3. The society, its products and the environmental role of consumption

Joachim H. Spangenberg

3.1 INTRODUCTION

Sustainable development does not provide an ideological blueprint for a future society: nobody knows what the future will look like, although we are all involved in creating it. For this creation process we need an orientation, a compass indicating the direction of what is probably desirable, offering a sustained quality of life in particular in the long run, and for all the Earth's citizens. For implementing these insights, for making them operational and relevant in day-to-day decision-making we need a democratic, highly participative political process to translate the general orientation, based on the values of the society, into concrete strategies and politics. However, while this participatory approach calls upon responsible citizens (or selfish ones with an enlightened self-interest), the same individuals are consumers as well. How can and should they contribute to sustainable development in this role, which motives would orient their preferences towards sustainable development and environmentally benign consumption (Røpke 2001)?

For mainstream neoclassical economists it is simple: preferences are exogenously given, and they do not change endogenously. Every consumer is a homo oeconomicus with full information, taking decisions exclusively based on selfish utility maximisation: social or ethical values, emotions and affection are not relevant for this 'ideal' person's 'rational' behaviour (unless interpreted as basically selfish motivations). In a truly Orwellian use of language, consumers are all taken to behave like the kind of guy you would not invite for dinner (Bossel 2000), and this is called 'rational'. Furthermore, all these 'homini' are identical in their behaviour (so they are rather 'homunculi'), permitting to aggregate their un-individual behaviour into household demand curves and match them with supply.

Reality is more complex, however, and thus ecological economics has to deal with the challenge of a more realistic perception of human beings (*Ecological Economics* 2000). Fashion, taste and thus preferences change over time, are individually differentiated and influenced by social groups and public discourses. Humans are *social individuals*: neither can societal processes be predicted by just aggregating independent individuals, nor can individual behaviour be explained without taking the social context duly into account. Whereas basic needs like food, shelter, and so on are relatively easy to define, the means to satisfy these needs vary considerably between cultures, income groups and according to gender (Max-Neef 1991) and evolve over time. The history of production and consumption indicates how the environmental problems emerged, and how deeply they are rooted in our model of civilisation (Section 2).

Furthermore, the preferences expressed at the shopping counter result from a blend of interwoven intrinsic and extrinsic motivations, deep values and spontaneous emotions, influencing each other and co-evolving over time and income, but with different sensitivities, time scales and levels of resilience. Nonetheless they are not irrational: the way our society and economy functions provides perfectly rational reasons for ongoing consumption without any sign of saturation – not necessarily so, but definitely for the time being (Røpke 1999).

Products and services are not only economic goods (measured in monetary terms) with a social meaning, but physical objects as well, tangible or – like many services – otherwise physically enjoyed. No economic good exists without a physical footprint, and the resulting matter–money dichotomy can be considered as important for modern, that is, ecological economics, as the wave–particle dichotomy for modern physics. Consequently, any definition of sustainable consumption must reflect on the physical, social and economic processes behind production and consumption (Reisch and Scherhorn 1999), and institutional regulation, formal or informal, must take all of them into account to be effective. As a result, the challenges of measuring and reducing the environmental impact of consumption are manifold, despite the 50 years of debate on consumption since Vance Packard (Packard 1960) and the obvious needs to change *'the unsustainable pattern of consumption and production, particularly in industrialized countries'* as a *'major cause of the continued degradation of the global environment'* (United Nations 1993, Section 4 (emphasis is mine)). Open questions to deal with include:

- Who are the consumers to be analysed, do they include business, the state or only the households? As an immediate answer, we focus on households and their role as actors for sustainable consumption.
- What is the environmental relevance of household consumption? An answer to this question is only possible by deriving integrative indicators for environmental pressures and to relate them to

consumption options. Some such universal yardsticks are introduced in Section 2.

- What is the impact consumers have on consumption decisions? Answering this question necessitates a brief look into consumption motivations and what influences them (Section 3), plus describing the interaction of a plethora of actors shaping the final decision, when wishes and realities have to be accommodated at the same time (Section 4).

3.2 THE ARTEFACTS OF SOCIETIES

The history of humankind can be read as a history of its products – and vice versa. Our knowledge of earlier societies is not based on understanding their tradition and culture, but on analysing their artefacts, or, more precisely, the waste they left behind. Without arrow tips, bones or potsherds we would know little about their lives. Our way of interpreting human history is to a large degree an anthropology of products and their waste.

Products as such had been with human development since its first day (for a long time, using instruments has even been considered a key criterion distinguishing between humans and animals). With industrialisation, however, a new mode of production took over. Products were no longer manufactured by handicraft workers in the neighbourhood and exchanged against farmers' goods. Instead, major facilities produced a high volume of more and more specialised products on their assembly belts, based on the disintegration of production processes into small repetitive steps to increase productivity (Taylorism). The products were traded on an increasingly globalised market – at the end of the 19th century, trade volumes (relative to production size) and economic integration were higher than in the early 21st (*The Economist* 2000). Traditional goods were produced in high quantities at low prices, new products were invented, and increasingly the satisfaction of all kinds of human needs was commodified. Like the production of material goods, capitalism is trying to turn knowledge, caring for people, entertainment and nature into commodities, thus making access to them wealth dependent – a surprisingly still valid extension of Marx's comment that capitalism reduces everything to the 'cash nexus' (Giddings et al. 2002).

Mass production, however, faced one serious challenge: who should buy the products? It was Henry Ford who decided to pay a decent wage to his workers so that they could afford the products they were producing. Fordism is the basis of mass consumption, and the traditional cornerstone of our social models: when mass income declined, the result was almost inevitably a decline in consumption, production, employment and tax revenue. With mass production and increasing purchasing power of consumers, consumption soared, and with it resource depletion, emissions and waste generation.

