North East Scotland Global Footprint Reduction Report

ABERDEEN CITY COUNCIL

WWF

Aberdeenshire COUNCIL

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Introduction

The North East Scotland Global Footprint Project is funded by the Scottish Executive, WWF Scotland, Aberdeen City Council, Aberdeenshire Council, North Lanarkshire Council, Scottish Natural Heritage, Scottish Environment Protection Agency, and Scottish Power. It is one of two pilot projects that started in April 2004 and is connected with Scotland's Global Footprint Project. This project investigates how much natural resources we are consuming compared with what is available in the world. It aims to help policy makers and people in North East Scotland to understand the link between present lifestyles and environmental consequences, and to provide Local Authorities with a tool to make evidence-based decision that can reduce pressure on the environment.

The Principles of Global Footprint

The Global Footprint is a tool that measures the area of land and sea, in terms of global hectares, used to provide water, energy, food and materials required to support people's lifestyles, as well as absorb waste. Such a tool helps to judge how sustainable lifestyles are and what changes are needed now and in the future to reduce global impact.

The Policy Context

The Scottish Executive Sustainable Development Strategy - Choosing Our Future (2005) identified Councils and their community planning partners as leaders in delivering sustainable development at a local level. Councils must show that Sustainable Development is included in all aspects of the Local Authority.

As part of the Local Government (Scotland) Act 2003 local authorities must also demonstrate sustainable development within Best Value. Part of Best Value influences the purchasing of goods and services and a key principle is

to promote sustainability in consideration of the social, economic and environmental impacts of activities and decisions both in the shorter and longer term.

The Global Footprint tool is important for raising awareness of Sustainable Development issues. It will support Councils and community planning partners in delivering sustainable development.

The Corporate Commitment

Both Aberdeen City Council and Aberdeenshire Councils have made a commitment towards evidence-based policy decisions by supporting the Global Footprint tool as a measure of sustainable development. Through using the Global Footprint tool Councils can measure the pressure of policies and strategies on the environment and it's resources. This provides decision-makers with evidence-based choices for future planning. Elected Members and officers can meet this commitment by encouraging and incorporating Global Footprint into future decisions and using it as a performance measure.

The Global Footprint Objectives for the North East of Scotland

- To introduce Global Footprint as a measure of Sustainable Development
- To reduce North East Scotland's Global Footprint by implementing policies and strategies based on evidence based decision-making.

The Global Footprint Results for the North East of Scotland

A year of data collection was required to determine North East Scotland's Global Footprint. Specific data was required to determine both Aberdeen City and Aberdeenshire's Global Footprint. Regional demography, energy use, infrastructure, food, transport, waste and water use were used for analysis. This data were sent to the Stockholm Environment Institute, York to accurately calculate the region's footprint.



North East Scotland's Global Footprint is higher than Scotland's overall Global Footprint of 5.37 global hectares per person (gha/person). Aberdeen City's Global Footprint is 5.80 gha/person and Aberdeenshire's Global Footprint is 5.64 gha/person.

If the world's resources were spread evenly throughout the world population then the earth resources would provide 1.9 global hectares per person (biological capacity). The current Global Footprint for Scotland and North East Scotland exceeds the earth's biological capacity and if everyone in the world lived as those in North East Scotland, it would require two extra planets to sustain present lifestyles.

