

Time to act on climate change

A clarion call from Scotland's environmental movement

Scottish Environment LINK

The climate challenge

> *The science is clear. Climate change is happening. The impact is real. The time to act is now.*
>
> **Ban Ki-moon**
> **UN Secretary General**

Climate change is now a global crisis. Rising temperatures and changing weather patterns are already impacting dramatically on people and ecosystems around the world. Concentrations of greenhouse gases in the atmosphere are fast approaching suspected tipping points, which could commit our descendants to dealing with rates of environmental change unprecedented in human evolution.

Climate change will be felt across the world. The International Panel on Climate Change has said that if the necessary action is not taken, climate change is likely to place an additional 80–120 million people at risk of hunger; 70–80 per cent of these will be in Africa.

We still have time to avoid the most serious consequences if we act now. There is growing awareness around the world of the need to act, and groups of people from all walks of life are joining together to show their support for firm positive action by Governments and individuals.

Climate change is part of a wider environmental emergency, which arises from the unsustainable exploitation of finite and fragile natural resources. Worldwide people are consuming around 25% more resources than the planet can replace.[1]

The Millennium Ecosystem Assessment[2] concluded that most of the world's natural systems are being pushed to the point of collapse, including fresh water resources, fish stocks, productive and stable soils. Soon, breaching these environmental limits will also begin to impact very deeply on our ability to feed ourselves, and to deal with diseases and natural disasters such as floods and droughts (all of which will be rendered more acute by climate change). Not all these problems will manifest themselves in Scotland with equal severity, but we are not immune from the problems they will cause worldwide.

The economic costs of inaction are unthinkable. Sir Nicholas Stern's 2006 review on 'The Economics of Climate Change' estimated that 'business as usual' could cause economic impacts greater in scale than the two World Wars and the Great Depression together.

The social cost of climate change is also becoming apparent – as people face the consequences of severe weather incidents, health impacts, food and water shortages, and displacement caused by sea level rise.

Many of these problems are more often associated with people in distant places - with increasing reports of severe hurricanes in the USA, devastating floods in Asia and droughts in Australia. In an interdependent world, we can no longer see ourselves as isolated from emissions and their impacts elsewhere. People in Scotland are also starting to experience many of the same phenomena directly – with increased flooding events and changing sea-levels challenging our traditional defences.

Decision-makers here in Scotland therefore need to take action which, although politically difficult, is essential for the long-term survival of our environment and for our well-being. Now is the time to put into practice the sustainable development rhetoric – by tackling economic, social and environmental concerns in an integrated way. Ultimately we all depend on the carrying capacity of the planet. Short-term economic gains which put the environment at risk in the long-term are not a viable way forward.

The nature and scale of the challenge require a step change in the way society thinks and behaves, and a radically different approach to policy-making and delivery. It will take courage and strong leadership, but the more we do today to reduce emissions and to manage the impacts which are now unavoidable, the less damage will happen in the future, and the cheaper and easier it will be to cope with change.

John Mayhew
Chairman, Scottish Environment LINK

Scottish Environment LINK (LINK) – the liaison body for Scotland's voluntary sector environmental bodies – believes that urgent action is needed now, and wants to play a constructive part in helping to bring about the necessary response. This statement sets out LINK's views on the main issues we believe must be addressed if climate change is to be tackled effectively in Scotland.

Further information about each of these issues, and the context and rationale for LINK's position, can be obtained from LINK (see back page).

Examples of environmental changes already happening in Scotland

Historic buildings – Scotland's historic buildings were generally not designed to withstand the sustained damp conditions which they currently have to endure, and many are also becoming seriously affected by flooding episodes as rainfall increases. The rising temperatures and increasing humidity triggered by climate change are threatening to unleash a plague of pests on the priceless contents of Scotland's historic buildings.

Marine life – Warm water plankton are displacing cold water plankton in the North Sea. Plankton peaks or blooms are happening at different times of year compared with 20 years ago. Suddenly birds and other animals whose life cycles have evolved over thousands of years to coincide with abundant plankton are starved of food. This also has serious implications for the economic recovery of important fish stocks such as North Sea cod.

Coastal habitats – One of the predicted impacts of climate change is a rise in sea levels combined with increased storm surges, which will place pressure on coastal flood defences, increasing the risk of erosion and flooding. The rising seas also threaten important coastal habitats and wildlife.

Mountain environments – Scotland's mountains with their distinctive and special natural heritage value are particularly vulnerable to climate change. Increasing temperatures result in rarer mountain species being outcompeted by widespread generalists as their habitat becomes more and more confined to higher altitudes. Scottish tourism has its stronghold in attracting people to the special mountain environments that are now under threat.

The climate challenge

Algal blooms like this are becoming more common

Flooded Perth-Inverness railway line

Local volunteers excavating Bronze Age structures from within the eroding burnt mound at Cruester, Bressay, Shetland. The site has been moved, stone by stone, to a nearby location.

Examples of environmental changes already happening in Scotland

Freshwater life – warmer water temperatures could lead to widespread algal blooms, especially in lochs, where toxic blue-green algal blooms can threaten both the environment and human health. Climate change may provide more favourable conditions for the spread of invasive non-native species, posing danger to native populations of fish, affecting biodiversity and the important freshwater game fishing business.

Water resources - Scotland is predicted to get warmer in the summer months, but there is an increased risk of heavy rainfall, leading to flash floods and increasing the risk of pollution. Winters will become wetter and milder, with extreme rainfall events leading to serious flooding events.

