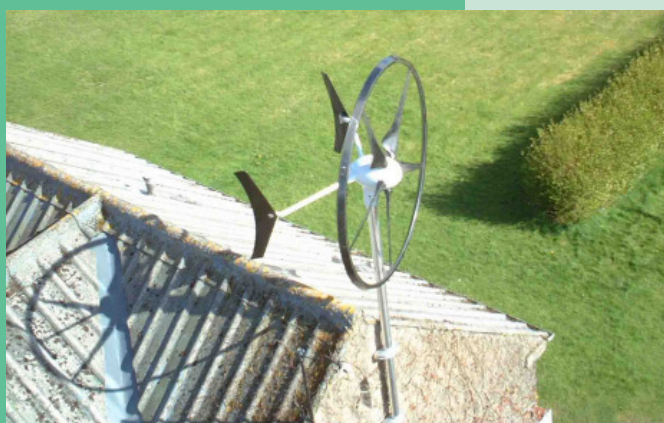


# Small is powerful



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Shiona Baird MSP  
Scottish Green Party  
December 2005

## Foreword

My colleague Mark Ruskell said in the introduction to his bill on climate change: *"we are living through one of the most crucial periods in the history of humanity. There are two options we can take as a global society. The first is to respond with immediate action to the threat of Climate Change. The second is to fail to do enough and to gamble with the future of the planet."*

Mark has now received support from a wide range of organisations for his climate change bill and intends to lodge a final bill proposal to make it a legal requirement that the Scottish Executive should set a national target for reducing the greenhouse gas pollution that causes climate change.

Since Mark Ruskell began his consultation earlier in 2005 there have been a number of developments in energy policy. The Micropower Council gained support for two Private Members' Bills at Westminster to develop micro renewable energy and Greenpeace published an influential report on decentralised generation of electricity. Indeed the responses to Mark's consultation paper highlighted the potential for small-scale renewable energy.

What has become apparent is a potentially radical direction for global energy production. Instead of producing our energy in giant centralised plant, we could produce energy locally on rooftops and in our homes or in small local facilities. This would have benefits both in terms of efficiency and in tackling climate change. Furthermore it could help break our increasing dependency on oil and gas imports and provide energy security. These developments have convinced me the time is right, as this session of Parliament passes the half way stage, to introduce a proposal to support small-scale energy production and herald a revolution in micropower.

I have received positive responses to my own Home Energy Efficiency Targets Bill and subsequently the Executive announced their intention to bring forward a target for energy efficiency. I believe this proposal for a bill on micropower is complementary as energy efficiency helps us save energy and micropower ensures the energy we use is produced cleanly and efficiently.

This paper outlines a draft proposal lodged in my name, for a bill that would legally require the Executive to bring in a range of measures that would encourage the development of micropower – the generation of electricity and heat from homes and businesses as an alternative to getting our energy from more large-scale power stations and gas pipelines.

I would like to invite views from individuals, organisations and businesses interested in the potential of micropower to comment on this proposal for legislation. Details of how to contribute are given at the end of this paper.

Yours sincerely



Shiona Baird MSP  
Enterprise speaker  
Scottish Green Party

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## Executive Summary

Micropower devices that provide electricity and heat from renewable sources on a small scale are being installed in households and businesses across Scotland. Micropower offers an alternative to energy from large-scale, centralised, power stations, fired by coal, oil, gas or nuclear reactors, and therefore reduces greenhouse gas emissions that cause climate change and radioactive waste. Micropower is also more efficient than conventional sources of energy and provides greater security of supply.

Whilst there is potential for micropower to be expanded there are regulatory and financial barriers that if removed would accelerate its introduction. The UK Government has undertaken a public consultation concerning the promotion of micropower and two Private Members' Bills have been presented in the UK Parliament at Westminster in support of micropower.

In Scotland, powers over renewable energy and planning are devolved to the Scottish Parliament and legislation to promote micropower could be passed by the Scottish Parliament. Green MSP Shiona Baird has lodged a draft proposal *'for a bill to require the Scottish Executive to introduce financial and administrative measures to support the development of small-scale renewable energy generation by households and businesses.'*

There are a variety of measures that may be introduced within the scope of the Green Micropower Bill including: setting targets for micropower, requiring micropower in new buildings, and giving council tax rebates to those installing micropower. Shiona Baird MSP invites responses from individuals, organisations and businesses to this proposal.

## Introduction

Small-scale, micro renewable energy or 'micropower'<sup>1</sup> for short has long been of interest because it can be used to provide electricity and heat to homes and businesses in remote locations away from the national grid or gas connections.

Presently, most of the energy needs of households and businesses across Scotland, excluding transport, are met either by electricity supplied through the national grid, by gas through national pipelines, or by suppliers of heating-oil and coal. Most of these centralised sources of energy require the burning of fossil fuels (coal, oil and gas) and also usually involve the transmission of electricity, or transportation of heating fuels, over large distances.

However, as the challenge of meeting global and national targets for tackling climate change becomes more pressing, the potential of micropower to provide clean energy from the sun, wind, hydro and biofuels, with far fewer greenhouse gas emissions than conventional centralised fossil fuel sources has stimulated further interest in micropower.