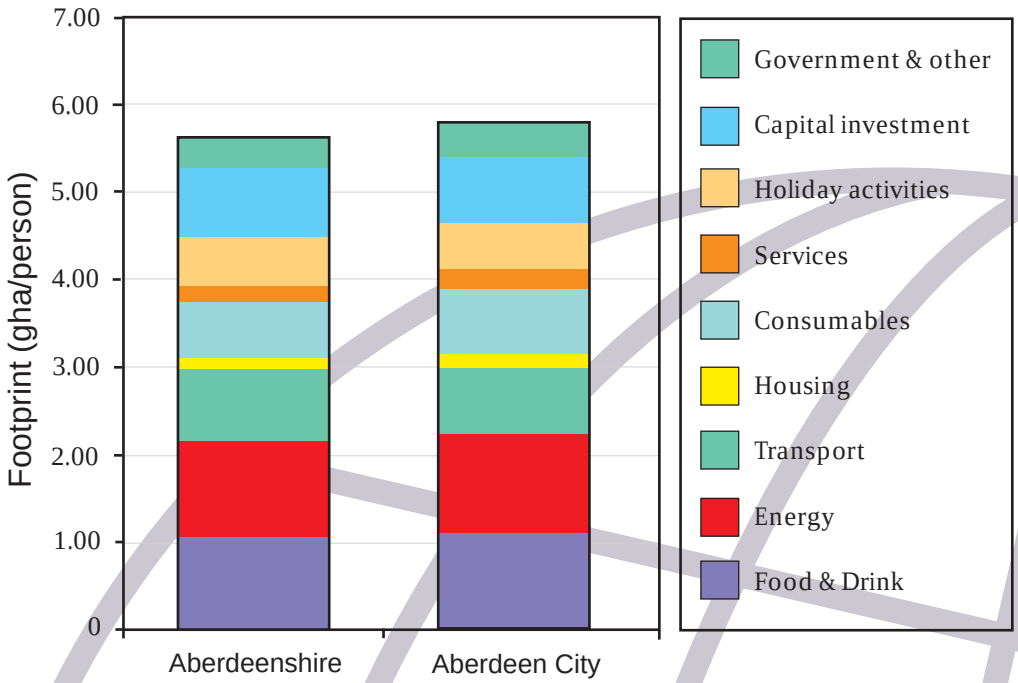

Figure 1 – Aberdeenshire and Aberdeen City's Global Footprint

The Built Environment and Energy

Energy is the largest contributor to North East Scotland's Global Footprint with Aberdeen City's at 1.14 gha/person (20%) and Aberdeenshire's at 1.09 gha/person (19%). These figures indicate high-energy consumption associated with domestic fuels like gas, oil, electricity and other fuels. With the inclusion of housing, the built environment and energy accounts for a Global Footprint of 1.31 gha/person (23%) Aberdeen City and 1.22 gha/person (21%) in Aberdeenshire.

Food and Drink

Food and drink is another factor that contributes to the North East of Scotland's Global Footprint with Aberdeen City's footprint at 1.07 gha/person (19%) and 1.11 gha/person (20%) for Aberdeenshire. These figures represent the consumption of food and drink purchased for home consumption, alcoholic drinks purchased in a public houses, restaurants and other eating out establishments including takeaway meals.

Transport

Transport contributes to both Global Footprints with Aberdeenshire's Global Footprint at 0.81 gha/person (14%) and Aberdeen City's at 0.74 gha/person (13%). It represents the costs of car fuel, the impact associated with purchasing and maintaining private vehicles and public transport services such as bus, train and air travel.

The Global Footprint Reduction Options

The North East Global Footprint Project identified transport, the built environment and energy as areas in which Global Footprint reductions can be achieved. These policy areas are currently under review with both the regional transport strategy and the land use structure plan being developed. Food and drink did not have reduction options identified as both Councils have greater influence on transport and the built environment and energy.

However, the project has contributed funding to Aberdeen Forward's REAL food project which looks to bring health benefits to local communities by encouraging the consumption of fresh local produce and consequently, the environmental benefits from reducing the food miles in transporting produce.

Scenario modelling is a process used to examine future examples of how life would be if different decisions were made.This was used to develop transport and built environment and energy scenarios. Scenarios are inherently uncertain, given the high number of variables. However, they can have real value when scenarios are based on good information.

Scenarios ranged from a market driven do minimum approach to a more sustainable and environment focused approach.

Each scenario was developed through workshops and 'one on one' discussion with officers from both Councils.

The results of the Global Footprint scenarios were calculated by the Stockholm Environment Institute,York using the Resource and Energy Analysis Programme (REAP) (www.sei.se/reap/). This software programme was developed in conjunction with the project. REAP calculates the global impact of an area's consumption activities and models the future impacts of policy measures. Through these results the following Global Footprint reduction strategies were developed.

