Local and regional authorities promoting resource efficiency

The file note was written by
Progress Consulting S.r.l. and Living Prospects Ltd
It does not represent the official views of the Committee of the Regions.

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Catalogue number: QG-30-13-381-EN-N
ISBN: 978-92-895-0693-9
DOI: 10.2863/76656

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1. Introduction

1.1 Background

The demands created by a rising world population and growing global economy are placing increasing pressure on natural resources such as air, water, soil, ecosystems, and raw materials. Resource efficiency, intended to be '*producing more value using less material and consuming differently*' (EC, 2011), could help in handling current resource scarcity problems, in particular through: developing new products and services that require less input and have less impact on the environment; changing consumer attitudes and consumption patterns; developing new solutions for waste minimisation, for example by reusing, recycling, and reducing waste volumes; improving resource stock management; optimising production processes; and improving the transport and distribution of goods.

The 'Resource-efficient Europe' flagship initiative, launched by the European Commission in January 2011, is intended to boost sustainable growth by supporting the shift towards a resource-efficient and low-carbon economy. Economic growth must be decoupled from resource and energy use by means of CO_2 emissions reduction, energy security promotion and resource intensity reduction vis-à-vis current usage and consumption. The initiative provides a long-term framework for action, supporting policy development in relevant areas such as agriculture, climate change, environment, energy, transport, industry, fisheries, and regional development, with the aim of ensuring that policies incorporate resource efficiency considerations. Among the expected benefits are: increased economic opportunities, improved productivity and reduced costs; stimulation of technological innovation and employment; sustained EU trade; benefits to consumers through the provision of more sustainable products; support in dealing with climate change and achieving GHG reduction targets; protection of the environment and improvement in the quality of life; reduction of reliance on fossil fuels and raw materials; and improvements to Europe's supply security and its resilience with respect to global economic crises.

There is currently an effort to expand the knowledge base on resource efficiency. Besides the recently concluded EC consultation on the 'Roadmap for a resource-efficient Europe', in November 2010, the European Environment Agency (EEA) initiated a survey among the EEA member and cooperating countries to gather information on policies, targets and indicators related to resource efficiency, as well as priorities, main policy drivers and information needs. The preliminary findings of this consultation are reported in B.1.

B.1 Preliminary findings of the EEA survey on resource efficiency policies and instruments

Lack of clarity of terminology and underlying concepts

There is no standard definition of 'resources' and 'resource efficiency' across countries, nor is there a common understanding of the terms. Only a few countries formally define the term 'resources' in their policies. 'Resource efficiency' is often considered equivalent to 'sustainable use of resources' or 'minimising use of natural resources'. The borderline between resource efficiency, sustainable consumption and production (SCP), green economy, and sustainable use of resources is not well defined.

A cross-cutting policy area

'Resource efficiency' is addressed in several policy documents, from sustainable development strategies to environmental or SCP action plans but also within climate change strategies and economic reform programmes. Very few countries have dedicated policy strategies for resource efficiency. Holistic or integrated approaches are, on the other hand, becoming more frequent. Resource efficiency is mostly considered with regard to the energy and waste sectors.

Strategic objectives and targets

'*Strategic objectives for resource efficiency tend to be fairly general in nature, most often referring to ensuring sustainable use of natural resources; improving energy efficiency; increasing recycling of waste; and waste prevention or decoupling waste and growth. Other fairly common objectives include sustainable management of minerals; improving resource efficiency; reducing energy use; increasing the share of renewable energy; improving water quality; reducing the use of water; and protecting biodiversity*'. Some countries like Austria, Denmark, Germany and Italy also foresee, within their strategies, a quantitative reduction of resources used. Measurable targets are mostly set for '*waste, energy use and efficiency, reduced GHG emissions, reduced water use, and land use for organic farming*' or for high-impact sectors such as construction, transport and food. Several of these targets are driven by EU requirements and, often, policy initiatives are also a response to the Europe 2020 strategy.

Source: EEA (2011)

1.2 Scope of the file note

The Committee of the Regions (CoR) has already undertaken extensive work on some aspects of resource efficiency related to energy and the low carbon economy, as well as sustainable water management. This file note is aimed at providing complementary background information on the smart use of other resources, such as natural resources and waste, by local and regional authorities (LRAs), and on the adoption at the local and regional level of instruments supporting the absolute decoupling process of resource use and growth, such as the application of the 'ecological footprint' and of environmental accounting. In particular, this background research is intended to support the analytical review of the forthcoming 'Roadmap for a resource efficient Europe', expected to be released by the EC in summer 2011; the drawing up of an Opinion by the CoR on the EC Communication 'A resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy' (COM (2011) 17 final), expected to be adopted at the CoR plenary in October 2011; and the preparation of a workshop within the 2011 Open Days, that will be held in Brussels from 10 to 13 October, 2011.

1.3 Methodological notes

This file note is based on desk-work. It provides an overview of different types of local and regional initiatives in the three main areas of: (i) efficient use of biotic resources; (ii) promotion of sustainable consumption and production (SCP); and (iii) decoupling of resource use from growth. Initiatives outlined include, but are not limited to, those categorised in the literature consulted as 'best practices'. A brief analysis of the main types of initiative identified is provided for each area. Actions limited to energy efficiency or water efficiency were not taken into consideration.

Initiatives by LRAs were identified with some main categories in mind that also take into account the categorisation of policy outlined by the EC in the consultation on the Roadmap for a resource-efficient Europe[1]: (i) education and training of consumers, entrepreneurs and workers to raise awareness of resource-saving opportunities, including information tools (e.g. resource footprint information); (ii) binding regulations and standards (e.g. efficiency standards, eco-design requirements, compulsory resource accounting and reporting, compensation obligations for damage to ecosystems and for the sealing of soil, strict requirements for waste disposal and recycling); (iii) mandatory long-term targets and policy targets laid down in local and regional strategies for sustainable development; (iv) market-based instruments and incentives for businesses and citizens to use and consume less, re-use and

[1] http://ec.europa.eu/environment/consultations/roadmap_re_en.htm

recycle; (v) financial support for resource-efficient investments and for resource-efficient infrastructures, including through EU funds; (vi) access to credit for waste management and other sustainable products and services for households; (vii) eco-friendly public procurement to develop the market for resource-efficient products and services; (viii) Support to R&D on new technologies.

2. Efficient use of biotic resources

Europe relies heavily on natural resources, both abiotic and biotic, which, while sustaining economic growth and employment, are also vital to ecosystem health and quality of life. Technological advances and the shift to service-based economies in the past two decades have resulted in better efficiency of production processes with respect to resource use. Nevertheless, the use of natural resources and the related impacts on the environment are on the increase (EEA, 2010).

Initiatives promoting the efficient use of biomass and ecosystems are very diverse and are difficult to categorise clearly as strictly embedded in energy- or construction-related developments, in SCP patterns; or in 'incentive' schemes such as the payment for ecosystem services (PES).

Biomass is at the core of bio-energy production. Some countries such as the Netherlands do not have enough biomass resources and rely on imports, but in general biomass is expected to be used where it is produced, creating synergies and production-consumption chains, sometimes based on agricultural or animal rearing by-products.[2] The biomass market is still at a relatively early stage of development, making awareness-raising and (fiscal or financial) incentives as well as the active participation of both the public and private sector, important for its local development. Biomass production may conflict with food production; but also the efficient use of resources and the related diffusion of renewable energy sources (RES) may pose serious challenges to territorial planning at a local level and where the 'landscape' is an important resource, as highlighted by the ENNERSCAPE project.