As well as being cleaner, the other main advantage of micropower is its efficiency. Because energy from micropower is used at or near the point of its production, losses from delivering the energy to the place it is actually used are reduced. This means that less energy needs to be generated to provide us with our energy needs, saving resources and cutting pollution. This efficiency gain is an advantage even over large-scale renewable energy schemes such as wind farms.

The potential for micropower is extensive because almost every household and small business could literally become its own small powerhouse. It is not envisaged that micropower would totally replace the need for some centralised generation of energy but in the short to medium term micropower could reduce the demand for polluting, inefficient and insecure centralised generation. Micropower has already been installed in households and small businesses across Scotland. For example, under a government supported scheme some 700 projects have been set up in Scotland since 2002.<sup>2</sup>

However, there are presently a variety of administrative and financial barriers facing those considering installing micropower. Planning constraints and costs, administrative complexity and financial insecurity are currently preventing micropower from realising its full potential to revolutionise the supply and use of energy.

At the UK level, the Government has acknowledged the potential of micropower and the Department for Trade and Industry (Dti) published a public consultation in June 2005.<sup>3</sup> There have already been two proposals for legislation to support micropower from backbench MPs at Westminster.<sup>4,5</sup>

Although the responsibility for certain economic and financial reforms that would give a boost to micropower is reserved to the Westminster Parliament, there are other barriers and incentives for micropower that the Scottish Parliament has control over. Legislation requiring Executive Ministers to take action to support the development of micropower could bring about a major shift in the way our households and businesses obtain their energy, help reduce the impact of climate change and create an energy revolution.

Indeed, the Scottish Parliament's Renewable Energy Cross Party Group (SPREG) in a report last year concluded that: *'small scale renewables could play an important role in helping Scotland meet its energy needs in a sustainable manner, while also contributing to wider sustainability goals by helping tackle issues such as fuel poverty.'*<sup>6</sup>

Given the Scottish Parliament's devolved powers over areas that affect micropower, this consultation paper outlines a proposal by Green MSP and Enterprise speaker Shiona Baird for *'a bill to require the Scottish Executive to introduce financial and administrative measures to support the development of small-scale renewable energy generation by households and businesses.'*

There are a wide variety of measures that could be introduced within the scope of this bill. This includes introducing government targets for micropower, changes to building regulations to require all new developments to include micropower, and council tax rebates for those installing micropower.

This consultation document sets out the background and the reasons for this bill proposal and invites responses from individuals, organisations and businesses to inform a final bill proposal that MSPs of all parties will be asked to support.

## What is Micropower?

Micropower is the generation of electricity or heat on a small scale, usually in a home or small business. It is also known as micro renewable energy or microgeneration.

Electricity from micropower sources can either be used where it is generated or surplus electricity can be fed back into the shared electricity grid for use by others. This is called 'distributed' or 'embedded' generation to distinguish it from centralised generation by large power stations.

Micropower is growing in popularity because it is more efficient and less harmful to the environment than large, centralised power plants. It also offers greater diversity and therefore greater security of energy supply than a limited number of large centralised power stations.

Micropower can also help those households who find it difficult to meet the costs of energy to heat their homes. Such 'fuel poor' households can be protected from the increasing price of centralised energy, since once installed, micropower devices provide cost-secure electricity and heat.

## Micropower and the Environment

Most micropower devices collect energy from renewable sources like the sun, the wind or moving water, or use biofuels, rather than burning fossil fuels like coal, oil or gas. This means that micropower is less polluting and more environmentally friendly.

Climate change is widely recognised to be the greatest environmental threat facing mankind. The burning of fossil fuels to generate electricity, to provide heat and for transportation is the major source of the greenhouse gases that are responsible for rapid climate change. Electricity production in Scotland is responsible for about a third of our greenhouse gas emissions. This is Scotland's single greatest contribution to climate change and its pollution has increased by more than 10% since 1990.<sup>7</sup>

Greenhouse gas emissions can be reduced by us being more efficient in the way we use fossil fuels and using renewable energy alternatives that produce little or no greenhouse gas emissions. Most forms of micropower use fuels or energy sources that produce no greenhouse gases. Those that do use fossil fuels do so with efficiencies typically of greater than 90%.<sup>8</sup> So Micropower is said to be a 'climate-friendly' form of energy.

The Scottish Executive has a target of producing 40% of Scotland's electricity from renewable sources by 2020. Micropower could play a part in achieving and surpassing this target and therefore reducing Scotland's contribution to global climate change.

A further environmental benefit of micropower is its potential to reduce the need for nuclear power, which produces hazardous radioactive waste, because it reduces the demand for centralised electricity generation. Some commentators have pointed out that if micropower realises its full potential it could significantly reduce the demand for nuclear power and a report comparing the economics of micropower and nuclear has shown this to be realistic.<sup>9</sup>

## Efficiency of Micropower

In contrast to large power stations, micropower systems are typically situated close to the point at which where their energy is used. Because of this, micropower is more efficient since energy is not lost in transferring energy from the generator to the point of use – for example as happens when electricity is transported through power lines across large distances.

It is estimated that centralised production and transmission of energy wastes two-thirds of the energy generated, meaning that more fuel is used and more greenhouse gases pollution is caused than is necessary.<sup>10</sup> However, micropower generation has the potential to displace the inefficient use of power from large power stations. This means that our energy generation and use becomes more efficient, thus saving resources.