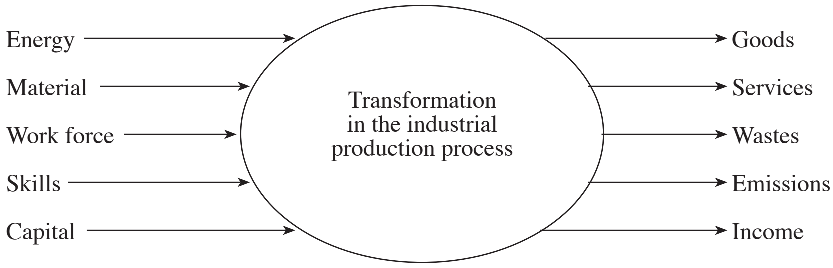


Figure 3.1 The industrial transformation system

Waste is the Janus face of products and production, its undesired but unavoidable backside. Its sheer volume developed into a key determinant of urban planning already in Ancient Rome, was the breeding ground for the plague killing a third of the European population in the 14th to 17th century and accelerated its growth with the emerging Industrial Revolution. Industrialisation was only possible based on new infrastructure, production facilities, roads and railways, their construction and maintenance. The growth of waste heaps and brownfields would have been the most telling symbol of the new era, even more so than the smoking chimneys (Spangenberg 1994). The pattern of production and consumption that emerged and in its basic traits remained unchanged right into the 21st century is a waste-intensive one (see Figure 3.1): the vast majority of all materials activated never enter the production chain. Vance Packard (1960) was right to call our societies 'wasteful societies' – products become waste after use, and with decreasing product life and recycling rates of less than 2 per cent of all materials activated, the production process is essentially a 'wastisation' process of labour and resources (Spangenberg 1996). So, long before any consumer is involved, every production process begins with waste generation; in terms of physical volumes, the goods and services we consume just a mere by-product, albeit a desired one, and the main product of our productive processes is waste.

For instance, while as of today the total volume of resources needed to provide a vacuum cleaner for households is several hundred kilograms, its total time of service delivery (that is, the use time accumulated over the life time) is about two weeks, and for an electric drill it is less than two days (Striewski 2003). An average German car is produced by turning about

10 tons of resources into 1 ton of a technical artefact used to transport in average 100 kilograms of humans. Its service, enhanced mobility, is used mainly in cities where the average car transport velocity is about 15 kilometres per hour well below the 17–20 kilometres per hour of the horse carriage, and for distances of less than 1 kilometre, where it would have been faster to go on foot. Its use is enjoyed for an aggregate time of about three months (average use in Germany 200 hours per year or 33 minutes per day over 12 years, making the car an 'auto*stabile*' rather than an 'auto*mobile*'), and then the car is thrown away; recycling of spare parts plays no significant role so far. Adding a much praised environmental device, the catalytic converter, consumes resources at least equivalent to the mass of the whole car. The relation of resource consumption and environmental impact to the volume of services generated is rather absurd, let alone the social and economic cost incurred.

3.3 PRODUCTION, CONSUMPTION AND POLLUTION

Sustainable consumption integrates social, economic and institutional as well as environmental aspects. However, the current international discourse is most advanced as far as environmental sustainability is concerned. Social sustainability criteria are just about to be formulated, but economic and institutional ones (except inoperational objectives like maintaining the respective capital stocks) are still rare and preliminary. So focussing on the environmental aspects, what are the criteria of progress towards environmentally sustainable consumption? Mainstream economists and environmental scientists have different world views, which ecological economics tries to integrate: whereas the cyclic flows of money are the basis of the economic analysis, the physical analysis is confronted with mainly linear flows through the economy and their transformation in the course of this process.

Every production process begins with an intellectual act: recognising the use potential embodied in a part of nature and landscape, be it land for grazing, wood for construction or ores for mining. In the next step, a value is attributed to what is now no longer perceived as a part of nature but a resource (although physically probably nothing has changed so far: the perception counts). This attribution of a value refers to the potential market value of the resource, that is, the demand people other than the owners have, not to any kind of intrinsic value. The resource is exploited if this market value is higher than the cost of exploring and exploiting the resource (plus the profit margin defined by the owner), which in reality is the cost of waste production. Overburden, drainage water, or waste heaps are all parts of nature that have been in the way of commercial exploitation of a resource – had the resource been defined otherwise, what is now the waste might have been part of valuable product, and vice versa.

In a Western European economy, 50–60 distinct abiotic materials including energy carriers and water but not air have been defined as such resources, are extracted from nature and crossing the border into the economic sphere at about 20 000 points of entry[1] (Spangenberg et al. 1999). There they undergo mechanical, thermal and (bio-)chemical treatment to be transformed into products, production waste and liquid and gaseous effluents. The production process increases the number of substances dramatically: on the output side about 100 000 substances – about 33 000 thereof in significant quantities – and 2 million products leave the human sphere and are returned to the environment (Sturm 2001), at countless exit gates (smokestacks, drainpipes, waste dumps, exhaust pipes…). Thirty thousand or 90 per cent of the mass-produced substances are so-called 'old substances', which have not undergone a state of the art environmental assessment as they were marketed before appropriate chemicals regulations came into force on the EU level in 1981 (Wille 2003).

Obviously, the sheer numbers of substances and their emission points are beyond the scope of effective control, and the massive resistance of economic interest groups makes effective environmental protection even harder to achieve. For instance, the latest initiative of the European Commission, suggesting the registration of all old substances (that is, collecting to collect meaningful data for them) by 2012 and assessing their impacts based on these data by 2020, has been denounced as 'overly ambitious' by the business lobby and consequently watered down by the governments, for example, of Germany and the UK. As a result, even the approximately 1350 cancerogenous and mutagenous (that is, cancer causing and genome damaging) substances and about 150 bio-accumulative ones will be on the market at least for another half generation (Wille 2003).

Given the figures presented on inputs and outputs, input accounting must be considered as an alternative to emission measurement, providing the opportunity for a comprehensive assessment. Although this admittedly neglects the substance-specific environmental impacts, this is not as much of a problem as it might seem at first glance: if a substantial reduction of resource extraction is set as the target, say a factor 4 for energy consumption (von Weizsäcker et al. 1997) or a factor 10 for material flows (Schmidt-Bleek 1994) by the midst of the century, in the course of time most production processes will have to be redesigned, and with them the goods and services consumed. This requires a significant number of innovations, social, economic, but in particular technical ones. Such innovation processes, speeding up the market-based search mechanisms and giving a clear direction to the permanent structural change usual in capitalist economies have to take into account the state of the art regarding environmental impact assessment. The 'old substances' would rather soon disappear from the market, replaced by newly developed ones based on the best of current knowledge, and – due to dematerialisation – used in smaller quantities. In this way, dematerialisation does not ignore detoxification, but rather provides the opportunity to overcome existing inertia also regarding the qualitative aspects of products and processes.

