Giving Power to the People; changing the way energy is used in Scotland's buildings

Friends of the Earth Scotland

February 2007

Summary
Friends of the Earth Scotland is campaigning for more action to tackle climate change, through reducing energy use in Scotland's buildings and increasing small-scale, renewable energy production.

What we want: as an absolute minimum, by 2011 at least: 40,000 buildings a year being built or renovated so that they feature super-insulation and passive solar gain (meaning that they have minimal or no heating bills) and meet part of their own energy needs using renewable energy technologies. Solar panels, micro wind turbines, biomass boilers, heat pumps and combined heat and power systems, must be incorporated into all new buildings and developments and retrofitted on to existing homes. A programme must also be introduced to ensure that these technologies are installed into all public buildings.

Why is action needed?

1. **The need to tackle climate change**

Scientists now agree that at least a 60% cut in CO_2 emissions (on1990 levels) will be needed by 2050 if dangerous climate change is to be avoided[1], although many more recent studies and commentators suggest that significantly tougher targets are needed[2]. The UK Government has made such a cut an aspiration and is now seeking to enshrine the 60% target in law. Failure to realise the target could contribute to devastating impacts:

- On the developing world including more extreme weather events such as droughts and floods, affecting 2 billion people[3].
- On the global economy amounting to cuts of between 5 and 20%, costing up to £3.7bn[4]
- In Scotland, from more unpredictable and less predictable weather patterns, with significant consequences for Scotland's economy, society and environment. 77,000 properties are under threat from flooding[5].

The domestic sector accounts for 25% of energy use and carbon emissions, so cutting $C0_2$ from this sector is therefore a vital part of the overall effort to meet the 60% target.

Friends of the Earth Scotland
Lamb's House, Burgess Street, Leith, Edinburgh, EH6 6RD
Tel 0131 554 9977 Fax 0131 554 8656 Email info@foe-scotland.org.uk Website www.foe-scotland.org.uk

2. The need to change the way we produce energy

The centralised system that is currently used to produce energy is highly wasteful. For every one hundred units of energy generated in a fossil fuel power station, 61.5 units are lost there and then through waste heat in cooling water and up the cooling towers. Another 3.5 units are then lost in transmission and distribution of the electricity through the national grid, meaning that we receive only a measly 35 units of energy for every 100 generated. The amount that has been lost at this point is enough to supply the whole of the UK's heating and hot water needs. And then more is wasted through our own inefficient use (in fact an average of another 13 units) leaving just 22 units of energy that is finally used from the original 100 generated.[6]

There is, of course, a better way of doing things. It needs us to think in a slightly different way; to view our energy system as a whole and to produce energy as close to where it is going to be used as possible. By taking this decentralised approach, it is possible to make much more efficient use of both electricity and heat generated through local combined heat and power plants using clean, green fuels. And it's not some utopian fantasy; Denmark already gets more than 50% of its energy this way.

A decentralised energy system would also make great use of small-scale renewable energy technologies, allowing people's homes to generate a proportion of their own energy and so decentralising the system further. There are many benefits to decentralising in this way. Firstly, of course, renewable energy produces vastly less carbon dioxide emissions than fossil fuels. Estimates vary but, for example, a solar hot water heater could save 0.8 tonnes of carbon dioxide a year, a micro wind turbine 1.5 tonnes and a ground source heat pump as much as 15 tonnes[7].

By generating energy in individual homes and communities, there is also less reliance on any one power station or fuel type. In other words, it gives greater energy security. This is likely to become ever more important as time goes on and fossil fuel and uranium supplies become more scarce or harder to get. And in generating some of our energy ourselves, there is great reason to believe that we will value it more and use it more wisely.

Recent research by the Sustainable Development Commission has shown that those people who have micropower in their homes undergo quite a transformation in their relationship with energy. Not only do they feel a great satisfaction at generating much of their own energy needs in, or on, their own home, but they become more aware of the way they use energy in all parts of their lives and soon find themselves using a lot less of it. A win-win for energy generation, energy security, fuel poverty and the climate.[8]

3. The need to raise housing standards

Scotland's buildings standards are years behind those in leading European countries such as Sweden, which are some of the toughest and most effective in the world for energy efficiency[9]. The 2003 Energy White Paper noted that a detached house built to the latest UK standards consumes 20% more energy than an equivalent home in Denmark, since then Danish standards have been tightened further.

Less than 1% of Scotland's current housing stock has an energy rating of excellent and less than half of all houses fall into the good category[10].

