Energy Efficiency & Microgeneration

Achieving a low carbon future
A Strategy for Scotland

Draft for Consultation
Scottish Executive
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Energy is essential for every day life. We need it to generate heat in our homes and businesses, to power our lights, appliances and industries. Energy demand and consumption continues to grow across Scotland, the UK and the rest of the World. But some 70% of global greenhouse gas emissions come from the way we produce and use our energy. As the recent Stern review confirmed, climate change is one of the biggest global threats and we must take urgent action to reduce our emissions of carbon dioxide and other greenhouse gases.

Our goal is to build a sustainable future for Scotland’s people. One way we can do this is by taking action on climate change. Although Scotland is a small country and only makes a small contribution to global carbon dioxide emissions, Scotland has a significant part to play. Scotland already takes climate change seriously. Recent figures show that Scotland’s carbon dioxide emissions have fallen by 14% since 1990, more than any other part of the UK and 14 of the 15 Member States that signed up to the EU Kyoto agreement.

However, we cannot be complacent and we recognise there is much more to be done. We need to lead by example – everyone must take responsibility for their own behaviour by using less energy and using it more efficiently. As the title of Scotland’s Climate Change Programme indicates, we all need to consider ‘Changing Our Ways’. The Executive has signalled its ambition to do so by the commitment to exceed Scotland’s share of UK carbon savings by one million tonnes.

Whilst energy policy and many of the regulatory powers associated with energy efficiency are the responsibility of Westminster, Scottish Ministers have chosen to take the lead by publishing this Strategy and by setting out the action they propose to take to help us meet our ambitious carbon savings targets through improving energy efficiency and encouraging a greater uptake of microgeneration.

I want all of the people of Scotland, in their homes and in their places of work, to play a role in combating the effects of climate change – principally by reducing demand for energy through improved energy efficiency but also by microgeneration with low carbon technologies. To help us all think in a holistic way about the
buildings in which we live and work, this strategy therefore addresses both energy efficiency and microgeneration.

We want to ensure every household, community, local authority and business is aware of their energy use, takes personal responsibility for their actions and strives to make Scotland a leader. Individual action is possible, and can make a difference. In this way we will meet a range of important objectives: addressing fuel poverty, improving business profitability, reducing the costs of delivering public services, as well as reducing our carbon dioxide emissions.

This is not an easy task and no one policy on its own will tackle the challenge. We are therefore investing in a portfolio of measures as set out in this draft Strategy that will enable us to rise to the challenge and achieve a low carbon future for Scotland.

Nicol Stephen MSP
Deputy First Minister & Minister for Enterprise and Lifelong Learning
Executive Summary

Executive Summary

Setting the scene for why we need to save more energy and create more clean energy on a small scale.

1. This first Energy Efficiency and Microgeneration Strategy for Scotland sets out the Executive’s aims for improving energy efficiency and encouraging a greater uptake of microgeneration. Together energy efficiency and microgeneration can help achieve a low carbon future for our homes and workplaces and this Strategy therefore takes and reflects a more joined-up approach. Delivering the actions contained within this strategy will require effective partnership working between the Executive and partners.

2. This is a draft of the Strategy for consultation. This consultative draft highlights work underway, sets out progress being made, and outlines work that is currently planned for the future. Once the consultation has concluded, the Executive will consider all responses and take these into account when revising the Strategy. All of the existing and new targets and commitments in the final Strategy will be compiled into a single Action Plan which will be published during 2007. The Executive will use the action planning process to set energy efficiency and microgeneration targets. Progress being made against delivering these targets will be monitored through the Action Plan, which will be reviewed and reported on, on an annual basis. The Action Plan will include a summary of the carbon savings associated with the various actions, thus providing an overall picture of the contribution that energy efficiency and microgeneration will make to Scotland’s Climate Change Programme targets.

3. The Executive’s Sustainable Development Strategy – Choosing Our Future (November 2005) and Scotland’s Climate Change Programme - Changing Our Ways (March 2006) provide the backdrop to the development of this Strategy. They both reinforce the need for action to ensure that the vision for Scotland in 2050 as a prosperous and sustainable low carbon economy is secured.

4. There is clear direction from Europe to set ambitious and realistic targets for tackling climate change and improving energy efficiency. The EU Energy Efficiency Action Plans published in October last year and the more recent Strategic Energy Review propose setting targets to reduce greenhouse gas emissions by 30% by 2020,
and to improve energy efficiency by 20% by 2020. Scotland has a key role to play in delivering and achieving these European and UK targets and we will make our contribution.

5. The Executive is contributing towards the UK delivery of the Kyoto targets and supports the UK Government’s ambitious domestic target – to reduce domestic carbon dioxide emissions by 20% below 1990 levels by 2010, with a longer-term goal to reduce carbon dioxide emissions by 60% by 2050. Scotland’s Climate Change Programme demonstrates its commitment to reduce carbon dioxide and other greenhouse gas emissions in the long term by quantifying and setting an ambitious carbon savings target for Scotland to 2010. The Executive’s commitment is to exceed Scotland’s share of UK carbon savings by one million tonnes.

6. The UK Government is responsible for measures that relate to regulation, appliance labelling, mandatory obligations, and energy services. Although these areas are reserved, the Executive keeps a close eye on them and works closely with the UK Government to ensure that Scottish interests are represented.

7. However, Scotland has significant powers in this area, including the promotion of energy efficiency. Improving energy efficiency is widely recognised as the easiest and most cost-effective means of reducing carbon dioxide emissions. The financial benefits of doing so are clear – industry and society can achieve more with less energy, public services are delivered at lower cost, and fuel poverty is reduced. Better insulated buildings and more energy efficient workplaces cut energy bills for householders and businesses. Reducing demand also puts less pressure on energy supplies.

8. Energy Efficiency will help to reduce carbon dioxide emissions, but not on its own. In order to move to a low carbon economy, more clean energy must be created. Microgeneration can make a significant contribution to tackling climate change, ensuring reliable energy supplies and could help to tackle fuel poverty. It can provide a sustainable source of low carbon energy and help to reduce carbon dioxide emissions from homes, small commercial buildings, and community buildings, such as leisure centres and schools. Microgeneration can also have a wider impact, by increasing awareness and engaging the public in tackling climate change.

9. There are still a number of barriers to overcome before the full potential of microgeneration can be realised. These include financial costs, availability, a limited knowledge of the benefits and cost effectiveness of various technologies, and a range of planning and technical issues. The Executive is, therefore, putting in place a range of measures to encourage the uptake of microgeneration, develop the market and provide significant business opportunities for Scotland.

10. This Strategy identifies how the Executive will encourage more households, the public sector and businesses to take up those opportunities, and outlines a
package of policies and measures to drive an increase in energy efficiency and encourage the uptake of microgeneration across these sectors of the economy.

The Executive believes that it will be most successful when energy users themselves recognise the benefits of reducing their energy use and changing their behaviour.

11. The Executive is already taking action to encourage behavioural and cultural changes: by supporting awareness raising campaigns and funding a range of information and advice programmes designed to deliver greater energy efficiency across the domestic, public and business sectors throughout Scotland. In 2005–06, these advice programmes helped over 80,000 householders, over 500 business and public sector organisations, and over 350 SMEs to realise carbon and financial savings. Taken together, these programmes are predicted to produce lifetime savings of over 500,000 tonnes of carbon by 2010.

12. Although this is real progress, the Executive recognises that more needs to be done if we are to meet our ambitious carbon savings target outlined in Changing Our Ways, Scotland’s Climate Change Programme. The Executive will:

- Introduce a 'one-stop-shop' approach to advice and support for householders offering a more pro-active, customer focused service, covering energy efficiency, transport and renewable energy.

- Ensure that all local authorities demonstrate leadership in investing in carbon-saving measures by taking part in the Carbon Trust’s Carbon Management Programme.

- Help businesses to understand that by reducing their energy consumption through energy efficiency measures they can cut their energy bills and carbon dioxide emissions, and improve business growth, profitability and competitiveness. The Executive will commit up to a further £2 million to loans for small and medium sized businesses to help smaller companies to make upfront investments in energy efficiency. In recognition that energy efficiency is just one part of a wider picture of resource efficiency, the Executive is also reviewing resource efficiency initiatives so that it can take action and make it easier and clearer for business to access advice and support.

- Help everyone to have access to information on the most appropriate and relevant energy saving actions that they can take as quickly and easily as
possible. The Executive also wants to ensure that the support it provides and funds is cost-effective and well targeted, therefore, it has commissioned an independent review of energy efficiency and microgeneration support in Scotland to help take action to improve the delivery of support in Scotland.

- Better promote and raise awareness of energy efficiency and microgeneration in schools. Scotland has already achieved the ambitious UN target for 80% of its schools to be registered under the Eco Schools Programme by 2008 – but the Executive wants to see every school registering on the Eco School Programme and striving for the Green Flag award.

By knowing how much energy we are using in our homes and at work, and by having good information on how much energy different products consume, our energy use will change.

13. The Executive is supporting a number of activities to help us gain better access to information on energy use, including:

- The introduction of more accurate billing methods and new technologies, such as real-time displays and smart meters in to homes and across the public sector.

- Raising awareness to help inform consumers about the most energy efficient products, such as the Energy Saving Trust’s Energy Saving Recommended; and the ecological footprint of goods and services.

- Work being carried out with manufacturers and retailers across the UK and Europe to improve the energy efficiency of a wide range of products from the domestic and business sectors, including reducing the ‘on’ and ‘standby’ power consumption of household appliances.
Our buildings must incorporate, as standard, much higher levels of energy efficiency and low carbon technologies to bring about a reduction in carbon dioxide emissions.

14. The Executive has already done much to drive this vision forward in Scotland, including:

- Publishing a new statement on Architectural Policy which sets out the Executive’s **vision for sustainable building design**.

- Developing **planning policies** which set out how energy efficiency, good design and the incorporation of microgeneration form an essential part of new developments.

- Providing **support to professionals** in the design and construction industry to raise ambition and drive forward standards by developing best practice guides.

15. The Executive recognises that there is more to be done to go that step further and will therefore:

- Introduce **new Scottish Building Regulations** that incorporate minimum energy standards from May 2007 which will deliver carbon dioxide savings in the region of 18–28% when compared to current standards. It will also investigate the impact of further increasing the energy standards. The revised standards will lead the UK with the most demanding requirements for the thermal insulation of new buildings.

- **Require energy performance certificates** in buildings when constructed, sold or rented out (including homes, public sector buildings and business premises). This will give better information about the energy consumption and carbon dioxide emissions from buildings and will provide recommendations for measures to improve the energy performance. The Executive believes that these certificates will: encourage the public sector to lead by example and set more ambitious goals for the energy performance of their own estates; and act as a driver for improving energy efficiency in the home.

16. **Coupled to energy efficiency, microgeneration could make a significant contribution to tackling climate change**, by ensuring reliable energy supplies and providing a powerful visual statement which helps to increase awareness and engage
the public into taking action. It can provide a sustainable source of low carbon energy and help to reduce carbon dioxide emissions from homes, small commercial buildings, and community buildings, such as leisure centres and schools.

17. The Executive’s Scottish Community and Householders Renewables Initiative (SCHRI) has been very successful in raising awareness of renewable technologies and stimulating the demand for small scale renewables in Scotland. Since 2002, £16 million has been committed, helping nearly 1700 individual and community projects across Scotland and leading to an increase in the number of accredited installers from 14 in 2003 to 74 in 2007. The Executive is therefore investing an additional £2 million to provide further grant support through SCHRI.

18. However, there are still a number of barriers to overcome before the full potential of microgeneration can be realised. These include financial costs, availability, a limited knowledge of the benefits and cost effectiveness of various technologies, and a range of planning and technical issues. Therefore the Executive is carrying out a significant amount of work to help ascertain what it could and should be doing to support and develop microgeneration in Scotland. All of this work will help to steer future policy developments including the setting of microgeneration targets for Scotland which the Executive will do during 2007. The work includes:

- Revising planning policies to encourage the wider take up of microgeneration.
- Consulting on detailed changes to permitted development rights to make the uptake of microgeneration easier.
- Changes to the Renewables Obligation Scotland from April 2007 which will make it easier for small generators, including householders, to qualify and obtain accreditation for Renewable Obligation Certificates (ROCs) which can then be sold to electricity suppliers.
- Research to ascertain what form future support might take and how best to target that support.
- The establishment of a high level working group made up of a small number of relevant internal and external stakeholders to help steer future direction of policy support.
The Executive is committed to improving the energy efficiency of Scotland’s homes as it will assist in fulfilling our objective of ensuring the availability of safe, warm housing and will contribute to our objective of tackling climate change.

19. During the 2002 Spending Review, the Executive set challenging targets to improve domestic energy efficiency by 20% by 2006. Significant progress has already been made – the latest statistics which present 2003/04 data report that the energy efficiency of Scottish housing has improved considerably from 2002 levels. The Executive will report fully on its achievements in meeting the 2002 Spending Review target in 2008–09 when all of the data to 2006 is available. The Executive recognises that more still needs to be done to build on this and will set further, more challenging targets linked to the next Spending Review in 2007.

20. In 2007, the Executive will review progress being made by local authorities towards meeting their targets for improving energy efficiency of their respective housing stocks under the Home Energy Conservation Act (HECA). The latest HECA statistics (2003–2005) shows that steady progress is continuing with an average 17.2% improvement in energy efficiency, and an estimated overall reduction of 3.1 million tonnes of carbon dioxide since the start of HECA in 1997.

21. Through Communities Scotland, the Executive makes a considerable investment in housing – this amounted to £800 million in 2006/07. Their revised ‘Sustainable Housing Design Guide’ gives guidance to housing associations on how to adopt a low carbon, sustainable development approach for new and refurbished housing. Communities Scotland is currently consulting on proposals for setting an ambitious mandatory target of EcoHomes ‘excellent’ by 2010, a mandatory energy standard, and to establish, where possible, carbon savings across the building programme.

22. The Executive is working closely with the UK Government and the energy supply companies to deliver better energy efficiency to householders through the Energy Efficiency Commitment (EEC). The Executive wants to ensure that EEC has demanding goals, is better targeted and that it works more effectively with Scottish Executive fuel poverty and energy efficiency initiatives.

23. The Executive is investigating the barriers to take–up of home energy efficiency and is currently considering a range of options to help householders in Scotland to improve the energy efficiency of their home. This could include, better targeted advice, loans, equity release initiatives and ‘green’ mortgages, and more
comprehensive home energy audit services. The Executive will publish further details during 2007.

24. **The Executive will continue its commitment to end fuel poverty by 2016.** Significant progress has been made through the Executive’s Warm Deal and Central Heating Programmes – fuel poverty has more than halved between 1996 and 2002, from 35% to 13% of households (738,000 to 286,000). The programmes lift households out of fuel poverty by improving the energy efficiency of the home – to date free central heating systems have been provided to over 74,000 homes and over 315,000 homes have been insulated. The Executive has committed a further £108 million for both programmes to 2008. In addition to energy efficiency, the Executive is currently assessing the impact of microgeneration technologies on alleviating fuel poverty.

The public sector has the potential to significantly influence the behaviour of both individuals and organisations and, therefore, must lead by example.

25. **The Executive’s £20 million Central Energy Efficiency Fund (CEEF) is helping public sector organisations to lead the way in energy efficiency.** This ‘invest to save’ fund is being used by local authorities, NHSScotland Health Boards and Scottish Water to invest in energy efficiency projects which bring about energy, cost and carbon savings. CEEF has been successful – as well as delivering financial and carbon savings, it is raising the profile and stimulating behavioural changes across the participating organisations. The Executive therefore recently announced an **additional £4 million to extend the fund to Further and Higher Education** to enable this sector to realise similar benefits.

26. The Executive recognises that, as an organisation, it must lead by example and it has already delivered major energy efficiency improvements by reducing carbon dioxide emissions by almost 50% on its own estate since 1991. During 2007, the Executive will introduce a single carbon dioxide emissions reduction target to cover all activities, including business travel, energy use and waste production. This will include a commitment to reduce the emissions associated with business travel by at least 25% by 2020 against 2005/06 levels. The Executive wants to show its commitment by investing in microgeneration and is currently investigating which of its current buildings on its own estate are most suitable.

27. The Executive has tasked its agencies and non–departmental public bodies (NDPBs) with improving their environmental management practice by putting in place
policies and challenging targets which will be published and reviewed on an annual basis.

28. Through the Scottish Climate Change Declaration, local authorities have demonstrated their commitment and have signed up to achieve a significant reduction in greenhouse gas emissions from their own operations.

29. One of the Executive’s main priorities is to modernise the school estate with well designed, well built and well managed schools. Through significant Executive funding, local authorities are required to consider sustainability as a key aspect of school buildings – not just the initial purchase price of an asset but also the ongoing running and maintenance costs. The Executive wants to encourage and deliver greater energy efficiency and uptake of renewables throughout the entire procurement process and is currently carrying out research to better understand how the energy standards of existing schools stack up and to help identify future action that is needed.

30. Sustainability is a key aspect to NHSScotland property – each NHSScotland body must have in place local policies for sustainable property management, environmental management, construction procurement and design quality. These include targets for reducing energy consumption and greenhouse gas emissions. Over the 19 year period to 2004/05, NHSScotland has made a significant achievement. It has reduced energy consumption by around 36% and carbon dioxide emissions by nearly 39%. NHSScotland has set a national target to further reduce energy consumption by 2% each year until 2010, representing a total saving of almost 50% in energy consumption by 2010 over 1990 levels.

31. It is estimated that, currently, £8 billion is spent per year on public sector procurement. As well as securing Value for Money and adhering to public procurement policy and legislation, energy efficiency is one of the key aspects to good procurement practice. The Executive already promotes best practice across the public sector through a variety of means including guidance, toolkits and training and is currently seeking more ways to further promote energy efficiency and microgeneration through the procurement process.

The Executive’s next step is to compile a single Action Plan detailing all existing and new measures, and it will use this action planning process to set energy efficiency and microgeneration targets for Scotland.
Chapter 1
Setting the scene

How does this Strategy aim to reduce energy demand from the public sector, business and households?