This is why enforcing specific environmental standards, substance legislation and the forthcoming EU framework are not superfluous efforts, but are complementary to any input reduction scheme and need to be implemented as a matter of urgency, and why substituting at least substances with proven harmless characteristics for the suspicious ones in product design would be a significant step forward. However, as long as we do not manage to design our products so as to minimise the consumption of resources from the very beginning, only limited progress towards environmentally benign production and consumption will be possible.

3.3.1 Quantity and Quality

Input accounting is more than a second best option made necessary by the unmanageable complexity of comprehensive output-based accounting. Not only the quality of certain substances causes environmental concerns, the sheer volume of resource consumption is a reason to worry, as most current environmental problems are closely linked to energy consumption, material flows and land use intensity (UNDESA 1998). As a matter of fact, except for the impacts of small amounts of highly bio-active substances, and of spatial effects (ecosystem fragmentation by infrastructure construction) the most relevant environmental problems in Europe can be traced back to the overconsumption of these basic resources (Spangenberg and Lorek 2002). The consumption of primary energy, total material flows and land use intensity can thus be considered a reliable proxy measure for total environmental stresses. Some authors have tried to enhance the communicative value of input assessment by aggregating all kinds of input into one figure, based either on accounting for (and converting all other impacts into) appropriated energy, emergy or exergy, land use, or material flows. All these measures are useful to illustrate the current 'consumption overshoot', providing complementary rather than competing views (Robert et al. 2002). The broadest of these physical input measures is material flow accounting, since it includes by definition energy carriers (in tons, not in energy units) and erosion as an indicator of land use intensity. For this reason, and since it is less well-known than energy accounting, it is described here in some detail.

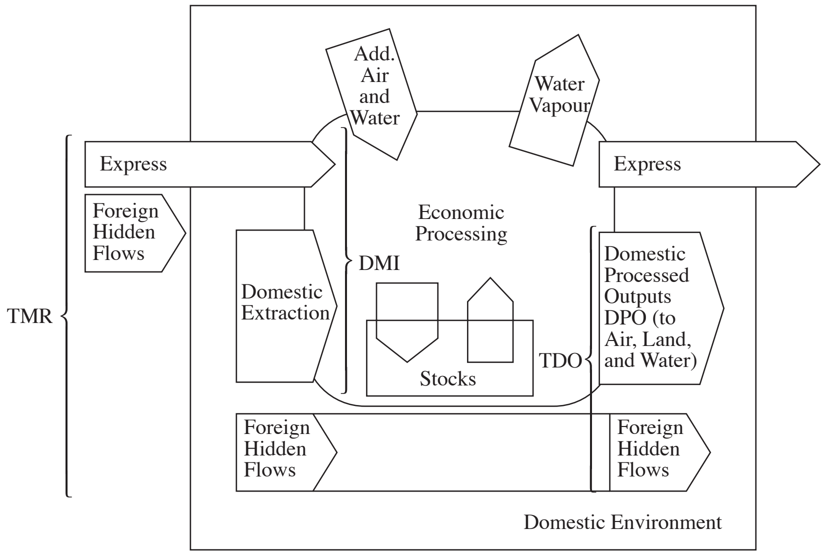
The volume of resources activated for maintaining service flows from stocks as well as from consumer goods, that is, the total physical throughput of the economy (Daly 1991) can be assessed in different ways. Like any other meaningful assessment of human-made environmental distortions, diverse as they are in their nature, their causes and their origins, it must be based on a lifecycle-wide approach, from resource mining to final disposal. However, depending on the kind of problem to be dealt with, and on data available different kinds of flows and different system boundaries are selected (OECD 2001; see Figure 3.2).

DPO (Domestic Processed Output) covers the traditional way of describing the interaction of effluents from the production and consumption system with the biosphere. It includes all those substance flows from domestic activities that regularly show up in environmental statistics. The steps to be taken into account include along the chain of production, consumption and disposal:

- the use of substances that are deliberately dissipated in the environment for a specific purpose, for example, pesticides or fertilisers in agriculture or salt on icy roads in winter time, as well as;
- emissions and deposition of solid, fluid and gaseous wastes, released into the environment as a result or side-effect of human activities like CO_2 from the energy consumption during manufacturing and use of a product.

Domestic output accounting is the basis for some more recent policy instruments like waste taxes and levies.

TDO (Total Domestic Output) adds the domestic hidden flows to the DPO. They comprise all the hidden physical flows like overburden or strip water from mining, and other materials that have not at all entered the production process. These materials are usually characterised by a negative economic value, that is, the cost of waste disposal, and are most frequently not taken into account in the waste statistics (Striewski 2003). Environmentally they represent open bills, irrespective of their economic valuation, causing environmental impacts like acid rain, groundwater contamination and a variety of not yet known damages, which we will have to deal with in future. Some of these effects are more or less stationary like heavy metal pollution in the ground or in sediments, while others spread ubiquitously. In one respect, the resulting pollution pattern from effluents and waste mimics the consumption patterns: the global consumer society



Source: Eurostat 2001.

Figure 3.2 Economy-wide material flows

leaves its footsteps in every corner of the world, from DDT in penguin eggs to dioxins for breast-fed babies.

DMI (Domestic Material Input) accounts for those physical inputs into the economy that have been extracted domestically, plus the volume of imported goods (both without the hidden flows associated with them, and imports without the production waste generated). As the number of entry gates and the diversity of substances is much lower on the input side, accounting for inputs covers the immediate outputs as well as those realised later due to a period of staying in the stocks. Therefore, input accounting provides a more comprehensive assessment of the environmental damages caused by today's activities, and offers itself to innovative instruments for reducing the total throughput, such as the Swedish tax on gravel (Palm 2002). This tax basis is quite broad: for instance, in Denmark as a highly trade-dependent country, the DMI in 1997 has been about 185 million tons or 35 tons per capita. Allocated to final demand, resources have been used as shown in Table 3.1.

However, these figures do not provide a full picture of the Danish footprint on the global environment: as the DMI does not take the flows associated to imports into account, the goods and services purchased by the revenues from the exports do not show up satisfactorily in the statistics. Nonetheless the table very clearly indicates the importance of the physical dimension of international trade, in addition to the monetary one (Döppe et al. 2003; Giljum and Hubacek 2003), that is, the matter–money dichotomy.

