

Nuclear Free Local Authorities **new nuclear monitor**



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POWERING BRITAIN: SUSTAINABLE ENERGY STRATEGIES AND THE ROLE OF LOCAL AUTHORITIES

Key highlights from submission to the UK Energy Review

Introduction

The Government's energy review consultation closed on 14th April 2006. More than 2000 written responses were received. The review then moved on to the next crucial phase - analysing the evidence presented, incorporating it together with the Government's own analysis and preparing a report for the Prime Minister by Summer 2006. Energy Minister Malcolm Wicks said at the close of the consultation that "...decisions we need to take will determine energy strategy up to the middle of the 21st century ... Our response must be underpinned by our key energy policy goals: to cut the UK's CO2 emissions, to maintain reliability of supply, to promote competitive markets and to end the cruel correlation between being old and being cold." [1]

The Review has provided an opportunity to highlight the exciting potential of renewable energy, as well as how much can be achieved at a local level to tackle the threat of climate change by implementing local energy strategies based on energy efficiency, decentralised and small-scale energy generation.

Despite pledges to the contrary, many believe that a new nuclear build programme will undermine the implementation of more sustainable local energy strategies.

The submission from the Nuclear Free Local Authorities Steering Committee (NFLASC) highlighted the unique position of local government to promote the achievement of sustainable energy use with low carbon emissions. [2] And these strategies have multiple benefits for authorities and their communities, particularly in tackling fuel poverty. That is why there are already several examples of innovative local authorities developing their own local energy strategies.

Undoubtedly the leader is Woking in Surrey which offers a vision of the future. By decentralising energy generation, capturing and using the waste heat from its power plants, and improving energy efficiency, the council has cut carbon emissions from its own buildings by an impressive 77% over the past 15 years.

The Greater London Authority has established a Climate Change Agency, with the remit to decentralise energy and cut emissions. London Mayor Ken Livingstone has called on Tony Blair to abandon plans for a new generation of nuclear power stations, and move away from centralised power generation, which wastes around two thirds of the energy produced, towards decentralised energy.



THE LOCAL GOVERNMENT VOICE ON NUCLEAR ISSUES

Manchester City Council has launched a campaign to persuade government that the way forward is to reduce the amount of energy we waste and increase small-scale renewable energy generation, rather than building a new generation of nuclear power stations. Edinburgh has set itself the goal of becoming the most sustainable Northern European city region by 2015

Small-scale or micro-generation technology, including solar panels, mini-wind turbines, ground source heat pumps, small hydro turbines, and mini combined heat and power (CHP) plants could, according to the Energy Savings Trust provide 30-40% of the UK's electricity by 2050.

A local energy strategy based on micro-generation and decentralised power stations can provide security of supply, but unlike nuclear power stations is unlikely to provide terrorist targets.

Fears of a looming energy gap should not stampede us into irrational decisions. There need be no gap if we adopt sensible strategies. The claim that 'we need every energy technology' does not stand up. We must choose the best buys first, not last. Nuclear power will divert private and public investment from cheaper alternatives – CHP, renewables, and efficiency. The Government's own Sustainable Development Commission has advised that nuclear plants could only make a small contribution to tackling climate change. The danger is that by giving the go-ahead to a new nuclear programme political attention will shift and efforts to increase the proportion of renewables in the energy mix and improve energy efficiency will be undermined. And given the history of the nuclear industry, a worst-case scenario might be that we end up with nothing, because nuclear power fails to deliver.

This issue of New Nuclear Monitor draws almost exclusively on submissions to the UK Energy Review. It paints a picture of failure on the part of government to implement the 2003 Energy White Paper, with its emphasis on energy efficiency and renewables, and an overoptimistic assessment of future costs by a nuclear industry which has failed to learn from its past mistakes. But it also paints an inspiring picture of an alternative future scenario based on a sustainable and decentralized energy system which puts local authorities in a pivotal position to deliver.

Putting nuclear into perspective

The climate change debate sometimes appears to focus almost exclusively on carbon dioxide (CO₂) emissions from electricity generation, yet this sector is responsible for only around a third of total UK emissions. Several commentators incorrectly use the term 'energy' when what they mean is electricity. For example, the Government's chief scientist recently said that nuclear power provided 20% of 'energy on the grid'. [3] Nuclear power provides around 19% of our electricity, but only 4% of our energy. [4]

Nevertheless, electricity is still the single largest contributor of CO₂ emissions, and to deliver cuts consistent with the Government's long-term national target of a 60% cut by 2050, it is likely that electricity generation would be expected to emit virtually no CO₂ at all by then. But we also need to be making savings in the transport sector, and reducing the fossil fuels we burn to provide heating.

The Energy Review

Environment Groups believe the 2003 Energy White Paper [5] was correct to focus on energy efficiency and renewables. WWF, for example, says the current energy review should be used as an opportunity to reassert the vision set out in the White Paper, and to ensure that it is implemented vigorously. It is important that the review addresses transport (including aviation) and heat as well as simply the electricity sector.