1.1 This first Energy Efficiency and Microgeneration Strategy for Scotland sets out the Executive's aims for improving energy efficiency and encouraging a greater uptake of microgeneration. Together energy efficiency and microgeneration can achieve a low carbon future for our homes and workplaces and this Strategy therefore takes and reflects a more joined-up approach. Delivering the actions contained within this Strategy will require effective partnership working between the Executive and partners.

1.2 This is a draft of the Strategy for consultation. This consultative draft highlights work underway, sets out progress being made, and outlines work that is currently planned for the future. The Executive is welcoming views on its current thinking.

1.3 In the chapters that follow, this Strategy outlines a range of measures to improve energy efficiency and encourage investment in microgeneration across the domestic, public and business sectors. The benefits in taking action speak for themselves:

- A reduction in domestic energy bills and more comfortable homes;
- A reduction in number of households living in fuel poverty;
- More efficient and better provision of public services through reduced energy use;
- A reduction in energy bills and overheads for Scottish businesses leading to improved profitability and competitiveness;
- A reduction of greenhouse gas emissions which contribute to climate change; and
- A move towards a sustainable, lower-carbon economy.

1.4 Once the consultation has concluded, the Executive will consider all responses and take these into account when revising the Strategy. All of the existing and new targets and commitments in the final Strategy will be compiled into a single Action Plan which will be published during 2007. The Executive will use the Action Planning process to set energy efficiency and microgeneration targets. Progress being made against delivering these targets will be monitored through the Action
Plan, which will be reviewed and reported on, on an annual basis. The Action Plan will include a summary of the carbon savings associated with the various actions, thus providing an overall picture of the contribution that energy efficiency and microgeneration will make to Scotland’s Climate Change Programme targets.

**Why is this so important?**

1.5 The Executive’s Sustainable Development Strategy – Choosing Our Future (November 2005) and Climate Change Programme – Changing Our Ways (March 2006) provide the backdrop to the development of this Strategy. They both reinforce the need for action to ensure that the vision for Scotland in 2050 as a prosperous and sustainable low carbon economy is secured.

1.6 The Kyoto Protocol targets for climate change established an essential first step for International action. However, if all countries meet their Kyoto targets, global emissions are only expected to fall by 1–2% by 2012. The UK Government therefore set a more ambitious goal to reduce domestic carbon dioxide emissions by 20% below 1990 levels by 2010, with a longer-term goal to reduce carbon dioxide emissions by 60% by 2050. The recently published UK Climate Change Programme was designed to help deliver this target. The International Community agreed at the Montreal Summit in December 2005 to begin consideration of the further action needed beyond 2012 to stabilise greenhouse gases.

1.7 However, many of the decisions that are taken now will leave a legacy for the future far beyond 2012, especially the investments that are made in our housing stock and transport infrastructure. We therefore cannot afford to wait for International decisions to be made before action is taken. Scotland’s Climate Change Programme demonstrates its commitment to reduce carbon dioxide and other greenhouse gas emissions in the long term by quantifying and setting an ambitious carbon savings target for Scotland to 2010. The Scottish Share of the UK’s carbon savings amounts to around 1.7 million tonnes of carbon equivalent in annual savings by 2010. To encourage Scotland to lead by example, the Executive took a step further by setting an ambitious Scottish Target to exceed this share by delivering an additional 1 million tonnes of annual carbon savings by 2010.

1.8 Although everyone must take personal responsibility, government clearly has an important role to play through the development and implementation of energy policies that will inspire and spur each and every individual into taking action. During 2006, the UK Government carried out a major review of progress in achieving goals set out in a 2003 White Paper. The review highlighted two major long-term challenges – climate change and security of energy supply.

1.9 The Executive recognises the critical contribution that energy efficiency and microgeneration can play in tackling the issues of climate change and security of supply. While some actions (including regulation of markets) are for the UK
government, the Executive is responsible for promoting energy efficiency and microgeneration – as well as building a vibrant renewable energy sector more generally.

What’s happening to our energy?

1.10 As the economy grows, demand for energy also grows. This has two main consequences:

- Much of the energy is currently sourced from fossil fuels, therefore, increased energy use leads to growing carbon dioxide emissions; and
- At a time when North Sea energy production is declining, increased energy demand accelerates a reliance on imported energy.

1.11 Department of Trade and Industry statistics show that total electricity produced in Scotland for 2005 was approx. 49 Tera Watt hours (TWh) – this is a reduction of approximately 1% from 2002, where electricity produced was 49.6 TWh. The major sources of electricity in Scotland in 2005 were nuclear (38%), coal (25%) and gas (17%). Renewables accounted for 13% and oil for 6% of electricity generation. Total electricity consumption in Scotland for 2005 was 35.6 TWh.

1.12 As part of the Scottish Energy Study series, the Executive has commissioned research to examine potential patterns of energy supply and demand in Scotland in 2020 and to project the possible energy picture for Scotland in 2050. Assumptions will be made about the factors that affect energy demand, as well as factors that could affect Scotland’s future energy mix. These assumptions will provide information on the potential carbon dioxide emissions associated with the various scenarios and will allow consideration of where further action is needed. This data will be presented in Volume 5 of the Scottish Energy Study which will be published during 2007.

Saving more energy

1.13 Improving energy efficiency is widely recognised as the easiest and most cost–effective means of reducing carbon dioxide emissions. The financial benefits of doing so are clear – industry and society can achieve more with less energy, public services are delivered at lower cost, and fuel poverty is reduced. Better insulated buildings and more energy efficient workplaces cut energy bills for householders and businesses. Reducing demand also puts less pressure on energy supplies.

1.14 Scotland is reducing its overall carbon dioxide emissions. Recent figures show that Scotland’s net carbon dioxide emissions have fallen by 14% since 1990, from 17.6M tonnes of carbon in 1990 to 14.86M tonnes of carbon in 2004. This reduction is more than any other part of the UK and of 14 of the 15 Member States that signed up to the EU Kyoto agreement. Despite the progress being made,
Demand for energy continues to rise and the scope for reducing energy consumption and carbon dioxide emissions is still significant. The residential and transport sectors have shown the most significant growth in energy consumption and carbon dioxide emissions, however, these sectors are also the most difficult to tackle as they involve a behavioural change for millions of individuals.

1.15 Residential energy is used to heat and light buildings, and to power appliances. The rise in energy use is partly due to changing social trends, such as an increase in the number of households where people are living on their own. But we are also still using far more energy than we need, for example:

- Energy is often wasted because of poorly insulated existing buildings or where heating, ventilation, air conditioning and lighting are poorly controlled;
- Products are less energy efficient than they could be – for example, the average upright freezer on the market today uses nearly three times as much energy as the most efficient one;
- Energy saving light bulbs use less than a quarter of the energy of ordinary light bulbs, and can last up to twelve times longer, but few people use them;
- Lights are left on in rooms when they’re not being used;
- Appliances are left on stand–by rather than being switched off; and
- Rising wealth is leading to greater energy consumption through the proliferation of energy intensive consumer goods and services, such as digital set top boxes, plasma TVs and home computers.

1.16 However, many individuals and organisations do not fully realise the benefits that can be achieved through simple energy efficiency measures. This strategy identifies how the Executive will encourage more households, the public sector and businesses to take up those opportunities, and outlines a package of policies and measures to drive an increase in energy efficiency across these sectors of the economy.

Whose Responsibility?

1.17 There is clear direction from Europe to set ambitious and realistic targets for tackling climate change and improving energy efficiency. The EU Energy Efficiency Action Plan published in October last year and the European Commission’s recent Strategic Energy Review (January 2007) highlight a number of priorities which are closely aligned with the Executive’s policies for tackling climate change and improving energy efficiency. These propose:

- Setting targets to reduce greenhouse gas emissions by 30% by 2020; and
- Improving energy efficiency by 20% by 2020.
Case Study – European Action on Energy Efficiency

Following the publication of the European Commission’s Green Paper on “A European Strategy for Sustainable, Competitive and Secure Energy”, the 2006 Spring European Council called for the adoption, as a matter of urgency, of an ambitious and realistic Action Plan for Energy Efficiency. The resulting EU Energy Efficiency Action Plan was presented and adopted in October 2006. It outlines ten priority actions to put Europe on track towards achieving at least the 20% cost-effective energy savings potential by 2020 through a range of measures to overcome barriers to improvement. These include:

- appliance and equipment labelling;
- minimum energy performance standards;
- better building performance requirements including low energy buildings;
- making power generation and distribution more efficient;
- financing of energy efficiency investments for small and medium sized businesses;
- use of taxation; and
- raising energy efficiency awareness.

1.18 Scotland has a key role to play in delivering and achieving these European targets and we will make our contribution. The Executive has devolved responsibilities for the promotion of energy efficiency and takes on the challenging role of changing behaviour through raising awareness and providing advice and financial incentives to improve energy efficiency across the public, business and domestic sectors. This Strategy therefore focuses on what the Executive and its partners in Scotland can do to contribute to European and UK targets.

1.19 The UK Government is responsible for measures that relate to regulation, appliance labelling, mandatory obligations, and energy services. The Executive already works closely with the UK Government on these issues, and will continue to do so, to ensure that Scottish interests are represented. (The Executive is, for example, ensuring that the White Paper which will follow the recent Energy review reflects Scottish interests.) UK-wide measures that have an impact in Scotland are outlined in Annex A.

Creating more clean energy

1.20 Energy Efficiency will help to reduce carbon dioxide emissions, but not on its own. Changing Our Ways – Scotland’s Climate Change Programme points out that the energy sector contributed 37% of Scottish greenhouse gas emissions (excluding removals) in 2003. In order to move to a low carbon economy, more clean energy must be created. Most of our electricity is generated in large power stations, and around three quarters of the heat that is used comes from gas fed through a nationwide network. Both electricity distribution and gas networks are optimised for a one-way flow, from a small number of entry points out to industry and buildings. This centralised model delivers economies of scale, safety and reliability.
1.21 There are a number of ways of producing heat and electricity for a home, housing development, industrial site or local community, and potentially towns and cities, and of connecting these sites through small-scale electricity or heat networks. ‘Distributed energy’ or ‘decentralised energy’ is a broad term used to describe this model. Its essence lies in generating energy near where it is used. It can include a range of technologies, such as microgeneration, Combined Heat and Power (CHP) plants, biomass boilers, solar thermal panels, geothermal energy and heat pumps.

1.22 A distributed energy system using these technologies could radically change the way our energy needs are met in the long-term and it could lower emissions, increase the diversity of energy supply and, in some cases, lower costs. However, many of these technologies are still emerging and there are a number of significant barriers preventing more widespread investment in distributed generation – including a range of financial, technical and practical issues, low awareness and a lack of reliable information on their future potential.

1.23 The Executive is keen to make progress to develop its long-term potential for Scotland and understand the challenges faced in getting there. There is much to learn from the Scandinavian countries where distributed generation works well, for example, 50% of Denmark’s power comes from decentralised energy, and 90% of Helsinki is heated by district heating. The UK Government, in conjunction with Ofgem, is currently undertaking a comprehensive review of the potential of distributed energy as a long-term alternative or supplement to centralised generation, looking at the incentives and barriers that impact on distributed electricity generation including CHP. The review is expected to report in the first half of 2007, and the Executive will use these findings to help take forward the potential for Scotland. As decentralised energy includes more than just microgeneration, this much larger piece of work is being carried out separately to this Strategy.

1.24 The Executive has already started to make a difference. Some low carbon technologies, such as microgeneration, are suitable to power an individual home or a community. In the chapters that follow, this Strategy outlines steps the Executive is taking, and will take, to further increase awareness, demonstrate potential, help to remove some of the barriers and encourage more widespread take-up across the domestic, public and business sectors.

Creating more clean energy on a small-scale

1.25 Microgeneration can make a significant contribution to tackling climate change, ensuring reliable energy supplies and helping to tackle fuel poverty. It can provide a sustainable source of low carbon energy and help to reduce carbon dioxide emissions from homes, small commercial buildings and community buildings, such as leisure centres and schools.
1.26 Microgeneration can also have a wider impact: Increasing awareness and engaging the public in tackling climate change. The attractiveness, visibility and personal nature of microgeneration installations, especially those in the community, can help stimulate the potential for home generation and encourage more energy efficient behaviour. Its use in schools can create an enhanced understanding of energy issues and climate change amongst future generations, helping to influence future behaviour patterns. Microgeneration technologies could also help to tackle fuel poverty, particularly for those households that are harder to help through traditional energy efficiency methods or who are not connected to the gas grid.

Case Study - What is Microgeneration?
This Strategy refers to both "microgeneration" and "microrenewables". Microgeneration is widely defined to be the small-scale production of heat (less than 45 kilowatt thermal capacity) and/or electricity (less than 50kW electrical capacity) from zero or low carbon source technologies. The suite of technologies caught by this definition includes solar photovoltaics (PV) to provide electricity and thermal to provide hot water, micro-wind (including rooftop mounted turbines), micro-hydro, heat pumps, biomass, micro-combined heat and power (micro-CHP) including small-scale fuel cells. The definition of microrenewables is principally the same, however it excludes those technologies which are not purely from renewable sources (e.g. small scale fuel cells, heat pumps and micro CHP). The Executive supports the full range of microgeneration technologies as different technologies are suited to different circumstances, conditions, and purposes.

1.27 The Executive supports the full range of renewable generation technologies, including microgeneration, to enable Scotland to realise its considerable renewable energy potential. The Executive has set a target of generating at least 40% of Scotland’s electricity demand from renewable sources by 2020 (an estimated 6 gigawatts of renewable capacity). The importance of using clean and sustainable energy from renewable sources will continue to increase as a result of the need to tackle climate change and ensure secure and diverse energy supplies. Microgeneration will play a part in helping to meet that target.

1.28 The built environment, including domestic, commercial and industrial premises, accounts for over 40% of our carbon dioxide emissions. Microgeneration could reduce this figure by providing low carbon sources of heat and electricity. The markets for microgeneration technologies are still in the early stages of development, therefore they may not have a significant impact on reducing emissions by 2010, but they will be particularly significant in meeting longer term emissions targets. Recent research suggests that, by 2050, widespread installation of microgeneration could provide 30–40% of Scotland’s electricity needs and help to reduce household carbon dioxide emissions by 15% per year.

1.29 There are still a number of barriers to overcome before the full potential of microgeneration can be realised. These include financial costs, availability, a limited
knowledge of the benefits and cost effectiveness of various technologies, and a range of planning and technical issues. The Executive is, therefore, putting in place a range of measures to encourage the uptake of microgeneration, develop the market and provide significant business opportunities for Scotland.

1.30 To address the lack of reliable information on the future potential of microgeneration in Scotland, the Executive is carrying out further research to ascertain its true potential. In addition, a wide range of other actions are required and will involve the Executive and its agencies, the Enterprise Networks, local authorities, UK Government, Ofgem and the microgeneration industry to work together to address these constraints. This strategy sets out the work that the Executive is doing and will do in the future to address these barriers and to help support and develop microgeneration in Scotland. All of this work will help to set microgeneration targets for Scotland which the Executive will do during 2007.

1.31 To date, the Executive’s support for microgeneration, and renewables in general, has tended to focus on the generation of electricity and it is now considering what is needed to support the promotion of renewable heat. This is critical because it is estimated that, in the residential sector, 80% of energy used goes towards heating and the potential to reduce emissions is therefore significant. In addition, Scotland has significant forestry & agricultural resources and is well placed to become a major player in renewable heat and biomass production. In recognition of the importance of the renewable heat sector to Scotland, the Executive is separately developing a Renewable Heat Strategy, which is due by the end of 2007. This will cover a wide range of potential technologies including biomass, ground source heat pumps, solar water heating, geothermal energy, energy from waste, anaerobic digestion and landfill gas.

What about transport?

1.32 Transport is an essential part of economic activity, but this activity produces carbon dioxide emissions – it has an impact on the local, national and global environments. In 2002, transport accounted for around 29% of energy use in Scotland.

1.33 Key trends include: the continuing growth in travel, particularly by air and road and the growing contribution this makes to Scotland’s carbon dioxide emissions; changes in international trade; changes in land use patterns and lifestyles and changes in demographics and health.

1.34 The challenge therefore, is to develop transport systems, both infrastructure and services, in new ways which accept at the outset that there is a carbon imprint to transport which must be addressed. The Executive published the National Transport Strategy for Scotland during December 2006. This sets out the Executive’s plans for taking forward Scotland’s transport services over the next twenty years. The Strategy
is based around three key strategic outcomes: improving journey times and connections, reducing emissions and improving accessibility, quality and affordability.

1.35 Developing Scotland’s transport infrastructure and delivering against these key strategic outcomes poses challenges for Scotland, especially for reducing or limiting carbon dioxide emissions from the transport sector. The National Transport Strategy sets out a number of policies aimed at reducing carbon dioxide emissions. These include:

- Maintaining commitments to the Renewable Fuels Transport Obligation;
- Enhanced sustainable freight distribution strategies;
- Better land use planning; and
- Programmes aimed at influencing travel behaviour and the promotion of more sustainable transport options e.g. travel planning, consumer transport advice and eco-driving campaigns.

1.36 Although these activities aim to reduce carbon dioxide emissions, the National Transport Strategy recognises that there are a number of transport policies that could have a negative effect on reducing emissions. The Executive will, therefore, present a “carbon balance sheet” for monitoring and reviewing progress being made against all transport policies – not just those that reduce emissions. As the impact of the transport sector on emissions is being looked at on the whole as part of the implementation of the National Transport Strategy, the transport sector is not discussed any further here.

**Energy and equality**

1.37 In promoting energy efficiency and microgeneration, the Executive is committed to ensuring that support provided meets equality objectives. An equality impact assessment of the Strategy is currently being carried out. We do not anticipate the Strategy itself having a discriminatory impact but we need to ensure that programmes of support are equally available. Work carried out so far has highlighted the need to improve data on uptake and the Executive is working to improve data collection. This will help identify, for example, whether delivery mechanisms require to be redesigned in any way.

