

Promoting Sustainable consumption in Cities
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Eco-products and Secondary Raw Materials
Key-roles and practical cases at local and regional levels

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Waste is a loss of natural resources

As the European Commission emphasized in its Sixth Environment Action Programme, *"our use of non-renewable resources such as metals, minerals and hydrocarbons and the associated generation of wastes, gives rise to numerous impacts on the environment and human health. The consumption of scarce non-renewable resources also presents us with the ethical dilemma about how much we should use now and how much should we leave to the future generations"*.

Each European consume 50 tons of resources per year

The average European produces approximately 540 kg of municipal waste¹. This is the visible side of waste. In reality waste production is manifold higher and most waste we produce are hidden and result from resource extraction and production processes.

Indeed, as the Wuppertal Institute put it *"the economy takes in raw materials from the domestic environment and via imports from foreign countries. A significant part of material extraction has no further use and is shifted aside, for instance as overburden and mining waste. These so-called hidden flows impact on the local environment, pollute groundwater and contribute to landscape change"*².

The other part of resource extraction is used as direct material input for further processing, manufacturing, production and consumption. Some materials such as construction minerals are stored and added to the stock for many years in the form of buildings and infrastructures. They are also incorporated into durable goods such as cars, industrial machinery, household appliances and other consumables.

After the end of their "use" time, all product become waste and may be recycled or disposed in landfills or in incineration plants.

According to surveys from the Wuppertal Institute, Total Material Requirement (that is the total material basis of the economy) of the European Union amounts to 18,500 M³ tons per year, that is 50 tons per person (water excluded). About 20% (i.e. 10 tons /person) is added up to the stock in the form of buildings and infrastructures such as roads, buildings as well as of various appliances and consumables. The remaining 80% (i.e 40 tons/person) become waste in the course of the year. These waste are either produced in Europe or abroad but since for some raw materials such as metals, Europe largely relies on importations, this means that the waste we produce are mainly produced abroad.

¹ Source : Environmental signals 2002, EEA

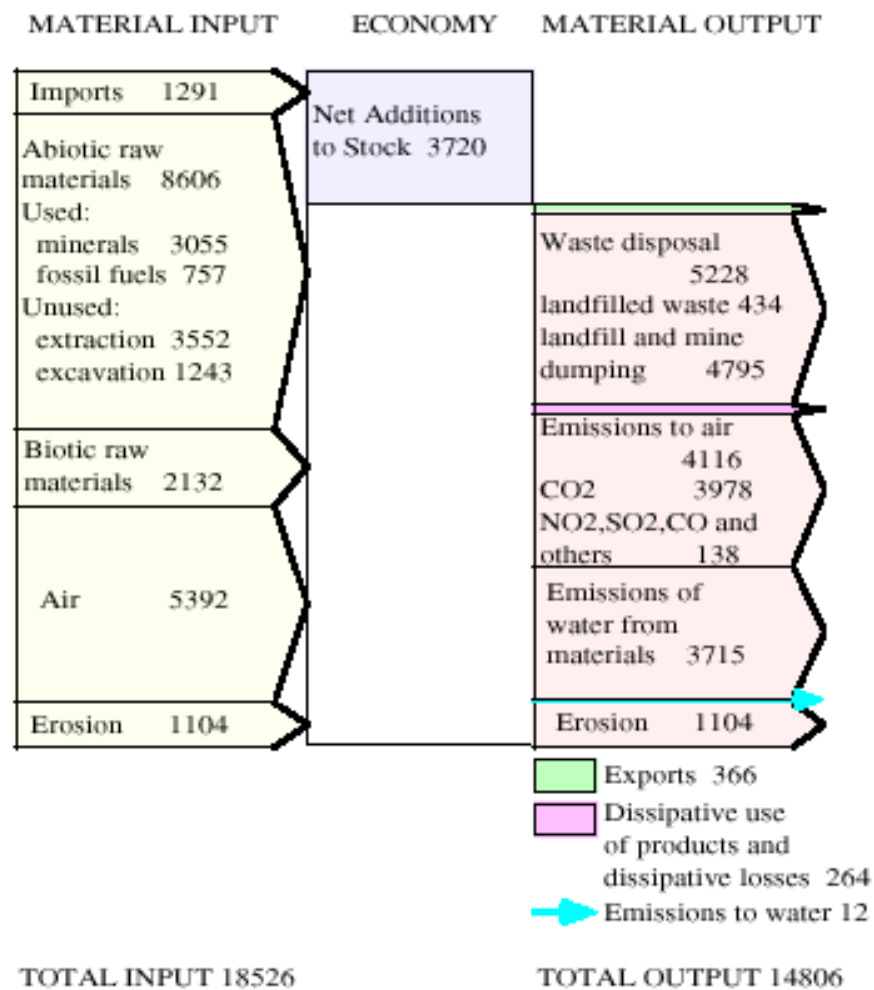
² Resource use and efficiency of the UK economy, a report by the Wuppertal Institute for the Department for Environment, Food and Rural Affairs