The Built Environment and Energy

Aberdeen City and Aberdeenshire's built environment and energy consumption contributes 23% and 21% respectively towards the region's Global Footprint (Figure 1). This contribution is due to domestic energy consumption, the implications of using electricity, gas and other fuel sources, current housing developments and infrastructure within Aberdeen City and Aberdeenshire.




For North East Scotland, four built environment and energy scenarios were modelled.

1. "Laissez-Faire" scenario based on market driven built environment with energy inefficient buildings and existing heating sources.

2. "According to Plan" scenario based on North East Scotland's Together (NEST) Structure Plan with existing improvements in energy efficiency and heating systems.

3. "Towards Better Communities" scenario that integrates communities with a focus on energy efficient housing for existing buildings and the development of excellent building standards in new buildings.

4. "Great Transition" scenario that focuses on Compact City and Towns that integrate communities with further improvements in energy efficient housing and renewable energy sources throughout new and existing buildings.

The built environment and energy scenario results suggest that through a range of energy efficient measures, significant CO_2 and Global Footprint reductions can be achieved. The "Laissez-Faire" scenario would lead to an increase in the built environment and energy footprint (Figure 2). The most effective energy efficiency measure is to retrofit existing housing stock. However, new houses built to excellent standards would further reduce the region's footprint.

Aberdeen's HECA (Home Energy Conservation Act) target is to reduce CO_2 emissions by 30% by 2012. If this is achieved across the region, the footprint could be reduced by 9% from 0.85 gha/person in 2003 to 0.78 gha/person in 2021 (Figure 2). If alternatives within the "Towards Better Communities" and "Great Transition" scenarios were adopted the built environment footprint



would reduce to 0.61 gha/person and 0.46 gha/person respectively, a 29% and 46% reduction compared to current practices (Figure 2).

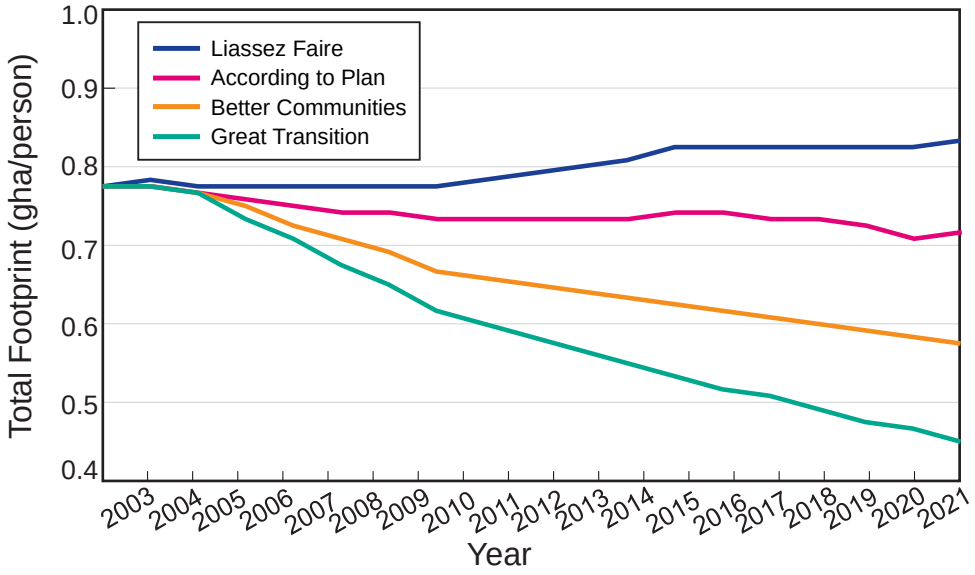

Figure 2 – A Comparison of the Built Environment and Energy Scenarios modelled by Resource and Energy Analysis Program (REAP)

Both "Towards Better Communities" and "Great Transition" scenarios reveal that the development of energy efficient heating systems such as Combined Heat and Power (CHP) and the development of alternative energy sources can contribute to reduce North East Scotland's Global Footprint. At present Aberdeen City Council operates two Combined Heat and Power (CHP) stations at Stockethill and Hazelhead that serve over 500 homes and two Council buildings. A further CHP station is to be built which will link 500 homes and three Council buildings. The investment in CHP stations will reduce the dependency on current fuel sources and therefore further reduce the region's Global Footprint. Aberdeen City Council's Energy Management team has also undertaken extensive work to promote the use of micro-renewables in the City.