The practice of compensating measures and payments for encouraging ecosystem-related services, such as biodiversity, is becoming frequent. Eco-account schemes are being used in several German regions where an eco-points trading system has been implemented. In Sweden, the City of Gothenburg applies a 'compensation tool' at the planning stage that measures the compensation due by developers where biological value is removed. In Spain, the Autonomous Community of Extremadura has set an eco-tax whose revenues are re-invested in municipalities with less than 20,000 inhabitants and where

[2] Sustainability criteria for solid biomass were not identified in the Renewable Energy Directive (2009/EC/28), and the topic is thus still currently being debated. Countries importing biomass are usually in favour of such criteria, while countries mainly relying on domestic production of biomass would consider such criteria to be an additional administrative burden, creating unfair competition with fossil fuels (BAP Driver Project, 2010).

more than 50% of their territory falls within Natura 2000 sites, which thus face more barriers to land development.[3]

With regard to soil resources, there is pressure from increased use of land for new buildings and infrastructure (artificial surfaces). It has been estimated that over 50% of land taken up by artificial areas, or about 2.3% of the total land area, was actually sealed in 2006, with the situation being particularly severe around large cities and in the Mediterranean area. The percentage of soil sealing exceeds 5% of the land in Malta, the Netherlands, Belgium, Germany and Luxembourg.[4] Several LRAs are concentrating their efforts on limiting urban development on virgin land (greenfields) by reusing already developed land (brownfields). Initiatives range from the creation of independent re-development agencies, active at the regional and local levels, to the establishment of public-private partnerships for urban regeneration projects, and of covenants or contracts between LRAs and developers upon the selling of public land.

Many LRAs have established binding regulations and policy targets. Most targets generically address the protection of natural resources and are qualitative in nature. LRAs are also making use of market-based instruments to promote the sustainable use of natural resources. However, where instruments exist, such as Dresden's Soil Compensation Account, their uptake remains uncertain due to the possible reaction of land developers.

Finally, there is evidence that at the local level, holistic or integrated approaches to a more efficient use of resources are also being undertaken, as is the case of the BETRE partnership in the UK.

[3] This information was provided by the corresponding local authorities in connection with the consultation on the Assessment of Territorial Impacts of the EU Post-2010 Biodiversity Strategy, launched by the Committee of the Regions on 9 September 2010.

[4] *Umweltbundesamt* (2011), EEA (2011a).

Table 1 - Examples of initiatives by LRAs on the efficient use of biotic resources

Business Excellence Through Resource Efficiency (BETRE) – East Sussex County Council (UK)
BETRE is implemented through a collaborative partnership set up in 2001 and including, among other partners, all local authorities in East Sussex. BETRE provides a range of free support and advice to East Sussex small- and medium-sized businesses, in particular on how to '*cut utility costs, environmental impact and work towards a low carbon economy*'. Since 2003, over 1,100 businesses in East Sussex and Brighton have been advised on energy and water savings and on reduction of waste being sent to landfill, for an estimated £1m of savings per year. In particular, savings totalled: 2,360 tonnes of waste diverted from landfill; 7.4 million kWh less energy used; and 39,000 m^3 of water saved. In 2005, the programme won a national Green Apple Award.
Source: BETRE website
EFA Toolbox (PIUS-Check and PIUS-*Finanzierung*) – Efficiency Agency of North Rhine-Westphalia (DE)
The Efficiency Agency of North Rhine-Westphalia (EFA NRW) provides guidance to manufacturing SMEs on organisational and technical measures for the improvement of their resource efficiency. The EFA Toolbox includes, among other tools, the PIUS-Check audit and the PIUS-*Finanzierung* programme. The Pius-Check audit enables analyses of the relevant material flows and current levels of production technology and makes recommendations for potential improvements; the tool has been reported to have been particularly successful in introducing cleaner production in the metal and food processing industries. The PIUS-*Finanzierung* programme provides guidance to SMEs on financing projects aimed at improving their resource efficiency.
Source: EFA Effizienz-Agentur NRW website
BIOPTIMA International Fair of Biomass and Energy Services – local authorities of the Province of Jaén, Andalusia (ES)
The event, held every two years, has become a reference forum for renewable energies in Europe, in particular with regard to biomass and energy efficiency. It is the result of public and private collaboration, with significant involvement

of local authorities (at municipality and province level). The fair has the twofold aim to: (i) '*promote the development of a consolidated biomass market, especially agricultural biomass*'; (ii) '*become the benchmark for biomass and solar energy in southern Europe, being the meeting place for producers and suppliers of equipment, technicians, installers, engineers, consultants, universities, research centres, utilities and consumers of energy*'.

Source : Timber Project – Report on Best Practices

Eco-labelled district heating and district cooling at Norrenergi – cities of Solna and Sundbyberg & Igelsta CHP-plant, the largest biofuelled co-generation plant in Sweden – cities of Södertälje, Huddinge and Botkyrka, Stockholm County (SE)

Norrenergi is an energy company owned by the cities of Solna and Sundbyberg, and the Swedish Society of Nature Conservation. In 2008, it was awarded the Swedish Society of Nature Conservation's 'Good Environmental Choice' eco-label. The company produces 1 TWh of district heating per year, 56% of which is derived from large heat pumps that use residual waste water as a heat source (as well as other fuels including: bio fuels for 27%, tall oil pitch for 13% and fossil oil for 2%). The eco-labelling process has resulted in improved competitiveness, a strengthened brand, more environmentally friendly requirements for fuel contractors, and motivation to explore other recycling processes such as the use of wood ash. The Igelsta CHP-plant, also in Stockholm County, was inaugurated in 2010 by Söderenergi, an energy company controlled by two companies belonging, respectively, to the city of Södertälje and the cities of Huddinge and Botkyrka. The plant, with a capacity of 200 MW heat, enough to heat 50,000 houses, and 85 MW electricity, enough to power 100,000 homes, is highly efficient as it uses some 70% of the heat produced and uses as its main fuel '*forest waste, i.e. wood chips from branches and tops*'. This is considered a good example of a resource-efficient way of using biomass.

Source : Timber Project – Report on Best Practices

Wood Innovation Centre – ten municipalities in Upper Styria (AT)

This initiative is a good example of innovation and business development driven by local authorities taking advantage of the potential of locally available raw material: wood biomass. The project idea started in 2001 when ten municipalities, located in the 'Styrian Pine Tree Land', joined forces to sustain their wood-based economies, including the maintenance and creation of jobs. By realising that individual municipalities may not have sufficient

land at their disposal, especially in the wood business where large plots are needed, they took advantage of the 2001 LEADER programme and started working on a common *Holzinnovationszentrum* – HIZ (Wood Innovation Centre), the construction of which was completed in 2007. An 'Impulse Centre' extension was also added to the innovation centre in 2007. The aim of HIZ is '*to benefit from the enormous future potential of the raw material wood*' and '*to maintain and generate added value through innovation, promotion and networking*'.

Sources: HIZ website; Sustainable Mountains project (2008)- RES and RUE Stimulation in Mountainous - Agricultural Communities towards Sustainable Development

ENNERSCAPE Interreg MED project – among the partners are the following authorities: Lazio Region (IT), Prefecture of Magnesia (EL), Province of Vercelli (IT), Junta de Andalucía (ES)

Implemented under the Interreg IVB MED Operational Programme – Cohesion Policy 2007-2013, the project aims at investigating how the irregular but growing spread of Renewable Energy Sources (RES) may remain compatible with landscape and heritage preservation. Taking into account best practices and normative solutions, the project will identify an assessment method and rules for introducing the perspective of environmental-landscape safeguards into energy and territorial planning, further to the development of RES. The project is co-funded (85%) by the ERDF; national funding covers the remaining 15%.

