Scotland's Global Footprint

Reducing our environmental impact

Final Report

February 2007

Scotland's Global Footprint project

WWF worked with Aberdeen City, Aberdeenshire and North Lanarkshire Councils to reduce their local and global environmental impact. The project:

- measured footprint
- developed a software tool to inform policy making
- developed projects to reduce footprint and
- produced education materials for schools.

The project explored some of the best examples of sustainable living and working by 'footprinting' different policy options for each area. What can achieve the greatest footprint reduction – an increase in recycling rates or improved energy efficiency, better public transport systems or car pooling?

For further details visit www.scotlandsfootprint.org

Contents

Technical consultant to the project:

SEI STOCKHOLM ENVIRONMENT INSTITUTE

Preface

"The Scottish Executive is committed to reducing Scotland's global footprint. This project, with our support, has shown that the Ecological Footprint can help to improve our understanding of the impact of policy and practice on our environment, at home and around the world. That understanding will help us to meet the challenge we all face – learning to change our ways and live within environmental limits while maintaining a good quality of life. That is why we are supporting the adoption of the Local Footprints project approach in local authorities and their schools."

Sarah Boyack, Deputy Minister
for Environment and Rural Affairs

"Ecological Footprinting is an important tool that will allow us to measure our policies and plans against their potential environmental impact. The City Council has made great strides to reduce its footprint and recently achieved a 30% reduction in CO_2 emissions. The Global Footprint project, however, has highlighted that more effort is needed."

Douglas Paterson,
Chief Executive,
Aberdeen City Council

"The focus of the project in North East Scotland has been on how the councils can use footprinting to inform decision making. The transport and buildings scenarios were very helpful in giving an insight into the choices that must be considered if we are to reduce our footprint in the future. With our partners, Aberdeen City Council, we will be looking to progress this work in the coming months as part of our wider commitment to work on climate change and are pleased that some of our communities are already involved in developing their own footprint reduction reports."

Alan Campbell,
Chief Executive,
Aberdeenshire Council

"Footprinting is a robust, easy to communicate concept which has helped the Council to deliver on our new duties for sustainable development in both community planning and Best Value. It is the perfect tool with which to examine patterns of consumption and environmental impact, and to formulate policies that benefit both people and the environment. It has the potential to assist local authorities in developing environmentally-aware policies that go hand-in-hand with economic development and a better quality of life."

Gavin Whitefield,
Chief Executive,
North Lanarkshire Council

1 Executive summary

With duties like Best Value now in place for local government in Scotland, local authorities are increasingly expected to deliver on sustainable development. But how do local authority staff and members know which policy is best? Where should they invest most? And how should a council engage its staff and the public to create more sustainable places and lifestyles?

WWF Scotland believes that one way to tackle these challenges is with the Ecological Footprint, a tool which can be used to enthuse people while at the same time provide a credible measure for policies and strategies. To test the usefulness of footprint for Scottish local authorities, WWF Scotland set up Scotland's Global Footprint project.

WHAT IS THE ECOLOGICAL FOOTPRINT?

The Ecological Footprint provides a measure of human demand on nature by assessing how much biologically productive land and sea area (biocapacity) is necessary to maintain current levels of consumption. This can then be compared to available biocapacity. If global demand exceeds global supply, then we are consuming at a higher rate than the planet can sustain. This is a quantitive measure and needs to be seen alongside measures of environmental quality.

According to the *Living Planet Report 2006*[1], we are using the Earth's natural resources faster than they can be replenished. In fact, if everyone in the world lived as people do in Scotland (on average), the Earth's population would need three planets to survive – but we only have one. Scotland's Ecological Footprint is therefore too big and we need to move towards living within our environmental limits.

This raises a significant challenge: how can we live well, within ecological limits? The footprint approach pioneered through the Global Footprint project is an important way for local authorities to find answers to this pressing question.

The Ecological Footprint is measured in global hectares per person (gha/person).

1.8gha Our "fair Earth share" – the area we each have if the Earth's resources are shared equally.

5.37gha The area the average Scot currently uses. If everyone in the world used this much, we would need three planets to meet demand for resources.

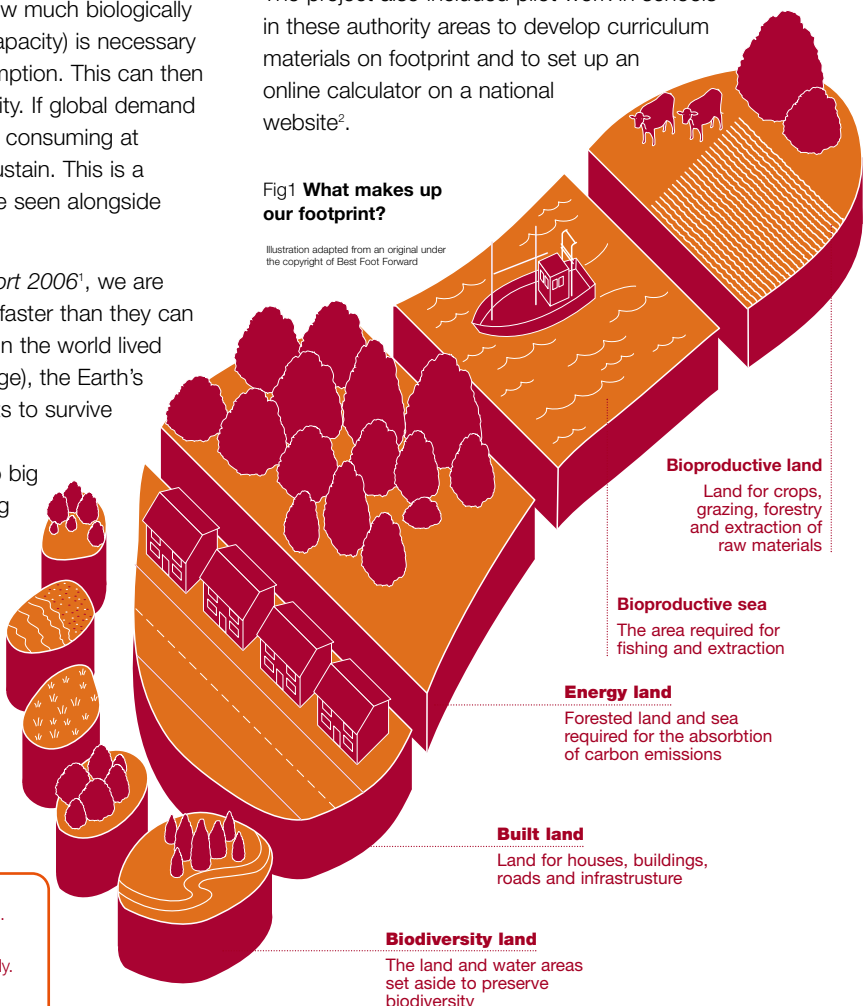
HOW CAN SCOTTISH LOCAL AUTHORITIES USE THE ECOLOGICAL FOOTPRINT?

The pilot authorities for the Global Footprint project were the north-east councils of Aberdeen City and Aberdeenshire (the North East), and North Lanarkshire (the North Lanarkshire Partnership). Both areas calculated their own footprint and developed footprint reduction strategies which highlight different options for implementing actions and strategies to reduce footprint.

The project also included pilot work in schools in these authority areas to develop curriculum materials on footprint and to set up an online calculator on a national website[2].

Fig1 **What makes up our footprint?**

Illustration adapted from an original under the copyright of Best Foot Forward



1 Living Planet Report, WWF 2006

2 The website is www.LTScotland.org.uk/sustainabledevelopment/schoolsglobalfootprint


© WWF-Canon / WWF CARPO/Jules Esquerre


© WWF-Canon / Quentin BATES


istockphoto.com


istockphoto.com


Gary Doak / WWF Scotland

There are four main findings to come out of the project:

1 The Ecological Footprint satisfies current demands for evidence-based policy making

The pilot authorities found that the Ecological Footprint is one of the most innovative tools to help them get to grips with the environmental resource consumption that is happening in their areas. They found that the Ecological Footprint is a powerful tool which is scientifically credible and easy to explain, and which provides new information to inform decision making.

The computer-based support tool which has been developed as part of the project – Resource and Energy Analysis Programme (REAP) – helps local authority policy makers to understand and measure the environmental impacts of human consumption at local, regional and national levels. It provides some of the scientific and statistical evidence that is needed to prioritise and justify policy options for reducing an area's footprint.

2 Local authority policies can help to reduce the Ecological Footprint

With Best Value audits now measuring performance on sustainable development and the new planning legislation including a duty of sustainable development for Development Plans, councils increasingly need ways to measure results and demonstrate local authority performance in these areas. Developing an Ecological Footprint reduction strategy is a practical way of doing this. It gives local authorities the scope to think beyond existing strategies and plans, and examine what actions will be the most successful in reducing their overall footprint. The strategy can also highlight the difference that a council's own policies can make to reduce footprint.

3 There are benefits for councils which implement footprint reduction

The Global Footprint project has demonstrated that footprint can help local authorities:

- fulfil Best Value obligations which require councils to demonstrate that they are contributing to sustainable development
- make efficiency savings by reducing energy and other resource use as part of a footprint reduction strategy
- assist implementation of Strategic Environmental Assessment (SEA) through determining the significance of environmental impacts, assessing the cumulative effects of policies and strategies, and providing an indicator for an environmental baseline
- make links between departments as part of the process of developing scenarios for reducing footprint
- meet their commitments made in Scotland's Climate Change Declaration.

4 The Ecological Footprint is a persuasive tool for getting people involved in sustainable development

Both the pilot areas reported that the Ecological Footprint has wide-ranging appeal – everyone, from chief executives to children, seems to understand the strikingly visual three-planet depiction of our consumption of finite resources.

The Schools' Global Footprint project also demonstrated the level of interest that footprint can generate. Based on highly successful experiences of the pilot schools in the project authorities, there is now a national website and curriculum materials for use by all teachers and learners in Scotland.

Local Footprints project


Photodisc

Building on the success of Scotland's Global Footprint project, a follow-on project – Local Footprints – will encourage the take-up of footprint by local authorities and schools across Scotland. This project is a partnership between WWF Scotland and the Sustainable Scotland Network and is funded by the Scottish Executive, the Improvement Service and ScottishPower.

The Local Footprints project will work with local authority networks and stakeholders throughout Scotland to ensure the next round of Development Plans, Transport Strategies, Regeneration Plans and Procurement Policies – to name a few – set the right framework for a One Planet Scotland.

For further information, contact localfootprints@ksbscotland.org.uk

2 Introduction

We only have one planet from which to provide resources for over six billion people and preserve an environment that can provide for future generations. Yet on a global scale, we are living beyond the ecological limits of the planet.

