Friends of the Earth Cymru

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Cyfeillion y Ddaear Cymru

Evidence to the Welsh Affairs Committee Inquiry into Energy in Wales

1. UK Government Energy Policy In Relation To:

a. the current and future energy needs of Wales
b. the current and future provision of energy in Wales

The UK Government's recently announced energy review – 'A Secure And Clean Energy Future' – will assess progress against the four goals set by the 2003 Energy White Paper. These are:

- to put ourselves on a path to cut the UK's carbon dioxide emissions by 60% by 2050 with real progress by 2020
- to maintain the reliability of energy supplies
- to promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve our productivity: and
- to ensure that every home is adequately and affordably heated.

We believe that this inquiry should be set within this framework but that energy policy, and policies in areas such as transport, must now be primarily driven by the overriding need to reduce carbon dioxide emissions. Climate change is now the overarching issue that will increasingly have a major impact on global and local economic, social and environmental well-being.

Climate Change
Since 1997, carbon dioxide emissions in the UK have risen by 5.5 per cent[1] and are continuing to rise. This is occurring despite a commitment by the UK Government to reduce these emissions by 20 per cent on 1990 levels by 2010, and despite recent alarming scientific evidence that the effects of human induced climate change are happening earlier and more severe than anticipated.

On August 11th, the New Scientist reported that research by scientists from Oxford University and Tomsk State University in Russia had recorded the melting of an area of Siberian bog the size of Germany and France combined and that this threatened to unleash billions of tonnes of methane, a potent greenhouse gas, into the atmosphere. On September 29th, the BBC news website reported that scientists from the National Snow and Ice Data Centre at the University of Colorado had identified a record loss of sea ice in the Artic indicating that the Arctic has entered an irreversible phase of warming that would accelerate the melting of the polar ice that has helped to keep the climate stable for thousands of years. And in October, scientists from Cranfield University reported in Nature magazine[2] that soils in Britain are no longer acting as carbon sinks but, due to rising temperatures, are releasing huge quantities of carbon dioxide to the atmosphere. All these are regarded as probable 'tipping points' beyond which change is irreversible.

In Wales, carbon dioxide emissions have risen by 0.2 per cent since 1990 while emissions in England, Scotland and Northern Ireland declined by just 6.9 per cent, 7.7 per cent and 3.4 per cent respectively[3]. Whilst Wales has the poorest record, all these figures are disappointing as the UK should have achieved much greater reductions by now in order to meet the UK government's target of a 20% cut on 1990 levels by 2010. The Welsh Assembly Government's target of a 20% cut in carbon dioxide by 2020 will also be missed on current trends.

Although emissions in Wales of the overall basket of six greenhouse gases – carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride - were an estimated 3.6% lower in 2003 than they were in 1990, they are worryingly adrift of the target figure of a 12.5% reduction. They are also substantially less than that achieved by England (15.9%) and Scotland (10.1%)[4].

It should be noted that much of the reduction in emissions of greenhouse gases have been achieved coincidentally as a result of changes in industrial and agricultural practices rather than as a direct consequence of climate change policies. The decline in coal mining and manufacturing and the reduction in livestock numbers on farms have all had a significant impact. Methane emissions in Wales, for instance, declined by 34.5% during this period as a result of these factors, as well as the introduction of methane capture technologies on landfill sites[5]. Sometimes, relatively simple measures have achieved substantial reductions in emissions of the greenhouse gases other than carbon dioxide. Emissions of perfluorocarbons declined in Wales by 78% during this period because of improved control measures in the aluminium industry and, in England, nitrous oxide emissions fell by 40% as a result of the installation of abatement measures in one adipic acid plant[6]. Achieving reductions in the emission of the main greenhouse gas, carbon dioxide, is the main challenge and, in this, Wales is failing badly.

One reason for the higher level of greenhouse gas emissions in Wales compared to the rest of the UK is the preponderance of industry. According to the Carbon Trust in Wales[7], industrial activity per head of population in Wales is approximately two and half times the UK average. And, the Assembly's Economic Development Committee's consultation report on renewable energy (April 2002) stated that 42% of gas supplied to Wales is to industry compared to 27% in the UK.

It is against this backdrop that current and future energy needs and provision in Wales ought to be assessed.

Energy In Wales

The Carbon Trust data[8] shows that, in 2002, Wales used 130 TWh of energy and that this generated 34 million tonnes of carbon dioxide accounting for over 75 per cent of Wales' greenhouse gas emissions. Industry was the largest consumer of energy (42%) followed by the domestic sector (24%), transport (23%) and the service and public sector (11%). These data shows a huge dependence on fossil fuels with just under two per cent of Wales' total energy needs coming from renewable sources. In the UK, nuclear power is estimated by the DTI[9] to have contributed 3.2 per cent to total energy demand but in Wales this proportion is slightly higher at around 5 per cent because of the 30 per cent contribution of Wylfa nuclear power station to electricity generation in Wales.

The Carbon Trust study also shows how dependent Wales is on imports to meet its energy needs. All of the oil, gas and uranium and over half the coal used in Wales is imported. Most of the oil is exported after refining while a small proportion of the electricity and coal is also exported. Although Wales is, overall, a net exporter of electricity, it has to import power to south Wales with the result that consumers there pay higher prices for their electricity. Over half the energy content of the coal and uranium ore and approximately half the energy content of gas is lost in the process of generating electricity[10]. According to the DTI's 'UK Energy Sector Indicators (2005)', UK electricity generators lose all but 38 per cent of the energy of their fuel through inefficient technologies while further losses occur as a result of transmission and distribution.

It can be difficult to obtain detailed up-to-date energy data for Wales. We suggest that the Assembly's Statistical Directorate attempts to plug this gap in order to facilitate the formation and delivery of energy policy in Wales.

Security of Supply

The issue of security of energy supply has been widely raised recently, particularly in relation to both the supply of gas, as North Sea resources diminish and the UK becomes more dependent on imports, and to the closure of ageing nuclear and coal-fired power stations. The Prime Minister, in an attempt to justify a new consideration of the role of nuclear power during his Labour Party conference speech, warned of our energy supplies being dependent on "some of the most unstable parts of the world". The Energy Minister, Malcolm Wicks, pointed out, when announcing the Energy Review on November 29th, that by 2020 the UK is likely to see the decommissioning of coal and nuclear plants that contribute about 30 per cent of the UK's generating capacity, and, that the UK is now a net importer of gas as North Sea production has declined quicker than predicted. In Wales, this has been reflected in calls to consider nuclear new build to replace the closure of Wylfa nuclear power station in 2010, developments to import LNG through Milford Haven and proposals to drill for gas in the Irish Sea.

The Minister pointed out that world prices for fossil fuels have increased by more than 50 per cent over the past three years and that these prices had fed through to higher energy costs for homes and businesses. Although domestic electricity prices are still 10 per cent lower in real terms compared to 1997 and industrial fuel prices halved in real terms between 1980 and 2004[11], fossil fuel prices are expected to rise in the future as a growing demand is confronted by limited resources.