WWF expresses the suspicion felt by many that the energy review may simply be a smokescreen to support new nuclear build, which it describes as a costly, dangerous and fundamentally unsustainable technology. [6] The NFLA submission quotes members of the previous energy review team expressing surprise at the launching of another review so quickly. Most of the energy community was surprised by the decision to hold another energy review only three years after the previous one. The policies set out in the 2003 Energy White Paper have had little time to start taking effect let alone reveal their long-term potential. [7] Dr Catherine Mitchell, a member of the last Energy Review team, said we don't need another review – what we need to do is implement the recommendations of the last White Paper on energy efficiency and renewable energy. [8]

Greenpeace goes further and accuses the Government of failing to formulate and deliver effective policies in light of the 2003 White Paper recommendations. The main driver, it says, behind the Government's renewed enthusiasm for nuclear power (and hence this Review), is not climate change and energy security as it officially states, but the fact that it has failed to deliver on the recommendations of the last review. [9]

Powering the UK without nuclear energy

WWF commissioned energy consultants, ILEX, to provide a realistic assessment of the potential to achieve significant CO₂ emissions reductions in the UK power sector by 2010, 2016, 2020 and 2025 without new nuclear build. [10] ILEX developed two scenarios which focus on achieving emissions reductions through conventional means such as energy efficiency, additional encouragement of renewable and CHP generation, and through a rising price of carbon in the EU Emissions Trading Scheme (ETS). The results are very promising. Minor extensions to current policies and targets could enable the UK power sector to cut its CO₂ emissions by approximately 40% from 1990 levels by 2010 and maintain them at this level until 2025 despite the closure of almost all nuclear power plants during this period. Further evolution of existing policies could potentially reap reductions of around 55% from 1990 levels through to 2025.

One of the key issues in the ILEX scenarios is the role gas will play in the fuel mix. It is assumed that gas will be used to generate around 62-65% of electricity in 2025. Another key issue is that measures to reduce electricity demand are potentially extremely cost effective, but the Government must ensure that current obstacles to energy efficiency are addressed in the near future. It is disappointing that the 2003 White Paper's promised 'step change' in energy efficiency has failed to materialize. To this end WWF calls on the Government to introduce changes to the electricity and gas markets to make the provision of energy services, rather than just electricity and gas sales, a viable core business model. It supports an Energy Saving Trust (EST) idea of placing a cap on the total amount of electricity and gas utilities can supply. This could revolutionize the market and move companies away from a focus on supply to a focus on demand management.

Friends of the Earth (FoE) has also developed a model which illustrates that we can fulfill our electricity requirements and reduce CO₂ emissions without embarking on a new nuclear programme. [11] FoE describe six scenarios, which not only meet demand, but also show the electricity sector achieving reductions in emissions of CO₂ (from 1990 levels) by 2020 of 48-71% without needing to replace decommissioned nuclear power stations with new ones. Under all but one of the scenarios natural gas consumption by the power-generating sector would see only marginal growth with subsequent decline.

NFLA Scotland Forum commissioned energy consultancy, Garrad Hassan, to look at Scotland's future energy requirements. Their report concluded that there are a number of options for meeting Scotland's so-called energy gap without resorting to building new nuclear power stations. Strong decisive action on energy efficiency and renewables will be necessary in any event because it will

not be possible to build nuclear power stations quickly enough to meet carbon targets. Garrad Hassan also expressed a concern that a decision in favour of new conventional plant would remove at least some of the drive towards a sustainable energy strategy. [12]

The NFLA Wales Forum, in its submission, is able to support the recognition by the Welsh Assembly Government that: “...*sufficient other new electricity generation will come on stream in Wales over the next 10-15 years to make the pursuit of new nuclear build unnecessary...*” [13]

Turning aspirations into reality

The 2003 White Paper set an aspirational target for renewables to supply 20% of the UK’s electricity by 2020. The British Wind Energy Association (BWEA) says the most obvious way for the Government to communicate its seriousness about promoting renewable energy would be to convert this aspiration to a firm target, and this should be a key result of the Energy Review. BWEA goes on to say Government should subsequently work with the renewable industry to implement the policies required to reach this objective. [14] Environment groups agree, as does Scottish Power, [15] and WWF calls for a further target to increase renewable output to 25% by 2025.

The NFLA Wales Forum submission highlights the Welsh Assembly Government’s ‘benchmark’ of generating 4 TWh per year of energy (mainly electricity but also some heat) from renewable resources by 2010. This amounts to approximately 20% of Welsh electricity demand. However, it is possible that as much as 27 per cent of its electricity demand could be generated from wind energy alone by 2012; far sooner than a new nuclear power station could be built. The Garrad Hassan report for the NFLA Scotland Forum highlights the Scottish Executive’s ambitious target for 40% of electricity consumption in Scotland to come from renewable sources by 2020. A report by Scottish environment groups demonstrates the considerable opportunity for Scotland to meet these targets, whilst protecting sensitive areas of our environment. [16]

Whilst progress on onshore wind has been acceptable, progress on offshore wind – which is critical to delivery of the Government’s renewables targets for 2010 and 2020 – has stalled badly. BWEA says under current policies only 2,000MW of offshore wind capacity will be installed by 2015 – compared to a realistic potential of 8,000MW with additional support from Government. WWF calls on the Government to act urgently to ensure that the offshore wind industry continues to develop at the pace necessary to meet renewable energy targets. Scottish Power agrees with BWEA’s outlook for offshore wind - that delivery, which is critical to meeting targets, has been slow, so help is required. Overall, the Government must refocus attention and political will to create a thriving UK renewables industry including channeling significant new funding to the less commercially developed renewable technologies, such as wave, tidal turbines and biomass.

The Open University Energy and Environment Research Unit (EERU) says a major programme of offshore wind could supply 26% of UK electricity by 2024. [17] BWEA says wind is the only low-carbon power source that can be built in sufficient quantities before 2015 to address the gap that retirement of coal and oil plant under the Large Combustion Plant Directive would otherwise create.

Missed targets – missed opportunities

Environment Groups urge the Government to refocus on Combined Heat and Power (CHP) – power stations which make use of waste heat for district heating when generating electricity - to ensure that its long-standing target for 10GW by 2010 is met. WWF want additional measures urgently, including a possible CHP obligation, and says the Government should commit to a further target of 15GW by 2020. EERU calls for a major expansion of CHP and district heating networks.