According to the *Living Planet Report 2006*[3], we are using the Earth's natural resources faster than they can be replenished, by some 20%. And if everyone lived as we do in Scotland, we would need three planets to survive. Scotland's Ecological Footprint is too big and we need to learn to live within our environmental limits.

© WWF / Svein B. OPPEGAARD

Already we are witnessing the threats this 'overshoot' is causing: commercial fish stocks are threatened, vast areas of forest are being cleared of timber to make way for soya and palm oil plantations, and the Arctic sea ice is melting at an unprecedented rate, cutting the polar bear off from its food sources. And Scotland is not immune from these changes – around 80% of commercial fish species in the North Sea are below safe limits, with cod in a perilous state; wetter, stormier weather is a likely effect of climate change, with an increasing risk of floods; and the rapidly rising costs of congestion and waste that are burdening the taxpayer.

The key challenge for this generation is: how can we live well, within ecological limits? To meet this challenge, individuals, businesses and governments must act. Scotland's Global Footprint project focuses on what local authorities can do to play their part.
The project is a partnership between WWF and Aberdeen City Council, Aberdeenshire Council and the North Lanarkshire Partnership to reduce their local and global impact.

3 Living Planet Report, WWF 2006

The project pioneered the use of the Ecological Footprint with local authorities as a performance measure, to inform policy and as part of the school curriculum. This report marks the conclusion of the project and sets out recommendations for taking forward footprinting work in local authorities and schools, and more broadly in Scotland.

This report gives an overview of the project – its rationale, its objectives and scope. It goes on to explain the Ecological Footprint in more detail, as well as the methodology used for calculating a footprint. The main part of the report is the case studies from each council, providing the important lessons learned and providing practical examples of using footprint in a variety of ways. The complete Footprint Reduction Strategies adopted by each of the councils are available at www.scotlandsfootprint.org

As a whole, the report offers considerable evidence as to why local authorities should take up the Ecological Footprint and how they can make it work for them and their local communities.

WHY FOOTPRINT AND LOCAL AUTHORITIES?

Local authorities are increasingly expected to deliver on sustainable development – but how? It can be a daunting prospect for some. What does it mean on a practical level for local authorities? How do we engage council staff and the public in this challenge? At the same time, local authorities are responsible for many of the infrastructure developments and services which can enable a low-footprint lifestyle. How does a local authority know which policy is best able to reduce footprint? Where should a local authority invest most?

LINKING TO POLICY AND DEMONSTRATING PERFORMANCE

In Scotland, the Local Government in Scotland Act (2003) outlines two duties, those of Best Value and Community Planning, as well as a Power to Advance Well Being. Making a 'contribution to sustainable development' is a key, mainstreamed objective within this Act. Ecological Footprinting can be used effectively to address and inform these duties and responsibilities.

The Ecological Footprint is one way to enthuse people while at the same time providing a credible measure for policies and strategies. With Best Value and the new Planning (Scotland) Bill requiring local authorities to contribute to sustainable development – authoritative methods to measure results and demonstrate local authority performance are becoming more critical.

This project was designed to test how useful footprinting was for local authorities in fulfilling their core responsibilities. Three local authorities were chosen as project partners – Aberdeen City and Aberdeenshire Councils, which worked together as the North East Global Footprint project and the North Lanarkshire Community Planning Partnership. The partners called the project Scotland's Global Footprint because it best reflected the global nature of the project and was an easier concept to grasp.

Other local authorities participated as 'project affiliates' and kept an interest in the project through workshops,

seminars and events. The project has been part of an overall WWF-UK Footprint programme with similar projects in England, Wales and Northern Ireland[4].

REDUCING SCOTLAND'S FOOTPRINT

The project aspired to contribute to stabilising Scotland's Ecological Footprint and to set it on a reducing trend by 2012. Scotland's footprint was measured in 2006 at 5.37 global hectares per person, slightly above the UK average, and 14th in the league of nations footprinted in the *Living Planet Report 2006*. A main objective of Scotland's Sustainable Development Strategy is to reduce Scotland's global footprint[5].

If past trends continue, Scotland's footprint can be expected to increase in line with the UK. This project demonstrates that there are policy options that could be adopted now which could reverse this trend.

© R Dixon / WWF Scotland

In the three years of the project, the Ecological Footprint was used by Scottish local authorities and schools to increase understanding about the local and global impact of consumption and to inform decisions to help reduce Scotland's Ecological Footprint.

The project proceeded in three phases:

1 calculating the local area footprint

2 developing policy scenarios

3 devising footprint reduction strategies.

A steering group guided the project, including representatives from WWF Scotland, partner local authorities, the Scottish Executive, Scottish Enterprise, Scottish Environment Protection Agency, Sustainable Scotland Network, Eco Schools, Scottish Natural Heritage, Stirling University and ScottishPower. The Stockholm Environment Institute acted as the main technical consultant. Alongside this work, the Schools' Global Footprint project progressed, which is discussed in section 4.

"Members of the Steering Group ensured that links were made with national policy, and extended the benefits of footprinting to their own organisations," said George Tarvit, Development Manager, Sustainable Scotland Network (SSN) and Chair of the Scotland's Global Footprint Project Steering Group.

CALCULATING LOCAL AUTHORITY AREA FOOTPRINTS

The first step was to calculate the local authority area footprints. This figure would provide the baseline from which progress could be measured. It could also be broken down into various sectors of local authority business such as transport, energy and housing. The project used the Resource Energy Analysis Programme (REAP) software tool to calculate the footprint. Local data was fed in – transport, energy and waste figures – to ensure the results were as locally accurate as possible (see section 7 for a further discussion of REAP and data requirements). The calculation highlighted that the key impacts in both areas came from food, energy and buildings, and transport.

WHAT'S THE BEST POLICY?

The next stage used the footprint to measure the environmental impact of various policy options. For example, what would be the transport footprint of the area if the current Local Transport Strategy objectives were met? What would happen if other options were considered – for example, increasing use of public transport or even changes in planning policy? How would the footprint be altered if we made changes to policies on, for example, procurement, regeneration or energy use and how can the footprint help to illustrate the potential choices that a local authority needs to consider in order to bring about a stabilisation or reduction of the footprint?

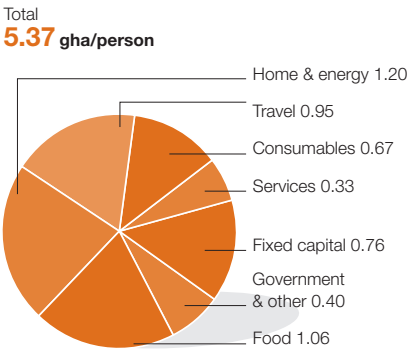


Fig 2 **Scotland's Ecological Footprint presented by consumption categories (gha/person)**

Each local authority decided on key priorities for analysis – based on urgency (largest environmental impact) and opportunity (potential to achieve change). In the North East, policy scenarios were investigated for transport, development plans and home energy use. In North Lanarkshire, topics were food procurement, development plans and a major brownfield development at Ravenscraig.

Based on the scenario work, each local authority produced a Footprint Reduction Strategy (summarised in Section 3) which set out the ways it would use the Ecological Footprint to focus policies and actions to reduce its global environmental impact. It is a testament to the project and the credibility of the thinking behind it that all the partner local authorities have committed to the continued use of the footprint tool to inform future policy decisions.

4 www.wwf.org.uk/footprint

5 Choosing Our Future – Scotland's Sustainable Development Strategy, Scottish Executive, 2005

6 Counting Consumption, WWF, 2006

3 The view from the North East and North Lanarkshire

Local authority policies, strategies and frameworks offer some of the most important ways to reduce an area's Ecological Footprint. The following section details the experience of Aberdeen City and Aberdeenshire Councils, and the community planning North Lanarkshire Partnership, in finding out just what they can do to make a difference.

North East Global Footprint project

When officers at Aberdeen City and Aberdeenshire developed three Ecological Footprint scenarios for the future growth of transport in the area, the resulting graphs led to a debate on the choices to be made in order to reduce the area's footprint.

Debbie Burroughs, Natural Heritage Team Leader at Aberdeenshire Council recalls, "Every transport scenario pointed to a growth in our global footprint." Suddenly, the council had fresh information about the environmental implications of future transport decisions. And, according to Andrew Win, Global Footprint Coordinator at the North East councils, the graphs actually provided an opportunity for the councillors to start asking what they should do.

Of course, Aberdeen City and Aberdeenshire are not alone in their struggle to contain the growth in transport. But, thanks to their involvement in Scotland's Global Footprint project, both councils have a more accurate picture of the choices they face.

Aberdeen and Aberdeenshire are both committed to reducing their footprint, so the fact that the transport footprint was going to be difficult to contain has opened up a discussion on how to reduce their footprint in other ways.

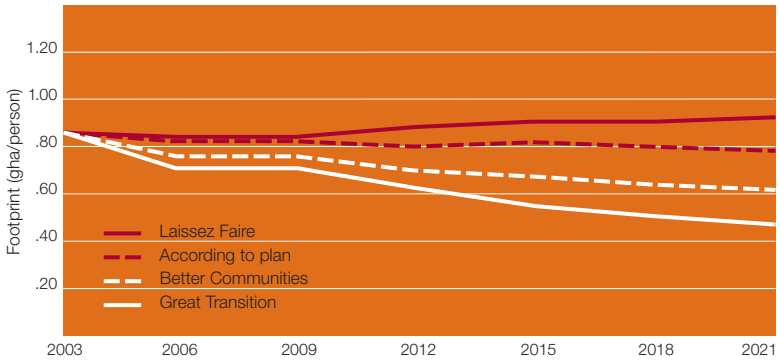


Fig 4 **A comparison of the built environment and energy scenarios modelled by Resource and Energy Analysis Program (REAP)**

Debbie puts it like this, "If our transport footprint is going to go up, how are we going to bring our overall footprint down? What will give? What can we do in other areas? The footprint is a powerful information source for looking at what else we can do."

Global Footprint at Aberdeen City and Aberdeenshire

Aberdeen City and Aberdeenshire Councils joined forces to take part in the Global Footprint project.

Aberdeen City's Global Footprint is 5.80 global hectares per person (gha/person) and Aberdeenshire's Global Footprint is 5.64 gha/person, both of which exceed the Scottish average of 5.37 gha/person. In other words, if all the world's population consumed at this rate, we would need another two planets.

Aberdeen City and Aberdeenshire Councils identified transport, the built environment and energy as areas in which Global Footprint reductions can be achieved. Scenarios were developed which addressed a range of future possibilities from a market driven, 'do minimum' approach to one which is more sustainable.