	Share of import in EU 15*	Ecological rucksack (kg of material unused/ kg of material extracted)**
Aluminium	60%	6
iron	93%	15
zinc	74%	28
copper	92%	420
tin	100%	-

* source : <http://www.wuppertal-institut.de/Publikationen/WP/WP121.pdf>

** source : Factor Four, E. von Weizsäcker, A.B. Lovins, 1997

The Figure below presents the Material flow balance of the European Union in 1996



Source: Bringezu and Schütz 2001b

Which type of resources do we use?

Each European consume an average of 50 tons of materials of which :

- **Fossil fuels** contribute 29% to total material requirement (TMR) out of which nearly two thirds (63%) are produced in Europe. Coal, crude oil, refinery products and natural gas are the main components. 72% of the fossil fuels resource requirement are not used and then constitute hidden flows.

TMR fossil fuel = 14,5 tons ; hidden flow = 10,44 tons; EU production = 63%

- **Metals** hold 23% of TMR most of which (95%) is imported. The main components are ores and concentrates, metals, and products manufactured from iron, copper and other non-ferrous metals. Again, most of the total resource requirements for metals (92%) are hidden flows.

TMR metals = 11,5 tons; hidden flow = 10,98 tons; EU production = 5%

- **Minerals** represent 22% of the EU's TMR most of which 91% are domestically extracted. The main components are construction minerals, in particular sand and gravel, natural stones, and clays, as well as a variety of industrial minerals like salts, phosphates, diamonds and other precious stones. In contrast to metals and fossil fuels, a much smaller portion (24%) of the minerals resource requirement consists of hidden flows.

TMR minerals = 11 tons ; hidden flow = 2,64 tons ; EU production = 91%

- **Biomass** accounts for 12% of the TMR of EU-15. Most of the biomass comes from agriculture.

- The rest results from excavation, dredging , erosion and other imports.

Source : <http://www.wuppertal-institut.de/Publikationen/WP/WP121.pdf>

Will we have enough resources?

Nearly 80% resources we use are non renewable. Contrary to *idée reçue*, proven reserves of non-renewable resources such as metals and minerals are not diminishing and even growing (with may be an exception for oil, of which current proven reserves are estimated to 60 years). The quantities available for renewable resources such as fish, forests and fresh water are of much higher concern: their stocks are steadily decreasing, putting their security of supply at stake.

If in terms of quantities, the scarcity of most non-renewable resources doesn't appear to be immediately in danger, the evaluation of resource life expectancies should also take into account crucial factors influencing their consumption, which are:

- the growth of population and economies (the world economy increased 7 fold in 50 years)
- the disparities in consumption levels (since 20% of the world population consumes 80% of the natural resources consumed worldwide)
- the environmental impacts of resource exploitation , transport, transformation and consumption.

When comparing the 50 tons of material consumed by each European with the 86 tons used by each American and the 2 to 5 tons used by each Vietnamese, it is clear that materials consumption is directly related to the lifestyle of people.

The longing of developing countries to enjoy the same standard of living than those in developed countries could have dramatic consequences.

According to the Worldwatch Institute, assuming that Chinese would consume like Americans:

- China would need more paper than the world currently produces.
- it would need 100 million tons of seafood—the entire world fish catch.