Source: ENNERSCAPE website

The Farm Resource Efficiency Programme (FREP) – Yorkshire Forward, the regional development agency for Yorkshire & Humber (UK)

'*FREP is a small capital grants programme designed to help farmers improve the overall economic performance of their holdings*' through '*the introduction of new technology to promote energy, manure and water resource efficiency*'. The funding is for buying capital equipment benefiting both business and environment; it covers from 50% to 60% of eligible costs and ranges from £1,500 to £25,000.

Source: FREP website

Circular Land Use Management and Circular Flow Land Use Management – Duisburg and Stuttgart municipalities (DE); local and regional authorities from CZ, DE, IT, PL and SK are involved in the CIRCUSE project.

Circular land use management is an integrated policy and governance approach to land use, aimed at increasing the reuse of derelict land (brownfields) and reducing the consumption of virgin land (greenfields) for urban development. It is based on the principle 'Avoid-Reuse-Compensate'. The approach was tested in several areas in Germany, including in the cities of Duisburg and Stuttgart over the period 2003-2007, in the context of a research project funded by the German Experimental Housing and Urban Development Programme. Based on the same concept is the Circular Flow Land Use Management (CIRCUSE) project, the aim of which is to develop an integrated land management and governance approach for the sustainable use of land, promoting employment and increasing investment in urban areas. CIRCUSE (2010-2013) is implemented through the Central Europe Programme and co-funded by the ERDF.

Source: Umweltbundesamt (2011)

Eco-account systems – several German regions, such as Hessen and Schleswig Holstein (DE);Vienna municipality and the Lower Austria region (planned) (AT)

The German national nature conservation law (2002) requires compensation measures in cases of important land development works, such as large infrastructure projects, to compensate for soil and biodiversity losses. In this context several German regions have introduced eco-account systems, based on eco-points and eco-point trading. Developments subject to compensation measures are assigned eco-points depending on the losses that they generate. These losses have to be compensated by measures of equal eco-point value. Eco-points are traded by compensation agencies, which also carry out the compensation measures. In total, 21 agencies have been established in Germany, such as the *'Ökoagentur für Hessen*' in Hessen and *'Ausgleichsagentur*' in Schleswig Holstein. A similar approach, the 'Landscape Account', will be tested in Austria by the Vienna municipality and the province of Lower Austria, with regard to the extension of the Vienna airport.

Sources: HLG Ökoagentur für Hessen website; Ausgleichsagentur SH website

Soil compensation account (‘*Bodenausgleichskonto*’) – City of Dresden (DE)

In 2002, the Dresden municipality, Saxony, introduced the Soil Compensation Account, which, in contrast to the eco-account scheme, is specifically focused on the ‘de-sealing’ of derelict areas. New developments are required to adopt de-sealing measures in other areas within the city boundaries to compensate for new land being developed. Developments in the inner urban area are usually exempted from compensation measures, in order to favour developments in the inner city and combat urban sprawl. Developers have the option of either carrying out the compensation measures or paying a compensation fee to the municipal environmental authority that is then responsible for the implementation of de-sealing projects. The compensation fees are relatively high, amounting to approximately EUR 20 per m² of de-sealed soil. The scheme is reported to have been successful: in the period 2000-2009; an average of some 4 hectares per year has been ‘de-sealed’ within the city boundaries. However, the future of this mechanism is uncertain, as it is reported to have been often perceived by investors as a barrier to economic development and employment.

Source: Umweltbundesamt (2011)

Brownfield Recycling Award – Baden-Wurttermberg State (DE)

The award is granted every two years to the best projects for the redevelopment of brownfields in Baden-Wurttemberg. The competition, launched and supported by the Baden-Wurttermberg Ministry for the Environment, Nature Conservation and Transport, together with other associations of professionals, cities and municipalities, is already in its third round; in 2006 and 2008 good illustrative examples of land recycling and opportunities were highlighted, in particular with regard to the mutual benefits achievable by the different actors involved – investors, local authorities, and planners. Participation is open to local authorities, community representatives and municipal associations, private investors, development companies, architects, town planners and engineers. The City of Stuttgart won the Award in 2010. The award is expected to increase awareness among professionals of the need to recycle derelict land.

Sources: Umweltbundesamt (2011); Ministerium für Umwelt, Klima und Energiewissenschaft Baden-Württemberg website.

The Danube PES project – among the partners are Ruse Municipality, Tzenovo Municipality, and Dolna Mitropolija Municipality (BG)

The project '*introduces economic incentives – payments for ecosystem services – to help land managers in the Lower Danube to sustain the typical benefits we get from nature in the river basin*'. Implemented by the WWF Danube-Carpathian Programme, with funding from the GEF through UNEP, over a 48 months period (January 2010 - December 2013), expected results include the development and promotion of PES and other Sustainable Financing schemes in Bulgaria and Romania.

Source: WWF website.

'Local Energy Concept' – Kocevje municipality (SI)

According to the 'Local Energy Concept', by the end of 2014 Kocevje municipality could be the first CO_2-neutral community in Slovenia for the production of heat and electricity. Heat will be produced from wood waste, biomass, and communal waste. Implementation of the concept in terms of construction activities is ongoing, alongside awareness-raising, counselling and bookkeeping training. This is considered to be an example of precise determination of the potential of unused renewable sources at the local level, followed by the development of a plan for the project execution.

Source: Energie-Cités, Fact Sheet 2009

A recently published report prepared by the *Umweltbundesamt* for the European Commission, DG Environment, provides several examples of interventions by LRAs with regard to the reduction of soil sealing. Some of these interventions have been categorised and presented in B.2.

B.2 Best practices for reducing soil sealing at the local and regional level

Below are highlighted major types of intervention for a more efficient use of the resource 'soil', mentioning some examples of each type.

- *Public-private partnerships for brownfield redevelopment and urban regeneration*

In several EU countries public-private partnerships have been established at the regional and local levels for the regeneration of previously developed and derelict land (brownfields), for example in the context of land development and regeneration agencies (Czech Republic, France, Poland, United Kingdom) or brownfield covenants (Flanders Region, BE).

- *Binding standards to limit the increase of land covered by artificial surfaces and soil sealing in municipal master plans*

Several municipalities in Italy have adopted master plans including quantitative targets to limit artificial surfaces in new developments. Examples include: the municipalities of Brescia (requirement for a minimum percentage of permeable green areas ranging from 15% to 35%), Padova and Parma (minimum standards for surface permeability according to land use). These targets are, however, mainly aimed at reducing hydro-geological risks rather than at preserving the soil resource.

- *Qualitative and quantitative soil sealing targets*

Qualitative targets to limit the amount of soil sealed in new developments exist in several regions in the EU such as in Hovedstaden and Sjælland (DK), in the Øresund region (association between Hovedstaden region, DK, and Skåne region, SE), and in Saxony (DE) within the Land Development Plan. An association of 29 municipalities in the Vorarlberg Rhine valley (AT) has agreed on an integrated approach for the Rheintal region with a focus on the reduction of soil sealing. Finally, the municipality of Dresden (DE) has defined a long-term quantitative target which limits to 40% the share of land used for settlements and transport infrastructures; in order to achieve this target, a 'soil compensation account' mechanism has been established (see detailed description in Table 1).