Archaeology - Archaeological sites along Scotland's coasts are particularly vulnerable to damage and destruction from rising sea levels and increased storminess. Inland sites are being devastated by changes in vegetation, especially the increase in bracken and scrub caused by the milder climate and the decline in upland farming.

How should Scotland respond to the climate challenge?

Urgently. People are already starting to experience the impacts of climate change here in Scotland, as well as becoming more aware of the human and environmental consequences across the globe. The range of these impacts is creating a growing sense of urgency, but **LINK believes that the necessary changes to the way we all live and work will not happen unless we change the way we are approaching the issues**.

If we tackle climate change by taking steps towards sustainable development we can deliver social and economic benefits as well as environmental ones. Scotland is already beginning to benefit from thousands of new jobs in the renewable energy industries, but in other respects policy has yet to be joined up. Had we sought to tackle fuel poverty in the last decade by investing in energy efficiency in the homes of the fuel poor, rather than by trying to keep prices low by energy market liberalization, rising fuel prices would hold few fears even for Scotland's poorest. If we address the conflict between car-use and carbon emissions by enabling active transport (walking and cycling) rather than focusing on vehicle technology, then the looming health crisis amongst Scotland's children could be defused.

Whilst Scotland is a small country, the way we live our lives has a far greater impact - through our imported goods and travel abroad contributing significantly to other countries' emissions. On average each Scottish inhabitant uses more than twice as much carbon as someone living in China – even without taking account of emissions in China to produce goods consumed in Scotland. As a developed nation, the way Scotland addresses climate change sends important signals to other nations. We must cut greenhouse gas emissions if we expect others to do likewise. This requires bold and urgent Government action.

However, the responsibility is not solely that of Government. LINK recognises that its member bodies, and more than half a million people across Scotland who support them, have an important role to play both in raising awareness of the issues and in showing what can be done through our own activities. **LINK and its member bodies are committed to supporting positive action for change**.

LINK also believes that we need to mobilise people from all walks of life, not just those in the environmental movement. LINK is part of the **Stop Climate Chaos Scotland coalition** – through which non-governmental organisations and bodies representing the environmental and development movements, faith groups, trade unions, women's groups and others have come together to press for concerted action on climate change.

LINK shares the objectives of Stop Climate Chaos Scotland in relation to the proposed Scottish Climate Change Bill:

- **Set long term greenhouse gas reduction targets**. The Bill should require Government to keep within a fair share of global greenhouse gas emissions, at a level that restricts temperature rise to no more than 2°C. On current science, to stand even a 50% chance of doing this, we must set an overarching target to reduce greenhouse gases by at least 80% by 2050, based on 1990 levels.
- **Set statutory annual emission reductions targets of at least 3%: As an absolute minimum**, year on year cuts of at least 3% will be required to ensure that overall targets are met. Lower rates of annual progress will mean a higher level of cumulative emissions.
- **Include international aviation and shipping**. International aviation and shipping emissions should be accounted for in targets.

For further information about Stop Climate Chaos Scotland and its activities see http://www.stopclimatechaosscotland.org

How should Scotland respond?

LINK believes we need to take the following approaches to tackling climate change in Scotland.

- **We must mitigate the effects of climate change**, by delivering immediate and sustained greenhouse gas reductions to prevent the worst consequences of climate change, while we still have time.
- **We must adapt to the changes we are experiencing already**, which result from past greenhouse gas emissions, to help ensure we have a healthy and robust environment for the future.
- **Our approach must tackle social, economic and environmental issues in an integrated and sustainable way**. It is no longer possible to address these complex, inter-related issues separately – unless we adopt a genuinely new approach, we will fail to meet the challenges we now face.
- **We need clear leadership** – from politicians, the voluntary sector, businesses and individuals and communities. We all have a part to play, but without leadership from Government we will not achieve the necessary step change.
- **We must learn to live differently**, by ensuring that our formal and informal education systems equip our population with the knowledge, skills and attitudes needed to live within the environmental limits of our planet in a society that is fair and equitable.

This statement addresses each of these overall goals in more detail, and sets out LINK's recommendations for action in relation to each.

The language of climate change

The terms 'mitigation' and 'adaptation' are commonly used in international scientific and government policy literature relating to climate change. Nevertheless, they are not always well understood. In this publication, LINK uses this terminology as defined by the International Panel on Climate Change (see further http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf)

Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Mitigation – an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases.

Climate change mitigation – preventing the worst

In order to prevent the worst climate change scenarios from becoming a reality – with the dire social, economic and environmental consequences they are predicted to bring – LINK believes policy-makers should have **three priorities**:

To bring about *at least* an 80% reduction in greenhouse gas emissions by 2050 from 1990 levels

Scotland and other developed countries need to reduce greenhouse gas emissions by a minimum of 80% in order to have just a 50% chance of preventing the global temperature rise from exceeding 2˚C. If global temperatures rise by more than 2˚C, we face the severe risks of crossing irreversible environmental 'tipping points' and triggering greenhouse gas feedbacks that will further accelerate climate change. A long term target is not an excuse for delay; our trajectory towards 2050 must ensure early reductions in emissions and a steady progress of at least 3% per annum otherwise greenhouse gas concentrations will exceed acceptable levels. The sooner and larger the cuts the safer our future will be.

To reduce emissions of *all* gases, not just CO_2

Approximately 16% of Scotland's greenhouse gas emissions are caused by gases other than carbon dioxide, many of which are generated by our land use practices. If Scotland is to make a fair contribution to the overall emissions reduction target, we must focus efforts on reducing all greenhouse gases.

