APPENDICES

Appendix 1: Glossary

'bag-free' towns: areas where single-use plastic bags are not provided (or not provided free) by retailers, by agreement between businesses and the local community;

Behaviour change: changes in the habits or choices of people and organisations which can, without significant investment or technological change, reduce the undesirable impacts of their behaviour.

Best Foot Forward: a company specialising in measuring and communicating carbon and ecological footprints for individuals, businesses and other organisations. http://www.bestfootforward.com/

Biomass: Living and recently dead biological material which can be used as fuel or for industrial production.

BREEAM: standards for the environmental assessment of buildings developed by the Buildings Research Establishment. The version of BREEAM for homes is known as Ecohomes. Ecohomes is still used as a standard for refurbished homes, but standards for new homes are now set by the **Code for Sustainable Homes**.

Bus priority: measures which give public transport buses priority over private vehicles at junctions with traffic lights; often combined with bus lanes.

Business Link: a Government-supported advice service for small and medium-sized businesses.

Carbon Footprint: Strictly speaking, a carbon footprint is the total amount of carbon dioxide emitted over the full life cycle of a product or service. Other **greenhouse gases** may also be included, converted to equivalent grammes or tonnes of carbon dioxide. In practice, the 'carbon footprint' of an area or group is often used to mean simply the carbon dioxide emitted directly by the area or group.

Carbon metrics: measures of carbon impact, including carbon footprint or carbon price.

Carbon offsetting: measures taken to compensate for an increase in carbon emissions associated with an investment or behavioural decision. This sometimes take the form of investment in energy efficiency, renewable energy or sustainable forestry schemes, in this country or elsewhere.

Carbon quotas: a form of carbon rationing, probably using some form of tradeable carbon allowance, which allows each individual or business to emit a certain amount of carbon in a given period.

Carbon Reduction Commitment: The Carbon Reduction Commitment (CRC) is a proposed mandatory cap and trade scheme in the United Kingdom that will apply to large non energy-intensive organisations in the public and private sectors. Consultation is underway on details of the proposed scheme.

Carbon Trust: a Government-funded independent company which helps businesses and the public sector to reduce carbon emissions, and supports the development of low carbon technologies.

CCS: Carbon Capture and Storage – emerging technologies which aim to capture and store carbon dioxide produced by power generation or other processes, thus avoiding emissions to the atmosphere.

CE: Cambridge Econometrics

CHP: Combined Heat and Power – electricity generating scheme which is designed so that waste heat can be used by nearby houses or businesses.

Climate Change Implementation Plan: 'A Climate Change Mitigation and Adaptation Implementation Plan' – a report prepared for SEERA by Collingwood Environmental Consultants and LUC, with support from the ESPACE programme (see Annex 1).

Climate South East (formerly the South East Climate Change Partnership): a partnership of public, private and voluntary organisations working together to investigate, inform and advise on the threats and opportunities arising from the impacts of climate change in South East England and to promote adaptive planning in the region.

Code for Sustainable Homes: national standards for the sustainable design and construction of new homes, launched by the Government in December 2006. Level 6 of the Code will become mandatory in 2016.

Consumption basis: analysing impacts from the viewpoint of consumers in the region. This means including the impacts of imported goods and services, made outside the region, but excluding the impacts of goods and services which are made in the region but consumed elsewhere.

CSR: Corporate Social Responsibility

CURE: Centre for Urban and Regional Ecology, University of Manchester

DBERR: Department for Business, Enterprise and Regulatory Reform

DCLG: Department for Communities and Local Government

Decoupling: the concept of achieving economic growth without increasing environmental impacts.

DEFRA: Department for Environment, Food and Rural Affairs

DfT: Department for Transport

Diamonds: local authority areas identified as being potential growth areas in the Regional Economic Strategy for South East England.

EU Emissions Trading Scheme (ETS): a European Union 'cap and trade' which allocates tradeable permits to emit CO_2 to energy-intensive industries across the EU and requires them to report their emissions. Phase 1 of ETS included power generation but was not effective at reducing CO_2 emissions because permits were easily available at low prices. Phase 2, which started in January 2008, applies to a wider range of sectors and a wider range of greenhouse gases.

EnviroBusiness: a not-for-profit membership organisation based in South East England with a mission to drive the growth and success of the environmental technologies and services sector. More information can be found on www.envirobusiness.co.uk

Envirowise: a government-supported programme that provides free environmental advice to businesses

ESCO: an Energy Services Company that provides energy management services to local customers, usually using local energy sources.

ESRC: the Economic and Social Research Council.

Factor Four reduction: the reduction in developed countries' resource use that would be required to achieve sustainable and fair levels of resource use around the globe, usually taking the final years of the twentieth century as a starting point.