Built environment and energy

The built environment and energy scenarios found that through energy efficiency measures, significant CO_2 and footprint reductions could be made. While a market-driven, 'do minimum' approach (Laissez Faire) increased the North East Global Footprint, alternatives that increase energy efficiency in housing, use energy efficient heating systems and renewable energy sources will reduce footprint. The development of new buildings with excellent standards in energy efficiency will also help reduce footprint.

Adopting the measures listed, as outlined by the 'Great Transition' scenario, would lead to a 46% reduction in this portion of the built environment's footprint by 2021, when compared with current practices.

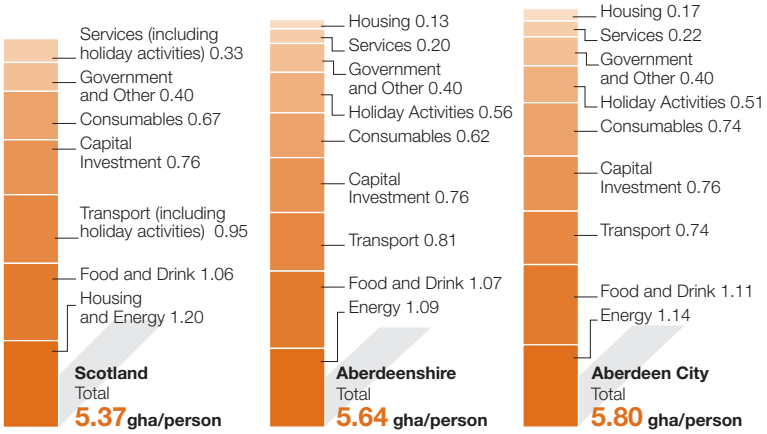


Fig 3 **The Global Footprints of Scotland, Aberdeenshire and Aberdeen City (gha/person)**

Transport

The development of an effective transport strategy is very important for the North East. The project developed three transport scenarios in association with officers as part of the review of the North East Scotland Transport Partnership's (NESTRANS) modern transport system and current local transport plans. The scenarios showed that if strategies only support one mode of transport as seen in the 'Laissez Faire' scenario, or if they do not improve alternative forms of transport the footprint for the North East will increase drastically. The 'Demand Management' approach, as defined by NESTRANS and the current local transport plans, focuses on reducing car use. It would still increase the transport footprint by 36% by 2021 (which would be 6% lower than 'Business as Usual'), such is the impact of car carbon emissions on the transport footprint. It is identified from the scenarios that a demand management approach alone will not address the transport footprint but will require a reversal of existing transport trends and the development of a new travel culture throughout North East Scotland.

Combining the scenario outcomes for built environment, energy and transport revealed that transport accounts for approximately 80% of the footprint for these areas. The best strategy for reducing footprint is to integrate and link communities with retail and employment opportunities to reduce car use.

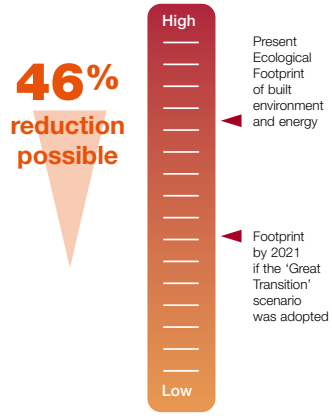


Fig 5 **Reduction for built environment and energy footprint of Aberdeen City**

"We have found that the Global Footprint project has helped councillors to understand environmental issues. They know that we need to make better environmental decisions or we will be in trouble."

Andrew Win, Global Footprint Coordinator at the North East councils

These scenarios were included in a global footprint reduction report which both councils have adopted. This paves the way for actions – particularly through urban planning – that will help them to put their aspiration to reduce their footprint into practice.

As part of the project, Aberdeen City and Aberdeenshire have identified practical solutions for reducing their footprint. The project is supporting Aberdeen Forward REAL Food project which is working with local communities to encourage the production and consumption of fresh, local produce. Aberdeenshire Council is identifying areas to reduce its CO_2 emissions while Aberdeen City is developing a Sustainability Code, which will ensure that the City's regeneration areas meet best practice in sustainable building. Finally, two local communities, Ellon and Huntly, are measuring their own footprints and will use the information to devise their own footprint reduction plans.

KEY THEMES

Improving what we know

Andrew Win says, "We have found that the Global Footprint project has helped councillors to understand environmental issues, especially in tandem with a general increase in awareness of these issues. They know that we need to make better environmental decisions or we will be in trouble."

Within this context, the project has generated valuable new information as well as providing a constructive tool that can help measure environmental resource use and examine ways to reduce it.

This is of particular value when officers are testing the potential of different options. For example, home energy conservation officers at Aberdeen City are using footprint to develop scenarios for energy use for council housing. The team has

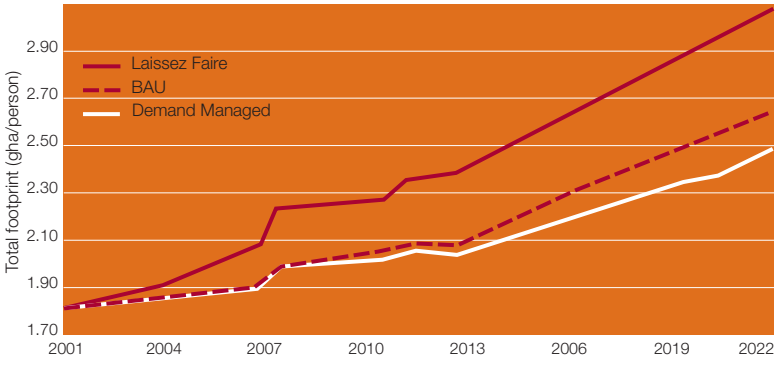


Fig 6 **North East Scotland's transport scenario results modelled by Resource and Energy Analysis Program (REAP)**

set a target for improving the energy efficiency of council housing and the scenario modelling is enabling them to look at the different ways they could achieve this.

You're better off with footprint

The Ecological Footprint provides useful and persuasive information. But on its own, it can do little. How it gets integrated into the wider working of the council is where the real benefits can start to accumulate.

Take Best Value – the requirement that local authorities should contribute to the achievement of sustainable development through Best Value is a challenging one. But Aberdeen City and Aberdeenshire are pointing to their work on the Ecological Footprint to demonstrate that they are taking sustainable development seriously.

Andrew points out, "The Global Footprint programme has provided us with a tool to measure sustainable development performance and show that we are fulfilling our Best Value obligations."

The Ecological Footprint can also assist with Strategic Environmental Assessment (SEA) requirements. Both Aberdeen City and Aberdeenshire councils are currently looking at how they can use the Ecological Footprint to feed information into SEA, for example by developing baseline information for each area of SEA. Information gained from the current project is already being used to update and refresh Aberdeen City Council's *State of the Environment Report 2006*.

Influencing change

Andrew says, "Global footprint is a brilliant tool but the constant challenge is how the information will be used – that is the real proof of the pudding."

There are encouraging signs that decision makers recognise the value of the information that the Global Footprint project has generated. One example comes from Aboyne in Aberdeenshire. Before the council had approved its Global Footprint Reduction Report, the community here tried to introduce a district heating system. At the time, the council refused the proposal because of cost. However, now that the council has the information generated by the Global Footprint project, some councillors are saying that footprint would have helped to balance the evidence available and highlighted the environmental benefits of implementing a district heating system.

Nonetheless, for the Ecological Footprint to successfully influence decision making, the scenarios that are developed need to reflect the timetable and opportunities in council policies. There isn't much point in carrying out exhaustive scenario work on issues that are already decided upon.

Andrew stresses that the Ecological Footprint won't be the answer to everything. But it can ensure that decision makers are better informed about the environmental implications of their decisions.

The view from above

Q&As with Debbie Burroughs, Team Leader at Aberdeenshire Council

What was your involvement in the Global Footprint project?

I am the Team Leader who looks after the Global Footprint project at Aberdeenshire Council. I helped to put together the original bid proposal to WWF Scotland.

Why did Aberdeenshire decide to get involved?

Our sustainability charter already had an aim to measure our Ecological Footprint. This project seemed like a good way to go about doing it.

What difference has the project made for how the council makes decisions?

Where large decisions have to be made, we can now give a more honest assessment about the environmental implications of decision X, Y or Z – we have much more balanced information on which to base decisions. Having this information makes the difficult choices much more real – which is what an aid for decision-making should do.

The Ecological Footprint sounds very technical – is it?

Individual officers or councillors don't need to know all the technical information. The tools developed through this project help people develop scenarios and we are hoping to train a representative from every service area on how to use them.

It is important that the Ecological Footprint has a home within a council so that somebody is tasked with reminding people that the council has a commitment to reducing its footprint.

"Housing can be attractive and have a low footprint"

North Lanarkshire Global Footprint project

INTRODUCTION

In October 2006, the Scottish First Minister, Jack McConnell, congratulated North Lanarkshire Council for being "the first local authority in Scotland to commit to reducing its footprint… I hope this initiative will continue to make a real difference for many years to come."

He was speaking at the launch of the North Lanarkshire Partnership's Footprint Reduction Report. Amie Fulton, the council's Global Footprint Project Coordinator, was delighted at the endorsement given to footprint, "By having the support of the First Minister, the message to come out of the launch was that the Ecological Footprint is something that is very important."

About Global Footprint in North Lanarkshire

The footprint of North Lanarkshire residents is 5.09 gha/person, which is lower than the Scottish average of 5.37 gha/person. Nonetheless, this level of environmental consumption across the world's population would still require an extra two planets.

The project goals were to:

> measure the Ecological Footprint for the North Lanarkshire area
> develop the footprint software tool (REAP) to inform policy-making
> use REAP to develop a report and action plans
> reduce the area's Ecological Footprint
> use the Ecological Footprint as an indicator for community planning and sustainable development.

The council's recently endorsed sustainability statement commits North Lanarkshire to minimising its Ecological Footprint. The Footprint Reduction Report was also approved by the council's Policy and Resources Committee and the community planning North Lanarkshire Partnership.

The project examined three policy and project areas: a development of 600 new homes at Ravenscraig, school meals procurement and the draft Local Plan.

Ravenscraig Area 1 Planning Brief (APB1)

North Lanarkshire is home to one of the biggest regeneration projects in Europe – the redevelopment of the Ravenscraig steelworks site. The redevelopment of this site will have major implications for North Lanarkshire's Ecological Footprint. The Global Footprint project has worked with the Ravenscraig manager and the house builder to analyse the impact of the proposed development and devise options to reduce the development's footprint. A scenario has been completed on the first phase of 600 homes.

