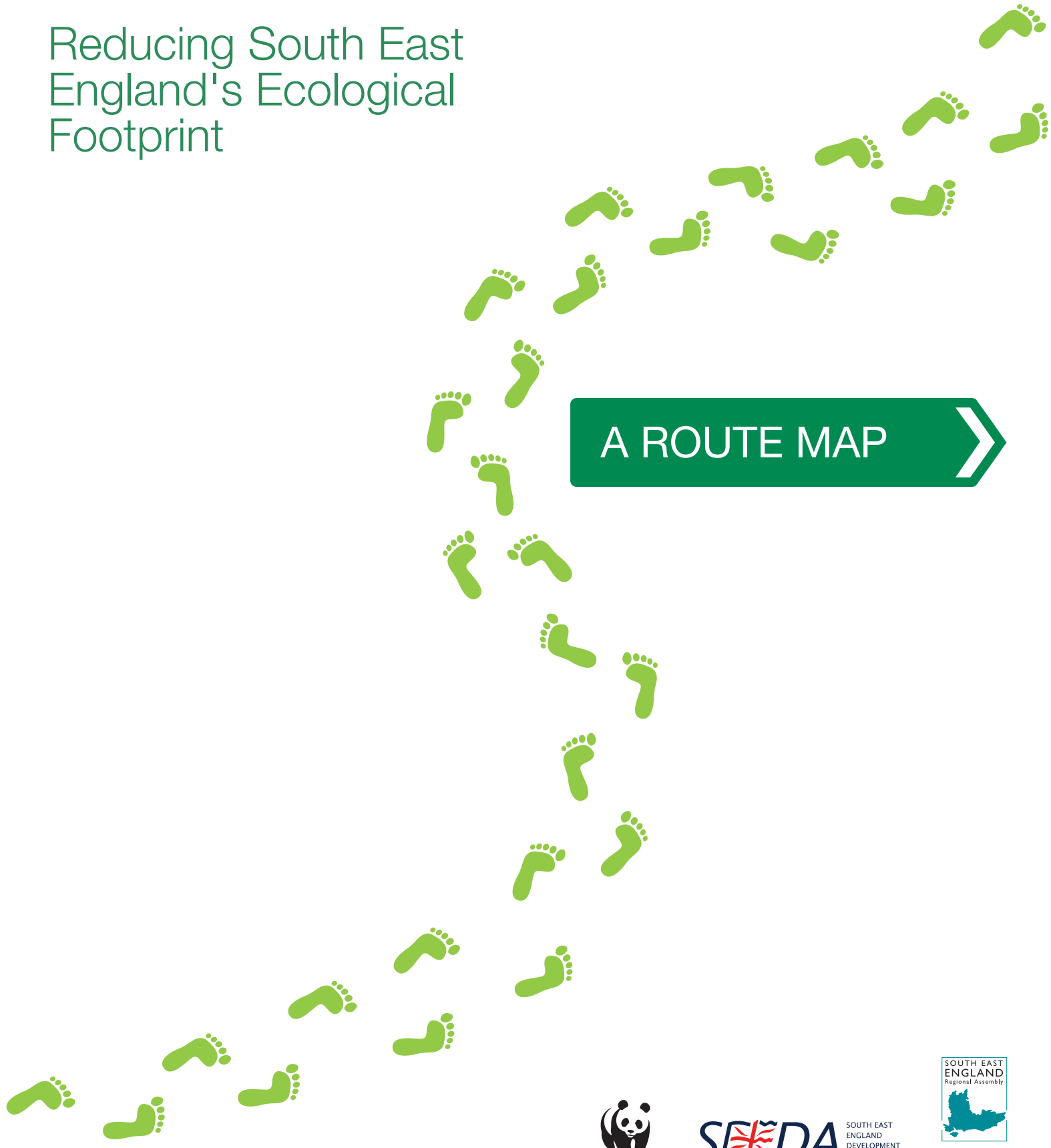
Reducing South East England's Ecological Footprint



A ROUTE MAP

WWF

SEEDA
SOUTH EAST ENGLAND DEVELOPMENT AGENCY
Working for England's World Class Region

SOUTH EAST ENGLAND
Regional Assembly
COUNCILS AND COMMUNITIES IN PARTNERSHIP

Reducing South East England's Ecological Footprint

A ROUTE MAP

This route map is a practical guide; setting out actions required by different organisations and individuals to mitigate and adapt to the predicted effects of climate change, meeting the objectives of the South East Plan and Regional Economic Strategy.

Summary report prepared by CAG Consultants
in association with the Stockholm Environment Institute, Cambridge Econometrics and the Centre for Urban and Regional Ecology

August 2008

WWF

Many people associate WWF with wildlife and wild spaces, but there's a lot more behind the Panda. Conserving species and protecting habitats are still on the agenda, but if we are to achieve our mission - a future with which people live in harmony with nature - we also need to address global threats, such as unsustainable consumption and pollution.

In the UK, WWF works with government, business and civil society to find long-term solutions to the environmental challenges we face. We are pleased to support the South East in their developing work on Ecological Footprint.

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FOREWORD

The amount of resources we consume in the South East is rising steadily and this trend will continue unless we take urgent action. In developing the South East Plan and the Regional Economic Strategy (RES), partners across the region recognised that this upward trend in our Ecological Footprint cannot continue if we are to remain prosperous, have globally competitive businesses, and offer the quality of life that both communities and businesses expect.

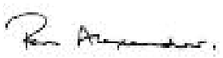
Without that quality of life and environment, businesses will go elsewhere and the cohesion and vitality of our communities will suffer. This, and our responsibility towards the global environment, is why the regional partners are committed to stabilising the rate of growth in the region's Ecological Footprint and then reducing this from 2016 onwards. We need to change our lifestyles and business practices as we are currently consuming resources at an unsustainable rate. If everyone in the world lived the lifestyle we lead, we would need three-and-a-half planets to support us.

This 'route map', commissioned by the Regional Assembly and SEEDA in partnership with WWF, was developed by national experts to identify the means by which the South East can work towards becoming a 'One Planet Region' by 2050. We welcome this report as it represents a major step towards identifying how we can tackle our Ecological Footprint. There are no simple solutions and we must work collectively at the national, regional and local level now to enable the region to develop sustainably in the future.

Addressing the South East's Ecological Footprint is fundamental if we are to maximise the economic, environmental and social potential and sustainability of the region. All sectors of society – businesses, local authorities, regional bodies, individuals, voluntary groups and community groups – will need to play their part if we are to make progress. By publishing this 'route map', we hope we can encourage everyone to consider what part they can play on this journey, including developing their own route maps.

Transformation of the South East towards a 'One Planet Region' will be challenging, but will offer far-reaching benefits for the local and global environment, opportunities for the economy, improvements in social cohesion and quality of life within the region.

Paul Bevan
Chief Executive
South East England Regional Assembly



Pam Alexander
Chief Executive
South East England
Development Agency

David Nussbaum
Chief Executive
WWF

EXECUTIVE SUMMARY

What's the problem?

For some time, scientists and policy-makers have been concerned about climate change caused by man's CO_2 emissions, particularly those from burning fossil-fuels. The impacts of climate change appear to be accelerating, and scientists now warn that significant reductions in CO_2 emissions are required to reduce the risk of very serious climate change. Our current way of living is clearly not sustainable. If significant action is not taken now, it is likely that more drastic measures will be needed in future.

Rising oil and food prices are now hitting our pockets. Increasing global demand for energy, particularly in emerging economies, is raising concerns about 'Peak Oil' – do higher oil prices mean that growing demand is outstripping supply of this finite resource? Rising world food demand, combined with increasing production of bio-fuels, is also pushing up food prices around the globe. These are complex and difficult issues: solutions to one problem (e.g. substitution of bio-fuels for fossil-fuels) may in turn contribute to other problems (e.g. competition between food and bio-fuel production). We need to find more sustainable ways of living, but how can we do this without inadvertently causing other problems or dramatically reducing our quality of life?

What does this study do?

In this study, we examine the South East's use of resources and set out a 'route map' towards sustainable living in the South East. The study has been commissioned by the South East England Regional Assembly (the Assembly) and the South East England Regional Development Agency (SEEDA) in partnership with WWF and has been led by CAG Consultants, in a consortium with the Stockholm Environment Institute (SEI), Cambridge Econometrics (CE) and the Centre for Urban and Regional Ecology at Manchester University (CURE).

The Regional Economic Strategy and the Regional Spatial Strategy both make a commitment to reduce the South East's 'Ecological Footprint'. The Ecological Footprint is a measure of our overall use of resources and helps us to examine whether we are living within sustainable limits. The Ecological Footprint measures both the 'real land' required to grow our food, support our buildings and other infrastructure, and the 'energy land' notionally required to absorb the CO_2 generated by our use of fossil fuels. The footprint is measured in land terms and stated in 'global hectares per capita'. It is closely related to our 'carbon footprint', but takes account not only of CO_2 emissions from fossil fuels but also of competition between different land uses. We have used this tool to examine our current and future resource use, and to develop a 'route map' towards a low-footprint, sustainable South East.

What is our Ecological Footprint now?

The South East is an affluent region, and our use of resources reflects this. If everyone used as many of the Earth's resources as we do in the South East, we would need three and a half planets to support the world's consumption[1]. The South East's Ecological Footprint in 2003 was about 6 global hectares per person – equivalent to about 5.5 full-size football pitches. This means that, on average for each one of us, 6 hectares of the earth's productive surface (of land and sea) would be needed to grow food and other resources, and to absorb the CO_2 generated by the supply chains which support our lifestyles. This footprint is still growing – we estimate that now, in 2008, the average Ecological Footprint of South East residents is 6.5 global hectares per person. This compares to the world average of only 2.2 per person, and the 'fair earth share' of 1.8 hectares per person (derived by dividing the total bio-productive area of the earth by its current population).

The footprint is calculated at the point of consumption, and includes goods and services consumed in the region even if they were produced elsewhere. The ongoing decline of manufacturing in the South East, which has the side-effect of reducing CO_2 emissions from the region, has little effect on the region's footprint. We simply consume more imported manufactured goods, produced outside the region.

[1] WWF (2006) Ecological Budget UK - Counting consumption

SEEDA and the Regional Assembly are committed to working with other organisations, businesses and individuals in the South East to reduce this footprint. Our analysis suggests that the main elements of our lifestyle contributing to this footprint are: food (19%); personal transport (18%); home energy and housing (15%); public services and capital investment (24%); and other goods and services (25%).

In this study, we have been able to use emerging new information from SEI on past trends in the region's Ecological Footprint. This has helped us to develop predictions for the future. Without significant changes to current policy and trends in the region, we predict that the South East's footprint will continue to increase at about 1.6% per year. Certain elements of the footprint are predicted to grow quickly, while others appear to be beginning to stabilise:

- The footprints of personal travel (by road, sea, air and rail), public services, capital investment and other goods and services are all predicted to increase at rates between 2.4% and 3.0% between 2003 and 2016;
- The footprint of home energy is predicted to stabilise (owing to current action on energy efficiency) while the footprint of food consumption is predicted to decrease slightly.

Reducing the region's footprint therefore requires a reversal of current trends in many sectors. The challenge for the route map is to find ways of reducing the region's Ecological Footprint while maintaining, as far as possible, our quality of life. We have started by developing a long-term vision of a low footprint future in 2050, and then worked back to identify the actions we need to be taking now to achieve this vision.

What would a low-footprint future look like?

There is growing consensus that, to avoid high risks of runaway climate change, CO_2 emissions in highly-developed countries need to be reduced to 80% of 1990 levels by the year 2050. At this level, people living in both developed and emerging economies would consume their 'fair share' of the earth's resources, while living within the carrying capacity of the planet.

In this study, we advocate that the South East should aim to become a 'One Planet Region', following the principles set out in the 'One Planet Economy Network'[2]. This would require an 80% reduction in the region's Ecological Footprint and its CO_2 emissions by 2050. Far reaching 'transformation' would be needed: in our values, our society, our government structures, our economy and our lifestyles. In exploring the transformations required to achieve this goal, we have drawn on a number of studies undertaken at national level.[3]

The types of transformation needed in each sector would be:

- **Built environment:** Transformation of the entire existing housing stock (3.5 million dwellings) and the non-domestic building stock; retrofitting of energy and water efficiency and low/zero-carbon energy measures throughout; investment in high-efficiency housing and construction, supported by public procurement, improvement partnerships and supply-chain development; a major shift towards energy-efficient behaviour by households and business, supported by lobbying for carbon quotas and trading schemes; the development of 'Green Action Zones' for low-footprint living and working;
- **Transport:** Transformation of the entire transport sector, including low/zero carbon vehicles, and a shift to low-impact modes for freight and passenger transport; integrated accessibility and green travel planning, including the development of 'Green Action Zones' and low emission zones; capping of air travel impacts at current levels, so that any growth is balanced by efficiency improvements; the eventual development of low carbon air technology;
- **Energy supply:** Transformation of the energy system; accelerated investment in renewable sources and micro-generation, aided by forward commitment through public procurement; the development of industrial clusters for low/zero carbon technologies; promotion of Carbon Capture and Storage as an interim measure to reduce the impact of fossil fuels; Combined Heat and Power (CHP) as standard in all large developments;
- **Food:** A commitment to fair trade and ethical procurement; the development of low impact farming; reduction in impacts throughout the food supply chain (e.g. production, packaging, logistics); a major shift towards lower-impact diets (e.g. low meat, organic, local and seasonal food) through behaviour change, public procurement and retailer incentives;
- **Goods and services, public services and capital investment:** A shift from material-based output to dematerialised value-added services; design for low footprint/impact throughout product life cycles; major improvements in the energy and resource efficiency of industry in the region; clusters of innovative businesses supporting the supply of low and zero-carbon technologies; de-coupling of economic growth from environmental impacts, leading to improved value added and competitiveness in global markets; a pro-active programme of social enterprise to encourage sustainable consumption; promotion of low-impact services (e.g. sustainable tourism, leisure, retail and so on) with a particular focus on financial services as the key to all other sectors; best possible practice in low-impact health, education and other public services, using the immense power of public procurement as the main mechanism;
- **Waste:** Product design for waste minimisation and eventual recycling; universal application of reuse and recycling technologies, funded by deposit and disposal levies; the development of 'industrial ecology clusters' in which waste from one industry becomes a resource for another;
- **Water:** Water-efficient design in buildings, products and supply chains; active management of business and household demand for water; investment to safeguard water supplies and minimise flood risks in preparation for climate change impacts.

These types of transformations for climate-related issues are currently being widely studied at national and global level (e.g. by the forthcoming Pathways project, sponsored by WWF-UK). The greatest barrier to action for the region, and every other level, is generally seen to be the upfront costs of investment and innovation. Benefits of innovation tend to be recouped later, often by different parties from the original investor.

So, successful transformation will depend not only on technological advances, but also on new business models, such as the 'Energy Services Company' concept[4], where investment can be linked to returns on efficiency. This will also depend on changes in the way that the public sector, business and communities work together, and on better integration between different levels and departments of government. We envisage a more strategic and pro-active role for government (local, regional and national), using procurement as the spearhead for a wider market transformational approach.

This gives some sense of where we need to get to. But how do we get there? What does this vision mean in terms of actions and policy decisions in the next few years?

[2] The One Planet Economy Network prospectus is available on www.ecologicalbudget.org.uk.

[3] In particular '80% Challenge – delivering a low carbon UK' (Institute for Public Policy Research) and 'Zero Carbon Britain' (Centre for Alternative Technology).

[4] For example: Woking Borough Council's Thameswey Ltd was the UK's first Energy and Environmental Services Company (ESCo) – a public/private joint venture company.

What do we need to do now?

We have developed a 'route map' for each sector, setting out the types of actions required both to stabilise and then reduce that sector's Ecological Footprint. We have done the same for a number of cross-cutting issues: behaviour change, lobbying, procurement, planning and 'Diamonds'/growth areas (see below).

These route maps, and a table of priority actions, are set out in the summary report. More detailed action tables are presented in the full report, together with supporting evidence from our modelling work. Many different actors within the region would be involved in delivering the actions below, and some would require action at the national level. These responsibilities are explained more fully in the summary and full reports.

Short-term priorities emerging from the route maps for each sector are as follows:

- **Built environment:** Implementation of home energy policies should be continued, including support for rapid achievement of the 'Code for Sustainable Homes' Level 6. More action is needed to encourage retrofitting of energy efficiency and low/carbon technologies to existing homes and buildings. Partnerships should be established for strategic improvement programmes;
- **Transport:** Strong action is needed here, as impacts are increasing despite current efforts to promote alternatives to the car. Active steps should be taken to limit and then reduce car travel, and to promote public transport. Air travel is a special case with huge impacts, local and global: the region should lobby for aviation to be brought into the EU Emissions Trading Scheme, and, ultimately, to constrain growth in air travel to equal growth in technical efficiency;
- **Energy supply:** Strong support for renewable energy projects is required to achieve the current EU and UK target for renewable sources to generate 15% of total energy (equivalent to 40% of grid electricity) by 2020, given current barriers to development of these projects. Another priority is the development of infrastructure for Combined Heat and Power schemes;
- **Food:** Procurement should be used as a tool to promote lower impact food consumption within public and private organisations. In the wider community, the emphasis should be on reducing food wastage, and promoting low-impact farming;
- **Goods and services, public services and capital investment:** Business incentives and accreditation/labelling schemes should be developed to encourage energy and resource efficiency within business. Carbon-trading schemes should be piloted. Sustainable procurement should be promoted through public procurement and community-based projects;
- **Waste:** Regional markets should be developed for waste and intermediate products, involving all stakeholders in the supply chain. Innovative waste-reduction schemes should be set up, involving both communities and businesses;
- **Water**: Water metering should be introduced as quickly as possible; water-efficiency measures should be retrofitted to existing houses and other buildings, and fitted as standard on new homes and buildings.

