the average output would be around 280 MW or nearly 14% of Welsh consumption.

It is possible that the overall output of renewable energy schemes off the Welsh coast may fall within the range of 14% - 26% of Welsh electricity consumption by 2010.

Note

Welsh electricity consumption has been estimated between 15 to 16 Twhrs/year but some research suggests a higher consumption approaching 20 Twhrs/year. As it happens the annual output of 2,000 MW of continous generation is 17.5 TWhrs/year which conveniently lies near the middle of this 15 - 20 Twhr range:

2000 MW X 24 hours X 365 days = 17.52 TWhrs/year

and 2,000 MW is a convenient figure, as 1% equates to 20 MW average output.

November 2001

Friends of the Earth Cymru
33 Castle Arcade Balcony
Cardiff
CF10 1BY
Tel: 029 20229577
Fax: 029 20228775
E mail: cymru@foe.co.uk
Web: http://www.foe.co.uk