- China would need over 80 million barrels of oil a day—slightly more than the 74 million barrels per day the world now produces
- this alone would roughly double global emissions, accelerating the rise in the atmospheric CO₂ level.

Environmental impacts associated with resource use

The growth of EU economies outweighs the improvements in using resources more efficiently, which results in a net increase of resource input as well as of emissions output.

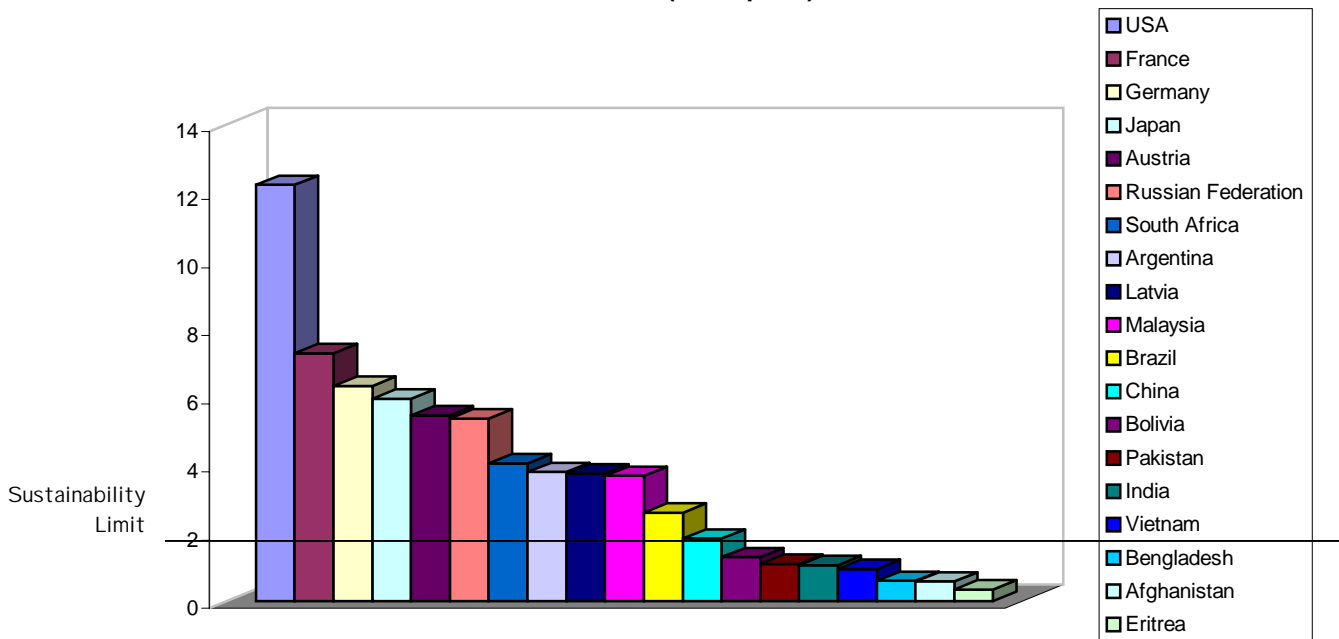
Each material flow may affect different environmental media at various scales. For instance, the extraction of minerals, their transformation and transport require energy. With current technology, energy use releases air pollutants and green house effect gases to the atmosphere. Abandoned mining sites are usually soils which are no longer appropriate for agriculture: the extraction of non-renewable resources continuously diminishes the capacity of production of renewable resources. The same is true for the sealing of land by additional buildings and houses. The use of “non-renewable resources” is then not only a problem of “depletion” of those resources themselves. It is — and here the hypothesis is taken: even more — a problem of damaging and reducing the capacity of renewable supply. These problems may be regarded as “creeping hazards” which endanger a future sustainable supply and management of resources.

Are our patterns of consumption sustainable?

Damaged forests, polluted soils, water, air and reduced biological diversity are signs that the world becomes ecologically overloaded and that pollution released exceeds the “carrying capacities” of the Planet. Mathis Wackernagel and William Rees have developed a method to quantify and assess the load imposed by human population on nature. “The ecological footprint” represents the surface of land necessary to maintain the standard of living of a defined population. It calculates the biologically productive area (land and water) required to produce the food and wood people consume, to give room for infrastructure, and to absorb the CO₂ emitted from burning fossil fuels.