The Minister also touched upon fuel poverty pointing out that four million households had been lifted out of fuel poverty in the UK since 1997 but that a million remained, and recent fuel price increases could have increased that number by 400,000. According to the Welsh Assembly website, there are 220,000 households suffering from fuel poverty in Wales.

Although we need to keep energy security issues at the front of or mind, we should not overstate any threat so as to promote unsustainable technologies such as nuclear power. According to the DTI[12], the chief supplier of piped gas to Britain in the foreseeable future will be Norway which, along with the Netherlands, has around 4 trillion cubic metres of gas reserves. As nuclear power is a costly and hazardous technology that contributes just over three per cent to total UK energy demand, we see no role for it in meeting future energy needs in the UK. The most sustainable and sensible response to the energy security challenge would, in our view, be to vigorously promote energy efficiency, more actively harness the UK's resources of

renewable power, and ensure maximum efficiency from existing fossil fuel generation. More details of these options will be provided in section 3 of this submission.

We are pleased that the Welsh Assembly Government's Energy Route Map consultation document reflects a similar approach to Friends of the Earth Cymru. Our response to the consultation is attached as **Appendix 1**. The Route Map's vision is to make Wales a showcase for clean energy whilst maintaining international competitiveness. It recognises "that this will primarily be achieved in the short to medium term through an increased role for highly efficient gas and coal stations and renewables in the energy mix as well as greater emphasis on energy efficiency". Whether this can be achieved will depend, to a large extent, on the relationship between the UK Government and the National Assembly for Wales on energy policy.

2. The relationship between the UK Government and the National Assembly for Wales – including the division of powers – on energy policy

While responsibility for energy policy in the UK is reserved to the DTI, a number of areas relating to energy policy are devolved to Wales. These are

- environment policy
- support for innovation
- housing
- planning (apart for power station consents over 50MW)
- control of the budget for energy efficiency schemes in Wales e.g The Home Energy Efficiency Scheme (HEES) and part of the activities of the Carbon Trust.

The Welsh Assembly also has a world leading remit to promote sustainable development that takes into account energy issues.

The areas not devolved are

- promotion of renewable energy
- promotion of energy efficiency
- building regulations
- power station consents (over 50MW)
- overhead electricity line and gas pipeline consents.

Despite the lack of devolved powers on energy policy, the Welsh Assembly has attempted to play a significant role in this area. As the Richard Commission points out in its consideration of economic development policy:

"The boundary between devolved and non-devolved issues did not appear to pose a problem, with the Assembly Government seeking to work with and influence Whitehall and businesses on non-devolved issues such as energy and telecommunications." [Ch.5 Para.74]

In April 2000, the First Minister agreed that, in order to inform the creation of a realistic energy framework for Wales (a betterwales.com commitment), a strategic study into the potential for renewable energy developments over the next decade should be undertaken. This was produced in January the following year. In March, the chair of the Economic Development Committee recommended that it should undertake a review of energy policy based on "the Assembly's responsibility to promote sustainable development whilst facilitating economic

growth and development". A wide range of expert witnesses presented evidence and, following consultation, reports on renewable energy (April 2002) and energy efficiency (April 2003) were produced.

Both reports attempt to steer Wales towards becoming 'a global showcase for clean energy developments and energy conservation', a vision set out in the Assembly Government's national economic development strategy, 'A Winning Wales' (January 2002). They reflect UK national energy strategy by, for instance, setting a benchmark of generating approximately 4TWh per year, amounting to just over ten per cent of Welsh electricity production, from renewable sources by 2010, and supporting the UK government's targets for energy efficiency. They also favour increasing the powers of the Welsh Assembly by, for instance, calling for a non-statutory 'Green Dragon' energy efficiency certificate for buildings in Wales that would be above normal building regulation standards, and, seeking an extension of its powers to approve power generation facilities over 50MW under sections 36 and 37 of the Electricity Act 1989.

We believe that the Welsh Assembly should be given the powers to both establish more stringent building regulations for Wales and to decide on power station consents over 50MW.

These powers are necessary if Wales is to realise its vision of being a global showcase for clean energy. The Welsh Assembly's limited powers on energy efficiency could be significantly enhanced by it being granted authority over building regulation standards. And it certainly does not help the Assembly develop 'safe, clean and secure energy supplies' if decisions are seen to be taken by one minister based at the head of the DTI in London, as happened in the case of the Cefn Croes wind farm application.

The Richard Commission points out that the Economic Development Minister, Andrew Davies, identified two specific areas in which the Assembly Government's objectives had been constrained. One of these was the power to decide on proposals for power stations above 50MW. The report states:

"Although the Assembly can regulate the development of small power stations (including wind farms), the Department for Trade and Industry retains responsibility for power stations with a generating capacity of over 50MW in Wales (but not in Scotland). The Assembly Government has requested the transfer of these specific energy powers to Wales." [Ch.5 Para 75]

In chapter 9, on the boundaries of devolution, the report considers the Cefn Croes wind farm application, which Friends of the Earth Cymru supported, in more detail. It points out that the Assembly "had played no formal part in the decision making process". It compares Wales to Scotland where, although the UK parliament retains the right to legislate on energy matters, the executive functions relating to the approval of large electricity generating stations have been transferred to Scottish ministers.

The Minister told the Commission:

"We feel it would be much more in line with our major policy areas, like energy production and renewables, if we had the power to deal with applications over 50MW." [Ch 9 Para. 26}

The Minister also considered that there would be economic benefits from the transfer of these powers because it would make it easier for Wales to secure more indigenous power. Electricity

costs in South East Wales were around seven per cent above the UK average because of the shortage of local generation.

According to the Commission, the UK Government believes that the integrated nature of the electricity supply system and markets – where North Wales forms part of the Merseyside distribution network and South Wales is linked to South West England – prevents this transfer of power. It should be noted, though, that a similar situation exists with regard to transport routes yet transport is a devolved policy area There is a suspicion, referred to by the Commission [Ch. 9 Para.30], that Whitehall might be hanging on to these powers in order to retain control over decisions on nuclear energy generation in Wales.

The Richard Commission suggests a way forward. It states:

"Wales could be given a stronger role in the decision-making process under the current legislation even without transferring these powers. This would be achieved by the Secretary of State exercising her right to leave the planning aspects of such development to be considered by the relevant planning authority (the local authority unless the Assembly decided to call it in)".

We are disappointed that, considering the strength of feeling in Wales over this issue, that this has not happened.

A broader vision of how Wales could become 'a global showcase for sustainable clean energy' was set out by the Economic Development Minister in an energy statement to the Assembly on February 26th 2003. In this, the Minister outlined five priority policy areas, as follows:

1. **Pursuing now much greater energy efficiency, including small-scale on site CHP (combined heat and power) and renewable plants in our domestic, business and public sector, working in partnership with local authorities.** The Minister noticeably added that "we are seeking a transfer of some Building Regulation powers" and that they were intending to produce a Wales energy conservation action plan.