Table 3.1 Danish DMI by final demand 1997

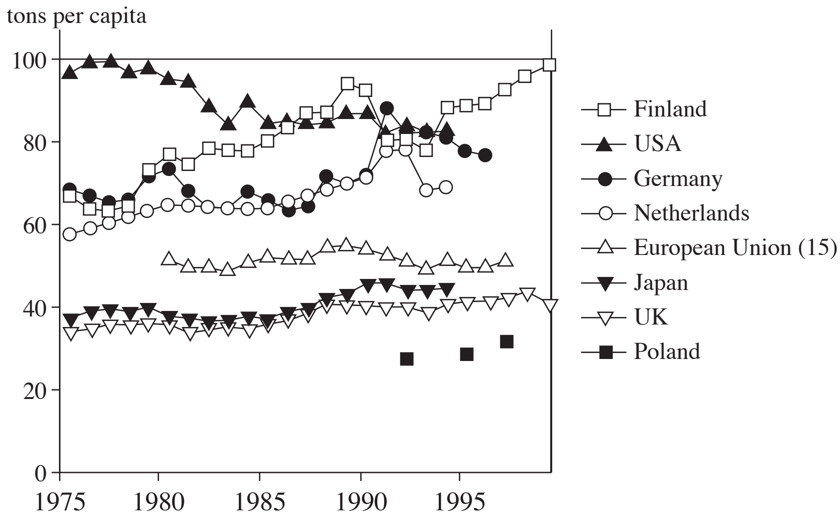
Final demand	Volume (million tons)	Share in national DMI (%)
Capital formation	38	20
Export of goods and services	94	51
Government consumption	10	6
Private consumption	42	23

Source: Pedersen 2002.

TMR (Total Material Requirement) is the all-encompassing measure including the domestic material input plus the hidden flows, both domestically and in the country of origin. As compared to the DMI it covers not only the domestic impacts of economic activities, but their global environmental consequences.

Naturally, the figures for different measurement methodologies diverge. So, for instance, for Sweden, domestic used extraction (DMI minus imports) in 2001 was 20 tons per capita, with DMI 25 tons per capita and TMR 45 tons per capita (Palm 2002).

The figures vary considerably between different countries, due to their level of consumption and to the structure of their domestic industry (for instance, Germany has a high contribution from lignite mining, and the Netherlands a similarly high one from meat production (Adriaanse et al. 1997). Both countries have a TMR of about 70 tons of material use per capita per year, with the German TMR gradually returning to its pre-unification level. Regarding TMR, Denmark also falls quite in line with its neighbour. The lowest level is found for Japan and the UK at about 40 tons capita, while Finland has outgrown the USA (see Figure 3.3): despite its focus on IT industries, Finland's TMR grew from around 60 tons per capita to nearly 100 tons per capita, a rapid increase usually typical for newly industrialising economies. This illustrates that even a modern high-tech business structure cannot exist without underlying traditional and material-intensive production, and provides a warning to all those who hope that the ongoing structural change towards a knowledge-based economy would in itself guarantee a significant dematerialisation of the industrialised economies. Overall, Figure 3.3 illustrates the trend to a relative, but not



Source: Bringezu and Schütz 2001.

Figure 3.3 Total material flows between 1975 and 2000 in seven countries and the EU 15

absolute delinkage of economic growth and resource consumption (except for the USA): despite a growth of at least 50 per cent of the GDP since the mid-1970s, the TMR did not follow suit but remained rather constant (Japan, EU 15, UK) or grew less than the GDP.

3.3.2 Take Three: The Environmental Space Concept

Material flow accounting, although the best single unit measurement available, still suffers from the problem all physical aggregates are confronted with: essentially, all conversions of resource consumption are rather arbitrary, as matter, energy and land – the three basic physical categories – have no common denominator. In the environmental space concept they are held separate for this reason, providing clear indications for prioritising changing land use intensity, energy saving and/or dematerialisation, and making trade-offs and synergies visible. The price to be paid is that there is not one figure but three and thus no unambiguously best or optimal result. The concept was developed by Hans Opschoor (Opschoor and Reijnders 1991) and applied to household consumption by the Dutch NGO Vereniging Milieudefensie (Buitenkamp et al. 1992). In its current form, the concept accounts for material flows, primary energy consumption and land use intensity, defining limits to inputs and measures to halt the loss of biodiversity (Spangenberg 2002). Besides the maximum, it also defines a minimum resource provision necessary to live a dignified life, free of poverty and exclusion. The issue of underconsumption, however, is not the focus of this chapter.

Although environmentally relevant only when they are disseminated, the resources accumulated in the stocks of society deserve a closer look, too. Stocks are public goods like roads or buildings, private goods like refrigerators, cars and houses, or industrial goods like machinery, railway lines and telecommunication infrastructure; they contain a vast amount of embodied material, energy and land. Goods and services can be distinguished according to their lifetime expectancy (short or long) and according to the type of market in which they are sold (fluctuating markets where products are only fashionable for a short time, or saturated markets where products are replacements) (see Table 3.2). Unlike the impression given in much of the consumption debate, not only short-lived goods are a reason for concern, but the accumulation of durables is problematic as well. On the one hand, the mere maintenance of long-lived goods and infrastructures requires an increasing volume of monetary expenditures as well as environmental space use, without providing *additional* welfare: they need to be cleaned, upgraded, repaired or renovated to continue providing the *same* service. This creates a positive feedback cycle: as a rule of thumb, the more materials we have fixed in the stocks, the more flows we need to maintain them. On the other hand, the stocks are bound to become waste as everything else, although after a longer time span. In the meantime, they are a restriction to behavioural options other than those foreseen at the time of their construction.

Table 3.2 Market types and life expectancy

Economic lifetime expectancy	Short	Long
Type of market		
Fluctuating	Tamagotchis	Personal computers
	Plateau soles	Transformers
	DDT	PUR foam
	Rubik's cube	PlayStation
Saturated	Blue jeans	Washing machines
	Newspapers	Water pipes
	Phosphorus	Bricks

Source: van der Voet et al. 2002, modified.

Regarding substance qualities, experts warn that around the middle of the century, when decreasing populations in a number of regions (for example, EU, China) will reduce the demand for housing and transport infrastructure, with the decommissioning of settlements that have exceeded their lifetime, CFC emissions from construction foams will result, their volume about as much as the total releases during the last century. Similarly, the decreasing trend of emissions of heavy metals is expected to be reversed soon, due to releases not from production, but from the stocks of products (van der Voet et al. 2002).