WWF sees a strong case for new and additional policies to improve the competitiveness of biomass energy schemes, based initially on existing biomass wastes but moving increasingly into sustainable energy crops. For example, creating a Renewable Heat Obligation (RHO) and accompanying targets for 2010, 2015 and 2020 could require energy suppliers to source a percentage of heating fuel from a range of renewable sources, such as willow, straw, solar power and ground heat. In a report to Government, the Biomass Task Force concluded that biomass has significant potential contribute to UK CO₂ targets and security of energy supply, while benefiting rural economies. [18] However, WWF was disappointed that the Task Force failed to recommend the introduction of a RHO. FoE also sees a strong case for a RHO. [19]

Greenpeace complains that the current Government support programme for solar energy is to be wound down six years early, despite attracting major private sector investment in solar photovoltaic (PV) manufacturing. The programme spent just £31 million of the £150 million committed in 2002. The UK has only 7.8MW of installed solar PV capacity compared to the stated commitment to match the solar capacity of Germany's 794MW.

Microgeneration

The Government's Planning Policy Statement 22 (PPS 22) has given local authorities (in England) the power to require "*a percentage of the energy to be used in new residential, commercial or industrial developments to come from on-site renewable energy developments.*" Although this now sets a firm policy framework for local authorities to require embedded generation, the reality is that the market is still failing to provide cost-effective technology options. Without continued, uninterrupted and increased grant schemes from government, local authorities will fail to achieve the planning gain that PPS22 enables. [20]

WWF wants to see a step change in uptake of microrenewables, district heating and micro-CHP. To achieve this investor certainty will be required – in other words longer-term funding guarantees (over 10-20 years) need to be provided by the Government. Therefore WWF believes the government should set new and high targets for the level of micro-generation and district heating capacity in the UK, and on a regional basis, for 2010, 2015 and 2020. For illustration, one scenario used in Ilex's report for WWF suggests that microgeneration could supply 3% of the UK's electricity by 2020 and 5% by 2025. These figures are consistent with estimates by the Energy Saving Trust that microgeneration could supply 30-40% of the UK's total electricity needs by 2050. [21]

Decentralised Energy

Research carried out by PB Power for Greenpeace and the Mayor of London found that the combined contribution of micro-generation, district heating and CHP schemes to reducing carbon emissions could be enormous. [22] For example, according to the study, if half the houses in the UK had combined heat and power boilers, this would generate as much electricity as current nuclear power plants while saving householders money on their electricity bills. The report lays out a vision for London that builds on approaches already successfully adopted in Denmark and the Netherlands, where decentralised energy and the utilisation of waste heat provides over 50% and 40% of energy supplies, respectively.

FoE says that Woking Council has proven that it is possible to have a more decentralised model for energy generation. However, this requires a number of regulatory changes to become viable more widely. Ofgem's mandate needs therefore to be amended. Greenpeace calls for a wholesale reform of the energy system in order to bring about a truly holistic, decentralised energy system that

genuinely incentivises rapid deployment of renewable energy at all levels, makes efficient use of gas supplies as a necessary bridging fuel and provides a framework for achieving demand reduction across all sectors.

BWEA estimates that onshore and offshore wind, micro and small-scale wind, wave and tidal power, could together provide 21% of UK electricity by 2020. This is to say nothing of the contributions that other renewable resources such as biomass could make. The available evidence demonstrates that the intermittent nature of renewable generation is not an issue for generation levels of up to around 20% of demand.

Building a Manufacturing Base

The UK has not yet reaped the economic benefits from exploiting renewable energy, according to the BWEA. While this is in part due to the fact that the UK has until recently been a small market for renewable generation equipment, there is much more that could be done to encourage local and inward investment. There is currently little incentive for developers to choose UK-made equipment and for manufacturers to establish manufacturing here. This can and should change; resources are available within Government and the Regional Development Agencies to support industry investment. There must be a renewed programme of co-ordinated action by Government if the potential is to be fulfilled.

BWEA research shows that the UK has the industrial capability to build 8,000 MW of offshore wind capacity in UK waters by 2015, from projects that are currently under development. Beyond it would be feasible to install 14,000 MW by 2020. However, this potential will not be realised unless action is taken now to support this new industry. Without new measures, the sector will struggle to build more than 2,000 MW by 2015.

The marine renewable technologies - wave power and tidal stream - are at a very early stage of development, but could be contributing as much as 3% of the UK's electricity by 2020, and 15-20% in the longer term, providing a clear path is laid out now for the development and commercialization of the sector. These technologies represent an opportunity to develop a major new industry in the UK, but there are some significant barriers in the way. BWEA calls on the Government to use the Energy Review as a major opportunity to remove these barriers. Confidence in this emerging sector will be badly affected if the Government allows offshore wind to stall. An economic solution which works for offshore wind as well as wave and tidal power would give confidence that Government is committed to bringing emerging renewable technologies into the mainstream.

Scottish Power says if the potential of marine energy is to be realised, additional capital funding is necessary to achieve the initial commercial breakthrough. Scottish Power is working closely with Ocean Power Delivery, the world leader in wave technology and manufacturer of Pelamis. Taking a project forward is only feasible if the correct support mechanism is made available.

The DTI's Wave and Tidal-Stream Energy Demonstration Scheme (WTSEDS) in principle provided an ideal solution with a package of capital and revenue support outside the existing Renewable Obligation mechanism. However limits on capital and revenue support have severely restricted project scale, and needs to be reviewed.

Energy Efficiency

Greenpeace says the 2003 White Paper expected reductions of around 10MtC (Million tonnes of Carbon) per year by 2010 to come from energy efficiency, but the policy mechanisms for delivering

reductions from households are inadequate. The Energy Efficiency Commitment, for example, is expected to deliver just 0.7MtC of savings per year by 2010. The Government has scaled down energy efficiency requirements in the new Building Regulations, so that a new home built to new UK building regulations will use on average 65% more energy than a new home built in Sweden to Swedish building regulations. The former Office of the Deputy Prime Minister (ODPM – now the Department for Communities and Local Government) also backtracked on key commitments to ensure energy efficiency improvements during the refurbishment of existing houses – these will now be required only on buildings larger than 1000m², which will let most houses off the hook.