Free-cycle hubs: local networks, operating through the internet, which allow individuals and businesses to recycle unwanted goods by finding new homes for them. Effectively operates like e-bay but without payment changing hands.

GAP: Global Action Plan – a voluntary organisation working to promote environmentally sustainable behaviour.

GHG: Greenhouse Gases – gases contributing to the greenhouse effect, primarily carbon dioxide but also methane, nitrous oxides and some other gases. Usually converted into tonnes or grammes of carbon dioxide equivalent.

GOSE: Government Office South East.

Green Action Zones: a proposal made in 2000 for a demonstration combination of physical improvements, new fiscal measures, new institutional setup, and new forms of social economy, in selected areas (Ravetz, 2000). This has been taken up partly in the national Sustainable Communities programme, partly by Bio-Regional DG, and to some degree in the Diamonds programme, but not fully achieved in the UK as yet.

Gross Value Added: a measure of productivity in an area. GVA shows how much an area contributes to the UK economy.

'Hard' transport measures: changes to transport infrastructure, for example through junction design, bus priority lanes, pedestrian or cycle lanes, traffic calming, road surfaces, road improvements and so on.

HECA: Home Energy Conservation Act (1995).

ICT: Information and Communications Technology

Industry ecology clusters: a group of industries in close proximity to enable one firm to use another's waste as a resource. The most well-known cluster has been working since 1986 in Kalundborg, Denmark. There are examples in the UK available on the National Industrial Symbiosis Programme site, www.nisp.org.uk

International Institute for Sustainability: an institute set up by SEEDA, EEDA and the LDA in the Thames Gateway, in collaboration with Arup, to capture and create value from the work needed to develop the Thames Gateway and Dongtan Eco-City in China.

IPPR: Institute for Public Policy Research

ISO 140001: an environmental management system, widely recognised and used across both the public and private sectors.

LAA: Local Area Agreement.

LDF: Local Development Framework.

LTP: Local Transport Plans.

LZC: low and zero carbon technologies

MAA: Multi Area Agreement.

Merton rule: a planning policy pioneered by the London Borough of Merton, which stipulates for larger developments – that 10% of energy used by new developments should be generated from onsite renewable energy sources.

ONS: UK Office for National Statistics.

OPERA: the One Planet Economy Regional Analysis – a methodology developed for SEEDA/SEERA and Defra by CURE on 2007. See Appendix 4 for further details.

Peak Oil: the concept that oil production is on the verge of decline, owing to the scarcity of new supplies and their high production costs. Combined with growing demand for oil in many developing economies, this is likely to lead to higher oil prices which will eventually choke back demand.

Photovoltaics: technology that uses solar cells or thin films to convert the sun's energy into electricity.

PPS1: Planning Policy Statement 1 – new draft statement on Planning and Climate Change (**DCLG**).

PPS3: Planning Policy Statement 3 – Housing (**DCLG**).

Production or 'territorial' basis: analysing impacts from the viewpoint of regional production. This means focusing on emissions which are physically generated within the region, by industry, transport, domestic or other sectors. It excludes the impacts of imported goods and services, and includes the impacts of goods and services which are made in the region but consumed elsewhere.

RDA: Regional Development Agency.

Real/energy land – the Ecological Footprint calculates how much productive land and sea is needed to provide the energy, food and materials we use ('real land'); it also calculates the carbon dioxide emissions generated from the oil, coal and gas we burn, and determines how much forested land is required to absorb this carbon dioxide ('energy land').

REAP: Resources and Energy Analysis Programme – a model developed by the Stockholm Environment Institute which calculates Ecological Footprints for different categories of consumptions. See Appendix 4 for further information.

REEIO: Regional Economy and Environment Input Output model developed by Cambridge Econometrics which analyses industries across a number of sectors in a given region, and calculates CO_2 emissions, waste arisings and water use. See Appendix 4 for further information.

Renewable energy sources – natural resources such as sunlight, wind and tides that provide energy which is naturally replenished. Renewable energy sources include solar power, wind power, hydroelectric, tidal power, geothermal and biomass.

RES: Regional Economic Strategy.

RESOLVE: an inter-disciplinary research team based at the University of Surrey which aims to unravel the complex links between lifestyles, values and the environment.

Retrofit programmes: fitting of energy efficiency and renewable energy measures – and where relevant water efficiency measures - to existing housing and other buildings.

RSF: Regional Strategic Framework.

RTB: Regional Transport Board.

SEEDA: South East England Development Agency.

SEFS: South East Forum for Sustainability – a network of voluntary organisations in South East England which are working to promote sustainability.