We have identified a number of cross-cutting priorities, which would help to reduce the region's footprint across a number of sectors:

- **Behaviour change:** Develop and implement a regional strategy for behaviour change. Develop behaviour change projects with communities, and support community-led and social enterprise schemes which encourage behaviour change. Promote local incentives for low-footprint behaviours;
- **Lobbying:** Lobby the UK government for national-level incentives for footprint and carbon reduction by all stakeholders;
- **Procurement:** Promote sustainable procurement by all public sector bodies, aiming for Level 3-5 of Defra's Flexible Framework, and identify immediate potential for changing procurement specifications;
- **Planning:** Ensure that funding allocations, strategies and plans reflect Ecological Footprint and carbon reduction priorities. Promote use of Ecological Footprints and carbon metrics (including carbon prices) in decision-making and policy appraisal;
- **'Diamond' local authorities and growth areas:** Pioneer new approaches to footprint stabilisation and reduction, focusing on priority sectors, including business incentives, skills and supply-chain development, regional innovation clusters, behaviour change and carbon-offsetting (see page 40).

Using the route map

It is easy to focus on the costs of route map actions, without assessing the cost of doing nothing. The Stern Review of the Economics of Climate Change concluded that the cost of unabated climate change would range from 5-20% of GDP while the costs of mitigation would range from -1% to 5% of GDP. In a recent speech, Lord Stern indicated that evidence suggests that climate change is happening faster than anticipated so faster action is needed. He now suggests that 2% of GDP would need to be spent now to avert the risk of runaway climate change.[5] But the costs of acting collectively now are outweighed by the potential benefits of avoiding unabated climate change.

The use of the Ecological Footprint takes a wider view than simply counting climate emissions:

- It is a measure of total impacts through the supply chain, both direct and indirect, all the way to final consumption. It encompasses the bio-fuels issue, where conversion of farmland to bio-fuels has been encouraged by climate policy, but at the cost of displacing food production for over 260 million people.[6]
- It includes imports and their embedded impacts, currently estimated at over a third of direct impacts. This avoids the 'green illusion', in which the UK appears to become more sustainable simply by exporting its heavy industry to overseas.

No-one has yet attempted to develop a global costing of unabated Ecological Footprint growth, but it is safe to assume that this would be more than the costs of climate change on its own.

Reducing the region's Ecological Footprint is closely linked to other aspects of the environmental agenda. The 'route map' set out here would help the region to comply with a wide range of environmental targets and legislation, including EU waste targets and carbon reduction objectives.

The current Regional Economic Strategy already stresses the economic opportunities from new environmental technologies. Many of the actions in the 'route map' would also bring positive benefits to our quality of life (e.g. healthy, active lifestyles involving more walking and cycling; stronger communities where people live and work more locally, using ICT to replace some long-distance travel; increased demand for local food and local tourism; shift from the consumption of material goods to leisure services).

[5] www.guardian.co.uk/environment/2008/jun/26/climatechange.scienceofclimatechange

[6] Action Aid, 2008: 'Cereal Offenders'

Starting the journey

Given the challenges presented by the route map, the wide range of stakeholders and the many barriers to progress, the key question is how to mobilise action. In practice, institutional arrangements in the South East will depend on the outcome of the current Sub-National Review. Whatever the detail of regional/sub-regional structures and responsibilities emerging from this review, we recommend that:

- Strategic priorities and action plans from the route map are fed into mainstream strategies and plans, including the Integrated Regional Strategy – led by SEEDA, the Assembly and GOSE, together with the Sustainable Futures Group;
- The short-term priority actions should be mobilised through funding and procurement. Immediate steps should be taken on actions which cost little, use available technology, gain political viability and generate social benefits;
- But more difficult issues (such as constraining growth in car and air travel; and promoting more sustainable consumption of goods and services) should also be tackled as a priority, as these are central to reducing the region's footprint;
- The Diamond local authorities should pioneer specific actions from the route map at local level, involving other sub-regional groupings and local authorities where appropriate;
- Consideration should be given to developing a 'Foresight' programme, to explore future trends and opportunities, bring together networks of stakeholders, and develop incentives, strategies and programmes. This could be implemented through existing institutions (e.g. the International Institute for Sustainability; RESOLVE) or could have its own secretariat and resources.

Progress towards the Ecological Footprint, and associated CO_2 emissions targets, should be monitored on an ongoing basis. The REAP[7] tool used for this study can be used to monitor footprint and emissions for geographical areas (e.g. specific local authorities). But other tools, such as Corporate Stepwise developed by Best Foot Forward[8] and SEI's Triple Bottom Line, can be used by specific organisations, sectors or businesses. In addition to monitoring progress towards the targets, it will be important to keep the effectiveness of methods and strategies under review. The route map proposed here is a starting point which can be refined and developed as information improves and time progresses.

[7] Regional Energy Analysis Programme: (www/sei.se/reap/index.php)

[8] www.bestfootforward.com

Conclusion

The proposed route map for the South East calls for a concerted effort to tackle and reverse the upward trends in the region's Ecological Footprint. Meeting long-term reduction goals for both Ecological Footprint and CO_2 emissions will require major transformation of the South East towards a 'One Planet Region'. This transformation will be challenging but will offer far-reaching benefits for the local and global environment, for the region's competitive position, for social cohesion and for quality of life in the region.

CONTENTS

1 INTRODUCTION

This summary presents highlights from the full report of a study to develop a 'route map' showing how South East England can meet its targets for reducing the region's Ecological Footprint.

The Regional Economic Strategy and the Regional Spatial Strategy for South East England both make a commitment to reduce the region's 'Ecological Footprint'. The Ecological Footprint measures both the 'real land' required to grow our food, support our buildings and other infrastructure, and the 'energy land' notionally required to absorb the CO_2 generated by our use of fossil fuels. The footprint is measured in land terms and stated in 'global hectares per capita'. It is closely related to our 'carbon footprint', but takes account not only of CO_2 emissions from fossil fuels but also competition between different land uses.

The Ecological Footprint is a measure of our overall use of resources, and helps us to examine whether we are living within sustainable limits. The unsustainability of our current lifestyles is highlighted by growing concern about the future impacts of climate change, recent rises in oil prices and the emerging concept of 'Peak Oil'. Steep rises in world food prices appear to be due not only to rising food demand but also to competition between land use for food and bio-fuel production. We need to find solutions to environmental problems that do not in themselves cause more problems.

The study was commissioned by the South East England Regional Assembly (the Assembly), the South East England Regional Development Agency (SEEDA) and WWF-UK, with support from Defra. It has been led by CAG Consultants, in a consortium with the Stockholm Environment Institute (SEI), Cambridge Econometrics (CE) and the Centre for Urban and Regional Ecology at Manchester University (CURE).

The study has involved a review of the region's current footprint and projections of future impacts under different policy scenarios. From this analysis, we have developed a set of 'route maps' to help guide the region towards achievement of its target for Ecological Footprint reduction. The 'route maps' look not only at potential actions by regional bodies such as SEEDA and the Assembly, but at what needs to be done by other organisations and individuals, at national, regional and local levels. While this summary focuses solely on Ecological Footprint reduction, the full report also examines potential reductions in carbon emissions.

This study builds on the recent work of the Select Committee of the South East England Regional Assembly on 'Reducing the South East's Ecological Footprint'. We have also consulted representatives from other Ecological Footprint projects in the region.

2 WHY DEVELOP A 'ROUTE MAP'?

Regional targets

This study has arisen out of commitments, in both the South East Plan (the Regional Spatial Strategy) and the Regional Economic Strategy (RES), to stabilise and reduce the region's Ecological Footprint and its CO_2 emissions. The aim of the study has been to develop a 'route map' or 'action plan' to show how these targets could be achieved, both in the medium term (within the timescale of the RES – to 2016; or the South East Plan – to 2026) and in the long-term (up to 2050).

For the longer-term perspective, we have gone beyond the 60% target specified in the RES to examine the implications of an 80% reduction in emissions and footprint by 2050. There is emerging consensus that a reduction of this scale will be required to avert catastrophic climate change, while achieving a fair distribution of resources and wealth around the globe. This appears likely to require 'transformation' of policies, markets, technologies, infrastructure and consumer behaviour.

Uncertainties and limitations of the route map

There are considerable uncertainties surrounding development of the 'route map'. Firstly, there is no unique solution: there are unlimited combinations of different policies that could reach the reduction targets. Within the scope and resources of this study, it has only been possible to develop one plausible route towards the stabilisation and reduction targets. A more extensive study would be needed to develop and consider alternative approaches to reaching the regional targets, although we have drawn on studies of this type that have been undertaken at national level[9].

There are also a large number of uncertainties affecting the region's future path towards the targets:

- Scientific evidence about the potential impacts of climate change, and the scale of reduction required in CO_2 emissions, is continually evolving;
- Industrialisation is increasing wealth in many developing countries, but contributing to global pressures on food supply, energy supply and emissions;
- Concern is currently emerging about 'Peak Oil' – declining reserves and growing demand are combining to put upward pressure on prices;

Ecological Footprint targets:

- To seek to stabilise the South East's Ecological Footprint by 2016, and to reduce the Ecological Footprint during the second half of the Plan period (2016-2026) (South East Plan, Policy CC3; Regional Sustainability Framework);
- To reduce the rate of increase in the region's Ecological Footprint..stabilise it and seek to reduce it by 2016 (RES, headline target 3);

CO_2 Emissions targets:

- To reduce CO_2 emissions by 20% below 1990 levels by 2010 and by at least 25% below 1990 levels by 2015 (South East Plan);
- To reduce CO_2 emissions by 20% from the 2003 baseline by 2016 as a step towards the national target of achieving a 60% reduction on 1990 levels by 2050 (RES).

[9] In particular, we have drawn on '80% Challenge – delivering a low carbon UK' , led by the Institute for Public Policy Research (IPPR), and 'Zero Carbon Britain' by the Centre for Alternative Technology (CAT).

- New technologies could contribute significantly to improving efficiencies and reducing CO_2 impacts, but it is unclear how soon these will be feasible;
- Public awareness of the need to reduce CO_2 emissions and resource use is developing but willingness to take significant action is at present limited;
- Policy is responding to these factors, but it is not yet clear whether the UK Government will introduce bold enough measures to encourage significant change from 'business as usual';
- Institutional arrangements in the South East and all English regions are being reviewed as part of the Government's Sub-National Review.

By its nature, the remit of the regional bodies is multi-level and multi-lateral. So much of the route map is about influencing other bodies through coordination, enabling and encouragement. This makes assessment of the direct effects of policy more difficult.

Although our study has focused on the South East region, within the UK context, it is clear that there are few boundaries in a globalised economy. Therefore 'transformation' of the South East would require similar actions in the UK and overseas. While these cannot be assumed, it is clear that there are economic advantages for the South East in taking a lead. It is, both morally and practically, the right course of action and it will demonstrate leadership for others to follow.

3 PRINCIPLES BEHIND THE 'ROUTE MAP'

In developing the route map, we have followed the principles behind the 'One Planet Economy'. The Ecological Footprint measure shows that consumption by residents of the South East region is using up the earth's limited resources of bio-productive land area, at over 3 times their per capita share. The region's footprint in 2003 was 6 global hectares per person, and rising (equivalent to about 5.5 full-size football pitches). We have assumed that the overarching goal is for the region to become a 'One Planet Region' by 2050, using up its 'fair share'[10] of the earth's resources as measured by the Ecological Footprint, and producing CO_2 emissions at only 80% of the 1990 rate.

General recommendations for a One Planet Region

(based on the One Planet Economy Network Prospectus, available on www.ecologicalbudget.org.uk)

a **Ecological budgeting –** ensure at least 3.5% per year reduction in climate emissions, Ecological Footprint and total resource use, across all policies and programmes;

b **Fiscal policy and stewardship –** new forms of levies, permits, procurement and re-investment, to promote 'market transformation' in key sectors;

c **Investment and partnership –** promote longer-term private finance and equity partnerships, to promote 'market transformation' in key sectors;

d **Trade and development –** ensure through procurement and investment that all goods and products are from sustainable and ethical sources;

e **Integrated supply chain –** promote corporate social responsibility in all business, supply chains and product life cycles;

f **Infrastructure and assets –** strategic 'integrated asset management' for all stocks of buildings, vehicles, plant and other fixed assets;

g **Consumer and social enterprise –** promote sustainable consumption on the demand side, enabled by communities, networks, non-profit and other social / community markets;

h **Stakeholding and labour –** ensure that the wider community of employees and other stakeholders are engaged and mobilised;

i **Stabilisation and equity –** ensure that local and city-region economies are resilient and empowered to realize their own potential;

j **Eco-systems integration –** facilitate new forms of market for environmental, social and economic assets.

[10] The 'fair share' is calculated by dividing area of the earth's bio-productive resources (both land and sea) by the predicted population of the earth.

4 METHODOLOGY

The project has taken a scenario approach. It explores the policies and modelling results of three alternative future trajectories:

- **'Reference scenario':** assumes that past trends are broadly continued, except where this would not be technically or economically achievable;
- **'Current policy scenario':** this assumes that current economic and environmental strategies are successfully implemented, at both national and regional level (e.g. the Regional Economic Strategy, the UK Energy White Paper, South East Plan) – this means slightly stronger economic growth as well as stronger action for sustainability;
- **'Transformation scenario':** this looks at more radical policy changes (at national/regional/local level) required to transform production and consumption within the region, to achieve 80% reduction in both climate emissions, and carbon/Ecological Footprint by 2050.

Each of the scenarios has been modelled using the two main tools for regional sustainability analysis, plus an overall framework:

- The REAP tool (Resources and Energy Analysis Programme)[11] developed by the Stockholm Environment Institute has been used to project the region's future Ecological Footprint on a consumption basis. The REAP model analyses the footprint under a number of consumption headings (e.g. household energy use, personal transport, food, consumer goods). Business impacts are allocated to the final consumers of goods or services produced by those businesses. REAP takes account of imports and exports in assessing the impact of consumption;
- The REEIO tool (Regional Economy and Environment Input Output model)[12] developed by Cambridge Econometrics has been used to make projections of the region's carbon footprint on a territorial basis. REEIO analyses carbon emissions across a number of industrial sectors (e.g. energy supply, transport, waste management, water supply, manufacturing, services). REEIO does not take account of imports and exports, but looks at what happens within the region's boundaries;
- To structure the analysis, and to provide overall understanding beyond the limits of these models, the OPERA framework has been applied (One Planet Economy Regional Analysis)[13].

These tools have been used to assess the scenarios in terms of two main indicators:

- **Ecological Footprint** is an overall measure of impact on the global environment. This is measured in terms of global hectares per capita. This is calculated by the REAP model on a 'consumption' account basis, (i.e. counting the impacts of all the supply chains of products and services reaching households in the SE region, including imports);
- **CO_2 emissions** represent the largest component of climate change emissions. These have been calculated by the REEIO model, on a 'production' account basis (i.e. those emissions produced within the territory of the South East, including emissions associated with exported goods and services).

[11] www.sei.se/reap/index.php

[12] www.cambridgeeconometrics.com/suite_economic_models/reeio.htm

[13] 'One Planet Economy Regional Analysis (OPERA)' Consultation draft report. (CURE, July 2007).

Preliminary findings from our modelling work were presented to a workshop of regional stakeholders in February 2008. We are grateful to the contributions of these stakeholders and other consultees, who are listed in the full report.

This summary report presents our findings in relation to the Ecological Footprint. Our findings on CO_2 emissions, which are closely related, are presented in the full report.

We have analysed findings in relation to a number of key themes. These are defined further in the relevant chapter on each theme:

- **The built environment** (energy use and construction in housing and non-domestic property);
- **Transport** (including passenger and freight transport; some aspects of aviation and shipping; and transport infrastructure);
- **Energy supply** (including energy use from the UK grid);
- **Food** (the supply, distribution and transport of food);
- **Goods and services, public services and capital investment** (including consumer goods, appliances, clothing and so on; also private services (e.g. financial services, private health care), government services (e.g. local government spending on health and education), and capital investment that is not allocated to other sectors);
- **Waste and resource use** (assessed in terms of waste arisings, not footprint);
- **Water** (assessed in terms of water use, not footprint).

We have also examined a number of 'cross-cutting issues' that relate to all sectors, and are particularly important both to Ecological Footprint reduction and to the remit of the regional bodies:

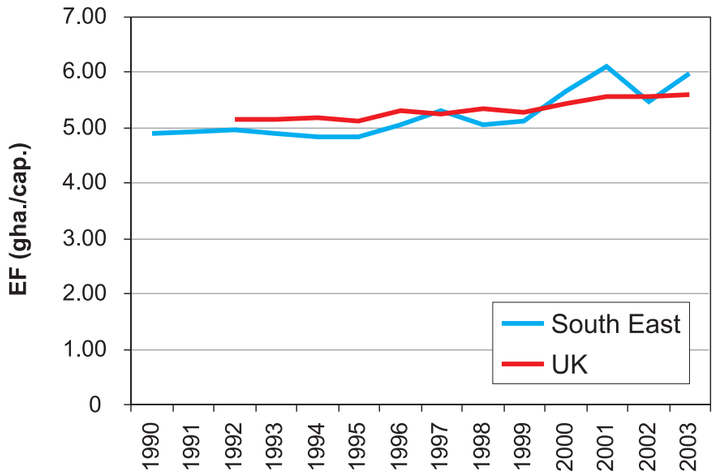
- Behaviour change;
- Procurement;
- Planning;
- The 'Diamond' clusters of local authorities and other growth areas identified in the Regional Economic Strategy.

An overview of our findings from the study is given in Chapters 5-8 below. Further detail on cross-cutting issues and specific sectors is given in Chapters 9-15. Recommendations for taking forward the route map are presented in the two final chapters.

5 WHERE ARE WE HEADING?

Chart 5.1
Historical trends in the South East and UK (Ecological Footprint per capita)

Source: REAP model, Stockholm Environment Institute



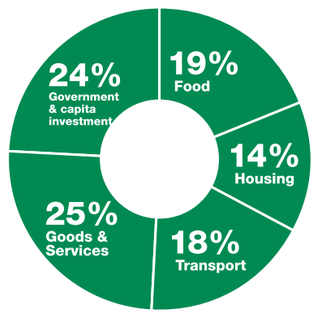
Our current Ecological Footprint

The South East has a high, and increasing, Ecological Footprint: it has increased from 4.90 global hectares per capita (gha/cap) in 1990 to 5.99 gha/cap in 2003.[14] The South East's footprint is higher than the UK average footprint which was 5.5 gha/cap in 2003. This is because of the region's relative wealth, and the consumption associated with this wealth.