Scottish Power also wants building efficiency regulations to be upgraded and enforced, aligned with the comprehensive promotion of energy labelling of buildings. Long-term development of higher building standards up to and beyond 2020 will help guide direction and help planning for investment.

The Association for the Conservation of Energy (ACE) says Government schemes on energy efficiency are working, but to realise the full potential of demand-side management, a simple, market-based framework must be applied on a scale that is commensurate with supply-side solutions currently deployed. [23] Even at current levels of activity, the economics of saving energy are far superior to generation. Any programme of nuclear new build is fraught with both cost uncertainties and is almost certain to require taxpayer input. It is ACE's contention that resources would be better spent reducing dependence on energy.

ACE complains about the lack of fiscal incentives for energy efficiency in the latest budget. Scottish Power also calls for fiscal instruments to enhance the role of energy efficiency, including council tax discounts, stamp duty rebates and differential VAT

Like WWF, ACE calls for a 'cap and trade' scheme to replace the Energy Efficiency Commitment (EEC) in 2011. This will deliver energy efficiency and microgeneration on a significant scale. It would shift us from modest energy efficiency schemes that are successful on a modest scale to schemes that are hugely successful on a huge scale.

A cap and trade scheme would oblige energy suppliers to offer energy services in order to meet tradable carbon quotas. The market would then have to deliver a credible service – through accreditation of installers, and quality assurance. Once these services are available, personal recommendations from customers are bound to follow. Consumers would become made aware of potential energy efficiency savings as a result and there would be a step change in carbon literacy. ACE believes that this system should eventually lead to some measure of personal carbon trading by around 2020.

ACE says energy efficiency measures and microgeneration are mutually reinforcing – in other words once energy demand has been cost effectively reduced, microgeneration can produce a much larger share of the remaining demand *very* cheaply and consumers become more aware of the energy they are consuming. This combination is best delivered by the energy service companies (ESCOs) which would inevitably develop under the cap and trade approach. ACE concludes that large-scale adoption of an integrated demand-side energy framework embracing energy efficiency and microgeneration is central to a sustainable UK energy future.

BWEA agrees with ACE saying there is evidence that installation of domestic microgeneration promotes a new awareness of energy use and encourages people to minimise their consumption, through behaviour change and investment in more efficient appliances. BWEA recommends targets, enhanced grant programmes and commitments to install on-site generation in the Government estate.

Scottish Power says it plans to invest £180m in energy efficiency measures in the next three years, and is investigating and trialling options for more innovative forms of energy efficiency, such as smart metering and microgeneration. It wants to see building efficiency regulations enforced more rigorously and upgraded, and the energy labelling of buildings promoted.

The role of local authorities

The Convention of Scottish Local Authorities (CoSLA) says the importance of the role of local government in almost every aspect of energy policy delivery should be reflected in government policy. The UK has been gifted with enormous untapped renewable energy potential, which if fully exploited will generate not only invaluable low carbon electricity and heat, but jobs and economic growth. CoSLA calls for energy efficiency to be prioritised; for renewable generation to be maximised; and the establishment of a sustainable energy strategy for Scotland.

The All Ireland Nuclear Free Local Authorities Forum's submission discusses the opportunities that a single electricity market for the island of Ireland provides for purchase of green electricity, and concludes that it is unlikely that many local authorities in Ireland would wish to purchase imported electricity generated by the UK nuclear industry. [24]

The Local Government Association (LGA) agrees that local government is pivotal to delivering the step-change in CO₂ emissions reductions required. [25] The scope for local authority action is significant. Through delivery of services such as transport, planning and housing as well as through their influence on all sectors of the community, local authorities can make reductions in emissions from corporate activities and through stimulating savings in the wider community. Such action can help to deliver joint social, economic and environmental aims and link together initiatives to maximise their impact.

Recognising this, the LGA has a dedicated programme of work on sustainable energy and climate change, as a result of a partnership with the Energy Saving Trust. [26] Around 109 Councils have now signed the Nottingham Declaration on Climate Change, signalling their commitment to action on climate change within their authority and local community. But local authorities need a systematic framework for government support. There is currently a wide range of initiatives (eg DTI, EST and Carbon Trust programmes) but it requires a degree of knowledge to access these. It could be simplified. Resources need to be available to join up initiatives within councils to enable significant progress by those authorities which are finding resource pressures a barrier to action.

The role of planning is central to creating sustainable communities with buildings which help reduce greenhouse gas emissions through incorporating energy efficiency measures and renewable technologies and developments which encourage low carbon lifestyles. The planned construction of millions of new homes represents a massive opportunity to build in low carbon living for decades to come. Local authorities want to put in place ambitious standards but there needs to be far greater joined up national policy thinking across government departments to provide the most effective reinforcement of local authority and community actions. An LGA survey in 2004 showed that a perceived lack of priority from national government was a barrier to sustained action at local authority level.

There is considerable scope for development of micro-generation by local authorities, both at household and community level, but it requires a support framework including development of skills for installation and maintenance, information campaigns to help overcome public perception barriers and sufficient capacity in equipment suppliers to meet demand. Research from the EST published in March 2005 indicated that the most commonly perceived key barriers to greater use of microgeneration were legislation, high cost and the level of consumer awareness. One aspect where

government action could significantly increase take-up is by shortening payback periods for capital investment by ensuring that electricity exported to the grid is paid a fair price, particularly reflecting the higher peak period costs. The government has already indicated that it will sweep away planning restrictions in England so that homeowners can put wind turbines and solar panels on their houses without the need to apply for planning permission. [27]

Nuclear vs sustainable energy

Greenpeace warns that the scale of the financial, political and institutional commitments required to build new nuclear power plants will undermine support for new technologies (such as renewable generation) and more efficient existing technologies (such as DE) and energy efficiency measures. CO₂ can be cut more rapidly at less cost by existing, off the shelf technologies, ready for application now. Investment in nuclear capacity will create a significant 'chill effect'. Even announcing future investment in nuclear will dramatically undermine a potential global market with significant first mover advantage for the UK. Those who say we need renewables, efficiency and nuclear power assume that time, money and political attention are unlimited. This is clearly not the case. Spending it on nuclear will inevitably undermine or even totally destroy investment in sustainable energy.