Their calculation do not provide optimistic conclusions. With a population of 5.7 billion people in 1996, the available space per person should be 2.2 hectares for each. In contrast, their calculation showed that the world average footprint was 2.85 area units per person. This exceeds by about 30 percent the existing biologically productive space per person. The average footprint for Europeans is around 8 ha, this means that Europeans use four times their share or that if each citizens on earth would live with the same standards, we would need four planets.

**Ecological footprint of nations (1996)
(in ha/pers)**



Strategies and instruments for dematerialisation

Dematerialisation refers to the reduction of resource consumption. It is closely linked with improving products efficiency and saving, reuse or recycling of materials and products. It entails actions at every stage of the production and consumption chain from resource savings in material extraction, improved eco-design of products and technological innovations in the production process to more environmentally consumption patterns and recycling of waste.

It thus requires the involvement and the co-ordination of all the actors of the production and the consumption chain and notably of:

- Public authorities (from international to local authorities)
- Industry
- Consumers
- NGO's

The role of local and regional authorities

Local and regional authorities are central drivers of changes in resource management notably since :

- they have influence on the legal, economic and voluntary instruments of resource and waste management.
Local and regional authorities notably control the collection and sorting of municipal waste, they have tax-levying powers, and may thus have a decisive impact on economic conditions under which different processes of recycling and waste disposal are carried out. They represent a large purchasing power and may thus play an active role in the development of market for recyclable materials through public procurement.
- they are key actors of dialogue with citizens and are main drivers of cultural evolution.
As the public actors closest to local population, they have a major role to play in launching debates around societal issues. As far as waste is concerned, the public consultation process which goes with planning creates opportunities for public authorities to organise surveys, meetings with neighbourhood committees and round tables of stakeholders. These meetings

allow local people and experts to debate on the appropriate balance between various waste management options, prevention and recycling initiatives.

Incentive instruments available to local and regional are numerous. In a market economy, economic instruments have a special role to play. However, their potential of use at the local and regional levels is limited. In a globalised economy, we still miss instruments which reward material productivity as much as labour productivity.

We will focus in this article on the opportunities created by the proximity with citizens and we will describe some strategies and initiatives developed at the local level to promote dematerialisation.

Some local and regional initiatives to promote dematerialisation

These strategies are generally oriented towards influencing consumer behaviour and are striving for bringing changes either to citizens' lifestyle, to their consumption patterns or to the waste management practices all in view to decrease waste production and to increase resource efficiency.

1. Strategies addressing the lifestyle

The transition from products to services and the promotion of new services

When producers provide services instead of products this increase their involvement with use phase of products rather than just with the delivery of goods to the consumer. Buying and selling are replaced by different ownership options like producer take-back, leasing and pooling arrangements. Value is not anymore generated by the production of goods with a certain added- value. In such a system, value derives from the service / function provided by the producer while the product is just a means of delivering this service. The development of a functional economy is based upon the notion that consumer's needs are met by the provision of functions/services, rather than by the provision of a product as such. This strategy notably leads to:

- the extension of the producer responsibility. Producers and retailers ensure the take-back of products for repair, resale or recycling.
- changes in ownership of products which leads to the development of leasing, renting, sharing and pooling.
- the promotion of repair and second-hand shops

These systems already apply locally for various products such as furniture, electric and electronic equipments, nappies, computers, baby goods, tools, caravans, magazines, cars,

The City of Milton-Keynes for example has calculated that disposable nappies represent about 6% of households waste in volume. Consequently, the city launched in 1999 a campaign to promote a privately operated nappy-washing service.

In Munich, since 1991, returnable tableware had been imposed for nearly all large-scale events such as the Oktoberfest, the Christmas Market, the Auer-Dult Fair and the Munich City Marathon. Even sport and music events held in the Olympic stadium are now using returnable drinking cups made from plastic material. For smaller events, the city rents out multi-way tableware and two mobile dishwashers at a moderate charge. After some hesitation on the part of organisers, attitudes began to change and most of them now support this initiative. School food services have replaced single-use cans and bottles with reusable containers.