The chart above shows historical changes in the region's footprint compared to the UK as a whole. The sharp fluctuations seen in 2001 and 2002 are largely attributable to short-term shifts in exports and imports.

A sectoral breakdown of the region's Ecological Footprint shows that three major individual sectors making a significant contribution to the region's footprint are food (19% in 2003), housing (14%) and transport (18%). The joint category of goods and services outweighs these at 25%, while public services and capital investment account for the remaining 24%. The sectors which are growing fastest are transport, goods and services and public services/capital investment.

Chart 5.2
Sectoral Breakdown of South East Ecological Footprint (2003)



Source: REAP model, Stockholm Environment Institute

[14] There is some variation in estimates of the South East's footprint, arising from different versions of the REAP model. All estimates for 2003 are around 6 global hectares per capita. The overall messages from the study do not depend on the exact figure used.

Future predictions

We have analysed the Reference and Current policy scenarios up to 2020, using emerging new information from SEI on past trends in the region's Ecological Footprint. Our findings suggest that the region's Ecological Footprint is likely to continue growing under Current policy:

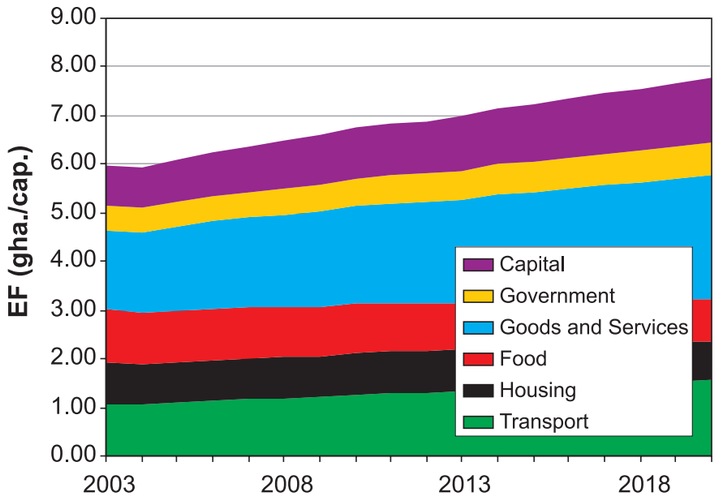
- **Reference scenario:** the Ecological Footprint could increase by over 30% from 2003 to 2020;
- **Current policy scenario:** assuming stronger economic growth combined with stronger policies on energy efficiency, the Ecological Footprint would still increase by nearly 30% from 2003 to 2020.

Without significant changes to current policy and trends in the region, we predict that the South East's footprint will continue to increase at about 1.6% per year. Certain elements of the footprint are predicted to grow fast, while others appear to be beginning to stabilise:

- The footprints of personal travel (by road, sea, air and rail), public services, capital investment and other goods and services are all predicted to increase at rates between 2.4% and 3.0% between 2003 and 2016;
- The footprint of home energy use is predicted to stabilise (owing to current action on energy efficiency) while the footprint of food consumption is predicted to decrease slightly.

Chart 5.3
Ecological Footprint projection by sector – Current policy scenario

Source: REAP model, Stockholm Environment Institute



6 HOW CAN WE STABILISE AND REDUCE THE ECOLOGICAL FOOTPRINT?

Stabilising the region's Ecological Footprint

Significantly stronger policies will be needed to stabilise the region's Ecological Footprint and to meet the long-term target for Ecological Footprint reduction.

In Chapter 5 we analysed the likely impact of Current policy on the region's Ecological Footprint and concluded that the region's footprint was unlikely to be stabilised by 2016 under current policy. Table 6.1 presents the predicted changes by sector.

To avoid double counting, energy supply, waste and water impacts are not explicitly listed in this table. The REAP methodology already includes them in one of the consumption categories set out above.

Table 6.1 highlights the predicted level of increase in the footprint of transport, public services, capital investment and other goods and services. If the region's Ecological Footprint is to be stabilised, let alone reduced, it is essential that action is taken on these sectors.

The predictions for the energy and food sectors, which have a stable or declining footprint, are dependent on effective implementation of current policy. For example, the Current policy scenario assumes that under current policy 40% of new homes built between 2008 and 2020 meet Level 6 of the Code for Sustainable Homes, which is itself a demanding target. Further detail of assumptions for each sector can be found in the full report.

Priority actions to achieve stabilisation of the footprint at 2008 levels are presented in Annex 1, together with a few of the short-term actions for Transformation. A fuller set of recommended actions for each sector is presented in the full report.

Table 6.1
Predicted Ecological Footprint to 2016 under Current policy (global hectares per capita)

Key: Green shading for decrease; red shading for increase 2008-2016.

Source: REAP model, Stockholm Environment Institute

Consumption category	Actual		Predicted		Change (%)	Predicted change (gha/cap)
	1990	2003	2008	2016	2008-2016	2008-2016
Housing	0.87	0.88	0.84	0.85	0%	+0.00
Transport	0.74	1.06	1.19	1.44	+21%	+0.25
Food	1.14	1.11	1.04	0.90	-13%	-0.14
Goods and services	1.17	1.59	1.90	2.33	+22%	+0.43
Public services and capital	0.98	1.35	1.53	1.84	+21%	+0.32
Total	**4.90**	**5.99**	**6.49**	**7.36**	**+13%**	**+0.87**

Meeting the reduction target

In the Transformation scenario, we have used REAP to model combinations of policies that would meet the long-term target for Ecological Footprint reduction. This scenario presents one of many possible paths to reach the target, but shows the scale of change required.

Transformation scenario – REAP assumptions

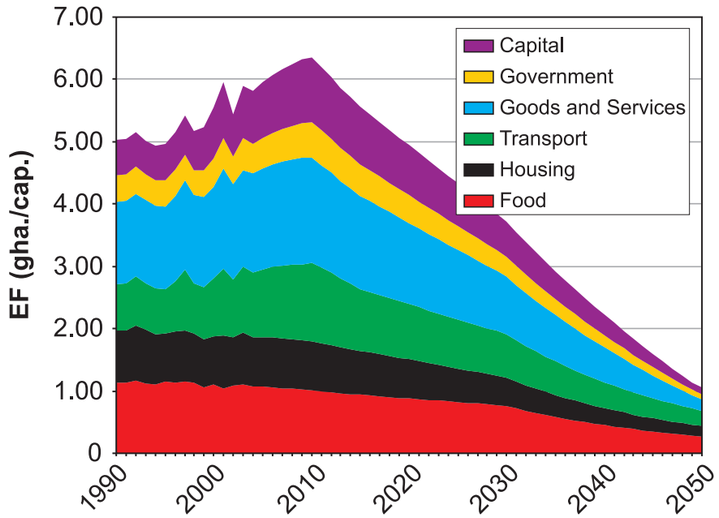
The Transformation scenario would require radical changes to current policy:

- **Housing:** All new homes built to Code 6 (Code for Sustainable Homes) by 2016; retrofit programme for all houses by 2025; carbon intensity of electricity reduces by 20% by 2020 and reduction trend continues thereafter; behaviour change programme significantly affecting energy use in every single home;
- **Transport:** Infrastructure changes to stabilise car growth by 2016; every individual targeted through 'Smarter Choices' measures by 2016; 50% of journeys by walking and cycling by 2030; 1% per year efficiency improvement in all vehicle types; occupancy/infrastructure efficiency improvement of 1% per year;
- **Food:** Renewable energy accounts for 80% of the agricultural energy mix by 2050; food/drink/catering sectors increase efficiency by 2% per year from 2010 onwards; consumers adopt a low carbon diet in which meat consumption is halved and dairy product consumption reduced by a third; reduction in food waste cuts food consumption by 15-25%;
- **Goods and services:** A 5% reduction per year in the impact of household consumption of goods and services from 2010 onwards (or equivalently a 5% per year efficiency gain in the global economy);
- **Public services and capital investment:** A 4% reduction per year in the impact of public services and capital investment, through a combination of service efficiency improvements, low impact procurement and efficiency gains in the wider economy.

7 HOW CAN WE TRANSFORM THE SOUTH EAST?

Chart 6.1
Ecological Footprint projection by sector – Transformation scenario

Source: REAP model, Stockholm Environment Institute



A breakdown of the Ecological Footprint projections under the Transformation scenario is shown above, for the period 1990-2050. The greatest reduction is seen in the footprint of goods and services (nearly 90% reduction), with around 80% reductions in the other sectors.

Our analysis suggests that there are plausible policy combinations that could enable the region to meet its short-term stabilisation target, and its long-term target for reduction of the Ecological Footprint. But reductions of this magnitude are unlikely to be achievable without supporting policies at national level, such as carbon quotas or fiscal incentives for footprint/carbon reduction.

The next question is how to achieve this transformation? In the next chapter we consider how to transform the South East into a 'One Planet Region'.

In subsequent chapters we consider the types of policies and actions that would be needed to achieve long-term transformation in particular sectors. Short-term priority actions for Transformation are highlighted in Annex 1.

The challenge of transformation

To reach the target of an Ecological Footprint 80% below 1990 levels by 2050 requires a reduction of 4% per year, assuming that major action starts in 2010. This rate of decrease would also bring the region's footprint back down to 1990 levels by about 2016.

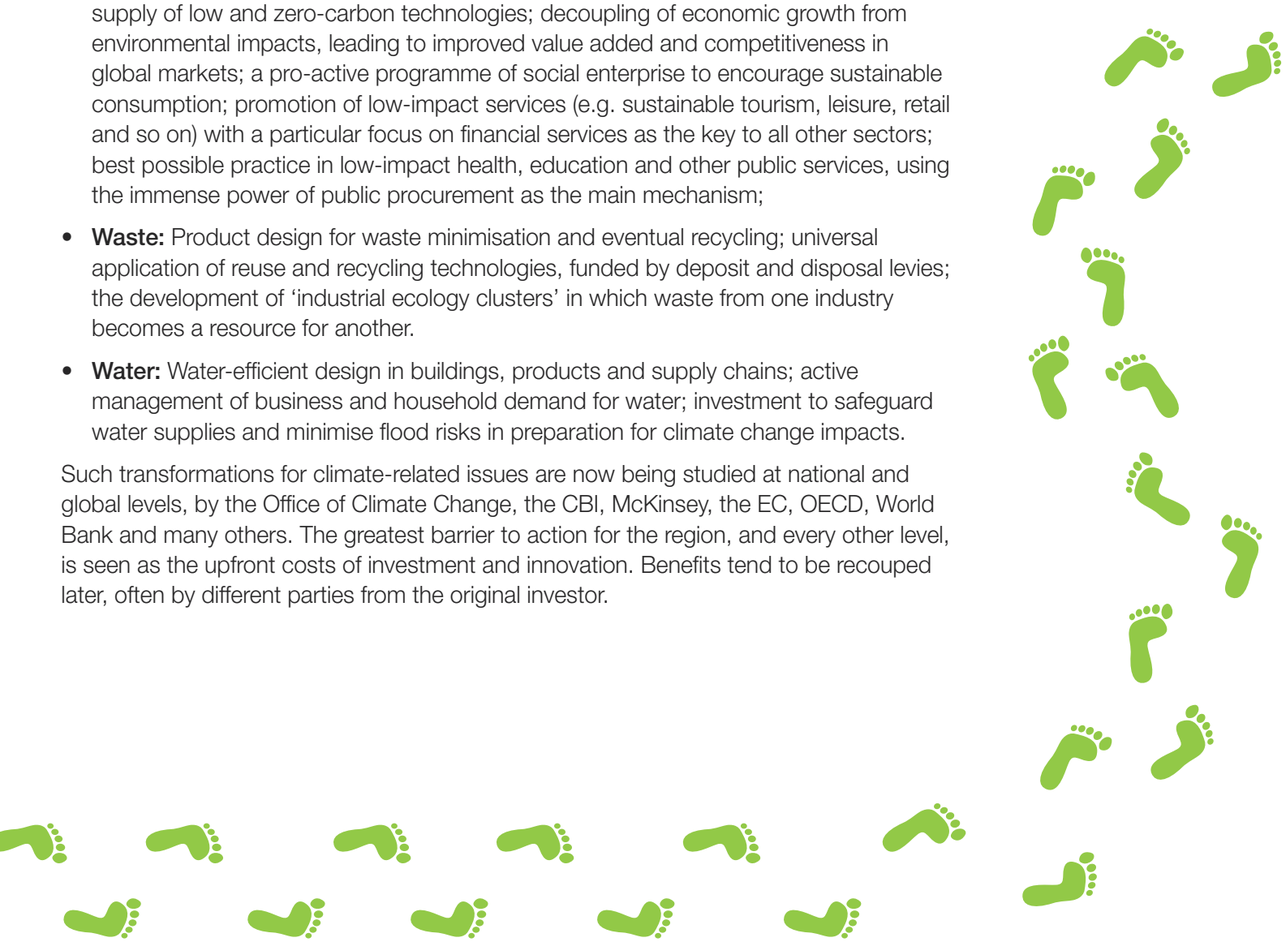
On top of this reduction, there is also a need to mitigate the impact of economic growth. For the RES economic growth target of 3%, this would mean an annual reduction of 7%.

This suggests that major transformation, rather than marginal change, is needed in supply chains and markets. The types of transformation required in each sector would include:

- **Built environment:** Transformation of the entire existing housing stock (3.5 million dwellings) and the non-domestic building stock; retrofitting of energy and water efficiency and low/zero-carbon energy measures throughout; investment in high-efficiency housing and construction, supported by public procurement, improvement partnerships and supply-chain development; a major shift towards energy-efficient behaviour by households and business, supported by lobbying for carbon quotas and trading schemes; the development of 'Green Action Zones' for low-footprint living and working;
- **Transport:** Transformation of the entire transport sector, including low/zero carbon vehicles, and a shift to low-impact modes for freight and passenger transport; integrated accessibility and green travel planning, including the development of 'Green Action Zones' and low emission zones; capping of air travel impacts at current levels, so that any growth is balanced by efficiency improvements; the eventual development of low carbon air technology;
- **Energy supply:** Transformation of the energy system to meet reduced demand; accelerated investment in renewable sources and micro-generation, aided by forward commitment through public procurement; the development of industrial clusters for low/zero carbon technologies; promotion of Carbon Capture and Storage as an interim measure to reduce the impact of fossil fuels; Combined Heat and Power (CHP) as standard in all large developments.

- **Food:** A commitment to fair trade and ethical procurement; the development of low impact farming; reduction in impacts throughout the food supply chain (e.g. production, packaging, logistics); a major shift towards lower-impact diets (e.g. low meat, organic, local and seasonal food) through behaviour change, public procurement and retailer incentives;
- **Goods and services, public services and capital investment:** A shift from material-based output to dematerialised value-added services; design for low footprint/impact throughout product life cycles; major improvements in the energy and resource efficiency of industry in the region; clusters of innovative businesses supporting the supply of low and zero-carbon technologies; decoupling of economic growth from environmental impacts, leading to improved value added and competitiveness in global markets; a pro-active programme of social enterprise to encourage sustainable consumption; promotion of low-impact services (e.g. sustainable tourism, leisure, retail and so on) with a particular focus on financial services as the key to all other sectors; best possible practice in low-impact health, education and other public services, using the immense power of public procurement as the main mechanism;
- **Waste:** Product design for waste minimisation and eventual recycling; universal application of reuse and recycling technologies, funded by deposit and disposal levies; the development of 'industrial ecology clusters' in which waste from one industry becomes a resource for another.
- **Water:** Water-efficient design in buildings, products and supply chains; active management of business and household demand for water; investment to safeguard water supplies and minimise flood risks in preparation for climate change impacts.

Such transformations for climate-related issues are now being studied at national and global levels, by the Office of Climate Change, the CBI, McKinsey, the EC, OECD, World Bank and many others. The greatest barrier to action for the region, and every other level, is seen as the upfront costs of investment and innovation. Benefits tend to be recouped later, often by different parties from the original investor.



Enabling innovation and investment

The One Planet Economy Network project of WWF-UK is launching a report on 'Pathways' later in 2008. This contains very positive proposals for ways to bridge the gap between upfront costs and ultimate benefits. This advocates a practical approach to investment in each sector:

- Increase the number of years allowed for payback on efficiency investment (i.e. reduce the effective discount rate);
- Look for economies of scale and critical mass in application;
- Design a framework for targeted public procurement, with forward commitment for market transformation;
- Use appropriate fiscal instruments, mainly targeted at the point of capital investment;
- Apply these instruments right across the wider supply chain, in particular the services and demand side;
- Build up a portfolio of public partnership shared-equity funds to facilitate partnership investment for supply chain innovation.

These proposals are designed to be built into current schemes for carbon pricing and trading such as the EU Emissions Trading Scheme Phase 2, the Carbon Reduction Commitment and other micro-economic measures. They involve a more strategic and pro-active role for government (local, regional and national), using procurement as the spearhead for a wider market transformational approach.

We recommend that the regional bodies keep a watching brief on the progress of the Pathways project as it emerges in 2008.

What would 'transformation' involve?

Transformation would require far-reaching changes to governance within the region, to the way our economy works, to the technologies we use and the lifestyles we live. This section highlights some of the types of change required to transform the South East into a 'One Planet Region', as illustrated in Chart 7.1.

Chart 7.1
Transformation into a One Planet Region

Transformation of the economy will involve:

- New measures of wealth, well-being and impacts, as a basis for investment and decision making;
- Fiscal incentives to support sustainable consumption and production decisions, at a national – and where possible local – level;
- Integration of efficiency investment costs into production supply chains, through more comprehensive versions of the Emissions Trading Scheme/ Carbon Reduction Commitment;
- Targeting procurement and subsidies, coordinated at local, regional and sub-regional level, at supplies of low-footprint and low-carbon goods and services;
- Pro-active procurement, through forward commitments, to stimulate 'integrated supply chains', innovation clusters and technological development in key sectors.