If all of the 780,000 dwellings without cavity wall insulation were insulated this could save 1.1 million tonnes of carbon annually[11], equivalent to 65% of the current Scottish Executive climate change target.

4. The need to tackle fuel poverty

Fuel poverty occurs where a household is forced to spend a disproportionate part of its income (over 10%) on heating. Fuel poverty is caused by a combination of three factors:

- poor energy efficiency of the dwelling
- low disposable household income
- high price of domestic fuel

The Scottish Executive has powers in only the first of the three areas mentioned above. The other two are reserved to Westminster. It is therefore vital that the Scottish Executive uses its powers to improve energy efficiency in order to effectively combat fuel poverty.

The most recent government estimates showed that 328,000 households were in fuel poverty in 2003-04[12] 59% of this figure is likely to be made up of pensioner households[13]. 100,000 Scottish children are in fuel poverty according to children's charities. 25% of households in rural Scotland are estimated to be in fuel poverty[14]. The number of excess winter deaths in Scotland over last winter was 1790, with 1460 of those being older people. While excess winter deaths are not unique to the UK, the numbers are higher here than in other countries with similar climates and standards of living.

Action is essential as 30,000 more households fall into fuel poverty for every 5% rise in fuel prices. Since 2003 gas prices have risen by 90% and electricity by 60%.[15] This implies that fuel poverty may have almost doubled since 2003.

What is being done already?

Climate change
Scotland has a climate change strategy and a target for reducing CO_2 levels by 1.7million tonnes, which – assuming a 1990 baseline - goes beyond the targets set for the UK as whole[16]. Despite this, the targets remain inadequate.

Fuel poverty
The Housing (Scotland) Act 2001 and the subsequent Scottish Fuel Poverty Statement require that fuel poverty be eradicated, as far as is practicable, in Scotland by 2016. This target cannot be met without radical improvements in Scotland's housing stock. Despite initial progress rising fuel prices are leading to increasing levels of fuel poverty, making it unlikely that the 2016 target will be met without dramatic action to provide fuel security for households.

Building standards and micropower
The Scottish Executive last updated building standards in 2002 and is currently planning a further update, which will raise standards by a further 18-25%. However, these standards only apply to new buildings (adding 1% of the stock each year) and don't cover changes to existing buildings. Action to promote micropower is being taken forward via proposed changes to planning regulations and the annual £3.7m grants programme for communities and households that funded 600 projects since 2002[17]. To make a meaningful contribution to climate change objectives, building standards will have to be substantially enhanced and the rate of installation of micropower dramatically accelerated.

Planning rules
In England, more than 75 local authorities are making the installation of micro-power a condition of planning permission for new developments over a certain size. Merton Borough Council in Surrey was the first council to take this approach. There are a handful of Scottish local authorities that have followed this lead. The Scottish Executive has recently proposed changing national planning policy to require all local authorities in Scotland to do the same. Friends of the Earth Scotland fully supports this move as it would reduce the carbon footprint of new developments and increase the economies of scale for the micropower industry resulting in a unit cost reduction. This in turn would make micropower more accessible to households wishing to retrofit. Planning permission rules for the installation of micropower on homes and offices are being relaxed in England, to make it possible to put up solar panels, micro wind turbines and other micropower technologies in most locations without planning permission being needed. Scotland is likely to follow suit, but is moving more slowly in implementing this, with a possible year's delay in Scotland.

What more needs to be done?

Super insulated homes
By employing high levels of insulation, passive solar design and air tightness it would be possible to slash heating requirements by over 70% based on voluntary standards being adopted in Germany, using techniques and technologies that have been in place since the 1990s[18]. Similar homes have already been built in the UK such as the award winning BedZED development in South London[19].

A micropower revolution
A DTI backed study by the Energy Saving Trust estimated that 30-40% of UK electricity needs could be met from micropower by 2050, reducing household CO2 emissions by 15%[20]. All councils must require developers to install micropower before they can get planning permission and installation should be allowed without planning permission in most circumstances.