One particularly efficient example of micropower is the Combined Heat and Power (CHP) system that both generates electricity and provides heating. This contrasts with typical large-scale, coal-fired or nuclear, power station where the heat by-product of electricity generation is usually treated as a waste product. Micro CHP units that look just like an ordinary central heating boiler are already being installed in households in the UK.<sup>11</sup>

## Micropower and Security of Supply

Generating our electricity at a few very large power plants or using fuels that come from a small number of sources means that we are vulnerable to loss of supply as a result of technical failure, political instability or even sabotage.

Coal, oil and gas supplies are increasingly being sourced from other countries and leave the UK vulnerable to loss of supply. Nuclear power stations are particularly vulnerable to breakdown, generic faults and attack. Since nuclear reactors are inherently dangerous, the need for safety means that when problems are encountered, nuclear reactors often have to be shut down while the problem is investigated. Because many nuclear plants are of the same design, when one reactor is shut all other similar plants may have to be shut leading to widespread loss of supply. Last year both Torness and Hunterston nuclear power stations were each closed for periods of more than two weeks on two occasions which resulted in the loss of the equivalent of 40-50 days output between them.<sup>12</sup>

In contrast, micropower technologies have the potential spread energy generation across a large number of different kinds of small generators and energy sources throughout the country, making energy supply much more secure. If a few large power stations fail the supply to many users could be disrupted but if a few micropower generators fail the overall supply is largely unaffected.

## Where Micropower is Installed

Micropower is already installed in a wide range of situations in Scotland and other countries. The German and Japanese governments have both had programmes to promote installation of solar panels on domestic properties. In the US, the 'Million Solar Roofs' initiative is a unique public-private partnership, aimed at overcoming barriers to market entry for selected solar technologies and is aiming for the installation of one million 'solar roofs' by 2010.<sup>13</sup> Under the UK Photovoltaic (PV) Major Demonstration programme

to date nearly £26 million of grants have been committed to nearly 1,400 PV projects.<sup>14</sup>

In Scotland the Scottish Executive has funded the 'Scottish Community and Householders Renewables Initiative' run by the Energy Saving Trust which provides grant funding and support for installation of micropower in homes and businesses. The EST has a range of case studies of households that have installed solar heating systems, wood-fuelled heating systems, micro wind turbines and ground-level heat pumps. The five year, £10.3 million programme expects to fund 800 household renewable installations, 250 community renewable installations and 150 feasibility studies.<sup>15</sup>

## The Potential of Micropower

In their response to the UK Government's consultation on micropower, the Energy Saving Trust concluded that: *'Delivery of the Government's 2010 renewable energy targets will rely principally on large scale technologies already being deployed, notably large wind turbines. But delivery of 2020 targets will require a wider range of technologies.'*<sup>16</sup>

Similarly, the report from the Scottish Parliament Enterprise Committee's inquiry into renewable energy concluded; *'The potential of micro renewables, such as solar panels and small wind turbines, should also not be over-looked. Micro wind turbines now have the capability to supply SMEs [small to medium-sized enterprises] as well as domestic demand, and solar panels for water and space heating are becoming much more widespread. The scale of these technologies means that they will currently have a limited impact on meeting the renewables targets, but there is the potential for a significant culture change in this area as they become more commonly adopted by individuals.'*<sup>17</sup>

Some commentators see micropower as literally having the potential to revolutionise the energy sector bringing very significant environmental benefits. As Greenpeace put it in their recent report 'Decentralising Power: An Energy Revolution for the 21st Century': *'In a decentralised energy (DE) system, electricity would be generated close to or at the point of use. Buildings, instead of being passive consumers of energy, would become power stations, constituent parts of local energy networks. They would have solar photovoltaic panels, solar water heaters, micro wind turbines, heat pumps for extracting energy from the earth. They might also be linked to commercial or domestic operated combined heat and power systems. The massive expansion in renewable capacity that this would represent, and the fact that when fossil fuels were burnt the heat would be captured and used, would lead to dramatic reductions in overall carbon emissions – at least half of all emissions from the power sector, or 15% of total UK emissions.'*<sup>18</sup>

## Micropower Technologies

### Solar Photovoltaic Panels

Solar Photovoltaic (PV) panels use energy from the sun to produce electricity to run appliances and for lighting. Solar PV systems never need refuelling, have no moving parts, emit no pollution, are silent, and require minimal maintenance. Although Solar PV systems only produce electricity during day light hours, electricity generated during the day can be stored for use at night. PV requires only daylight and not direct sunlight to generate electricity. So PV works efficiently in Scotland.

Solar PV panels can be placed on almost any building surface which receives daylight for most of the day. The average UK home could use solar PV panels to generate 50-60% of the power needed to supply its own electricity, provided the electricity is used efficiently and it has a south facing roof.<sup>19</sup> A typical domestic system is about 2 kilowatts (kW) in size.

The electricity generated by solar PV panels can be used immediately or the excess electricity can be fed into the national grid to supply other consumers. Excess electricity generated by some micropower schemes is already fed into the grid thus generating electrical credit. There is potential for households and businesses to install solar PV panels and effectively make their electricity meters run backwards.