2. **A strong drive in Wales now, against appropriate benchmarks, for a sustainable mix of renewable energy developments.** The Minister indicated that he would approve the benchmark recommended by the Economic Development Committee. He also stated that a new Technical Advice Note (TAN 8) was being developed to ensure an integrated approach to planning. Rather surprisingly, the Severn Barrage proposal, which has been strongly opposed by environmental groups, is flagged up as a 'desirable' project.

3. **Encouraging energy infrastructure improvements and pressing for reform of electricity trading arrangements.** Particular reference is made to strengthening gas transmission infrastructure to transport gas from proposed LNG terminals in West Wales.

4. **Encouraging now the production in Wales of electricity from new clean coal power stations**. Coal gasification and carbon sequestration technologies are regarded as promising.

5. **The setting of achievable and measurable carbon dioxide reduction targets for 2020.** This is set at a 20% reduction by 2020, reflecting the UK government's target of a 20% reduction on 1990 levels by 2010.

The Minister believed that "this energy mix will mean that we have secure, diverse and affordable energy whilst meeting environmental commitments without any new nuclear power generation in Wales in this time frame". This energy statement was set out, as the Minister stated, "against the background of the UK Energy White Paper" which had just been published.

The Energy White Paper states, in Section 9.18:

"We will continue to work closely with the Devolved Administrations on energy policy objectives. We are encouraged that the Devolved Administrations are developing strategies and targets on devolved aspects of energy policy.

"Renewable energy, CHP and energy efficiency opportunities have already been examined in depth by the Welsh Assembly's economic development committee and are being supported within the EU Structural Funds programmes. Against this background the Welsh Assembly Government and relevant agencies are strongly pursuing an increasingly active clean energy/energy-conservation strategy which will be further boosted in the light of developments described in this white paper."

Since the publication of the White Paper, the Welsh Assembly Government has moved energy issues forward by producing an Energy Efficiency Action Plan (February 2004), TAN 8 - Planning for Renewable Energy - and the accompanying Ministerial Interim Planning Policy Statement (July 2005), and the Energy Route Map consultation document (June 2005). A number of energy actions are also referred to in the Sustainable Development Action Plan (October 2004), the Wales Spatial Plan (2004) and the draft Environment Strategy (2005).

A brief look at the Assembly Government's energy efficiency plan gives an indication of the difficulties that arise as a result of the lack of devolved powers on the issue. We have been critical of the Energy Saving Wales believing it to be long on generalities, short on specifics and doing little more than reiterating standard energy efficiency advice that has been available for years and which has failed to reverse the increase in energy use. Our response to the consultation paper is at **Appendix 2**. In a number of ways, it compares unfavourably with the UK Government's energy efficiency action plan produced by DEFRA. This, for instance, contains far more detail and sets targets of saving 4.2 million tonnes of carbon in households, a 29% reduction in carbon emissions from central government buildings and a 5.8 million tonne reduction in the business sector by 2010. By comparison, no targets or timetables for delivery are set in Energy Saving Wales. It is regrettable that, according to the Sustainable Development Action Plan, "the Assembly Government, its agencies and the NHS in Wales" will only "report annually on the use of energy in its estates" rather than set a target of cutting carbon emissions by 29% as stated in the DEFRA action plan. With the National Assembly's commitment to sustainable development, one would have expected it to be ahead of the UK Government on a policy that so clearly embodies the environmental (reduced greenhouse gas emissions), social (less fuel poverty and ill health) and economic (lower fuel bills and more jobs) benefits of sustainable development. Had energy policy been devolved to the Welsh Assembly, the Welsh Assembly Government would have been in a position to take more effective action to improve energy efficiency and conservation.

The lack of devolved powers on energy policy means that, in Wales, it amounts to little more than a mirror image of UK Government policy. The efforts of the Welsh Assembly to give this policy a strong Welsh dimension are to be welcomed but these efforts are unlikely to be sufficient to enable Wales to achieve its aim of becoming a 'global showcase for clean energy

developments and energy conservation'. At present, we seem to be acting out a pretence of delivering an energy policy when Wales does not in fact have the powers to do so. It is difficult to understand why important policy areas, such as economic development, transport, health and education, have had the power of executive competence (as opposed to the power to make primary legislation) devolved from Westminster to the Welsh Assembly while a key issue such as energy has, by and large, not. We believe that, if Wales is to develop a distinctive energy policy that will enable it to become a world leader in clean energy, the transfer of these powers is essential.

3. The current and future portfolio of energy provision in Wales including:

a. Nuclear Energy

Friends of the Earth Cymru opposes the construction of a new generation of nuclear reactors because a range of safer, greener and cleaner alternatives can deliver greenhouse gas reductions to meet climate change targets and maintain energy security.

We believe that the risks of nuclear far outweigh the benefits:

- Nuclear power produces waste that stays dangerous for tens of thousands of years. The Government still doesn't know what to do with this waste.
- Nuclear reactors have and may again be threatened by terrorists. Attacks, for example by hijacked airliners, could pollute large areas with radioactive materials
- Many processes used as part of nuclear power generation can also be used for covert weapons programmes. If the UK chooses to use nuclear power to cut its greenhouse gas emissions, it will provide an excuse that other countries may use to justify what are really weapons programmes.

In 2004, nuclear power generated 19 per cent of UK electricity output[13]. In Wales, nuclear power is estimated to contribute 30 per cent of the electricity and just over 5 per cent of total energy. It was disappointing recently to see two organisations, CBI Wales and Wales TUC, make the mistaken claim, in their responses to the Energy Route Map consultation, that nuclear power provided 30 per cent of Welsh 'energy' as opposed to 'electricity'. This is a basic error that significantly overstates the ability of nuclear power to play a meaningful role in achieving energy security and reducing carbon dioxide emissions.

We believe that a combination of affordable, innovative renewable energy solutions together with sensible measures to improve energy efficiency and the efficiency of coal and gas-fired power plants, means the electricity sector can deliver its greenhouse gas targets, and keep the UK's lights on. Nuclear power is not needed.

What are the alternatives?

- Government estimates show we can save 30 per cent of the energy we use through cost-effective energy saving measures alone. This would save the UK £12 billion every year and cut emissions[14].

- There are more than enough theoretical renewable energy resources, such as wind, tidal, wave, solar and bio-fuel energy, to meet all of Britain's needs. The Energy Review (2002) estimates, on page 86, that "renewables could be among the most cost-effective options for reducing carbon emissions" and could "by 2050 provide very large quantities of electricity". In Wales, the potential is significant**.** Existing and proposed onshore and offshore wind farms could generate over twenty five per cent of Wales' electricity demand within six years[15]. Tidal lagoons in Swansea Bay and the Severn Estuary, subject to an acceptable environmental impact assessment, could double this contribution from clean renewable sources within the time it would take to build a new nuclear power station. Large lagoons could also generate or store power at any time. This capability would contribute significantly to replacing fossil-fuelled spinning reserve for grid balancing. Smaller contributions to our electricity needs could also be obtained from energy crops and wave, solar and other 'free flow' tidal power schemes.