To tackle climate change and its impacts in a sustainable way

The legislative and policy framework needed to achieve such radical emissions reductions must encourage a sustainable approach, which conserves the natural environment and prioritises demand reduction and efficiency in our energy use. This means delivering energy conservation along with environmentally acceptable renewables, reducing waste and encouraging recycling. It means greater support for walking, cycling and public transport to help manage the way we travel rather than accept the folly of expanding airports and roads to meet ever increasing demand. It also means finding ways to manage our land to provide multiple public benefits, including important landscapes and natural habitats, improved local economies and quality of life. Tackling climate change and conserving our natural environment both have proven economic benefits and failure to achieve either can have more serious economic and social consequences.[4]

Integrated transport encourages people to use cycles and trains instead of cars

Providing greener transport solutions in our cities

Remove barriers to the roll-out of renewables

Climate change mitigation

Conserving energy by using alternative appliances

The following pages set out in more detail what LINK believes policy-makers should do to mitigate the worst effects of climate change.

Tackling emissions from energy

LINK fully supports the Scottish Government's commitment to delivering energy conservation and efficiency alongside renewables without causing environmental harm. However, LINK believes that new approaches are needed to tackle energy emissions effectively.

The need for a sustainable energy hierarchy

LINK calls on the Scottish Government to produce a strategic energy framework, which relies on energy conservation alongside the development of renewables, using the full range of technologies and scales. We believe that this strategy should be informed by a sustainable energy hierarchy.

The hierarchy sets out different ways of delivering carbon reductions. The idea is that all should be pursued, but since those at the top have least risk of adverse social and environmental impact, they should be prioritized.

Reduce demand

Reducing our energy demand is critical if we are to secure the necessary early cuts in emissions to prevent dangerous climate changes. At current rates, our electricty demand is rising by 1% per annum and could negate the carbon benefits of our renewable energy achievements by 2050. If we do not cut demand we will have to rely on ever increasing development of renewable energy sources to ensure we remain on target to cut greenhouse gas emissions.

Improve efficiency

Scotland needs mandatory targets to improve the efficiency with which energy is used and to help tackle fuel poverty. Targets which enable progress to be monitored would stimulate action to address energy consumption, and would also ensure sufficient resources are committed to achieving these targets.

A strategy for heating

More energy is used for heating and hot water in Scotland than for transport and electricity combined. There are considerable opportunities for addressing our heating needs from renewable resources such as wood fuel or solar power. LINK would like to see a national heat strategy to reduce

A sustainable energy hierarchy

Conservation and avoidance energy management systems to control lighting, heating, etc

Energy efficiency (including insulation, efficient building design, energy efficient appliances)

Micro-renewables and micro-CHP Household / development scale including CHP boilers, rooftop turbines, heatpumps, pv, solar thermal etc
- Heat
- Electricity

Macro-renewables – community scale wind, biomass, hydro, etc
- Heat
- Electricity

Macro-renewables – commercial scale wind, wave, tidal, biomass – avoiding areas of environmental sensitivity
- Distributed generation
- Grid based generation

heat wastage and encourage development of Combined Heat and Power (CHP), district heating and other forms of renewable heat generation.

Energy use in buildings

Nearly half our emissions come from the built environment and home energy use alone accounts for nearly 30%. The Scottish Government must develop and implement a low and zero carbon buildings programme to ensure the built environment achieves an 80% reduction in emissions by 2050. New and existing homes which are made more comfortable, warm, healthy and cheaper to run will reduce energy use and help address fuel poverty.

Decentralised generation

Our reliance on centralised fossil fuel energy generation is hugely wasteful – approximately 2/3 of energy generated is lost in the process. Scotland's future energy distribution will need to be capable of supporting a geographically dispersed generation base, and have the flexibility to accommodate multiple sources of energy. The Scottish Government must provide support for decentralised energy, that is close to the point of use and facilitates the large scale uptake of micro renewables and the potential this offers for private energy sale to the grid. A move towards more decentralised energy generation is possible now and would have the combined effect of reducing emissions and raising public awareness of the link between electricity use and energy generation. A commitment to decentralised energy frees the potential of CHP to provide highly efficient energy without the losses associated with transmission.

Small and medium scale renewables

As part of a de-centralised approach, small scale renewables offer additional benefits, as they can be widely deployed in a way that has minimal environmental impact. Bringing energy generation closer to the point of end use is also an effective way of raising awareness and potentially helping with energy conservation.

Large scale renewables

LINK supports the Scottish Government's target for 50% of our electricity production to come from renewables by 2020. Studies[5] demonstrate that the renewables opportunity in Scotland is so great that the Government's targets can be delivered while avoiding environmentally and culturally sensitive areas on land and at sea.

Scotland has a much treasured and finite resource of wild land and seascape. We also have a considerable resource of renewable energy sources including wind, wave, hydro and biomass. The quality of wildness is particularly vulnerable to some forms of energy generation such as wind turbines on high ridges. Scotland's important environmental sites as well as the small declining reserve of remote wild land and sea passages should be protected when taking forward development of renewable energy. If carefully planned, there is no need for conflict between delivering renewables targets and safeguarding the environment.

LINK believes that the development of marine renewables needs to be supported by urgent identification of important areas for wildlife conservation, in order that these can be protected from any adverse impacts. To aid the delivery of offshore renewables and avoid unnecessary conflict, better strategic marine planning is required.

Biomass and bioenergy

There are opportunities for biomass to provide significant renewable energy directly as heat in wood burning stoves/ boilers for individual properties, or in district heating schemes. Biomass used to generate electricity in dedicated large scale biomass plants or as co-firing for coal fired plants tends to be an inefficient option.