3.4 SUSTAINABILITY, CONSUMPTION AND THE PURSUIT OF HAPPINESS

The World Commission on Environment and Development (WCED or Brundtland Commission) has coined the most frequently quoted description of sustainable development by characterising it as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987, p. 43). Human needs include basic needs like food, clothing and shelter, but also additional material and non-material demands, which if satisfied are supposed to make life more pleasant and entertaining, and a part of these are consumption demands (Max-Neef 1991). Others are the challenge of raising children, gaining reputation from voluntary work in the community or the satisfaction from learning or pursuing a personal hobby. Which demands are articulated depends on a variety of factors, including the idea of what makes the quality of life, what is accepted/admired by the social reference groups, or which options are available and affordable. Time availability plays a central role as well, as time becomes a more and more scarce resource (Cogoy 1995). The resulting consumption patterns (including preference formation, purchasing, using and disposing of artefacts) do not only have significant environmental impacts, but penetrate all spheres of life. Consumer technology has severe social impacts, provides options for action as well as obstacles to it, and thus increasingly shapes the kind of activities chosen (if not the motives behind them). The mutual enforcement of individualisation and (auto-)mobility illustrates this point: a car, besides being a sink for resources and a source of pollutants has the effect of a 'social presence dilution machine'. It permits its owner not to stay put in a certain neighbourhood for living, shopping, consuming and leisure, but to reach out over a significantly larger distance, covering more people. This way, the car owner can and must be more selective when deciding where to shop, whom to meet and where to go – on the one hand, a gift of choices enhancing individual freedom, on the other a mechanism that contributes to the disintegration of society into different and rather unconnected sub-cultures. Individualism and sub-culture development are at the same time driving forces for increasing mobility demands.

The symbolic value of consumer goods is frequently more important than their initial function as 'service delivery machines' (Schmidt-Bleek and Tischner 1995), providing an important contribution to the subjective quality of life (Spangenberg and Lorek 2003), but also fuelling competitive consumption ('keeping up with the Joneses'). As a consequence, today too many people buy things they don't need with money they don't have to impress people they don't like, regardless of the costs involved and the environmental impact caused. The willingness to consume is a social as well as a psychological phenomenon, and its impacts are environmental as well as social and economic ones. However, what is really the role of products and their consumption in our societies is still far from fully understood. Whereas rather obviously in a capitalist economy the profit motive is driving the dynamics of growth and innovation on the production side, is money the overall driver for our societies, or just a lubricant? Is it commodities, technical artefacts and gadgets, or individual attitudes that make consumption the current key means in the pursuit of happiness? Are humans amoral utility maximisers, social integration seekers, or fun addicts? What is the driving force on the consumption side? Are we watching the rise and fall of the consumer society (Jackson 2002)? Which kind of consumption contributes to the quality of life, and which one does not (Daly 2001)? How can we enjoy gains in the quality of life without detrimental effects on the source of all resources, the environment? What in the end is sustainable consumption, what is overconsumption (Miljöverndepartementet 1995)? What needs to be sustained – life satisfaction, disposable income, or the total standard of living from bought and donated goods and services (Spangenberg 2002)?

3.4.1 The Driving Forces

Products and services are consumed because buying, owning and/or using them has a personal value for which a monetary value is paid or another kind of material or immaterial compensation is offered. In determining what is consumed, different spheres of influence overlap. Developers, producers, retailers, other exchange partners, and consumers themselves, all have a role to play (Lorek et al. 1999). The relative level of influence of the different actors depends on social and institutional settings determining their power position, on arguments (including the 435 billion dollar turnover of the global advertising industry, but also social relations and peer group pressures) and on the responsiveness of the respective audience to these arguments. The responsiveness itself is influenced by a variety of intrinsic and extrinsic factors.

Intrinsic factors comprise cognitive capacities, psychological factors, spontaneous emotions, individual interests and philosophical, moral or ethical norms. Extrinsic factors include socio-economic aspects like the disposable income and time availability as well as social relations (self-esteem, respect, admiration leading to imitation, peer pressure, fashion, family bargaining). Intrinsic factors determine the preferences, while extrinsic ones reflect the economic, social and legal possibilities, obligations and constraints. As both overlap (for example, individual preferences are shaped by social norms and relations and vice versa) no quantitative determination of the relative importance of each one for the resulting behaviour is possible; they co-evolve. For instance, the need for food is a constant, but with societal change, eating habits, time patterns and so on have changed more rapidly in the last 50 years than in the centuries before, a development made possible by increasing income and available technology. As a result, access to a refrigerator was no immediate need in the 1950s, when buying fresh products from the markets was a widespread habit, but today it is.

While extrinsic factors like disposable income have a significant influence on the availability of consumption options, intrinsic factors shape the choice between the alternatives available. One key factor determining such decisions is the individual assessment if existing alternatives are affordable in terms of purchasing power, time use preferences, resource endowment, and the desire to maintain or improve self-esteem, social status and acceptability (Cogoy 1999). Similar criteria apply to goods not traded on markets, but exchanged with or without equivalent compensation, like all services from unpaid work (caring and supply, housekeeping and education, voluntary and community activities, and so on).

The goods consumed, products or services, paid or unpaid, can be symbols of group identity, reflecting the visions, *Leitbilder*, grand narratives or concrete utopias a group like a nation, an ethnic group, or a lifestyle-based sub-group has, the idea of quality of life they share and live according to. Exposing a certain good (privately or collectively owned, or borrowed) can thus symbolise the membership of a certain group (or the aspiration to be a member), support for a certain idea, and so on: products do not create identity, but they are indispensable tools to express it. This way, goods serve as a 'projection screen' for otherwise defined values. However, to make them suitable for such projections, they must exhibit a 'blank screen', not being too obviously attached to specific values of their own. This mechanism is one of the reasons why green products or those from fair trade have significant problems reaching customers beyond the niche market they already occupy: they are not suitable for expressing any other identity than the ethical values their production is based upon. Expressing one's own identity as an active act, however, is experienced as extremely positive, since it creates the opportunity to experience one's identity, in this case by exhibiting certain products (an extremely frustrating mechanism for those who wish to join this group, but cannot).