SFG: the Sustainable Futures Group – the champion body for sustainable development in South East England.

SEI: Stockholm Environment Institute

'Smarter Choices': A report for **DfT** by Cairns et al, 2004, which reviewed the evidence for reducing road traffic through **'soft transport measures'**.

SMEs: Small and medium-sized enterprises.

Social and community enterprise: actions taken on the edge or outside the formal economy, involving trading or exchange between members of a network or culture: voluntary activity: self-help and community empowerment actions.

'Soft' transport measures: initiatives aimed at changing people's travel choices, for example through residential or institutional travel plans, personalised travel planning, public transport information, car sharing, car clubs, teleworking and home shopping

South East Sustainable Energy Partnership: a partnership which exists to share best practice, support local projects and raise awareness of the benefits and opportunities of sustainable energy in South East England.

SUDS: Sustainable Urban Drainage Systems. A sustainable drainage system aims to mimic as closely as possible the natural drainage of a site to minimise the impact of urban development on the flooding and pollution of waterways.

Sustainable Consumption and Production: the types of resource use needed to achieve **Factor Four reduction**, supporting lifestyles that are both fair and sustainable in global terms.

Sustainable Travel Demonstration Towns: the **DfT** set up the Sustainable Travel Towns of Darlington, Peterborough and Worcester to see what a sustained programme of '**Smarter Choices'** could achieve.

SEI: Stockholm Environment Institute (UK base is in the University of York).

SCPNet: Sustainable Consumption and Production Network.

Sustainable energy sources: energy sources that are environmentally, socially and economically sustainable. Usually used interchangeably with '**renewable energy sources'**.

Transition Towns: is a movement that was founded by environmentalist Rob Hopkins during 2005 and 2006. The aim of the project is to equip communities for the dual challenges of climate change and **Peak Oil**. The movement currently has member communities in a number of countries worldwide.

Triple-Bottom Line accounting: accounting systems that take account of social and environmental balances, as well as financial.

WAG: Welsh Assembly Government.

WRAP: a government-supported organisation which aims to help individuals, businesses and local authorities to reduce waste and recycle more.

WWF: Worldwide Fund for Nature.

Zero carbon homes: new houses designed so that there are no net emissions of carbon dioxide emissions from all energy use in the home.

Appendix 2: Contributors

The consultancy team would like to thank the following individuals, who contributed their views towards the study. Most of the people listed here participated in the stakeholder workshop on 20 February 2008, while others were consulted during the study.

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Appendix 3: References

This appendix presents references under the following themes:

- Regional strategies and plans (general)
- Ecological Footprint studies
- One Planet Economy/Sustainable Consumption and Production
- Economic development
- Climate change
- Behaviour change
- Planning
- Procurement
- Built environment
- Transport
- Energy supply
- Food
- Goods and services, public services and capital investment
- Waste
- Water

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One Planet Economy / Sustainable Consumption and Production

- Changing Patterns: the UK Government Framework for Sustainable Consumption and Production (2003)

- The Living Planet Report (WWF, 2004)

- One Planet Economy Network – a number of reports are available at: http:/www.wwflearning.org.uk/ecological-budget/download-centre/one-planet-economy-network,778,AR.html

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Appendix 4: Information on OPERA, REAP and REEIO

The OPERA methodology

In developing the route map, we have been guided by the 'One Planet Economy Regional Analysis' (OPERA) methodology developed for SEEDA, the Assembly and Defra by CURE. Central to the OPERA methodology is the preparation of a series of templates, analysing the structure of different sectors and their scope for change. Examples of these are presented below. Further details about the OPERA methodology can be found in the draft methodology report prepared by CURE in July 2007[1].