- *Binding provisions in contracts between local authorities and land owners*

The practice of including binding provisions in contracts between municipalities and buyers upon the selling of public land is being used in seven Austrian provinces. The contracts may include provisions for future land use, and the timeframe for development. This instrument would

B.2 – continued

supposedly help reduce new developments on greenfields.

- *Other initiatives aimed at reducing developments on greenfields*

In the province of Tyrol (AT), a scheme is expected to reduce new developments on greenfields through public funding earmarked for the renewal of existing housing stock. In 2009, 60% of the projects funded were renewal projects. In the province of Upper Austria (AT), the inter-municipal business locations programme requires municipalities to work together to develop and advertise a common commercial location, avoiding the development of commercial settlements on greenfields and increasing the reuse of derelict land. The 'Pilot project to reduce the consumption of land by activating the potential within the community', in Baden-Wurttermberg (DE), provided funds to local authorities for activities aimed at avoiding urban development on greenfields; the project covered 13 towns in Baden-Württemberg over the period 2003-2008, with funds ranging from EUR 0.6m to 1.5m for each town.

3. Sustainable consumption and production

Our high-consumption lifestyles drive Europe's consumption and production patterns and are responsible for the high usage rates of natural resources and the high levels of waste generation. Waste generation remains a concern despite waste management improvement across the EU resulting from increasing recycling rates and decreasing amounts of waste sent to landfills. The need to reduce the amount of waste generated in the different waste streams can be addressed through waste prevention or re-use and recycling of waste or by favouring products with low environmental impact throughout their life-cycle, for example by means of green public procurement (GPP). LRAs support relevant initiatives in this sense both with regard to households and businesses, as evidenced by the Scotland's Zero Waste Programme, the Local Authority Prevention Network in Ireland and the Intermunicipal Waste Management initiative in Greater Porto. Many LRAs are implementing green public procurement schemes covering a variety of products and services, including forestry products and furniture. There is also evidence of some schemes that include quantitative targets and resource efficiency-related criteria in their procurement policy.

A recent report from the EEA highlights how, in 2005, three main consumption areas, namely (i) eating and drinking, (ii) housing and infrastructure, and (iii) mobility, were responsible for most of the material input and emissions of greenhouse gases, acidifying substances and tropospheric ozone precursors caused by activities related to consumption in Europe (EEA, 2010). Resource use and pressures on the environment can therefore be reduced by improving, for example, the energy and water efficiency of homes and buildings, or by switching from private to public transport, i.e. changing behaviours. In fact, several of the initiatives by LRAs have the aim of increasing consumer awareness of consumption and production matters, by highlighting the opportunities and benefits of sustainable patterns, or through information campaigns encouraging the use of low resource intensity products or purchasing behaviours. Some such initiatives are specifically targeted at school pupils.

Campaigns may focus on single products (for example, bottled water), recycling or re-using schemes, often linked to solidarity scopes, or 'no thanks' campaigns aimed at preventing waste, as in the case of paper advertisement. Many initiatives target individual or community composting, often linked to organic farming. Examples of discouraging waste production by applying the 'pay-as-you-throw' principle were also identified.

LRAs are also concerned about sustainable building and construction and in implementing sustainable housing programmes, with the purpose of promoting standards for buildings and sustainable urban neighbourhoods. Examples include the eco-districts in Malmø (Sweden) and the subsidies for passive housing construction/renovation in Brussels Capital Region (Belgium).

In general, it seems that market-based instruments and mandatory long-term political targets to support SCP as well as financial support for resource-efficient investments at the local and regional level do exist but are not so frequent if taken independently from support for energy and water efficient devices and measures (support for passive houses is an explanatory case in this sense). An example of a local authority setting quantitative targets is the Chambery Metropolitan area (FR), which, in line with the national objectives set in 'La Grenelle 1' (law of 3/08/2009), aims at reducing its waste generation by 7% by 2014 as compared to its 2009 baseline.[5]

Table 2 – Examples of initiatives by LRAs on the promotion of SCP

Scotland's Zero Waste Programme – Scottish Government (UK)
The programme was created to support the delivery of the Scottish Government's Zero Waste Plan; it is managed by the Waste & Resources Action Programme (WRAP) on behalf of the Scottish Government. Among the policy targets of the plan are: (i) development of a waste prevention programme; (ii) 70% recycling and composting for all waste (from businesses or households) by 2025; (iii) introduction of landfill bans for certain types of waste, to avoid losing the value of these resources; (iv) implementation of education and awareness-raising campaigns; (v) development of incentive schemes to improve recycling rates. The programme functions as a one-stop shop to support businesses, communities, individuals and local authorities in reducing waste, recycling more and using resources in a sustainable manner. Within the programme, the following are available: advisory services, undertaking of campaigns, support to voluntary waste reduction agreements (such as the 'Halving Waste to Landfill' voluntary agreement by the construction industry), capital investments, tools, research, training and identification of best practices. Under the Zero Waste Scotland Food Waste Programme £4m is being made available '*to support councils and commercial businesses to divert food waste from landfill by developing food waste collection services to provide feedstocks to existing processing facilities*'.
Sources: Zero Waste Plan website; Natural Scotland, Scottish Government, Zero Waste

[5] *Dohogne J.J., Mini waste: Inventory of good practices regarding (bio-)waste minimisation in Europe*

Plan for Scotland.

Local Authority Prevention Network (LAPN) – 12 local authorities across Ireland (IE)

LAPN is a national-level initiative that, nevertheless, provides for a collaborative approach with local authorities '*to deliver resource efficiency and waste prevention initiatives at a local and grassroots level*'. By using the financial resources of the Environment Fund and the technical support of the Environmental Protection Agency and Clean Technology Centre, local authorities implement a wide range of projects including, for example: (i) the 'Supporting Small Business' project of Cork County Council (since 2009), aiming at cost effectively improving the environmental performance of businesses through waste prevention; (ii) the Waste Prevention Schools Competition, run by the Monaghan County Council, involving 21 schools with some 700 students on topics such as sustainable transport, alternative energy, landfills, litter, home composting, environmental attitudes and water quality; (iii) prevention measures in the hospitality and catering sector, by the Wicklow County Council; and (iv) the Galway Waste Prevention Programme by Galway County Council, which has been running since 2006 and has achieved the following results: 16% waste reduction in participating business; 9% reduction in energy consumption by participating business; 18% reduction in water consumption by participating business; 11% reduction in waste arising from households; 9% reduction in energy consumption in households; 12% reduction in water consumption in Galway County Council HQ. The Galway programme also produced several outputs among which, for example, is the environmental guide for businesses, 'Changing Behaviour – Saving Resources'.

Sources: LAPN website; Galway Waste Prevention Programme (2009), Changing Behaviour – Saving Resources. A guide to improving environmental performance in business.

LIPOR – Intermunicipal Waste Management of Greater Porto – 8 partner municipalities (PT)

LIPOR is an association of municipalities established in 1982. It is responsible for the management, recovery and treatment of municipal solid waste produced by the eight partner municipalities: Espinho, Gondomar, Maia, Matosinhos, Porto, Póvoa de Varzim, Valongo and Vila do Conde. Its vision is to become a '*reference organisation, through the exploitation of resources, social responsibility and eco-efficient performance*'. The association has adopted the waste management model: Prevention, Reusing, Recycling (Multi-

material and Organic), Energy Recovery, and Technical Confinement. Waste prevention policy is based on three main implementation areas, all supported by communication/awareness campaigns: (i) changing productive processes for reducing waste at source; (ii) behaviour change; and (iii) reusing. Details of projects are reported in B.3.