ACE warns that the outcomes of the Energy Review may lock this country into certain energy trajectories for a very long time.

A report by Warwick Business School for the Green Alliance examines the impact a new nuclear programme would have on the rest of the UK's liberalised electricity market which provides 80% of the UK's electricity, and 92% of the UK's broader energy market. In particular it looks at the impact on moves towards a more decentralised, sustainable energy system. [28] It concludes that new nuclear power will actively limit the UK's ability to meet its climate change targets. At best, the current fleet of nuclear power plants will be replaced, but will undermine development of other low carbon technologies. There will not be sufficient development of renewables, demand reduction technologies and energy system change to transform the other 80% of the electricity generation market (or 92% of broader energy) into a low carbon energy system.

This means that the UK will fail to capitalize on the potential to build a renewable energy manufacturing base. It will fail to develop the required skills, and it will not create the spread of jobs across the renewable engineering sector, which could be widely spread across the country. At best existing jobs in the nuclear industry might continue, but only in a few local authority areas with existing nuclear facilities. At worst a decision to promote new reactors might not necessarily result in existing stations being replaced because of cost or public opposition, but the decisions stalls the development of a low carbon energy system.

Energy security will get worse because more gas will be needed in the short term before the nuclear plants are constructed; efforts to reduce fuel poverty will be hampered as demand reduction is undermined and electricity costs rise to subsidise the industry; and UK business will take a hit as we are locked out of the rapidly expanding global markets for renewable energy, which are far greater than the nuclear energy market. [29]

The Mayor of London also says support for a new generation of nuclear power stations would be the great misjudgment of our generation. It would be an expensive and dangerous mistake to go back down the nuclear road, and one that will not even solve the stated problem of climate change. Two-thirds of the energy inputted into our centralised power stations, including nuclear, is wasted in the form of heat energy emitted as steam through the huge cooling towers that dot the countryside, and in the process of transmitting energy from rural power stations to the towns and cities where it is largely needed. The answer is to use "decentralised" energy systems which would

slash energy losses to just 10 or 15 per cent. [30] The Environment Agency has also warned that building more nuclear power stations could "drain resources" from developing renewable energy and other green forms of fuel. [31]

Amicus calls on the Government to implement a balanced energy policy that promotes the use of all available energy, including conventional fossil fuels (coal and oil) gas, renewables and nuclear. [32] The union, however, places greatest emphasis on the replacement of nuclear power stations, and says it does not subscribe to the view that new nuclear stations should not be built until the treatment of radioactive waste is "solved." It also wants to see THORP re-opened as soon as possible, and the Sellafield MoX Plant operated.

A "balanced energy policy" - the idea that 'we need every energy technology' - suggests that we have infinite amounts of money, which is obviously not the case, according to Amory Lovins. In fact, it is essential that we buy the fastest and most effective climate solutions. Investment in nuclear power worsens climate change by buying less solution per dollar. Efforts to 'revive' this moribund technology will divert investment from cheaper market winners – cogeneration, renewables, and efficiency. [33]

Interestingly very few submissions make references to the jobs potential of a decentralised and distributed energy strategy compared with a centralised nuclear strategy. Experience suggests that the jobs potential of a capital intensive centralised strategy will not be anywhere near as much as with a DE strategy. Further research is needed in this area.

In contrast to Amicus, the recent Unison conference urged the UK government to invest heavily in renewable energy supplies and not to expand its nuclear power. Unison warned that 'costly' nuclear energy diverts valuable funds from renewables and energy-saving schemes. The union pledged to work with MPs and environmental pressure groups to oppose the development of any further nuclear power stations. [34]

Nuclear Economics

According to WWF, the industry's history of cost over-runs inspires little confidence in the claims now being put forward by the nuclear lobby. Claims that nuclear could provide electricity at 2.5p/kWh or less have been made on many occasions over the past few years. But the PIU put costs at 3-4p/kWh – and noted that the generating costs of Sizewell B, the UK's most modern reactor, were actually around 6p/kWh. The economic case for the only reactor currently under construction in Europe, the EPR in Finland, is shrouded by hidden subsidies. Giving the green light to new nuclear build is an extremely risky strategy which is likely to result in a huge drain on public finances.

Nuclear is an established, mature technology which has benefited from decades of public subsidy in the UK and overseas. Recent estimates show that the nuclear industry has received around \$1 trillion in state support worldwide, compared to \$50 billion for renewable energy [35] Moreover, in contrast to renewables, nuclear has limited potential for further cost reductions through economies of scale or technological advances. As such, WWF says it should not be supported by direct or indirect subsidy by the government or energy users. According to FoE, who use International Energy Agency figures, the UK government has spent £6.8 billion in research and development funding for nuclear fission since 1974 (compared to £540 million for renewables).

ACE points out [36] that new nuclear stations would produce electricity at around £833 - £1,000/kw according to British Energy. Yet microgeneration starts at around £500/kw of installed capacity.

ACE quotes a new study which predicts that domestic micro-CHP boilers could be producing the equivalent amount of electricity to five nuclear stations by 2015.