The UK Dti Renewables Innovation Review estimated that PV could contribute 6–8% of overall electricity supply by 2050 and lead to a 3MtC per year reduction in carbon emissions.<sup>20</sup>

Over the last 20 years the price of solar PV panels has fallen dramatically. At the moment, a typical price for a grid-connected PV system is between £4000 and £8000 per kW, which means that a 2kW system for a typical domestic property would cost around £8,000 to £18,000.

### Solar Water Heating

Solar water heating systems, also known as solar thermal systems, gather energy radiated by the sun and convert it into useful heat in the form of hot water. Vacuum tubes or flat plates transfer heat from the sun to a fluid in pipes and a hot water store such as a domestic hot water cylinder. A solar panel can provide 50–70% of a typical domestic hot water requirement.<sup>21</sup>

Water heating makes up 8% of UK energy demand.<sup>22</sup> More than half of the UK building stock is suitable for solar thermal water heating. Estimates put the total number of existing installed domestic systems in the UK at over 70,000, with about 5,000 new domestic systems installed each year. It is estimated that there is huge potential for the number of installations to increase to 50,000 new units installed per year by 2010, 300,000 by 2015 and 800,000 by 2020.<sup>23</sup> A typical household system of four square metres costs between £2,500 and £4,000.<sup>24</sup>

### Micro Wind Turbines

Micro wind turbines are smaller versions of the turbines used in wind farms. The most common design is three blades mounted on a horizontal shaft, which is free to rotate into the wind on a vertical post. The blades drive a generator either directly or via a gearbox to produce electricity. The electricity can either

be fed into the grid or charge batteries. Modern small wind turbine designs tend to be almost silent when operating.

Micro wind turbines are not usually mounted directly onto buildings, but small building mounted machines are becoming more commonplace. It is estimated that there are around 650–700 small-scale wind turbine installations in the UK.<sup>25</sup> The potential for micro wind in Scotland is large because of high average wind speeds across much of the country.

A domestic wind turbine can provide all the electricity needs of a household – typically between 1.5 and 6 kilowatts of electricity, depending on the location and size of the home. Micro-wind turbines cost around £3000 per kW.<sup>26</sup>

## Micro-hydro

Hydro-power systems use flowing water to turn a turbine to produce electricity. The amount of electricity that can be produced is determined by how much water is available and how fast it flows. Hydro is the most reliable renewable energy because the water to drive the turbine can be stored to provide a constant flow.

A micro hydro plant generates below 100kW of electricity. Improvements in small turbine and generator technology mean that micro hydro schemes are an attractive means of producing electricity. Useful power may be produced from even a small stream. The likely range is from a few hundred watts (possibly for use with batteries) for domestic schemes, to a minimum of 25kW for commercial schemes. The potential of micro hydro is limited by the requirement for sources of running water.

Costs for hydro projects depend greatly on the site and so vary greatly, but generally cost between £1,000 and £3,000 per installed kW.<sup>27</sup>

## Ground Source Heat Pumps

The ground stores heat from the sun during the summer and a few metres down the earth keeps a constant temperature of about 11–12C throughout the year. Ground source heat pumps (GSHP) can transfer this heat from the ground into a building to provide space heating and for pre-heating domestic hot water. For every unit of electricity used to pump the heat, 3–4 units of heat are produced. As well as ground source heat pumps, air source and water source heat pumps are also available.

The market for ground source heat pumps is currently small but growing. The total number of existing installations in the UK is estimated at 5MW (megawatts<sup>28</sup>) made up of around 600–700 units. It is estimated that there is the potential for the number of installations to increase from this low level to 10,000 new units installed per year by 2010, 35,000 units by 2015 and 55,000 by 2020. A typical household system costs £4–6,000 and will provide 95 to 100% of its heating requirement.<sup>29</sup>

## Air Source Heat Pumps

Air source heat pumps work in the same way as ground source heat pumps except that the source of the heat is the ambient air. Because external temperature is more variable than in the ground, performance is likely to be more variable too, but installation costs may be lower as no digging is required.

These systems have yet to become widely available for the domestic market and continue to be developed. However, they are likely to become commercially viable in the near future.

## **Biofuels**

Biofuels and biomass are produced from organic, biological materials, either directly from plants or indirectly from industrial, commercial, domestic or agricultural products. They are still considered as a renewable form of energy because unlike coal, oil or gas, they can be replaced within the same time scale as they are used.

Biofuels fall into two main categories: woody biomass (includes forest products, untreated wood products, energy crops, short rotation willow or elephant grass) and non-woody biomass (includes animal wastes, industrial and biodegradable municipal products from food processing and high energy crops, eg, rape, sugar cane, maize).

There are two main methods of using biomass to heat a domestic property: stand-alone stoves providing space heating for a room (fuelled by logs or pellets) or boilers connected to central heating and hot water systems (suitable for pellets, logs or chips).

Typical stand-alone room heaters of 6–12kW in output cost about £1,500 to £3,000 installed. A pellet or log fuelled boiler to heat a medium sized house costs around £5,000 installed.<sup>30</sup>

The running costs of a typical domestic system would be comparable to gas or oil heated properties and this would prevent 6–9 tonnes of carbon dioxide pollution each year.

The current domestic wood burning installations in the UK amount to about 270MW of output. The Government predict that the main use for domestic scale biomass heating will be in more rural locations and estimate the market size to be at least ten times the existing output.<sup>31</sup>

## The Need for Legislation

Micropower has the potential to reduce climate change emissions, improve energy efficiency and increase security of energy supply. However, there are a variety of regulatory and institutional barriers, as well as market failures that require intervention by Government, by regulators and other policy makers if micropower is to fulfil its potential.

