

ECO-REGION NW

Applications to policy & business

July 2004

ECO-REGION NW sets a new standard for analysis of waste minimization and resource flows at the regional scale. It provides a 'joined up' information system with a series of performance benchmarks for waste minimization and resource productivity.

The project makes links between waste / resource flows, and economic activity in production and consumption. It also makes links between waste / resource flows and productivity at different scales from the region to the sector, firm, consumer and product levels. It aims to develop a regional pilot package as a template for wider application across the UK.

Below is a summary of the main types of applications to various sectors in policy, business and research. Further details are in the project Work Programme Sept 2003 v1.0)

Economic development: NWDA

Environmental assessment of economic trends and strategies:

- Enhancing & extending the Environment Agency 'resource productivity' model
- Providing a set of 'balance sheets' for resources, energy, landuse etc, as an essential component of the regional intelligence.

Resource productivity benchmarks & business reporting

- Development of advanced business environment reporting systems as a model for promoting business competitiveness etc.
- National / regional comparisons of performance benchmarks by sectors
- Linking resource productivity benchmarks to regional data & regional policy issues

Sectoral sustainability strategies for clusters

- Provides detailed information base for developing & monitoring sectoral strategies.
- Enables comparison of national / regional sectoral performance benchmarks

Appraisal methods and tools

- Provide detailed database & contextual trends, as a baseline for SEA and integrated appraisal
- Application of modelling system directly to appraisal tasks

Integration of economic with other strategies

- Developing detailed information which links economic with other strategies, via economy-environmental modelling system.
- Providing an 'ecological footprint' measure as one potential indicator in the Vital Signs framework.

Environment / spatial strategy: NWRA

Action for Sustainability framework

- Developing detailed information which links economic with other strategies, via economy-environmental modelling system.
- Detailed database which informs an integrated 'communications framework' for the AfS indicators systems.
- Providing an 'ecological footprint' measure with policy implications, as one potential indicator in the Vital Signs framework.
- Benchmarks for sectoral performance as part of the AfS framework
- Benchmarks for lifestyle & product performance as part of the AfS promotions campaign.

Environmental assessment of regional strategies:

- Enhancing & extending the Environment Agency 'resource productivity' model towards spatial development options
- Providing a set of 'balance sheets' for resources, energy, landuse etc, as an essential component of the regional information system for AfS.

Appraisal methods and tools

- Provide detailed database & contextual trends, as a baseline for SEA and integrated appraisal
- Application of modelling system directly to appraisal tasks

Waste management strategy:

These have been discussed with Merseyside Waste Disposal Authority, as project sponsors, and also with Greater Manchester Waste Disposal Authority.

1. Application of the Eco-Region NW to sub-regional waste strategy

These are general issues arising:

- The Eco-Region as a whole is designed as an enhanced information / intelligence for waste / materials management and assessment. Therefore it should have practical value to the GMWDA.
- There are many policy pressures which are leading WDAs and others towards a more comprehensive data system and analysis of their operations.
- To persuade the public and businesses to engage in recycling / minimization, concepts such as the 'ecological footprint' have great potential.
- The Eco-Region project is also working closely with the 'REWARD' system of the Environment Agency, which is building a detailed economy / waste model for the NWDA and other RDAs. The REWARD system and the Eco-Region system are very complementary, and together offer greater added value.
- The Eco-Region Workstage 3 is specifically focused on analysis of the

waste and materials management industry, with components as outlined below.

2. Analysis of county / urban / rural profiles (WP 3.1)

A breakdown of the mass balance and waste ratios of the five counties / other city / rural divisions will be calculated in a series of 'satellite accounts'. This will allow comparisons to be made for the various components of the ecological footprint.

- comparison of 'top-down' regional / UK data, with 'bottom-up' local / county data on waste arisings.
- Detailed 49 sector breakdown of waste arisings from industry groups, and comparison with regional & GM data on C&I, and C&D waste.

3. Mass balance of waste & materials management (WP 3.2)

This again combines and compares top-down and bottom up data for the region and sub-region where possible:

- major waste streams such as paper / board, food / organic, metals and glass:
- major waste-producing industries, such as water or agriculture:
- waste disposal options i.e. landfill, incineration, composting:
- other impacts of waste management, such as land-use or transport.

4. Ecological footprint of waste / materials management (WP 3.3)

This produces a series of generic regional and sub-regional factors showing the aggregated environmental impacts:

- Basic footprint factors for waste streams
- Comparative footprint data for different disposal / transportation options

5. Strategic assessment of waste arisings (WP 3.4)

A typical regional waste management study tends to assume in the absence of further evidence, constant growth rates (2-3% per annum) in waste arisings. One major contribution of the Eco-Region project will be to assess alternative rates of growth in waste arisings of different types. This will use the integrated economy-environment modeling system from Workstage 5, to generate alternative economic development paths, with a range of values for the waste arisings coming from them. Such waste arising trajectories will generally be subject to the following variables:

- Sectoral shift
- Technological change
- Waste management practices
- Consumer lifestyles
- Shift in balances of imports / consumption and exports / production

Lastly the implication is that such waste arisings are subject to influence by policy at the local, regional and national levels. This offers the potential to take strategic waste management options to a much greater degree of policy engagement, where economic development, spatial strategy, infrastructure and environmental policy are all part of an integrated picture.

6. Assessment of waste management options (WP3.5)

The particular contribution of the Eco-Region, as above, is to provide greater resolution and clarity on cross-cutting issues:

- Potential for coordination of economic development / spatial development strategy with waste management options:
- Linking the regional level with greater detail on specific sectors, e.g renewable energy sources, housing construction etc.
- Potential for critical mass by coordination between waste streams for municipal, commercial / industrial, construction / demolition wastes
- Assessment of special waste streams in the light of regional economic development e.g. tyres, vehicles etc.