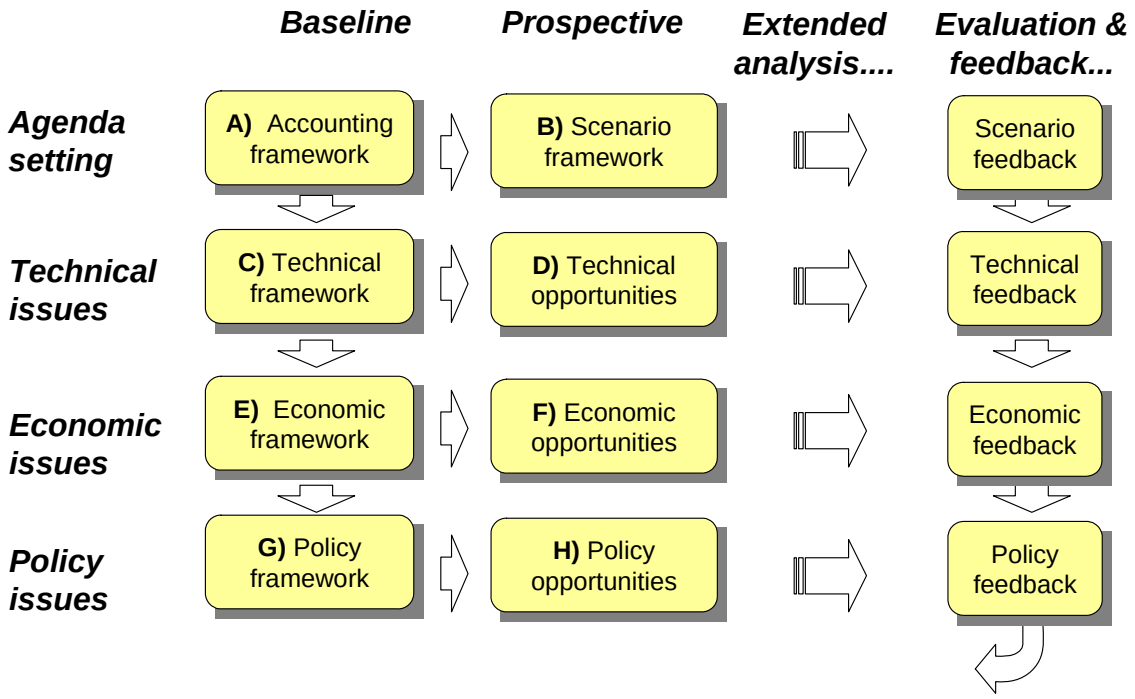
The One Planet Economy Regional Assessment concept is simple: a structured approach to investigating situations which are often complex, many-layered and uncertain. To do this we use a framework - 4 main stages, each with a 'baseline' (present) component, and several kinds of futures components. The 4 main stages are:

- **Agenda setting:** this is about defining the problem and setting clear boundaries for the present and the future;
- **Technical issues:** this includes the technology and infrastructure, with its environmental and spatial impacts, and the opportunities for change;
- **Economic issues:** focus on the 'wider economy' system - flows of capital and human value, on the production and consumption sides, in public and private sectors;
- **Policy issues:** this focuses on the organizations in public, private and civic sectors, and the opportunities for new kinds of policy.

There is a **'baseline'** component for each of these, followed by a **'prospective'** (future opportunities) component. This should then be put through an **'extended analysis'**, in order to look more closely at further linkages, cross impacts, and underlying factors. Finally the results can be taken to an **'evaluation'** stage, which digests the implications, and provides feedback to users.

The arrows shown in the diagram are suggested only for guidance. We would recommend starting at the top left with the 'problem definition'. Beyond that, each type of issue or policy question would generate its own logical path through the various stages. Having produced a policy evaluation (bottom right corner), the next step could be to start again, and revisit the problem / agenda definition at the top left corner (subject to time and resources).

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



Applying the OPERA methodology helps to ensure that the policy agenda is approached in a holistic way. The framework also helps to ensure that opportunities for change are considered as broadly as possible, and are logically worked through. This is vitally important given the scale of technical, economic, political and social change required to achieve footprint reduction targets.

One particular benefit of using the OPERA methodology is to focus attention on the questions that need to be answered – rather than the questions that available models can answer. Examples of OPERA resource analysis frameworks are attached.

REAP tool (Resource & Energy Analysis Programme)

The Resources and Energy Analysis Programme[2] (REAP) developed by the Stockholm Environment Institute has been used to project the region's future Ecological Footprint on a consumption basis. This model analyses the South East's consumption under a number of headings (e.g. household energy use, personal transport, food, services, consumer goods). Within the REAP analysis, the impacts of business organisations are allocated to the final consumers of goods or services produced by those businesses. So the REAP model highlights the impacts of our lifestyles as consumers. It will

[2] http://www.sei.se/reap/index.php

soon be possible to use REAP to analyse carbon emissions – as well as Ecological Footprints - on a 'consumption basis'[3] but this capability was not available at the time of this study.

The Resources and Energy Analysis Programme (REAP) provides scenario and modelling and policy assessment on the issue of Sustainable Consumption and Production. REAP uses sophisticated modelling approaches to understand the material flows, carbon dioxide emissions and Ecological Footprint of the UK, regions and local authorities.

The REAP methodology allocates Ecological Footprints, and Greenhouse Gas Emissions to industrial activities, final demand and household consumption using an input-output analysis. The result is a comprehensive model that can establish the environmental impacts of socio-economic groups, highlighting areas of high impact. REAP can help policy makers to answer 'what if' questions about the effects of policy on the environment, and can help to formulate strategies for local, regional and national government. The model is technically robust and can be used to forecast trends.