Aberdeenshire Council has encouraged different scales and technologies for generating renewable energy sources. Aberdeenshire Council is planning a significant biomass project by converting the Aboyne Academy boiler from oil to carbon neutral wood chip. There is also planning to encourage micro-renewable and alternative energy sources throughout Aberdeenshire.

Proposed Outcomes:

- Incorporate energy efficient and sustainable building excellent standards into new housing developments and regeneration of existing homes.
- Further promote current Home Energy Conservation Act initiatives to increase energy efficient homes and reduce CO2 emissions.
- Develop the use of renewable energy sources and use more energy efficient heating sources.

Transport

The development of an effective transport strategy is an important issue for North East Scotland. At present, transport contributes 14% and 13% of the region's footprint (Figure 1) which is associated with the high dependency on private transport.

Three independent future scenarios were developed for transport within North East Scotland. These were associated with the options developed by officers as part of the review of current local transport plans.

1. "Laissez Faire" approach focused on an infrastructure that facilitates car use with minimal or no investment in public transport,

2. "Business as Usual" (BAU) scenario based on North East Scotland's Transport Partnership (NESTRANS) modern transport system.

3. "Demand Management" approach focused on reduced car use with increased investment in public transport.

The Global Footprint reveals that current policies and strategies fail to address North East Scotland's transport problem. If one mode of transport continues to be favoured it is expected that North East Scotland's transport footprint will increase from 1.80 gha/person to 2.61 gha/person by 2021, an increase of 45% (Figure 3). This compared to a do minimum approach results in an increase of 70% to 3.04 gha/person (Figure 3). The high transport footprint of these scenarios is a reflection of the direct impacts of car carbon emissions.

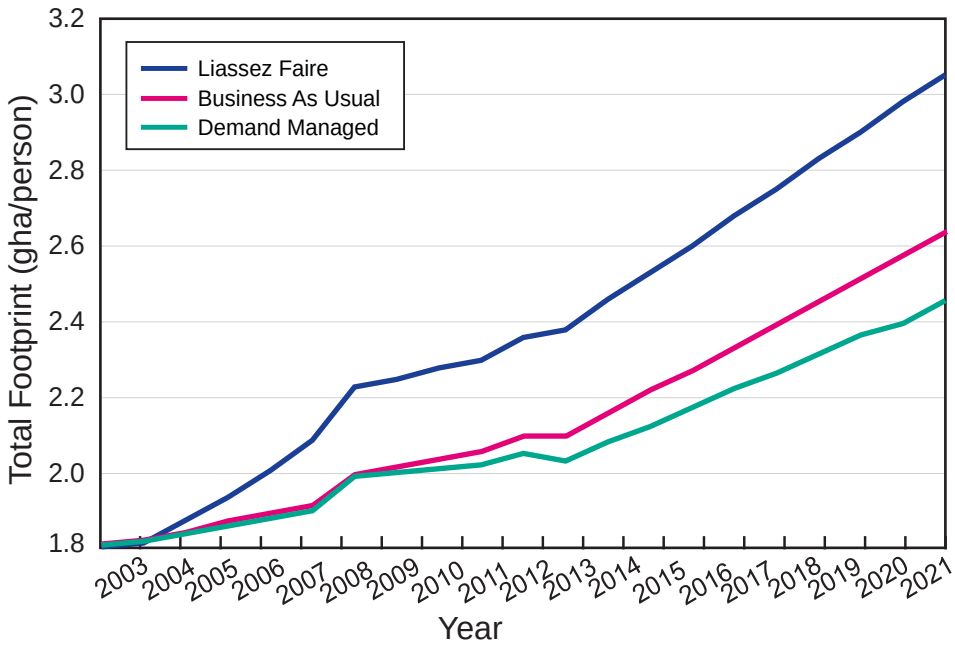

Figure 3 - North East Scotland's transport scenario results modelled by Resource and Energy Analysis Program (REAP).