- All the major renewable technologies and energy efficiency have shorter timescales for implementation than nuclear. New nuclear reactors take at least 10 years to build but gas-fired plants can be built in three and renewables in one to three. Any small-scale measures, like micro-CHP, can be installed in weeks[16]. The developers of the tidal lagoon proposal estimate that the Swansea Bay scheme could be "up and running within 18 months to two years"[17].

- A UK programme to replace inefficient light bulbs with new super-efficient LED or compact fluorescent light bulbs could save 7 TWh or 1.75 per cent of UK electricity use by 2020. This is the equivalent of one nuclear power station[18].

- Introducing new standards to ensure appliances waste less electricity on stand-by could save 8 TWh or two per cent of UK current electricity use by 2020[19].

- Promoting more efficient electric motors in industry could save 24 TWh or six per cent of UK electricity use by 2020. This is equivalent to three nuclear power stations[20].

- Encouraging UK households to generate their own electricity through small gas-fired combined heat and power (CHP) boilers, solar panels and micro wind turbines could generate 18 TWh or 4.5 per cent of current electricity needs by 2020. This is equivalent to more than two nuclear power stations[21]. If 750,000 homes in Wales install micro-CHP by 2020 (the UK replacement rate is approximately 1.3 million central heating boilers a year) then the overall electricity output of the boilers would be equivalent to 10-15 per cent of Welsh electricity demand, or 2.25 to 3 TWhrs a year in Wales[22].

- Further developing the potential to use the waste heat given off by industrial plants, and other heat sources in the UK could generate up to 125TWh[23]. Waste heat from oil refineries in Gothenberg, for instance, provides a third of the city's space heating[24].

Costs

Nuclear power has always been costlier than promised and has always had to rely on public subsidies. Many of the costs of a nuclear plant are hidden in the waste disposal, insurance and security costs.

- It is currently estimated that the cost of nuclear waste disposal will be around £56 billion, according to the Government's Nuclear Decommissioning Authority (NDA). This is an increase of £8 billion over previous estimates.

- The Government's rescue of British Energy in 2003 is expected to cost British tax payers £12 billion over the next 100 years[24].

- Since 1974 the UK government has spent £6.8 billion in research and development funding for nuclear fission (compared to £540 million for renewables) according to information from the International Energy Agency.

Potential Contribution of nuclear power

Nuclear power is not the answer to climate change as its potential contribution has been overestimated.

- If we doubled the electricity generation from nuclear reactors (from a quarter to a half of our electricity) we would only reduce greenhouse gas emissions by about 8%.

- Nuclear is not an 'emissions free' solution. The mining and transport of uranium, the making of nuclear fuel rods, the building of nuclear power plants and the storage and reprocessing of nuclear waste all lead to carbon dioxide emissions. Nuclear produces 50% more greenhouse gas emissions than wind power[25].

- Given the appropriate support, renewables can make a significant contribution to carbon reduction in a much shorter timescale than the ten years it takes to build the first of a new generation of nuclear reactors.

Waste

No long-term solution has been found for safely storing and protecting this extremely hazardous material for tens of thousands of years.

- Britain has 470,000 cubic metres of waste - enough to fill the Royal Albert Hall five times - for which there is no agreed long-term management solution.

- Nuclear waste can remain highly radioactive and dangerous for tens of thousands of years

- The Government can't show that waste might not leak from proposed waste dumps. They can't possibly predict how secure waste dumps will be over tens of thousands of years. In May of this year, it was revealed that 83,000 litres of a nuclear liquor, reportedly containing enough plutonium to make 20 nuclear weapons, had been leaking undetected for at least nine months from a badly designed pipe at the Thorp reprocessing plant in Cumbria.

- If spent fuel rods were buried around the time of the Norman Conquest 1000 years ago, they would still be highly dangerous today.

- The Swiss Government's nuclear waste authority assumes that the safety of the repository for spent fuel and high-level radioactive waste has to be guaranteed for at least 1 million years.

A proposal to store nuclear waste at a former military depot at Trecwn in north Pembrokeshire in 1999 triggered very strong opposition throughout west Wales.

Nuclear Weapons
Technology used for nuclear power can be misused to make nuclear weapons.

- Nuclear reactors use enriched uranium, made at enrichment plants. Yet enrichment plants can be used to make super-enriched, weapons-grade uranium.
- Reactors produce plutonium that can be separated through reprocessing and used to make bombs.
- Over the past year, North Korea and Iran have been investigated by international agencies over their alleged misuse of civil nuclear power to make weapons-grade uranium
- Recently, even Zimbabwe was reported to be planning a civil nuclear programme as a stepping-stone to weapons production.

Radioactive Discharges
The possibility of nuclear proliferation also increases both the problems of routine radioactive discharges to the atmosphere and seas and the likelihood of nuclear accidents. Radioactive contamination from Sellafield can be found throughout the Irish Sea and restrictions resulting from the radioactive fallout from Chernobyl in 1986 still affect 359 farms covering 53,000 hectares of land in North Wales.

Terrorism
Nuclear plants are vulnerable to terrorist attack.

- No nuclear reactor would be able to withstand a direct hit from a 747 crashing into it

- Last year, Australian police stopped suspected terrorists who were believed to be staking out a research reactor near Sydney

- George Bush announced that US troops had found plans of US nuclear power stations at al-Qaeda hide-outs in Afghanistan.

Unlike other generation sources, nuclear power produces a constant power and cannot reduce and increase output to match fluctuating demand. Nuclear power stations have, however suffered from major shutdowns as a result of technical problems and routine maintenance. The Wylfa nuclear power station, for instance, has only operated at around 56 per cent of its full capacity since it opened. During 2004, generation from nuclear sources fell by 10 per cent because of outages for repairs and maintenance[26].

Over the last fifty years, nuclear power has had a fair chance to prove itself but has failed to deliver economic, safe or clean energy and has left a legacy of hazardous waste and financial costs for future generations. It seems that it is once again being promoted as a quick fix solution to an energy challenge but in reality amounts to no more than an expensive fig leaf to

cover the embarrassment of failed attempts to make adequate reductions in carbon dioxide emissions.

b. Liquefied Natural Gas

We believe that LNG is an essential part of the fuel mix for the UK for the medium term future. However, we consider it to be, like natural gas, only a 'bridging fuel' that emits less carbon dioxide than coal or oil rather than the solution to climate change.

We have, however, opposed proposals to site two LNG terminals and storage facilities at Milford Haven on safety grounds. We do not believe that facilities dealing with such a hazardous fuel should be sited so close to a populated area. An LNG fire is more intense than petrol and can cause second-degree burns at a distance of two miles. Yet, the Petroplus LNG terminal is approximately only one mile from the towns of Milford Haven and Pembroke Dock and two large oil refineries, and it is directly adjacent to the village of Waterston (population 250). The Exxon terminal at South Hook is only one mile west of Milford Haven. The recent explosion and fire at the Buncefield oil storage depot in Hertfordshire has increased concerns about the safety of the thousands of local people who are living close to the LNG developments.