The REAP methodology combines existing footprinting accounts with national economic and environmental accounting and allocates direct and indirect environmental impacts to household consumption activities. A well-established approach to construct comprehensive and consistent environmental accounts is the use of input-output analysis (Leontief, 1970; Miller and Blair, 1985). Standardised economic accounting frameworks establish the link between intermediate and final consumption and – when combined with environmental data – the environmental impacts of the intermediate use of commodities can be attributed to elements of final demand.

In the framework of national accounts the final consumption of products is illustrated in the final demand section of the input-output tables. In the UK, a 123 sector breakdown of final demand expenditure is available annually. More importantly, the expenditure of private households is disaggregated by functional headings using the COICOP classification (Classification of Individual Consumption According to Purpose) (ONS, 2003). This allows a detailed allocation of environmental impacts to a number of household consumption activities and provides information directly relevant to sustainable consumption policies. The categories used in this study are listed in Appendix 5.

REEIO tool (Regional Economy-Environment Input-Output) model

The Regional Economy and Environment Input Output[4] (REEIO) model developed by Cambridge Econometrics has been used to make projections of the region's Carbon Footprint on a territorial basis. This model analyses production by industries in the South East across a number of sectors (e.g. energy supply, transport, waste management, water supply, manufacturing, services). As well as calculating carbon dioxide emissions, the REEIO model predicts other environmental pressures including waste arisings and water use. So the REEIO model highlights the impacts of the business sector.

[3] See Glossary in Appendix 1 for explanation of technical terms.
[4] http://www.cambridgeeconometrics.com/suite_economic_models/reeio.htm

REEIO is a unique decision toolkit designed to assist policy makers analyse regional policies and programmes with regard to the economy and environment. It provides a firm basis for sustainability appraisal, strategic environmental assessment and benchmarks for the resource productivity of businesses and sectors. REEIO was originally developed by Cambridge Econometrics as part of the Reward project, a partnership led by the Environment Agency (EA) with the participation of Regional Development Agencies and the National Assembly for Wales. More recently REEIO has since been supported by SCPnet (see http://www.wwflearning.org.uk/scpnet/ for more information).

The links between the economy and the environment are vast and complex. REEIO focuses on one particular set of links, namely those between the economy and source and sink functions of the environment. Furthermore REEIO is focused in which of these links it encompasses, modelling the links between a region's economy and the key environmental pressures of waste, energy, emissions to air and water demand.

The model provides annual comprehensive projections to 2020 for a wide range of indicators including:

- GVA, personal incomes, consumer spending and investment
- output and employment by industry
- employment by occupations
- waste arising by waste streams and industry
- waste entering different management routes
- energy demand by fuel and fuel user (including transport)
- key emissions to air (e.g. $C0_2$)
- water demand by water households and industries

Further information on REEIO, illustrations of how it has been used in the regions and guidance on its application can be found on the SCPnet website.

Attachment: Examples of OPERA Templates:

The attached OPERA templates set out an analysis of the Reference and Transformation scenarios, based on research by CURE for the One Planet Economy Network. The templates cover physical, economic and institutional aspects of the following sectors:

- Construction and built environment
- Energy supply
- Transport
- Foods
- Products (i.e. goods)

Construction & built environment: resource analysis template

	Material sources	Manufact uring	Logistics	Services	Demand side 1	Demand side 2	Products in use	Externalities
PHYSICAL	**Import %, source, extraction mode**	**Energy in production**	**Transport distance & mode**	**Tertiary activity & value added**	**Intensity & utilization factors**	**Consumption / mode choice**	**Product life: energy efficiency**	**Waste, recycling %: waste mgmt: emissions**
Reference scenario	Higher energy & import %	Rising energy in production			Lower floorspace & land utilization	Stock turnover for short term gain	Shorter building life & lower efficiency	Higher building waste & emissions
Transformation scenario	Import reduction	lower energy materials	Low impact transport modes	Design for low impact	Higher floorspace & land utilization	Stock turnover for optimum benefit	Higher building life & energy efficiency	Lower building waste & emissions
General policy options	Resource protection	New processes: new products	Integrated supply chain mgmt	ICT materials markets	Utilization incentives	Integrated spatial planning	Regulation / accreditation	
ECONOMIC	**Commodity prices: market effects**	**Fuel costs: factor & finance cost**	**Int. transport fuel / transaction cost**	**labour costs: investment costs**	**Consumer exp / saving: social discount**	**Market behaviour: stock turnover**	**Product life: energy prices in operation**	**External costs / impact charges**
Reference scenario	Lower material prices	Fuel / material costs level	Fuel costs level		High time preference & short term investment			
Transformation scenario	Higher material prices	Fuel / material costs rise	Fuel costs rise	Investment & share value linked to CSR	Low time preference & long term investment	Lower quantity, higher quality purchasing	Higher building life & energy efficiency	Total costs internalized & marketized
Policy options	Commodity levies /	public procurement	International fuel	ESCOs & other financial vehicles for	Public procurement	Eco-labels & other	Incentives for demand side	Domestic tradable