In complement to this initiative, a brochure published in 1994 compiles a list of addresses of repair shops in Munich. This was followed-up by the "Repairwork-day" organised for the first time in 1997. On this day, the citizens were able to bring their broken household utensils to have them repaired by experts free of charge. The surprising result was that more than two-third of the household utensils could be restored by minor repair work.

In March 1999, the Municipal Department 22 (Environmental Protection) of Vienna, in collaboration with the Municipal Department 48 (Waste), launched the first exchange platform for second-hand goods on the Internet. Go to <http://service.wien.gv.at/wab/> to exchange, sell, buy or give away second-hand goods. The service offers four "markets": second-hand goods, compost, teddy bears and information. The information market provides online versions of the repair guide, the guide to renting facilities and the waste disposal manual. The second-hand exchange is open to private users as well as to commercial operations, second-hand dealers and landscape gardeners.

The promotion of "cultural" economy

Nowadays, in wealthy nations only a small fraction of consumption is dedicated to fulfil our basic needs (food, shelter, housing, water and sanitation, health care). The largest part of what is consumed allows for the satisfaction of extra-needs for comfort, leisure, entertainment and the expression of one's standing in society. The municipality of Nuremberg for instance has addressed the challenge of how dematerialising "leisure". For Christmas, it widely disseminated 99 *suggestions for gifts without waste such as seasonal tickets for public transport, a cinema-card, vouchers for a massage, a dinner, a ticket for a concert or a stay in a thalassotherapy centre, a visit to the hairdresser, a course in an educational centre,.....*

The promotion of new technologies.

Electric and electronic appliances hold a special position in the debates on dematerialisation and eco-efficiency: technological innovation in the electric and electronic equipment sector accelerates changes in product composition and the replacement of old products with new products. This is the reason why waste from Electrical and Electronic Equipment (WEEE) is the fastest growing waste stream containing a large quantity of dangerous substances.

On the other hand, the development of e-technologies can also create opportunities in the field of dematerialisation and saving of material resources with the increasing recourse to telecommuting, tele-shopping, teleconferences, e-mails, e-books and services offered on the Internet. Will the technological progress and development of the information society contribute to dematerialising or on the contrary will the unrestrained race to progress, the reduction of the lifespan of products lead to an increased waste production?

The discussion remains rather open. Telecommuting appears a quite rather interesting way towards dematerialisation. The Ministry of Environment in Finland for instance has estimated that 450.000 workers (about 20% of the population) could potentially become telecommuters and thus perform all or a part of their job outside the workplace. If all of them would work one day a week at home, distances travelled by car would be reduced by about 216 million kilometres, thus reducing by 1% CO₂ and air pollutant emissions from privately owned motor vehicles in Finland.

As far as waste is concerned, e-books may offer a solution in some cases to the tremendous wastage of paper resulting from all those documents printed to be read once and immediately thrown in the dustbin.

2. Strategies addressing the consumption patterns

It is acknowledged that consumers can contribute by their choice and consumption behaviour to dematerialisation. With the increasing awareness on environmental stress, consumers are more and more conscious of the environmental consequences of their current lifestyle. The main issue is to provide them with sufficient information on the performances of the products they buy in order to help them to consciously orientate their choice and to create a demand sufficient to prompt producers to adapt their range of products.

Eco-labels are a very helpful tool to provide essential information on the environmental characteristics of products but beyond eco-labels, it is crucial to develop the appropriate communication strategies to lead to lasting changes in consumer habits and behaviour. This represents a fundamental but particularly challenging issue of sustainable development. Bringing sustainable consumer behaviour implies a profound rethinking of the most common daily choices and represents a cultural challenge to the urban society. Indeed, every single initiative in prevention at source is not directly translated into spectacular and visible results in waste reduction or savings of materials. It rather creates a new frame of mind where consumers wonder and raise questions on the environmental and societal consequences of their everyday actions. This implies intensive, high-profile and long-term communication campaigns.