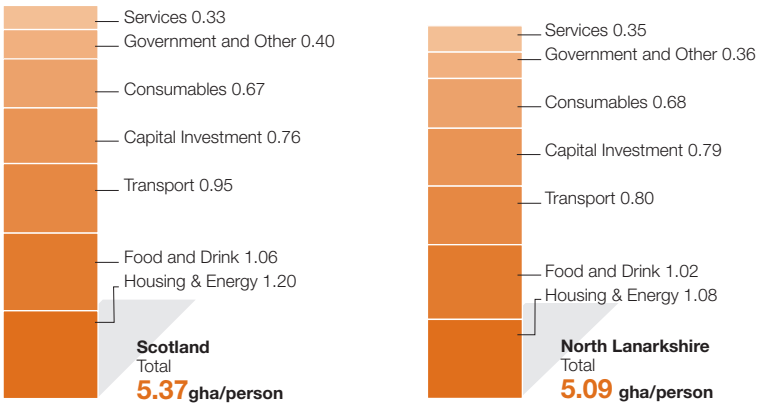


Fig 7 **The Global Footprints of Scotland and North Lanarkshire (gha/person)**

The results show that gains made through energy efficiency were lost by increases in transport. In the end, using the design standards and transport options stated, Ravenscraig residents would have a slightly lower (3% less) footprint than the average North Lanarkshire resident.

School meals procurement

This scenario compared a sample primary school menu before and after the Hungry for Success initiative (designed to improve the nutritional benefits of school dinners). The latter menu, which includes more fruit and vegetables and less fat, resulted in a 42% lower food footprint compared with the first menu (see page 16). The North Lanarkshire partnership is strengthening the connections between the footprint producing actions in schools and the wider effort of council procurement.

The Scottish First Minister, Jack McConnell, congratulated North Lanarkshire Council for being "the first local authority in Scotland to commit to reducing its footprint…"

Draft Local Plan

The Global Footprint project has contributed to a sustainable design and construction checklist that will be considered as part of the consultation draft of the new local plan. The list includes five categories (energy, access, biodiversity, resources and community) with footprint as a cross-cutting category. It requires planning applicants to tick each criterion that their proposal satisfies and demonstrate how it meets each of these. There is a corresponding set of tick boxes for officers to indicate whether they accept the applicant's supporting evidence. The result is a traffic light (green, amber, red) illustration of the likely impacts on the Ecological Footprint.

KEY THEMES

The power of persuasion

The Ecological Footprint is a scientific concept with a powerful message that is relatively easy to communicate. While not everybody needs to understand the data behind the calculation, the end message – that individuals are consuming more than their fair share of resources – is a strong one.

When Amie Fulton began in her role as the Global Footprint Project Coordinator, few people had heard of the Ecological Footprint so it was important to raise awareness and then maintain a profile for the project. The onus was on her to make links with other areas of the council’s work but as the project’s profile has increased, officers have been seeking her out, on projects ranging from drama in schools to biomass.

According to Amie, the project has brought around the table officers and partners who hadn’t previously worked together. The Ecological Footprint has facilitated new links, especially in relation to planning and environmental issues.

It has been important to cultivate this from the top down. One way was to get the corporate management team to set an example for the rest of the council. They all assessed their own footprints which also helped to raise awareness of the links between individual behaviour and the size of the overall Ecological Footprint.

Linking footprint to sustainable development

Although the Ecological Footprint focuses on ways of measuring and reducing environmental impact, Amie argues that it can be used as a hook to get a wider debate and action on sustainable development, “footprint definitely opens the door for sustainable development – it helps the conversation to happen.” Officers and others were originally concerned about footprint because of its sole emphasis on environmental impacts, but the project has been an opportunity to point to the need to show environmental impacts alongside economic and social indicators.

Integrating footprint into a wider sustainable development agenda is also a crucial way of highlighting how footprint can benefit a council because of the Best Value requirement on local authorities to demonstrate a commitment to achieving sustainable development.

Can we develop sustainably?

There are some positive signs. An increase in demand for development in the area is providing a lever to discuss what that development should look like. For example, there is potential to effect some reduction in the transport footprint by working with the developer to provide a bus service as a condition of the planning permission, rather than it being introduced later when car driving habits have been formed. This may also increase the social mix of the development.

The Ravenscraig manager is supportive of initiatives to reduce the overall footprint and the house builder is willing to consider environmental design standards provided they don’t cost too much. And it is recognised that high quality design and eco-performance may actually help to market the new houses.

“An increase in demand for development in the area is providing a lever to discuss what that development should look like.”

Learning the ropes

Q&As with Amie Fulton, Global Footprint Project Coordinator, North Lanarkshire Council

When you first started as a Global Footprint Project Coordinator, you hadn't previously worked with footprint before – what are your observations of it as a tool?
Measuring the Ecological Footprint challenges the status quo because it's new. It's a fantastic model because it creates these challenges and identifies what needs to change.

How have other people responded to it?
It has raised awareness and pushed the council to do more. For example, when the Footprint Reduction Report was published and outlined that Ravenscraig could reduce its footprint by 3%, some councillors said that wasn't good enough. This then presented an opportunity to open up the debate about how to get a better reduction and to drive people to improve.

Schools have shown a real interest in footprint reduction. The pupils are raising issues that the council needs to address to ensure footprint reduction.

What have been the challenges?
One of the biggest challenges is that nobody disagrees with the concept of the Ecological Footprint. There is a need to push people from 'this is a nice idea' to 'what are we going to do?'. We're working on turning the goodwill towards footprint into effective actions.

It can be risky doing an Ecological Footprint calculation because it might turn out to be so bad that everyone gives up. Fortunately, the Ravenscraig footprint demonstrated that taking account of the proposed changes doesn't have to be hugely painful. While the projected Ravenscraig footprint is not too bad, it's not great either. But there is hope for improvement.

Another challenge has been time. Calculating the footprint and devising scenarios took more time than anticipated, especially around data collection and spreading knowledge and understanding.

"We're working on turning the goodwill towards footprint into effective actions."

4 Schools' Global Footprint pilot project

The Global Footprint project hasn't only focused on local authorities' policies. A vibrant schools programme has been running in parallel with the work in North Lanarkshire, and Aberdeen City and Aberdeenshire councils.

Young people have a key role to play in finding solutions to environmental and sustainable development challenges at a local level. To play a part, we all need to acquire the necessary knowledge, awareness, understanding and skills. There is therefore a growing recognition of the crucial relationship between the formal education sector and sustainable development in Scotland.

- The Scottish Executive Education Department is taking account of sustainable development in its Ambitious, Excellent Schools programme[6]
- As part of this programme the Scottish Executive's *A Curriculum for Excellence* (ACfE)[7] identifies sustainable development as an 'in-depth activity' which should 'lie at the heart of the curriculum'
- One of the National Priorities within the School Improvement Framework asks local authorities to report on the number of schools participating in the Eco Schools programme, an international initiative designed to encourage whole school action for the environment.

As consumers of resources, reduction in a school's footprint can make a positive contribution to the overall local authority footprint. At the same time, the footprint concept provides a valuable teaching and learning opportunity that can inspire and inform pupils to take practical action.

The project's objectives were to:

- explore the ways in which upper primary and secondary schools (9-14 years) can examine, measure and take action to reduce their impact on the environment locally and globally
- enhance the understanding and practice of sustainable development education among teachers and raise awareness of sustainable development among pupils
- demonstrate that sustainable development education is an integral part of education for citizenship.

THE PROCESS

A set of curriculum materials and a CD-Rom to help learners calculate their school's footprint were developed by a Partnership Group (WWF Scotland, Eco Schools Scotland, Learning and Teaching Scotland, advisors from the three partner local authorities, and funders SEPA, SNH, ScottishPower and the Scottish Executive). Stockholm Environment Institute and environmental education consultant, Lynnette Borradaile, helped develop the resources.

The materials were piloted in 17 primary and secondary schools in the North East and North Lanarkshire from September 2004 to June 2005. The pilot included training, support and feedback sessions. According to Betsy King, Education Policy Officer at WWF Scotland, this piloting was a really critical stage, "It gave the project credibility and helped to get the right partners on board at the start – this was important for later stages of the project."

THE PRODUCT

Feedback from the pilot schools indicated that the curriculum materials were excellent, however, the CD-Rom was proving to be difficult to use in classroom settings. Learning and Teaching Scotland agreed to host the Schools' Global Footprint website as part of the sustainable development education section of Learning and Teaching Scotland's website (www.LTScotland.org.uk/sustainabledevelopment/schoolsglobalfootprint).

"There has been incredible interest in Schools' Global Footprint, both within Scotland and from outside. The Ecological Footprint is a very powerful metaphor and it is a great way of explaining to pupils that our planet's resources are finite."

Betsy King, WWF Scotland

6 Learning for Our Future: Scotland's First Action Plan for the UN Decade on Education for Sustainable Development 2006

7 A Curriculum for Excellence, Ministerial Response, 2004

www.LTScotland.org.uk/sustainabledevelopment/schoolsglobalfootprint

Online Resource
The Schools' Global Footprint website provides a straightforward way to help schools play their part in reducing Scotland's Global Footprint. It comprises two complementary parts:

For Learners: The materials are written for use with P7, S1 and S2 pupils. The site includes an Ecological Footprint calculator for learners to calculate their own and their school's footprint.

Pupils are then encouraged to look at the relative value of each component of the school's Ecological Footprint and to use the results in developing and prioritising the school's Action Plan. Which is the largest component of the overall Ecological Footprint? How can this impact be reduced? What direct actions will make a real difference and help reduce the school's Ecological Footprint? What clear realistic targets can be set for next year?

For Teachers: Practical, curriculum-based, teaching and learning ideas, and background information are offered in a broad global context – hence the term 'Global Footprint'. There are suggestions for activities to introduce and investigate each of the components of the Ecological Footprint and their interconnections.

How much waste is the school producing and how is it disposed of?
Survey the amount of waste produced by the school and establish the proportion to be recycled, composted, incinerated or sent to landfill.

How much energy does the school consume?
The amount of electricity, gas and heating oil used can be found by looking at bills and meters.

How much water is the school using?
Find out by taking water meter readings.

How big is the school's transport footprint?
Find out the distances staff and pupils travel between home and school and on school trips and how they travel (walk, bicycle, bus, rail, car, taxi).

How much food does the school consume?
Survey the type and quantity of food consumed in the school in a typical week, whether it is bought from a supermarket or local shop and if it is organic or not.

How much material has the school used to construct its building?
Work out the average floor area of the school per pupil using plans of the school.

The Ecological Footprint is the total of the individual footprint components.

"The thing I learned that shocked me was the amount of waste we humans throw out each day and the effect it has on our environment and on the animals who share this planet. It is good that we are aware of the problems caused by ourselves and hopefully these problems can soon be resolved. To reduce our impact on the planet, everyone will have to join together and reduce, reuse and recycle."