	Material sources	Manufact uring	Logistics	Services	Demand side 1	Demand side 2	Products in use	Externalities
	tariffs	for clean technology	levy	env.mgmt	for market transform	incentives for ZED	management	quotas???
INSTITUTIONAL	**Sustainable sourcing**	**sustainable production**	**Low-impact logistics**	**Service economy / social economy**	**Utilization choices**	**Behavioural choices**	**Operational choices**	**Waste practices**
General policy themes	Sustainable mining & forestry	Producer responsibility: env management	integrated logistics chain management	CSR	Sustainable urban development	Social economy & community initiatives	Education for low impact living	

Energy supply – resource analysis template

ENERGY								
	Material sources	**Logistics**	**Manufact uring**	**Services**	**Demand side 1**	**Demand side 2**	**Products in use**	**Externalities**
ECONOMIC	**Commodity prices: market effects**	**Int. transport fuel / transaction cost**	**Fuel costs: factor & finance cost**	**labour costs: investment costs**	**Consumer exp / saving: social discount**	**Market behaviour: stock turnover**	**Product life: energy prices in operation**	**External costs / impact charges**
Reference scenario	Energy prices stay low		Energy prices stay low		UK final energy demand 1% growth			UK costs internalized / other externalized
Transformation scenario	Renewables costs reduce	International transport costs rise	Energy prices rise	Investment & share value linked to energy eff	UK final energy demand --1% reduction	Investment based on triple accounting	Incentives for ultra-efficient products	Total costs internalized
Policy options	Renewable development incentives	International fuel tax	Carbon levy: public procurement for clean technology	Tax incentives for partnership investment	Public procurement for energy transform	Cross-subsidy for demand side management	Eco-labels linked to tax incentives	Emission trading scheme enlarged
PHYSICAL	**Import %, source, extraction mode**	**Transport distance & mode**	**Energy in production**	**Tertiary activity & value added**	**Intensity & utilization factors**	**Consumption / mode choice**	**Product life: energy efficiency**	**Waste, recycling %: waste mgmt: emissions**
Reference scenario	Coal & tar: nuclear: some renewable	Import % rising from Africa, Asia			UK final energy demand 1% growth			UK CO2 emissions – level
Transformation scenario	Shift to renewables	Embedded & local renewables where possible	New power generation technology	Energy services	UK final energy demand --1% reduction	Direct heat & cooling	Design for ultra-low energy	UK CO2 emissions – 3% reduction

ENERGY								
	Material sources	**Logistics**	**Manufact uring**	**Services**	**Demand side 1**	**Demand side 2**	**Products in use**	**Externalities**
Policy options	Resource protection	Integrated supply chain mgmt	New processes: new products	ESCOs & similar	Diversified energy grid	Infrastructure for heat distribution	Stock replacement programme	
INSTITUTIONAL				Service economy / social economy	Utilization choices	Behavioural choices	Operational choices	Waste practices
Policy options	International development & ethical trading	CSR	Producer responsibility: env management	CSR	Regional Partnership energy agencies	Social economy & civic society	Education for ZED design & operation	

Transport - Resource analysis template

SECTORS: PASSENGER / FREIGHT / AIR	Material sources	Manufact uring	Logistics	Services	Demand side 1	Demand side 2	Products in use	Externalities
ECONOMIC	**Commodity prices: market effects**	**Fuel costs: factor & finance cost**	**Int. transport fuel / transaction cost**	**labour costs: investment costs**	**Consumer exp / saving: social discount rate**	**Market behaviour: stock turnover**	**Product life: energy prices in operation**	**External costs / impact charges**
Reference scenario	Existing trends	"	"	"	"	"	"	"
Transformation scenario	Fuel / material costs rise	Fuel / material costs rise	Aviation emissions trading market	Travel costs internalized to consumer services	Incentives for utilization, life cycle management	External cost recovery & reinvestment	Increased product life & re-use: higher efficiency	Total external costs internalized & marketized
Policy options		public procurement for clean vehicles	Multi-lateral aviation emissions cap & trade	Tax incentives for green travel schemes	Public procurement for market transform	Road pricing: differential license fees: vehicle carbon tax	Fuel tax: mileage charge:	Tradeable quotas:
PHYSICAL	**Import %, source, extraction mode**	**Energy in production**	**Transport distance & mode**	**Tertiary activity & value added**	**Intensity & utilization factors**	**Consumption / mode choice**	**Product life: energy efficiency**	**Waste, emissions**
Reference scenario	Existing trends	"	"	"	"	"	"	"
Transformation scenario		Lean engineering & design for recycling	Aviation substitution strategy	services & employ ment in green travel schemes	lower intensity, higher utilization,	mode switch: accessibility planning	ultra efficient vehicles	Emissions controls: fuel quality
Policy options		Integrated supply chain & life cycle management		ICT based markets / exchanges	Utilization incentives: demand side management	Integrated transport planning	Regulation / labelling /	Regulation / market transformation