Informing consumers on products

In Brussels, a partnership between the Brussels authorities (IBGE) and consumers associations (CRI OC), has been launched in March 1999 within the framework of the waste prevention plan of the Brussels Capital Region. This co-operation led to the set up of a research and information centre for sustainable consumption (Observatoire Bruxellois de la Consommation Durable - OBCD). The centre aims at gathering objective information on responsible consumption. This information, based on in-depth research and product analysis (composition and weight of content and packaging, price, level of recyclability, noxiousness...) results in identifying and naming of brands. Naming brands is a concrete approach: it really answers to population's demand. Better informed, consumers are more aware and more likely to change their behaviour.

In 1999 and 2000, the OBCD has been studying the following themes: washing powders, personal care products, batteries and chargers, cleaning products, pesticides, snacks, light bulbs, toilet cleaning products, wipes, gadgets, over-packaging. The project was three folded:

- research on products and behaviours consistent with sustainable development, with ecological labels and marking as a core concern. Later on, the project enlarged to research and identify products and packaging for which more ecological equivalents exist on the market, first of all those producing less waste or less hazardous waste.
- dissemination of research results through technical documents and through publications, communication campaign, and a call center to raise public awareness. The call centre received an average of 2.300 calls a year. All technical and practical information can be found on the web site: <http://www.observ.org>. For instance, in May 1999 some 50.000 copies of a folder explaining the most frequent logos and label or those to support have been distributed to the general public.
- information actions targeted at public authorities and lobbying directed at producers through actions elaborating on research results, such as round-tables of all stakeholders (on washing powders and batteries), press release, political interpellations, etc.

In 2002, this research on products led to consider products that are useless and OBCD conceived and set up an exhibition and a brochure on "the shopping trolley of useless".

Promoting consumers' choice

Besides, as in many other cities, Brussels has developed a campaign which addresses those who do not wish to receive free advertisements and/or free magazines and who previously threw them directly in the

dustbin. A sticker allows each one to express his/her choice for receiving free press or advertisements or none of them. In Brussels, the sticker has been proposed for the first time in April 99 and since then, 17% households adopted him. If the 48% population that are estimated to be not interested by free advertising (according to a survey by an independent consultant) would affixed the sticker, up to 10.000 tons of paper waste could be avoided. This represents about 25 kg/mailbox/year. The effectiveness of the campaign relies on the partnership with the retailing sector which committed to respect citizens' choice.

Partnerships with retailers and associations to favour information dissemination

Such partnerships prove to be of core importance for the success of awareness campaigns that aim at changing behaviour. Retailers can provide the appropriate information infrastructure and products to help consumers exerting a free choice.

The case of the Walloon Region (Belgium) is also illustrative in this respect. In November 1999, 14 municipalities have set up a partnership with an NGO "Espace Environnement" to raise awareness of households on waste prevention. The NGO is responsible for conceiving and launching a campaign to promote "smart purchasing" while involving citizens, municipalities and associations. As a start, information meetings were organised to provide attendees with practical tips for shopping. A partner consumer network runs a permanent phone line to advice citizens on how to reduce waste and inform them on returnable or refillable products. In addition, all regional supermarkets are now involved in awareness-raising campaigns. They make available free information leaflets to their customers and organise group visits. Since the beginning of 2002, the supermarkets are marking products generating few or no waste at home. Their identification, conducted by Espace Environnement, is based on regional criteria assessing their contribution to packaging waste prevention. It is conceivable for LRA to develop similar actions to promote eco-labelled products all the more since an objective evaluation has been already conducted, encompassing several environmental issues further than packaging waste, and involving multistakeholder panels (see annex for further information).

3. Strategies addressing waste management

Waste represents a loss of valuable resources, many of which are scarce and could be recovered and recycled. Recycling waste which cannot be prevented helps reduce society's demand for virgin raw materials.

Through a survey carried out among nearly 40 European cities, ACRR has shown in 2000 that the situation is evolving in municipal waste management. In Northern as well as in Southern Europe, some cities already reach significant results in selective collection of dry and wet municipal waste. Some of them nearly achieve to reduce by 50% the amount of waste to be disposed of. These municipalities could not have reached those encouraging results without having developed intensive communication campaigns towards citizens. Without participation quantity and quality of recyclable materials are poor.