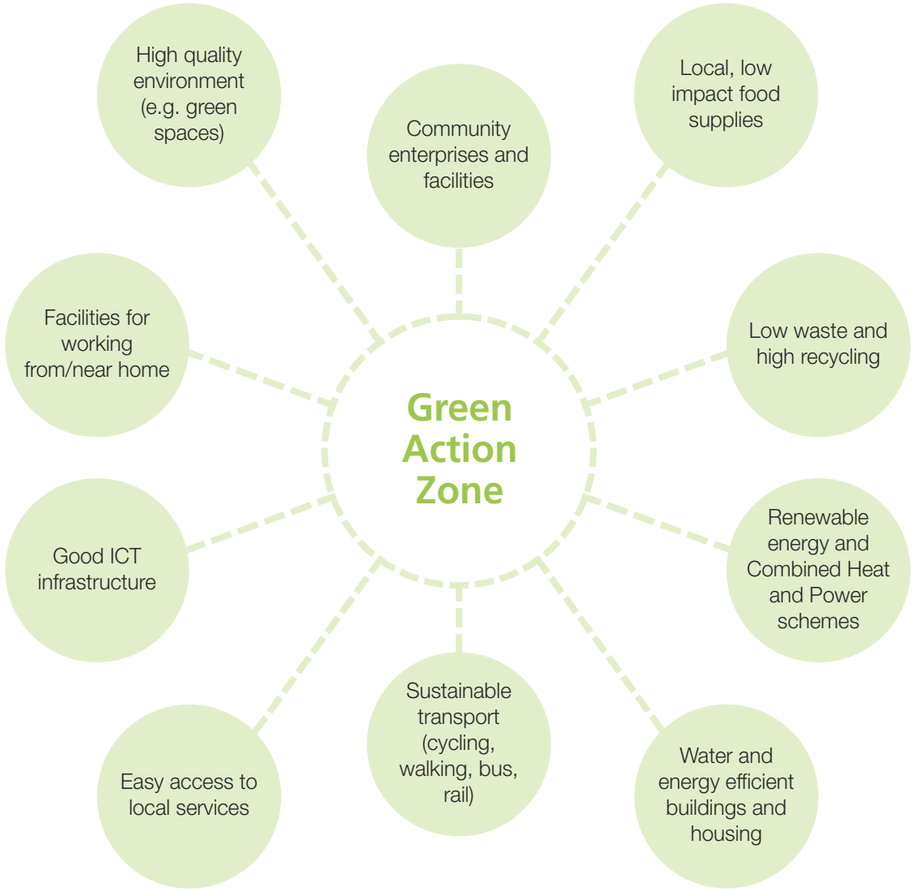
Transformation of production will involve:

- Low carbon and low footprint materials, processes, manufacturing and distribution systems throughout the producer and consumer economy;
- Design for zero waste, throughout the supply chain and lifecycle of products and services;
- Support for the development of these technologies through pro-active procurement and the development of clusters of innovative businesses;
- 'Industrial ecology clusters' involving reuse of waste from one industry as a resource for another, as part of 'closed-loop' systems at regional or wider levels;
- Management of the indirect impacts of services through pro-active and transparent accreditation and Corporate Social Responsibility schemes.

Transformation of consumption will involve:

- Incentives, infrastructure and information to make sustainable consumption choices more attractive and convenient;
- Demand side management through the pro-active promotion of low-impact lifestyles, working through communities, the social economy and community enterprise;
- Integrated asset management and the re-engineering of the entire domestic and commercial building stock;
- Area-based transformation schemes (e.g. 'Green Action Zones' or 'One Planet communities') using integrated planning and high-quality infrastructure to support low-footprint and low-carbon living and working (see Chart 7.2 below).

Chart 7.2
Vision for a 'Green Action Zone'



Transformation of communities and governance will involve:

- The development of closer partnerships between public bodies, businesses and social networks or community enterprises;
- Pro-active investment by these partnerships in products and services related to the built environment and infrastructure;
- Full benefit-cost management of public services as the basis for overhauling the environmental performance of health, education and other services;
- Targeted use of public sector funding as procurer, investor, steward and fiscal mediator;
- A pro-active role for planning: to encourage integrated solutions in urban development, social economy and local enterprise, based on new measures of prosperity.

The region's role:

At the regional level, aspirations and potential are often higher than direct powers and resources. So much of the regional agenda is about softer measures of coordination, facilitation and enabling, rather than about direct spending, legislation or control. Important roles for regional and sub-regional bodies in making transformation happen include:

- Pro-active enabling and implementation of relevant sectors in national / EU policy and markets;
- Focusing of spending and services by local government and other public bodies;
- Coordinating infrastructure and urban development partnerships;
- Leading partnerships for behaviour and organisational change programmes.

The next few chapters present a set of route maps which the region could use to make transformation happen. Chapter 8 sets out a way forward for four cross-cutting issues which affect a number of sectors, while Chapters 9-15 present highlights from the route-map for specific sectors. Further detail on each of these route maps can be found in the full report.

8 CROSS-CUTTING ISSUES

This chapter presents analysis and recommendations for four issues that cut across all sectors, and which are central to transformation of the region:

- Behaviour change;
- Procurement;
- Planning; and
- Diamond/growth areas.

Behaviour change

Change by individuals

Behaviour change could potentially have a very significant role to play in stabilising the region's footprint. It is relevant to almost all sectors. Using REAP we have estimated that energy saving behaviour has the potential to reduce the Ecological Footprint of home energy use by up to 17% between 2003 and 2030 (see Chapter 9). Similarly, the 'Smarter Choices' report[15] estimated that 'soft' measures aimed at influencing travel behaviour could – if accompanied by appropriate 'hard' infrastructure measures – reduce car use by 10-11%. This would not, in itself, be enough to stabilise the footprint of transport, but it would reduce the rate of growth.

At a very rough guess, behaviour change – without major structural changes – could potentially reduce the Ecological Footprint by 5-10% – mainly through energy efficiency and transport behaviour, and changing consumption patterns for food and other goods and services. The impact on an individual's consumption could be much greater than this, but many individuals will not be willing to make far-reaching changes without accompanying incentives. The potential for behaviour change would be much greater if accompanied by incentives such as carbon quotas or taxes, and road pricing schemes.

Change by organisations

In addition to behaviour change at an individual level, the region needs to consider how to change the values and behaviour of organisations: public sector bodies, businesses and community/voluntary groups. Organisational change is a science in itself. Tools which may be useful include partnership working, business advice schemes, accreditation schemes and Corporate Social Responsibility. Again, incentives will play an important role in supporting change.

[15] 'Making Smarter Choices Work' (DoT, 2004)

Strategic priorities for behaviour change

Transformation will require more than adjustment to behaviour patterns. It will require a major shift in the values and expectations of our society, in response to the revised reality of a world in which climate change and 'Peak Oil' are major threats. These changes will happen more readily when the effects of climate change are more strongly felt, but by then many opportunities for change will already have been lost. The need to act now must be urgently communicated. Information and awareness-raising are not enough, in themselves, to persuade most people to change their behaviour. Action needs to be taken on all four elements of Defra's model of behaviour change: Enable, Encourage, Engage, Exemplify.[16]

Our route map for behaviour change is based on the following strategic priorities:

- Promote major behaviour change across individuals, communities, businesses, government and other organisations;
- Promote, develop and adopt appropriate labelling and accreditation schemes;
- Promote strong incentives for behaviour change;
- Work with communities to achieve far-reaching transformation of values and behaviour;
- Develop and share information on sustainable choices.

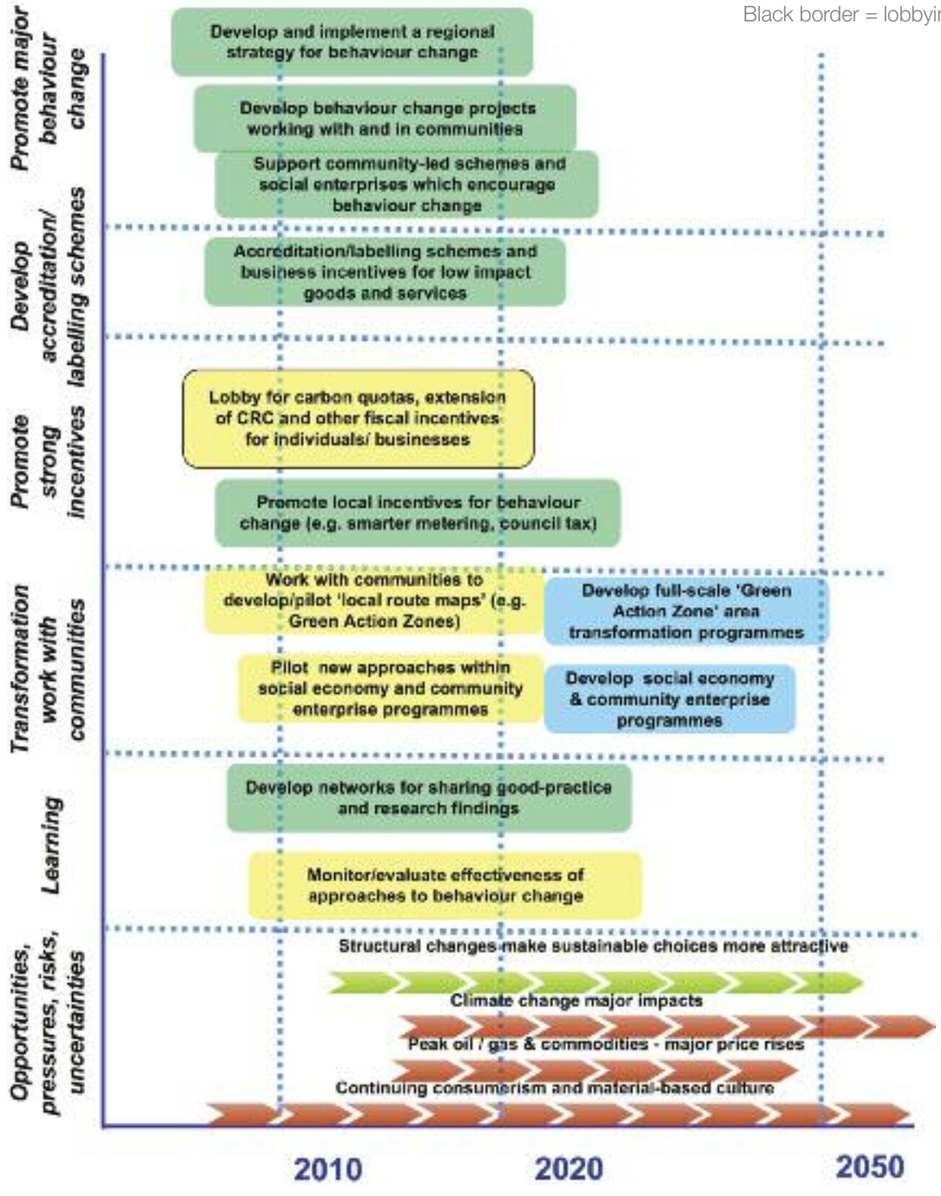
Our recommendations for action on behaviour change are summarised in Chart 8.1.

Recommendations for short-term priority actions are listed in Annex 1.

[16] The 4 E's model is set out in 'Securing the Future – the UK Government Sustainable Development Strategy' (Defra, 2005).

Chart 8.1
Behaviour change – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



Procurement

Total expenditure on public procurement in the region is estimated to be £22 billion per year (13% of GDP). Procurement should be one of the principal means of achieving sustainability policy objectives. In practice it is often constrained by institutional barriers, professional conventions, consortium contracts, EU State Aid rules, and particularly 'value for money' short-term accounting and budgeting standards.

Stabilisation

In the period 1990-2003, the Ecological Footprint of government spending and capital investment grew at around 2.5% per year, and these trends are broadly expected to continue if past policy and economic growth levels continue. So a reduction of around 2.5% per year in the impact of public sector procurement is required to stabilise this element of the footprint. First steps would be for the South East Plan for Sustainable Procurement to be taken forward at high level, and for all public bodies to reach at least Level 3 (and up to Level 5) in the Defra Flexible Framework for sustainable procurement.

Transformation for footprint reduction

To reach the long-term targets for transformation, involving a decrease of around 4% per annum in government spending and capital investment, a more pro-active approach to procurement needs to be developed. There is a potential role for regional bodies to influence procurement through their role as coordinators/facilitators of other public and quasi-public executives, agencies, partnerships, consortiums and so on.

We propose the following strategic priorities for the procurement route-map:

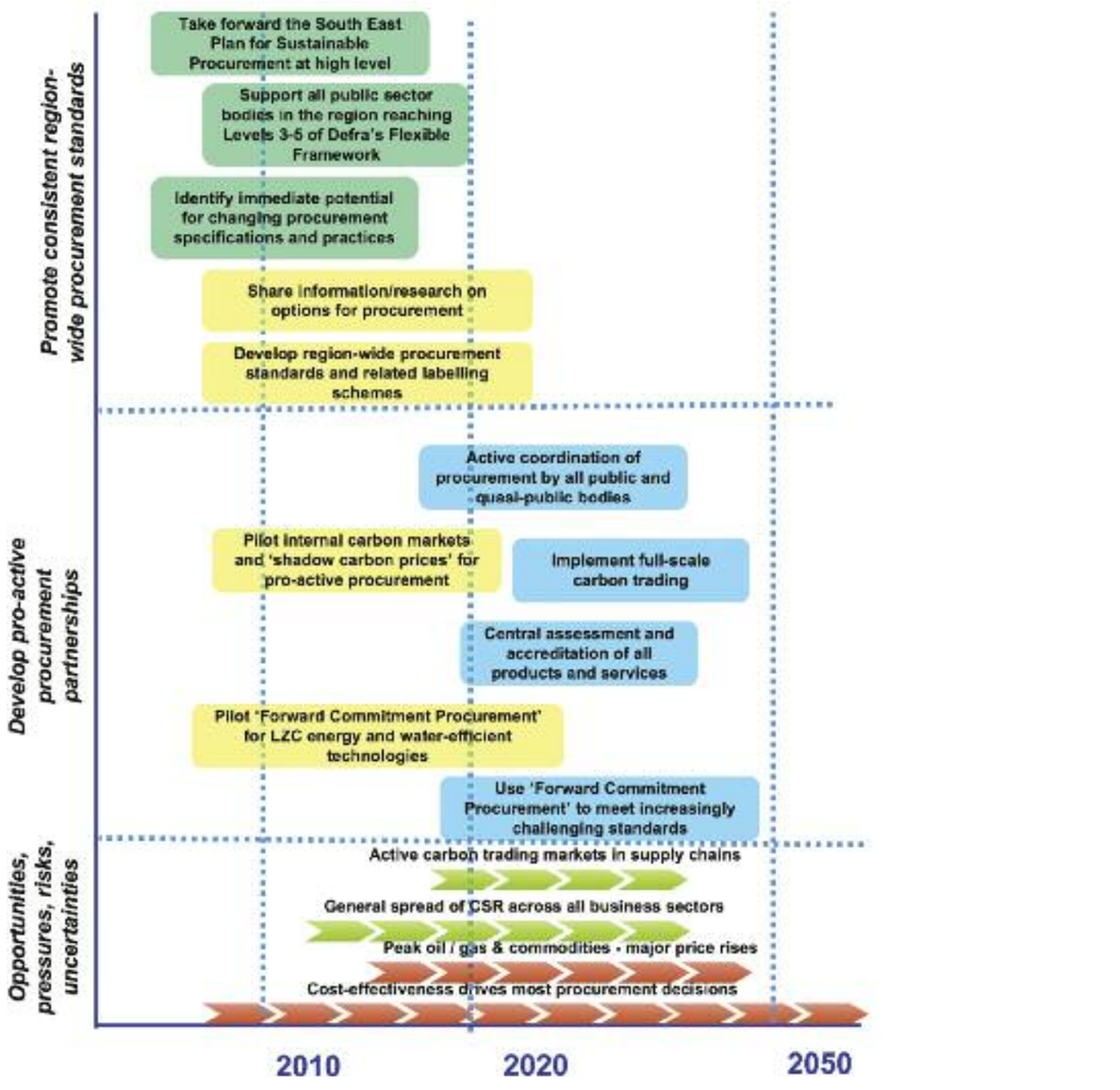
- Promote consistent region-wide procurement standards;
- Develop pro-active procurement partnerships, using shadow carbon prices and Forward Commitments where appropriate.

Our recommendations for action on procurement are summarised in Chart 8.2.

Recommendations for short-term priority actions are listed in Annex 1.

Chart 8.2
Procurement – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



Planning

Planning policy and building regulations are central to development of a low-footprint region. They have a potentially large impact on: energy use in the built environment, (particularly in new housing and properties); transport and accessibility; and waste and water management.

Stabilisation

At a very rough guess, current planning policy could potentially reduce the Ecological Footprint by around 5% - mainly through energy efficient/low carbon development and urban design for accessibility. This would support efforts to decrease the footprint of the built environment and could help to halt the increase in the footprint of transport.

Transformation

Land-use and development planning is key to sustainable development: land is effectively the ultimate 'finite' resource on which all else depends. But planning currently has little power to counter underlying trends and pressures. Its power rests mainly in the veto of unacceptable development, and it only controls direct physical change.