Small-scale heat and power generation from biomass can deliver significant emissions savings whilst enabling the restoration, management and creation of woodlands.

Careful land use planning, along with properly appraised expansion of bioenergy cropping, will protect Britain's most important areas for biodiversity, landscape

Combined Heat & Power Boilers, Aberdeen

Solar installation at RSPB Vane Farm reserve


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© Richard Livett

and cultural heritage from inappropriate bioenergy developments. Provided the right source crop is selected, located, designed and managed appropriately, forestry products and agriculture energy crops can help increase the share of biomass in the energy mix without harming the environment.

LINK believes that environmental standards should be developed urgently to help assure consumers that biomass has been sustainably sourced. Better targeting of resources and advice is needed to encourage biomass production that helps deliver wildlife benefits.

Energy from waste

LINK believes that mass burn incineration is not a sustainable option for delivering any significant part of our energy needs. The majority of our waste is recyclable or reusable, and this brings far greater energy savings than the inefficient process of generating energy from burning waste. Given the need to make progress towards zero waste - through waste reduction, re-use and high levels of recycling – LINK believes that we should be designing waste out of the system rather than creating electricity generation facilities that require waste in order to operate.

For biowaste, appropriately developed anaerobic digestion facilities can play a role in generating energy, where gas can be produced and recovered from composting units and the gas used to produce heat or electricity.

Coal and gas

LINK believes that in the context of delivering an 80% reduction in greenhouse gas emissions it is not justifiable to allow the building of any new fossil fuel power stations in Scotland which do not have Carbon Capture and Storage (CCS) installed and operating from the outset. We are concerned that the claim that stations are "carbon capture ready" may be used as a fig leaf – there are no guarantees of when, if at all, CCS would be fitted.

LINK supports the application of a greenhouse gas emission standard to new electricity power plants in Scotland.

Nuclear power

LINK believes that nuclear power is expensive and dangerous, and new reactors have no place in Scotland's future energy provision. Even without nuclear power, it is possible to deliver Scotland's renewables targets without having to compromise important environmental areas.

Energy transmission

In order to help deliver renewables that are effective in reducing greenhouse gas emissions, without environmental harm, LINK believes that Scotland should develop a planned approach to developing and improving the electricity grid through a Strategic Environmental Assessment (SEA).

The grid should support developments which the planning system has identified as being in the 'right' place, rather than adopting a 'first come first served' approach.

Scotland's native woodlands producing woodfuel

In the Central Lowlands, domestic hardwood log businesses are being built up on the back of thinning and removal of exotic species as part of the conservation management of native woodlands. These businesses have started simply - a man with a pickup truck, chainsaw, splitting axe and bag. Now they are producing an increasing quantity of seasoned timber for a growing market.

The Sunart Oakwood Initiative is a broad-based partnership working to restore the special native oakwoods on the shores of Loch Sunart on Scotland's West coast. The habitat conservation programme has also brought wider economic spin-offs for the area – such as Richard Livett's business using softwoods for firewood & chip, sold locally.

http://www.sunartoakwoods.org.uk

Reducing emissions from transport

LINK believes that more must be done to ensure that all transport proposals and policies contribute to reducing emissions, including measures to stabilise the growth of air travel and an end to major, traffic generating road schemes. In addition, the Scottish Government must do much more – including better development planning and localisation of services – to reduce the *need* for travel, and to ensure greater sustainable travel options such as public transport, cycling and walking. Simply increasing road and air infrastructure to meet increased transport demand is no longer an acceptable option in the face of climate change - from both an environmental and economic perspective.

Use of transport biofuels

Severe doubts have now been cast over whether any first generation biofuels can be considered truly sustainable – in some cases, they may lead to increases in greenhouse gas emissions as well as being a very land-hungry fuel source and reducing the areas left for food growth and biodiversity. To reach the UK's energy crop needs, fuels will be sourced outside the UK. This can impact upon internationally important habitats such as the Malaysian and Brazilian rainforests. Intensification of production driven partly by increased growth of energy crops will also impact on the environment, landscape, habitats and species in Scotland.

Biofuel targets within the UK and Europe should not be imposed unless stringent and mandatory standards for both net greenhouse gas balances of biofuels and the sustainability impacts of their production and use can be set and practically enforced. Transport policies should concentrate on efficiency and reducing vehicle use, rather than on alternative fuel solutions.

Rising arable crop prices, partly as a result of demand for biofuels, can lead to conversion of previously uncultivated land and intensification of production.

Carbon Policies

Humankind has never faced such a challenge – we need innovative policy approaches to address the issues effectively. However, we must also be careful not to adopt measures which offer apparently simple solutions but may not deliver genuine results.

The role of carbon offsets

Carbon offsets which attempt to allow those emmitting carbon to pay for reductions elsewhere may have a role in tackling climate change– but should only be applied after all efforts to reduce the polluters' own emissions have been genuinely exhausted. If offsets are to be used by governments, companies, individuals and the public sector, steps must be taken to ensure they have been certified by an independent, transparent, internationally recognised body, and meet strict criteria such as the Gold Standard[6] to ensure a genuine reduction in emissions has been achieved. LINK supports the purchase of independently verified international credits only when these are in addition to Scotland's own reduction target.

Carbon offset schemes which include the management of natural habitats such as woodlands or peatlands can help conserve biodiversity only if they are carefully designed; there still remains considerable uncertainty in the science around the claimed carbon benefits.