LNG Power Stations

While we recognise the role of LNG in the UK energy mix, we cannot support its use in CCGT (combined cycle gas turbine) power stations unless the waste heat is used locally. A 2GW LNG-fired CCGT power station has been proposed on the site of the former power station near Pembroke. A proposal for a 1.6GW power station at Waterston, Milford Haven has been withdrawn but we understand that an amended application might be re-submitted. We estimate that approximately 25 per cent of the energy content of the gas extracted in the Middle East will be used in the processes of liquefaction, transport and re-gasification. The gas would then be burnt in a CCGT power station operating at 55-60 per cent efficiency. Thus, over half of the energy content of the original gas would be lost. We believe that this level of inefficiency is unacceptable in this age of climate change and that the power stations should be suitably sized and sited to use their waste heat in local industrial processes, such as the oil refineries. A scheme such as this has been developed at the Immingham gas-fired power station in Lincolnshire. This complies with the government's policies of both reducing carbon dioxide emissions and developing CHP.

The two CCGTs at Milford Haven would total 3.6GW capacity and would generate an annual average of around 3GW of electricity and 2GW of waste heat. At the Waterston power station, 250MW of the 900MW of waste heat would be used to re-gasify the LNG at the Petroplus terminal but no such proposals exist at the South Hook LNG terminal. This would result in 1,750 MW of waste heat, which is more than the generating capacity of both Wylfa and Trawsfynydd nuclear power stations, emanating from the two LNG power stations. Nearby, are two oil refineries with a constant demand for process heat in the form of steam. We believe that LNG-fuelled power stations on the shores of the Milford Haven waterway should only be approved if they are to operate efficiently as CHP stations.

c. Clean coal technology

The power station sector continues to be the single largest source of carbon dioxide emissions in the UK. We believe that, in general, a switch from coal to natural gas for electricity generation is desirable for the purpose of reducing these emissions. We recognise, however, that a switch back to coal burn is already happening, because of the current price differential between coal and natural gas and because of over-allocation in the Emissions Trading system, and that a considerable dependence on natural gas imports might be considered undesirable. A

limited role for more efficient and less polluting (rather than 'clean') coal systems would, therefore, be acceptable.

In Wales, we would like to see the Aberthaw and Uskmouth power stations retrofitted with advanced super-critical boilers, feedwater heating and oxyfuel firing. According to the engineering company, Mitsui Babcock, replacing an old boiler with an advanced super-critical one could reduce carbon dioxide emissions by 23 per cent[27]. The latest boilers also allow biomass to be added to the fuel mix. This, claims Mitsui Babcock, could reduce emissions by a further 20 per cent. We support biomass co-firing at Aberthaw and Uskmouth with crops supplied from a local source. Mitsui Babcock estimates that the combined effect of retrofitting boilers and biomass co-firing can reduce emissions from coal down to similar levels as a gas-fired power station.

Coal gasification systems, such as Integrated Gasification Combined Cycle (IGCC), are being developed and could be used for poly-generation. This allows the gas (hydrogen) to be used either to power a gas turbine or to be piped elsewhere, such as industry or transport. A coal gasification power station has been proposed for the Swansea Valley but is currently on hold. These more efficient coal technologies have potential but are still either in the demonstration phase or have never been implemented on a large scale.

In view of the enormity of the threat of climate change, a limited amount of carbon sequestration and storage (CCS) may have a role to play, and we believe that any new coal or gas plant should be built as a 'capture ready' plant in that they could easily implement CCS in the future. We cannot, at present, support the large-scale implementation of CCS due to the legal, regulatory, permanence and liability issues that still need to be resolved. We would, though, support research to identify suitable capture and storage sites in geological structures with proximity to Wales.

We support research and possible development of the capture and extraction of methane from coal seams. We oppose any opencast coal production but would support investigation of the possibility of a deep mine in the Margam area and any drift mine potential. We believe the Welsh Assembly Government should produce a coal TAN at the earliest possible opportunity.

d. Wind power

Wind power is one of the cleanest forms of energy available. The fuel is free, abundant and inexhaustible, and no waste is produced when energy is being generated. It is technologically the most advanced of the renewable sources of energy and one of the most cost-effective. It has a great deal to offer in a world that needs all the clean energy it can get if it is to overcome the threat posed by climate change. It is not surprising to learn that it is the fastest growing source of electricity generation globally.

The UK has 40 per cent of the total European wind resource but has not been the quickest to exploit it. Denmark and Germany have led the way. According to the British Wind Energy Association website, there are currently 117 wind energy projects in the UK amounting to 1,445 turbines generating 1,337MW of electricity and displacing 3,022,066 tonnes of carbon dioxide. In Wales, there are currently 23 wind farms (22 onshore and one offshore) generating 314MW of electricity.

As the lead renewable technology, it is not entirely surprising that wind farms have aroused controversy and a certain amount of opposition. Generating electricity on a significant scale

from renewable sources is a considerable departure from centralised fossil fuel and nuclear generation with, often, a more local and visible impact. Other renewable energy proposals, such as wood burning, the growth of energy crops, hydro-power and the Severn Barrage, have also triggered a hostile response from some. An opinion survey in 2004, for instance, by the Tyndall Centre for Climate Change Research at Manchester University found that eight times more people were in favour of wind turbines than were in favour of a biomass plant in Devon[25]. This is remarkable considering Devon's resistance to wind power having approved only one 3MW wind farm in the county.

The arguments raised against wind energy have been closely scrutinised by a number of authoritative bodies and generally dismissed.

In the 1993-94 session, the Welsh Affairs Committee study into wind energy strongly criticised evidence presented in opposition to wind energy, most notably by the Country Guardian organisation, the Campaign for the Protection of Rural Wales and the Countryside Council for Wales, referring to "inaccuracies", "misinformation", "misrepresentation" and "complete fiction".

Almost ten years later, in January 2003, the Welsh Assembly's Economic Development Committee was so concerned about the misinformation presented to them about wind energy that they added a special annex [Annex A] to their report about renewable energy. This refuted the 'myths and legends' that existed about subsidies to wind energy, shortages of electricity supply in California 'caused by expensive wind energy', intermittency, wind power replacing other power stations, the cost of wind energy and wind turbines supposedly destroying tourism and harming birds.

In May of this year, the Sustainable Development Commission produced a report, 'Wind Power in the UK: A Guide to the Key Issues Surrounding Onshore Wind Power Development in the UK'. This also dismisses 'myths'. A survey of 50 opinion polls in the UK concluded that people supported wind energy by, on average, a majority of four to one. The argument that wind energy requires 'spinning reserve' in the form of conventional power to compensate for its intermittency is regarded as "seriously flawed". It rejects the argument that onshore wind energy is excessively expensive, putting its cost at 3.2p/kWh compared to gas at 3.0p/kWh. This assessment does not take into account the financial benefits to health and the environment of using a non-polluting source nor the inevitable rise in the future cost of fossil fuels. On noise, it makes the valid point that rural activity, such as traffic and farm machinery, creates noise but that noise levels from a wind farm are on a par with background rural noise at night time.