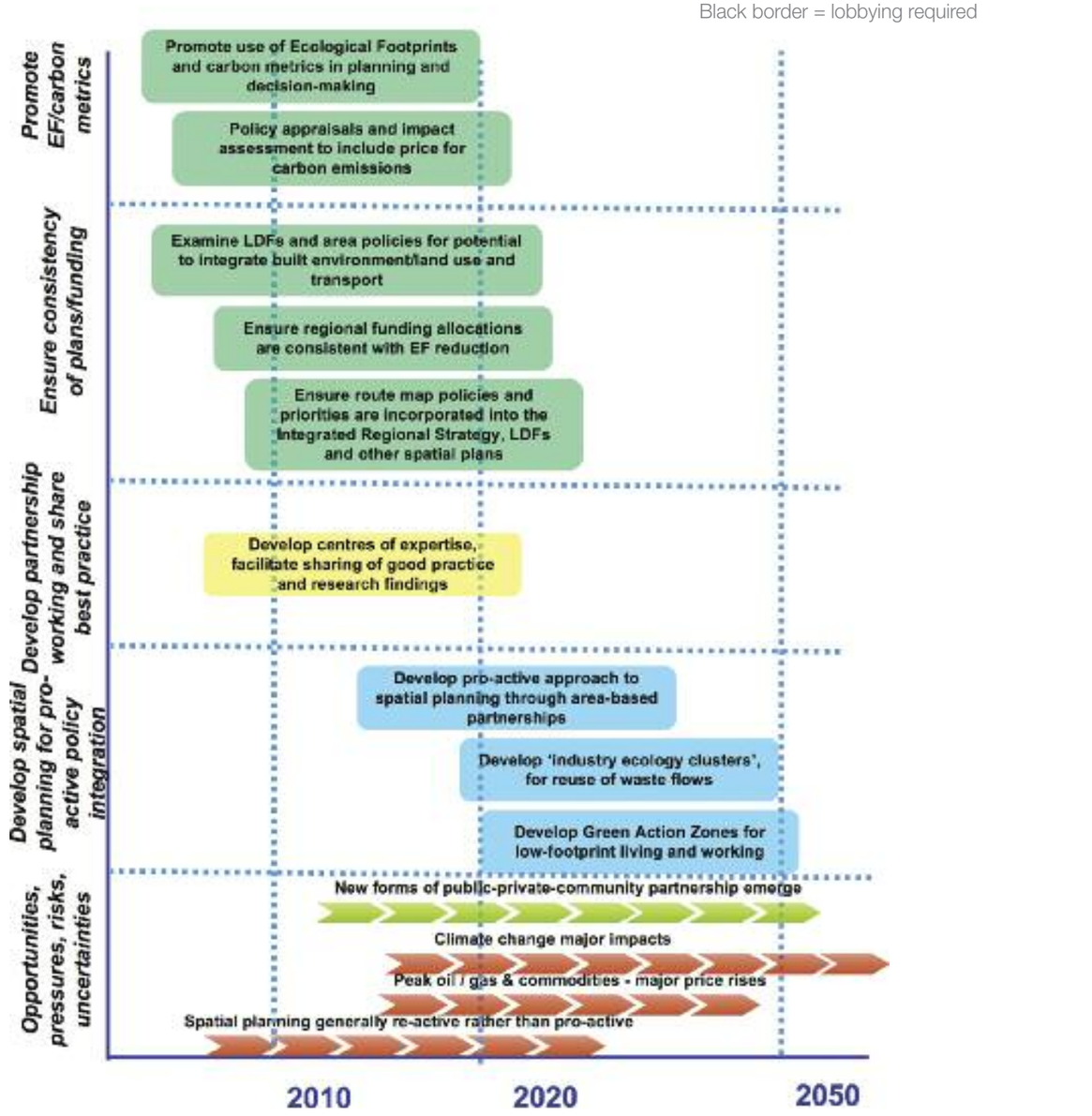
In response there is a challenging and exciting agenda for integrated planning, which the full report explains in more detail. 'Integrated planning for sustainable development' (Ravetz, 2000) applies the principle of integration in each dimension of the regional system. Pro-active planning for policy integration could go much further and deeper than planning agreements on new development. Spatial planning can be seen as the main instrument for the physical restructuring and re-engineering of the physical region and sub-regions in the Transformation scenario.

Strategic priorities for the planning route map (shown in Chart 8.3) are:

- Promote use of Ecological Footprint and carbon metrics in decision making;
- Reallocate funding to meet Ecological Footprint and carbon reduction objectives;
- Take forward actions in the Climate Change Mitigation and Adaptation Implementation Plan for the South East;
- Coordinate and facilitate partnership working and sharing of best practice on spatial planning;
- Ensure sustainable policies are carried through into spatial plans, including Local Development Frameworks; and
- Develop spatial planning for pro-active policy integration.

Chart 8.3
Planning – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



Diamonds and growth areas

The Regional Economic Strategy (RES) identifies eight 'Diamonds for Investment and Growth'. These include those parts of the South East which are national Growth Areas (e.g. Thames Gateway Kent; Milton Keynes and Aylesbury). They also include a number of 'Regional Hubs' as defined in the Regional Spatial Strategy.

The Diamonds are a focus for economic growth and innovation in the region. They are highlighted here as a 'cross-cutting issue' because of the scope they offer for innovative work on footprint reduction, for partnership work with businesses and for the promotion of new low-impact technologies. They will offer opportunities for separating economic growth from resource use and environmental impacts.

Diamond Local Authorities have made a commitment to play a leadership role in the region's work towards reducing its Ecological Footprint. In early 2008 the Diamond Local Authorities adopted a series of targets which involve early implementation of the region's sustainability objectives.

We recommend that the regional bodies and Diamond Local Authorities should work together to pilot innovative approaches to stabilising and reducing the Ecological Footprint of their areas. They are potential leaders for many of the sector-specific initiatives set out in Chapters 9-15.

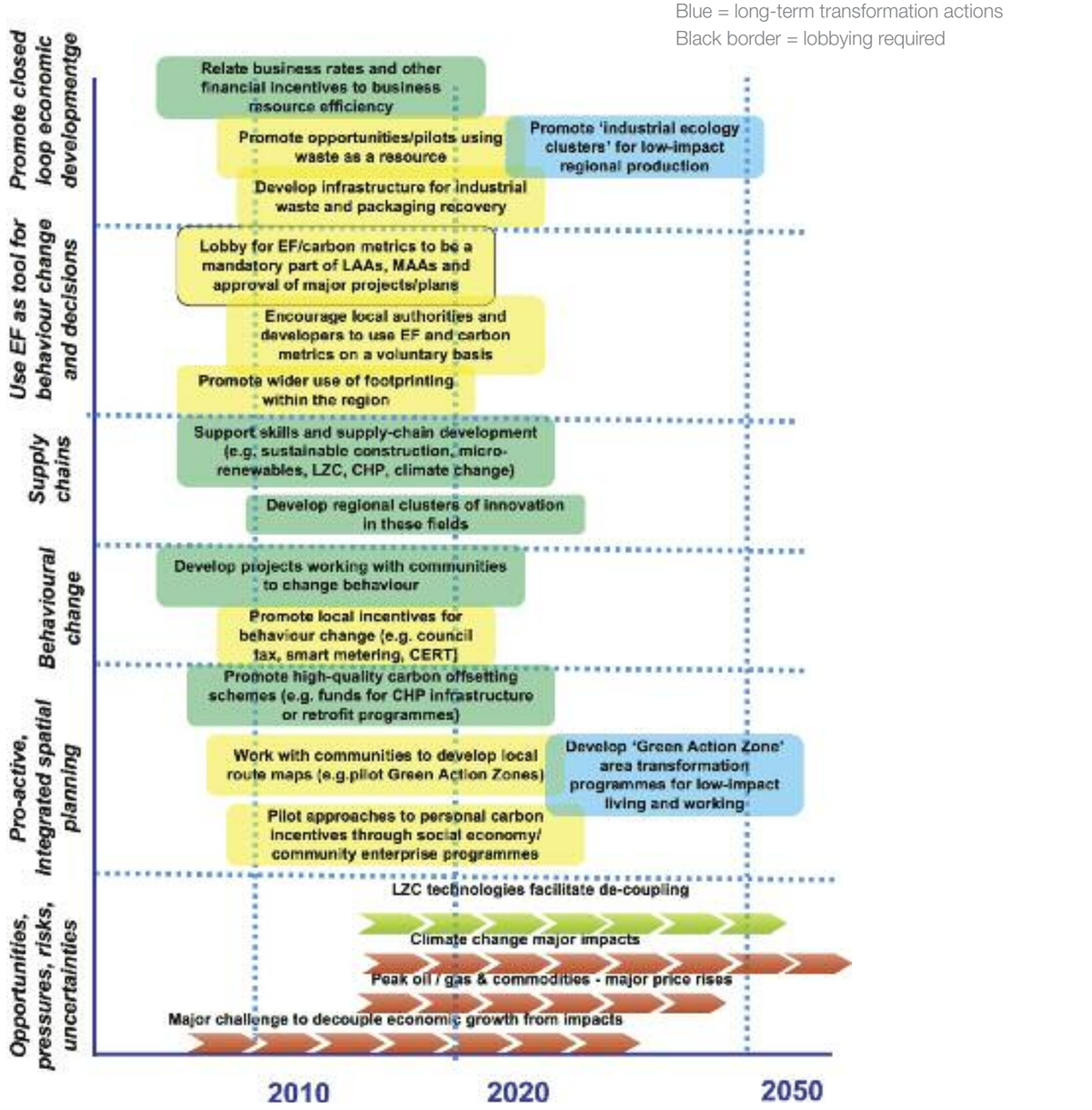
We propose the following strategic priorities for the Diamonds route map:

- Promote 'closed loops' for resource use within the economy as a whole;
- Use the Ecological Footprint as a tool for promoting behaviour change and more sustainable decision-making;
- Support technological and supply-chain development in appropriate fields;
- Promote major behavioural change across households, businesses and other organisations;
- Develop pro-active spatial planning and infrastructure development;
- Pursue cutting edge policies and programmes (across all sectors) to achieve Diamonds targets.

Our recommendations for action by Diamonds and Growth Areas are summarised in Chart 8.4.

Chart 8.4
Diamonds - route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



9 THE BUILT ENVIRONMENT

Definitions:

Our recommendations on this theme cover all aspects of construction, use and demolition of houses and other property.
The consumption-based REAP estimates of Ecological Footprint relate only to the impact of the housing stock, as the impacts of other buildings are included in other production sectors. The REAP accounts cover the following household consumption activities:

- Gas, electricity and fuel use in the home;
- Construction, repair and maintenance of dwellings.[17]

The Ecological Footprint of housing represented 14% of the region's total footprint in 2003, including energy use in the home and the construction supply chain. This figure would be even higher if other property were included, so the built environment is an important focus for footprint reduction.

If current policies are effectively implemented, the Ecological Footprint of the housing sector is predicted to stabilise and begin to decrease by 2020. But this requires effective implementation of measures in the Energy White Paper 2007, achievement of the Code for Sustainable Homes level 6 for 40% of new housing by 2020, and significant retrofitting of energy efficiency measures to existing housing. Support for the sustainable construction sector will be required to achieve this.

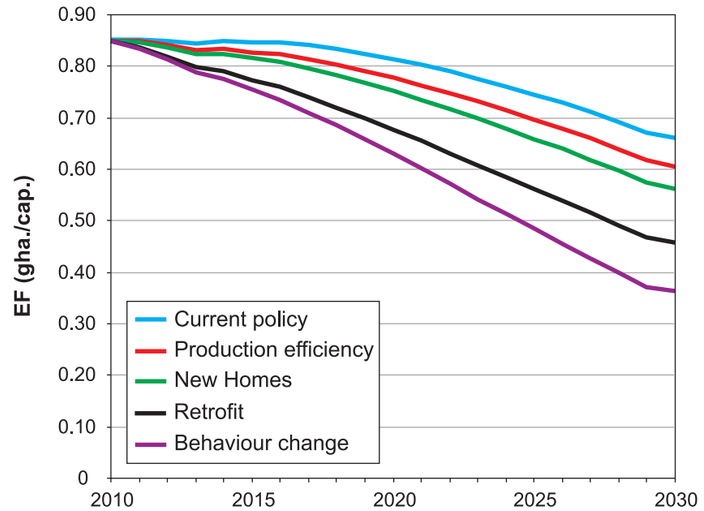
Faster and more far-reaching implementation of energy efficiency measures is required if the long-term reduction target is to be met. While faster improvement of standards on new housing and property should be pursued as a priority, major retrofit and behaviour change programmes will also be required to reach the majority of the housing and property stock. These will be much more effective if accompanied by national or international measures to provide strong incentives for carbon saving. In the longer-term, the region should develop visionary 'Green Action Zones' which combine excellent energy efficiency with other aspects of low-footprint lifestyles.

Chart 9.1 shows the relative effectiveness of different Transformation policy options in reducing the Ecological Footprint of housing, as predicted by the REAP model up to 2030. The greatest savings appear to be attributable to major retrofit programmes and to widespread behaviour change. But significant savings would also result from stronger policy on new housing (e.g. accelerating achievement of Level 6 of the Code for Sustainable Homes), and improving production efficiency (e.g. reducing the carbon-intensity of energy supply). The assumptions underlying these predictions are explained in more detail in the full report.

[17] The capital costs of housing appear in the REAP system as actual or 'imputed' rentals: i.e. the rent that the house-owner would pay if renting rather than owning their property.

Chart 9.1
Predicted impact of different Transformation policies on the Ecological Footprint of housing

Source: REAP model, Stockholm Environment Institute

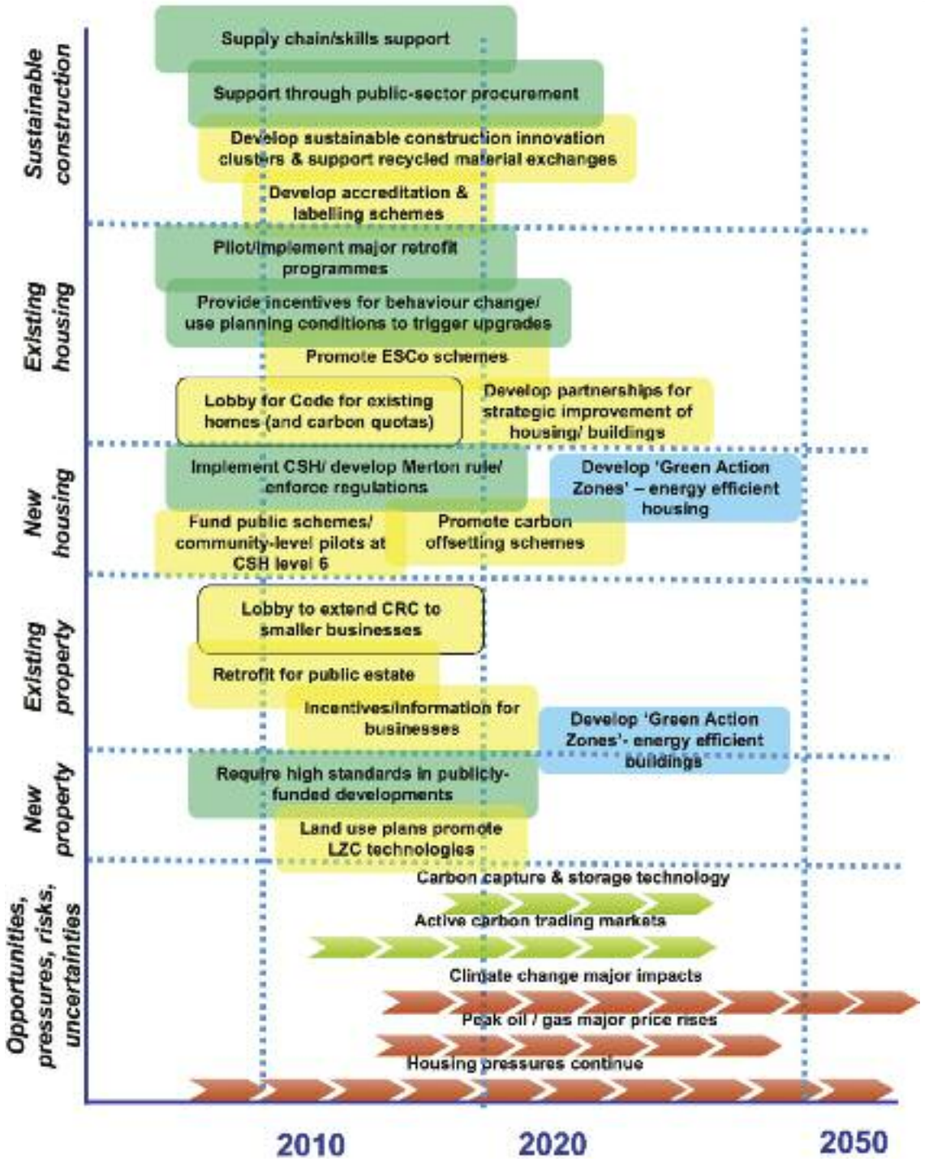


Many initiatives are already underway within the region to reduce the impact of the built environment. These initiatives will need to be prioritised and scaled-up as part of the 'route map' programme, if Current policy is to be effective. More radical action will be required within the region for transformation of the built environment, accompanied by lobbying for national incentives to support regional initiatives. We propose the following strategic priorities for the built environment route map (as summarised in Chart 9.2):

- Promote more sustainable construction;
- Strategic transformation of the existing housing stock (low energy; low carbon; micro-generation and Combined Heat and Power (CHP));
- New housing to meet Code for Sustainable Homes (level 6) or above by 2016, or 2014 where feasible;
- Strategic transformation of the existing property stock (whole building energy management);
- New property to meet challenging standards for low footprint and carbon impact.

Chart 9.2
Built environment – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



10 TRANSPORT

Definitions:

REAP's estimates of the Ecological Footprint of transport measure the impact of personal travel by residents of the South East, wherever they are travelling around the globe. It incorporates travel by car and other private vehicles, public transport, taxis and air.

Freight travel is incorporated in all categories of the Ecological Footprint and is not treated as a specific consumption activity by REAP. Similarly, business travel is included within the supply chain for each consumption activity.

While freight and business travel are not included in the Ecological Footprint estimates below, our recommendations on this theme cover both passenger and freight transport, for business and personal use.

Personal transport represented 18% of the region's Ecological Footprint in 2003. This share would increase significantly if freight transport were also included. Similarly transport generated 33% of the region's territorial CO_2 emissions in 2005.

The region's demand for road transport and air transport is still growing. The Ecological Footprint of personal travel is increasing at around 2% per year, despite current efforts to promote more sustainable transport modes. There is considerable good practice within the region, but this is currently not doing more than scratching the surface of people's travel patterns. Policies in other areas (e.g. the choice agendas in health and education; rationalisation of services such as the Post Office network) are increasing the need to travel for some people.