1.38 As later chapters of this Strategy set out, some existing programmes are already expressly directed to groups who are in fuel poverty. But the Executive must ensure that broader programmes of information and advice are designed and delivered so as to meet equality objectives. The Executive will publish further details of how it will meet these objectives during 2007.
**What next?**

1.39 The chapters that follow set out the measures in place and the steps we will take to improve energy efficiency and encourage investment in microgeneration technologies across the domestic, public and business sectors. The final Chapter highlights how the Executive will implement the Strategy through the development of an Action Plan.
Chapter 2
Energy use in Scotland

2.1 The supply of energy is essential to heat and light homes, deliver public services, run businesses, power appliances and to transport goods and people. This Chapter outlines some key facts on energy use and carbon dioxide emissions in Scotland. Unless otherwise stated, data from the Scottish Energy Study is used to provide information on how energy use has changed in recent years. In some cases, the most recent comparisons are for 2002, therefore, we have commissioned further research to update these figures for the most recent available data (2004), and this will become available during 2007.

2.2 In 2002, Scotland consumed approximately 176 terawatt hours (TWh) of energy resulting in emissions of around 12.02M tonnes of carbon. In addition, Scotland generated a further 8 TWh of electricity, which was exported to England, Wales and Northern Ireland. Figure 2.1 shows the domestic sector as the largest energy consumer, with the transport sector second, and the industrial sector (including primary and secondary industries) third. The services sector (including service industries and the public sector) consumes the lowest amount of energy.

![Energy consumption by sector (2002)](image)

2.3 Compared to 1990 (the only previous year in which comprehensive energy data for Scotland is available), overall energy consumption is very similar – Scotland consumed approximately 180 TWh, which was responsible for around 12.56M tonnes of carbon equivalent. Despite these similar headline figures for overall energy consumption, there are substantial differences in the fuels that are used and the sectors that are using them.
2.4 Recent figures show that Scotland’s net carbon dioxide emissions (taking account of emissions and removals due to land use) have fallen by 14% since 1990, from 17.6M tonnes of CO₂ in 1990 to 14.86M tonnes CO₂ in 2004 (see Figure 2.2).

![Figure 2.2 Greenhouse gas emissions in Scotland (tonnes carbon equivalent)](source)

2.5 Scotland’s carbon dioxide (CO₂) emissions have fallen in recent years in relation to a rise in GVA, as shown in Figure 2.3. An Index of CO₂/GVA where both measures are indexed to 2003 at a value of 100 shows a fall of 31% from 1990 to 2004. (The CO₂ emissions data does not include that relating to land use as sources and sinks from land use CO₂ are not considered to relate to economic activity).

![Figure 2.3 CO₂ emissions and GVA in Scotland](source)
2.6 In 1990, final energy use was dominated by oil-based fuels (46%) with gas at 28% of total supply, however since then, there has been a large decline in the use of solid and oil-based fuels and a growth in the use of gas, electricity and renewable energy. In 2002, oil and gas were the major forms in which energy was consumed (both at 37%), with 21% of energy consumed coming from electricity, and the remainder from solid fuels and renewables. The changes in fuel use are detailed below:

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>1990</th>
<th>2002</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity – Renewables</td>
<td>0</td>
<td>3</td>
<td>–</td>
</tr>
<tr>
<td>Electricity – Other</td>
<td>25.5</td>
<td>34.2</td>
<td>+34%</td>
</tr>
<tr>
<td>Gas</td>
<td>49.1</td>
<td>63.5</td>
<td>+29%</td>
</tr>
<tr>
<td>Oil based</td>
<td>80.8</td>
<td>71.1</td>
<td>+12%</td>
</tr>
<tr>
<td>Solid</td>
<td>24.2</td>
<td>4.2</td>
<td>-83%</td>
</tr>
<tr>
<td>Total</td>
<td>179.6</td>
<td>175.9</td>
<td>-2.0%</td>
</tr>
</tbody>
</table>

Table 1 – Comparison of energy consumption in Scotland by fuel type and by sector, detailed as TWh of total consumption for each year and percentage change between years.

2.7 From a sectoral perspective, energy consumption has grown in the domestic and transport sectors in the last 12 years, and these are now the top two energy users. Demand has also increased slightly in services but has reduced significantly in industry. The comparisons are shown below:

![Figure 2.4 – Energy Demand by sector, 1990 comparison with 2002](image)

2.8 In 1990 the industrial sector in Scotland was the largest consumer of energy (35%), whereas in 2002, the sector dropped to third position consuming 26% of total energy in Scotland. This represents a decline of more than 9% relative to total consumption, and a decline of 26% relative to 1990 industrial consumption.

2.9 Changes in the patterns of energy consumption can be attributed to a variety of factors, including changes to the urban and rural mix of the population, fuel/transport switching, behavioural changes and changes to the industry base, for
example, the economy is moving away from traditional heavy engineering and manufacturing industries and is seeing a growth in the less energy intensive service-type businesses.

2.10 Domestic sector consumption is rising more rapidly than the rest of the Scottish economy and is now the single largest energy user – in 2002 the sector accounts for 34% of all energy use. Scottish domestic energy use per capita is higher than the average for the UK. Energy used in the domestic sector in Scotland accounts for over 10% of the total UK domestic consumption, however Scotland only has 8.5% of the UK population. This is because Scotland has a colder climate, fewer useable daylight hours and fewer homes with access to the gas grid. Although gas is more limited than in the rest of the UK (25% of homes in Scotland are without a mains gas supply), it is still the main fuel used, currently meeting over 60% of the sector’s energy demand.

2.11 Heating and lighting buildings consumes a significant proportion of energy used in the domestic sector – typically about 60% of energy is consumed in space heating, 20% for heating water and the remainder for domestic appliances and lighting. Although reductions have been made in energy use through more efficient heating systems and better insulation, this is often offset by an increased demand for new electrical appliances. Appliances and lighting currently show the greatest growth in domestic energy use (mostly as electricity), currently growing at around 2% per annum.

Figure 2.4 – UK electricity consumption by household domestic appliances by type
(Source: DTI Energy Consumption In The United Kingdom and the Environmental Change Institute)
Typical appliances found within each broad type include: Lighting (light bulbs, fluorescent strip, halogen bulbs, incandescent bulbs, etc); Cold (fridge freezer, refrigerator, etc); Wet (washing machine, dryers, dish washer, etc); Brown (TV, video/DVD players, set top boxes, telephone chargers, etc); Cooking (electric ovens and hobs, microwaves, kettles, toasters, etc); Miscellaneous (central heating pumps, DIY equipment, garden equipment, hair care equipment, etc).

2.12 Overall electricity consumption due to household appliance use has increased over the last thirty years. As figure 2.4 shows, electricity consumption across a range of products has increased. This can be attributed to a number of factors, including the increase in the amount of appliances owned and the introduction of standby features on some electronic goods. The increase in lighting energy consumption has been mainly due to the shift away from rooms lit by single ceiling bulbs towards multi-source lighting from wall and table lamps as well as multi-ceiling lights. The recent fall in energy consumption from the late 90’s can be attributed to the introduction of increased energy efficient appliances and energy labelling.

Conclusion

In Scotland:

- In 2002 the domestic sector was the largest energy consumer (34%), transport sector was in second position (29%), and the industrial sector in third position (21%). The services sector, which includes the public sector, consumed the lowest amount of energy (16%).
- Although total energy consumption has not changed between 1990 and 2002, there have been substantial differences in fuel use and the amount used by different sectors – domestic sector consumption is rising more rapidly than other sectors and the industrial sector has fallen from being the largest consumer in 1990 to third position in 2002.
- Scotland’s carbon dioxide emissions are falling, net emissions in 2004 fell by 14% since 1990 levels. This is despite a rise in GVA.
- Overall electricity consumption due to household appliance use has increased over the last thirty years.
Chapter 3
Changing our behaviour

3.1 Governments can require action: of energy suppliers, of house builders and of consumers of energy. But we will be most successful where users of energy themselves recognise the benefits of reducing their energy use and changing their behaviour. The key challenge for the Executive is to lead this change in culture and behaviour.

3.2 The Executive’s awareness raising campaign – It’s Our Future – aims to ensure the sustainable development message is clear and easily understood. It encourages more people to take action now to make Scotland, and the wider world, a more sustainable place for future generations.

Case Study – Save Your 20% Campaign

The Energy Saving Trust’s (EST) ‘Save your 20%’ consumer campaign spells out the ten simple steps that everyone can take to become more energy efficient, and how the average Scottish household could save up to £300 a year on its energy bills:

1. Turning your thermostat down by 1°C could cut heating bills by up to 10% and save around £30 a year.
2. Is your water too hot? Your cylinder thermostat shouldn’t need to be set higher than 60°C.
3. Close your curtains at dusk to stop heat escaping through the windows.
4. Always turn off the lights when you leave a room.
5. Don’t leave appliances on standby and don’t leave appliances on charge unnecessarily.
6. If you’re not filling up the washing machine, tumble dryer, or dishwasher, use the half-load or economy programme.
7. Only boil as much water as you need (but remember to cover the elements if you’re using an electric kettle).
8. In just one day, a dripping hot water tap wastes enough water to fill a bath. Make sure they’re turned off.
9. Replace your light bulbs with energy saving recommended ones: just one can reduce your lighting costs by up to £78 over the lifetime of the bulb – and they last up to 12 times longer than ordinary light bulbs.
10. Do a home energy check. Just answer some simple questions about your home and we’ll give you a free, impartial report telling you how you can reduce your household energy bills.
Today’s Picture

3.3 The Executive funds a range of information and advice programmes designed to deliver greater energy efficiency across the domestic, public and business sectors throughout Scotland. The budget for these is currently some £10 million. The organisations through which support is currently provided are the Energy Saving Trust and the Carbon Trust.

3.4 For small and medium sized businesses we have a dedicated Business Advisor Network which is exclusive in Scotland. SMEs often experience difficulties in accessing the right information, or need additional more targeted ‘hands-on’ help in learning how to make their business more energy and resource efficient. The advisors provide a range of free services including telephone and face to face advice, energy audits and reports, and signposting to appropriate sources of funding or further specialist support.

3.5 In 2005–06, advice and support was provided through the entire range of programmes to:

- 80,000 householders in Scotland producing lifetime savings of 524,000 tonnes of carbon and financial savings of £24 million;
- Over 350 SMEs providing nearly 6000 tonnes of lifetime carbon savings and financial savings of over £2.5 million; and
- Over 500 business and public sector organisations through on-site energy audits and carbon management programmes for large energy users. These identified total lifetime savings of 330,000 tonnes of carbon, which represents a financial saving of around £38m.

(this data has been verified through formal evaluations undertaken by the Carbon Trust and Energy Saving Trust).

3.6 Taken together, these programmes are predicted to produce lifetime savings of over 500,000 tonnes of carbon by 2010. Although this is real progress, there is more to be done if we are to meet our ambitious carbon savings target outlined in Scotland’s Climate Change Programme.

Next Steps:
Information and Advice

3.7 The Executive will introduce a ‘one-stop-shop’ approach to advice and support for householders covering energy efficiency, transport and renewable energy. This will build on and enhance the work of the current Energy Efficiency
Advice Centres (EEAC) and will target more customers, offer a more pro-active, customer focused service, with a greater emphasis on the implementation of advice and ambitious carbon savings targets. It is estimated that this approach could produce over 400,000 tonnes lifetime carbon savings compared to the current performance of over 100,000 tonnes of carbon – an additional saving of over 300,000 tonnes. During 2007, the Executive will work with interested and affected parties, such as the Energy Saving Trust and the EEAC network, and take account of any research findings (including those arising out of the work described under paragraph 3.18) to develop the one stop shop approach for householders.

3.8 The Carbon Trust’s Carbon Management Programme will help more public sector organisations to demonstrate leadership in investing in carbon-saving measures. Carbon management typically results in a 10–15% reduction in carbon dioxide emissions – for local authorities alone this could identify savings of 30–45,000 tonnes of carbon per annum in 2010, equating to financial savings of between £10–15 million. To date, 10 out of 32 local authorities have participated in the scheme. By 2009 the Executive wants all of the remaining local authorities to be taking part in the programme.

Case Study - Aberdeen City Council does Carbon Management Programme

Aberdeen, Scotland’s third largest city with a population of around a quarter of a million, was one of the first authorities to seize the opportunity to participate in the Carbon Trust’s Local Authority Carbon Management Programme. With the help of the Carbon Trust, Aberdeen City Council calculated its baseline carbon dioxide emissions from 2002/3 – 62,000 tonnes of carbon, which was costing the council £7.7 million a year – and set an ambitious but achievable target to lower its emissions to 58,000 tonnes per annum within 5 years, reducing the costs to £6.9 million a year. With an initial investment of £183,000 to integrate energy efficient and sustainable technologies into its public and corporate buildings, Aberdeen City Council was able to begin saving £93,000 per year – a payback of less than 2 years. One combined heat and power project was particularly successful, making a 50% saving in energy. The council’s success with the programme has changed the way it procures its supplies – not always going for the most inexpensive item, but the one with the best life cycle costing – and truly strengthened its commitment in lowering greenhouse gas emissions.

3.9 The Executive is fully committed to helping businesses to reduce their energy consumption and their carbon dioxide emissions. In doing so, they will improve their cost-effectiveness and make a contribution to tackling climate change.

3.10 The Executive challenges all businesses to do their bit in helping to tackle climate change, from the large energy intensive users to the small office based company. Implementing energy efficiency measures can cut energy bills and improve business growth, profitability and competitiveness. It is estimated that around £250 million of energy is wasted by Scottish businesses each year. Experience has shown that businesses who adopt a range of simple no–cost and low–cost energy reducing measures can typically save 20% on their fuel bills. For those who invest in energy
efficient equipment, such as condensing boilers, compressors or variable speed drives, savings can be even greater – in some cases in excess of 30%. This represents a financial saving of more than £50 million pounds per annum.

Case Study – Tips from the Carbon Trust - How can business save energy and money?

Switch off lights and office equipment when not being used:

- Lighting an office overnight wastes enough energy to heat water for 1000 cups of tea.
- A photocopier left on overnight uses enough energy to produce over 1500 copies.
- Leaving a PC monitor on all night wastes enough energy to microwave six dinners.
- Switching off non-essential equipment in an office overnight saves enough energy to run a small car for 100 miles.
- An average office wastes £6,000 each year by leaving equipment on over weekends and bank holidays.

Check equipment regularly:

- If heating equipment is not checked, it could add as much as 10% to heating bills without knowing it.
- If a motor isn’t working at its most efficient, it can add 5% or more to energy costs.
- Most businesses using compressed air can save up to 30% simply by fixing any leaks.
- A compressed air leak the size of a match head wastes enough energy in a working day to toast 444 slices of bread.

Manage equipment better:

- Installing newer, more efficient systems with good controls can often halve existing lighting costs but even good practice and maintenance of existing systems can often provide lighting energy savings of 30%.
- Managing office equipment effectively can reduce their energy consumption (and therefore cost) by up to 70%, often at little or no extra cost.

Financial incentives for SMEs

3.11 The Executive recognises that it is more difficult for smaller companies to make the upfront investment that will help them make more energy savings. Loan Action Scotland therefore helps SMEs become more energy efficient by providing interest free loans to invest in technology and activities that allow them to reduce their energy consumption. The Executive has invested over £2m in the initiative since it was launched in 1999. This has helped over 120 companies to realise financial savings of nearly £7 million and lifetime carbon savings of 37,000 tonnes (this is over and above the savings detailed under paragraph 3.5).
3.12 The Executive recently carried out an evaluation of Loan Action Scotland to assess its impact, effectiveness and value for money. The report is due to be published in March 2007 and the review concluded that it is highly rated by business and has a high degree of customer satisfaction:

- Over 80% of recipients felt that the loan has resulted in increased competitiveness for their business;
- Demand has grown year on year – almost £1m in loans to over 50 Scottish businesses is expected in 2006. These are the highest figures achieved to date;
- The provision of energy audits adds value to the scheme and is popular with business;
- Nearly all businesses felt that the impact of implementing energy efficiency measures was as expected or greater than anticipated; and
- The real impacts of the scheme are almost certainly underestimates as businesses implement a number of no-cost, low-cost energy saving measures as a result of participation which are not accounted for.

3.13 The loan scheme is providing essential support to business to help with energy efficiency improvements. The review, however, did highlight that although rural areas in particular have benefited from the scheme, take-up in urban areas has been low.

3.14 The Executive wants to see more businesses, especially in urban areas, take responsibility and take action to reduce their energy consumption and carbon dioxide emissions. Therefore, over the next two years, the Executive will commit up to a further £2 million to support the loan fund and a pro-active marketing campaign to raise better awareness. This funding package is made up of monies from the Executive and European Structural Funds. As it is a revolving loan fund, all monies will be recycled back into the fund to support further business investments in energy efficiency. Along with the original fund, this additional funding could achieve in the next 2 to 3 years:

- A further 180 loans;
- Lifetime carbon savings of 60,000 tonnes; and
- Financial savings of at least £10 million.
3.15 For business in particular, energy efficiency is just one part of a wider picture of resource efficiency. The Executive’s green jobs strategy, which was published in 2005, made a commitment to ensure that businesses are aware of potential resource efficiency gains. Action has already been taken to improve the services offered, for example:

- The Executive provides support to SEPA for the NetRegs website. This is a free resource designed to help small businesses by giving them specific details of the environmental legislation affecting their areas of business;

- Business Gateway advisers now undertake business efficiency training, as part of their continuing professional development, to improve their ability to signpost companies to specialist support; and

- Free energy and waste audits are offered to all companies that apply for a Regional Selective Assistance (RSA) grant. Recipients of grants of over £1 million must engage with the Executive and its agents in considering the environmental, waste and resource issues connected with the project.

3.16 However, there is more that could be done to make it easier and clearer for business to access advice and support. The Executive is investigating the effectiveness of the way that resource efficiency initiatives are provided to business and this review will report during 2007.

3.17 The Executive wants everyone to have access to information on the most appropriate and relevant energy saving actions for them, that they can take as quickly and easily as possible. The Executive also wants to ensure that the support and funds it provides are well targeted. At the moment, in addition to the services offered by the Energy Saving Trust and Carbon Trust, there is a range of advice provided by, for example, independent organisations, voluntary groups, charities and energy supply companies. This can lead to confusion – individuals and organisations don’t know where to go for help, what actions they should take or what impact those actions have on carbon dioxide emissions and the environment.