SECTORS: PASSENGER / FREIGHT / AIR	Material sources	Manufact uring	Logistics	Services	Demand side 1	Demand side 2	Products in use	Externalities
INSTITUTIONAL				Service economy / social economy	Utilization choices	Behavioural choices	Operational choices	Waste practices
General policy options				Integrated transport services company	Social economy for car & lift sharing	New travel networks for eco-leisure & tourism		

Food – resource analysis template

FOOD								
	Material sources	**Manufact uring**	**Logistics**	**Services**	**Demand side 1**	**Demand side 2**	**Products in use**	**Externalities**
ECONOMIC	**Commodity prices: market effects**	**Fuel costs: factor & finance cost**	**Int. transport fuel / transaction cost**	**labour costs: investment costs**	**Consumer exp / saving: social discount rate**	**Market behaviour: stock turnover**	**Product life: energy prices in operation**	**External costs / impact charges**
Reference scenario				Catering & value added growth		Processed food consumption rises	-	UK impacts level: global impacts rise
Transformation scenario	Commodity prices rise	Fuel / material costs rise	Fuel costs rise	Investment & share value linked to CSR	Low time preference & long term investment	Lower quantity, higher quality purchases	-	Subsidy on low impact farming
Policy options	Commodity levies / tariffs	Carbon tax: public procurement for clean tech	Comm / indust energy tax: Multi-lateral aviation tax	Incentives for CSR	Public procurement for sustainable food	Incentives for low impact diets	-	eco-services trading: food waste recovery
PHYSICAL	**Import %, source, extraction mode**	**Energy in production**	**Transport distance & mode**	**Tertiary activity & value added**	**Intensity & utilization factors**	**Consumption / mode choice**	**Product life: energy efficiency**	**Waste, emissions**
Reference scenario	Import % growth: intensive farming	Rising energy int.	Air freight growth	Increased catering = higher waste %	Globalizing of food markets	More processed food	-	disposal without recovery
Transformation scenario	Import reduction:	Organic foods = lower energy int.	Air freight reduction: local food	Quality & low impact catering	Local & niche food markets	Vegetarian diet = lower energy in production	-	Less waste = increased utilization
Policy options	Sustainable farming /	Cleaner production	Integrated supply	Incentives for low	Local food policy	Social marketing	-	Integrated agri-

FOOD								
	Material sources	**Manufact uring**	**Logistics**	**Services**	**Demand side 1**	**Demand side 2**	**Products in use**	**Externalities**
	forestry		chain mgmt	impact catering				environ policy
INSTITUTIONAL				Service / social economy	Utilization choices	Behavioural choices	Operational choices	Waste practices
Policy options	International development: ethical trading	Producer responsibility: env management	CSR	CSR	Social economy & civic society	Social economy & civic society	-	Education on waste recovery