Source:LIPOR website.

Reklame nej tak – 12 municipalities in the Hovedstaden Region, including Copenhagen, in cooperation with Vestforbrænding, a Danish waste management company (DK)

The 'Advertising no thanks' campaign is aimed at reducing the amount of paper advertising received by households. It is estimated that some 60 kg of advertising is delivered yearly to each household in the Hovestaden region. Some 40% of households in Copenhagen already participate in the campaign. The scheme is administered by the Danish Post and enjoys the participation of 12 municipalities. The campaign is linked to efforts to reduce waste and CO_2 emissions and invites participants to use the internet to consult advertisements as an alternative.

Sources: Reklame nej tak campaign website; Københavns Kommune website.

Distintivo de Garantía de Calidad Ambiental (DGCA) – Geralitat de Catalunya (ES)

The ecological label scheme was first established in 1994 and extended thereafter. The aim is to provide reliable information to consumers and to promote the design, production, marketing, use and consumption of products and services with high ecological quality and resource efficiency standards. The scheme covers a wide range of products and services, including wood products, paper and cardboard products, water-saving devices, hotels and camping sites.

Sources: Generalitat de Catalunya website; ConsumoResponsable.org website.

Subsidies for passive house construction/renovation and 2011 call for '*Bâtiments Exemplaires*' – Région Bruxelles-Capitale (BE)

Since 2007, the Brussels Capital region has provided incentives for the construction or renovation of passive energy houses and buildings. In 2011, new passive construction was subsidised by between EUR 50 and 90 /m^2 and passive renovation by between EUR 90 and 130/m^2. Additionally, in 2011, the

region re-launched a call for projects '*Bâtiments exemplaires de l'éco-construction et de l'énergie*' (BATEX), with funding of EUR 5m. Projects selected will receive a grant: EUR 10/ m^2 for the planner, with a minimum of EUR 5 000 and a maximum of EUR 100 000 per project; and EUR 90/m² for the project owner, up to a maximum of EUR 500,000 per project. The 2007 call supported 117 projects and resulted in the equivalent of some 265,000 m² of buildings consuming 10 times less energy. Incentives for passive houses are also provided in Austria and Germany.

Sources: IBGE (2011) – Primes énergie 2011; IBGE website.

Eco-City Augustenborg – Malmø Municipality (SE)

The city district of Augustenborg in Malmø has been redeveloped using high environmental standards. Targets for the sustainable use of natural resources have been adopted. These include, for example: recycling, re-using or composting 90% of all waste generated; and cutting total resource consumption, including water and energy, by 20%. The initiative was funded by the City of Malmö and by central government subsidies through the Local Investment Programme.

Source: Union of the Baltic Cities website.

The City of Vienna's cross-departmental procurement programme "*ÖkoKauf Wien*" (Eco-buy Vienna) – Vienna Municipality (AT)

The programme provides tools for green procurement, covering in particular paper, electrical and electronic appliances, construction, vehicles, and food. The programme has been running since 1998 and is mandatory. It is estimated that the city saves at least EUR 17m and cuts about 30,000 t of CO_2 emissions each year, with some EUR 1.5m saved, for example, on a yearly basis for reduced water demand in public buildings. Within the *ÖkoKaufWien* programme, products and facilities to be submitted must respond to specific requirements in terms of environmental friendliness, performance, efficiency, quality, and worker protection. These criteria are binding by decree.

Source: wien.at "ÖkoKauf Wien" - programme for sustainable public procurement

Green public procurement schemes for forestry products and furniture – Madrid and Barcelona municipalities, and the environmental authority of the Basque Country (ES); Cognac municipality (FR)

The Green Public Procurement scheme for Madrid municipality with regard to forestry products, lays down environmental and social criteria for the award of contracts by the City Council. The Barcelona Municipality has adopted a similar scheme, focussing on forestry products. Other examples include the environmental authority of the Basque Country (IHOBE) that applies a GPP scheme for the purchase of furniture; and the municipality of Cognac (FR), which uses a GPP scheme for the purchase of wooden street furniture. Usually, the technical specifications of these schemes include criteria related to the origin of the raw material (the wood should originate from forests managed in a sustainable manner, preferably Forest Stewardship Council (FSC), or equivalent, i.e. certified) or the processing cycle of the material (use of recycled materials and recyclable level of end-products).

Sources: GPP Case studies Sustainable procurement of wood products in Barcelona; GPP In Practice Procurement of green office furniture by Basque Government; GPP In Practice Sustainable wood procurement in Cognac

Copenhagen's waste plan 2008: Copenhagen puts only 3% of waste into landfill – municipality of Copenhagen (DK)

The plan specifies how to reduce waste and improve management. It is renewed every four years and '*covers a twelve-year period to ensure it delivers long-term solutions. It is very flexible and is constantly adapting to input from businesses and the community*'. The principles on which it is based include: (i) less waste must be produced and less hazardous substances should be present in waste; (ii) less waste should go to landfills and incinerators; (iii) the plan must be adapted to needs, must be logical and people should be aware about it. The plan is structured around three pillars: prevention, separation and treatment. Prevention is through information, regulation, reduced packaging and local Agenda 21 projects; separation is through agreements with waste contractors, collection at the source, a 'caretaker scheme', easily accessible disposal sites and local projects; treatment is through incineration, special treatment of hazardous substances, recycling of building waste (85%), and finally landfill for whatever cannot be processed otherwise. The system has reduced CO_2 emissions by 40,000 tons and generated 1,000,000 MWh of additional energy. In addition, the cost of recycling has proved to be cheaper than incinerating waste.

Source: C40 Cites website

Closed Loop Gardening & Re-use Centres in Flanders (BE)

Flanders have a long tradition in promoting home composting, considered a primary way to prevent waste and as such prioritised within the Flemish waste policy. In recent years, the home composting programme has developed into a more articulated 'closed loop gardening' programme. The programme is promoted by the federated level through agreements with and subsidies to municipalities and provinces for implementation at the local level. Households are given the tools for home composting; since home composting decreases the amount of bio-waste left for collection, it contributes to a reduction of the amount due according to the 'pay as you throw' system. Re-use centres represent another priority of the waste policy: they are present all over the Flanders and subsidised by the federated government, and in some cases also by local authorities, to collect, fix and resell products that have been thrown away.

Source: Dohogne J.J., Mini waste: Inventory of good practices regarding (bio-)waste minimization in Europe.

Bio-waste Management and Organic Farming – City of Vienna (AT)

The city of Vienna has created a win-win situation by re-using the biodegradable waste from households for the production of environment friendly compost to be applied in organic farming. Started in the early nineties, the system had to gain public support and commitment and produce high quality compost with low metal content adapted for use in gardens and organic farms. The following results were achieved: (i) diverting some 90,000 tonnes from landfills, equivalent to savings of US$10,000,000 per year; (ii) converting 230 hectares to organic farming; (iii) increasing earthworms, and decreasing diseases in crops; (iv) setting standards for other municipalities. The initiative was started with a municipal grant and is now self-sustained through local taxes for waste collection.

Source: The Eco Tipping Point Projects – Models for Success in a Time of Crisis

'Schnitzelpower', local government support for transport biofuels – Graz City, Styria (AT)

The City of Graz has for a long time invested in the development of integrated bio-energy. In 2003, the transformation of used cooking oil recovered from restaurants and households into biofuels progressively led to the conversion of the city's bus fleet to using 100% locally produced biodiesel both from fatty acid methyl ester and locally grown rape seed oil (although fossil diesel is

added in winter to improve performance). The taxi fleet also started turning to biodiesel and filling stations were opened. In practice, the initiative follows a closed loop as raw material is either collected from households and restaurants, with no costs, or grown by local farmers involved by the city, is then distributed and finally re-used locally through public transport (end-user).