7. Waste management information systems (WP 3.6)

There are many possible applications of a sub/regional mass-balance / footprint database to existing waste management practices. Some of the most common applications would include:

- Analysis by stock-flow modelling of common material types in the waste stream. For instance, the number of end of life fridges or vehicles, can be calculated with a regional spreadsheet-based model of stocks, new consumption, lifetime, recycled fraction and annual arising to waste.
- Analysis by material composition of common material types. For instance the fridges or vehicles are listed in the consumption database with approximate material composition, import fraction, distance traveled, overall ecological footprint etc.
- Analysis by social groups of the likely level of waste arisings from each ward / postcode profile
- Application of the footprint component data to the strategic waste options. For instance, the relative merits in footprint of transporting cullet for recycling can be compared against the financial costs and benefits.

Within this project it will not be possible to research every possible question. However there is a value in demonstrating a data framework with available data, which then serves to facilitate further development and research.

8. Current issues for MWDA / GMWDA

a) Existing business-environment schemes with existing / potential links to Eco-Region:

- EnWorks
- REMADE
- Construction – green procurement initiative

b) Interaction between C&I and MSW.

- Increasing use of civic amenity sites by commercial sources

- Growth area – bulky household waste where there is more potential for recycling / remanufacturing
- Need to develop C&I processing capacity to offer more flexibility, which can then help to justify large investment for MSW with uncertain future volumes.
- Upgraded data systems are now being developed, the WCA levy is now for the first year being managed on tonnage basis.
- NW Waste strategy – contrasting approaches. Merseyside going for MBT, GMWDA favouring recycling / composting. Technical questions on RDF, whether MSW could be fed to existing incinerators.

Construction sector applications: BRE

a) construction activity impacts of economic trends and policies:

- Economic modelling of future scenarios for construction activity, to be explored in the light of environmental policies, pressures & limits
- a set of 'balance sheets' for minerals, aggregates, energy, landuse etc, to highlight the implications / assessment of construction activity.
- Strategic assessment of environmental pressures from alternative construction technologies & methods, compared against the regional economy / environment.

b) Resource productivity benchmarks & reporting

- Development of advanced business environment reporting systems in the construction sector (one of the targeted sample sectors).
- National / regional / firm level comparisons of performance benchmarks in construction sector

- Linking resource productivity benchmarks to regional data / indicators & regional policy issues in the construction sector.

c) Appraisal methods and tools

- Provide detailed database & contextual trends, as a baseline for SEA and integrated appraisal of construction activity at the regional scale e.g. effect of regional planning guidance, transport strategy, flood defences etc.
- Develop applications of the integrated modelling system directly to appraisal tasks
- Providing an 'ecological footprint' measure of the construction sector / construction technology with alternative options & scenarios.

Research programme applications

There is substantial added value and innovation of the Eco-Region project in relation to a wider research agenda:

- Regional level analysis of economy-energy-environment interactions through an integrated model. The regional level offers in many ways a closer connection than the national, to users, policy choices, industrial clusters, social implications, land-use implications etc.
- The prototype of the integrated model is at present under development on a parallel project in the SE region. This includes
 - the regional economy-environment IO model:
 - a large database on consumption of goods and materials, resource flow, embodied energy and ecological footprint:
 - a set of regional energy and resource balances

- an 'activity' model designed for scenario choices and policy inputs.

- In the North West prototype, the Eco-Region is being designed as an interactive web-based platform, geared to benchmarking of energy-environment / resource productivity performance. This kind of 'interactivity modeling' is, from experience, of much wider interest than scenario modelling for its own sake. The particular features include:

- identifies performance benchmarks in production by industrial sector: and in consumption by final demand sector (using 'multiplier' technique in the IO framework).
- uploads and reports on firm level data to compare in benchmark format, and provides signposts to risks and opportunities.
- Disaggregates performance benchmarks by consumer product and material.
- Uploads and reports on consumer level data to compare in benchmark format.

This interactivity and linkage to 'bottom up' data then offers a wider frame of reference than that of 'expert-driven' or top down modelling efforts. In particular it would have the following advantages:

- Real time tracking of the rate of innovation & eco-efficiency in firms and products, (drawing from a case study of the business-environment programme for 4000 firms in Merseyside).
- Direct connection to regional policy & programmes on innovation, clusters, training, infrastructure etc.
- Direct connection to household / consumer performance, consumption patterns and preferences for a wide range of specific goods and products.
- This material can then be fed back into model parameters suitable for scenario development: e.g. the rate of technological efficiency change, rate of household consumption change etc.

Overall, such an approach to interactivity modelling extends the **scenario** methodology of relatively limited application, towards that of **'foresight'**: i.e. linking together future studies, strategic planning and stakeholder capacity building.

Linkages to UK / EU research

Several collaborative linkages may be relevant and are under discussion:

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- Tyndall Centre – energy/ economy modelling at EU / national / local / sectoral scales:
- Environment Agency WRERP (resource productivity) project: this is already providing some modeling and data, but there is scope for further development.

- EPSRC Sustainable Urban Environment Programme
- ESRC Sustainable Technologies Programme
- EU Framework 6: various themes

The Eco-Region could potentially provide to these various programmes:

- Provides regional level to a global / national modelling programme
- Provides bottom up data from firms and sectors
- Demonstrates the value of an 'interactivity modelling' approach to decision support systems
- Potential spin off material for advanced modelling in decision analysis, social simulation, agent-based modelling etc.