Products – resource analysis template

PRODUCTS								
	Material sources	**Manufact uring**	**Logistics**	**Services**	**Demand side 1**	**Demand side 2**	**Products in use**	**Externalities**
ECONOMIC	**Commodity prices: market effects**	**Fuel costs: factor & finance cost**	**Int. Transport fuel / transaction cost**	**labour costs: investment costs**	**Consumer exp / saving: social discount rate**	**Market behaviour: stock turnover**	**Product life: energy prices in operation**	**External costs / impact charges**
Reference scenario	Fuel / material costs level	Fuel / material costs level	Fuel costs level	Service sector growth	High time preference & short term investment	Efficiency gains overtaken by increased spend	Fixed capital increases	UK costs internalized, others externalized
Transformation scenario	Fuel / material costs rise	Fuel / material costs rise	Fuel costs rise	Investment & share value linked to CSR	Low time preference & long term investment	Lower quantity, higher quality purchases	Increased product life & re-use: higher efficiency	Total costs internalized & marketized
Policy options	Commodity levies / tariffs	Carbon tax: public procurement for clean technology	Multi-lateral aviation tax / emissions trading	Incentives for CSR & environ.mgmt	Public procurement for market transform	Incentives for demand side management	Eco-labels & incentives for product life & efficiency	Emission & eco-services trading schemes
PHYSICAL	**Import %, source, extraction mode**	**Energy in production**	**Transport distance & mode**	**Tertiary activity & value added**	**Intensity & utilization factors**	**Consumption / mode choice**	**Product life: energy efficiency**	**Waste & emissions**
Reference scenario	Import % growth:	Decoupling rate = growth rate	Air freight growth					Increase waste disposal
Transformation scenario	Import reduction	Increase in energy efficiency & waste minimization	Low impact modes & logistics management	Increased service economy	Increase product utilization	Switch to long life low impact products	Increased product life & re-use: higher efficiency	Full cycle resource management
Policy options	Resource protection	Low impact technology	Integrated supply chain mgmt	ICT based markets / exchanges	Utilization incentives	Integrated planning & resource mgmt	Regulation / quotas / labelling	Regulation / legal liability

PRODUCTS								
	Material sources	**Manufact uring**	**Logistics**	**Services**	**Demand side 1**	**Demand side 2**	**Products in use**	**Externalities**
		innovation						
INSTITUT IONAL				**Service / social economy**	**Utilization choices**	**Behavioural choices**	**Operational choices**	**Waste practices**
Policy options	International development: ethical trading	Producer responsibility: env management	CSR	CSR	Social economy for product life & sharing	Social economy for product life & sharing		

Appendix 5: Ecological Footprint – further detail

Breakdown of the Ecological Footprint for South East England by consumption activity (2003)

Source: 2003 estimates produced in January 2008; Stockholm Environment Institute

Note: SEI often allocates selected capital investment activities to higher level consumption themes. Capital investment has been kept separate in this analysis. Brackets are used to illustrate how capital investment categories could be allocated to high level consumption themes.

Consumption Activity

Housing

Domestic fuel and land consumption (i.e. oil, gas etc)
Electricity and gas distribution (primarily electricity use)
Maintenance and repair of the dwelling
Imputed rentals for housing
Actual rentals for housing
Goods and services for routine household maintenance

Transport

Private transport (car fuel)
UK resident holidays abroad
Purchase of vehicles
Operation of personal transport equipment
Air transport
Other land transport
Railway transport
Water transport
Ancillary transport services

Food

Food
Catering services
Alcoholic beverages

Non-alcoholic beverages

Consumer items

Other recreational items & equipment
Personal effects n.e.c.
Household appliances
Audio-visual, photo and inf. processing equipment
Furniture, furnishings, carpets and other floor coverings
Newspapers, books and stationery
Other major durables for recreation and culture
Clothing
Tools and equipment for house and garden
Tobacco
Glassware, tableware and household utensils
Medical products,appliances and equipment
Household textiles
Footwear
Telephone and telefax equipment

Private services

Accommodation services
Insurance
Financial services n.e.c.
Recreational and cultural services
Education
Personal care
Other services n.e.c.
Water supply and miscellaneous dwelling services
Telephone and telefax services
Social protection
Out-patient services
Hospital services
Postal Services

Public services

Public administration (central govt)
Health services (central govt)
Education (local govt)
Public administration (local govt)
Social work (local govt)
Sanitary services (local govt)
Recreational services (local govt)
Education (central govt)

Health services (local govt)

Capital investment – for the following categories:

Dwellings (housing)
Real estate, renting, business activities (housing)
Electricity (housing)
Water (housing)
Gas (housing)
Other transport services (transport)
Motor vehicles sales and repairs (transport)
Transport equipment (transport)
Other land transport (transport)
Air transport (transport)
Roads (transport)
Water transport (transport)
Rail transport (transport)
Agriculture; forestry and fishing (food)
Food, beverages, tobacco (food)
Chemicals, man-made fibres (consumables)
Pulp, paper printing and publishing (consumables)
Electrical and optical equipment (consumables)
Basic metals and metal products (consumables)
Machinery and equipment (consumables)
Other non-metallic minerals (consumables)
Valuables (consumables)
Textile and leather products (consumables)
Post and telecommunications (private services)
Other services (private services)
Hotels and restaurants (private services)
Financial intermediation (private services)
Retail trade
Wholesale trade
Transfer costs for land, etc.
Public administration etc.
Extraction - oil and gas
Sewage and refuse disposal
Health and social work
Education
Construction
Other manufacturing
Solid and nuclear fuels, oil refining
Other mining and quarrying