Source: Biofuel Cities European Platform – The Graz case

The Mayor's Draft Municipal Waste Management Strategy – City of London (UK)

The Mayor of London's Municipal Waste Management Strategy is an example of a comprehensive policy framework proposing targets and indicators to measure progress in the medium- and long-term. Growing concerns on climate change and the rising cost of landfill are among the key drivers of the policy. The strategy is developed around six main areas: (i) informing both producers and consumers of the benefits derived from '*reusing, reducing and recycling*'; (ii) reducing the impact on climate change by setting an emission performance standard for waste management activities undertaken/technologies used by the municipality; (iii) capturing the economic opportunities provided by waste; (iv) boosting recycling and composting; (v) keeping the value of waste within the city boundaries through the development of necessary infrastructure; and (vi) improving the quality of life by keeping London cleaner. Among the targets proposed in the strategy are: zero municipal waste going to landfill by 2025; 20% reduction of waste produced by each household by 2031; increased capacity of the city to reuse waste (from 6,000 tonnes/year in 2008 to 120,000 tonnes/year in 2031); increased recycling share of municipal waste (45% by 2015 and 60% by 2031); achieving annual greenhouse gas emissions savings (from 1.2 million tonnes of CO2eq in 2015 to 1.6 million tonnes of CO2eq in 2031); and producing as much energy as possible from municipal waste. Within the strategy, actions for each policy area are outlined, together with good practices undertaken by different London boroughs. Among the good practices proposed are: the 'Less in your bin, more in your pocket' waste reduction campaign launched in 2009 by the Council of Wandsworth; the 2008 Waste Prevention Implementation Plan of Hackney; the revenue share contract put in place by the Westminster City Council in 2010 and allowing for an innovative type of relationship between the borough and the waste service provider; investment in waste infrastructure by the North London Waste Authority; the Royal Borough of Kensington and Chelsea commercial waste collection service; the Recycling Improvement Plan of Tower Hamlets; and the South London Waste Partnership between four boroughs procuring, among other things, multi-annual contracts for the management of Household Reuse and Recycling Centres.

Sources: UNEP (2011b); London's Wasted Resource -The Mayor's Draft Municipal Waste Management Strategy. Public consultation draft, Greater London Authority, October 2010.

B.3 LIPOR - *Serviço Intermunicipalizado de Gestão de Resíduos do Grande Porto*

According to the 2010 Activity Report of the Waste Prevention Working Group, the projects implemented by the association of municipalities of Greater Porto refer to six main areas:

(i) *Organic waste*

There are three main initiatives related to organic waste: (1) home composting, with 3 projects aiming at encouraging composting in domestic gardens ('*Terra à Terra*' project) including through the distribution of bins; at promoting domestic organic farming ('*Horta à Porta*' project); and at introducing composting bins and small gardens in schools. (2) Community composting, through the establishment of a community composting park ('*Parque do Gorgolito*' project), and community composters serving condominiums, clusters of houses and university residences. (3) Food waste reduction through the '*Dose Certa*' project aimed at preventing the use of excessive doses.

(ii) Recyclable waste

Recycling is also centred around three main initiatives: (1) Reducing the amount of bottled water consumed by increasing the use of tap water and changing the habits of the population through awareness-raising campaigns. (2) Encouraging the adoption of recyclable lunch boxes by students, with the double aim of raising their and their parents' awareness of the impact of their choices as consumers. (3) Campaign 'non-addressed mail, no thank you', to reduce the amount of paper in mixed waste.

(iii) Waste hazardousness

Two main initiatives were implemented with regard to dangerous substances: (i) the recovery of mercury thermometers, by giving a digital thermometer to those correctly disposing of their old one; and (ii) a selective collection system for cooking oil in line with guidelines set in Law Decree 267/2009.

B.3 – continued

(iv) Waste reuse

Two main projects were implemented on the re-use of materials, namely: (1) The 'Goods of Social Utility' project, aiming at supporting structures already active in reuse/recovery/repair; storing the goods donated; and re-distributing goods to beneficiaries, for example charitable institutions, after they have been fixed or renewed. (2) The '*RE(CRIAR)*' programme, to give new life to electrical and electronic equipment before being donated and thus re-used.

(v) Economic instruments

Mainly developed around the 'Pay as you throw (PAYT)' use-pricing model according to which users are charged on the basis of the waste they produce. This project, implemented on a pilot basis in Maia municipality is, in practice, a direct application of the 'polluter-pays' principle.

(vi) Communication/Awareness

Communication and awareness are undertaken through events and training courses, and also implemented in schools (LIPO EDUCA 'RE-AGIR' project); the European Week for Waste Reduction is supported until 2011 through the LIFE+ Programme.

Source: LIPOR 2010, Waste Prevention Working Group, Report 2010

4. Decoupling resource use from growth

The concept of decoupling resource use and environmental pressures from economic growth was first introduced by the OECD in its 'Environmental Strategy for the First Decade of the 21st Century', adopted in 2001. In this context, decoupling was defined as breaking the link between 'environmental bads' and 'economic goods' (OECD, 2001). The European thematic strategy on the sustainable use of natural resources defines 'decoupling' as reducing '*the negative environmental impacts generated by the use of natural resources in a growing economy' (*Austrian Institute of Ecology, 2007).

Decoupling can be measured by comparing relevant variables representing environmental pressures (e.g. CO_2 emissions) on the one hand, with economic variables, such as GDP or population, on the other. A distinction is made between 'absolute' and 'relative' decoupling; the former occurs when environmental pressures are stable or decreasing while economic growth is increasing; relative decoupling is achieved when environmental pressures are increasing at a lower rate than economic growth. In recent decades, considerable progress has been made in the EU on decoupling resource use from growth. Relative decoupling has been achieved in many areas, while absolute decoupling has only been achieved occasionally, during periods of economic recession (EEA, 2010a; Bio Intelligence Service, 2010).

This section presents a brief analysis of initiatives aimed at decoupling resource use from growth, including the application of the 'ecological footprint' and of environmental accounting, both intended as policy tools for the monitoring of sustainability at the regional or local level or for measuring progress towards decoupling. These tools are frequently developed with the purpose of increasing awareness of the importance of decoupling and sustainable use of resources but also of informing planning or political decisions.

According to the Global Footprint Network some 100 cities around the world use the Ecological Footprint (EF) for '*informing sustainability policy and campaigns at the local government level*'.[6] For example, in Europe, the province of Milano (IT) measured its EF in 2008 with respect to land and consumption[7]; the city of Cascais (PT) studied its EF in 2009 with the aim of identifying areas under high ecological pressure, and outlining the contribution to the footprint of various sectors[8]. As scopes in the use of the EF are similar, only the cases of a

[6] Footprint Network website
[7] Provincia di Milano website
[8] Agenda Cascais 21 Local website

municipality (Vienna, AT) and of a region (Wales, UK) have been more extensively described in Table 3.