3.18 The Executive has therefore commissioned an independent review of energy efficiency and microgeneration support in Scotland. The review is due to report during summer 2007 and it aims to provide evidence on both:

(i) The effectiveness of the process and framework of energy efficiency and microgeneration advice; and

(ii) The impact of the policy in terms of outcomes e.g. value of carbon savings achieved, changes in behavioural attitudes towards energy efficiency and microgeneration, etc.
It will look for any gaps, overlaps, duplication or unhelpful competition; any barriers to effectiveness; and it will identify examples of best practice from within Scotland and from the rest of Europe and the World that can be learned from.

3.19 The Executive will use the results and recommendations of the review, and working with partners, will take action to improve the delivery of energy efficiency and microgeneration support in Scotland to ensure that support is cost-effective, is targeted appropriately and helps to achieve the reduction in carbon dioxide emissions that is so needed. The Executive will publish proposals for achieving this once the review has reported.

But adults are not our only audiences. It starts at school……

3.20 The Executive recognises that initiatives that educate and encourage young people to save energy are key for the creation of sound long-term energy aware behaviour – for the young people themselves and also for the influence that they can exert on the behaviour of their families. The Executive is supporting a number of initiatives to increase young peoples’ awareness and engagement with climate change issues, including: a poster campaign with the Sunday Mail; and a partnership with ScottishPower and Learning and Teaching Scotland to deliver screenings and a package of educational curriculum materials, based on the Al Gore film “An Inconvenient Truth” to Scotland’s secondary schools.

3.21 The Executive currently supports the Eco Schools initiative which is an international programme designed to encourage whole-school action for the environment. There are over 2,000 schools registered with the Eco Schools Programme in Scotland and over 300 of these schools have attained the highest award level – the Green Flag. There is an ambitious UN target for 80% of schools to be registered by 2008 – Scotland has already achieved this target. The Executive wants to see every school registering on the Eco Schools Programme and striving for the Green Flag award. The Eco Schools Programme provides an environmental management tool, learning resource and recognised award scheme. It incorporates eight environmental topics, one of which is energy. The Executive wants to build on the work of the Eco Schools Programme and do more to raise the profile of energy efficiency and microgeneration. We will therefore develop more focussed education and awareness programmes aligned to the Eco Schools initiative during 2007.
Conclusion

As set out in this section we will:

- Introduce a one stop shop approach to advice for householders on energy efficiency, sustainable transport and renewable energy.
- Ensure that all local authorities have taken part in the Carbon Trust’s Carbon Management Programme.
- Commit up to a further £2 million to a loan fund for small and medium sized businesses.
- Review energy efficiency measures to address any gaps or duplication so that publicly funded support is as effective as possible.
- Encourage every school to work towards becoming a Green Flag Eco School.
Chapter 4
Knowing what we use

4.1 The previous chapter looked at how we raise awareness of the benefits of reducing energy use and at the advice and support that is available to identify energy saving measures. But at home, at work and on our travels our energy use will change if we know how much energy we are using and if we have good information on the energy which different products consume.

Better information about our energy use

4.2 More accurate billing methods coupled to new technologies, such as real-time displays and smart meters, can provide more accurate information about energy use in buildings, whether homes, work places or parts of the public sector estate such as schools. They can help improve awareness of energy use and can lead to behavioural changes that will help to reduce energy consumption.

For example:

1) Improved billing – providing more frequent and accurate bills, and displaying more detailed information, such as comparing energy use in the current period to energy used over previous periods, could offer a better incentive to consider and monitor energy use.

2) Real-time displays can provide direct, instant information on electricity use and cost by transmitting information from the electricity meter to a portable display.

3) Smart meters can provide instant updates on energy use and allow remote reading, thereby ensuring accurate energy bills. Smart meters can also be used with variable tariff structures for electricity consumption, for example, to discourage electricity use during peak periods. Those with an “import-export” facility can also allow consumers with microgeneration installations to sell spare electricity to the grid.

4.3 The recent UK Energy Review 2006 concluded that improvements to billing, the provisions of energy efficiency advice and the use of smart meters could help to reduce carbon dioxide emissions from households by just over 300,000 tonnes of carbon by 2010, rising to 400,000 tonnes of carbon by 2020.
4.4 There are a number of trials of different approaches to billing and metering being carried out across the UK. These aim to compare different options, test some of the technical issues, ascertain their potential for financial and energy savings and demonstrate their cost effectiveness. A major pilot taking place across the whole of the UK, involving a partnership between DTI, Ofgem and the energy supply companies, is due to commence in 2007 and more details will be available from April. If this pilot raises any specific issues for Scotland, the Executive will carry out further work to ensure that Scottish circumstances are addressed.

Case Study – Smarter homes

Changing people’s behaviour with respect to energy consumption is a key element in reducing the UK’s carbon dioxide emissions, which is why the Government has launched the Energy Demand Reduction Pilot - a study on the use of smart energy meters and feedback devices. The £9.75 million pilot, managed by Ofgem, focuses primarily on the domestic sector, with the aim of influencing and sustaining behavioural change in relation to energy conservation. Not only will advanced types of smart meters be trialled, but energy efficient behaviour will be encouraged through additional information on bills (e.g. historical or comparative), visual display units that work off existing basic energy meters, as well as audits, advice, reward schemes, tariff changes, and promotional activities. The pilot will test out a number of different types of smart meters, including ones with in-house displays, ones that can be dialled remotely, and pre-payment meters. It aims to show that people will take a more active role in reducing their energy consumption when they can see in monetary terms just how much energy is consumed through appliances, lights, and heating.

Next Steps

4.5 The public sector can suffer from significant energy waste from buildings, for example, through equipment being left on during unoccupied evening and weekend periods. This can add substantially to the energy costs of the site and cause unnecessary carbon dioxide emissions. Scotland’s local authorities have a combined electricity, gas and water expenditure of around £150 million per annum. As billing is often estimated, local authorities can find it difficult to pin-point where that energy is being wasted. Accessing real time data will allow local authorities to quickly identify energy waste and enable them to take prompt action to reduce energy consumption. Research has shown that the introduction of smart meters could bring about savings of up to 30% – a potential saving of over £40 million per year, with the further benefit of a reduction in carbon dioxide emissions of up to 22,000 tonnes of carbon per annum.

4.6 The Executive has therefore launched a pilot programme with the public sector (including a number of Local Authorities and Scottish Water) in Scotland to test the potential of metering technologies. The pilot commenced in February 2007 and will test a range of technologies to monitor electricity, gas and water usage, and will focus on sites such as schools, community centres and other councils properties. This will also ensure the participating organisations act as a group in procuring the
goods and services for the pilot, thus increasing their purchasing power and enabling them to achieve value for money.

4.7 The Executive will use the results from these pilots in the domestic and public sectors, and learn from best practice from the other UK pilots to consider rolling out more advanced displays and smart metering more widely to all homes and across the wider public sector in Scotland.

More efficient appliances

4.8 Making the energy-using products in our homes and businesses more efficient and using them more efficiently, will help to reduce energy consumption and fuel bills, and therefore cut carbon dioxide emissions. Much of the energy used at home and at work goes to power appliances, and if nothing is done, electricity consumption is predicted to rise by 20% between now and 2020. It is estimated that in 2004, 8% of all domestic electricity was used to power appliances on stand–by. The potential for carbon savings is high – if the standards for all the priority products sold in the UK are raised, emissions of around 1.3M tonnes of carbon could be avoided by 2010 and up to 4.7M tonnes of carbon by 2020.

4.9 The Executive wants to see more people using more efficient appliances and to be using those appliances in an energy conscious way. We therefore support education and awareness raising programmes, such as the Energy Saving Trusts Energy Saving Recommended campaign.

Case Study - Energy Saving Recommended

The energy saving recommended logo was developed in 2000 as a way of signposting consumers to the most energy efficient products in the marketplace. The logo guarantees a product will save energy, cost less to run, and help the environment – it’s currently used on over 1,700 products across more than 106 manufacturers and 36 retailers. Approximately 90% of all washing machines sold across the UK are now A-rated, which shows us that attitudes are changing, as more consumers are opting for the environmentally-friendly choice. Dishwashers, tumble dryers, washing machines, and other ‘energy saving recommended’ appliances are not necessarily more expensive than their inefficient counterparts – in actual fact, their prices are quite comparable and they undoubtedly save money in the long run. An energy efficient ‘A-rated’ fridge freezer will save about £35 a year on energy bills – even more if it’s received an A+ or A++ rating. An energy efficient washing machine uses a third of the energy of an old, inefficient model, and cuts water consumption considerably. Using a 40°C wash cycle rather than 60°C will reduce energy consumption by a further third. Considering that 9 out of 10 homes in the UK own a washing machine, and on average use it 274 times a year, the concept of reducing energy consumption in as many ways as possible is becoming progressively more important.
4.11 Buying goods and services have environmental consequences, not just in terms of the energy and other natural resources they consume or their day to day use, but also in their production, transportation and eventual disposal. We need to build the public’s growing awareness of social and environmental concerns, and the influence they have as citizens and consumers. The Executive is working with partners to raise awareness and encourage informed public debate about the environmental and social consequences of the goods and services consumers buy. One approach used for learning how to make more sustainable choices is the ‘ecological footprint’ tool. The Executive is supporting the work of the World Wildlife Fund and partner organisations to roll this approach out in local authorities and schools across Scotland.

4.10 The Executive also supports the work being done to improve the energy efficiency standards of new products and to remove the least energy efficient products from the market, which is generally done at a UK and European level. Several groups of products from the domestic and business sector have been identified as a priority for action:

- Domestic lighting;
- Consumer electronics such as set top boxes, television sets and chargers;
- White goods such as fridges, freezers and washing machines;
- Static electric motors and drives used in machinery such as pumps and fans (as used, for example, in air conditioning systems); and
- Office equipment such as computers, printers and photocopiers.

4.12 The Executive has a leading role to play in setting an example to the rest of the public sector. Sustainability and ‘whole life cycle’ costs are a key feature for all of the goods and services it procures. This includes the procurement of energy efficient office equipment – the Executive currently requires that all office IT equipment must conform to the Energy Star or equivalent. The Energy Star is a voluntary labelling scheme for office equipment which sets aims to identify and promote appliances that meet high energy efficiency standards.
Conclusion

Better information and better products will lay a basis for improvements in energy efficiency. The Executive will support a number of activities to help us gain better access to information on energy use:

- Introducing more accurate billing and metering methods.
- Awareness raising campaigns on energy efficient products and the ecological footprint of goods and services.
- Improving the energy efficiency of a wide range of products.
Chapter 5
Changing our buildings

5.1 The built environment plays a central role in the development and sustainability of our future communities and economies. It is estimated that energy use in buildings is responsible for over 40% of carbon dioxide emissions – the majority of the those emissions arises from heating (80%). The Executive wants those involved in the commissioning, design and construction of buildings – including new housing developments, public sector buildings and commercial premises to incorporate as standard much higher levels of energy efficiency and low carbon technologies within new and existing buildings so as to bring about a reduction in carbon dioxide emissions.

Better building design

5.2 An effective approach to energy efficiency needs to be design led. For example, ensuring that new buildings and changes to existing buildings are energy efficient can be achieved by good, careful design at the outset in order to minimise the total energy demand of the building. Passive measures such as orientation, layout and materials chosen can reduce energy demand even before considering the generation of energy demand from renewable sources. Designing for passive energy efficiency can also minimise on-going maintenance costs.

5.3 Investing in good design to secure beneficial outcomes such as energy efficient, sustainable buildings and showing leadership in this area is a key objective of the Executive’s recently launched statement on Architecture, published during February 2007. It sends out a clear message regarding expectations. It illustrates what can be achieved and outlines how the Executive will create the conditions in which these ambitions can be realised.

5.4 These messages flow through to the Executive’s planning policies which set out how energy efficiency, good design and the incorporation of microgeneration form an essential part of new developments. Energy standards in Scottish building regulations deal with the energy efficiency of the building fabric and services.

5.5 All new development plans and policies must ensure that developers consider onsite generation of renewable energy to reduce predicted annual carbon dioxide emissions. At the design stage, developers must consider the potential for incorporating microgeneration technologies as part of a range of energy efficiency measures to be included in new residential, commercial or industrial developments.
Case Study - Sustainability in Architecture

There has always existed a wealth of architectural talent in Scotland, from the prominent neo-classical designers William Henry Playfair and Alexander ‘Greek’ Thomson, to the legendary Glaswegian Charles Rennie Mackintosh, considered by many to be one of the finest architects of the early 20th century. Converted in 1999 from Mackintosh’s Glasgow Herald newspaper office, ‘The Lighthouse’ is Scotland’s first dedicated national centre for architecture and design, delivering a range of dynamic and innovative programmes, exhibitions, events, and projects. The Lighthouse is currently working in collaboration with the Scottish Executive’s Architecture Policy Unit in implementing ‘SUST’, an initiative which aims to raise public awareness of sustainable design and the contribution it can make in delivering a sustainable future. Elements of SUST include a valuable web resource giving access to information on sustainability, client training and guidance on green principles, and grant funding for community groups. Partick Housing Association was eager to apply for a SUST grant towards the development of a new energy efficient block of flats on Crathie Drive. Developers looked on this as an opportunity to provide new sustainable housing which would reduce tenants’ running costs as well as carbon dioxide emissions. The new housing consists of solar water panels on the roof, two communal condensing boilers, efficient underfloor heating, large south facing windows to maximise use of daylight, and top quality insulation made from sheep’s wool from Yorkshire. Each flat has its own flow heat meter to measure energy usage for billing purposes, and each room has a thermostat to control temperature. It is estimated that this advanced heating system will achieve a 30% saving in energy consumption, even without attributing the savings made by the solar panels.

5.6 To help professionals in the design and construction industry to raise ambition and drive forward standards, the Executive has already:

- Produced a guide to explain the key features, benefits and installation of different microgeneration technologies and to address the associated environmental concerns (This is contained in Planning Advice Note (PAN) 45: Annex on microrenewables). This includes guidance on the siting and design of microrenewables on listed buildings, in conservation areas and on scheduled ancient monuments;

- Supported the SUST programme which aids architects and designers by providing information, resources and guidance on sustainability issues; and

- Established the Scottish Energy Systems Group which provides software support and training to organisations.
Planning Reform

5.7 To further encourage the uptake and realise the potential contribution that microgeneration can make, the Executive:

- **Wants to make it easier to install microgeneration by removing or reducing some of the planning requirements.** A recent research report commissioned by the Executive looking at permitted development rights has recommended, amongst other things, extending these rights in relation to microgeneration. The report recognises there are issues to be addressed regarding siting, design and noise for example. The responses to the consultation on draft Scottish Planning Policy 6: Renewable Energy indicated strong support for microgeneration, however, there were mixed views on using permitted development to encourage greater uptake, with some concerns relating to design and siting. The Executive intends therefore to consult on proposals for using permitted development to facilitate microgeneration during 2007.

- **Recently consulted on Scottish Planning Policy 6 (SPP6) on Renewable Energy which included proposals for adopting a minimum target of 10% reduction in annual carbon dioxide emissions in new developments from the installation of on-site microgeneration energy equipment.** Views were supportive of the proposals, with many respondents suggesting that 10% was too low. The Executive is currently considering the issues raised by the consultation, including the minimum standard, and will include revised guidance in the finalised version of SPP 6 due to be published in 2007.

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**Case Study - Woking Plan**

When world leaders met in Rio de Janeiro in 1992 for the Earth Summit, the seriousness of global climate change was only just starting to enter into the world’s consciousness. Woking Borough Council, in contrast, had already produced its own report on climate change two years prior in 1990, and has continued to be at the forefront of promoting energy efficiency and sustainable development since then. In parallel with Ken Livingstone’s ‘London Plan’, Woking Borough Council has developed its own comprehensive Climate Change Strategy, whereby new developments must be as sustainable as possible and obtain 10% of their energy requirements from renewable sources. This policy, in combination with the energy efficiency measures which the council has been carrying out since 1991, has made Woking Borough Council officially recognised as the most energy efficient local authority in the UK. By 2004, the council had reduced its energy consumption by 49% compared with 1990 levels, and its carbon dioxide emissions by 77%. As a result, Woking has saved approximately £5.4 million in municipal energy and water bills since 1990.
New building regulations

5.8 The **Scottish Building Regulations** incorporate minimum energy standards that apply when a new building is constructed or an existing building is extended, altered or converted. Revised standards will come into effect in May 2007.

5.9 The revised standards will:

- Require new buildings to meet a target level of carbon dioxide emissions and be considered holistically in terms of energy;
- Lead the UK with the most demanding requirements for the thermal insulation of new buildings, extensions and conservatories;
- Require low energy lighting for new dwellings which will be at the best level in the UK; and
- Require condensing boilers for replacement and alteration work in dwellings.

5.10 These energy standards will encourage the incorporation of low and zero carbon technologies, including microgeneration, such as heat pumps, solar water heating and biomass boilers into building design. The standards reflect a key move towards further reducing the energy demand from buildings and exploiting more sustainable energy sources.

5.11 The energy standards were last raised in 2002 and the 2007 revision will deliver further carbon dioxide savings in the region of 18–25% for new dwellings and 23–28% for new non-domestic buildings when compared to current standards. Specific savings will largely depend on the fuel type and the size and shape of each building, but carbon savings are particularly good for those homes heated by electricity.

5.12 In total, the changes made to the energy standards in 2002 and 2007, will help to reduce carbon dioxide emissions from new buildings by over 40%. In most cases these new-build proposals have the capability to deliver the best carbon savings of any standards in the UK. Further revisions to the energy standards in Scottish building regulations will be made on a four-yearly cycle.