Although the price of micropower technology has fallen over recent years, micropower units could cost much less and be more cost-effective if more units were being manufactured and installed. That is, the cost of micropower devices would fall because of economies of scale.

As well as filling order books and reducing prices, the key to ensuring that a micropower industry flourishes is security for investors in the industry. The principle way to provide investor security would be for government to indicate its commitment to micropower, for example by setting a national target for obtaining energy from micropower. Potential investors would then be sure they were committing their funds to a secure and growing area of enterprise.

The Scottish Parliament Renewable Energy Group concluded that: *'The key to successfully building a renewables market for small scale is to ensure that long term support signals are in place, and that measures are targeted towards ensuring larger scale installation programmes that will lead to volume orders and falling costs, ensuring that over time, the unit installation cost will go down, thus ensuring the technology is competitive on the open market.'*<sup>32</sup>

As well as paying the cost of the micropower device, those wanting to install micropower currently have to jump through regulatory hoops and they are not adequately rewarded for providing pollution free energy. It could be made far easier and more financially viable for home owners and businesses to install micropower.

Policy-makers are accustomed to an energy system based on large, centralised providers like nuclear or gas-fired power stations. But there is now an opportunity to change this approach, offer more incentive and bring micro-generation into the mainstream, bringing benefits to communities.

Following its inquiry into climate change, the Scottish Parliament Environment and Rural Development Committee recommended that the Scottish Executive's forthcoming energy efficiency strategy *'must also include targets for the development of small-scale renewable energy developments,'* and continued: *'It is frustrating that there has not yet been significant commercial exploitation of these technologies, which have the potential to link energy needs effectively with land use, transport and rural development issues. The Executive should examine how to encourage these technologies to be considered as real options and to secure the necessary investment.'*<sup>33</sup>

## Government Initiatives

Section 82 of the UK Energy Act 2004 requires the UK Government to publish a strategy for the promotion of microgeneration in Britain.<sup>34</sup> In June 2005 the Government published a consultation on the development of this strategy, including the development of a Low Carbon Buildings Programme (LCBP).<sup>35</sup>

The aim of the strategy is to develop a more strategic and co-ordinated approach across Government in order to identify cost effective measures to help new and existing microgeneration technologies make a significant contribution to energy policy goals.

Malcolm Wicks MP, Minister of State for Energy, said in his introduction: *'Our vision for 2020, as set out in the Energy White Paper, is for much more diverse, local energy generation with fuller connection to the distribution network. We want to see more micro-CHP, micro-wind, micro-hydro, solar thermal and photovoltaics, ground and air source heat pumps, fuel cells (and any other low carbon small-scale generating technology), supplying individual customers and buildings. We need sustainable, secure, affordable heat and electricity to be delivered through competitive markets, and microgeneration has an important contribution to make in achieving this goal.'*

It has yet to be seen whether the UK Government's recent consultation on microgeneration will lead to legislation at Westminster to promote the development of micropower. In the meantime, two bills from backbench Labour MPs promoting micropower have been introduced in the House of Commons.

## **Proposals for Legislation on Micropower at Westminster**

### **Climate Change & Sustainable Energy Bill**

Mark Lazarowicz MP has introduced the 'Climate Change and Sustainable Energy Bill' which will require the Government to produce a fiscal and economic strategy to assist with microgeneration.<sup>36</sup> The bill will also introduce both Great Britain-wide and local targets for the take-up of microgeneration, and will set up a scheme which will require electricity suppliers to buy electricity produced by domestic customers by microgeneration. It will also include measures to make it easier for green energy certificates to be allocated to those producing energy by microgeneration, along with the introduction of a renewable heat obligation for suppliers of heating fuel.

The bill will also require the Government to report to Parliament on a yearly basis on the level of greenhouse gas emissions in the UK, and the steps the Government has been taking to reduce these (Green MSP Mark Ruskell's Climate Bill already proposes legislation to require reporting and action plans for reducing climate change pollution in Scotland).<sup>37</sup>

As this Green Micropower Bill consultation went to press, the Climate Change and Sustainable Energy Bill had received a successful second reading in the House of Commons in November 2005 and passed to the committee stage. It remains to be seen what measures in the bill are finally passed into law. However, measures that relate to devolved matters would still have to be passed by the Scottish Parliament. Such measures are incorporated in the Scottish Micropower Bill which this document is consulting on.

### **Management of Energy in Buildings Bill**

Alan Whitehead MP also introduced the 'Management of Energy in Buildings Bill' to the Commons. The bill intended to amend current building regulations to ensure that new buildings will contain renewable and sustainable energy devices which will be required to produce a minimum standard of energy generation.<sup>38</sup> This Bill also intended to simplify the planning regime for the installation of home based energy producing devices such as photovoltaic,

wind power, solar thermal or a combined heat and power system. An obligation on the Government to examine and report on the carbon saving potential of domestic appliances that use 'off peak' electricity was also included.