The ecoBUDGET, environmental management systems, and Life Cycle Analysis are other instruments used by LRAs for supporting more sustainable policy making and strategic processes. However, although there is some evidence of successful cases, these tools do not seem to be widely spread. ICLEI reports the ecoBUDGET methodology to have been satisfactorily implemented in only a few cases at the local level (Lewis, in the UK; Växjö, in Sweden; Bielefeld, Dresden, Heidelberg, Kaiserslautern, and Nordhausen County, in Germany; Bologna and Ferrara, in Italy; and Amaroussion and Kalithea, in Greece) even if the methodology was developed almost one decade ago.[9] In general, decoupling indicators and their application seem to be still in a definition phase (B.4).

Other initiatives for implementing decoupling appear to be linked to the development of partnerships that may also involve the private sector. The added value of acting in partnership rather than individually seems to be the improved capacity to attract funding (among which EU financial support) for the implementation of shared plans and the achievement of common goals/targets, as in the case of ProjectZero and Green Cities, both in Denmark.

Table 3 - Examples of initiatives by LRAs on decoupling resource use from growth

The ecological footprint of the city of Vienna – Vienna municipality (AT)
In 2009, the city of Vienna published the results of the measurement of the city's Ecological Footprint (EF) by the Municipal Department for Environmental Protection. The city footprint was dominated by 'Grazing Land and Cropland' (i.e. the food produced in Vienna) and by CO_2 area (i.e. related to fossil energy consumption; CO_2 emission by production, consumption and disposal of goods; by energy use and by energy of goods not produced in the city). Although the EF of Vienna (3.9 ha/capita) is performing well compared to other Austrian and European cities, it is nevertheless above the sustainable global average of 1.8 ha per capita, drawing policy makers' attention to the need for a reduction in CO_2-related areas and in goods associated to Grazing Land and Cropland.
Source: Municipality of Vienna website

[9] ICLEI (2010), Managing environmental quality and the use of natural resources with ecoBUDGET

The ecological footprint of Wales – Welsh Assembly Government (UK)

The ecological footprint (EF) is one of the main five measures of progress towards sustainable development selected by the Welsh Government. In the 2008 report, the measurement of the EF, calculated using 2003 values for each of the 22 local authorities and for the region as a whole, was for the first time accompanied by the presentation of a long-term series (1990-2003) that allowed for a projection of the footprint to 2020. The footprint of Wales is to a large extent (63%) generated by household consumption (housing, food, and travel). The analysis showed that existing housing policies would be effective in stabilising the per capita footprint of housing by 2020 or even in achieving reductions; the transport footprint, on the other hand, was expected to rise due to increasing distances travelled and the lack of a sufficient improvement in the efficiency of cars, while food consumption, accounting for the largest proportion of the ecological footprint, was potentially able to drive a reduction of the footprint, provided that policies were aimed at influencing people's food purchasing decisions. In practice, the report evaluated the measurement results of the footprint in view of existing or planned policies, strategies, plans and initiatives to see whether adjustments were needed and where.

Source: SEI (2008)

ecoBUDGET: integrated environmental and financial resource management for an ambitious municipality – Växjö municipality (SE)

The ecoBUDGET environmental management system allows for the monitoring of the consumption of natural resources and of the impact of environmental initiatives with respect to environmental (and potentially, social and economic) targets; '*ecoBudget supports local government in meeting their ambitious environmental and sustainability targets as well as fulfilling their legal obligations and voluntary commitments*'. It is an accounting system where '*physical environmental quantities are measured instead of money*'. In 2003, the municipality of Växjö adopted its first ecoBUDGET 'Master Budget'. One year later, the municipality had managed to integrate the ecoBUDGET into its accounting system; it is now working on the inclusion within the system of indicators of social and economic sustainability. From 2001 for three years, the development of the ecoBUDGET was funded through an EU pilot project and subsequently, up to 2006, through other EU initiatives. Since 2007, local funding was raised for 50% of a full-time position dedicated to ecoBUDGET work. However, since the system is now integrated into the administration, several people within different departments participate in its management.

Source: ICLEI case study (2007): Växjö

Preventive environmental budget balance – Bologna municipality (IT)

The municipality of Bologna was one of the participants in the ecoBUDGET LIFE project implemented from September 2001 to August 2004, with a total budget of EUR 2.3m. As a result of this participation, since 2003 Bologna has been using the 'preventive environmental budget balance' as an instrument to measure progress towards sustainable urban development. The preventive balance defines limits for the use of natural resources and pollutant discharges, applying the ecoBUDGET methodology (ICLEI). It also allows for the measuring of progress towards the achievement of short- to medium-term targets in eight areas: energy, climate change, air quality, natural resources, land use, green areas, drinking water, and electromagnetic pollution. Progress is assessed through a number of indicators on an annual basis. Additionally, the initiatives identified for reaching the targets are linked to the planning documents approved by the municipal authority.

Sources: Municipality of Bologna website; Bilancio Ambientale Preventivo 2011 – Comune di Bologna; The ecoBudget experience in the city of Bologna (2011)

Managing Urban Europe-25 (MUE-25): sustainable future for cities – 25 European local and regional authorities

Managing Urban Europe-25 (MUE-25) was a European project (2006-2008), aimed at improving environmental quality and sustainability performance in 25 European local and regional authorities. The project delivered a framework for the better implementation of existing environmental management systems (EMS) such as EMAS, ISO 14001 and ecoBUDGET, and provided a methodology for integrated management to be used by cities and regions. By applying and improving integrated EMS local authorities are expected to improve their overall environmental performance, including more sustainable use of resources. The project budget was EUR 2.9m, co-funded by DG Environment.

Source: Managing Urban Europe-25 website

RAMEA (Regional NAMEA) – Emilia Romagna Regional Agency for Prevention and Environment (IT), South East England Development Agency and South East England Regional Assembly (UK)

The purpose of the project is to establish an environmental accounting system at the regional level that is coherent with national accounting tools such as NAMEA (National Accounting Matrix with Environmental Accounts). RAMEA is intended to enable the evaluation of the economic and environmental performance of regions and '*to inform regional policies/strategies about sustainable development*'. In particular, the system allows the identification of 'hot spots'; it can develop eco-efficiency indexes and can analyse the relationship between economic development and environmental pressures, i.e. monitor decoupling. '*Data provided by RAMEA, in combination with environmental input-output analysis, allows a deeper insight into regional production chains and indirect effects caused by the final demand for goods, the production of which is intensive in terms of pollution.*' The project was part of the GROW programme funded through INTERREG IIIC 2005/07 and involved four regions: South East England (UK), Malopolska (PL), Emilia-Romagna (IT) and Noord-Brabant (NL), for which case studies were developed (SCPnet website).

Source: RAMEA project website

Sustainability Appraisal and Life Cycle Analysis of Strategic Waste Management Options – Welsh Assembly Government (UK)

The Welsh Assembly Government commissioned a life cycle analysis to determine the Best Practicable Environmental Option (BPEO) and the preferred Strategic Waste Management Option (SWMO) to support the review of the Regional Waste Plans of the three Welsh regions. The analysis appraised 19 waste management options that were previously developed and agreed, over an 18-month time span, with local authorities, all including recycling and composting initiatives along with a variety of treatment technologies to deal with residual waste. Appraisal was through the use of 22 weighted indicators. The highest scoring options were expected to guide the development of the Regional Waste Plans. However, other assessments were also considered while performing the final selection, including a Health Impact Assessment and a Strategic Environmental Assessment, as well as a public consultation process.

Sources: Environment Agency Wales (2008), Sustainability Appraisal and Life Cycle Analysis of Strategic Waste Management Options. Report for the SW Wales Regional Group. Part 1, Issue 2 – January 2008.