The role of cap-and-trade systems

A cap-and-trade system, such as the European Emissions Trading Scheme (ETS), is based on allocating a cap on emissions over a period of time. It is critical to the credibility of such a system that it applies an emissions ceiling which is in line with the commitment to limit global temperature rise to 2˚C. Future allocations for new and existing installations captured by the ETS should be based on 100% auctioning of emissions allowances.

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Climate change mitigation

Whitmuir Organics are piloting a scheme to off-set methane emissions from livestock

Energy efficiency measures and renewables play an important role at Cream o' Galloway

Reducing emissions from land and water use

Agriculture

Agriculture is responsible for 12% of Scotland's greenhouse gas emissions due to the use of nitrates in fertilizer and methane from livestock, whilst land use accounts for a further 8% in the form of carbon dioxide lost from cultivated soils.

Over 50% of all fertiliser used on farms ends up in the atmosphere or waterways.

The main way agriculture can reduce its greenhouse gas footprint is by reducing the use of artificial fertiliser and more efficient recycling of animal waste. Methane emissions from ruminant animals could be tackled by addressing human diet, to encourage people to consume less meat and more fruit and vegetables. Farms can also be large energy users (both electricity and fuel) – they should be encouraged to adopt energy efficiency measures and to use renewable sources.

If people followed current healthy eating guidance, we could cut food emissions by about 15%.

Sound management of soil resources is vital in helping reduce emissions, given the high levels stored in Scotland's soils. Soil planning could help with the introduction of new measures such as reducing tillage and leaving soil bare for minimum lengths of time.

Examples of positive action on Scottish farms

Whitmuir Organics is a small farm in the Borders which grows organic vegetables and rears pigs, beef cattle, sheep and chickens under organic conditions. They run a farm shop and an on-farm butchery. They aim to cater for local customers to reduce the distance the food produced travels. In addition to this, Whitmuir is attempting to offset the methane emissions produced by their livestock. They have introduced their own greenhouse gas charge on meat based on a calculation of the social cost of carbon. The funds raised are then used to support tree planting and energy efficiency measures on the farm and in the local community. (http://www.whitmuirorganics.co.uk)

Cream o' Galloway produce organic, fair trade ice creams and frozen smoothies from milk from their own organic farm in Dumfries and Galloway. They have been actively engaged in managing for wildlife as well as maintaining the area of ancient woodland on their farm and planting around 40,000 native trees. They also run a Visitor Centre demonstrating how the ice cream is produced. In order to cut down on the energy needed for running the farm and visitor centre, energy efficiency measures and recycling have been introduced. On farm solar panels and a wind turbine are in place, and ground source heat-pumps are being installed. (http://www.creamogalloway.co.uk)

Native woodlands delivering multiple benefits

Scottish Native Woods are working with Ardkinglas Estate at Creag Loisgte by Loch Fyne to develop the wood as a valuable local resource, while also securing its future as a carbon store. Oak trees felled as part of the sustainable management of the site are milled by a local business, then converted into bridges by members of the Argyll Green Woodworkers' Association. These bridges form part of the core path network and allow local people and visitors to explore the woods as well as having a lower carbon impact than steel or concrete structures.

At Blarbuie Wood, Scottish Native Woods has developed woodland management plans for a wide-ranging partnership including the NHS, Reforesting Scotland, the Argyll Green Woodworkers' Association, Lochgilphead Community Council and the Scottish Association of Mental Health. This has involved different groups participating in an initial appraisal of the woodland, involving the local community in planning its future, felling trees for use locally – for paths, bridges, firewood etc – and improving access to the area by building paths, observation hides, introducing interpretation boards, art in the wood and running education events.

Forestry

Forestry policy must continue to promote sustainable multi-benefit forest management. This means that new woodland planting must be appropriately located, designed and managed to enhance, not damage, important biodiversity, and provide for recreation, access and other benefits along with any carbon savings through sequestration.

Forestry planting to sequester carbon must not be seen as the 'silver bullet' for reducing our emissions. Using Scottish forestry to offset carbon emissions from other sources of emissions is currently unregulated, open to abuse and lacking in scientific basis. The development of any carbon standards must ensure genuinely additional carbon benefits, and be independently verified by accredited auditors, to be consistent with sustainable forest management.

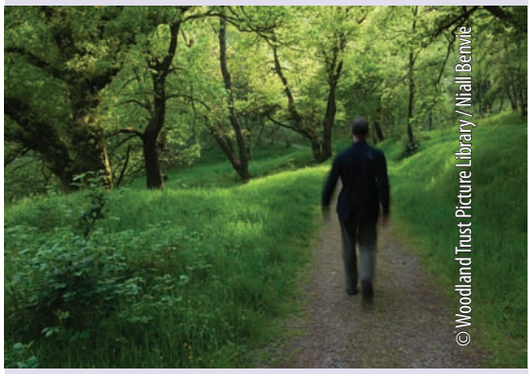
Peatlands and soils

Scotland must safeguard its important peatlands – not just as a carbon store but for their multiple natural and cultural heritage and other ecosystem benefits. It is vital that this important peatland resource is protected through appropriate forestry, agriculture and development planning policies, an end to commercial peat mining and an urgent programme of peatland restoration. Windfarm developments should avoid sensitive peatland areas and ensure carbon and biodiversity safeguards are fully addressed.

Biodiversity Action Plan priorities for Scotland's peatlands aim to restore around 600,000ha of blanket bog, which has been damaged by past grazing and/or drainage and forestry, and continues to deteriorate. Delivery of the BAP target could deliver a carbon dioxide saving of some 5 million tonnes.