A 40,000 green homes per year target by 2010
Based on an analysis of UK wide research Scotland needs to ensure that at least 40,000 homes (new and old) every year are fitted with micropower technologies if the domestic sector is to meet the target of a 60% reduction in carbon dioxide emissions by 2050[21]. Research from Oxford University showed that early action to maximise the uptake of micropower in new build is vital given the slow renewal of the building stock through new build. New-build rates are currently in the region of 25,000 homes a year but should be accelerated to speed up the replacement of the worst and least energy efficient stock. Reaching an annual figure of 40,000 homes is therefore a modest starting point that must increase rapidly so that micropower technologies, including renewables, will eventually help the residential sector to meet in the region of 80% of heat and 100% of electricity demand by 2050[22]. In this respect the Oxford University research concludes that, "the targets are challenging but feasible, if government starts now"[23]

In comparison the Scottish Executives current Central Heating Programme, in 2004-5, fitted over 15,000 systems to properties in Scotland (of approximately 117,000 new boilers fitted in Scotland as a whole). The Warm Deal insulation and heating improvement programme assisted over 20,000 properties with basic measures, targeting people on low incomes[24]. However, these programmes don't yet include micropower and usually don't bring the homes up to standards equivalent to today's new build properties. Friends of the Earth Scotland wants to see all newly constructed properties and a substantial proportion of renovated existing stock meeting today's highest energy efficiency standard.

Why it can be done

The technology is available and most sources of micropower will be cost effective in the next decade, a process that could accelerate if energy prices continue to rise[25]. Increasing demand will reduce costs further as more suppliers and installers enter the market early in the next decade[26].

There is widespread public support for action on both fuel poverty and climate change. Micropower is a popular method of energy production[27] and has caught the public imagination, with people now purchasing turbines and panels from DIY stores. Research has shown that people who install micropower change their overall attitude to energy consumption, seeking greater efficiency in all aspects of their lives[28].

It is a better option than investing in new nuclear power stations, which are expensive, inflexible and hazardous and leave a legacy of radioactive waste that will have to be dumped on future generations.

How it can be achieved

- Planning guidance should require all new buildings offset 20% of their CO2 emissions from onsite renewables, whilst micropower should not require planning permission apart from in conservation areas.
- Building regulations should be put on a course to ensure that new buildings are carbon neutral by 2015, matching the best standards in Europe (currently Sweden) by 2010.
- Deliver better public information provision, on energy efficiency and micropower – with information tailored to individual homes via a one stop shop.
- Public sector investment programmes need to set standards specifying that all new buildings should be carbon neutral and must generate a proportion of their energy needs from onsite renewables.
- Homes that install micropower should receive council tax discounts to encourage the uptake of the new technology.
- Targets and funding should be in place to ensure that by 2010 15,000 existing homes are brought up to the highest energy efficiency standards every year.
- The amount of support available through existing grants programmes should be reviewed and increased.

Notes and references

[1] Royal Commission on Environmental Pollution 2000
[2] G8 Science Conference Exeter 2005
[3] HM Treasury (2006) The Stern Review: The Economics of Climate Change
[4] Ibid 1
[5] SEPA (2006) State of Scotland's Environment 2006
[6] Greenpeace UK http://www.greenpeace.org.uk/climate/solution/index.cfm
[7] of course this depends on what fuel each technology is replacing. These figures assume that the solar hot water heater is replacing natural gas and that the ground source heat pump is replacing oil or coal. These assumptions are based on information gathered by the Scottish Community and Household Renewables Initiative.
[8] Sustainable Development Commission: **Seeing the light: the impact of micro-generation on the way we use energy. http://www.sd-commission.org.uk/publications.php?id=239**
[9] DEFRA (2006) Comparison of UK and Best International Standards: Energy Efficiency Standards as at Feb 2005, Report by the Market Transformation Programme
[10] Scottish House Conditions Survey 2003-4
[11] Written Answer S2W-18491
[12] Written Answer SW28656
[13] Based on Scottish Household Survey Estimates 2002
[14] Written Answer SW29061
[15] BBC report 29/9/06 http://news.bbc.co.uk/1/hi/business/5391774.stm
[16] Scottish Executive (2006) Changing our ways Scotland's Climate Change Programme
[17] Scottish Executive 16/5/2006 News Release: Small Projects reflect big future for renewables
[18] http://en.wikipedia.org/wiki/Passive_house
[19] http://www.peabody.org.uk/FileStore/PressRoom/downloads/BedZEDfactsheet.pdf
[20] DTI (2006) Our Energy Challenge: Power from the people
[21] Analysis based on Environmental Change Institute University of Oxford Report the 40% House 2005, p69. Table 7.4.
[22] Ibid XVIII p72 & p90
[23] Ibid XVIII p84
[24] Scottish Executive (2005) Central Heating and Warm Deal, Annual report 04-05
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[26] Ibid [26]
[27] McGowan, F & Sauter, R (2005) Public Opinions On Energy Research, A Desk Study for the research councils, Sussex Energy Group
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