A specific form of distinction is the ownership and exhibition of positional or oligarchic, mostly paid goods. The less people can afford a certain artefact at a given time, the smaller the group of potential owners, the higher its positional value, and the higher the incentive for all others to strive for future ownership as well. Then the good will be no longer positional, rendering the intended positional gain unattainable, which is subsequently promised by another good. Although positional goods need not be monetary, tradable or material – status is a clear positional good, time can be one – Mainwaring (2001) suspects that as a rule of thumb positional goods will be more environmentally damaging than less positional goods, as status is most frequently advertised by exhibiting material goods. Once environmental services become sufficiently scarce and thus more valuable in market-economy terms, environmental intensity as such might become a characteristic of positional goods (Altvater 2002). As societies and economies change, altering the patterns of scarcity and the relation of capital, labour and the environment, the failure of consumers to adapt to changing circumstances can lead to a lock-in, to sclerotic, outdated but quasi-sacred consumption patterns, as is the case, for example, with the 'American way of life'.

Such sclerotic consumption patterns inhibit the adaptation of consumption to ever-changing extrinsic conditions and thus the evolution of societies in general and the one towards sustainability in particular. To a significant degree they are the result of fear-induced and safety-oriented value systems emerging from the experience or social stress and deprivation, causing a desire for an idealised past (Giddens 1996), a retroprojective idealism.

3.4.2 The Evolution of Preferences

Whereas in the pursuit of happiness during the 1950s and 1960s the quantity of consumption was taken as a measure of its quality, in the 1970s its social attributes, in the 1980s its price and in the 1990s its fun factor defined its added value for the quality of life. At the turn of century the consumption drive is slowing down and the hunt for bargains is heating up, the risks of life (stock exchange losses, social security cuts, terrorism and war) dominate the public mood, and the quality of life seems likely to re-emerge as a core motive in the first decade of the new century. However, only time will tell whether this will result in another turn in the 300-year-old competition of paradigms between sustainability and expansionism (Grober 2002). A move from the high-throughput consumption society attitude of 'to buy is to be' to the wealthy, value-based durability promoting 'to have is to be' is possible if not plausible, and the rather philosophical attitude of 'to be is to have' is lurking in the visions of a sustainable knowledge society where social status is more based on knowledge than on the possession of material goods.

However, such a turn to sustainable consumption and production is neither to be expected without deliberately investing significant political, scientific, technological and educational efforts, nor is it easy to achieve. Nonetheless it is possible: less resource squandering products and services are feasible, as an overwhelming list of examples illustrates (von Weizsäcker et al. 1997; Schmidt-Bleek 1999). However, individual preferences alone will not do the job: sustainable consumption today is the art of 'right' behaviour within 'wrong' structures. In this perspective, the strategic challenge of sustainable development policy is to use, to find or even to create opportunities to leave the established socio-economic trajectories and change course towards a new paradigm. This can be based on the values expressed by ordinary people when asked for their most prominent wishes and aspirations: health, fitness, paid work, social security, education and information, a social environment providing acknowledgement and contact, and last but not least a healthy environment. Unlimited consumption, wealth or just only a high income level are not on the wish list – they are means for security and well-being, but no ends in themselves (Dahm et al. 2002).

3.5 MEASURING HOUSEHOLD RESPONSIBILITY

Industrialised, market-based capitalist societies have embarked on a very specific development path in their pursuit of happiness: accumulating material artefacts is considered as increasing wealth, and wealth has become synonymous to well-being. Little wonder then that the richer individuals and societies become, the heavier is their pressure on the environment, and all hopes that the environmental pressure would sooner or later rather automatically decline 'once we can afford it' – the so-called Environmental Kuznets Hypothesis – have turned out to be just wishful thinking (Fischer-Kowalski and Amann 2001; Lorek and Spangenberg 2001b).

With economic globalisation, this process has reached a new quality. Mergers and acquisitions have led to an immense capital concentration, and the expected synergies from these friendly or hostile takeovers can only be realised if the standardisation of core components is extended to all products of the respective transnational corporation. So, for instance, the car frames and the motors are the same in Skoda, Volkswagen, Seat and Audi cars, in Fords and Volvos, and only the outer skin, the design is different. The same applies to computers, shoes and banking services: to exploit the economies of scale, standardisation is applied, resulting in what looks like a broad variety of products at first glance, but is based on a rather narrow range of basic models and components. Product diversity is created as *pluralism by design*, a secondary or *virtual diversity* of essentially identical products. Contemporary consumers are confronted with the broadest choice of products human history has seen, but still their choice is limited to the virtual diversity the market offers.

3.5.1 Getting the Framework Right

What can households do to contribute to a stepwise but massive reduction in environmental space use, given the significant but limited influence *of* consumers, and the plethora of influences *on* them? On the one hand, household production and consumption play a role, but also the upstream impact of consumer demand and the downstream consequences of their consumption and disposal attitudes. Most frequently, when applying the household economics approach favoured by consumer organisations, environmental NGOs and – for instance in Germany – environmental agencies, these up- and downstream influences and thus responsibilities are quite neglected. The other extreme is the system of national accounts (SNA), allocating all impacts to the sectors of final demand (admittedly, the SNA is not intended to measure responsibilities, but – as for welfare – it is frequently misinterpreted in this sense). As households through their consumption of traded goods and public services are directly and indirectly consuming all what is accounted for as final demand (except for a trade surplus, allocated to foreign consumers), in this view households are responsible for all environmental impacts. This kind of assessment is the basis for the calculation of per capita material flow data, resulting in figures like the average material consumption in industrialised countries (80 tons per capita × year) or the average freshwater use (500 tons per capita × year) (Schmidt-Bleek 2003).

None of the extremes adequately reflects the influence and capabilities of consumers; nonetheless they are frequently used and – even worse – mixed without explaining their methodological differences (in the OECD consumption statistics (OECD 1999). A more appropriate methodology must be sought somewhere in the middle ground. One way to do so is to use the all-encompassing SNA approach and the corresponding monetary and physical input–output tables to assess the environmental space consumption of *all* consumption clusters and thus to identify the most relevant ones. In a second step, those clusters can be named that are under control of or at least significantly influenced by consumers' decisions. Thus the relative influence of households can be determined and their overall environmental responsibility characterised (if not measured) (Spangenberg and Lorek 2002).

3.5.2 The Role of Households

For Germany, ten consumption clusters have been identified, covering more than 90 per cent of the environmental space use; six of them, each representing a share of more than 5 per cent are considered environmentally relevant (see Table 3.3). Half of these clusters represent state consumption, that is, processes that can hardly be influenced by consumers to increase the environmental profile of the services generated. Only three clusters remain that are both environmentally relevant and open to significant household influence: construction and housing, transport, and nutrition (the food chain). Each of them presents more than 20 per cent of environmental space use, and together they represent about three-quarters of all environmental pressures in terms of environmental space consumption (Lorek et al. 1999).