5.13 In terms of comparisons with European counterparts, the revised standards for new dwellings have thermal insulation levels that appear to be close to the current Finnish equivalent. This is despite the fact that winter temperatures in Helsinki are significantly lower than those in Scotland. For example, Helsinki averages minus 7 degrees Celsius in February (sometimes recording around minus 30 degrees Celsius), whereas average winter temperatures in the East and North of Scotland are around 2.8 and 3 degrees Celsius, respectively. It is thought that Sweden has slightly more demanding insulation standards but it is important to
consider offsetting the true value of this against their average sub-zero winter temperatures.

**Case Study - ‘Finnished’ to a High Standard**

As a cold northern country that consumes a great deal of energy, Finland has always understood the importance of energy efficiency, and continues to be a world leader in this area. In the summer of 2005, a block of flats in the city of Espoo became the site of a range of innovative low-energy technologies, cutting energy requirements by 70%. The technologies included thermally-insulated and airtight exterior walls, balcony doors, windows and sauna elements, as well as an integrated ventilation heat recovery system that removes the need for radiators in the apartment. As a result, external energy is only required for heating for two to three months a year. These measures are only 2-3% more costly than those that meet the minimum criteria of building standards in Finland, however they quickly pay for themselves in energy savings. Over the course of 10 years, one ‘low-energy’ apartment block built in this style could save approximately £34,000 compared with present requirements.

5.14 It should be noted, however, that comparisons made on energy performance standards across Europe are difficult as they are all expressed slightly differently and they each use different calculation methods. SBSA is currently compiling a research brief for a benchmarking exercise that will aim to compare a home designed to the new Scottish standards against current requirements in Scandinavian countries. It is proposed that this work will be carried out by Scandinavian researchers during 2007.

5.15 **It is important that Government sets out its vision to industry and the SBSA is currently considering the review of building standards for 2009.** The review will consider a wide range of issues that will help to make further progress towards achieving sustainable development, including waste storage that encourages recycling, as well as, water conservation. SBSA has also commissioned research investigating the impact of even more challenging measures for reducing carbon dioxide emissions on building design and construction. This project together with the Scandinavian benchmarking project will help to inform the next review of the energy standards.

5.16 Buildings must comply with the building regulations and with the design for which a building warrant was granted. SBSA is investigating the feasibility for monitoring on-site compliance, including the use of thermal imaging cameras by local authority verifiers.

5.17 The Executive is working to ensure that planning policies and building standards are aligned. The SBSA are carrying out research into the building integration of low and zero carbon technologies including microgeneration and will use this work to ascertain whether any further changes to the building regulations are needed. This research will include the assessment of any risk or injury to people or damage to buildings. Once the research has been carried out, SBSA will publish
advice and good practice guidance on the safe installation of microgeneration technologies after the research is concluded later in 2007.

Promoting greater uptake of microgeneration

5.18 The Executive’s Scottish Community and Householders Renewables Initiative (SCHRI) was established in 2002 to support the development and installation of small-scale renewables and raise awareness of renewable technologies and their benefits to Scotland. It offers advice and grant support to householders and a range of community and public sector organisations to help with the installation of microrenewable technologies.

5.19 A network of locally based development officers raise awareness of the benefits of renewable technologies, support the development of new projects, and provide expert assistance with the grant application and planning process. The Executive has allocated nearly £16 million for the scheme up to March 2008.

Case Study - Scottish Community and Householder Renewables Initiative (SCHRI)

With Scotland’s huge capacity for generating its own power, many householders, local authorities, and community groups are beginning to look into the installation of renewable technology as a way to cut down on carbon dioxide emissions and energy bills. As a part of a project to improve school grounds, Gullane Primary School in East Lothian was keen to install a wind turbine to generate electricity for the school’s use, and provide an educational resource for the school and wider community. With funding from SCHRI, the project was completed in February 2006. A 6kW grid-connect wind turbine was installed at the south-west corner of the playground, and is visible from some classrooms and the surrounding locality. This turbine has helped the school reduce its electricity consumption by up to a quarter, and has also strengthened the pupils’ enthusiasm for energy issues.

5.20 An independent review was carried out in 2005 which demonstrated that the scheme is extremely successful. To date it has committed funding to nearly 1700 projects across Scotland, and the popularity of the scheme is increasing as demand for installing microrenewables continues to rise. The scheme has also been successful at growing the microrenewables industry, as the number of accredited installers of small-scale renewables in Scotland has grown from 14 in 2003 to 74 in 2007. The scheme’s success shows that householders, communities and the public sector are eager to do their bit to support the cause. The Executive is therefore investing an additional £2 million to provide further grant support through SCHRI.

5.21 The Executive is committed to supporting microgeneration and believes that it has the potential to provide a sustainable source of low carbon energy and help to reduce carbon dioxide emissions from buildings. There are still a number of barriers to overcome before the full potential of microgeneration can be realised, including
financial costs, availability, a lack of knowledge of the benefits and cost effectiveness of various technologies, and a range of planning and technical issues.

5.22 The Executive, therefore, is carrying out a significant amount of work to help ascertain what it could and should be doing to support and develop microgeneration in Scotland. All of this will help the Executive set microgeneration targets, which it will do during 2007. As well as the work on planning and building standards already mentioned, this includes:

- Further research to gain a better understanding of the effectiveness, costs, potential carbon savings, suitability of technologies for use in Scotland, the economic potential, and to identify any risks or opportunities;

- Further research to investigate the potential uptake of different technologies based on different scenarios of support, e.g. level and availability of grant subsidies or loans, availability of ROCs, planning scenarios, etc. As the demand for microgeneration increases, it is likely that installation costs will come down and it may be more appropriate to target support or to support projects with lower intervention rates; and

- Establishing a high level working group made up of a small number of relevant internal and external stakeholders (including industry representatives) to help steer future direction of policy support. It is anticipated the group will have its first meeting during Spring 2007.

5.23 The Renewables Obligation (Scotland), or ROS, is the key driver for promoting the development of the wider renewables sector across Scotland. It places an obligation on electricity suppliers to provide more of their electricity from renewable sources such as wind, wave, tidal, hydro and biomass, and therefore creates a strong incentive to build new renewables capacity in order to meet the obligation. Under the ROS, eligible renewables generators receive Renewables Obligation Certificates (ROCs) for each megawatt hour of electricity they generate.

5.24 Small scale and microrenewable generators can face difficulties in gaining ROCs as they often don’t meet the requirements. To gain ROCs the renewable system must be connected to the grid and generate at least 0.5 MWh per annum – most microrenewables don’t meet these criteria. If they do meet the criteria, the accreditation process can be difficult and can dissuade those from generating energy on a small scale.

5.25 The Executive recently consulted on proposed changes to the ROS aimed at reducing and eliminating these barriers and to help small renewable generators benefit from the financial rewards that are available under the ROS. The changes, which will take effect from 1 April 2007, will enable small generators to appoint
agents to act on their behalf and allow the output from a number of small generators to be amalgamated.

**Better information about energy performance of buildings**

5.26 The EU Directive on the Energy Performance of Buildings aims to raise public awareness of the energy use of buildings and thereby improve energy efficiency and encourage take up of low and zero carbon technologies, including microgeneration. The Directive includes requirements to set and apply performance standards, inspect and advise on air-conditioning systems and boilers and certification schemes detailing the energy performance of all buildings.

5.27 The SBSA is leading on the implementation of this Directive for Scotland and most of the requirements are already fulfilled by the building standards system. There are three key areas which the SBSA are currently progressing including: the introduction of energy performance certificates; an information campaign on boiler efficiency; and the introduction of inspection of air-conditioning systems which will be accompanied by energy improvement advice.

5.28 Buildings when constructed, sold or rented out, including homes, public sector buildings and business premises will require an Energy Performance Certificate and these will be phased in as follows in Scotland:

- Construction from May 2007
- Point of sale during 2008
- Rental by January 2009

5.29 All public sector organisations will be required to display an energy performance certificate in a prominent place in all their new and existing buildings, which have a total floor area of over 1000m² and where the public regularly have access. This public scrutiny will encourage public sector organisations to improve the energy efficiency of their buildings. The Executive wants the public sector to lead by example by implementing the cost-effective improvements. It wants public sector organisations to use these certificates to set more ambitious goals for enhancing the energy performance of their estates.

5.30 The energy performance certificates will give householders better information about the carbon dioxide emissions from their home – every new home in Scotland will require a certificate when it is constructed and every existing home will need one when it is sold or rented. The certificate and energy report will include information on the current average costs for the heating, hot water and lighting of the home. They will include practical tips on simple cost-effective home improvement measures that will help save energy, reduce bills and cut carbon dioxide emissions.
5.31 Energy performance certificates will allow prospective occupiers to make an informed choice and the Executive believes they have the potential to act as a driver for improving energy efficiency in the home. Prepared as one element of the Single Survey, which will be required for the sale of an existing house, it will include information on the condition of the property, a valuation, and further information on accessibility features. All of this information will be provided on the basis of one inspection of the property. The Executive will commission an awareness raising programme during 2007 on the certificate requirements to help inform home-owners and others involved in the house-selling process prior to the introduction of the Single Survey in late 2008.

**Case Study – What will an Energy Performance Certificate look like?**

Energy Performance Certificates, for new dwellings and new non-domestic buildings, will be introduced from 1st May 2007. The certificates will give an indication of energy consumption and carbon dioxide emissions, shown against an A to G rating, similar to that used for fridges and other white goods. The certificate will also be supported by reference to any relevant building standards and benchmarks along with recommendations for improvements in energy performance. Certification will involve accredited experts. The precise nature of the certificate is still in development, although it is likely that it will be similar to that pictured below:

**Sample certificate for non-domestic buildings**

![Sample certificate for non-domestic buildings](image)
5.32 The Executive is also exploring methods for using the information contained within the certificates to build a picture of progress being made on energy efficiency across all sectors. It is anticipated that this information will help to benchmark better and will highlight opportunities for more targeted advice, support and intervention.

Conclusion

As set out in this chapter we will:

- Consult on detailed proposals for permitted development rights for microgeneration.
- Investigate the impact of further increasing the energy standards.
- Invest a further £2 million in support for microgeneration for householders and communities.
- Remove barriers to microgeneration giving eligibility for ROCs from April 2007.
- Set microgeneration targets in 2007.
- Require energy performance certificates and use these to promote enhanced performance in the public sector.
- Raise awareness of energy performance certificates amongst householders.
Chapter 6
Improving our homes

6.1 The Executive is committed to promoting energy efficiency in all buildings. But we know that our housing stock must be a particular focus. We are committed to improving energy efficiency in new build and existing housing in both the social and private sectors. Action on energy efficiency across the housing system will assist in fulfilling our objective of ensuring safe, warm housing is available throughout Scotland and will contribute to our objective of tackling climate change by reducing carbon dioxide emissions. This Strategy and the forthcoming Action Plan will fulfil the Executive’s requirements under section 179 of the Housing (Scotland) Act 2006, in which Ministers are expected to prepare and publish a strategy for improving the energy efficiency of living accommodation (and later to review it and report on its implementation).

6.2 The Executive supports the ambition set out by the Chancellor in his Pre-Budget Report for all new homes to be zero-carbon by 2017. To help achieve these goals, it will continue to develop a package of sustainability measures for new buildings through planning, design and building regulations described in the previous section. The Executive is also aiming to significantly improve the energy standards of existing homes.

6.3 The 2002 Spending Review set challenging targets to improve domestic energy efficiency by 20% by 2006. Progress against achieving this target is being measured through the Scottish House Condition Survey. Significant progress has already been made – the latest statistics which presents 2003/04 data reported that the energy efficiency of Scottish housing has improved considerably from 2002 levels – 40% of dwellings were rated ‘good’ on the National Home Energy Rating (NHER) scale in 2003/04 compared to 31% in 2002.

6.4 The Executive will report fully on its achievements in meeting this target in 2008-09 when all of the data to 2006 is available. However, we can’t afford to wait for this data before taking further action – we must act now to build on and further improve energy efficiency across all types of housing. The Executive will therefore set further, more challenging targets linked to the next Spending Review in 2007, ensuring that resources are earmarked to support increased targets.
The Scottish House Condition Survey (SHCS) is the largest single housing research project in Scotland, and the only national survey to look at the physical condition of Scotland’s homes as well as the experiences of householders. It covers all types of housing, whether owned or rented, flats and houses, in urban, rural and island locations across the whole country and is commissioned by Communities Scotland. The purpose of the SHCS is to obtain good quality information about the nature of housing and communities in Scotland from which good quality public policy can be developed and resources can be wisely invested.

SHCS first reported in 1996 and was initially conducted every five years. The survey has now moved to a format of continuous fieldwork with key estimates available annually. These annual reports contain updated key information on the estimates of the number of households in fuel poverty, energy efficiency estimates and the progress rates for meeting the Scottish Housing Quality Standard, a standard by which all social housing must comply by 2015.

This first annual report was based on data collected in 2003/2004 and was published in March 2006. It found that the energy efficiency of the Scottish housing stock is improving. Fewer dwellings have a ‘poor’ National Home Energy Rating (NHER) and the proportion of dwellings rated ‘good’ has risen by 9 percentage points from 31% to 40% since the 2002 survey. The report also found that the 6% of households who do live in dwellings with a ‘poor’ NHER are much more likely to be in fuel poverty. In fact, 43% of households in Scotland living in dwellings with a ‘poor’ NHER rating in 2003/04 were in fuel poverty, compared to 18% of households living in dwellings with a ‘moderate’ rating, and 8% living in dwellings with a ‘good’ rating.

6.5 The Executive will work with social landlords to ensure that the target for all social sector housing to meet the Scottish Housing Quality Standard (SHQS) by 2015, is achieved. So far as energy efficiency is concerned, the SHQS includes a specific commitment that all social houses will have effective insulation and efficient central heating systems by 2015. The SHQS also provides for additional energy efficiency measures (on top of efficient central heating and effective insulation) that can be implemented as necessary for achieving a minimum National Home Energy Rating (NHER) rating of 5 subject to technical feasibility and without incurring disproportionate costs. The NHER measures the energy efficiency of homes and gives an energy rating on a scale from 0 (poor) to 10 (excellent). It takes into account the total energy costs per square metre of floor area required to achieve a standard heating regime, the type of heating system, standard of insulation and the type and age of dwelling. It includes space and water heating, lighting, domestic appliances and standard charges. NHER also models climatic variations like wind speed and orientation, and the geographical location of a house. As part of the work being done for improving domestic energy efficiency in social housing, the Executive will issue a report which measures progress on energy efficiency aspects of the social housing stock by 2009. This will measure how far the social housing stock has come in terms of energy efficiency some 5 years after the introduction of the SHQS.

6.6 In 2007, the Executive will review progress being made by local authorities towards meeting their targets under the Home Energy Conservation Act (HECA).
Under HECA, every local authority with housing responsibilities has to devise a strategy and develop a target to achieve significant improvements in the energy efficiency of their respective housing stocks. All local authorities published their initial HECA strategies in 1997 and the targets for improving energy efficiency range from 8% to 36% against the 1997 baseline. Local authorities are required to submit biennial progress reports covering improvements in energy efficiency, reductions in carbon dioxide emissions and costs of improvement measures.

6.7 The latest HECA statistics suggest that steady progress is being made (the latest HECA Progress Report (2003–05) is due to be published in Spring 2007). Since the start of HECA in 1997:

- Overall energy efficiency has improved by 17.2%;
- Carbon dioxide emissions have reduced by nearly 850,000 tonnes of carbon; and
- Households were £152 (on average) better off as a result of the energy efficiency improvements.

6.8 The Executive makes a considerable investment in housing and regeneration through Communities Scotland – this amounted to £800M in 2006/07. Communities Scotland have recently consulted on its Sustainable Development policy which includes a package of action that the Agency will take in relation to housing and regeneration. Further details will be published later in 2007 – proposals include:

- An ambitious mandatory target of EcoHomes ‘very good’ by 2008, extending this to EcoHomes ‘excellent’ by 2010 for registered social landlords in Scotland. EcoHomes is an independent and authoritative environmental assessment method for new homes developed by the Building Research Establishment in conjunction with the construction industry and Government. It supports housing developers (including registered social landlords) to deliver better quality housing with lower running costs for occupants and lower negative environmental impacts. EcoHomes has seven sections to the standard – including energy, transport, water and materials – which are tradable elements. Communities Scotland is considering introducing a non-tradable energy section.

- To establish, where possible, carbon savings across the building programme. Communities Scotland recognises the value of measuring progress in terms of carbon saved and will develop a methodology to establish it’s contribution towards climate change targets.

6.9 Communities Scotland ‘Sustainable Housing Design Guide’ has been revised, updated and expanded to give guidance to housing associations on how to adopt a low carbon, sustainable development approach for new and refurbished housing.
Case Study – Communities Scotland - Sustainable Housing Design Guide

Housing can make a significant contribution to sustainable development, simply because decent homes are essential to the health of individuals and to the well-being of the wider communities they live in. Where a home is, what it is made of, how it uses resources like energy and water, and how it is connected to the rest of the world (public transport, walking or cycling), all have major environmental implications. Incorporating the principles of sustainability into housing development, maintenance and refurbishment, will make a significant contribution to achieving true sustainable development.

The Sustainable Housing Design Guide for Scotland (www.communitiesscotland.gov.uk/shdg) offers comprehensive and user-friendly guidance on how to incorporate sustainable development principles into maintaining, rehabilitating and developing social housing. The guidance is there to improve both new and existing homes, and to make them more efficient.

One such project was a mixed-use new build developed jointly by Perth Housing Association and Servite Housing Association. The buildings are four storey tenements incorporating flats, offices and a sheltered housing development. The scale and diversity of power demands offered an ideal opportunity to install a combined heat and power (CHP) system. The CHP plant is a ‘lean burn’ engine which generates electricity using gas instead of petrol. The heat produced by the system is recovered to heat water and this hot water is pumped around the buildings to heat wet radiators in each room. The CHP produces up to 40% of the electricity required, the remaining power and back up in case of failure coming from mains gas and electricity.

The use of CHP has increased the efficiency of electrical production from 30% (standard power stations) to 85% and has reduced carbon dioxide emissions by 50%. The payback on installing the CHP system in terms of reduced energy bills is 3-5 years with maintenance costs being met by ongoing savings.