As this Green Micropower Bill consultation went to press, the Management of Energy in Buildings Bill had been 'talked out' at its second reading in the House of Commons in November 2005 and ran out of Parliamentary time. However the measures within it related to planning matters which are devolved to the Scottish Parliament. The Scottish Green Micropower Bill incorporates the principle measures of the UK Management of Energy in Buildings Bill which this document is consulting on.

## **Scottish Legislation**

Some of the areas in which legislation is being proposed by Westminster MPs, as outlined above, are devolved to the Scottish Parliament. If equivalent laws in support of micropower are to be applied in Scotland they will require legislation by the Scottish Parliament. Shiona Baird's Green Micropower Bill is intended to achieve this and a range of possible measures for inclusion in a Scottish bill to promote micropower, including most of those devolved measures proposed at Westminster, are outlined below.

## What Will the Green Micropower Bill Do?

The Micropower bill proposes legislation that will require Scottish Executive Ministers to introduce various measures to support micropower. This public consultation sets out to identify those measures that should be included in the final bill. Those measures presently under consideration are outlined below.

### Set National Targets for Micropower

In 2002 the Scottish Executive set a target for 40% of Scotland's electricity to come from renewable energy by 2020.<sup>39</sup> This target, along with other incentives, is mainly driving the expansion of wind farms in Scotland and is not intended to encourage micropower. However, the proposed bill could require the Executive to set an additional target for the amount of micropower installed in Scotland. To try to ensure that this target is met, the Executive would also be required to draw up an action plan of measures designed to meet the target and then to report annually on progress. Similarly, Local Authorities could also be enabled to set local micropower targets for their area.

Merely setting such targets could stimulate growth in small-scale, micropower electricity and heat generation, since the existence of these targets would reassure business investors that putting funds into developing, manufacturing and installing micropower devices is a good investment.

A further way of increasing the amount of micropower being installed is to reduce the cost of micropower devices to potential installers. Due to the economies of scale, as more micropower devices are ordered and production is scaled up, the cost of production comes down and the cost of each unit is reduced, in turn encouraging more people to install micropower. A target that drives the installation of more micropower would in turn drive down the cost of devices and stimulate the installation of yet more micropower.

As the Micropower Council stated in their submission to the UK Government consultation on Microgeneration: *'The most significant step the government can take is to set targets for the uptake of microgeneration. This will inspire investor confidence and reduce the prices at which the microgeneration technologies are available.'*<sup>40</sup>

The 'Climate Change & Sustainable Energy Bill' introduced at Westminster proposes just such targets,<sup>21</sup> but since powers over renewable energy are devolved to the Scottish Parliament, such targets in Scotland must be approved by the Scottish Parliament. The Green Micropower Bill proposes such targets and views are invited on this proposal.

### Require Micropower in All New Developments

There is huge potential to expand the use of micropower through its incorporation in new buildings. It is estimated that if only 10% of new developments had micropower installed the increase in demand would allow mass production and prices to halve, thus triggering more demand.<sup>41</sup>

However, at present there is no requirement for developers to install any renewable energy in their buildings. Instead, developers assume that the buildings energy needs will be met through centralised energy provision. Building regulations are therefore a potentially important way of stimulating the expansion of micropower by requiring that new buildings generate a proportion

of their energy on site using a renewable method. The Micropower Bill proposes changes to building regulations that would require all new buildings to have some micropower installed.

The Scottish Parliament Renewable Energy Cross Party Group concluded in their recent report, 'Developing small-scale renewables in Scotland', that: '*Building Regulations could do more to encourage small scale renewables by setting regulatory standards...to ensure installation of small scale renewables in new build.*'<sup>42</sup> The Dti consultation on the UK's Microgeneration Strategy, also acknowledges the potential for changes to building regulations to encourage microgeneration.<sup>43</sup>

There are precedents for promoting micropower in new buildings. The Greater London Authority has recently adopted a policy outlined in the Mayor's Energy Strategy which states: '*To contribute to meeting London's targets for the generation of renewable energy, the Mayor will expect applications referable to him to generate a least 10% of the site's energy needs (power and heat) from renewable energy on the site where feasible. Boroughs should develop appropriate planning policies to reflect this strategic policy.*'<sup>44</sup>

The London Borough of Merton has introduced a policy that requires all new non-residential developments to reduce predicted carbon emissions by 10% through the use of onsite renewable energy sources.

Public procurement also has potential to expand the use of micropower. Kirklees Council, in West Yorkshire, has recently introduced a policy that all new public buildings will have their energy needs met from 10% renewable energy sources, rising by 5 per cent each year until 2011 when a 30% target will be met.<sup>45</sup>

The Management of Energy in Buildings Bill introduced at Westminster<sup>22</sup> proposed that building regulations be altered to require the incorporation of micropower. Building regulations are devolved to the Scottish Parliament. The Green Micropower Bill is proposing an equivalent measure in Scotland and comments are invited.

## **Council Tax and Business Rates Rebates for Installing Micropower**

Before deciding to install micropower householders and business will consider carefully the financial costs to themselves. Although once installed, micropower offers free renewable energy, presently the capital cost of installing micropower can often be greater than the cost of connecting to and buying power from centrally provided energy sources. Therefore, an effective way of encouraging the installation of micropower by householders and businesses would be to offer financial incentives to set against the costs of installation.