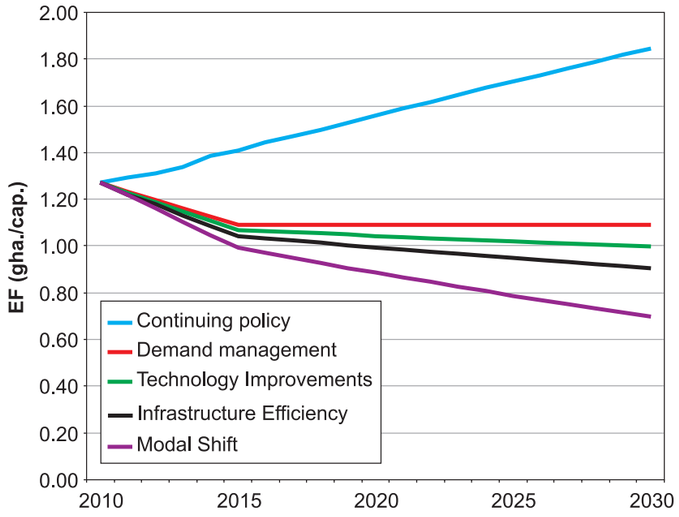
Stabilisation of the Ecological Footprint of personal travel would require strong policies to constrain growth in car use. This would require measures to reduce the availability of car parking, reallocate road space, promote more sustainable travel modes and create 'car free' town centres – following the model demonstrated by Oxford. This can be done with existing technology, and without changes at national level, but it will require local support. Commitments would also need to be made to curb growth in air travel.

Much stronger measures, backed up by road pricing, carbon quotas or other incentives at national level, are required if the long-term reduction target is to be met. Low-carbon transport technologies will assist with this agenda in the longer-term, as will the use of advanced ICT to reduce the need to travel. There will be scope to develop 'low emission' and 'Green Action Zones', based on low footprint living and low travel lifestyles.

Chart 10.1 below shows the relative effectiveness of different Transformation policy options in reducing the Ecological Footprint of personal transport, as predicted by the REAP model up to 2030. This chart shows clearly the continued growth in the footprint that is predicted under Current policy. Demand management, to constrain and reduce demand for travel, is predicted to have the greatest impact over the period 2010 to 2030. Other policies that are predicted to contribute to footprint reductions in the Transformation scenario are modal shift (i.e. people switching from cars to cycling, walking or public transport), infrastructure efficiency (i.e. increasing the average occupancy rate of vehicles) and technology improvements (i.e. cleaner, less polluting engines). Beyond 2030, new vehicle technologies might be expected to have a greater impact. The assumptions underlying these predictions are explained in more detail in the full report.

Chart 10.1
Predicted impact of different Transformation policies on the Ecological Footprint of personal transport

Source: REAP model, Stockholm Environment Institute

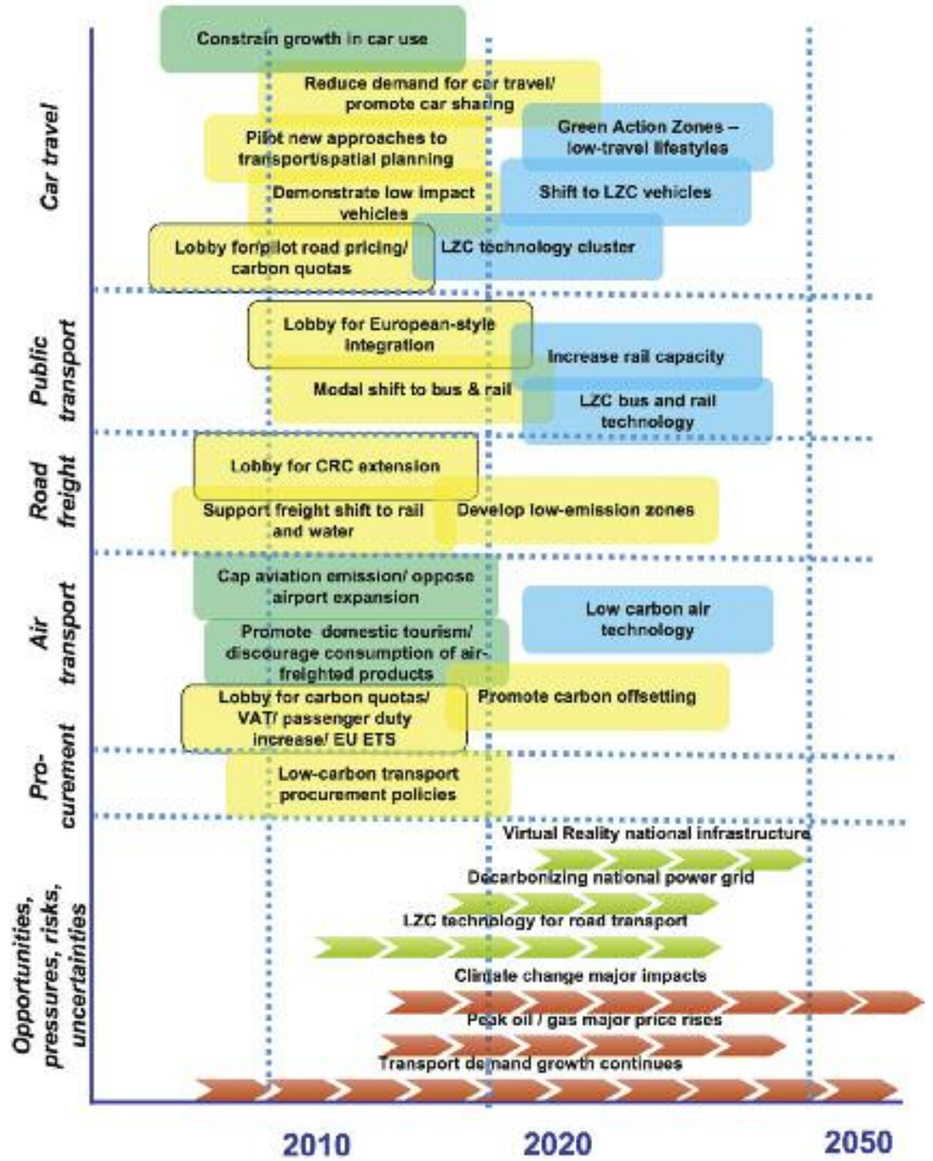


Our recommendations address not only personal travel, as modelled here by REAP, but also business and freight transport by surface and air. The strategic priorities underlying the route map summarised in Chart 10.2 are:

- Reduce the impact of passenger transport by road;
- Promote low impact public transport;
- Reduce the impact of freight transport;
- Limit, and subsequently reduce, the impact of passenger and freight transport by air;
- Reduce the impact of transport procurement;
- Support the development of low and zero carbon transport technology.

Chart 10.2
Transport – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



11 ENERGY SUPPLY

Definitions:

Energy supply contributes to the Ecological Footprint of a large number of household consumption activities. Within REAP, these impacts are built into the supply chains for all consumption activities, rather than being analysed separately.

Our analysis here therefore focuses on CO_2 and other Greenhouse Gas emissions from energy supply, as estimated by the REEIO model.

Power stations within the South East contributed nearly 30% of the region's CO_2 emissions. Electricity generated by these stations is fed into the UK grid. Electricity consumption within the region is not necessarily produced by these power stations, but comes from the grid as a whole. We therefore need to look at developments in energy supply across the UK, not just supply within the South East.

The UK government is now committed to generating 15% of total energy supply from renewable sources by 2020. This equates to nearly 40% of electricity at present day levels, in response to EU commitments.[18] If the 15% target for renewables is met by 2020, then CO_2 emissions from power stations within the region, and Greenhouse Gas emissions associated with grid electricity consumed in the region, are predicted to decline even though electricity demand remains relatively stable.

Our REEIO predictions assume lower shares for renewable energy, based on the Energy White Paper (2007) rather than the new EU targets which emerged after modelling work was complete. In the Current policy scenario we assume that, nationally, 20% of electricity is generated from renewable sources by 2020, and in the Transformation scenario this rises to over 30%. In the Transformation scenario we also assume additional implementation of Combined Heat and Power schemes (CHP) and partial introduction of 'Carbon Capture and Storage' for UK coal and gas power plants. Electricity use in the region increases, as people are encouraged to switch to this newly low-carbon energy source. But emissions associated with electricity generation would decline strongly.

[18] '2020 VISION – How the UK can meet its target of 15% renewable energy', Renewables Advisory Board (2008).

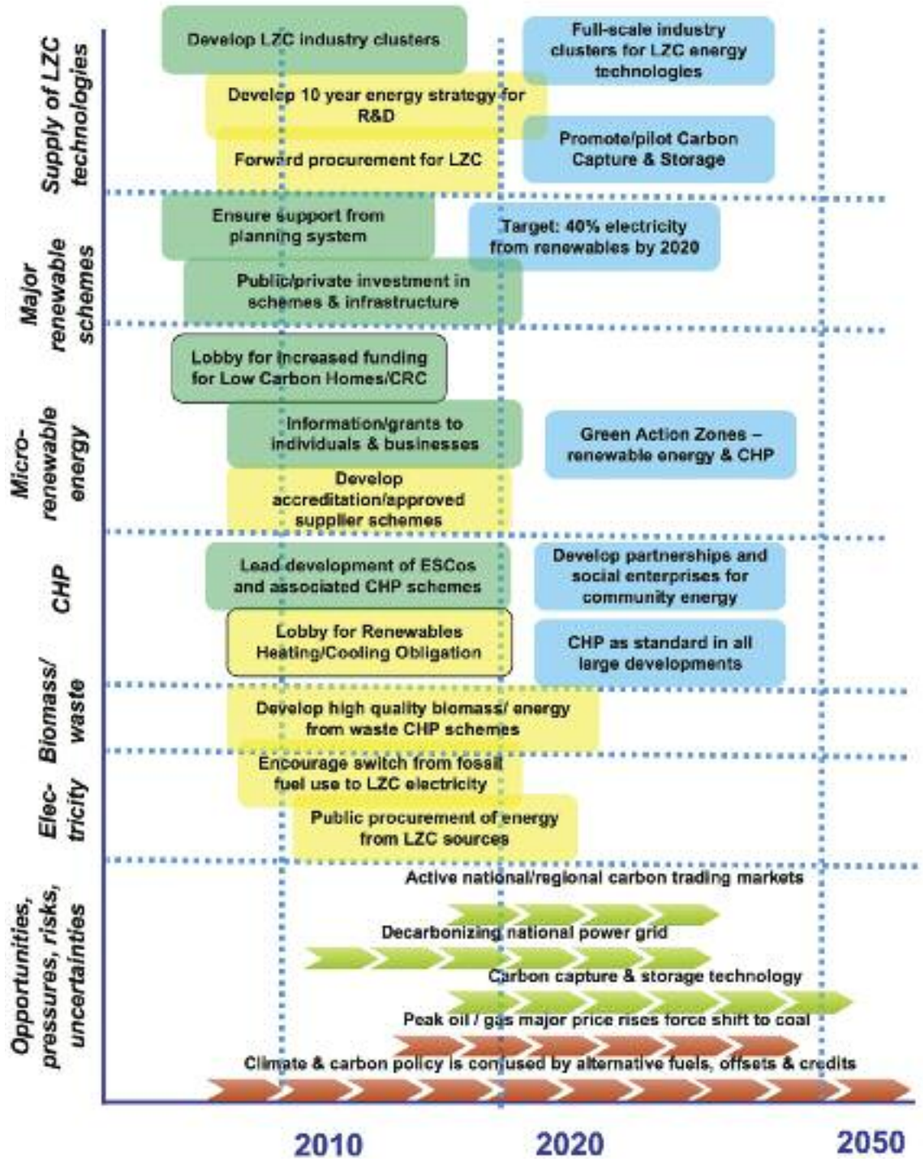
There remain considerable barriers to faster development of renewable energy sources and CHP, most of them institutional rather than technical. Pilot projects such as Woking's Thameswey Energy have shown that it can be done, but few are following their example. These barriers need to be tackled in the short-term, if transformation of the energy supply sector is to become a reality.

The strategic priorities underlying the route map summarised in Chart 11.1 are:

- Promote innovation in the supply of energy from low and zero carbon sources;
- Promote major renewable energy schemes in the region and offshore;
- Promote micro-generation from renewable sources;
- Promote Combined Heat and Power schemes;
- Promote quality biomass schemes;
- Encourage domestic and other users to switch from gas and oil to (low-carbon) electricity.

Chart 11.1
Energy supply – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



12 FOOD

Definitions:

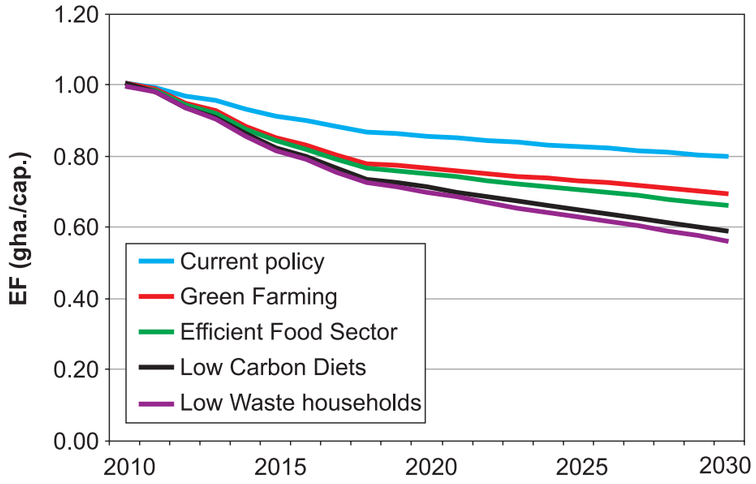
The Ecological Footprint of food measures the material and energy use associated with household food consumption, throughout the supply chain 'from farm to fork', including farming, processing, packaging and freight distribution. This includes restaurant meals, catering and take-away meals – where these are purchased by consumers. It does not include hospital and school meals which are provided within institutions: these are classified under private or public services. It does not include the impact of energy for cooking or travel to the shops: these are classified under 'housing/built environment' and 'transport' respectively. Food waste is considered only in the sense that it affects the quantities of food purchased. Waste and freight issues are considered in more detail in Chapters 14 and 10 respectively.

Food consumption, and its related supply chain, generated 19% of the region's Ecological Footprint in 2003. But data has recently emerged to suggest that the footprint of this sector has declined slowly in the period 1990-2003, probably owing to efficiency gains within the food sector. Further declines are predicted in the Current policy scenario, particularly if the current campaign by WRAP to reduce food waste is successful (see www.wrap.org.uk).

This decline could be accelerated to achieve the long-term footprint reduction target in the Transformation scenario. Reductions in the footprint of food consumption could be offset against Ecological Footprint increases in other sectors that are less amenable to regional influence (e.g. goods and services).

Chart 12.1 below shows the relative effectiveness of different Transformation policy options in reducing the Ecological Footprint of food consumption, as predicted by the REAP model up to 2030. This analysis suggests that the greatest savings would be generated by initiatives on Green Farming (e.g. sustainable energy use by farms) and Low Carbon Diets (e.g. eating less meat). Further reductions could be made by improving the efficiency of food production, and reducing food waste.

Chart 12.1
Predicted impact of different Transformation policies on the Ecological Footprint of food consumption



The promotion of Low Carbon Diets would require communication of new messages to consumers (e.g. the health and environmental benefits of eating 'less but better' meat). These messages would need to take into account not only Ecological Footprint concerns, but also issues related to rural development and landscape management within the South East, and those relating to international development and fair-trade overseas.

There are significant gaps in terms of the current level of understanding of what constitutes 'low carbon food' or 'low impact food', both nationally and within the region. Locally produced and organic food may be lower impact, but this depends on the production and transport methods used. Similarly, seasonal and low-meat foods tend to be lower impact, but research is needed at a national or international level to define which types of food products and which production methods are really 'low impact'.

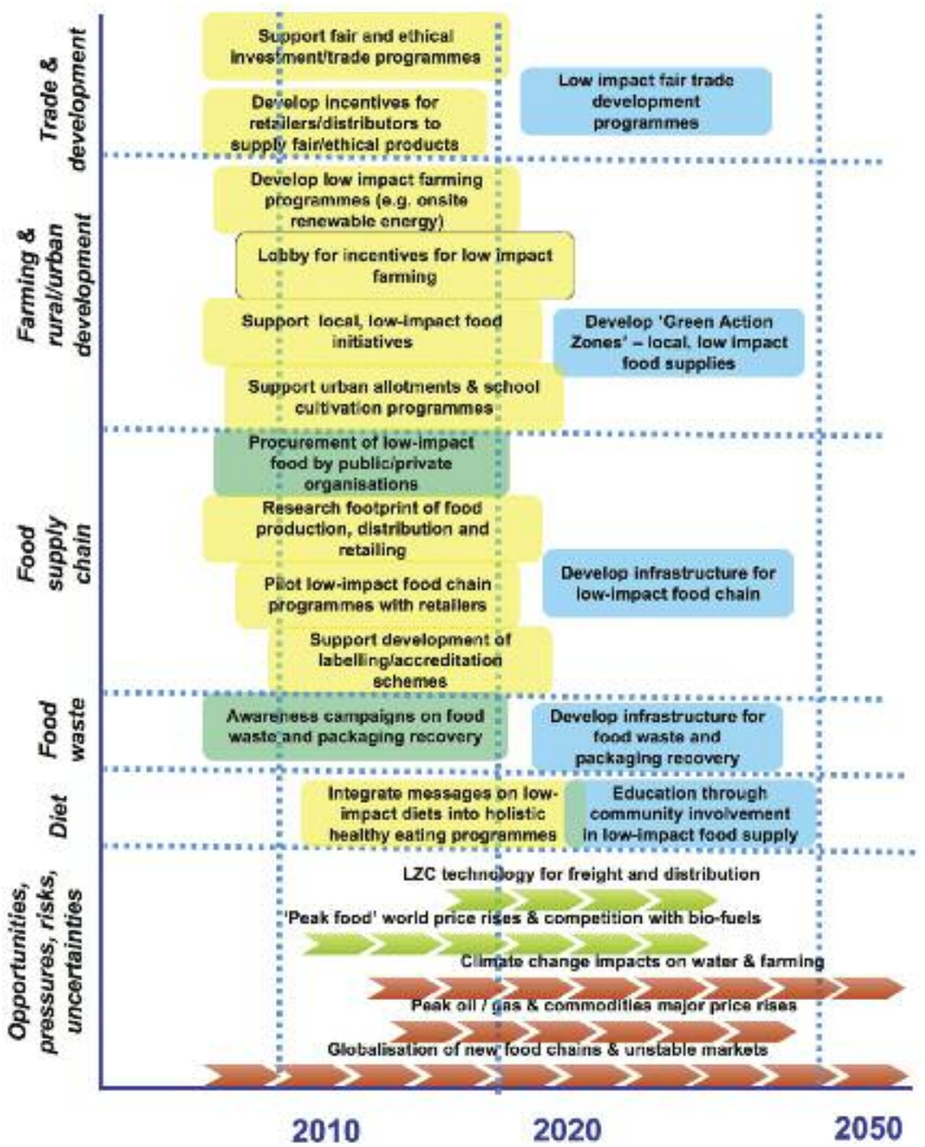
The strategic priorities that we propose in the route map for food, as summarised in Chart 12.2, are:

- Reduce the adverse impacts of food-related trade and development;
- Promote synergies between low impact farming and rural/urban development;
- Reduce the impact of the food supply chain;
- Reduce food wastage by households, businesses and public organisations;
- Promote behaviour change towards low-impact, healthy diets.