6.10 To help all householders seeking to reduce their impact on the environment, the Scottish Building Standards Agency has developed an on-line guide ‘Home improvements – a sustainability guide’. It provides advice to householders who are considering a range of energy saving and waste recycling improvements that they can make to their homes.

Case Study – Sustainability Guide for Home Improvements

Making existing buildings more sustainable isn’t always easy, therefore the Scottish Building Standards Agency have produced a Sustainability Guide specifically designed for householders about to embark on any home improvements.

The guide sets basic goals that we should all be able to achieve such as switching to low energy lighting, draught proofing and carrying out insulation works. It explains the main principles of sustainable home improvements such as buying low environmental impact products and repairing, renovating and recycling existing resources. It gives guidance on following planning guidance and building regulations. It provides a number of examples of the work that could be done in different types of home, from a traditional tenement flat to 1950s semi. For those wanting to go that bit further, it also has ideas for projects such as improving heating systems and micro-renewables which give extra comfort, energy efficiency and future financial savings.

The complete guide can be accessed via www.sbsa.gov.uk/homeimprovements.
The Executive continues to work with the UK Government and the energy supply companies to deliver better energy efficiency to householders. The **Energy Efficiency Commitment (EEC)** places an obligation on the supply companies to achieve targets for assisting households across Great Britain to be more energy efficient. Measures supported to date include cavity wall and loft insulation, energy efficient boilers, appliances and light bulbs. The **Executive is working closely with the UK Government to ensure that EEC has demanding goals, is better targeted and that it works more effectively with Scottish Executive fuel poverty and energy efficiency initiatives.**

Insulation is the predominant measure supported through the EEC and it is considered the most cost-effective and energy efficient improvement that can be carried out in the home. However, Scotland has a high proportion of housing that is not suitable for cavity wall insulation including tenements, multi-tenured flats, solid-walled and timber-framed dwellings, and housing in exposed areas that are subject to wind-driven rain. There are also further problems with shared areas and joint responsibilities for roofs, etc. This can mean that householders in Scotland have difficulties sourcing appropriate advice for their properties, securing agreement from owners over shared areas and accessing financial support that would help them make their homes more energy efficient.

The **Executive is therefore investigating the barriers to take-up, especially for existing homes, and will take further action to help householders in Scotland to improve the energy efficiency of their home. It is important that any additional support complements the EEC and the Executive is currently investigating a range of options. These could include, better targeted advice, loans, equity release initiatives and ‘green’ mortgages, and more comprehensive home energy audit services. The Executive will publish further details during 2007. Coupled to the energy performance certificates, such measures could provide a powerful driver for improving the energy efficiency standards of homes.**

**Lifting the vulnerable out of Fuel Poverty**

The Executive will continue its commitment to end fuel poverty by 2016. If efficient heating systems and effective insulation are installed in the homes of those in fuel poverty, it should both increase the energy efficiency of the stock and, other things equal, reduce the incidence of fuel poverty over time in line with this commitment. The **Warm Deal and Central Heating Programmes** aim to lift households out of fuel poverty by improving the energy efficiency of the home. For example, the Warm Deal and Central Heating Programmes specifically aim to lift households out of fuel poverty. The Executive defines fuel poverty as those households that spend 10% or more of their income on fuel. It can arise from a combination of factors including low household income, rising costs of fuel and poor energy efficiency of homes. The Executive is able to influence the third of these factors. The colder Scottish climate makes tackling fuel poverty more challenging, as does the rural nature of our
landscape, with Scotland having around 10% less access to the gas grid than the rest of the UK, and other fuels, such as oil and electricity, can prove more costly than gas.

6.15 These programmes make a real difference to people’s lives – the Executive recently commissioned research that shows:

- They do lift people out of fuel poverty – research on the first 3 years of the programmes show that 7 out of 10 people were lifted out of fuel poverty as a result of participating; and
- They do reduce fuel bills – the Central Heating Programme achieved a reduction in annual fuel bills of approx. £561.

6.16 Fuel poverty has more than halved between 1996 and 2002, from 35% to 13% of households (738,000 to 286,000). To date over £300 million has been spent on the programmes in Scotland, providing free central heating systems to over 78,000 homes and insulating over 315,000 – over 13% of Scotland’s housing stock. Together they are estimated to produce an annual reduction in carbon dioxide emissions of over 13,000 tonnes of carbon.

6.17 The Executive believes that its fuel poverty programmes provide the best targeted support in the UK. Central heating is available to anyone over the age of 60 who has no central heating or a system beyond reasonable repair, and from January 2007 to anyone over 60 on pension credit guarantee whose system is inefficient. The Warm Deal is available to people on benefits and those over 60 and from January 2007, to families with a disabled child. The Executive has committed a further £108 million for both programmes to 2008.

Case Study – Can microgeneration help the fuel poor?

Recent substantial rises in fuel prices are impacting the fuel poor. The Executive is keen to look at innovative solutions to fuel poverty and believe renewables could provide a more cost predictable alternative to mainstream power. A pilot scheme is currently underway in around 170 social housing schemes across Scotland from Orkney, Aberdeenshire to South Ayrshire and the Scottish Borders. The pilot will explore installation costs as well as running and maintenance costs and will canvas householders before and after the pilot to find out how user friendly the systems are and whether some systems are more suited to certain geographic areas, property or household types.

Technologies involved will include heat pumps, automated biomass heaters, micro wind and solar water heaters. Data will be collected on hourly room temperatures in 2 locations in each home, energy bills before and after installation, NHER figures with modelled scenarios, and information on installation costs and on maintenance costs.
6.18 The Executive is currently assessing the impact that microgeneration technologies have on fuel poverty through a £1 million pilot project. The project will last for a period of 2 years, and will test a number of different technologies in different house types across Scotland to determine their benefits as a potentially cheaper and more cost predictable alternative to existing fuels. Preliminary results are expected to emerge during summer 2007 with a final report in summer 2008. Both of these will help the Executive to determine the potential for including microgeneration more widely in its fuel poverty programmes.

Conclusion

As set out in this chapter we will:

- Set energy efficiency targets for housing.
- Review the Home Energy Conservation Act targets.
- Consult on proposals to set targets for EcoHomes excellent by 2010.
- Consider options for financial and other incentives to encourage householders to improve the energy efficiency of their homes.
- Continue our commitment to end fuel poverty by 2016.
- Test the impact microgeneration technologies have on tackling fuel poverty.
Chapter 7
The public sector leading by example

7.1 Although the public sector is not the biggest energy consumer and therefore only a minor source of carbon dioxide emissions in Scotland, its influence on overall emissions outweighs its direct contribution. The public sector must take a leading role in designing, procuring and building public sector projects such as new schools and hospital which are exemplars in terms of energy efficient sustainable design. The public sector has considerable purchasing power and it has a significant role to play in encouraging others, both individuals and organisations, to take action. For this reason it is essential for the public sector to lead by example.

7.2 In 2004, the Executive launched a new £20 million Central Energy Efficiency Fund (CEEF) to help public sector organisations lead the way in energy efficiency. Of the total £20 million fund, £15 million was allocated to local authorities, £4 million to NHSScotland Health Boards and £1 million to Scottish Water. The money is administered at a local level and is used to set up a revolving loan fund ring-fenced purely for energy efficiency projects which bring about energy, cost and carbon savings. The financial savings made must be re-invested in further energy efficiency measures, and any profit can be used to improve frontline services. At the time of the scheme’s inception, the annual energy spend of these public bodies was over £100 million resulting in emissions of over 250,000 tonnes of carbon each year.

7.3 The programme has ambitious goals – it aims to facilitate:

- A 20% reduction in energy consumption by local authorities and Scottish Water, and a 15% reduction by health boards over 5 years;
- A saving in public sector energy bills over the first 5 years estimated at around £70 million (and an ongoing saving of up to £30 million per annum thereafter); and
- A reduction in carbon dioxide emissions estimated at around 500,000 tonnes of carbon over the first 5 years (and around 100,000 tonnes of carbon per annum thereafter).

7.4 The CEEF programme was also set up to encourage and develop best practice across the public sector. The Executive has supported this by developing:

- A web based tool which provides generic guidance, allows the sharing of best practice and helps to stimulate new project ideas.
A technology list which gives guidance on the technical aspects of a variety of energy efficient technologies and interventions.

Case Study - Sir Matt Busby Sports Complex – North Lanarkshire

One of the most effective ways to reduce energy bills, cut down on carbon dioxide emissions, and improve overall energy efficiency in public sector buildings is to install a Building Energy Management System (BEMS). A BEMS is simply a computerised system used to provide automatic control of building services such as lighting, ventilation, heating and cooling, and data collection. Many of us work in offices where lights are left on overnight, some days are too cold, while others are stifling and hot. What many people don’t realise is that these are not the necessary evils of maintaining a large building. An efficient BEMS will ‘intelligently’ manage these issues through a network of sophisticated controls, making vast improvements in comfort and huge savings in utility bills.

North Lanarkshire Council used the Central Energy Efficiency Fund (CEEF) to install a BEMS at The Sir Matt Busby Sports Complex in Bellshill. As a result, the centre has now reduced its fuel consumption by more than 25%, and saved £28,800 in the first year. BEMS has the advantage of:

- Automatic management of air circulation and heat recovery in the swimming pool hall;
- Optimised ‘start-stop function’ which fires the boilers at the correct time to ensure that the building reaches an optimum temperature just as staff arrive in the morning;
- discontinues boiler firing during the summer when there is no demand for heating (a function which cannot be achieved manually); and
- a ‘room trim’ function, which senses the internal temperature and corrects it accordingly – particularly useful when there are variations in occupancy and activity for meeting and conference rooms, gyms and dance studios, etc.

7.5 The Executive recently completed an interim evaluation of the local authority part of the CEEF programme as this is where the majority of projects have been implemented. This was to assess its impact and effectiveness and to gain a better understanding of the financial and carbon savings that have been and can be achieved. The report is due to be published in March 2007 and the key findings are:

- The scheme is on track to achieve a 20% reduction in energy consumption with identified lifetime financial savings of nearly £30 million so far. If this progress is maintained, the scheme could lead to lifetime savings of up to £104 million by 2010. These are conservative estimates – recent fuel price increases will almost certainly mean the true savings will be even better;

- Identified carbon savings so far are estimated at over 80,000 tonnes of carbon and, by 2010, savings of more than 390,000 tonnes of carbon are predicted; and

- The loan fund is a very effective model and it has been pivotal in raising awareness of energy efficiency issues within local authorities. It has facilitated other initiatives, for example, authorities setting individual targets for reductions in energy usage.
7.6 This evaluation does not take account of the savings achieved by the NHS and Scottish Water and the Executive will carry out a full evaluation of the scheme in 2010 when the scheme will have been fully operational for 5 years.

7.7 These interim results show that CEEF is clearly a success – as well as delivering financial and carbon savings, it is raising the profile and stimulating behavioural changes across the organisations. The Executive therefore recently announced an additional £4 million to extend the fund to the Further and Higher Education sector. Working with the sector, the Executive will use the findings from the evaluation and learn the lessons from other similar public sector funds to develop the programme for further and higher education institutions. This funding will be made available from 1 April 2007 and further details will be available during Spring 2007.

Sub-sector specific Actions

Scottish Executive Estate

7.8 The Executive recognises that it must lead by example in tackling its own corporate contribution to climate change. The Executive has already taken significant action and has:

- Produced a Greening Government policy which sets out objectives and targets for improving environmental performance – including energy consumption, vehicle use, waste and recycling, and the procurement of goods and services.

- Delivered major energy efficiency improvements – since 1991 has reduced carbon dioxide emissions due to energy use by almost 50%.

- Set a target to reduce carbon dioxide emissions by energy use in its buildings by 30% from 1999/2000 levels by March 2020.

- Committed to participate fully in the Carbon Trust’s Carbon Management Programme to help further reduce energy and carbon dioxide emissions savings.

7.9 The Executive will:

- Continue to be an exemplar by implementing further energy and carbon savings where possible.

- Display energy certificates in all 14 of the target buildings detailed in its annual environmental report (despite only 10 buildings requiring them).
This represents around 90% of the Executive’s estate (and 94% where the Executive is the major occupier).

- During the summer of 2007 introduce a single carbon dioxide emissions reduction target to cover all activities, including business travel, energy use and waste production.

- Install microgeneration technologies on its own estate. The Executive is currently investigating which of its current buildings are most suitable and will publish further details during 2007.

7.10 The Executive reviews and reports on progress being made against meeting these targets and objectives on an annual basis in the Scottish Executive Environmental report.

Executive Agencies and Non–Departmental Public Bodies

7.11 The Executive recently tasked its agencies and non–departmental public bodies (NDPBs) with improving their environmental management practice by putting in place policies, procedures and to set targets for reducing their environmental impact by the end of 2006. Targets include energy consumption, carbon dioxide emissions, waste, biodiversity, transport and travel. Policies and targets will be published and reviewed on an annual basis by each organisation and the Executive will ensure that future targets that are set remain challenging.

7.12 The Executive estate currently refers solely to the buildings used by the Executive and we intend to widen this definition to include our agencies and NDPBs. This will mean that the environmental performance targets will also apply to our agencies and NDPBS. The Executive will announce how this will be implemented during 2007.

Case Study - Scottish Natural Heritage Leading by Example

In October 2006, the new sustainable and environmentally-friendly headquarters for Scottish Natural Heritage was officially opened in Inverness. ‘Great Glen House’ has been awarded the highest ever environmental rating (84%) for a building in the UK since the BREEAM (Building Research Establishment Environmental Assessment Methodology) system was introduced in 1998. Energy efficiency measures include use of daylight and natural ventilation, high grade insulation, low energy lighting, and a sophisticated Building Management System. Furthermore, solar collectors provide at least 62% of the hot water needs of the building and 5% percent of the building’s total energy requirements. Initial target emissions for the building were 8 kg of carbon per square metre per year, but Great Glen House has met and exceeded this ambitious target, with a maximum carbon dioxide emission of 7.16 kg carbon equivalent – well ahead of best practice.
Local Authorities

7.13 Local Government is Scotland’s largest public sector employer and therefore has a critical role to play in taking action to combat climate change through both its own local activities and its influence on the wider community.

7.14 Local authorities have committed to demonstrating that leadership and taking action through the **Scottish Climate Change Declaration**. The declaration was launched early in 2007 and has energy efficiency as one of its key actions. Councils have signed up to:

"Produce and publicly declare a plan, with targets and time-scales, to achieve a significant reduction in greenhouse gas emissions from our own operations. This will include our energy sourcing and use, travel and transportation, waste production and disposal, estate management, procurement of goods and services and through improved staff awareness"

7.15 The Executive will continue to support local authorities in meeting their commitments in the long term. For example, the Executive:

- Has provided resources to assist the Sustainable Scotland Network (SSN) develop a climate change programme for local government in Scotland. This programme, which will be in place by the end of 2007, will co-ordinate and strengthen the wide range of activity taking place at local authority level and set the strategic framework and direction for future action.

- Supports the network of energy officers from all 32 Scottish Local Authorities to help them to reduce energy consumption and carbon dioxide emissions by sharing best practice, to benchmark energy data and to move quickly on the introduction of new and improved energy efficient and renewable technologies.

- Will continue to work with COSLA, the Sustainable Scotland Network, the local authorities and other partners to ensure the right information and guidance is in place.

- Will work with the local authorities and other partners to develop a simple and practical way for local authorities to monitor and report greenhouse gas emissions and to use this information for benchmarking and setting targets for reducing emissions.
Case study – Sustainable Scotland Network

The Sustainable Scotland Network (SSN) brings together practitioners from Scotland’s 32 local authorities to promote and advance sustainable development at a local level. Working in cooperation with the Scottish Executive, the Convention of Scottish Local Authorities (CoSLA), and a huge number of organisations and networks, the SSN provides a range of helpful services and resources for the dissemination of best practice amongst local authorities. These include a free quarterly newsletter for all members, a website that serves as a centre for communication and learning, an annual conference, and a programme of quarterly network meetings to address topical issues in sustainable development. The SSN has recently announced the publication of ‘Best Value in Local Government – Sustainable Development Toolkit’, which was developed in close consultation with local authorities. Through the coalition of the network, many local authorities have developed their own strategies and action plans for sustainable development. Argyll & Bute Council is currently producing a practical design guide that will promote good quality, sustainable, and contemporary building design in the area. Edinburgh City Council’s Sustainable Development Unit has a number of projects underway, including ‘Eco-Aware’, an awareness-raising campaign, and the ‘Sustainable Travel Plan’, which aims to reduce single occupancy driving by 12%.

Schools

7.16 One of the Executive's main priorities is to modernise the school estate with well designed, well built and well managed schools. The Executive provides extensive funding to local authorities to support investment in school buildings in the form of revenue support for Public Private Partnership (PPP) projects, loan charges support for conventional borrowing and capital grants.

7.17 Sustainability is a key aspect when considering the whole life costs of a building. It is not just the initial purchase price of an asset but consideration must be given to the ongoing running and maintenance costs. This is a key feature of PPP contracts but should also be considered under conventional procurement. This provides the opportunity to demonstrate better value for money and to deliver public services in a more environmentally sensitive way, including being more energy efficient.

7.18 The Executive is already encouraging greater energy efficiency for schools - the Schools Fund Capital Grant for 2006–07 was enhanced by a further £30 million, with energy efficiency being a key focus for the additional monies.
Case Study – Public Private Partnerships in Action

Situated at the foot of the Campsie Fells and serving the large rural district of West Stirlingshire, the new Balfron High School is certainly proving the value of Public Private Partnerships. Rebuilt in 2001 under a PPP contract, the school’s modern new construction is based on a sound curriculum model and strong ecological principles. The building has made extensive use of natural light, with a large central atrium consisting of a glass ceiling and glass walls. Insulation and double-glazing have been incorporated throughout the school, as well as the use of low-energy light bulbs. Each classroom has its own radiator, so that temperature can be adjusted locally instead of centrally controlled.