Indeed, in their research report 'Changing climate, changing behaviour: Delivering household energy saving through fiscal incentives' the Energy Saving Trust found that '*council tax rebates ... are the tax incentives most likely to encourage consumer action, and would also be the policy shifts which could benefit the largest number of householders.*'<sup>46</sup>

One such financial incentive would be tax breaks for micropower installers. Although changes to national taxation, such as further reducing VAT on

micropower devices, is not within devolved powers, the levying of council tax and business rates by local authorities is directed by the Scottish Parliament.

Such a council tax rebate scheme has been proposed by the Energy Saving Trust for households installing energy efficiency measures. This recommended the introduction of a one-off council tax rebate of between £50 and £90 for existing properties that install relevant energy efficiency measures. A similar scheme could be adopted for households and businesses installing micropower.

There are existing examples of council tax rebates being used to encourage householders to install energy efficiency measures. Braintree District Council in Essex have been operating a scheme since 2004, in conjunction with British Gas, that provides rebates on council tax to householders installing cavity wall insulation.<sup>47</sup> This initiative in Braintree shows that linking a micropower installation to council tax rebates need not be administratively onerous.

The Micropower Bill proposes legislation that would allow local authorities to give council tax rebates and business tax rebates to households and enterprises that install micropower.

### **Permitted Development Status for Micropower**

Householders and business are usually required to obtain planning permission from their local authority before installing micropower on existing buildings, even if there is little or no impact as a result of the installation. Obtaining this permission can take time and cost money. Planning permission can therefore be a barrier to installation of micropower.

There are already categories of developments that do not require a planning application because planning consent is deemed to have been granted and it is envisaged that this could be further extended to micropower devices. Removing the requirement to obtain planning permission for certain approved micropower devices could encourage greater installation of micropower.

The Micropower Bill proposes that householders and businesses should be able to install micropower without planning permission given that there are limits to the scale of the installation and safeguards against noise and visual intrusion. Not having to apply for planning permission would reduce costs for householders wishing to install micropower and remove the possibility of losing money by having an application turned down.

This measure will also remove the need for manufacturers of micropower devices to negotiate individually with up to 32 local authorities to obtain planning permission to sell their products. Safeguards against noise or visual intrusion would be built in by only giving permitted development status to specific devices for installation in certain locations. Views are sought on this proposal.

### **Renewable Obligation Certificates for Micropower**

The principle mechanisms in the UK for ensuring that more electricity is generated from renewable sources are the renewables obligation schemes operating on either side of the border. These schemes oblige companies selling electricity to consumers to obtain a proportion of the electricity they supply from renewable sources. In this way a demand for renewable energy has been created and renewable electricity generation is expanding to meet it, primarily through the development of wind farms.

The scheme is operated so that generators of renewable electricity earn certificates for each megawatt of electricity they generate. These Renewable Obligation Certificates (ROCs), known as 'rocks' or green energy certificates, are then sold on to electricity supply companies to allow them to fulfil their obligation. Suppliers can either present enough certificates to cover the required percentage of their output, or they can pay a 'buyout' price per megawatt for any shortfall.

ROCs can be freely traded and the price varies according to the amount of ROCs available on the market. ROCs have traded more than the cost of generating the electricity. Because ROCs certificates can sell for more than the cost of generation this scheme has further increased the profitability of renewable energy generation.

The Scottish Executive has responsibility for the system of ROCs north of the border. Although micropower generators may be eligible to receive the same 'green energy certificates' as larger generators the administrative complexity of applying for ROCs means that is not worthwhile. At present, generators claiming ROCs have to register as an accredited supplier and the relatively small value of the ROCs to micropower generators does not outweigh the time and financial outlay incurred. Currently, ROCs are earned by larger generators such as power stations and wind farms.

Changes to the ROCs system that would allow household, community and small business micropower electricity generators to more easily benefit from these green energy certificates would make it more attractive to become a micropower generator.

The Dti consultation on the UK's Microgeneration Strategy acknowledged: *'there remain some areas in the administration of the RO in which improvement may facilitate access to ROCs for microgenerators.'*<sup>48</sup>

The UK Government is considering allowing the companies supplying micropower devices to claim ROCs for a nominal amount of the electricity that all the devices they have sold will generate. The supplier will then pass a share of the value of the ROCs back to those that have purchased their micropower devices. In this way the cost of registering for ROCs is effectively shared across a group of micropower generators. The Micropower Bill would oblige Ministers to simplify the ROCs system to allow micropower electricity generators to more easily claim ROCs.

## Renewable Fuels Obligation

As outlined above, the UK Government and the Scottish Executive presently have Renewable Obligation schemes in place to require electricity suppliers to source part of their electricity from renewable electricity sources. However, these schemes apply only to generation of electricity and not other forms of renewable energy.

Electricity provides only about 20% of our energy needs, the rest is provided by fuels that are used for heating and transport. These fuels are mainly fossil fuels; oil and its derivatives (petrol and diesel), and gas and coal. As such, their use by burning contributes to greenhouse gas pollution and climate change.

As the Micropower Council stated in their submission to the UK Government consultation on Microgeneration: *'There can be a tendency to focus on electricity*

*producing technologies, partly because of the significant regulatory challenges therein. The heat technologies today form the majority of microgeneration installations, and there is an urgent need to consider new policy measures to encourage their uptake.*<sup>49</sup>

The current ROCs scheme does nothing to encourage the use of renewable fuels such as biofuels and biomass. However, as with the ROCs scheme, an equivalent scheme could require suppliers of fossil fuels for heating and/or transport to supply a proportion of biofuels such as wood chips, bio-gas and bio-diesel.