GEstione Locale per la SOstenibilità ambientale – GELSO (Local Management for Environmental Sustainability). Among the partners is the National Association of Italian Agenda 21, with 363 members among regions, provinces, municipalities and other territorial authorities

The project makes a wide range of information on sustainability issues available to local authorities, ranging from best practices (related to protected areas, mitigation and adaptation to climate change, tourism and landscape) to an overview of tools available for complementing routine planning with sustainability criteria. Proposed tools are categorised in three main groups: (i) strategic planning and participation; (ii) social and environmental management; (iii) accounting. The accounting category includes, *inter alia*, environmental balances (CLEAR – City and Local Environmental Accounting and Reporting), the ecoBUDGET – Local Environmental Budgeting, Sustainability Indicators, and the European Common Indicators (ECI).

Source: GELSO website

ProjectZero – Sonderborg City Council (DK)

ProjectZero is a public-private partnership (Project Zero A/S) between the Sonderborg City Council and several private companies. The aim of the project is to create economic growth in the Sønderborg area on the basis of CO_2-neutral development. To this end, the following targets have been set: 50% reduction of domestic consumption of electricity by 2020, 75% reduction of CO_2 emissions by 2020, and carbon-neutrality by 2029. The project's primary focus is on energy, and in particular the intelligent management of energy consumption and converting energy production to sustainable sources; however, the project also provides for the development of sustainable transport, agriculture, and building and construction solutions. A ProjectZero Fund has been allocated some EUR 2.7m.

Source: Project Zero website

Green Cities: An environmental Partnership – seven Danish municipalities: Albertslund, Allerød, Ballerup, Copenhagen, Fredericia, Herning, Kolding (DK)

The Green Cities agreement was started in 2000 in seven Danish municipalities. The agreement set a common framework for a commitment to environmental cooperation on 10 sustainability areas among which are chemicals, climate, nature, organic food, sustainable construction and sustainable purchasing. The partnership works towards the achievement of 16

common benchmarks related to both management or products such as '*all institutions and civil services are environmentally certified and are operating in accordance with environmental management principles by 2015*' or '*at least 75% of municipal food must be organic by 2012*'. The partnership relies on networking (including with the business sector), campaigns and education initiatives to gain the necessary cooperation from all concerned. In 2004, the partnership received LIFE funding under the 'Environmental Management at City Level' theme.

Sources: Green Cities website; Green Cities: An environmental partnership

Towards taking a life-cycle perspective: the 'ecolizer' tool – Flanders (BE)

OVAM (*Openbare Vlaamse Afvalstoffenmaatschappij*) is the regional authority responsible for waste management and soil remediation in Flanders. Lately, OVAM has tried to promote sustainable consumption and production through 'ecodesign', thus considering a broader perspective of the life-cycle than the end-of-life phase on which traditional waste management practices usually focus. In practice, the strategy of the authority is to prevent waste by introducing more sustainable products and innovative materials on the Flemish market. A first version of the tool for designers to create environmentally friendly products, the 'ecolizer', was developed in 2005; a second version was released in 2010. The tool allows for the incorporation of environmental criteria into any design process. '*The Ecolizer 2.0 employs an updated set of eco-indicators based on the 'ReCiPe' method rather than the previous 'Eco-indicator 99' methodology – both single-score indicator methodologies based on Life Cycle Assessment (LCA). This new method is still used to express the environmental impact of the production materials and all the subsequent stages in one eco-indicator number, so a designer can assess the sustainability of a creation in a quality score*'. The initiative was allocated a budget of EUR 80,000 for development, printing and communication activities.

Sources: Cradle to Cradle Network project ***synopsis***; Taking out the rubbish - Maximising recycling and minimising residual waste, ***write-up of discussion,*** 27 April 2009 conference

B.4 – Decoupling indicators (resource efficiency indicators)

According to the JRC-IES accompanying document for public consultation on decoupling indicators, there are three main groups of indicators that may contribute to the steering of policies and initiatives towards decoupling:

eco-efficiency indicators, monitoring '*decoupling of the overall environmental impact associated with apparent consumption and related use of natural resources from economic growth*'; these relate economic performance to the environmental impact caused by domestic consumption and use of natural resources;

resource productivity indicators, measuring '*progress in productivity in the use of natural resources*'; these relate an economic indicator to the amount of natural resources used; and

resource-specific impact indicators, evaluating '*how negative environmental impacts may (or may not) decouple from resource use*'; these are impact-to-resource use ratios.

However, work on framework, methodology and data flows for the above indicators is still ongoing while the main indicator for sustainable consumption and production is currently 'resource productivity', i.e. the ratio between GDP and Domestic Material Consumption.

Sources: JRC, Institute for Environment and Sustainability (2010), Monitoring progress in Sustainable Consumption and Production in the EU - Decoupling indicators; Eurostat (2011): Green week - session 1.8 indicators and targets for resource efficiency: *Measuring resource efficiency - The Eurostat experience and ongoing work*.

Appendix I – List of References

Austrian Institute of Ecology (2007), Strategic Environmental Assessment: Environmental Report – Central Europe Programme 2007-2013, Version 3-0

BAP Driver Project (2010), European Position Paper

Beyond GDP (2011), website

Bio Intelligence Service (2010), Preparatory study for the review of the thematic strategy on the sustainable use of natural resources. Final report to the European Commission, November 2010

EEA (2010), The European Environment — State and Outlook Report 2010. Chapters on 'Soil' and on 'Natural resources and waste'

EEA (2011), 2011 survey of resource efficiency policies in EEA member and cooperating countries - Initial findings from the analysis of draft national reports on resource efficiency policies and instruments: Informal paper to support the preparation of the EU resource efficiency roadmap

EEA (2011a), Urban soil sealing in Europe

European Commission (2011), Resource efficiency – a business imperative. Fact Sheet, April 2011

Friends of the Earth Europe (2010a), 'The EU 2020 Resource Efficiency Flagship Initiative: How can we ensure that it makes a real difference?', 2 December 2010

Friends of the Earth Europe (2010b), 'Measuring Europe's Resource Use: A vital tool in creating a resource efficient EU', 1 June 2010

Friends of the Earth Europe (2011), 'Europe faces up to the resource challenge', 26 January 2011

Global Footprint Network (2010a), 'Ecological Footprint Atlas 2010'

Global Footprint Network (2010b), 'Earth's Overdraft Notice: On August 21st, we exceed nature's budget'

Global Footprint Network (2010c), 'A Big Foot on a Small Planet? Accounting with the Ecological Footprint, Succeeding in a world with growing resource constraints'

GUA (2000), 'Study on the analysis of the fundamental concepts of resource management', commissioned by DG Environment, European Commission

HLG Ökoagentur für Hessen website

OECD (2001), OECD Environmental Strategy for the First Decade of the 21st Century

Stockholm Environment Institute (2008), Wales' Ecological Footprint - Scenarios to 2020. Future Sustainability Programme - Working Paper

Umweltbundesamt (2011), Overview of best practices for limiting soil sealing or mitigating its effects in EU-27. Study contracted by the European Commission, DG Environment.

UNEP (2010), 'Assessing the environmental impacts of consumption and production priority products and materials', Report of the Working Group on the Environmental Impacts of Products and Materials to the International Panel for Sustainable Resource Management.

UNEP (2011a), Decoupling natural resource use and environmental impacts from economic growth, A Report of the Working Group on Decoupling to the International Resource Panel

UNEP (2011b), Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication

WWF (2010), 'Living Planet Report 2010: Biodiversity, biocapacity and development'

WWF (2011), Ecological footprint website