Obviously, effective environmental sustainability efforts should focus on these clusters, offering extrinsic frameworks supportive to change, and providing an appropriate contextualisation for a positive integration into the intrinsic motivations. When doing so, however, the potential high psychological or symbolic value of the clusters of minor environmental relevance must be taken into account as well.

Table 3.3 Where households can make a difference

Consumption clusters	Influence of private houseoulds	Environmental relevance
Clothing	x	
Education/Training		x
Nutrition/Foodchain	x	x
Health care		x
Construction/Housing	x	x
Hygiene	x	
Cleaning	x	
Recreation	x	
Social life		x
Mobility/Transport	x	x

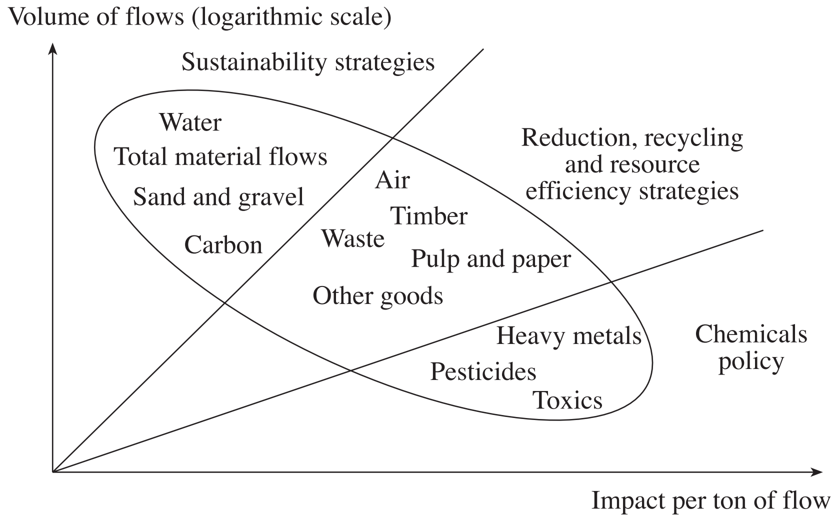
Source: Lorek et al. 1999.

In a similar fashion, within these three clusters a total number of 14 activities have been identified, which are dominating the environmental impact, and environmentally benign alternatives identified. This provides households with obvious choices for or against 'green consumption' in the environmentally most relevant cases, without suppressing the willingness to change by information overload. For instance, in construction/housing to build a new house or to inhabit an existing one is a key decision, as is the insulation and the resulting energy consumption level. For nutrition, the preference for local and seasonal products plays a role, plus the current overconsumption of meat. Regarding mobility, commuting is losing its dominant role, and leisure flights are the most rapidly growing pressure. Such decisions, however, are influenced by different actors in rather differentiated ways. These actors include households on the demand side, and planners, architects, producers, advertisers, retailers, regulators and others on the supply side.

Such lists can be used to describe the most environmentally relevant consumption decisions one by one, relating them to the relative weight of different actors, for example, on an ordinal scale from '0' to '++' in an 'actor matrix' (Lorek and Spangenberg 2001a). For these decisions, households have a significant responsibility – however, how much this is, for example, as compared to public authorities, producers and retailers and so on cannot be quantified. The reason is simple: although it is possible to calculate the resource consumption for each alternative of choices, the pattern of influence and thus of responsibility varies between individuals, over time and between regions, cultures and gender. No simple percentage figure will ever be able to reflect this dynamics, let alone the overlapping spheres of influence of different actors. As a policy guidance, this characterisation visualises which actors are most relevant for the sustainability of household consumption decisions, and offers an opportunity for voluntary agreements as well as for formal regulation.

The indicators developed this way have also been used to compare the relative environmental impact of consumers from different income strata (Lorek and Spangenberg 2001b): affluent people have higher impacts regarding housing and mobility, while on nutrition data are lacking. So rather obviously, the celebrities from the yellow press are as bad an example for sustainable consumption as one can imagine, but the rich and the beautiful still shape the aspirations of the middle class. As long as they are not substituted *by* society as a role model *for* society, this constitutes a specific responsibility and – as long as no voluntary action is taken – a justification for specific policy measures to orient the well-off towards sustainable consumption.

The change needed goes far beyond, but includes promoting eco-efficiency of goods and services in a lifecycle perspective as one key objective of sustainable consumption. For Germany for instance, the Statistical Office reported an increase of energy productivity of 24 per cent during the last decade, 2.2 per cent per annum – a significant improvement, but not enough: 2.4 per cent would have been necessary to meet the 30 per cent reduction target the government had set. Regarding material flows, the result was less promising; from 1990 to 2001 the total resource consumption (without hidden flows) declined by 2 per cent, a far cry from dematerialisation. Even worse, the area of soil sealed off by settlements and infrastructure increased by 8 per cent, 123 hectares daily (Dembrowski 2001). The lack of eco-efficiency is an economic challenge as much as an environmental one: Hartmut Fischer (2002) of Arthur D. Little has estimated the annual cost of the German resource consumption of 11 tons domestic mineral extraction (DMI) plus 9 tons energy carriers to amount to 730 billion euros or 20 000 euros per household. Saving a mere 25 per cent of this material use would result in 180 billion euros of savings, and in the creation of an additional 700 000 paid jobs.



Source: Palm 2002, adapted from Fischer-Kowalski and Hüttler 1999.

Figure 3.4 Impacts of resource consumption and mediation strategies

When quantifying eco-efficiency, the impacts from production, use and disposal of products are taken into account as environmental costs, and the volume of services delivered as benefits. Unfortunately, the definition of services in these formulas is ambiguous, partly based on more traditional concepts of insatiable desires for a maximum of utility (Giarini 1992) and partly extended to include factors exogenous to the neo-classical model like the satisfaction from ethical motives (Stagl and O'Hara 2001). In either case, a certain act of consumption and the use of time, work and resources needed to make it happen are allocated to one specific purpose (not least to avoid double counting when trying to quantify household impacts). The environmental impact of the consumption act is then allocated to this motive when calculating the environmental burden stemming from fulfilling specific needs or wants. For example, 100 kilometres of transport is considered a service, and the impact of providing it by car or by rail can be compared (Schmidt-Bleek 1999). However, consumption decisions are hardly ever monocausal, but incorporate and react to a variety of influences and interests, all mutually influencing and modifying each other. Consequently, the utility from consumption is not homogeneous and cannot be derived by aggregating single purchases (Keen 2001). To the contrary: utility is a characteristic attributed to goods by the consumers, based on the (expected) capability to provide user satisfaction, and thus as diverse as the needs and preferences, situations and attitudes of consumers. The indicators and consumption clusters suggested avoid this problem by measuring absolute flows, not relative impacts, and thus have no need to quantify 'services'.