If a demand management approach which supports alternative means of transport was adopted, the Global Footprint for North East Scotland would still increase by 36% to 2.65 gha/person, however this is 6% lower than the current strategies. This indicates that a demand management approach alone will not address North East Scotland's dependency on private transport (Figure 4). To develop sustainable transport within North East Scotland requires the reversal of existing transport trends and the development of a new travel culture where all parties involved are committed to the sustainable alternatives (Scottish Executive, 1997). The Regional Transport Strategy and Council's Local Transport Strategies need to focus on options that promote a shift in transport behaviour to reduce North East Scotland's Global Footprint.

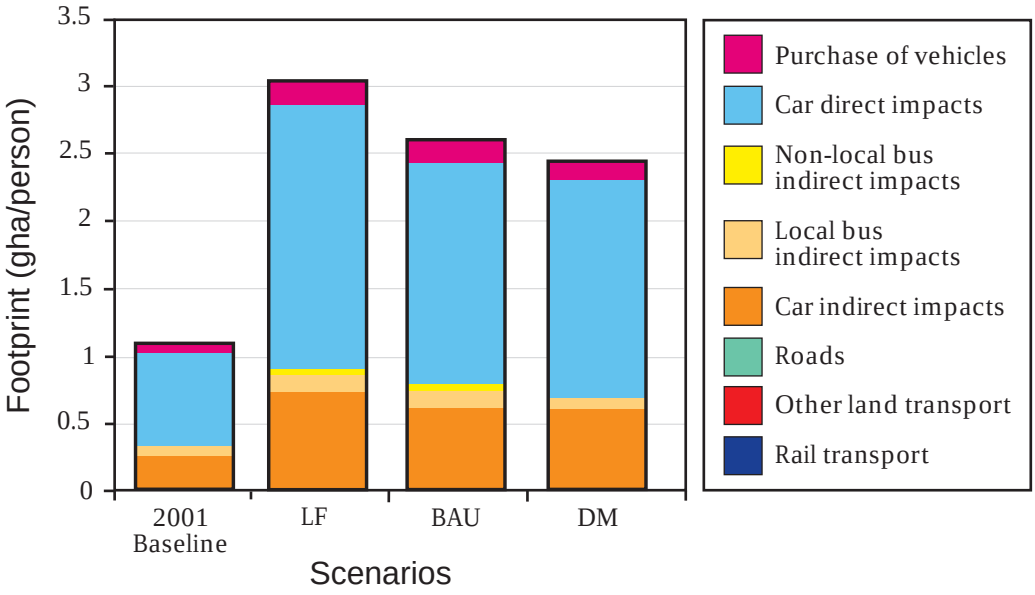

Figure 4 – A Comparison of the transport scenarios for the North East of Scotland

Providing sustainable transport options is important in reducing the region's dependency on private transport. The development of high frequency mass transport system with an integrated public transport centre will improve public transport within Aberdeen City and provide better links with Aberdeenshire. The North East Scotland Cross Rail project is an important step to enhance these links. Further improvements in infrastructure that support cycling and walking should be prioritised.

Proposed Outcomes:

- Invest into current infrastructure to prioritise, walking, cycling and public transport.
- Investigate a high frequency mass transport system within Aberdeen City that has links with Aberdeenshire.
- Develop alternative forms of transport such as the cross rail project for Aberdeenshire and Aberdeen City.




The Built Environment and Transport Relationships

The built environment has a big impact on transport. These scenarios cannot be assessed without considering the implications of the transport scenarios. Looking at both areas together, the Global Footprint for the built environment and transport reveals that the "According to Plan", "Laissez-Faire" and "Towards Better Communities" Scenarios all increase. However in "Towards Better Communities" the rate of increase is slowed and the Global Footprint in 2021 will be 10% below "According to Plan" (Figure 5). Only the "Great Transition" scenario can reverse the trend by achieving a net reduction in CO_2 emissions and Global Footprint.