P7R pupil, Cults Primary School, Aberdeen City

Using Schools' Global Footprint

Amie Fulton, Global Footprint Coordinator at North Lanarkshire Council, is an enthusiastic supporter of footprint work with schools. "Some of the biggest leaps we have made are with schools and this will hopefully be a springboard to working with wider council procurement."

One of the projects in North Lanarkshire schools, for example, looks to reduce the footprint of food in three pilot schools. The starting point for pupils at Kildrum Primary School has been to calculate their school's food footprint using the Schools' Global Footprint website. The school has an Eco School Green Flag and is also a Health Promoting School. Head teacher, Myra Lindsay, says, "Schools' Global Footprint work is helping to develop the four aspects (successful learners, effective contributors, confident individuals, responsible citizens) of a child's education aspired to within *A Curriculum for Excellence*."

"Activities presented children with thoughts and ideas about the problems today's world has and gave them opportunities to think about what they could do."

Primary School teacher

Pupils have come up with ways to take action to reduce the school's food footprint. Despite the school's typical urban site, plans are now underway to grow vegetables and fruit on a south facing plot. The school cook is keen to show children how to prepare and cook the food they have grown. Myra Lindsay is enthusiastic about the opportunity for a real world context for learning that footprint work has provided, particularly linking with the wider work of North Lanarkshire Council.

A North Lanarkshire footprint scenario was also constructed with startling results. Building on the national *Hungry for Success* initiative – which has aimed to improve the quality, attractiveness and nutritional value of school meals – the scenario showed that a healthier diet can reduce the food footprint by 15-25%. For some menus the reduction was by as much as 40%. The project is now working with the catering manager to develop a further scenario to analyse the footprint reduction in comparison to the nutritional value of the menus. The results of this project will hopefully lead to changes in food procurement policy and practice.

istockphoto.com

"The School's Global Footprint materials are cross-curricular and can be incorporated into a wide variety of subject areas."

Secondary School teacher

istockphoto.com

Key learning points

The pilot work in North Lanarkshire, Aberdeen City and Aberdeenshire schools concluded that:

The Ecological Footprint complements the Eco Schools programme. It provides a quantitative measure of progress on an Eco Schools Action Plan, recording environmental impacts and measuring change. Review of the Ecological Footprint after a period of time allows pupils to monitor whether their targets have been achieved and to revise their Action Plans. There are Eco Schools across the world and, in the future, there is potential for linking with schools in other countries that are also working on reducing their footprints.

Schools' Global Footprint activities provide numerous opportunities to link to the curriculum, particularly in social studies, sciences, mathematics, technologies, expressive arts, health and well-being, and religious and moral education.

There are strong connections with approaches that involve cross-curricular working including Citizenship, Sustainable Development Education and Health Promoting Schools.

Pupil motivation is improved when they are involved in Schools' Global Footprint work because pupils enjoy being involved in real-life issues. The relevance and involvement in meaningful decision making helps to enliven teaching and improve pupil motivation.

Schools working more closely with local authority departments beyond education on issues such as waste management, energy use and travel is an important aspect of Schools' Global Footprint work. Contacts in local authorities are often able to help pupils obtain data. Working on solutions with local authorities helps to enhance the pupils' understanding of local links and relationships. The greater part of a local authority's estate tends to be schools and other education establishments so there is a need for local authorities to work with schools to reduce the footprint of their estate.

"The components of the Schools' Global Footprint fit very comfortably with the Eco Schools themes. The Schools' Global Footprint adds an important quantitative way to monitor environmental impacts and measure change, an area that some schools can find difficult."

Kate Campbell, Eco Schools Manager, Scotland

Our Lady's High School, Cumbernauld

"Our school footprint is large but, hopefully we can reduce it through greater awareness of global issues. I think it's important that we know what the problems are so that we can change the way we act in school and outside."

S1 pupil, Our Lady's High School, Cumbernauld

5 The benefits of footprinting for local authorities

This section summarises the lessons from the projects in North Lanarkshire, and Aberdeen City and Aberdeenshire so that other local authorities can benefit from their experiences so far.

WHY IS THE ECOLOGICAL FOOTPRINT IMPORTANT?

National governments are waking up to the realisation that changes have to be made to the way we consume natural resources now, rather than treating this as a long-term problem. The high profile of climate change and the potentially alarming consequences for the global economy – articulated most graphically by the Stern report, which warned of costs of up to 20% of GDP if climate change was left unchecked – mean that governments at all levels need to act.

For local authorities, the Ecological Footprint is one of the most innovative tools to help them get to grips with environmental resource consumption that is happening in their areas. It is scientifically credible and easy to explain. Both pilot areas have concluded that the Ecological Footprint is a powerful tool which provides new ways to inform decision making and which raises community awareness about environmental problems and solutions.

WHAT ARE THE BENEFITS FOR LOCAL AUTHORITIES?

Scotland's Global Footprint project has demonstrated that footprint can help local authorities:

> fulfil Best Value obligations
> make efficiency savings
> assist implementation of Strategic Environmental Assessment (SEA)
> inform decision making
> raise awareness and engage communities
> make links between departments – real, joined-up working
> identify actions to reduce environmental consumption
> meet their commitments made in Scotland's Climate Change Declaration.

Fulfil Best Value obligations

The Local Government Act positions councils as leaders in sustainable development. The pilot councils cited the potential for the Ecological Footprint to demonstrate that a council is committed to achieving sustainable development, as set out by Best Value, as a significant benefit. Amie Fulton believes that one of the biggest outcomes for North Lanarkshire is that "sustainable development is a higher priority".

This is also a potential benefit for community planning partnerships. Amie reported that it was easy to persuade the North Lanarkshire Partnership (NLP) to endorse the council's Footprint Reduction Report because it was a step towards monitoring their commitment to sustainable development. Some of the NLP partners are also considering an examination of their organisation's Ecological Footprint to demonstrate their commitment to corporate responsibility.

Make efficiency savings

In some instances, making changes to reduce overall footprint may result in financial savings through highlighting opportunities for efficiencies, especially in energy use. North Lanarkshire is also using the Ecological Footprint to work with its Procurement Officer to look at ways of buying more sustainable products rather than accepting the cheapest price, again using Best Value as the driver.

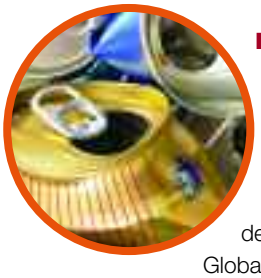
Assist implementation of SEA

Implementing the Ecological Footprint can lead to potential benefits for the mandatory process of SEA. It can help to determine the significance of the environmental impact, assess the cumulative effects of policies and strategies, and also provide an indicator for an environmental baseline. The ability of the Ecological Footprint to assess future scenarios will benefit SEA by informing future alternatives.

The North East councils are developing a framework within which they will use Global Footprint in the SEA scoping process for the proposed Aberdeen City Housing Strategy.

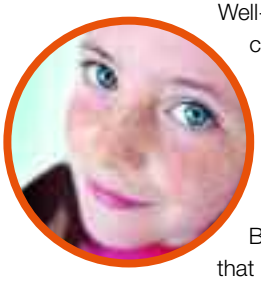
"It is essential that the SEA process considers the global context of environmental limits in its appraisal of options and evaluation of effects. It simply doesn't make sense anymore to only consider local environmental impacts. Using footprint to appraise options and evaluate the magnitude of effects provides an objective assessment tool for the SEA process as well as a good yardstick for comparing similar plans, programmes and strategies."

Dr Joseph Somevi, Strategic Environmental Assessment Officer, Aberdeenshire Council



Inform decision making

The Ecological Footprint provides environmental information which hasn't previously existed. Now that this data is available, it should help to balance the information on which decisions are made. As Andrew Win, Global Footprint Coordinator for the North East points out, "Previously the environment could be glossed over but the Ecological Footprint improves the balance of evidence that supports decision making. Well-informed scenarios offer more certainty to possible outcomes of policies and strategies than ill-informed decisions."



Raise awareness and engage communities

Both of the pilot areas reported that one of the most obvious benefits of the Ecological Footprint is its wide-ranging appeal – everyone, from chief executives to children, seems to 'get it'. The strikingly visual depiction of our consumption of finite resources being represented by three planets has reached far and wide – from the First Minister to school children.

The North East project reported that the Ecological Footprint is a very strong metaphor for demonstrating that current lifestyles are unsustainable and this is something that has 'clicked' with the corporate management teams. It helps politicians and the public understand why changes in direction and decisions are needed to ensure that we live within our environmental limits.

At a community level, both pilots would have liked to focus more on raising awareness. And yet, it seems as though the idea has caught on anyway. Two communities in Aberdeenshire are measuring their own footprint and there are plans for more to follow.

The Schools' Global Footprint project also demonstrates the level of interest that footprint can generate. Based on highly successful experiences of the pilot schools in the project authorities, there is now a national website and curriculum materials available for use by all teachers and learners in Scotland.

Make links between departments

From the moment the term *sustainable development* was coined, councils have talked about the need to 'break down silo thinking'. In practice, this has proved to be difficult to do. While the Ecological Footprint doesn't come with a template that provides all the answers for cross-departmental working, developing scenarios can only realistically happen if officers from across the council are involved.

In the North East, all key officers in strategic planning areas were involved in scenario planning through workshops and one-to-one contact. This cross-sector representation was important because, although the Ecological Footprint is primarily an environmental indicator, scenario modelling also includes socioeconomic and legislative parameters. Councillors also wanted to be trained on how to develop scenarios, although the original plan only included training officers, which further broadened the cross-sector working inspired by the Ecological Footprint.

"This project has proven that only through joint working – planning and transport, housing and energy – will we make the real changes needed to reduce our global impact on the environment."

George Tarvit, Development Manager, SSN and Chair of the Project's Steering Group

Identify actions to reduce consumption

The scenario stage gives local authorities the licence to think beyond existing strategies and plans, and examine what actions will be the most successful in reducing an area's overall footprint over time. Both pilot areas have produced Footprint Reduction Reports[8], which contain scenarios and potential actions to implement them. For most local authorities, the areas of greatest concern will be transport, domestic energy use and food consumption.

Meet their commitments made in Scotland's Climate Change Declaration

The Declaration commits local authorities to reduce carbon emissions from their own operations, through their policies and strategies, and through individuals and communities. The footprint analysis can aid understanding of the full carbon emissions (direct and indirect) related to operations and policies. It builds upon carbon management plans, exploring the maximum potential for local authorities to reduce the carbon footprint of their area.

8 The reports are available at: www.scotlandsfootprint.org

6 How does a local authority get started?

Based on the success of Scotland's Global Footprint project, many other councils are likely to want to start a footprint project.