Impressive as the building is, it’s the enthusiasm of the students and staff at Balfron High School that is so remarkable. As a part of their S1 Social Subjects curriculum, students designed leaflets on energy efficiency, some of which were entered into the European ‘Solar Schools’ competition, and were placed first in the UK. Balfron High is a keen participant in the Eco-Schools Programme, and having already attained the silver award, the school has put together an action plan to help them achieve the esteemed ‘Green Flag Award’. Over the coming months, the school is looking into acquiring two 6-kW wind turbines, so that they may generate their own electricity, and ultimately further reduce their carbon dioxide emissions.

7.19 There is more to be done and the Executive wants to encourage and deliver greater energy efficiency and uptake of renewables throughout the entire procurement process. To gain a better understanding of the energy standards of existing schools and to help identify future action, the Executive has commissioned:

- a project with a small number of the Councils who are in the early stages of procurement of a schools PPP project. During 2007, the councils will receive support in investigating the options, preparing the output specification, evaluating contract bids and agreeing the final contract terms to seek to ensure that provisions for energy efficiency and renewables are retained in the contract.

- a study to examine the energy efficiency of a number of schools built during different periods and under different contractual arrangements. The project, which is due to report in late Spring 2007, will consider a range of issues including the effectiveness of current guidance, the scope for grant support for the use of renewables, and the impact of factoring in the cost of sustainable energy systems compared to other heating and fuel systems when calculating whole life costings for school buildings.

NHSScotland

7.20 As an integral part of the commitment to the health and well-being of the community, the NHS must ensure that its activities are environmentally sustainable. Sustainability is a key theme running through a number of Health Department policies that relate to NHSScotland property, and each NHSScotland body must have in place local policies for property management, environmental management,
construction procurement and design quality that adhere to the Executive’s sustainable development objectives and that include targets for reducing energy consumption and greenhouse gas emissions.

7.21 Over the 19 year period to 2004/05, NHSScotland has made a significant achievement, it has:

- reduced energy consumption by around 36%; and
- reduced carbon dioxide emissions by nearly 39%

7.22 NHSScotland continues to pursue energy efficiency and has set a national target to further reduce energy consumption by 2% each year until 2010. This represents a total saving of almost 50% in energy consumption by 2010 over 1990 levels.

Case Study – NHS and the Central Energy Efficiency Fund

In 2004, the Scottish Executive announced the launch of a new “spend to save” initiative called the Central Energy Efficiency Fund (CEEF), whereby £20 million was distributed to all local authorities, health boards, and Scottish Water for investment in energy efficiency projects. Through measures such as insulation, draught proofing, improved lighting, and intelligent building controls, the scheme has improved hundreds of public sector buildings across Scotland, including hospitals:

- NHS Fife has improved the energy efficiency of a number of its hospitals, including the Queen Margaret Hospital in Dunfermline. In August 2006, CEEF allowed the installation of a Plant Management System, so that functions such as heating and air conditioning could be monitored and controlled, greatly reducing energy consumption. The total capital cost of the project was £11,000, however it is estimated that the controls will quickly pay for themselves, with financial savings of £23,000 per year – a payback of less than 6 months. It is also predicted that the System will bring about lifetime savings of over 300 tonnes of carbon.

- Glasgow Royal Infirmary has had a grand presence in the north-east corner of Glasgow’s city centre since 1794, and was one of the first hospitals to carry out CEEF improvements through NHS Greater Glasgow. In June 2006, the hospital had a boiler economiser installed in its main boilerhouse, which allows waste heat energy to be recovered from the flue gas, and returned to the system to be reused. Although the project’s total capital cost was £83,000, the estimated financial savings from the heat recovery are £56,400 per year, giving a payback of under 1 and a half years and saving nearly 2,000 tonnes of carbon over the course of its lifetime.

Public Sector Procurement

7.23 It is estimated that, currently, £8 billion is spent per year on public sector procurement. As well as securing Value for Money and adhering to public procurement policy and legislation, energy efficiency is one of the key aspects to good procurement practice. This is viewed in combination with a range of activities, including environmentally preferable products, minimising waste, encouraging use of
recycled materials and products, reducing carbon dioxide emissions and giving a fair opportunity to local suppliers.

7.24 The Executive already promotes best practice across the public sector by:

- Maintaining online guidance;
- Supporting the development of a Sustainable Development Procurement Toolkit for Local Authorities;
- Issuing advice to public sector procurement officials;
- Working with partners, including the Sustainable Scotland Network, the Association for Public Service Excellence, Remade Scotland and WRAP (the Waste and Resources Action Programme); and
- Providing specific training on how to incorporate sustainable development issues into procurement.

Case study – The Canny Buyer

Led by Aberdeen City Council, the Executive has supported the development of the Canny Buyer (www.cannybuyer.com) - a sustainable procurement initiative which includes an online guidebook and a small downloadable "Pocket File".

The website gives a straightforward up-to-date account of the important features of sustainable procurement, supplemented by links to sources, case studies, initiatives, and regulations. It also gives details of the different techniques that can be applied to the different stages of procurement.

This guidebook is designed for a variety of audiences: environmental specialists (who know perhaps relatively little about procurement); for procurement specialists (who need to know how to take account of sustainability in their work); for senior managers, board members, governing body members (who need to have a strategic overview of the issues so as to decide how to approach them) and for budget holders, project managers and other specialists who need to be aware of how this issue affects their work.

7.25 The Executive is also developing a Scottish Sustainable Procurement Action Plan that will build on progress already being made in Scotland and will take into account the work of the UK Sustainable Procurement Task Force. The Scottish Action Plan will identify key performance indicators and benchmarking opportunities to deliver on the Executive’s ambition to be a leader in this field.

7.26 For the public sector to be exemplar, there is more that could be done to increase energy efficiency and whole life costing principles. The Executive is currently considering what further action it can take. Possible options include: setting higher than minimum standards for the goods and services the public sector procures; contractual guidance; advice and training on incorporating energy efficiency and renewable energy into contracts and capital investments; exploring the opportunities for reducing costs through public sector bulk-buying; and by
supporting a number of pathfinder projects to act as demonstrators for the public sector as a whole. The Executive will publish how it intends to take this forward during 2007.

7.27 As part of the wider Efficient Government initiative, a review of public sector procurement in Scotland was led by Mr John McClelland. The McClelland Report (2006) concluded that:

- A step change in procurement practice is required to achieve targets for future years;
- Substantial savings are available from collaboration by buyers, both within specific sectors, (e.g. the NHS, Local Government, etc) and across the public sector at large; and
- “Commodity Centres of Excellence” should be put in place to support collaboration.

One of the key recommendations was to ensure corporate and social responsibilities such as sustainability are made part of purchasing policy and practices in every public sector organisation. A Public Procurement Reform Board, chaired by John McClelland, has been established to consult further on, and implement, the range of recommendations set out in the report. The Executive is also currently establishing a team to take forward the recommendations that came out of the review and it is anticipated that this team will be in place by April 2007.

**Conclusion**

As set out in this chapter we will:

- Encourage greater energy efficiency and uptake of microgeneration across the public sector estate, especially in schools.
- Commit £4 million to the Central Energy Efficiency Fund for the further and higher education sector.
- Set an ambitious single target for reducing carbon dioxide emissions from our own activities and estate.
- Install microgeneration technologies on our own estate.
- Set environmental performance targets for our NDPBs and agencies.
- Set targets for local authorities to reduce greenhouse gas emissions.
- Seek ways to better promote energy efficiency and microgeneration through the procurement process.
Chapter 8
Conclusions & Next steps

8.1 This first Energy Efficiency and Microgeneration Strategy for Scotland brings together, for the first time, a wide range of activities across a number of policy areas that have an impact on energy efficiency and microgeneration. The Strategy represents the Executive’s commitment to taking action and highlights work we are currently doing, the progress being made, and outlines work currently being planned or considered for the future. The Strategy reflects a more joined-up approach and delivering the actions contained within this strategy will require effective partnership working between the Executive and partners.

8.2 A summary of the key actions include:

For the **domestic sector**:

- Introduce a one stop shop approach to advice for householders on energy efficiency, sustainable transport and renewable energy.
- Set energy efficiency targets for housing.
- Consider options for financial and other incentives to encourage householders to improve the energy efficiency of their homes.
- Invest a further £2 million in support for microgeneration for householders and communities.
- Continue our commitment to end fuel poverty by 2016 and test the impact microgeneration technologies have on tackling fuel poverty.

For the **business sector**:

- Commit up to a further £2 million to a loan fund for small and medium sized businesses.
- Review resource efficiency initiatives and streamline the support available to make it easier and clearer for businesses to take action.
For the **public sector:**

- Set an ambitious single target for reducing carbon dioxide emissions from the Executive’s own activities and estate.
- Invest an additional £4 million in the Central Energy Efficiency Fund for the further and higher education sector.
- Set environmental performance targets for our NDPBs and agencies and targets for local authorities to reduce greenhouse gas emissions.
- Seek ways to better promote energy efficiency and microgeneration through the public sector procurement process.
- Encourage greater energy efficiency and uptake of microgeneration across the public sector estate, especially in schools and encourage every school to register on the Eco Schools Programme.

In our **buildings:**

- Implement new building standards from May 2007 and investigate the impact of further increasing the energy standards.
- Require energy performance certificates in buildings and use these specifically to enhance performance in the public sector.
- Consult on detailed proposals for permitted development rights for microgeneration.
- Remove barriers to microgeneration giving eligibility for ROCs from April 2007 and continue to support uptake of microgeneration for householders and communities.
- Set microgeneration targets in 2007.

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**8.3 This is a draft of the Strategy for consultation.** The Executive has already consulted extensively across a range of internal and external stakeholders during the development of this draft, but it is now seeking wider feedback. Should you wish to submit your comments then please send these to the address at the end of this section. The consultation will close on 11 June 2007 and after the consultation period, the Executive will consider all responses and take these into account when revising the Strategy.

**8.4** Once the final Strategy is complete, all of the existing and new targets and commitments will be compiled into a single Action Plan which will be published during 2007. The Executive will use the Action Planning process to set energy efficiency and microgeneration targets. Progress being made against delivering on targets will be monitored through this Action Plan, which will be reviewed and reported on, on an annual basis. The Action Plan will include a summary of the
carbon savings associated with the various actions, thus providing an overall picture of the contribution that energy efficiency and microgeneration will make to Scotland’s Climate Change Programme targets. We will report to the Scottish Cabinet in the first instance, and then submit a report to Parliament, and once approved this will be published on the Executive’s website.

8.5 The Executive is currently undertaking a Strategic Environmental Assessment (SEA) of the Strategy on a voluntary basis, and the Environmental Report is due to be published by the end of March 2007. Any major new programmes, policies or initiatives that are not currently included in the Strategy will be screened to determine whether they, individually, require an SEA.

8.6 This draft version of the Strategy has been made available for public consultation on the Scottish Executive's website. Hard copies can be provided on request at the address below. The consultation period will run from 12 March – 11 June 2007 and responses are invited by email and letter. Please send your response to the Scottish Executive by 17:00 on 11 June 2007 to:

eemstrategy@sotland.gsi.gov.uk; or

Energy Efficiency & Microgeneration Strategy Consultation
Energy Efficiency Unit
Scottish Executive
2nd Floor, Meridian Court
5 Cadogan Street
Glasgow
G2 6AT

If you require any additional information, please call 0141 242 5522.
Annex 1  Summary of UK–Wide Measures

1. Reducing Energy Consumption

1.1 The UK Government is responsible for the implementation of the EU Energy End Use Efficiency and Energy Services Directive which aims to improve energy efficiency, manage demand and reduce energy consumption across Europe. The Directive’s main target is for each Member State to achieve a 9% reduction in energy use (measured by actual consumption, rather than by emissions) over a 9 year period to 2017. It also requires more accurate metering and billing to allow consumers to make better informed decisions about their energy use. The public sector will be expected to play an exemplary role for energy suppliers and distributors to promote energy efficiency when the directive is implemented in 2008.

2. Smart Metering

2.1 Smart meters display and record real time information on energy consumption that is available immediately or remotely to energy suppliers and consumers. Providing better information on consumption patterns can help reduce energy usage and therefore reduce fuel bills, help to deliver carbon and fuel poverty targets and increase security of supply.

2.2 A better understanding of consumption patterns would also offer the opportunity to introduce innovative demand–management tariffs, and those meters with an "import–export" facility can allow consumers with microgeneration installations to sell surplus electricity to the grid.

2.3 The purchase and installation costs of smart electricity meters varies depending on their functionality but it is estimated that householders with such technologies installed, could reduce their energy bills by an average of 6.5%.

2.4 A range of smart meter trials are currently being undertaken across the UK in the domestic, business and public sectors. These pilots are due to report during 2007 and 2008.

2.5 The Carbon Trust is currently conducting a smart metering trial amongst SMEs to promote awareness and to help build support for smart metering. Early results suggest that significant energy savings are possible.

2.6 In partnership with the energy supply companies, DTI are to commence Smart Metering trials across the whole of the UK during 2007. The trials provide the opportunity to explore the wider benefits of smart metering to the UK economy and will include the value of gas smart meters combined with realtime displays. It will also highlight technical issues which are to be overcome and demonstrate the cost
effectiveness and value for money of Smart Meters. The UK Government is also currently piloting real-time electricity displays to determine the extent of energy savings that it can deliver to consumers.

2.7 The UK Government is responsible for the introduction of any mandatory metering and billing measures. Once the results of the various pilots are available, the UK Government will consult with Ofgem, energy suppliers and other interested parties on what these measures should be, how they may be implemented and will ensure they fit with the UK’s obligations under the EU Energy End Use Efficiency and Energy Services Directive.

3. More Efficient Use and Production of electrical appliances

3.1 Making energy-using products more efficient and removing the least efficient products from the market, will help to reduce energy consumption and fuel bills, and therefore cut carbon dioxide emissions.

3.2 The UK Government’s Market Transformation Programme (MTP) is working at a European and international level and with manufacturers and retailers in the UK to drive improvements in the energy efficiency of products through EU legislation, voluntary agreements and labelling schemes. Several groups of products from the domestic and business sector have been identified as a priority for action, such as:

- Domestic lighting;
- Consumer electronics such as set top boxes, television sets and chargers;
- White goods such as fridges, freezers and washing machines;
- Static electric motors and drives used in machinery such as pumps and fans (as used, for example, in air conditioning systems); and
- Office equipment such as computers, printers and photocopiers.

3.3 The most recent estimate by MTP is that taken together, consumer electronics, home computing equipment, domestic cooking equipment and office equipment in the UK produced approximately 800,000 tonnes of carbon in the UK during 2004 and that in the same year, 8% of all domestic electricity was used to power appliances on standby.

3.4 MTP has been encouraging manufacturers to reduce both the "on" and the "standby" power consumption of household appliances. The Eco-design of Energy Using Products (EUP), which is expected to come into force later this year, will provide a streamlined and effective route for setting EU-wide environmental requirements for traded goods.

3.5 EUP requires the Commission and member states to treat the issue of standby energy consumption as a priority area for consideration. The UK Government will
work proactively with the Commission and other member states to influence and speed the delivery of measures under EUP.

4. Fiscal Measures & Financial Incentives

4.1 There are a number of regulatory and fiscal measures which aim to improve energy efficiency across the public, business and domestic sectors.

4.2 The business and public sector is subject to a tax on their energy use known as the Climate Change Levy. It came into effect on 1st April 2001 and aims to encourage industry and the public sector to reduce their demand for energy and improve energy efficiency, and thereby reduce carbon dioxide emissions. It is paid through energy bills and the rates vary depending on the type of fuel used.

4.3 Defra has responsibility for the Climate Change Agreements with energy-intensive sectors. The agreements provide an 80% discount from the climate change levy for those sectors that agree challenging targets for improving their energy efficiency or reducing carbon dioxide emissions. Climate change agreements have now been concluded with almost all of the eligible sectors.

4.4 The EU Emissions Trading Scheme which started on 1 January 2005, sets a cap on carbon dioxide emissions allowances for the largest energy users. Organisations must meet their installation-level caps or buy allowances from the market. Those who do better than their cap can sell their allowances. The first trading period runs to 31 December 2007 and Phase 2 will cover the Kyoto commitment period from 2008 to 2012.

4.5 The European Commission is proposing to strengthen the Emission Trading Scheme post-2012 so that it provides a stable and transparent investment framework for business and greater clarity for investors. Work on reviewing the Scheme is underway and the UK Government, with support of Scottish Ministers, are developing and feeding in their views.

4.6 Following the Energy Review, the UK Government, with support of Scottish Ministers, is also considering proposals to achieve reductions in carbon dioxide emissions from large, non-energy intensive users of energy in the business sector, i.e., those not covered by the EU ETS. A public consultation on this finished on 31 Jan. '07. Under consideration is a mandatory auction-based emissions trading scheme, called the Energy Performance Commitment (EPC), and other options from which it is planned to reduce carbon dioxide emissions by 1.2M tonnes of carbon per annum by 2020. If the EPC emerges as the favoured option, it would involve some 5,000 organisations UK wide, including supermarkets, hotel chains, rail operators, large offices, universities, central government departments and large local authorities.
4.7 **Enhanced Capital Allowances** help businesses to invest in energy saving equipment by claiming 100% first year capital allowances on qualifying plant and machinery. The investment is offset against corporation tax. There are three schemes for Enhanced Capital Allowances:

- Energy-saving plant and machinery;
- Low carbon dioxide emission cars and natural gas and hydrogen refuelling infrastructure; and
- Water conservation plant and machinery.

4.8 The **Energy Efficiency Commitment (EEC)** is the UK Government’s main vehicle for delivering energy efficiency into the home. Under the Commitment, energy supply companies are required to achieve targets for assisting households to become more energy efficient. Measures supported to date include cavity wall and loft insulation and energy efficient boilers, appliances and light bulbs.

4.9 The first and second phases of the EEC, which run from 2002 to 2008 have so far delivered measures which are predicted to save 400,000 tonnes of carbon each year, saving consumers £9 for each £1 spent, and reducing consumer bills by £3 billion over the period to 2020. Insulation measures continue to dominate the measures used by suppliers to achieve their obligation – in the first year 430,000 cavity wall and 370,000 loft insulations were installed across the UK.