Besides improving the quantity and quality of selectively collected waste, communication campaigns on recycling change the citizens' perception of the role they may play in sustainable development. Experience gained from the implementation of legislation on packaging waste demonstrates that even basic necessary information to improve performances of selective collection also increases awareness among citizens about the environmental and economic dimension of the waste issue.

Citizens are largely satisfied with selective collection and are glad to participate in a citizen commitment useful for the community. Surveys notably in France show that citizens, living in municipalities with selective collection schemes, feel personally more concerned than before by the quality of the environment and think that this concern is shared by others. More aware of environmental problems than before, sorters are also more confident in the usefulness of specific actions for the improvement of environment. They may be all the more confident since they have feedback on the results achieved thanks to their contribution.

Waste management and industry

Further to actions targeting citizens, some municipalities have also developed initiatives towards industries:

Based on a parliamentary resolution to avoid waste, the replacement of the local waste incineration plant in Basel was decided with a reduced capacity (200.000 tons instead of a needed capacity estimated to 320.000 tons/year). The introduction of refuse disposal charges, improved sorting and a modified packaging policy in commerce allowed to reduce the household waste by about 40%. Nevertheless, the political decree made it necessary to develop a waste minimisation programme for trade and industry in the canton of Basel (actually, more than 60% of the municipal solid waste is due to activities in trade, administration and manufacture in Basel). Subsequently a three-stage waste minimisation programme was defined, starting in 1997 with waste management audits and followed by cooperative agreements between the authorities and companies.

200 companies out of the 10.000 firms identified were selected according to criteria such as the annual amount of MSW produced, the waste tonnage during the recent years and the overall recycling quota. The audits performed with the companies allowed evaluating the current status of waste management, recording the collection logistics and assessing the organisation of the company. Solutions for a better waste management were identified and agreed upon with companies. Finally, an evaluation procedure assessed the effectiveness of the measures agreed upon and showed that a great deal of agreements have been achieved so far. Between 1992 and 2000, measures taken in Basel allowed to reduce by 30% (from 117.000 to 89.000 tons) the amount of municipal waste to be disposed of .

In Munich, the city employs six consultants for industrial waste who assist the companies to handle and dispose of different kinds of industrial waste. They operate via a telephone line for companies, by visiting and consulting them and publishing info-folders about new laws or tips. They also organise special environmental sessions for companies.

Conclusion

Decoupling waste production from economic growth is a particularly challenging issue. It is not only a question of waste management, it is also a question of sustainability in terms of resources choice and consumption and in terms of equitable access to these resources.

Local and regional authorities, as public actors the closest to citizens, have a major role to play in promoting a more sustainable way of living. Some municipalities have taken up the challenge and have launched initiatives which raise questions and feed the debate with the citizens around sustainability. These initiatives do not only focus on waste management options and the promotion of recycling, they also address consumption patterns and current lifestyle. They question our relations with products, culture and technology. As the democratic intermediary between citizens / consumers and national and supranational authorities empowered to take measures able to strongly influence production and consumption patterns, LRA can bring consumers' expectations higher on the national and EU political agendas as well as easing the acceptance of constraining measures by citizens.

It is true that the direct benefits of these initiatives in terms of quantities of waste avoided are not always obvious and, in some cases, there might be a risk for side effects to exceed environmental benefits. However, in our opinion, the central point is not there. It is a question of raising awareness, promoting the questioning, feeding the debate around the consequences of our current patterns of consumption and ways of living. It is also a question of promoting the dialogue with citizens around our expectations for the world of tomorrow and of keeping citizens involved in societal choices.

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The Association of Cities and Regions for recycling (ACRR) is an International network gathering about 80 Cities, regions and NGO's in 20 European countries. Its various activities aim at developing the environmental, economic, and social efficiency of municipal waste management by the exchange of information and by partnership.

The ACRR offers its members a direct connection and a voice for European developments and debates concerning waste. It helps cities to present their initiatives and to share their experience about legal or economic instruments, voluntary agreements, treatment techniques, communication campaigns etc related to municipal waste management.