Our recommendations for short-term priority actions are set out in Annex 1. We have not currently included the promotion of 'Low Carbon Diets' in these priorities because of the complex factors surrounding this issue, which need to be studied further.

Chart 12.2
Food – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



13 GOODS AND SERVICES, PUBLIC SERVICES AND CAPITAL INVESTMENT

Definitions:

Our recommendations cover goods and services not specified elsewhere, including public services and capital investment. Within REAP, these categories combine household consumption with spending by government and others, including:

- 17 categories of household spend on common products including clothing, tobacco, newspapers and household appliances;
- 13 categories of household spend on private services including insurance, financial advice, private education and private health-care;
- Spending by government on public administration, health and education;
- Investment in capital such as roads, buildings and major equipment.

As well as examining the Ecological Footprint of these categories from the 'consumption-side' (using REAP), we have also analysed the 'production-side' (using REEIO): i.e. CO2 emissions from industry and commerce within the region.

Consumption-side

Goods and services consumed by residents in the South East represented 25% of the region's Ecological Footprint in 2003. Public services and capital investment represented a further 24% of the region's footprint. These categories together make up nearly 50% of the region's footprint. Their footprint has increased significantly over the period 1990-2003. These are clearly areas that must be tackled if the overall Ecological Footprint is to be stabilised and reduced. But this is a difficult issue, as many of the goods and services consumed within the region are produced elsewhere in the UK or overseas.

Reversing the current upward trend in the Ecological Footprint of goods and services will require radical action. The REAP Transformation scenario for goods and services requires a long-term energy or resource efficiency gain of 5% per annum for this consumption sector. REAP also requires a 4% efficiency gain per annum in the impact of national and local government services and capital investment.These gains will need to be achieved primarily through changes in consumption and procurement patterns, as many of the goods and services are produced outside the region. Influencing consumption to this degree will be a great challenge. This may be achievable if supported by national/international incentives such as carbon quotas or taxes. Without such support, it may be more realistic to aim initially for stabilisation rather than reduction in this sector, while pursuing greater savings in other sectors.

Production-side

Looking at production within the region, industry and commerce represented about 16% of the region's direct CO_2 emissions in 2005. These emissions are fairly stable. The implementation of energy efficiency measures and the decline of manufacturing will tend to decrease emissions, but GVA growth will have the opposite effect.

Again, more action is needed if emissions are to decline rather than simply stabilise. Efficiency gains of about 5% per annum are again required to meet reduction targets for CO_2 emissions from industry and commerce in the region. While still demanding, this should be more achievable given that the relevant production activity is within the region, and that there are emerging incentives for efficiency gains (e.g. the Carbon Reduction Commitment). The 'Diamond' groupings of local authorities offer important opportunities for progressing innovative work with commerce and industry.

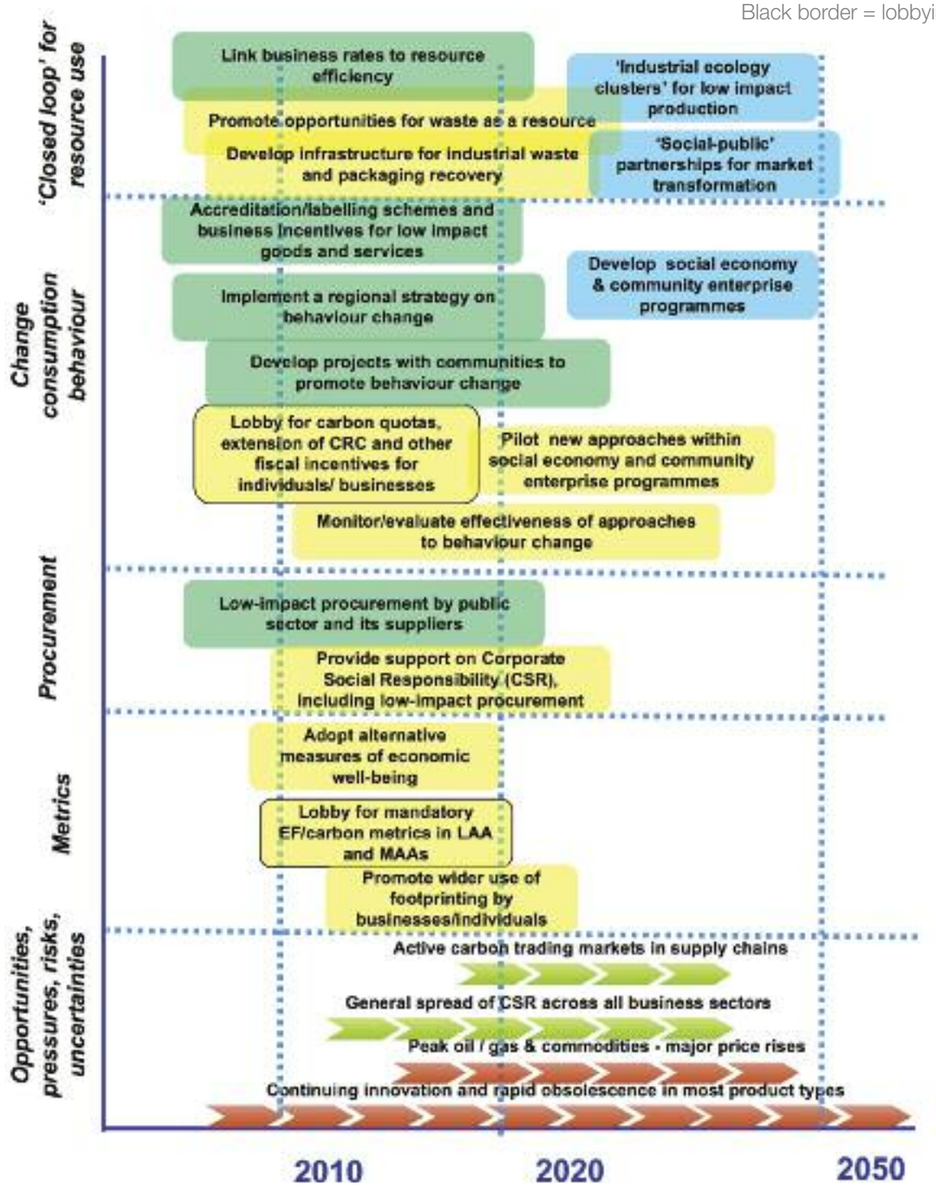
Priorities for the route map for goods and services, public services and capital investment (as summarised in Chart 13.1) are to:

- Promote 'closed loops' for resource use within the economy as a whole;
- Promote behaviour change to reduce the impact of consumption by individuals, businesses and organisations;
- Promote consistent region-wide procurement standards across the public sector, and the region as a whole;
- Adopt alternative measure of economic well-being (e.g. the Index for Sustainable Economic Welfare), alongside Gross Value Added and the Ecological Footprint;
- Promote personal carbon allowances and other fiscal incentives for sustainable consumption and production;
- Use the Ecological Footprint as a tool for promoting behaviour change and more sustainable decision making.

Our recommendations for action on goods and services, public services and capital investment are summarised in Chart 13.1 below. Our recommendations for short-term priority actions are listed in Annex 1.

Chart 13.1
Goods and services, public services and capital investment – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



14 WASTE

Definitions:

Waste minimisation and management are important aspects of sustainable resource use, but the footprint of waste is a by-product of consumption, rather than a consumption activity in itself. The impact of the waste industry is distributed across all categories of the Ecological Footprint.

Our analysis therefore focuses solely on the quantities of waste generated within the region, as estimated by the REEIO model. This includes all types of waste produced by households, businesses and other organisations.

Waste and resource use are key issues for the Ecological Footprint, since improvements in resource efficiency will tend to reduce the region's footprint. As part of this study, we have used REEIO to model the levels of waste arising within the region from different sources, and the types of waste management applied to this waste.

Waste arisings within the region were 40 million tonnes in 2005. This is predicted to rise in future. Waste volumes are predicted to be higher in the Current policy scenario, because of slightly faster economic growth relative to the Reference scenario. But more sustainable waste management methods in the Current policy scenario result in lower volumes of waste going to landfill (compared to 2005). Much of the recycled waste would be from the construction and demolition sector.

In the Transformation scenario, waste arisings are predicted to be lower than in both the Reference scenario and Current policy scenario, owing to assumed reductions in the waste-intensity of industrial inputs. But waste arisings are still predicted to grow over time, owing to economic growth. When waste management policies are applied, similar to those in the Current policy scenario, we find that there is marked shift away from landfill towards more sustainable and 'closed loop' waste management options.

These scenarios do not take account of the new target set by BERR in the 'Strategy for Sustainable Construction' (June 2008)[19] which requires a 50% reduction in construction, demolition and excavation waste going to landfill between 2008 and 2012. Effective implementation of this target would further reduce volumes going to landfill.

Considerable efforts are already being made to reduce waste volumes and reduce the impacts of waste management, driven partly by EU and UK government regulation and waste targets. But significant reductions will only be achieved if incentives for waste reduction are strengthened.

We propose that the strategic priorities for the route map for waste (as summarised in Chart 14.1) should be to:

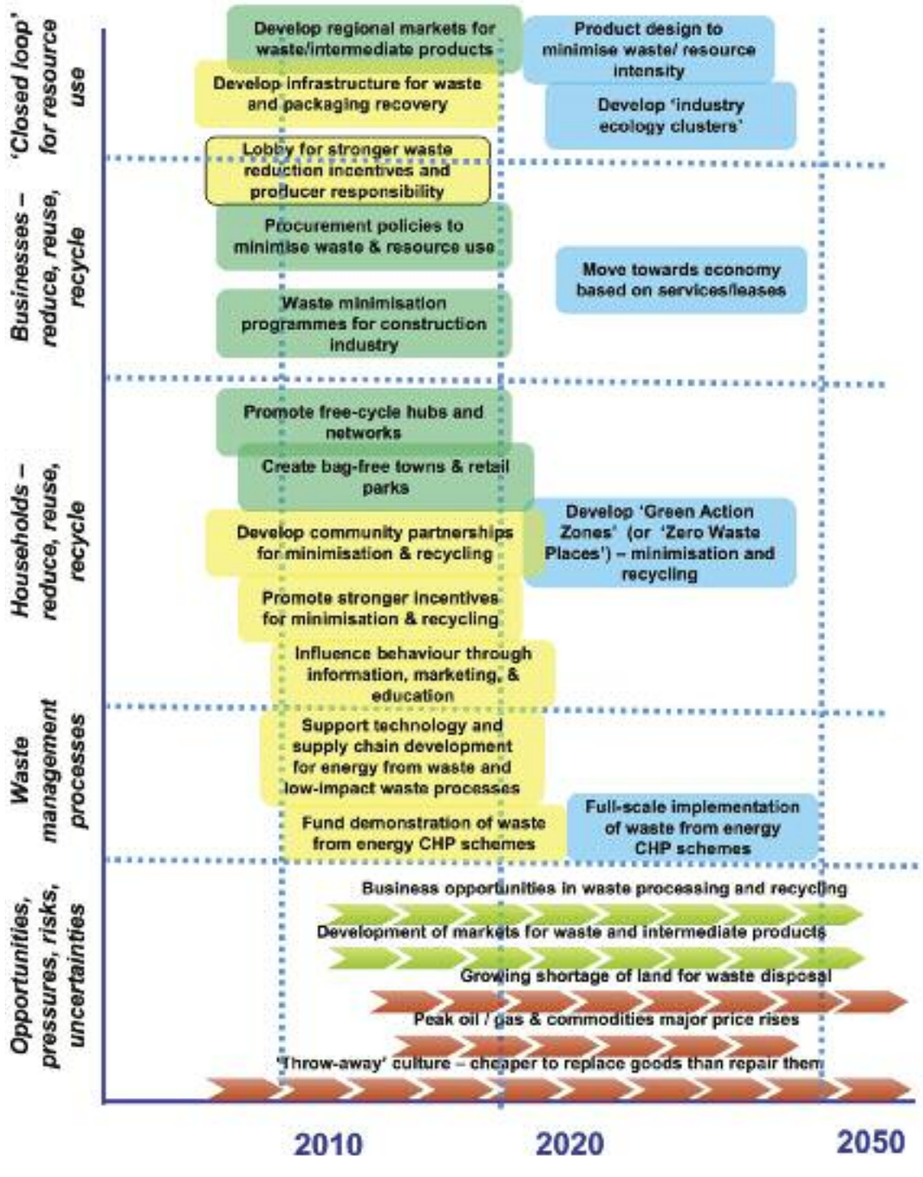
- Promote 'closed loops' for resource use within the economy as a whole, and reduce the impact of waste management;
- Encourage businesses and other organisations to 'reduce, reuse, recycle', particularly in the construction sector;
- Encourage households and communities to 'reduce, reuse, recycle';
- Reduce the footprint and greenhouse gas impact of waste management processes.

Our recommendations for short-term priority actions on waste are listed in Annex 1.

[19] 'www.berr.gov.uk/sectors/construction/sustainability/page13691.html

Chart 14.1
Waste and resource use – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



15 WATER

Definitions:

Water supply is a critical sustainability issue for the South East, and will become more so as climate change progresses. But water supply for households, as measured by REAP, has a relatively low impact on the Ecological Footprint. Household consumption of 'water supply' is treated as one of the 13 private services within 'goods and services' (see Chapter 13). REAP distributes the impact of the water industry across all consumption categories, as water is used by all production sectors in the UK economy.

Rather than presenting the footprint of the water industry, this chapter presents predictions of future water demand by households and other sectors, using the REEIO model.

Although the direct impacts of the water system represent only a small part (1.7%-1.85%) of the region's overall Ecological Footprint and CO_2 emissions, future water supplies are a critical sustainability issue for the South East. The effects of increasing population, coupled with progressive climate change, are likely to exacerbate this issue in future.

In 2006/7, per capita consumption in the South East from measured supplies was 137 litres/head per day. Consumption for unmeasured supplies was 157 litres/head per day. The weighted average was 152 litres/head per day, which is the highest regional average water consumption rate. Per capita consumption has reduced by about 10% from its peak in 2003/4.

We have modelled water consumption using the REEIO model. Water use is predicted to increase in the Reference scenario by just under 1% per annum between 2005 and 2020, stimulated by population and economic growth. In the Current policy scenario, water use would still increase – albeit at a slower rate owing to widespread introduction of water meters.

Stronger policies appear to be necessary to reduce overall water demand in the region, even if per capita consumption is stabilising. Water meters are a pre-requisite for the types of innovative tariffs that are likely to be required to curb demand. Technological solutions will also play an important part, in terms of water-efficient systems and appliances for new and existing housing. More costly solutions such as the creation of a national water grid, or desalination plants, could themselves have a significant impact on the footprint of water supply.

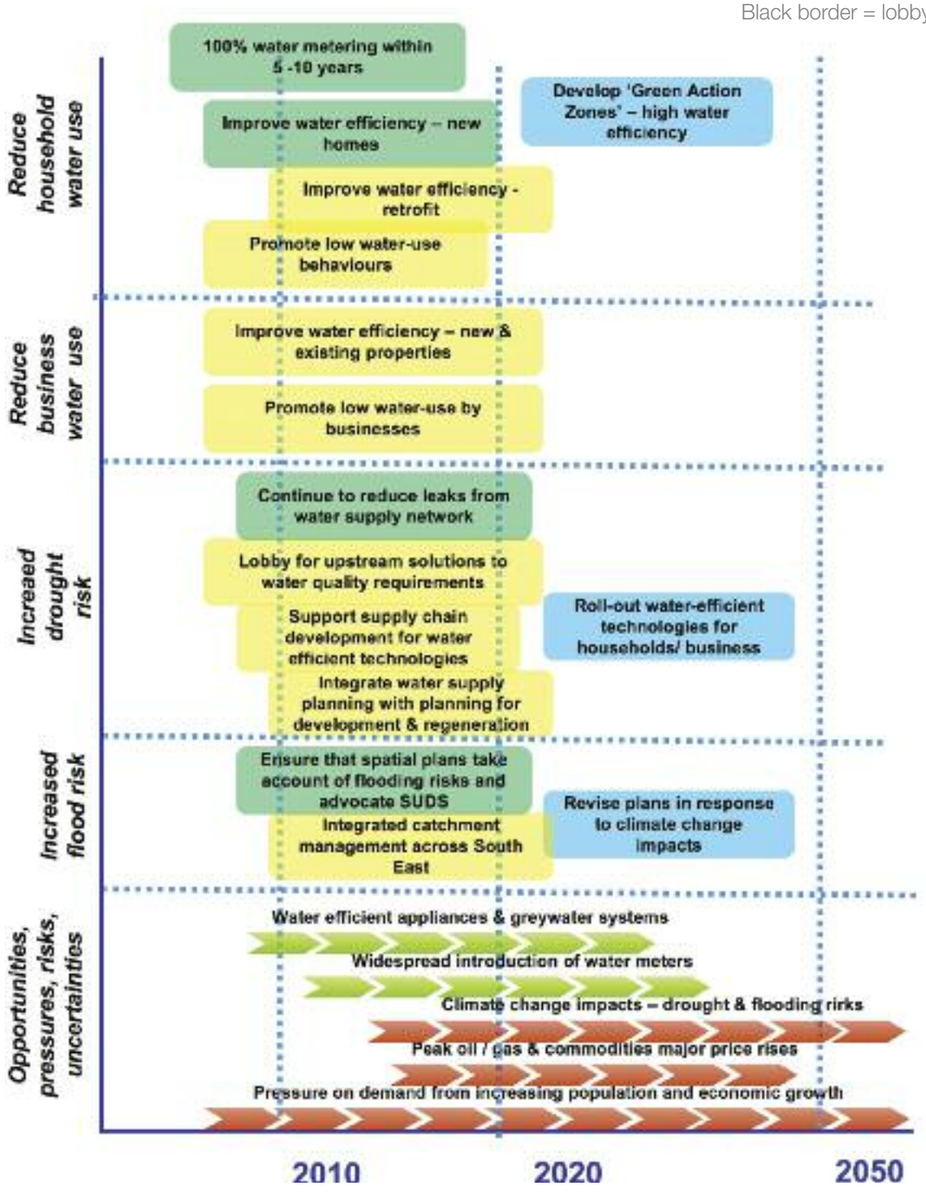
In preparing the route map for water, we have drawn on the 25-year 'Strategic Direction Statements' for Thames Water and Southern Water. All the water companies are required to prepare 25-year 'water resource management plans', which will be put out to consultation in summer 2008. These are likely to go beyond the commitments outlined in the existing 'Strategic Direction Statements'. We propose the following strategic priorities for the route map for water (as summarised in Chart 15.1):

- Reduce household water use, particularly hot water;
- Reduce water use by businesses and other organisations;
- Safeguard, and where possible improve, the supply of water in the face of increased drought risks owing to climate change;
- Prepare for greater risk of flooding, owing to climate change.