4.10 The EEC can also help to alleviate fuel poverty as at least half of all energy savings are directed at a ‘Priority Group’ of low income customers specifically, those in receipt of certain benefits and pension credits. Under the EEC 1 (2002–2005) the ‘Priority Group’ benefited from £1.8m in reduced energy bills and nearly half of the total energy savings achieved by suppliers resulted from measures provided to priority group households.

4.11 The third phase of the EEC will run from 2008 to 2011, and it is intended that the target for suppliers to promote energy efficiency improvements will be increased by a further 50 – 100%. Proposals for widening EEC3 to include measures addressing consumer behaviour, more accurate metering and billing and microgeneration are being considered. This will offer more flexibility for suppliers to deliver a larger range of measures to bring about carbon savings to householders. The UK Government carried out an initial consultation during Autumn 2006 and will issue a statutory consultation during Spring 2007.

4.12 The UK Government has announced a commitment to the maintenance of a household obligation on suppliers until at least 2020, and is currently considering mechanisms that would provide a more effective and sustained reduction in household energy demand post 2011, including better incentives for suppliers to help consumers reduce their energy consumption. As these mechanisms would involve a radical change of the supplier business model, the UK Government will be
working closely with the energy supply companies and will consult widely before deciding the final scope and objectives of the post-2011 framework.

5. Microgeneration

5.1 The Climate Change and Sustainable Energy Act 2006 received Royal Assent on 21 June this year. Under the Act, the UK Government has to consider setting national microgeneration targets by November 2008. (These include the number of electricity microgeneration systems installed in Scotland while any targets for heat systems are for the Executive to set). The Executive is currently carrying out work to assess the potential for microgeneration targets in Scotland during 2007.

5.2 The Act also empowers the UK Government to require all energy suppliers, through licence modifications, to offer to acquire electricity exported by microgenerators during 2007. If by the end of 2007, energy suppliers have not developed a system to acquire electricity from microgenerators, the UK Government will intervene.

5.3 The DTI’s Low Carbon Buildings Programme is available across the UK and provides grants for microgeneration technologies for householders, community organisations, schools, the public sector and businesses. It was launched on 1 April 2006 and will allocate £80 million of grants over a period of three years to March 2009 through two separate phases. The programme aims to demonstrate how energy efficiency and microgeneration can work hand in hand to create low carbon buildings, and supports a similar range of technologies as SCHRI. In addition, it also supports solar photovoltaics, micro CHP (Combined Heat and Power) and fuel cells.

5.4 Phase 1 of the programme was launched in April 2006 to replace the previous DTI Clear Skies and Solar PV grant schemes and will run over 3 years. This Phase applies to home owners, community groups, not for profit and commercial organisations and has £30 million funding.

5.5 Phase 2 of the programme launched in December 2006. It has funding of £50 million and aims to encourage the uptake of microgeneration in the public sector through procurement. This phase of the programme will operate on a framework-style agreement whereby a few suppliers of microgeneration installations (selected through an open and competitive tendering process) agree to provide products at reduced prices, in return for access to the market guaranteed by the £50 million grant funding. A condition of the grant award will be that equipment is purchased from signatories of the agreement.
Annex 2   Summary of current Executive-funded support measures and initiatives in Scotland

The Energy Saving Trust

The Energy Saving Trust (EST) is a not-for-profit organisation whose work in Scotland is funded by the Scottish Executive. It runs a number of programmes which promote energy efficiency to the business, public and domestic sectors with the aim of addressing the effects of climate change.

The EST currently delivers the following in Scotland:

The Business Adviser Network (BAN) is a geographical network of 6 business advisers and 10 energy consultants. They provide full cross-country coverage to help Small & Medium Enterprises (SMEs) and micro-businesses implement energy and resource efficiency measures. To qualify for support from BAN, a business must have an energy bill of under £50k per annum. Free advice is provided via site visits, promotional literature and energy audits. More information on the Business Adviser Network can be found at www.energy-efficiency.org or by calling 0845 458 5040.

Energy Efficiency Advice Centres (EEACs) give advice to the public on domestic energy efficiency. There are 2 EEAC offices based in Glasgow, and others in Edinburgh, Aberdeen, Inverness, Ayr, Dundee and Kirkwall. EEACs provide a range of advice and services to domestic consumers, and can guide individuals through the various grant schemes which can help with the cost of measures such as cavity wall insulation, draught proofing and other energy efficient technologies. More information on the services provided by the Energy Efficiency Advice Centres can be found at www.est.org.uk/myhome/localadvice. They can also be contacted centrally on 0800 512 012.

Within the Energy Efficiency Advice Centres, there are specialist staff who provide dedicated energy saving advice and support to local authorities, housing associations and partner organisations. Local Energy Support Advisors can help in a range of ways including developing sustainable energy strategies, identifying funding opportunities, assisting with grant bids and coordinating local and regional energy partnerships. More information on this specialist service can be found at www.est.org.uk/housingbuildings/localauthorities/information/localsupport or by contacting the EEACs on the number above.

Community Action for Energy (CAfE) is a programme that is designed to promote and facilitate local community-based sustainable energy projects. The aim of the programme is to improve the quality of life of people in the community by creating local training & employment opportunities, helping to reduce the cost of fuel bills and improve the warmth and comfort of homes. For more information on the
Community Action for Energy programme, go to [www.est.org.uk/cafe/what](http://www.est.org.uk/cafe/what) or call the helpline on 08701 261 444.

In 2005–06, the **Scottish Local Authority Training Resource** was piloted in two local authorities (North Lanarkshire & Moray). It provided comprehensive training for staff both for use in their own workplace and in their role as service providers. It also gave them the necessary skills and knowledge to advise their clients on the benefits of energy efficiency. The scheme is being extended in 2006–07 to two more local authorities with a total of 17 expressing an interest. For more information on the Scottish Local Authority Training Resource, contact the Energy Saving Trust on 0131 555 7900.

The EST’s **Travel Plans** is a package of measures designed to promote greener, cleaner travel choices within businesses and public sector organisations and encourage alternatives such as car sharing, public transport, walking and cycling. The travel plans are free to organisations with more than 50 employees and/or more than 10,000 visitors per year.

For organisations with a fleet of 20 or more cars and vans, the EST can provide a free **Green Fleet Review**. This service can help identify efficiency measures, or simply help organisations ensure that they are taking the right steps in managing their business transport. Financial and carbon savings can be made from buying the right vehicles, identifying and implementing fuel efficiency measures, driver education and reducing mileage wherever possible. For more information on both Green Fleet Reviews and Travel Plans, go to [www.est.org.uk/fleet/Waystotravel/scotland](http://www.est.org.uk/fleet/Waystotravel/scotland).

Help is available to individuals through the EST’s **Consumer Transport Advice** programme. The aim of this is to raise consumer awareness of the link between the type of vehicle they drive, their driving behaviour and the effect these can have on climate change. It also encourages the use of alternative modes of transport such as public transport and low carbon vehicles. The **Eco Driving** campaign highlighted that consumers could reduce their fuel consumption by 10% just through smarter driving. For more information on the EST’s Consumer Transport Advice, including smarter ‘Eco Driving’ go to [www.est.org.uk/myhome/efficientdriving](http://www.est.org.uk/myhome/efficientdriving).

**Loan Action Scotland**

**Loan Action Scotland** (LAS) is a programme funded by the Scottish Executive and European Regional Development Fund and managed by the Wise Group. LAS provides interest free loans from interest-free loans from £5,000 to £100,000 to Scottish small and medium sized enterprises (SMEs) for investments in energy efficient capital projects, including boiler replacements, variable speed drives and motors, and also some renewable technologies, such as biomass boilers, as long as a simple payback of 5 years or less can be achieved.
To be eligible for a loan applicants must:

- Be based in Scotland;
- Have up to 250 employees;
- Have been trading for over 12 months;
- Be able to provide technical evidence of the proposed measures to be installed and the potential energy savings;
- Be able to provide financial information which proves the company is trading at a profit.

For more information on Loan Action Scotland, go to www.est.org.uk/housingbuildings/funding/scottishbusiness/financialassistance/, e-mail loanactionscotland@thewisegroup.co.uk or telephone 0800 092 9002.

The Carbon Trust

The Carbon Trust (CT) is an independent, not-for-profit company funded in Scotland by the Scottish Executive. Their main aim is to help businesses and the public sector reduce their carbon dioxide emissions and energy consumption. CT offers the following range of products in Scotland to achieve these aims which can be adapted to fit the needs of the client, having particular regard to the sector that the client operates in.

Clients with an annual energy spend of £50k or more are offered a free Energy Survey. These identify energy saving opportunities and provide practical advice on how to achieve them. Savings on energy bills of up to 20% can be realised through the recommended measures. These include many no and low-cost actions that pay for themselves within a few months. More information on the Carbon Trust’s Energy Surveys can be found at www.carbontrust.co.uk/energy/assessyourorganisation.

Energy users with bills in excess of £1.5m per annum such as large businesses, local authorities and universities are eligible for more in-depth advice through the Carbon Management Programme. This provides up to 5 days free consultancy advice on site and the opportunity to work with CT on a long term basis. Carbon Management can help organisations manage and reduce their carbon dioxide emissions while growing profitably. It provides a strategic view of how carbon impacts on the organisation by identifying the risks and opportunities associated with climate change. For more information on Carbon Management, go to www.carbontrust.co.uk/carbon.

Enhanced Capital Allowances help businesses to invest in energy saving equipment by claiming 100% first-year capital allowances on qualifying plant and machinery detailed on an energy technology list maintained by CT. This investment can be offset against corporation tax. For more information on Enhanced Capital Allowances, go to www.carbontrust.co.uk/energy/takingaction/eca.
The **Low Carbon Design Advice Service** has been developed to help promote the construction of more energy-efficient non-domestic buildings. New build or renovation projects that are over 2,500m² may be entitled to free or subsidised design and construction consultancy. The larger the product, the more support available, up to and including staged support over the whole life of the scheme. More information on the Low Carbon Design Advice Service can be found at [www.carbontrust.co.uk/energy/assessyourorganisation/design_advice](http://www.carbontrust.co.uk/energy/assessyourorganisation/design_advice).

**Eco Schools**

The **Eco Schools** Programme is an international initiative designed to encourage whole-school action for the environment. It is an environmental management tool, a learning resource and a recognised award scheme. Involvement in the programme can help schools to:

- Encourage active citizenship;
- Improve the school environment;
- Reduce litter and waste;
- Reduce energy and water use;
- Devise efficient ways of travelling to and from school; and
- Promote healthy lifestyles.

Active participation leads to a series of awards: bronze, silver, 1st Green Flag, 2nd Green Flag, 3rd Green Flag and finally 4th (Permanent) Green Flag. In February 2007, Scottish schools met the 2008 target to have 80% of local authority schools registered in the scheme. Currently, 440 state schools in Scotland have been awarded their 4th Green Flag. For more information go to [www.ecoschoollsscotland.org](http://www.ecoschoollsscotland.org) or telephone 01786 468234.

**Scottish Community and Householder Renewables Initiative (SCHRI)**

**SCHRI** is a one-stop shop offering grants, advice and project support to assist the installation of new community and household renewables in Scotland. The scheme is funded by the Scottish Executive and managed jointly by the Energy Saving Trust and Highlands and Islands Enterprise. Under SCHRI, nearly 1700 grants have been approved for household and community projects since the scheme began. Solar water and ground source heat pumps are the most popular technology accounting for around 75% of all installations. As a result of the success of the scheme, the number of accredited installers of small scale renewables in Scotland has grown from 14 in 2003 to 74 in January 2007. For more information about SCHRI, including the full range of technologies supported, visit [www.est.org.uk/schri](http://www.est.org.uk/schri) or telephone the SCHRI Hotline on 0800 138 8858.
Central Heating Programme and Warm Deal

The Warm Deal programme provides grants of up to £500 for cavity wall insulation, loft insulation, tank and pipe insulation and draught proofing. It also gives advice on energy efficiency. It is available to households in receipt of certain benefits and those over the age of 60. For more information on Warm Deal, contact: Scottish Gas, Freepost, SCO 4421, Edinburgh, EH6 0BR or telephone 0800 316 6009.

The Central Heating Programme provides central heating, insulation and advice. It is available to all households in the private sector who lack central heating and where the householder or their partner is aged 60 or over. The Programme was extended in May 2004 to include householders (or partners) aged 80 or over who had partial or inefficient central heating systems. The programme has been further extended from 1 January 2007 to include homeowners aged between 60 and 79 and in receipt of the guaranteed element of Pension Credit if their home central heating is partial or inefficient. The programme provides the following package of measures:

- A central heating system and advice on how to use it;
- Loft, cold tank & pipe insulation; cavity wall insulation; and draughtproofing;
- A carbon monoxide detector (except where heating system is electric), a mains–linked smoke detector and a cold alarm;
- Advice on best use of energy in the home; and
- An optional check of entitlement to state benefit.

Further information is available from Scottish Gas, Freepost, SCO 4421, Edinburgh, EH6 0BR or by telephone on 0800 316 1653.

Central Energy Efficiency Fund

In 2004 the Public Sector Central Energy Efficiency Fund (CEEF) was launched. Under this initiative, £20 million in new funding was provided over 2004/05 and 2005/06 to implement energy efficiency measures across the public sector in Scotland. The scheme covers all local authorities, health boards and Scottish Water. The money is administered at a local level and is used to set up a revolving loan fund ring-fenced purely for energy efficiency projects which bring about energy, cost and carbon savings. The cost savings from the measures are then used to invest in further energy efficiency projects and to improve frontline services. The scheme is on track to achieve a 20% reduction in energy consumption with identified lifetime financial savings of nearly £30 million so far. Identified carbon savings so far, are estimated at over 80,000 tonnes of carbon and, by 2010, savings of more than 390,000 tonnes of carbon are predicted. For more information on the Central Energy Efficiency Fund go to http://ceef.energy-efficiency.org/.
Home Energy Conservation Act

The Home Energy Conservation Act 1995 (HECA) was introduced into Scotland in 1996. This Act designated all Scottish local authorities as energy conservation authorities, each with a duty to devise strategies to achieve significant improvements in the energy efficiency of their respective housing stocks, across all tenures, over the ensuing 10–15 years.

All Scottish local authorities published their initial HECA strategies in 1997. They were used as the basis for agreeing individual target improvements in energy efficiency. The targets, which take account of local circumstances and conditions, range from under 20% to more than 30%.

The latest HECA statistics (the latest Progress Report (2003–05) is due to be published in Spring 2007) shows that steady progress is continuing with an average 17.2% improvement in energy efficiency and an overall reduction in carbon dioxide emissions of nearly 850,000 tonnes of carbon, and that households were on average £152 better off as a result of energy efficiency improvements since the start of HECA in 1997. More information and HECA reports can be found at www.scotland.gov.uk/Publications/2003/12/heca03/2
Public Consultation

This draft version *Energy Efficiency and Microgeneration: Achieving a low carbon future: A Strategy for Scotland* has been made available for public consultation on the Scottish Executive’s website. Hard copies can be provided upon request from eemstrategy@scotland.gsi.gov.uk (telephone 0141 242 5522).

The consultation period will run from 12 March – 11 June 2007. Responses are invited by email and letter. The consultation period will close at 5:00 pm on 11 June 2007. Scottish Ministers will take account of all response received before publishing the final Strategy.

Please send your response to the Scottish Executive by email to: eemstrategy@scotland.gsi.gov.uk

or send your written response to the address below:

Energy Efficiency and Microgeneration Strategy
Energy Efficiency Unit
Scottish Executive
Enterprise, Transport and Lifelong Learning Department
2nd Floor, Meridian Court
5 Cadogan Street,
Glasgow,
G2 6AT

Copies of all responses received will be placed in the Scottish Executive's library and will be available to the general public. Responses will also be made available to the public on the Scottish Executive's website. The views expressed by respondents may also be quoted or referred to in any future review of responses.

If you do not wish your responses to be made public, please ensure that you indicate clearly that all or part of your response is to be treated as confidential. Confidentiality will be strictly respected. We will count confidential responses in any statistical analysis and confidential views will be taken into account along with non-confidential responses.

Your response is welcome on any aspect of the draft strategy. The following questions may assist you or your organisation in developing your response, but your submission need not be directed by these.

**Questions**

1. Do you agree with the overall approach taken in this draft strategy for improving energy efficiency and encouraging greater uptake of microgeneration? If not, why not?

2. Do you have any views on the key actions covered in the draft strategy summarised in Chapter 8 – Conclusions and Next Steps?

3. The draft Strategy states that we will consider targets to be included in the final Strategy and Action Plan:
   a) Do you have any views on specific targets referred to within the draft?
   b) Are there any other targets which you believe should be considered?

4. Are there any other comments you would like to offer on this strategy in relation to the promotion of energy efficiency and microgeneration in Scotland?
5. If you are responding on behalf of an organisation, how do you think your organisation will/can contribute to the success of the strategy?
RESPONDENT INFORMATION FORM: Energy Efficiency and Microgeneration Strategy

Please complete the details below and return it with your response. This will help ensure we handle your response appropriately. Thank you for your help.

Name: 
Postal Address:

1. Are you responding: (please tick one box)
   (a) as an individual (go to Q2a/b and then Q4)  □
   (b) on behalf of a group/organisation (go to Q3 and then Q4)  □

INDIVIDUALS
2a. Do you agree to your response being made available to the public (in Scottish Executive library and/or on the Scottish Executive website)?
   Yes (go to 2b below)  □
   No, not at all   (We will treat your response as confidential).  □

2b. Where confidentiality is not requested, we will make your response available to the public on the following basis (please tick one of the following boxes):
   Yes, make my response, name and address all available  □
   Yes, make my response available, but not my name or address  □
   Yes, make my response and name available, but not my address  □

ON BEHALF OF GROUPS OR ORGANISATIONS:
3 The name and address of your organisation will be made available to the public (in the Scottish Executive library and/or on the Scottish Executive website). Are you also content for your response to be made available?
   Yes  □
   No   (We will treat your response as confidential)  □

SHARING RESPONSES/FUTURE ENGAGEMENT
4 We will share your response internally with other Scottish Executive policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for the Scottish Executive to contact you again in the future in relation to this consultation response?
   Yes □
   No □