Recently the DTI has placed on its website a 'Wind Power – 10 myths explained' section. We believe that this addresses a number of important issues and is worth including in full.

Wind power: 10 myths explained

Myth: Turbines are taking over the countryside

The facts:

- There are now some 1,120 turbines in 90 locations.[1]

- Generating 10 per cent of UK electricity from renewables by 2010 could mean an increase by around another one and half times the current number.[2]
- Less than 1/20,000th of the UK (800–1,200 hectares) would be used for foundations and access roads.[3]
- Land between turbines can still be used for farming or natural habitat.

Myth: Wind farms are unpopular

The facts:

- Research suggests quite the reverse.
- 90 per cent of the public believe the Government should encourage the use of renewable energy.[4]
- 80 per cent support Government plans to significantly increase wind turbines.[5]
- 74 per cent agree that wind farms are needed to meet current and future energy needs.[6]
- 66 per cent would approve of a new wind farm in their area.[7]
- Approval is over 80 per cent among those already within 5 kilometres of a wind farm.[8]

Myth: Turbines are a health hazard

The facts:

- Wind generation produces no emissions, harmful pollutants or waste products.
- In 25 years of wind generation, with 68,000 turbines now worldwide, there are no significant reports of health issues. This includes Denmark, whose turbine density is 30 times that of the UK.
- The DTI has commissioned an independent study in response to public concerns about low frequency noise.
- However, vibration levels 100 metres from turbines are a factor of 10 lower than the safety requirements for modern laboratories.[9]
- Each development requires a noise assessment which can be validated by the Environmental Health Officer.

Myth: Wind farms devastate house prices

The facts:

- A study by the Royal Institution of Chartered Surveyors suggests that wind farms have no lasting impact on UK house prices.

- This study is supported by evidence at wind farms in England, Scotland and Wales.
- It shows that local house prices recover from any initial impact once a wind farm has been operating for two years.
- Evidence suggests that those living nearest to wind farms are their strongest advocates.[10]
- People promoting fears of falling prices risk making them self-fulfilling.

Myth: Wind farms keep tourists away

The facts:

- Many wind farms are tourist attractions.
- 30,000 people have visited the information centre for the new Scroby Sands offshore wind farm since May 2004.
- 90 per cent of tourists surveyed in Scotland said wind farms make no difference to enjoyment of their holiday.[11]
- Twice as many would return to an area because of a wind farm than would stay away.[12]

Myth: Turbine blades threaten bird populations

The facts:

- UK wind farms have not been associated with any major adverse effects on birds.[13]
- By far the biggest threat to UK bird populations is climate change,[14] which is mitigated by renewables such as wind.
- Environmental assessments are required as part of the planning process, to ensure wind farms are properly sited and configured in relation to bird movements.
- These assessments have improved the understanding of bird ecology, helping conservation.[15]

Myth: Wind produces little power

The facts:

- A single 1.8-megawatt turbine can produce enough power for 1,000 homes.[16]
- Existing wind projects generate enough for nearly half a million homes.[17]

- The average UK wind farm will pay back the energy used in its manufacture within three to five months – more quickly than coal and nuclear plants.[18]
- Over its lifetime,[19] a wind farm will repay this energy 50 times over.
- The geographical spread of wind farms minimises the loss of generation when the wind stops in any one location.
- Back-up generation is already in place to cover shut-downs of other forms of generation; little further back-up will be needed up to 2010 to cover periods when wind and other renewables generation is low.

Myth: Wind energy will not help climate change

The facts:

- Producing 10 per cent of electricity from renewables in 2010 could cut carbon emissions by 2.5 million tonnes a year.[21]
- Wind generation produces no carbon emissions.
- Every unit of energy generated by wind doesn't need to be generated by carbon-producing sources.
- Any emissions savings lost through use of fossil fuel back-up will be minimal to 2010.[22]
- Wind is part of a range of measures to tackle climate change, alongside other renewables and energy efficiency.

Myth: Projects are forced through with no regard for local concerns

The facts:

- Ministers have made it clear that wind farms should only be located in the appropriate place and that local concerns should be listened to.
- All wind farm proposals are subject to a strict planning process, addressing environmental, visual and community impacts.
- Local planning authorities consider onshore proposals up to 50 megawatts (the vast majority of applications to date).
- The planning framework[23] facilitates renewable energy, while maintaining safeguards for landscape and nature conservation.
- It does not impose targets or developments on local authorities.
- For applications over 50 megawatts, local authorities can trigger an independent public inquiry if they object.
- The public can participate in the planning processes and their views are taken into account at every stage.
- Projects not meeting planning requirements are refused consent.
- About a third of all applications are refused.[24]

Myth: Onshore wind is being promoted at the expense of other renewables

The facts:

- The Government has committed £500 million to develop longer-term renewables, such as offshore wind, wave and tidal, solar, biomass and community projects.
- Onshore wind is currently the most economically viable renewables technology with scope for expansion, but it will increasingly operate as part of a renewables mix as other technologies come on line.
- The UK is already the world's second-biggest offshore wind generator. Plans for further offshore wind farms represent the world's biggest expansion of renewable energy.

1. British Wind Energy Association (BWEA), November 2004.
2. A rather smaller number of offshore turbines would also be required.
3. BWEA, November 2004.
4. 'Attitudes and Knowledge of Renewable Energy Amongst the General Public' – TNS Consumer 2003.
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15. Dr Martin Perrow, University of East Anglia, on study of Little Terns at Scroby Sands wind farm, Norfolk.
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19. Based on a turbine life of 20–25 years – BWEA.
20. 'Renewables Innovation Review' – DTI/Carbon Trust, February 2004.
21. DTI Renewables Obligation Statutory Consultation, August 2001.
22. Mott MacDonald, 2003.
23. 'Planning Policy Statement 22: Renewable Energy' – ODPM, August 2004.
24. Based on applications in the year to September 2004.

We are pleased that the Welsh Assembly Government recognises the benefits of wind energy and that we have to develop this lead renewable technology if we are to reduce carbon dioxide emissions. A few politicians, however, have jumped onto the 'wind bashing' bandwagon, claiming that wind energy is unacceptable but other renewable energy sources, such as energy crops or tidal power, ought to be developed instead. While we agree that a wide range of renewable systems ought to be developed as soon as is realistically possible, this opportunistic approach conveniently ignores the fact that these other technologies might not yet be technologically, financially or environmentally feasible. Experience also shows that other renewable systems can trigger as much or more opposition from a minority as wind energy does.