LINK believes that there is a need for better Government-led coordination of research, more applied science and exchange of information, to help gain common agreement on the impacts of development on peatlands and their many functional values, and to inform future forestry and renewable energy strategies.

Agricultural practices also need to change to mitigate carbon losses from soils through practical measures that minimize soil expose and reduce tillage. Bare cultivated soil is prone to erosion and nutrient leaching and well timed cultivations and use of 'catch' and 'cover' crops should be used to limit extended periods of bare soil. This should also have synergistic benefits for biodiversity and water quality from, for example, over-wintering stubbles and green manures. Field operations, especially ploughing also disturbs soil organic carbon. Avoiding such disturbance through reduced tillage techniques should reduce GHG emissions.[7]



Children helping to restore native woodland

Restoring peatlands damaged by forestry in the Flow Country

Managing whole river catchments can improve water quality and help reduce pollution

Children's allotment, Botanic Gardens, Glasgow

Water

Supply

Scottish Water is the largest consumer of electricity, mostly used to pump water around its network. Almost half a million tones of carbon dioxide is emitted through energy use to pump and treat water in Scotland. Water leakage is estimated to be around 48 – 52% of total water supplied to homes and businesses. This rate of water loss is unsustainable. It not only results in the wastage of a precious resource, but also represents a significant waste of energy and public money. Further efforts to make sure we use water wisely and reduce demand will have even more energy saving and hence carbon saving benefits, by reducing the amount of water which needs to be pumped and treated.

LINK believes that Scottish Ministers and the regulator, the Water Industry Commission, must ensure greater efforts by Scottish Water to reduce leakage and introduce binding targets in order to achieve year-on-year reduction.

1146 million litres of treated water are lost from leaking pipe networks in the water supplies every day in Scotland – enough to supply one million families.

Addressing pollution at source

The threat of pollution to waters in Scotland, impacting both wildlife and people, will increase as a result of climate change. Scottish Water is increasingly required to install more sophisticated and expensive water treatment in order to protect the health of people from pollution. This water treatment consumes large amounts of energy. Such 'end of pipe' solutions are proving increasingly costly and unsustainable in the long-term. LINK believes that instead Scottish Water, SEPA and others responsible should start looking at managing catchments to improve raw water quality, and restore degraded habitats such as peatlands and wetlands which help reduce pollution naturally.

Gardens and Parks

Gardening which involves caring for and managing the soil can help reduce problems associated with carbon emissions. LINK believes that the gardening community has the potential to set an example of good practice through reduced fertilizer use, manual tools as alternatives to power tools, composting of organic waste, and promoting locally sourced food and flowers, all of which could have far reaching carbon implications if adopted across the nation's gardens, allotments and parks.

Living with the consequences of climate change

Past and present greenhouse gas emissions linger in the atmosphere, so Scotland's rural, urban, freshwater, marine and coastal environments will be affected by climate change.

The more the planet has to adapt to the increased impacts of climate change, the harder and more costly it will be to deal with – so LINK believes that mitigation should always be the first priority. The sooner we reduce emissions, the lesser the degree of change.

However we will still need to reduce the impacts which cannot be avoided. We need to help people, other species and habitats to adapt to this changing world.

Species and habitats which are important to Scotland economically, socially and environmentally, are especially vulnerable to climate change. Many are damaged and live in fragmented landscapes. This both threatens their continued survival and deprives them of the ability to move to areas with a more suitable climate.

Our understanding of how climate change will impact on the natural world and individual species is still developing – it is not simply a case of species 'heading north' to cooler climes. Research is starting to highlight a complex web of causes and effects. Dealing with change when many of the actual impacts are unknown and difficult to predict requires careful planning and preparation to help all sectors respond in a sustainable way.

An insight into our changing climate

The popular and rewarding experience of watching birds, plants, insects and other wildlife, as well as scientific monitoring programmes, provide a valuable tool for gleaning early warning of the effects of climate change on our natural environment.

The condition of our wildlife also provides an indication of the health of the ecological systems we depend on for food, water and our economy. There are a host of examples of how wildlife is responding to our changing climate which hint at things to come:

- wading birds and wildfowl overwintering on the east coast, because harsh weather is no longer driving them further west;
- British dragonflies expanding their ranges northwards by an average of 75 kilometres in 25 years;
- seabirds unable to find food for their young at the right time of year;
- plants growing for an average of three weeks longer than they did in 1980.

LINK believes that risk management approaches should be adopted which allow us to respond quickly with no- and low-regret actions. These should also put in place monitoring and research to reduce uncertainty.

Kittiwake numbers have fallen dramatically due to food scarcity at critical times for their young

Changes to growing patterns are affecting plants and other dependent species

Adapting to climate change

Insh Marshes – the management of Britain's largest floodplain mire at Insh Marshes in Badenoch & Strathspey as an RSPB nature reserve delivers a wide range of economic as well as environmental benefits – through tourism visitor spend, agricultural activities, fishing, improved water quality, etc.[8] By allowing natural flooding of the Spey, the need for hard flood defences – estimated to cost over £1m – is avoided, and space is created for much-needed housing elsewhere.

Nigg Bay – the managed realignment of coastal areas piloted by RSPB Scotland at Nigg Bay shows the potential of new approaches to managing coastal defences, under increasing pressure from sea level rise. By allowing the sea to encroach on areas where it will not damage communities and businesses, space can be created for housing and other development elsewhere.

How can Scotland adapt to a changing environment?