A Renewable Fuels Obligation scheme has been advocated by the UK Micropower Council. A Renewable Heat Obligation that would apply to fuels supplied for heating but not for transport is included in the backbench Climate Change & Sustainable Energy Bill introduced at Westminster.<sup>50</sup>

The Micropower Bill could oblige the Scottish Executive to introduce a Renewable Fuels or Renewable Heat Obligation for Scotland.

### **Guaranteed Capital Grants for Micropower**

Measures proposed within the Micropower Bill have the potential to stimulate a massive expansion of micropower, largely through reducing costs for installers. Until costs come down significantly, the provision of capital grants by Government is an important way to encourage individuals, communities and businesses to install micropower. Grants make it more financially viable for micropower installers to buy and install micropower devices.

The Scottish Executive's Scottish Community and Householder Renewables Initiative (SCHRI, known as 'scree') gives grants, advice and project support to assist the development of new community and household renewable schemes. This scheme has been successful in encouraging micropower installation.<sup>51</sup>

However, due to its popularity, in September 2005 SCHRI ran out of funding. Following political and public pressure, the Executive agreed to top up the funding to take it to the end of 2005.<sup>52</sup> The current SCHRI scheme only runs until 2007.

This shows the popularity of micropower and the Micropower Bill could require government to provide a minimum amount of capital grant funding for the installation of micropower by homes and communities.

## Micropower Bill and Other Green MSP Bills

There are two broad approaches to reducing the greenhouse gas emissions that result from energy use: bringing more renewable energy on-stream to replace the burning of polluting fossil fuels, and reducing the amount of energy used overall by being more energy efficient. Reducing energy use and switching to cleaner energy are therefore complementary approaches, and Green MSP Shiona Baird has brought forward two Members' Bills in the Scottish Parliament to address each of these areas.

### Home Energy Efficiency Targets Bill

As well as this proposal for a Micropower Bill, Shiona Baird has lodged a draft bill proposal to improve the efficiency of energy use in the home. The proposed Home Energy Efficiency Targets (HEET) Bill requires Scottish Executive Ministers to set targets for improving energy efficiency in the home, to plan a set of actions to achieve this aim, and to report on progress.<sup>53</sup> The First Minister subsequently announced to Parliament that the Executive intends to bring forward non-statutory targets for energy as part of the review of its Climate Change Programme.<sup>54</sup> It remains to be seen what, if any, targets the Executive will set. If these targets are insufficient it may be necessary for Shiona Baird to pursue statutory targets through the HEET Bill.

### Greenhouse Gas Emissions Targets Bill

Green MSP Mark Ruskell has also consulted on a draft Greenhouse Gas Emissions Targets Bill proposal to require Scottish Ministers to set an overall national target for reducing greenhouse gas emissions, to devise an action plan, and to report on progress.<sup>55</sup>

Mark's climate change bill does not specify what policies Ministers should introduce in order to reduce greenhouse gas emissions and it may be that Ministers decide to introduce measures to promote micropower under the terms of this bill. In the meantime, Shiona Baird's Micropower Bill will specifically ensure that Ministers will be obliged to take steps to support micropower. If they do so before the Micropower bill is introduced to Parliament, Shiona may withdraw her bill proposal.

## Responding to This Consultation

The purpose of this consultation is to receive feedback from interested organisations and members of the public to assist in the framing of a final Bill proposal.

The following questions may help you formulate your response:

1. What are your views on the proposed approach of legislating to require targets to be set for micropower?
2. Should targets be set by the Scottish Executive or Local Authorities or both?
3. At what level(s) and over what time frame(s) do you think micropower targets should be set?
4. How frequently and by what means do you think reporting on progress towards meeting targets should take place?
5. What are your views on the following specific measures in the bill?

(for background about these measures, please see section on 'What will the Green Micropower bill do?')

- (a) Requirement for micropower in all new developments
- (b) Council tax and business rates rebates for micropower installers
- (c) Permitted development status for micropower devices
- (d) Renewable obligation certificates for micropower generators
- (f) Renewable fuels or renewable heat obligation
- (e) Guaranteed capital grants for micropower

6. Are there any other specific measures to promote micropower that should be included in the bill?
7. Is there anything else you would like to add?

**The deadline for responses to this consultation is: 6 March 2006**

## Ways to Respond

By mail to: Ben Murray, Room MG11, Scottish Parliament, Holyrood, Edinburgh EH99 1SP

By email to: [ben.murray@scottish.parliament.uk](mailto:ben.murray@scottish.parliament.uk)

By fax to: 0131 348 5972, marked 'for the attention of Ben Murray'

Further copies of this consultation paper can be ordered by email from the address above.

Please note to help inform debate on the matters covered by this paper and in the interests of openness, the responses submitted on this consultation document will be made public. It will be assumed that responses can be made public unless the respondent indicates that his or her response is confidential.

Confidential responses will nevertheless be included in any summary or statistical analysis, which does not identify individual responses.

Shiona Baird MSP would welcome as many contributions to the consultation as possible.

Please pass this consultation paper to any other individuals or organisations that you think may be interested.

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