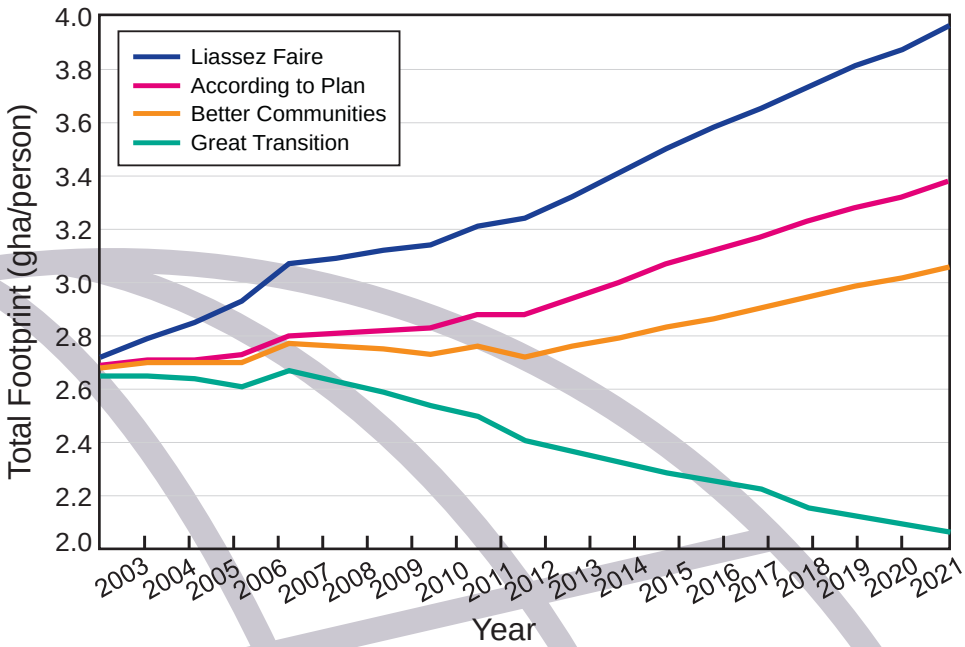

Figure 5 – Combined Built Environment and Transport Scenario results modelled by Resource and Energy Analysis Program (REAP)

When combined, transport accounts for on average 80% of the built environment and transport footprint. The current practice of placing housing developments within peripheral Aberdeenshire towns edging Aberdeen City has resulted in a high dependency on private transport. Alternately "compact city and towns" with integrated services within the communities as described by "Great Transition" scenario can reduce the amount of travelling by promoting other forms of sustainable transport.



Effective future planning must integrate and link communities with retail and employment opportunities. Evidence from Europe shows that integrated planning policies, based on a compact City have been successful in reducing CO_2 emissions without hampering mobility and economic growth (www.eaue.de). North East Scotland's land use strategies are due to be reviewed. The findings of this report can therefore be utilised in the development of new strategic land use strategies, policies and plans.

Proposed Outcomes:

- Encourage a "compact city and town" approach to the regeneration of existing brown field sites and communities.
- Work with planners to ensure the development of City and towns that will integrate communities with employment and retail opportunities.

The Global Footprint and Strategic Environment Assessment

Links have been identified between Strategic Environmental Assessment (SEA) and Global Footprint as both measure the effects on the environment. SEA is a statutory requirement which future policy and programmes are required to meet before they can be implemented. It determines the environmental effect by reviewing eight environmental indicators. The significance of Global Footprint within SEA is that it will provide a quantitative measure, which can be used to support the SEAprocess.

The Global Footprint can help to determine the significance of SEA screening, to assess the cumulative effects of policies and strategies and also provides an indicator for an environmental baseline. The ability of the Global Footprint to assess future scenarios will benefit SEA by informing on future alternatives.