Scotland is already seeing impacts of climate change on weather – winter precipitation has increased since the 1960s by almost 60% in the north and west. Scotland's annual rainfall has increased by 20%. (SNIFFER)[9]

All sectors of society will have to adapt, including those engaged in the management of the natural environment. A sustainable approach will require cross-cutting action, to ensure that each sector's approach is consistent, and supports whilst not undermining the natural environment's ability to adapt. There are also many situations where helping to conserve the natural environment provides us with adaptation solutions as well as other social and economic benefits.

Improve flood risk management

Climate change will increase the risk of flooding, inland and at coasts. We can no longer rely entirely on engineering our way out of these problems. A new approach to flooding is needed, which protects communities from flood risk in the long-term and works with nature rather than against it. Natural habitats have a capacity to absorb and store water, slowly releasing it back into rivers and so reducing the risk of flooding downstream. Restoration of damaged and drained saltmarsh in coastal areas can increase the buffering capacity of our coasts and help adapt to rising sea levels.

The Scottish Government must ensure that the new legislation on flooding introduces a framework for the sustainable management of flood risk and recognises the role of soft engineering and habitat restoration in flood management.

Reduce water use

Whilst flooding is one of the consequences of changing rainfall patterns, Scotland also faces water becoming scarcer in certain parts as a result of warmer temperatures and localised periods of low rainfall.

LINK believes that stronger and more focused efforts must be made to manage and reduce demand for water, especially in areas that might experience water shortages in the future. This should be achieved by a combination of public education in water efficiency, and fitting water efficient devices and water meters to existing and new homes.

Helping the natural world to adapt

Many natural habitats in the UK are in a damaged condition and their ability to adapt to the changing climate has been severely impaired. 62% of Scotland's internationally designated native pinewood forest is in unfavourable condition largely due to excessive grazing.[10] We urgently need to tackle the causes of damage so that the habitats and the species that depend on them are more robust in the face of a changing climate.

LINK believes that an adaptive strategy for biodiversity is needed to protect, restore, expand and link together semi-natural habitats and make the wider countryside more wildlife friendly. Planning for development, agriculture and forestry practices must work with biodiversity conservation to provide a landscape that is permeable to species movement. We need an integrated approach to land and sea use, to avoid losing Scotland's characteristic species and habitats to climate change.

This will require a combination of our existing conservation measures and additional specific adaptation measures. There is clear evidence that the statutory designated sites system is well placed to assist in our adaptation response. However, the existing measures must be delivered more effectively - on current progress, Scotland will fail to meet the EU target of halting the loss of biodiversity by 2010.

LINK believes that the strategy for helping the natural environment adapt to climate change should be founded on two key principles:

Make wildlife resilient to the impacts of climate change, and provide more options for dealing with uncertainty, by:

- protecting and better managing what we have - bringing it into favourable conservation status;
- restoring and expanding areas of habitat where these have been fragmented, damaged and degraded in the past.

Accommodate change in species and habitat distribution by:

- providing a wider countryside that is more permeable to wildlife, with key habitat features present across all farmed, forested, urban and marine landscapes;
- establishing new areas of habitat under conservation management, to provide for expected shifts in wildlife distribution.

Restoration of the Clyde river valley at RSPB Baron's Haugh nature reserve, Motherwell

Woodland Trust Scotland are carrying out native woodland regeneration within a landscape-scale project at Glen Finglas in the Trossachs

Adapting to climate change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Helping the natural world to adapt

LINK believes the following approaches are needed:

Ecosystem approach – provides a framework for countryside use on land and at sea, which helps maintain and enhance biodiversity, living processes and ecosystem services.

Landscape scale action - to help integrate decision-making across land use sectors and provide wider environmental as well as social and economic benefits.

Establish ecological networks - in urban and rural areas by developing and deploying appropriate landscape evaluation tools. Marine Spatial Planning is needed to help deliver this functionality at sea.

More urgent identification and designation of important wildlife areas, particularly in the marine environment. This should be supported by speedy delivery of conservation management objectives on our local, national and internationally designated wildlife sites and on other important wildlife areas (including Plantations on Ancient Woodland Sites).

Delivery of current Biodiversity Action Plan targets for priority species and habitats.

Improve our understanding of changing terrestrial and marine environments through monitoring, surveillance programmes and research designed to assess the impacts of climate change, the response of wildlife and the effectiveness of our adaptation measures.

Manage flood risk using sustainable and natural techniques – such as the restoration of wetlands, floodplains, and uplands – natural habitats that can store and slow down the flow of water, reducing the risks of flooding and providing opportunities for wildlife.

Walking the talk on sustainability

The transition to a low carbon economy must be seen as an opportunity to achieve a sustainable economy which delivers a high quality of life for all Scotland's people. This will involve significant changes in lifestyles; it will also require changes to governance and accountability structures and institutions, and new and more effective ways of measuring progress. Government must lead on this transition; but LINK members stand ready to support the necessary action.

When setting the policy framework for urgent action on climate change, the Scottish Government must ensure that it promotes **sustainable** ways of delivering climate change action – such as many of those outlined in this statement - which safeguard the environment as well as delivering other benefits. There are too many examples of action – for example in the transport sphere – where investment in new infrastructure undermines efforts to reduce emissions.

There is no point focusing energy efforts on new low carbon generation alone with too little effort to reduce demand, or responding to the threat of flooding by building carbon- demanding concrete structures with no regard for the environmental damage.

There is no point saving the planet if we destroy the natural environment's ability to be our life support system in the process.