Licensing and planning

The main nuclear utilities BNFL, [37] British Energy, [38] EoN, [39] and EdF [40] all call for some sort of pre-licensing of reactor designs, and a streamlined planning process. The CBI wants the decision to allow new nuclear construction to be decided nationally, with local inquiries focusing on site-specific issues. [41] EdF says planning inquiries should focus on local issues. Most of the nuclear utilities say that new nuclear build would use internationally recognized designs and want the UK regulatory process to take cognisance of the certification of such designs in other countries and avoid unnecessary modification for deployment in the UK.

The industry's desire to "streamline" the planning and licensing systems to allow more rapid construction of new reactors is extremely worrying – and appears to represent another attempt to distort the market. Such steps would undermine opportunities for legitimate stakeholders, and especially the general public, to engage in the decision-making process.

FoE says one of the arguments sometimes used in favour of nuclear power is that it would be easy to build new stations close to the existing ones. However, a report by government agency Nirex reveals that at least 11 preferred sites are at risk from flooding or coastal erosion from climate change. [42] BNFL says this need not be a concern since none of the sites are at risk over the next century, but clearly this means there would need to be some certainty that spent nuclear waste fuel as well as decommissioning waste from the new reactors had somewhere else to go once the reactors reached the end of their life.

Nuclear Waste

WWF says progress towards a "resolution" of the waste problem is slow – and in danger of being fatally undermined by any decision to proceed with new build. It should not be assumed that waste from a new generation of reactors could simply be accommodated within a facility set up to handle the existing legacy – not least because high level waste and spent fuel requires many decades of cooling before it could be placed in a repository. A decision to create more waste would greatly threaten the legitimacy of any consensus around options to tackle the legacy.

Similarly the LGA's Nuclear Legacy Advisory Forum (NuLeAF) says new waste accumulations may create new societal dilemmas over the implementation of future long-term management policy. It could also add complexity to the legacy management policy process now in hand. NuLeAF notes that problems associated with radioactive waste management will not be solved by the establishment of a new Government policy on long-term management alone. Making progress will require ongoing partnership between central and local government.

To subsidise or not?

Scottish Power says it has been suggested that nuclear could compete on economic terms with gas. However, it points out that the issues of liability and waste have not yet been sufficiently addressed, to be able to say this with any certainty. The Company doesn't believe a major new programme of nuclear is required now, preferring instead to opt for plant life extension and decide whether new build should go-ahead in ten years time. It says new nuclear should be operated without ongoing market subsidy. It should only be one part of the overall energy policy if it does not delay the growth and potential for new renewable generation and does not crowd out investment in competing technology. Any support given for pre-planning, licensing and decommissioning of

nuclear plant, should be equally available for other low or zero-carbon thermal generation plant technologies – including clean coal.

Assuming the licensing and planning processes can be speeded-up, EoN – the German owners of Powergen – would expect investment in new nuclear plant to be a credible economic option given current expectations of fossil fuel prices, if there is confidence at the time a final investment decision is made that there will be a sustained value given to carbon emission abatement. Similarly British Energy argues that new nuclear build does not require a subsidy to be economic, but it is important that the low carbon benefits of nuclear are valued as part of a framework that treats all low carbon technologies equally and there is “*greater investor certainty that the low carbon benefits of nuclear will be realized*”. EdF says clarity on future government policy towards carbon abatement is particularly required.

Malcolm Wicks, the energy minister, says the nuclear industry will build new reactors without direct state subsidies so long as the government sets a high price on carbon-polluting electricity. He said a proposed carbon pricing framework will encourage use of all non-carbon electricity sources including renewable energy, nuclear and micro-renewables. [43]

BNFL and EoN both say that although nuclear companies will be prepared to accept financial responsibility for decommissioning and their fair share of waste management costs, they will not be able to accept open-ended liabilities relating to waste and fuel disposal. Government are the ultimate legatee of nuclear wastes and must be prepared to accept title to packaged waste within a decade or two of a plant’s closure.

Associated with the large capital investment required to build a nuclear reactor, according to BNFL, is the financing cost, which is driven by the rate of return demanded by investors, and which in turn is likely to be highly correlated with their perception of the risks associated with the project. For private sector investors, confidence that these risks can be managed is vital so that they can be sure that the plant can be built and operated to budget and programme. Reducing the uncertainty, and allowing risk to be allocated to those who are best placed to manage the risks associated with the project, would reduce the required rate of return and thus improve the overall economic attractiveness of the project. It says nuclear can compete with fossil fuels, if barriers such as those posed by UK-specific planning risks, are overcome. Whilst subsidy is not required, there is a requirement for a degree of long-term certainty in the revenues that such investments return.

EdF says it is clear that the viability of nuclear depends on a new relationship between the private sector and Government in which each party takes responsibility for those risks which it is best able to control. It says if this can be achieved there are realistic scenarios under which new nuclear build is economic when compared to the principal alternative, new Combined Cycle Gas Turbine plant.

Energy analyst, Walt Patterson, says we are suffering from nuclear amnesia. [44] Britain has never built a nuclear plant on schedule or within budget, or that worked to its original specifications. Almost all of them have overrun schedules by years and some have cost twice as much as originally anticipated. The latest cost estimates from nuclear advocates all conform to this time-honoured pattern. All the major vendors have new reactor designs, but their costings are all hypothetical. Advocates appear to be proposing to build a whole series of plants before accumulating any operating experience – a misjudgment that became a key factor in the troubles of earlier reactor designs. History offers us plenty of reasons to steer clear of the nuclear option and opt instead for abundant, quicker, cheaper and safer options.

Energy Security

Concerns over the energy security implications and price implications of relying on gas mean that it should be used in the most efficient way possible, according to WWF. The public debate on gas security is almost exclusively dominated by its use in the power sector. In 2004, electricity generation accounted for 30% of total gas use in the UK. Other sectors of the economy are also hugely dependent on gas, including household heating (35% of total gas use in 2004) and manufacturing industry (21%). The UK economy is thus already highly dependent on gas. There is significant potential to reduce the demand for gas across the economy as a whole – particularly through energy efficiency measures focusing on heating. There is also considerable potential to increase the share of alternative fuels in these markets, particularly the use of solar thermal and biomass for heat. It is worth highlighting that many of the current concerns over gas security are exacerbated by short-term issues arising from lack of storage and inter-connector capacity, slow progress in liberalisation of EU energy markets and price spikes driven partly by the link with oil prices.