We welcome the Welsh Assembly Government's 'benchmark' of generating 4 TWhrs per year of energy (mainly electricity but also some heat) from renewable resources by 2010. The 4TWhr would amount to approximately 20 per cent of Welsh electricity demand. We also broadly welcome the aim of securing most of this output by means of wind energy (800MW of onshore wind along with 200MW of offshore wind and other renewables) as this is the most economically attractive and technologically applicable renewable energy resource currently available.

Further contributions could be made by other offshore schemes, such as the proposed 750MW Gwynt-y-Mor wind farm off the north Wales coast. In all, we calculate that present proposals for onshore and offshore wind farms could result in Wales obtaining as much as 27 per cent of its electricity demand from wind energy by 2012; this would be sooner than a new nuclear power station could be built.

The calculations are as follows:

Wales electricity demand = 20 TWhrs/yr

Onshore wind capacity = 200 MW (already built) plus 800 MW additional target by 2010. At 30% load factor this = 300 MW average annual output

Offshore wind capacity = North Hoyle 60 MW plus Scarweather 100 MW plus Gwynt y Mor 750 MW = 900 MW in total
35% load factor = 315 MW average annual output

In all, 615 MW from both onshore and offshore wind farms.

In one year, 615 MW average would generate 0.615 x 8.76 = 5.39 TWhrs/yr or 27% of current demand in Wales. This would supply 810,000 people in Wales.

e. Bio-mass Energy

Biomass is a term that describes fuels based on organic matter. In Wales, the main sources are forestry/woodland residues (around 70% of felled forestry is left on the forest floor), energy crops (e.g. short rotation coppice of willow or poplar, herbaceous grasses such as miscanthus) and wood manufacturing residue.

An early indication of the difficulties that bio-mass schemes could face emerged when proposals for using timber to generate electricity at Newbridge-Upon-Wye and at Llanddewi

Velfrey in Pembrokeshire, were defeated at the planning application stage having aroused considerable public opposition.

The Welsh Assembly Government has since produced a Farm Woodland Development & Biomass Action Plan. This has identified a range of actions, including research, demonstration projects, economic and market analysis, awareness raising, training, grant assistance and the examination of the current agricultural subsidy system. Despite this, progress has been slow and concern has been raised about the subsidy system in Wales compared to England. Whereas English farmers can obtain grants to grow energy crops, it would appear that in Wales grants are only available under the wood energy business scheme for help in developing markets and setting up wood burning fuel plants. As Aberthaw power station has now made a commitment to burn 200,000 tonnes of biomass crops annually, Welsh farmers now fear that these fuels will be transported in from England where farmers can receive grants of up to £1,000 a hectare to grow the energy crops. This is clearly an unsatisfactory situation that the Welsh Assembly Government needs to address. We believe that energy crops should be locally sourced in order to cut out the negative environmental and economic impacts of increased transport.

One example of what can be achieved in switching to a bio-fuel has occurred in Pembrokeshire. In 2000, the Pembrokeshire Energy Agency installed a wood pellet heater at its office based at the West Wales Eco Centre in Newport. A partnership, involving the Agency, the Eco Centre, the County Council, the National Park Authority, a consultant and a local school, was established to promote the fuel. As a result, both the Ysgol Preseli comprehensive school and leisure centre at Crymych and the newly refurbished offices of the Pembrokeshire Coast National Park Authority at Pembroke Dock are now heated by wood pellets rather than oil. We believe that schemes such as this could be more vigorously promoted by the Welsh Assembly Government.

f. Geothermal Energy

Wales has no ‘hot rocks’ which could be used to generate electricity as seen in, for example, New Zealand and Iceland. However, there are many areas of Wales off the gas grid where ground-sourced heat pumps could provide low emission space heating for dwellings and commercial buildings.

g. Tidal and wave energy

We support these forms of energy generation in principle and individual schemes provided they are environmentally acceptable and cost effective.

Tidal lagoons

We believe that tidal lagoons [see our briefing paper in Appendix 3] located in areas of high tidal range around the UK, notably the Severn Estuary, Liverpool Bay and the Thames Estuary, could generate significant quantities of cost-competitive electricity with a low environmental impact. The company that has devised the technology, Tidal Electric, are proposing a 48 MW (installed capacity) scheme, with an average output of 23 MW, which is equivalent to the average electricity consumption of 30,000 people, in Swansea Bay. It would impound just over two square miles of sea near Port Talbot. Further, and larger, schemes could be built in the Severn Estuary that could generate as much as 24TWhrs/year, which is equivalent to almost 7 per cent of the total annual electricity demand for England and Wales. The lagoons could generate electricity on both the ebb and flow tides and thus provide constant and controllable base load power that could be managed to act as a back up for variable sources of generation. They would also provide power close to the major demand centres in south Wales and the west

of England. The Swansea Bay proposal has been assessed by independent engineering consultants, WS Atkins, who regard it as viable and, at 3.4p/kWh per unit generated, cost effective. We have some concerns about the sourcing of primary aggregates for the construction of the lagoons as the tonnage could be significant and could have a large quarrying and transportation impact. We understand, however, that the use of geo-textile bags filled with dredged silt or scrapings from the seabed within the impounded area could significantly reduce primary aggregate demand. The lagoons, once built, could have a direct ecological benefit by creating new habitats for fish, birds and marine life. We have been disappointed by the apparent lack of recognition by the DTI and the Welsh Assembly Government of the tidal lagoon concept. We are pleased to learn, though, that the DTI has now given permission to Tidal Electric to seek planning consents.

Severn Barrage

We are disappointed that the Welsh Assembly Government appears to be favouring the Severn Barrage, which has been strongly opposed on environmental grounds, ahead of tidal lagoons. There are a range of possible negative and positive environmental and economic impacts associated with locating lagoons or the barrage in the Severn Estuary. However, initial comparisons strongly indicate that lagoons could be significantly less environmentally damaging and more cost-effective and powerful than the barrage. Lagoons would not directly impound the ecologically valuable inter-tidal areas of the Estuary as the barrage would. Indeed, they may enhance wildlife habitats. Lagoons would also generate twice as much power per square mile impounded than the barrage.

Tidal Hydraulic Turbines

This system was initiated in Pembrokeshire in 1997 and trials have taken place in the Milford Haven waterway. The project received early funding from the Assembly's Environmental Development Fund, administered by the Pembrokeshire Coast National Park Authority, but does not appear to have had Assembly support since. We hope that this innovative locally developed renewable energy scheme receives adequate support from the DTI and the Welsh Assembly Government.