Before starting a footprint project, a council should prepare the way by bringing together key people throughout the council – building services, planning and environment, education – and briefing them about what it hopes to achieve with the project. They should also consider what resources might be necessary to succeed and what expertise is required.

The pilot local authorities have concluded that in order to footprint policies effectively, a footprint expert is required who will support selected officers from each of the service areas. These officers will be trained to use the footprint software and in scenario development. The footprint expert can support the officers, assist with data collection and analysis, and help spot opportunities for footprint analysis.

Having selected a project leader – what happens next? Based on the pilot projects, the most important first steps are to:

> understand the Ecological Footprint
> build on what already exists
> gather information
> identify who needs to be involved
> get corporate support early
> look for early wins
> respect the limitations of footprint.

"For footprint to be adopted across the organisation, it needs to command widespread support."

>> UNDERSTAND THE ECOLOGICAL FOOTPRINT

This sounds obvious but a significant part of the job will be raising awareness about what a footprint project actually is, what the Ecological Footprint can and cannot measure, the role of scenarios and why reducing footprint is important. So you need to know what you are talking about. Familiarise yourself with what has happened so far and make time to talk with others who already have experience of implementing the Ecological Footprint programmes in Scotland and other parts of the UK.

>> BUILD ON WHAT ALREADY EXISTS

The Ecological Footprint is a relatively new concept to local authorities but it can build on existing work within a council. Find out what information is already collected and why (for example, what quality of life indicators or performance measures does the council use?), actions and policies that are already being implemented to reduce environmental impact and so on.

Make links with schools in your area that have adopted footprint as part of the curriculum, and/or are looking at ways in which they can reduce their own footprint.

>> GATHER INFORMATION

The first step is to gather the data for a baseline assessment. As explained in section 7, the footprint software will only be as good as the information that is fed into it. It will be important to find out who within the council already collects the information you need and to let them know your requirements.

>> IDENTIFY WHO NEEDS TO BE INVOLVED

A cross-section of officers usually needs to be involved in developing scenarios. Identify the key people as early as possible and ensure that these people are allocated time by their line managers to contribute. This participation should not be viewed as simply an 'add-on' to existing responsibilities as these officers need to be involved to a high degree in working out scenarios, providing input and making use of the results.

The Global Footprint Coordinators in both pilot areas stress that this should be seen as a two-way interaction. You will want other officers to incorporate the information from the Global Footprint project into their work once it is made available, so start developing relationships early and look for opportunities to demonstrate how the Ecological Footprint can help officers in the work they are already doing.

Jim Clare

First Minister Jack McConnell and a pupil inside Thornlie Primary School's greenhouse made from used plastic bottles, at the launch of the North Lanarkshire Partnership's Footprint Reduction Report.

>> GET CORPORATE SUPPORT EARLY

A local authority that is starting a footprint project already has some degree of commitment. But that might only be restricted to one part of the council or to one senior manager. For footprint to be adopted across the organisation, it needs to command widespread support. "The best way of doing this," says Amie Fulton, "is to get the corporate directors on board because local governments move when the top rung shakes." This might involve building a corporate working group that can monitor the Ecological Footprint project so that it can become part of the mechanisms of the council. It will certainly involve selling the benefits of the Ecological Footprint set out above, particularly those that address corporate obligations like Best Value.

Aberdeen City and Aberdeenshire councils have extended this approach to ensure that councillors have been kept up to date on the Global Footprint project. Officers have frequently reported to the Sustainability Working Group (a subgroup of the Policy and Resources Committee) on progress and to get feedback. As well as raising awareness, this can set up policy 'hooks' on which future actions can be hung.

Debbie Burroughs, Natural Heritage Team Leader at Aberdeenshire Council, says that, "Politicians make the decisions so they have to understand what this is about and how to use it. We have kept reporting back to them which takes time but you can never do enough of this."

>> LOOK FOR EARLY WINS

Measuring the Ecological Footprint and devising a reduction strategy is time-consuming. But it might be possible to have some influence in the short term. Undertake a policy analysis to see what policies can be influenced by the Global Footprint project in the upcoming months – is there a review coming up of the local plan; are local schools getting involved in environmental projects; are there forthcoming changes to the procurement process? The Ecological Footprint is potentially relevant to everything so you need to be realistic. But try and identify a couple of big policy areas that you can get involved with quickly. Ideally, you are looking for opportunities to insert a commitment to reduce the Ecological Footprint and undertake scenarios to find out how best to achieve this.

Because of the success of the Schools' Global Footprint project, it is likely that there will be schools in the council area that are looking at how they can reduce their own footprint. Find out what they have done and how you might be able to link their findings back into the council's procurement policies.

>> RESPECT THE LIMITATIONS OF FOOTPRINT

The experiences of both pilot areas reinforce that, like any tool, the Ecological Footprint has its limitations. For example, footprint should never be sold as a cure-all. Amie Fulton explains, "it is an aggregate indicator that measures environmental impacts – it doesn't show social outcomes. It can help to make links but don't use it to make correlations which can't be substantiated."

Implementing a footprint programme will take time, and probably more time than you anticipate at the start. It is important to be realistic about how long it will take to gather the information, generate scenarios and get a reduction strategy agreed. Amie advises, "you can't expect scenario results in less than a year but things get quicker as you go along."

Finally, a challenge: while almost everyone will be persuaded by the Ecological Footprint, moving from acceptance of the message to concrete actions will still require considerable political and persuasive skills – and a healthy amount of patience.

7 The Ecological Footprint in detail

This section provides a more detailed examination of the methodology behind the Ecological Footprint analysis and the software tool that was developed by Stockholm Environment Institute.

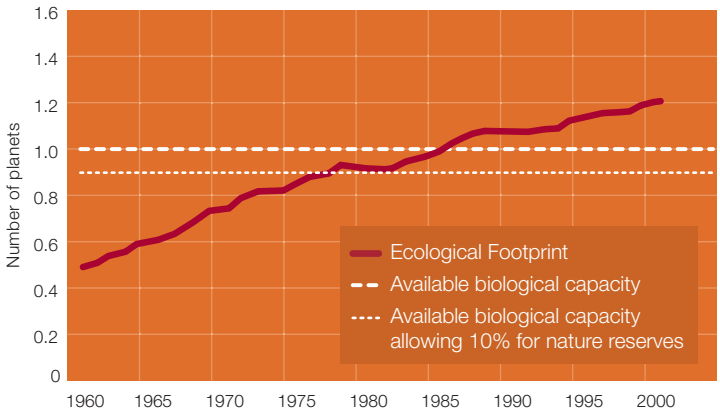


Fig 7 **Global Ecological Footprint compared with available biocapacity (Living Planet Report, 2006)**

LIVING WELL BUT WITHIN OUR MEANS

How can we tell if we are living within the means of the planet? A growing number of methods aim to answer this question and the Ecological Footprint is at the forefront of the debate. The Ecological Footprint provides a measure of the resources we use – food, fibre, timber, land on which to build and land to absorb CO_2 released by burning fossil fuels – to maintain current lifestyles. This can then be compared to available biocapacity (biologically productive land and sea area). If global demand exceeds global supply, this would indicate an overshoot, which is a core concern for sustainability. It is a quantitative measure – it does not measure the quality of the environment.

Initially introduced in the 1990s[9], the method has been further developed and used in numerous studies.[10] The growth in the number and range of studies led to the development of an international standard for calculating the Ecological Footprint, launched by the Global Footprint Network in 2006.[11]

The Ecological Footprint is a measure of whether we are living within environmental limits. It is a quantitative measure, and needs to be seen alongside measures of environmental quality. It does not take account of the way our activities affect the quality of the natural environment. A high quality environment benefits our quality of life, for example by maintaining the soils that we depend on for food production and water regulation, by enhancing our local surroundings, by supporting the wild animals and plants that we enjoy and make use of for medicines, food etc. It also attracts tourists to visit our country and support our economy. So, individually and as a society we also need to recognise how our activities affect the quality of our natural environment and seek to maintain and improve it.

NATIONAL ECOLOGICAL FOOTPRINT RESULTS

Every year, the Global Footprint Network provides a new set of Ecological Footprint calculations for 150 countries. This is documented biennially in WWF's *Living Planet Report*. Footprint results now exist from 1962 up to 2003 (see figure 7, left). On a global scale, the Earth's regenerative capacity can no longer keep up with demand. (See figure 8, page 23)

THE ECOLOGICAL FOOTPRINT METHODOLOGY

The Ecological Footprint is still a relatively new methodology undergoing rapid evolution. The Global Footprint Network (GFN) recognises the need to constantly improve and develop the Ecological Footprint methodology and statistical analysis, and has established an international standards setting process to do so.

There is little doubt that the Ecological Footprint is a powerful approach to translate a complex idea of ecological limits. There are other measures which can help – for example, measuring greenhouse gas emissions and linking these to the required reduction to achieve a stable climate is also an 'overshoot' indicator. Measuring CO_2 based on consumption, or Carbon Footprint, is another.

For the purposes of this project, the key concern about the Ecological Footprint is its application to policy. The National Accounts do not rely on consumption statistics by economic sector and hence fail to depict the interaction that occurs between industry sectors. For example, the banking industry may not have a big direct impact but it triggers resource flows indirectly through its supply chain.

9 Wackernagel and Rees 1996

10 e.g. Wackernagel et al., 1999; Simmons et al., 2000; Barrett, 2001; Lenzen and Murray, 2001, 2003; Lewan and Simmons, 2001; Barrett and Scott, 2003; Stöglehner, 2003; Wood and Lenzen, 2003; McDonald and Patterson, 2003, 2004; Erb, 2004; Haberl et al., 2004; Monfreda et al., 2004; Wackernagel et al., 2004a; Aall and Norland, 2005; Barrett et al., 2005; van Vuuren and Bouwman, 2005.