FoE point out that the UK's chief supplier of piped gas for the coming decades will be Norway. A deal with this country was signed in April 2005 that could secure up to 20% of our future gas supply. New LNG terminals and pipelines are being built to allow a larger diversity of sources of gas in the future (and hence security), and ensuring that no single gas exporting country will ever be able to have control over the country's supply.

Carbon capture and storage

Some of the Environment groups see carbon capture and storage (CCS) as a potentially viable option to further reduce reliance on gas for power generation while ensuring ongoing reductions in CO₂ emissions. It appears possible that CCS could be brought forward on a considerably faster timescale than nuclear, as confirmed by the growing number of proposed projects both the UK and elsewhere in Europe, provided rapid progress is made to resolve a range of legal, technical and financial issues. CCS could be used with either coal or gas, but is particularly attractive with coal as this allows greater diversity in the fuel mix. The nuclear industry claims that it offers an alternative to increased dependence on natural gas. This case is fatally flawed. Most of the increase in gas capacity will be required by 2016. Even on the nuclear industry's own highly optimistic timetable, the first new reactor could not be commissioned by that date – while building significant capacity through a series of 8-10 reactors would take many more years.

Conclusion

Several submissions to the Energy Review show how the UK can provide its energy requirements, and meet its climate change commitments without building new nuclear stations. The Government needs to show its commitment to renewable energy by setting a firm target for 2020, establishing adequate support mechanism for offshore wind, wave and tidal power and re-focussing attention on meeting CHP targets. It also needs to put in place new policy mechanisms to enable us to meet the required levels of saving from energy efficiency. Existing efficiency schemes do work, but they are not nearly ambitious enough. Whilst nuclear utilities suggest that they can build new reactors without direct subsidies provided that the price of carbon saved is high enough and planning and licensing procedures are fast-tracked. But past experience suggests they are being dangerously overoptimistic in their assessments. Opting for new nuclear stations threatens to set us on a course for a highly centralised energy system, with all its safety and security risks and attendant waste problems, which crowds out alternative energy pathways. On the other hand, a more decentralised energy future which capitalises on the strengths of local government, and local initiatives, can help

to establish a renewable energy manufacturing base in the UK with new industries spread around the country, creating a more sustainable energy, and economic, future.

- [1] Energy Review Moves On To Next Phase, DTI Press Release 14th April 2006
<http://www.gnn.gov.uk/environment/detail.asp?ReleaseID=196335&NewsAreaID=2&NavigatedFromDepartment=False>
- [2] Submission to the Energy Review by the Nuclear Free Local Authorities Steering Committee
http://www.nuclearpolicy.info/docs/consultations/NFLA_Energy_Review_2006.pdf
- [3] Guardian 29th May 2006
<http://politics.guardian.co.uk/homeaffairs/story/0,,1785144,00.html>
- [4] Nuclear power is often said to produce 8% of UK Energy (see for example the Sustainable Development Commission and Energy Review), but this figure represents the energy in the Uranium fuel before thermal losses in reactors. 3.6% is the energy supplied after steam generation losses. The calculation is confirmed in an e-mail from Julian Prime at the DTI to Neil Crumpton of Friends of the Earth, dated 25th November 2005. In the e-mail the DTI says: "In terms of energy supplied 3.6% of the total energy demand in the UK in 2004 was met by electricity generated from UK nuclear stations. In terms of inputs, 7.8% of primary energy inputs were attributable to the generation of nuclear electricity." See also the statement by Dr Kevin Anderson of the Tyndall Centre for Climate Change Research in "Nuclear Power cannot tackle climate change", by David Adam, Guardian 17th January 2006.
<http://www.guardian.co.uk/science/story/0,,1688034,00.html>
- [5] 'Our Energy Future – Creating a Low Carbon Economy', Energy White Paper February 2003.
<http://www.dti.gov.uk/energy/policy-strategy/energy-white-paper/page21223.html>
- [6] WWF's full submission to the government's Energy Review:
www.wwf.org.uk/filelibrary/pdf/cc_rspnsenrgyrvw.pdf
- [7] "Energy experts say Government Energy Review risks asking the wrong questions" Sussex Energy Group Press Release 24th January 2006.
<http://www.sussex.ac.uk/spru/1-4-7-5-6.html>
- [8] Evidence by Warwick Business School to the House of Commons Environmental Audit Committee's investigation on "Keeping the Lights On: Nuclear, Renewables and Climate Change" 19th October 2005.
<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmenvaud/uc584-i/uc58402.htm>
- [9] Greenpeace submission to the Energy Review, April 2006
<http://www.greenpeace.org.uk/contentlookup.cfm?CFID=3941073&CFTOKEN=58750037&ucidparam=20060426160239>
- [10] ILEX report "The balance of power - reducing CO2 emissions from the UK power sector"
www.wwf.org.uk/climatechangecampaign/thebalanceofpower.pdf
- [11] A Bright Future, Friends of the Earth, (EWNI) March 2006.
http://www.foe.co.uk/resource/reports/bright_future.pdf
- [12] Energy Review Response by Garrad Hassan, commissioned by NFLA[S]
http://www.nuclearpolicy.info/docs/consultations/NFLA_Scot_EnergyReview06.pdf
- [13] Consultation Response by the NFLA Wales Forum
http://www.nuclearpolicy.info/docs/consultations/Wales_EnergyReview_120406.pdf
- [14] British Wind Energy Association (BWEA)
<http://www.bwea.com/energyreview/>
- [15] Our Energy Challenge – Scottish Power Response, April 2006
http://www.scottishpower.com/applications/publish/downloadPublicDocument.jsp?guid=19d440_10a41a08f05_-7fbd0a026463&folderPath=/root/ScottishPower%20Media%20Library/Documents%20and%20Reports/&downloadParameter=Attachment
- [16] The Power of Scotland: Cutting carbon with Scotland's renewable energy, WWF (S), RSPB (S), FoE (S), February 2006. http://www.rspb.org.uk/Images/cuttingcarbon_tcm5-98900.pdf
- [17] Open University, Energy, Energy and Environment Research Unit, DTI Energy Review Consultation, Boyle, G. and Everett, R. (2006). <http://technology.open.ac.uk/eeru/pdf/EERUEnergyReview.pdf>
- [18] Biomass Task Force, Report to Government, October 2005. <http://www.defra.gov.uk/farm/acu/energy/biomass-taskforce/btf-finalreport.pdf>
- [19] Friends of the Earth Submission to the Energy Review, April 2006
http://www.foe.co.uk/resource/consultation_responses/energy_review_submission.pdf
- [20] Planning Policy Statement No.22 http://www.communities.gov.uk/index.asp?id=1143912#P24_1070
On 8th June 2006, The Minister for Housing and Planning (Yvette Cooper), clarified the situation with regard to PPS22. In a written Statement she said: "In particular the Government expects all planning authorities to include policies in their development plans that require a percentage of the energy in new developments to come from on-site renewables, where it is viable".