Wave Dragon

A wave energy device – the Wave Dragon – will be tested off the Pembrokeshire coast in the near future. If successful, the present 7 MW unit will be extended to a 70 MW unit in 2008/2009. The Assembly's Economic Development Minister has welcomed the development. We hope it receives adequate support.

h. Hydro Electric Energy

Hydropower has a long tradition in Wales playing an important role in the industrial revolution. According to the 'Strategic Study of Renewable Energy Resources in Wales' (2001), the total installed capacity of hydropower schemes is 160MW. These vary from medium sized grid connected schemes to domestic schemes. Only around four new domestic schemes are added each year. We do not believe there is potential for any significant expansion in hydropower in Wales and any that are proposed could face opposition from the angling community.

i. Energy from Waste

We oppose the incineration of waste for energy generation. Incinerators release toxic air pollutants, produce toxic ash that has to be buried in hazardous waste sites and encourage the production of waste as a source of fuel. Burning rubbish means that councils are less likely to

develop recycling and waste minimisation schemes. Numerous studies also demonstrate that recycling saves more energy than incineration generates.

j. Microgeneration

Microgeneration is defined as any technology that is connected to the distribution network (if electric) and with a capacity below 50-100Kw. Most domestic installations are below 3kWe, though thermal systems could be larger. The technologies include solar photovoltaics, wind turbines, small hydro, active solar water heating, ground source heat pumps, bio-energy, small CHP (renewable and non-renewable) and hydrogen energy and fuel cells.

Currently, there are thought to be approximately 100,000 microgeneration units in the UK, mostly solar heating, but installations are increasing, particularly in small wind and ground sourced heat pumps. Micro CHP is just beginning to enter the market.

A recent study by the Energy Saving Trust[26], in conjunction with Cambridge University Faculty of Economics, E Connect and Element Energy, has demonstrated a considerable potential in microgeneration for reducing carbon dioxide emissions. The report concludes that, by 2050, microgeneration could provide 30-40% of the UK's total electricity needs and reduce carbon dioxide emissions by 15 per cent a year.

This potential is acknowledged by the Energy Act 2004 which authorises the Secretary of State to 'prepare a strategy for the promotion of microgeneration in Great Britain'. We understand that the Welsh Assembly Government is due to produce a microgeneration strategy in April next year. We urge the Assembly Government to make the most of this opportunity to reduce carbon dioxide emissions and to take a global lead in clean energy.

The planning system in Wales could be given far greater support and guidance on approving and promoting the development of micro-generation technologies which would encourage the development of self-sufficient energy developments, particularly in new homes or business developments. The technology is widely available, and setting targets for microgeneration could drive a whole new innovative technology sector in Wales, creating more jobs and locally based economies around the production, installation and servicing.

4. Energy Efficiency

Further to comments made earlier in this paper, we wish to emphasise the importance of energy saving and conservation measures. The Energy White Paper (2003) states, "the cheapest, cleanest and safest way of addressing our energy policy objectives is to use less energy". And, according to an article in the Scientific American, delivering a kilowatt-hour from a nuclear plant costs at least three times as saving one through energy efficiency[27].

Energy conservation measures are one of the best examples of sustainable development in action, bringing about improvements to the environment by reducing fuel use and the associated pollutants; to the economy by reducing fuel bills and creating employment; and to society by reducing fuel poverty and improving health. Although energy conservation has improved over recent years, the UK's Energy Sector Indicators reveals that the average house in the UK only has an energy efficiency rating (SAP) of 51.3 out of a maximum of 120. Current carbon dioxide emissions from the existing 25 million dwellings in the UK are estimated to contribute around 30 per cent to UK emissions[28.]

We believe that the Welsh Assembly Government's Energy Efficiency Action Plan is a totally inadequate response and ought to be redrafted. A new Energy Efficiency Action Plan should include targets, timetables for delivery and mechanisms for measuring progress. This has to be backed by extra funding, such as an increase in the budget for the Home Energy Efficiency Scheme (HEES) and for local delivery services, such as energy advice centres and energy agencies.

The Welsh Assembly Government could also implement recommendations made by the International Energy Agency in two recent reports: 'Saving Energy in a Hurry' and 'Saving Electricity in a Hurry'[29]. These are based on experiences in California, Brazil, Norway, New Zealand and Japan where temporary shortfalls in energy supply and/or price hikes have been successfully dealt with through energy efficiency measures. An example of this is California replacing almost a million lamps in traffic light with high-efficiency Light Emitting Diodes (LEDs) saving over 60MW - enough electricity for 60,000 homes.

At present, cabinet responsibility for energy issues at the Welsh Assembly Government lie mainly with the Minister for Economic Development, with the Minister for Environment, Planning and Countryside with responsibility for biofuels, and the Minister for Social Justice and Regeneration having responsibility for HEES and fuel poverty. Establishing and delivering on energy policy would be better achieved, we believe, if all energy issues became the responsibility of one cabinet minister. It would be preferable if this minister also had a clear responsibility for leading on climate change issues.

5. Planning

Friends of the Earth Cymru recognises the important role of the planning system in helping to move from a highly centralised, fossil fuel and nuclear power based energy system towards a more distributed and sustainable renewable energy system. We have broadly welcomed the Assembly Government's 'TAN 8: Planning For Renewable Energy' [see Appendix 4 for the Friends of the Earth Cymru response] for its role in providing clearer guidance to local authorities, local communities, environmental organisations, government agencies and developers, and for accepting the essential role of planning in delivering the Assembly Government's target of producing 4TWh of electricity per annum from renewable energy sources, mainly wind energy, by 2010. We are concerned, though, that the process is too restrictive and would have preferred a 'criteria-plus' approach in which the sieve-mapping process was integrated with a criteria-planning approach. We also regret that the proposed 400MW Camddwr wind farm is not included in a Strategic Search Area because it is used by the MOD for occasional tactical low flying.

6. Concluding Recommendations

1. The main driver for energy policy in Wales should be the recognition of the crisis of climate change and the need to reduce carbon dioxide levels.

2. That the power of executive competence relating to the promotion of renewable energy, the promotion of energy efficiency, building regulations, power station consents (over 50 MW) and overhead electricity line and gas pipeline consents should be devolved to the Welsh Assembly Government.

3. No new nuclear power stations should be built because the risks far outweigh the benefits and because a range of safer, greener and cleaner alternatives can deliver both greenhouse gas reductions and energy security.

4. LNG power stations should only be approved if they operate as combined heat and power units and are safely sited at a sufficient distance from existing communities.

5. A limited role for less polluting (rather than 'clean') coal power stations is acceptable.

6. The Welsh Assembly Government should continue to support wind energy, both onshore and offshore, as it can make a substantial contribution to clean and cost effective electricity generation in Wales.

7. Tidal lagoons could make a substantial contribution to the generation of clean and cost effective electricity generation in Wales and should be given more serious consideration by the Welsh Assembly Government.

8. A range of other renewable energy sources, such as bio-fuels and wave power, and microgeneration systems should be supported in order to reduce carbon dioxide emissions.

9. The Welsh assembly Government's Energy Efficiency Action Plan should be redrafted to include targets, timetables for delivery and mechanisms for measuring progress.

10. Responsibility for all energy matters should rest with one minister who should also have responsibility for climate change issues.

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In one year, 615MW average would generate 0.615 x 8.76 = 5.39 TWhrs/yr or 27% of current demand in Wales. This would supply 810,000 people in Wales.
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