The recognised links between Global Footprint and SEA will continue to be developed. The Global Footprint tool is to be used in the SEA scoping process for the proposed Aberdeen City Housing Strategy.

Proposed Outcome:

- Develop a framework to incorporate Global Footprint in the Strategic Environmental Assessment process.

The Schools Global Footprint Project

Five schools (Cults Primary, St Peter's RC, Harlaw Academy, Dyce Academy and Hazlehead Academy) in Aberdeen City and five schools in Aberdeenshire (Keithhall, Inverurie, Fishermoss, Craigievar and Turriff Academy) have piloted web-based resources that enable schools to calculate and identify actions to reduce their footprint. Designed for P7, S1 and S2 pupils 'Schools Global Footprint' is now based on the Learning and Teaching Scotland web site (http://www.ltscotland.org.uk/sustainabledevelopment/) and is available to all Scottish schools.

A Schools Global Footprint calculator and practical, curriculum based, teaching and learning ideas are offered for teachers on each component of the Footprint: waste, water, energy, food, buildings and grounds and travel. When aligned with the Eco Schools programme this can help schools to identify and implement footprint reduction solutions.

In 2007 groups of schools in the three Local Authority areas will be using the resources to examine innovative educational approaches as a contribution

to a Curriculum for Excellence. Schools Global Footprint training for teachers and local authority Eco Schools contacts will be available in partnership with Eco Schools Scotland.

Proposed Outcome:

- Encourage schools to measure and take action to reduce their footprint as part of the Eco Schools programme.

The Footprint Reduction Projects in Aberdeen City and Aberdeenshire

The North East Scotland Global Footprint project has strengthened awareness of Sustainable Development within the region. Other initiatives to reduce the region's footprint have benefited from funding provided by the North East Global Footprint Project.

Community Global Footprint Projects

The towns of Ellon and Huntly have developed a project to measure their footprints. Both towns have developed and used questionnaire surveys for schools and community groups to determine their town's Global Footprint. The projects will identify local impacts and develop strategies within the communities to reduce these. The awareness of Global Footprint and Sustainable Development within the two communities is a key part of the projects.




Aberdeen Forward REAL Food Project

The production and transport of our food is a main contributor to the Global Footprint of North East Scotland. This project aims to bring health benefits to local communities by encouraging the consumption of fresh local produce and benefits the environment by reducing the food miles in transporting produce. Projects have been identified at Methlick in Aberdeenshire and Manor Park/Middlefield and Woodside Communities in Aberdeen City (www.aberdeenforward.co.uk/).

Aberdeen City - Sustainability Code for Regeneration Areas

Aberdeen City Council is to develop a Sustainability Code for the regeneration of areas within Aberdeen City. In 2005, the Community Regeneration Strategy for Aberdeen City identified six priority areas for regeneration. The Sustainability Code will ensure that the refurbishment of existing buildings, redevelopment of whole areas and new buildings meets the sustainability benchmark.

Aberdeenshire – Carbon Management Programme

Aberdeenshire Council is developing a programme to identify and reduce carbon emissions from its own activity such as street lighting, property, transport, and energy use. This is a partnership project with the Carbon Trust and will ensure Aberdeenshire Council will have a Carbon Management Plan to compliment Aberdeen City Council's plan.

Conclusions

Sustainable Development ensures that the actions today do not adversely affect future generations ability to support themselves. The North East of Scotland can contribute to this by ensuring that the consumption of resources matche the resources available to support it. The Global Footprint tool is an important measure of Sustainable Development and should be seen alongside economic and social progress measures. The North East Global Footprint Project therefore recommends:

- The Global Footprint tool is adopted as a decision-making tool for future strategies and policies within Aberdeen City and Aberdeenshire Councils.
- Aberdeen City and Aberdeenshire Councils adopt and use the Resource and Energy Analysis Program (REAP) Global Footprint.

References

Scottish Executive. 2005. Sustainable Development Strategy: Choosing Our Future.

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See www.sei.se/reap for more information.

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