11 www.footprintnetwork.org

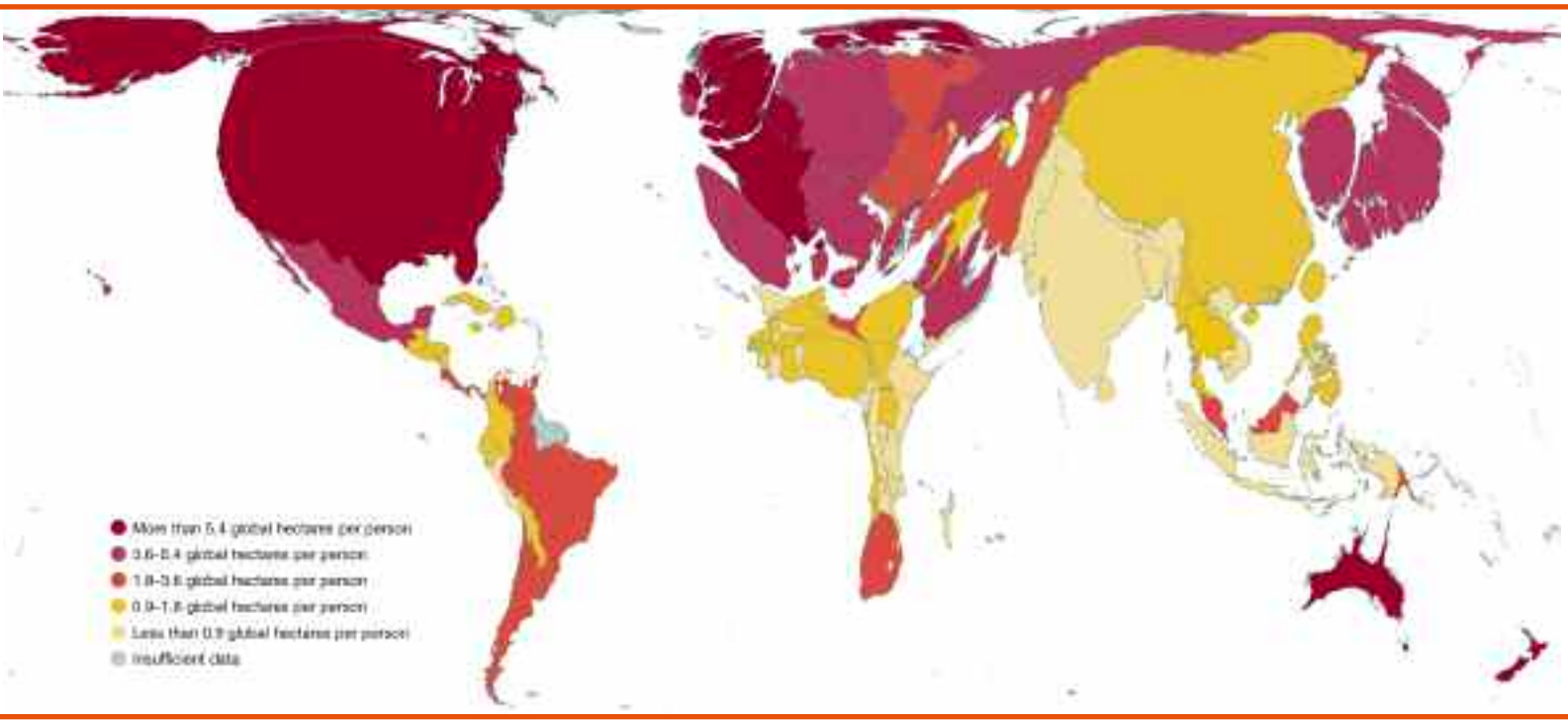


Fig 8 **Footprints across the world**
Each country's size represents its share of the global Ecological Footprint. Scotland, along with most of the developed world, uses some three times what would be considered its 'fair share'. (*Living Planet Report 2006*, WWF)

In order to provide meaningful analyses for policy makers, it is vital that the Ecological Footprint studies address these concerns. For Scotland's Global Footprint project, the Stockholm Environment Institute (SEI) developed a methodology and software tool which takes the National Footprint Accounts as a starting point and then combines the Material Flow Accounts and National Environment Accounts with 'input-output' analysis. Environmental input-output analysis is a well established approach that makes it possible to track and assign intermediate resource flows to consumption categories, making it possible to track indirect impacts and use of resources.

With this method it is possible to calculate the Ecological Footprint and greenhouse gas emissions by:

> economic sector (agriculture, food processing, textiles etc.)
> final demand category (private household, central government etc.)
> consumption category by household (food, clothing, transport etc.)
> national, regional and local area
> socio-economic group

All results are comparable and the analysis is fully transparent. Indeed, footprint results for all local authority areas are publicly available (see figure 9, page 24). This new methodology brings the Ecological Footprint analysis into the scope of economic models so policy analysis relates to government statistics and measures of progress[12]. Scotland's Global Footprint project has succeeded in demonstrating the value of this new methodology, and the follow-up Local Footprints project is partly designed to help strengthen and improve the Ecological Footprint approach so that weaknesses and limitations are overcome, gaining improvements through practical use, critical feedback and partnership working.

THE REAP SOFTWARE TOOL

The Resource Energy Analysis Programme (REAP) software tool is based on this new methodology. The strength of REAP is that it uses the best available methods and applies them at a greater level of detail than has been done before. At last, quantitative evidence can be produced to support decisions that could lead towards a more sustainable future.

REAP is a highly sophisticated model with a user-friendly interface. It can be used to help policy makers understand and measure the environmental impacts of human consumption at local, regional and national levels. In addition to the Ecological Footprint, REAP can be used for carbon accounting and generates indicators on CO_2 and greenhouse gas emissions, and the Material Flows of products and services through an area.

SOME SCENARIOS THAT HAVE BEEN EXPLORED IN REAP

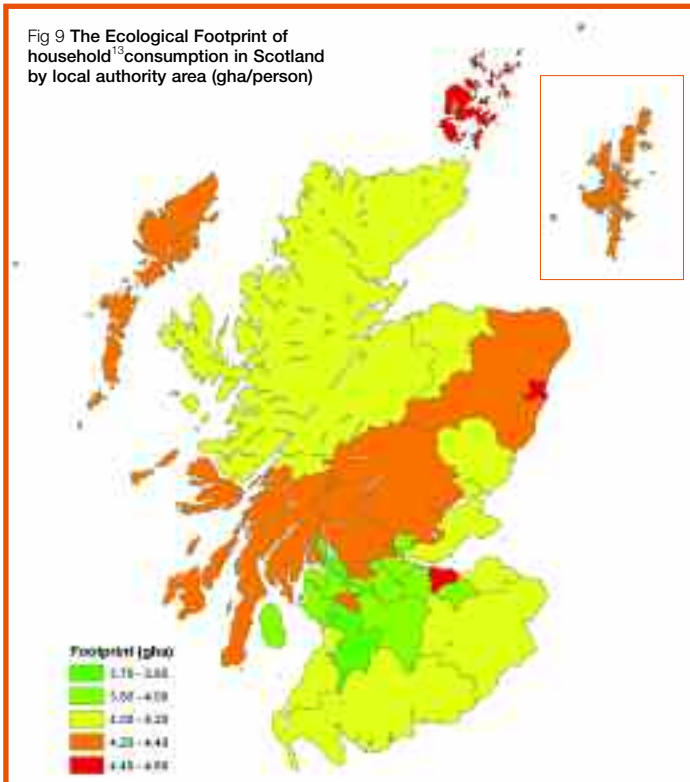
> The Ecological Footprint of different housing standards in the Thames Gateway
> The footprint reduction potential of the Welsh Assembly organic food policy
> The future CO_2 emissions from the housing sector in the Leeds City Region

PROVIDING STRATEGIC POLICY SUPPORT

Policy makers are increasingly recognising the need for a model that can reliably measure environmental pressures associated with policy decisions. REAP can be applied to the assessment, development and appraisal stages of

12 For more information please visit www.ecologicalbudget.org.uk

Fig 9 **The Ecological Footprint of household[13] consumption in Scotland by local authority area (gha/person)**



the policy process. At the assessment stage, it is possible to prioritise activities to tackle according to their contribution to the Ecological Footprint.

At the development stage, REAP can help create scenarios that test policies under consideration. This helps to reduce uncertainty and identify the most effective policies for reducing an area's footprint.

For example, in transport, there are 29 variables in REAP that can be changed at the touch of a button. These include occupancy, distance travelled, efficiency and ownership levels for different transport modes. By changing these variables, policy makers can use REAP to project changes in footprint and CO_2 up to 2050.

Because REAP allows users to compare a number of policy measures at once, it helps policy makers understand the effectiveness of a range of different approaches. As seen in this report, REAP was used to create Footprint Reduction Strategies in Aberdeen City and Aberdeenshire Councils and the North Lanarkshire Partnership.

13 The data shows the "household" footprint and has not included capital investment or government expenditure. For more information please visit www.sei.se/reap where you can download individual local authority reports.

14 The Office for National Statistics compiles a survey on PRODucts of the European COMmunity (PRODCOM), a harmonised system across the European Community for the collection and publication of product statistics.

These kinds of applications can help policy makers define in quantitative terms what environmental sustainability means. While there may be plenty of guidance on what constitutes a sustainable community, a sustainable region or a sustainable home, REAP provides some of the scientific and statistical evidence that is needed to prioritise and justify policy options in this context.

DATA SOURCES

The use of the best available data is one of the key concerns for policy makers. Although the baseline footprint and CO_2 emissions in REAP are based on 2001 data sets, it is possible to update this with locally available information. REAP's baseline data will be updated annually with the next update due in March 2007 based on 2003 data sets.

REAP combines top-down national accounting data and locally specific consumption data. Data for the flow of basic materials and products for each economic sector were obtained using data sources covering the period from 1997 to 2004. The main data sources used in REAP break down as follows:

> National (Economic) Accounts (Office for National Statistics)
> National Footprint Accounts (Global Footprint Network)
> National Environmental Accounts (Office for National Statistics)
> Household Expenditure Survey (Office for National Statistics)
> National Travel Survey (Department for Transport)
> National Food Survey (Office for National Statistics)
> household expenditure by ACORN group (CACI Ltd)
> composition of ACORN groups in LA areas (CACI Ltd)

A significant data source is PRODCOM[14] – detailed national trade and expenditure data used by the Office of National Statistics (ONS) and harmonised across the European Union. This is complemented by household expenditure data by local authority area and ACORN type.

ACORN stands for 'A Classification of Residential Neighborhoods' and has been developed by CACI Ltd, a data marketing firm. The classification system defines socio-economic groups within the UK, fitting the population into 17 distinct groups which contain a further 55 'typical' types.

A host of data has been collected on each of the ACORN types. This has been used to build profiles of household expenditure in each local authority area and covers everything from the types of holidays people go on to how many cars they own. Further locally specific data has been collected for energy, transport

and waste where possible. REAP has an 'Update Data' function for the input of more specific data.

SEI has produced its own supply chain relationships for the year 2000 with support from Cambridge Econometrics. These form the most up-to-date supply and use tables in the UK. They will be updated annually from March 2007.

The advantage of using the top-down approach described is that it allows direct comparisons to be made among all local authorities. It provides a good strategic picture of an area's footprint, which gives a good starting point for setting priorities.

Input of Local Data into REAP

When a local authority wishes to use REAP to measure the effects of specific policy options, the input of local data is advisable. The update data function in REAP provides the option to update their baseline year with specific local data. This ensures that REAP will be responsive to local changes and builds trust in the data sources.