Scotland taking the lead

© WWF / Gary Doak

Given the range of challenges involved in dealing with climate change, LINK believes that action is required at all levels of Scottish life – from individuals, families and communities to voluntary sector bodies, businesses and Government, local and national. The urgent need for emissions reductions, and for significant changes in the way we live our lives, mean that Government must now lead the way. If we wait for action by consensus, it will take too long, and the consequences will be deeper and more far-reaching.

The average person in Scotland produces 11.5 tones of CO_2 per year – compared to an average of 0.07 tonnes in Malawi.[11] Our total output may be relatively small compared to other larger nations, but our global responsibility to act is clear. There are also motivations closer to home – if Scotland wants to be at the forefront of the new global economy, it needs to lead in all spheres – including action to tackle climate change. This is a real opportunity for Scotland to show leadership on the international stage.

Learning to live differently

LINK recognises the important role that the environmental movement has in building public understanding, and preparing people for the changes ahead. LINK and its member bodies are keen to play a constructive role in growing public understanding of climate change and building capacity for more sustainable lifestyles. A number of exciting initiatives are already under way, and others are in the pipeline. The Government should do more to encourage such innovation.

Education – formal and informal – has a vital role to play by moving beyond building knowledge about sustainable development to developing the skills and attitudes needed to bring about sustainable development. Are our formal and informal education systems preparing us adequately to halve our carbon footprint by the time children starting school in autumn 2008 leave school?

Good foundations have been laid by the Government's continuing support for Eco Schools and the inclusion of sustainable development in the schools' Curriculum for Excellence. However we urgently need to build on these initiatives in formal education – e.g. through better teacher training and ensuring children have access to the natural world during school - and to ensure that informal education makes similar progress.

There is a large body of qualified individuals – community workers, youth workers, etc – working in **informal education** that have no training in, or access to, Sustainable Development Education (SDE). The huge potential of this group to build capacity for more sustainable living could be harnessed by more widely available training and if SDE were a requirement for informal education.

Community action - action at community rather than individual level is considered one of the most effective ways of moving towards sustainability. It is encouraging that Transition Town groups have grown from 1 in 2005 to over 60 by 2008 , with many more starting up. LINK welcomes the Scottish Government's Climate Challenge Fund, which supports initiatives at a community level. However there is no coherent system of support in place for community groups and finding advice/ expertise can often be more a case of luck than design.

The Scottish Government should **support communities which take the initiative** by working in partnership with NGOs and voluntary organisations to deliver a coherent system that provides advice, expertise and training to build the capacity of community groups to undertake sustainable development themselves.

How the environmental movement is encouraging behaviour change

Friends of the Earth Scotland promotes **sustainable living** through its members' magazine. It has also developed a web guide to carrying out home audits to assess micro-generation potential.

National Trust for Scotland and Sustrans provide web-based information on how to **travel by more sustainable means** to Trust properties; the Ramblers Association Scotland is working with others to enhance public transport facilities in walking destinations.

The Scottish Allotments and Gardens Society is developing plans to **encourage people to make more use of gardens and allotments** – reducing the need for travel to take exercise, contributing to improved health and offering more opportunities for people to grow their own food.

WWF has a **'footprint calculator'** to encourage people to think about their own personal impact http://footprint.wwf.org.uk. It is also encouraging local authorites and schools to make local contributions through a dedicated website www.localfootprints.org.

RSPB Scotland is promoting renewable energy and energy efficiency to its members and installing green energy projects in its nature reserve buildings.

A wide range of LINK member bodies produce a variety of climate change guidance and advice packs for their supporters to inform their lifestyle choices.

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About Scottish Environment LINK

LINK is the forum for Scotland's voluntary environmental organisations which have a combined membership of almost half a million people and represent a spectrum of environmental and associated cultural heritage interests. Operating primarily through its task forces, formed to address particular policy issues, LINK is concerned with influencing national policies to ensure that sustainable development underpins Government's agenda. LINK provides a forum and network for its members and assists communication between members, government and civic society.

LINK Members are:

Archaeology Scotland
Association for the Protection of Rural Scotland
Badenoch and Strathspey Conservation Group
Bat Conservation Trust
Buglife
Bumble Bee Conservation Trust
Butterfly Conservation (Scotland)
Cairngorms Campaign
Friends of the Earth Scotland
Friends of Loch Lomond
Hebridean Whale & Dolphin Trust
John Muir Trust
Marine Conservation Society
Mountaineering Council of Scotland
The National Trust for Scotland
North East Mountain Trust
Plantlife Scotland
Ramblers' Association Scotland
RSPB Scotland
Scottish Allotments and Gardens Society
Scottish Council for National Parks
Scottish Countryside Rangers' Association
Scottish Native Woods
Scottish Raptor Studies Group
Scottish Wild Land Group
Scottish Wildlife Trust
Soil Association Scotland
Sustrans Scotland
Whale and Dolphin Conservation Society
Wildfowl and Wetlands Trust
Woodland Trust Scotland
WWF Scotland

Further copies of this statement and detailed briefings on the issues covered can be obtained from the LINK website www.scotlink.org or by contacting LINK on tel 01738 630804 or tel 0131 225 4345.

LINK is pleased to acknowledge the support of the Craignish Trust in the production of this statement.

LINK is sponsored by grants from Scottish Natural Heritage, the Esmée Fairbairn Foundation, Scottish Government's Sustainable Action Fund, and supported by subscriptions from its member bodies, supporters and subscribers, and charitable donations.

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Published by and on behalf of Scottish Environment LINK, 2 Grosvenor House, Shore Road, Perth PH2 8BD © Scottish Environment LINK, 2008

Printed on Revive Forest Stewardship Council Certified 100% recycled paper

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