<http://www.publications.parliament.uk/pa/cm200506/cmhansrd/cm060608/wmstext/60608m0068.htm#0606086400013>
1

[21] Potential for micro-generation: Study and Analysis. EST 14th November 2005
http://portal.est.org.uk/uploads/documents/aboutest/Microgeneration%20in%20the%20UK%20-%20final%20report%20REVISED_executive%20summary1.pdf

[22] Report by PB Power for Greenpeace ‘Powering London into the 21st Century’ (March 2006).
<http://www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/7474.pdf>

[23] Association for the Conservation of Energy Submission, March 2006
<http://www.ukace.org/pubs/response.htm#consult>

[24] All Ireland Nuclear Free Local Authorities Forum submission to the Energy Review April 2006.
http://www.nuclearpolicy.info/docs/consultations/Ireland_Energy_Review_2006.pdf

[25] DTI Energy Review – LGA Response, April 2006
<http://www.lga.gov.uk/Briefing.asp?lsection=59&id=SXA6B4-A78395E6&ccat=1157>

[26] Leading the way: How local authorities can meet the challenge of climate change”.
Local Government Association, Energy Saving Trust, and Energy Efficiency Partnership for Homes, June 2005.
<http://www.lga.gov.uk/Documents/Publication/leadingtheway.pdf>

[27] Observer 25th June 2006, http://observer.guardian.co.uk/uk_news/story/0,,1805487,00.html

[28] New Nuclear Power: Implications for a Sustainable Energy System, Catherine Mitchell and Bridget Woodman, Warwick Business School, Green Alliance March 2006.
<http://www.wbs.ac.uk/downloads/multimedia/enclosures/new-nuclear-power.pdf>

[29] FT 19th May 2006
<http://news.ft.com/cms/s/149ee7f6-e6d3-11da-a36e-0000779e2340.html>

[30] Independent 19th May 2006
<http://comment.independent.co.uk/commentators/article546639.ece>

[31] Independent on Sunday 21st May 2006
<http://news.independent.co.uk/uk/politics/article549529.ece>

[32] Amicus response to the Energy Review, 2006 <http://www.epolitix.com/NR/rdonlyres/9DBDBD01-CCD0-42CF-9F53-2A6ED93A5912/0/EnergyReview2006.pdf>

[33] Green Future Magazine, Mar/Apr 2006
<http://www.greenfutures.org.uk/features/default.asp?id=2479>

[34] Unison Press Release 23rd June 2006. http://www.unison.org.uk/news/news_view.asp?did=2719

[35] Scheer, H (2004) Nuclear Energy belongs in the Technology Museum, WCRE Update, Sept 2004 – quoted in WWF submission (ref 6)
http://www.eurosolar.org/new/en/downloads/WCRE_Update_190904.pdf

[36] See ref [23]

[37] BNFL Submission to the Energy Review
<http://www.bnfl.com/UserFiles/File/BNFL%20submission%20to%20DTI%20Energy%20Review%202006.pdf>
BNFL Supporting Paper on Nuclear Energy Issues.
<http://www.bnfl.com/UserFiles/File/BNFL%20supporting%20paper%20on%20nuclear%20to%20DTI%20%20Energy%20Review%202006.pdf>

[38] British Energy submission to the Energy Review
<http://www.british-energy.co.uk/article.php?article=120>

[39] EoN UK’s response to the Energy Review
http://www.eon-uk.com/Content/about/policy_resp.aspx?MenuId=320

[40] EdF submission to the Energy Review
<http://www.edfenergy.com/core/energyreview/index.html>

[41] CBI Response to Government Energy Review,
[http://www.cbi.org.uk/ndbs/press.nsf/0/841a83040307d48080257155002eed5/\\$FILE/dti%20energy%20review%20240406.pdf](http://www.cbi.org.uk/ndbs/press.nsf/0/841a83040307d48080257155002eed5/$FILE/dti%20energy%20review%20240406.pdf)

[42] Full details of the study available here: <http://www.sundayherald.com/53111>

[43] Guardian 14th June 2006
<http://www.guardian.co.uk/guardianpolitics/story/0,,1796922,00.html>

[44] The World Today, April 2006, Nuclear Amnesia by Walt Patterson.
<http://www.waltpatterson.org/nucamnesia.pdf>