16 USING THE ROUTE MAP

Chart 15.1
Water – route map chart

Key
Green = stabilising actions
Yellow = shorter term transformation actions
Blue = long-term transformation actions
Black border = lobbying required



Chapters 8 to 15 have set out a proposed 'route map' for key sectors and cross-cutting issues. Our modelling work, supported by the REAP and REEIO models, suggests that effective implementation of the route map would enable the South East to stabilise and reduce its Ecological Footprint, becoming a 'One Planet Region' in about 2050. Further detail on the route map, including broad indications of potential costs and benefits of particular actions, are set out in the full report. But the route map is challenging and following it will require significant investment of time, money and effort.

What happens if we don't take this path?

The Stern Review

It is easy to focus on the costs of route map actions, without assessing the cost of doing nothing. The Stern Review of the Economics of Climate Change[20] concluded that the cost of unabated climate change would reach 5% of GDP and, if the effects were severe, could reach 20% of GDP. The Review predicted that the costs would fall most heavily on poorer countries.

Compared to this, the Stern Review estimated that the cost of mitigating climate change, aimed at keeping temperature rises below 2-3ºC, would reach about 1% of annual GDP by 2050. The Review estimates a range for mitigation costs from -1% (i.e. a net benefit to GDP) up to 5% of GDP.

In a recent speech, Lord Stern indicated that evidence suggests that climate change is happening faster than anticipated so faster action is needed. He now suggests that 2% of GDP would need to be spent now to avert the risk of runaway climate change.[21] But, provided that strong collective action is taken around the globe, the costs of acting now to avert the worst effects of climate change would be significantly outweighed by the potential benefits of avoiding unabated climate change.

[20] www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

[21] www.guardian.co.uk/environment/2008/jun/26/climatechange.scienceofclimatechange

Potential impacts of climate change on the South East

The types of impacts that are already predicted for the South East region, as outlined in the Climate Change Mitigation and Adaptation Implementation Plan, include: hotter, drier summers; more frequent extreme high temperatures; more extreme winter rainfall; a net sea level rise and increased storminess in winter.

Many adaptation responses are already in hand, supported by the work of Climate South East (formerly the South East Climate Change Partnership). The risks of moderate climate change for the South East are significant, but not as significant as for many poorer countries in lower latitudes.

But the risk of unabated climate change – involving temperature increases of 5-6°C or more – are potentially serious for the earth's ecosystems as a whole. Scientists have identified a number of ways in which significant temperature rises could limit the earth's ability to absorb and store greenhouse gases (e.g. within the oceans or permafrost), raising the possibility of 'runaway' climate change.

The issue is not therefore solely whether it is in the South East's interests to take action on the Ecological Footprint and CO_2 emissions targets, but whether the region has a moral responsibility to do so – as part of collective action around the globe.

During this study, several contributors have suggested that a 'war footing' is required to mobilise action, likening the potential impact of climate change to the impact of war. If significant action is not taken now, it is likely that more drastic measures will be needed in future.

Not just climate change

The use of the Ecological Footprint takes a wider view than simply counting climate emissions:

- It is a measure of total impacts through the supply chain, both direct and indirect, all the way to final consumption. It encompasses the bio-fuels issue, where conversion of farmland to bio-fuels has been encouraged by climate policy, but at the cost of displacing food production for over 260 million people.[22]
- It includes imports and their embedded impacts, currently estimated at over a third of direct impacts. This avoids the 'green illusion', in which the UK appears to become more sustainable simply by exporting its heavy industry to overseas.

No-one has yet attempted to develop a global costing of unabated Ecological Footprint growth, but it is safe to assume that this would be more than the costs of climate change on its own.

[22] Action Aid, 2008: 'Cereal Offenders'

Opportunities arising from the 'route map'

Reducing the region's Ecological Footprint is closely linked to other aspects of the environmental agenda. The 'route map' set out here would help the region to comply with a wide range of environmental targets and legislation, including EU waste targets and carbon reduction objectives.

The current RES already stresses the economic opportunities arising from new environmental technologies. The stronger pursuit of these policies advocated in the route map would offer potential to companies within the region to be market leaders in their fields and – through the exports of goods and services – to influence the sustainability of production and consumption outside both the South East and the UK.

There are also many opportunities for improving people's quality of life through actions which have synergies with other goals. For example:

- Higher levels of walking and cycling will have potential health and lifestyle benefits, as will better access to fresh, seasonal local food;
- More emphasis on local communities where people live and work, using ICT to replace a significant proportion of long-distance travel, will have positive benefits for social networks and community resources;
- Increased demand for local food production, and local tourism, will benefit suppliers within the region;
- The de-materialisation of the economy may offer greater scope for leisure time, leisure services and better quality of life.

This is backed up by current research on quality of life which shows that, beyond a certain basic income level, happiness comes not from material consumption but from families, communities and fulfilling occupations.[23]

[23] 'Happiness: Lessons from a New Science': Layard, 2005; Penguin Books.

17 STARTING THE JOURNEY

Mobilising action on the route map

Given the challenges presented by the route map, the wide range of stakeholders and the many barriers to progress, the key question is how to mobilise action to stabilise and reduce the region's Ecological Footprint.

Mainstream policies and plans

It is clearly important that strategic priorities and action plans deriving from the route map are fed into mainstream strategy formulation and planning, at regional, sub-regional and local level. This process should initially be taken forward by SEEDA, the Assembly and GOSE, together with the Sustainable Futures Group. The Diamonds local authorities offer opportunities to pioneer many elements of the route map, but wider involvement of other sub-regional groupings and local authorities will also be needed.

In practice, institutional arrangements in the South East will depend on the outcome of the current Sub-National Review. Whatever the detail of regional/sub-regional structures and responsibilities emerging from this review, we recommend that the process should focus on:

- Immediate priorities for stabilisation (as identified in the route map charts and in Annex 1);
- Short and longer-term actions for transformation of the region (see route map charts and full report);
- Developing a framework for taking forward the route map.

Given the level of technological and policy innovation inherent in the route map, one approach would be to develop a regional 'Foresight' process. This could be implemented in partnership with existing institutions (e.g. the International Institute for Sustainability; RESOLVE) or it could have its own secretariat and resources.

Foresight programme

The Foresight programme would explore future trends and opportunities, bring together networks of stakeholders, and develop strategies and programmes. This approach is much used in regional development and technology innovation, in the UK, EU and other OECD countries. This would aim to accelerate positive thinking and 'joined up' policy, through catalytic actions. This could work in parallel strands to:

- Develop a strategic framework for long-term transformation – build the evidence, analysis, motivation, leadership;
- Build partnerships and action learning networks for key sectors and supply chains, across public, private and civic sectors;
- Identify demonstration projects and area-based initiatives to show examples and leadership (e.g. supply chain networks using ICT);
- Identify all possible incentives in spatial planning system, with all possible extensions (building regulations, environmental regulation, business rating system, highway planning, public transport finance and so on);
- Mobilise the fiscal and procurement agenda, in particular with the Assembly's local authority members, other public agencies (NHS, Higher Education and Further Education Colleges), and regionalised government expenditure.

RESOLVE is a University of Surrey collaboration of four internationally acclaimed departments: the Centre for Environmental Strategy, the Surrey Energy Economics Centre, the Environmental Psychology Research Group and the Department of Sociology

Next steps – short-term actions

Mobilisation of funding and procurement is the key to mobilising short-term actions. The immediate 'next steps' will generally be actions which cost little, use available technology, gain political viability and generate social benefits. There are other immediate priorities (such as 'constraining car use' and 'capping aviation emissions') which are more controversial and difficult to implement, but are central to achieving stabilisation of the region's footprint.

Priorities for short-term action are suggested in Annex 1. These are strongly linked to the 'actions for stabilisation' marked in green in the route map charts, but include some transformation actions which are short-term and easy to achieve. Many of these actions have already been started, but need to be implemented more widely and fully.

These short-term priorities will require accompanying horizontal measures:

- a process of **capacity building** for the public sector, in order to build up financial and human resources to enable and take forward the above;
- A process of **evidence building**, including monitoring and appraisal on the supply side, demand side, infrastructure and spatial development policy options;
- A process of **policy innovation**, including research, development and pilot schemes as above.

These horizontal measures link back to the 'Foresight' programme, or an equivalent initiative, to build capacity and drive innovation within the region. Sub-regional groupings, such as the Diamond clusters, Growth areas and regeneration areas, would provide ideal test-beds for many of the short-term actions summarised here.

Milestones

It is important that progress towards the Ecological Footprint and CO_2 emissions targets is monitored on an ongoing basis. CO_2 emissions are already monitored within the Regional Monitoring Report, and are updated annually. The region should consider whether to incorporate estimates of CO_2 emissions on a consumption, as well as production, basis when these become available through the REAP model.

Monitoring progress towards Ecological Footprint targets has been difficult in the past, as REAP provided only a 'snapshot' of Ecological Footprint data. The revised version of REAP, which will be available shortly, will provide more scope for maintaining a time series of regional and sub-regional Ecological Footprints. 'REAP Petite' can also provide assessments of Ecological Footprints at community level.

Other tools, such as 'Corporate Stepwise' (developed by Best Foot Forward) and 'Triple Bottom Line' (developed by SEI), may be useful for specific organisations or sectors which want to monitor their progress on footprint reduction.

In addition to measuring progress towards the targets, it will be important to keep the effectiveness of methods and strategies under review. The 'pilot schemes' suggested above will need to be evaluated and reviewed, so that lessons can be extended into roll-out schemes. This is particularly the case for initiatives involving new approaches (e.g. behaviour change) or new technologies.

Conclusion

A concerted effort is needed to tackle the upwards trend in the region's Ecological Footprint, even if the goal is simply stabilisation. Meeting longer-term reduction goals will require major transformation towards a One Planet Region. This transformation will be challenging but will offer far-reaching benefits for the local and global environment, for the region's competitive position, for social cohesion and for quality of life in the region.

The proposed route map towards transformation of the South East is challenging and beset with uncertainties. This report offers a first sketch of a route map at regional level, which can be taken forward and refined by local knowledge, by sector-specific expertise and by emerging research as time proceeds.

ANNEX 1 PRIORITIES FOR SHORT-TERM ACTION

Most of these actions are required to stabilise the region's footprint in the short-term. Actions which could be started in the short-term but would particularly contribute to longer-term Transformation are marked with an asterisk.

Theme	Priority actions for the route map	Action by:
Behaviour change (cross-cutting)	• Develop and implement a regional strategy for behaviour change, targeted at individuals, communities, businesses, government and other organisations, and taking account of the range of approaches needed for different groups at different stages	Local authorities, the Assembly, with utilities, private, civic and community organisations
	• Support the development of behaviour change projects working with communities, in communities and supporting community-led schemes/social enterprise	Local authorities, communities
	• Promote local fiscal incentives for behaviour change in the sectors below (e.g. smart metering; council tax banding)	Local authorities, utilities
Lobbying	• Lobby UK government for national-level incentives for footprint and carbon reduction by all stakeholders (e.g. carbon quotas, fiscal schemes and extension of the Carbon Reduction Commitment)*	SEEDA, the Assembly
Procurement (cross-cutting)	• Support all public sector bodies and 'quasi' government bodies to reach Level 3-Level 5 of Defra's Flexible Framework, taking forward the South East Plan for Sustainable Procurement	SEEDA, the Assembly, NHS, LGA, local authorities
	• Identify immediate potential for changing procurement specifications and practices to low carbon/footprint options	SEEDA, the Assembly, NHS, LGA, local authorities

Theme	Priority actions for the route map	Action by:
Planning (cross-cutting)	• Examine current and forthcoming LDFs and area policies, for strategic potential to reduce footprints by integrating built environment/land use/ transport	SEEDA, the Assembly, local authorities
	• Ensure that policies and priorities are fully incorporated into Integrated Regional Strategy and relevant spatial plans, including LDFs	SEEDA, the Assembly, local authorities
	• Ensure that regional funding allocations are in line with climate and Ecological Footprint objectives	Regional funding boards
	• Promote use of Ecological Footprints and carbon metrics, and alternative measures of economic welfare, in public and private sector planning and decision-making	SEEDA, the Assembly, local authorities, businesses, Business Link, Carbon Trust, Envirowise
	• Include the social price of carbon emissions in policy appraisal and impact assessment	SEEDA, the Assembly, local authorities
Diamonds and Growth areas (cross-cutting)	• Pioneer new approaches to footprint stabilisation and reduction across priority sectors, including business incentives, skills and supply-chain development, regional innovation clusters, urban infrastructure, behaviour change and carbon off-setting	SEEDA, Diamond local authorities, businesses, Business Link, Carbon Trust, Envirowise

Theme	Priority actions for the route map	Action by:
Built environment	• Support implementation of the new Code for Sustainable Homes, including demonstration projects for Code 6 zero-carbon housing and higher than minimum standards in publicly-funded developments	SEEDA, SECBE, local authorities, developers
	• Form local partnerships for the strategic improvement of housing and commercial buildings*	Local authorities, developers, housing associations, regeneration bodies
	• Pilot and support demonstration of major retrofit programmes (e.g. smart meters, switching, whole house insulation, condensing boilers, micro-generation and so on)	Local authorities, EST, utilities
Transport	• Constrain growth in car use (e.g. through spatial planning, travel assessment of new development, reductions in road space/car parking, low emission zones, reallocation of road building funds to more sustainable modes and access improvements);	The Assembly, local authorities, SEEDA, Regional Transport Board
	• Commit to constraining growth in air travel by South East residents to levels which are equalled by efficiency improvements, to oppose further expansion of London airports and to lobby for air to be included in the EU Emissions Trading Scheme;	SEEDA, the Assembly, local authorities
	• Promote eco-tourism within the region, linked to capping air travel impacts;	SEEDA, Tourism South East, businesses
Energy supply	• Ensure that electricity generation from renewable sources rises to 40% of total generation in the region by 2020 (e.g. planning policies; partnership investment; grid strengthening; supply chain development)	SEEDA, the Assembly, Sustainable Energy Partnership, businesses, local authorities
	• Support an additional 310MW of Combined Heat and Power Capacity by 2020 (e.g. through Community Infrastructure Levy)	Local authorities, with SEEDA and energy supply companies

Theme	Priority actions for the route map	Action by:
Food	• Promote low impact food in all public institutions and major businesses (subject to further research, 'low impact' is likely to mean locally-sourced, seasonal, organic and low-meat)	SEEDA, NHS, local authorities, Carbon Trust, Business Link, Envirowise
	• Support and extend the WRAP campaign to reduce food waste	WRAP, local authorities, SEEDA, Carbon Trust, Business Link
	• Demonstrate low impact farming (including use of sustainable energy on farms)	SEEDA, Defra, Rural Development Partnership, Sustainable Energy Partnership
Goods and services, public services and capital investment	• Develop region-wide procurement standards and labelling/ accreditation schemes for low impact and fair-trade products and services	SEEDA, retailers, producers, consumer bodies, Carbon Trust, Business Link
	• Encourage low-impact production (e.g. reduce business rates for accredited resource efficient businesses)	Local authorities, SEEDA, Carbon Trust, Business Link
	• Demonstrate – and develop incentives for – low impact consumption patterns in combination with behaviour change initiatives (e.g. regional eco-tourism; ethical finance; free-cycle hubs)	Local authorities, consumer bodies, businesses, communities

Theme	Priority actions for the route map	Action by:
Waste	• Develop regional markets for waste and intermediate products	SEEDA, businesses
	• Engage all key stakeholders in the supply chain in waste reduction (e.g. Pathways to Zero Waste)	SEEDA, businesses
	• Set up innovative waste-reduction schemes, working with communities and local businesses (e.g. 'bag free' areas; deposit systems; free-cycle hubs)	Local authorities, communities, businesses
Water	• Introduce water metering as quickly as possible	Water companies, local authorities, communities
	• Promote low water-use behaviours in houses and gardens*	Water companies, communities
	• Meet 'Code for Sustainable Homes' Level 6 requirements for water efficiency in new housing, and retrofit water efficiency measures to existing buildings	Water companies, local authorities, housing partnerships, developers

Published in August 2008 by the South East England Regional Assembly
(SEERA Ltd) on behalf of the Assembly, SEEDA and the WWF.

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