Transport: information on the distance that residents have travelled and number of vehicles licensed. Source: local transport surveys, Scottish Transport Statistics. It also asks for the number of vehicles licensed in the local authority. (http://www.scotland.gov.uk/stats/bulletins/00184-00.asp)

Household Consumption: information on housing types, expenditure and transport behaviour. Source: The Scottish Household Survey. (http://www.scotland.gov.uk/Topics/Statistics/16002/shs-search)

Food Consumption: eating habits by local authority area. Source: The Scottish Health Survey http://www.scotland.gov.uk/Resource/Doc/76169/0019728.xls

Air travel: The Civil Aviation Authority is able to provide detailed time series data for demand for aviation by local authority area; however, this data is not free.

"Because REAP allows users to compare a number of policy measures at once, it helps policy makers understand the effectiveness of a range of different approaches."

© Steve Morgan / WWF-UK

These four data sources will provide the majority of information required within REAP. One of the areas that is difficult to source data for is demand for consumables and services. It is suggested that the current modelling approach within REAP provides the best available method by which to provide this data at the local authority level.

REAP AND POLICY MAKING IN THE UK

REAP is developing into one of the most significant tools for policy makers in sustainable development. The pilot local authorities are the first in the UK to use REAP to devise a footprint reduction strategy and this project has generated significant interest in other organisations. Several other local authorities are considering its use, as are agencies such as Highlands and Islands Enterprise. The Scottish Executive is planning its own pilot of the software to test its usefulness for civil servants. The Scottish Parliament has already completed a footprint assessment of one of its conferences. And across the UK, it has been used in at least 15 local authorities and regions, and is developing a wide-ranging menu of scenarios and applications[15].

Scotland is at the forefront of these exciting developments and is seen as a leader in the field of evidence-based policy making. The Local Footprints project offers a great opportunity for Scotland to maintain this leadership, while at the same time benefiting from policies that are backed up by evidence of their environmental impact.

15 www.regionalsustainability.org

8 Conclusion and recommendations

This report has documented the experience of three local authorities pioneering the use of the Ecological Footprint as a performance measure, as a means to inform policy, and in education. In the short period since it was launched in 2004, the project has spawned the use of footprint by many groups and organisations – from church groups through to the Scottish Executive.

The concept of global responsibility for Scotland's consumption is now accepted and, increasingly, we are gaining an understanding of our environmental limits. For local authorities, this project has reaffirmed their critical importance in delivering on their own duties for sustainable development – but also for national commitments in this area. The decision by all three local authorities to continue to use footprint as a performance measure and to inform policies confirms the benefits it brings. In short, Scotland's Global Footprint project has demonstrated the following:

> the value of and demand for evidence-based policy making

> the opportunities for footprint reduction through local authority policies

> the benefits of footprint reduction in council operations

> footprint as an effective way to engage people with sustainable development.

This project represents only the tip of the iceberg – it has identified only a few of the many ways local authorities can contribute to reducing Scotland's footprint. The heavy hitters of transport, food and energy are all areas of local authority influence. Local authorities are critical in helping individuals change their behaviour through changes in transport, planning and building decisions. They can also make their own operations more efficient and create demand for more sustainable products and services.

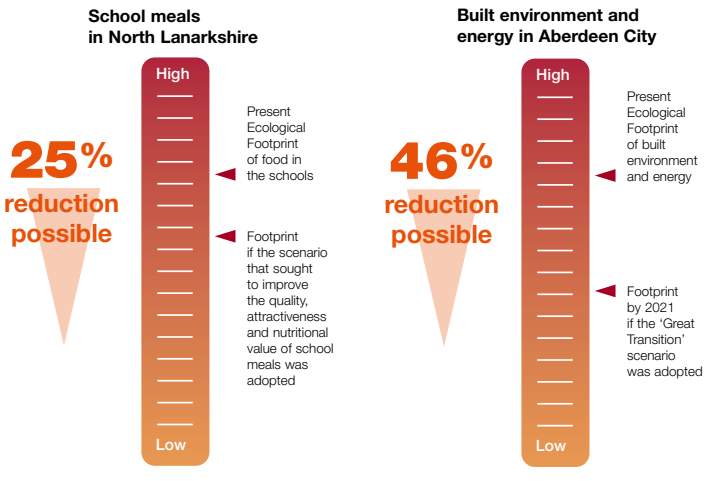


Fig 10 **Potential reductions in footprint**

Furthermore, this project has shown that if Scotland continues along a 'business as usual' path, our footprint will continue to rise. Scotland cannot afford to tread this path. Not only are we using more than our fair share, this pattern of consumption is leading to rising CO_2 emissions and environmental degradation at home and around the world.

A low-footprint, low-carbon approach is the future – for Scotland and for forward-thinking local authorities. The policy scenarios in this project have shown the real potential for change – and risks of taking a 'business as usual' approach. Furthermore, it has clearly shown the benefits of joint working, and that improvements in one component of the footprint can often be overshadowed by detrimental impacts of another:

> healthy eating diets can reduce the food footprint by as much as 25%

> even with demand management approaches, the North East would see a 36% increase in the transport footprint by 2021

> high energy efficient standards combined with renewable energy sources could reduce the built environment footprint by as much as 46%

> increased transport use can eliminate gains made in design standards of new developments which do not integrate service needs such as public transport, shopping and schools.

The footprint approach pioneered through this project is an important way for local authorities to realise these benefits and make a contribution to reducing our global footprint.

"A low-footprint, low-carbon approach is the future – for Scotland and for forward-thinking local authorities."

Photodisc

RECOMMENDATIONS AND NEXT STEPS

Local Footprints project

Building on the success of Scotland's Global Footprint project, a follow-on project, Local Footprints, will encourage the take-up of the footprinting approach by local authorities and schools across Scotland. It will provide expertise, advice and one-to-one consultation with local authorities and schools taking up footprinting. A range of support materials, workshops and publications will developed by the Project Officer. This project is a partnership between WWF Scotland and the Sustainable Scotland Network and is funded by the Scottish Executive, the Improvement Service and ScottishPower.

Local Footprints for Schools

To help all Scottish schools work towards footprint reduction, a support service for schools is planned. Working closely with Eco Schools Scotland the service will help schools, in liaison with relevant local authority departments, to:

> measure their footprint

> undertake data collection and analysis

> devise measures to reduce footprint

> use Schools' Global Footprint across the curriculum.

A Curriculum for Excellence

The Schools' Global Footprint project showed ways of working that link strongly with Scotland's new curriculum development, *A Curriculum for Excellence*. In particular, the pilot raised issues regarding working across the curriculum, using innovative teaching and learning approaches and involving pupils in real-life issues.

Teachers from three secondary schools and eleven of their feeder primary schools in three local authorities are working together as part of the *A Curriculum for Excellence* development work taking place in local authorities across Scotland. Using the Schools' Global Footprint resource they will be sharing approaches to cross-curricular working focusing on the transition from primary to secondary school, and reflecting on the challenges. Outcomes will be shared with all schools in the three local authorities and, through a report, with schools throughout Scotland.

Local Authorities – lynch-pin to a sustainable Scotland

A wider network of support will be required to make Local Footprints a success. This means the right signals from the national government – be it the Parliament, the Scottish Executive, Audit Scotland or COSLA – that a low-footprint, low-carbon Scotland is a priority. Efficient government must mean efficient in terms of all resource use – not just money. Local government duties for sustainable development must be taken seriously by their auditors. And local governments which 'spend to save' for future generations should be recognised and rewarded.

The Local Footprints project will work with local authority networks and stakeholders throughout Scotland to ensure the next round of Development Plans, Transport Strategies, Regeneration Plans and Procurement Policies – to name a few – set the right framework for a One Planet Scotland.

"Local authorities' decisions on transport, planning, waste, procurement and more will shape the way we live for years to come. They can either move us towards a lower footprint or allow current trends of growth to continue. This project has shown that local authorities want to do the right thing and can do so when given the right information to back up those hard decisions." **Elizabeth Leighton, Senior Policy Officer, WWF Scotland**

Annex 1: Scotland's Global Footprint project goal and objectives

Goal

By 2012 Scotland's Ecological Footprint has stabilised and is on a reducing trend.

Purpose

By 2007, the Ecological Footprint is used by Scottish local authorities and schools to increase understanding about the local and global impact of consumption and to inform decisions to help reduce Scotland's Ecological Footprint.

Objectives

Objective 1
Develop the REAP software tool, which will enable all Scottish local authorities to use the Ecological Footprint technique as an indicator, in education and as a management tool.

Objective 2
Measure the Ecological Footprint and apply the REAP software tool in the partner local authority areas.

Objective 3
Develop and start to implement an Ecological Footprint reduction strategy, which includes both policies and projects, in the partner local authority areas.

Objective 4
Use the Ecological Footprint to demonstrate performance on the local government Best Value duty and community planning.

Objective 5
Build capacity within the partner local authorities, the Steering Group and project affiliates in the Ecological Footprint analysis and application.

Objective 6
10% of Scottish schools are using the Schools' Global Footprint materials as part of the Eco Schools Programme and have taken measures to reduce their Ecological Footprint.

Objective 7
Raise awareness of the Ecological Footprint with partner local authority staff, partner community planning partnerships and targeted subsets of partner local authority residents.

Objective 8
Share experiences and lessons with all Scottish local authorities and encourage them to undertake the Ecological Footprint work.

Objective 9
Achieve the support of key stakeholders to encourage the use of the Ecological Footprint by local authorities and schools.

Objective 10
Develop and consider resources for a 'next steps' strategy.

More information

For more information about this and the Local Footprints project, contact
localfootprints@ksbscotland.org.uk
or visit:
www.scotlandsfootprint.org
www.wwf.org.uk/scotland

Designed by
www.thedesignpod.net
Printed on recycled paper
by Woods of Perth

With support from ScottishPower and the following organisations:

It's our future.

SCOTLAND'S GLOBAL FOOTPRINT PROJECT STEERING GROUP

and ScottishPower

In addition, for the Schools' Global Footprint project steering group

PILOT SCHOOLS

Aberdeen City and Aberdeenshire

Craigievar Primary School
Cults Primary School
Fishermoss Primary School
Harlaw Academy School
Keithall Primary School
Mill O' Forest Primary School
St Peter's RC Primary School
Turriff Academy School

North Lanarkshire

Clarkston Primary School
Greenfaulds High School
Keir Hardie Primary School
Langloan Primary School
Overtown Primary School
Our Lady's High School
St Patrick's High School

The mission of WWF is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:
· conserving the world's biological diversity
· ensuring that the use of renewable resources is sustainable
· reducing pollution and wasteful consumption

www.wwf.org.uk/scotland

for a living planet®

WWF Scotland
Little Dunkeld
Dunkeld
Perthshire PH8 0AD
t: 01350 728200
f: 01350 728201