Nonetheless, there are trade-offs between environmental criteria and social (and possible economic and institutional) sustainability objectives. As a result, compromises must be sought between goods that have no common denominator regarding their value except for the subjective values attributed to them by individuals based in their personal and usually uninformed preferences. Any meaningful compromising cannot be based on willingness to pay analysis, cost–benefit analysis (CBA) and similar one-dimensional assessments, but must take into account incomprehensible categories based on personal assessments, at best through collective discussions on norms and values. Consequently, multi-criteria decision aid (MCDA) is the method to choose, as it permits combining quantitative and qualitative, numerical and narrative, otherwise incomprehensible valuations, while cost–benefit analysis would not deliver adequate results. Unlike CBA, MCDA does not claim to identify an optimum solution but to provide a better structured and more transparent basis for compromising. In the end, a political process with civil society participation is needed to identify an acceptable compromise. Such politically defined objectives are no substitute for the everyday expression of preferences on the market, but provide an important complement to them, as consumers and citizens, although the same people may express different preferences according to their different roles, endorsing for example, price level increases through eco-taxes they would not have accepted voluntarily in the marketplace. So households may respond to their consumption-based environmental responsibilities not through their role as consumers in the

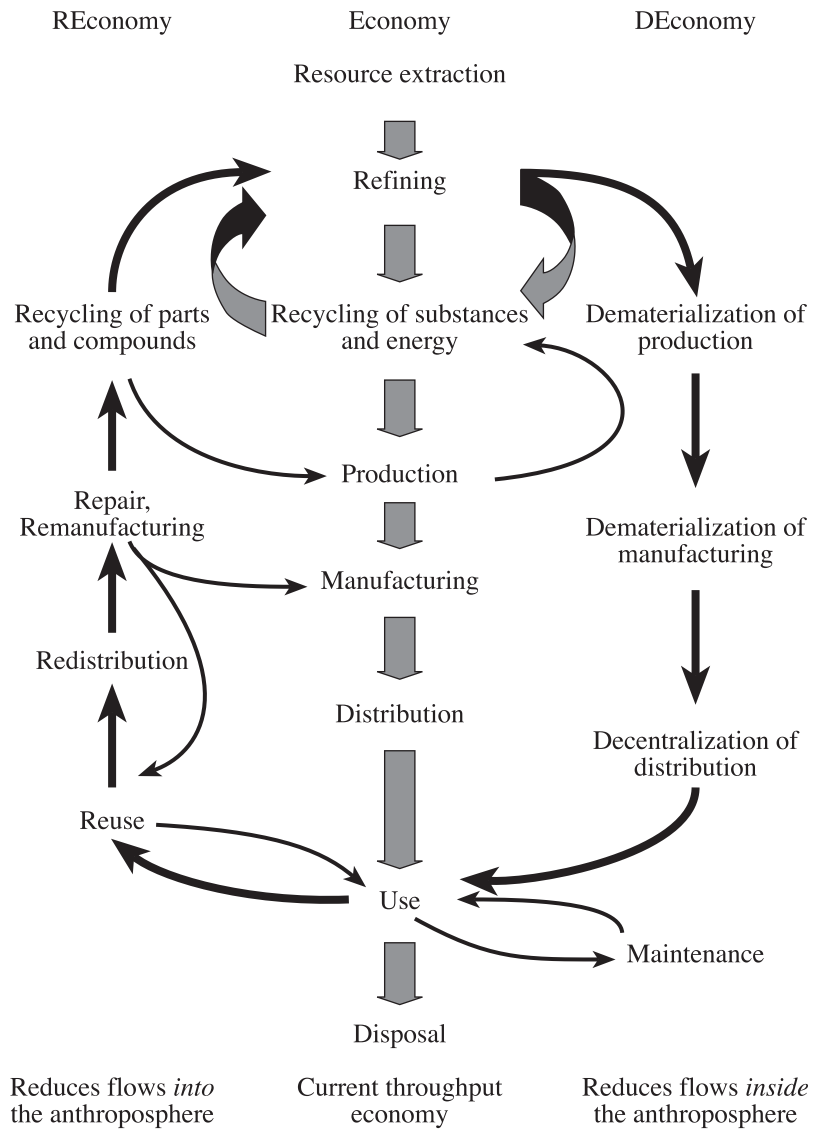


Figure 3.5 Sustainable consumption changes production patterns

marketplace, but rather rationally by endorsing restrictions in the way of consumption (and thus ruling out free rider effects) in their role as citizens (a nightmare to take into account for neoclassical economics).

3.6 CONCLUSION

Sustainable consumption is part of an overall paradigm shift towards sustainable societies, and such a paradigm shift needs to include all relevant actors. Households and individuals are involved in different positions, as citizens, as paid and unpaid workers in production and reproduction, and as consumers. Calling for change of consumer behaviour in isolation is urging for the 'right' behaviour within 'wrong' structures: the necessary change of consumption patterns must be part of a broader transformation. So, for instance, what is needed is short-term public policy regarding hazardous substances, medium-term eco-efficiency strategies and long-term dematerialisation, including a sustainable reorganisation of the total infrastructure of our societies and economies (see Figure 3.4). In all these processes, households will have to play a role, as consumers and as citizens.

Such a gradual but massive reduction of resource use is possible without impairing the standard of living, but only if significant changes in the production patterns take place. On the one hand, the total volume of resource flows must be minimised (dematerialisation), and on the other hand the share of resources extracted anew from the environment must be reduced (recovery and recycling). This transforms the *Economy* as we know it into a *DEconomy*, and complements it with a *REconomy*, as illustrated in Figure 3.5 (Striewski 2003). Both processes are complementary, demand significant investment, create a high number of new, highly qualified jobs (overcompensating those lost in the restructuring process, see for example, Hans-Böckler-Stiftung 2001). They require research, the development of new, dematerialised and recyclable products, learning how to enjoy them and how to dispose them properly as an input to the REconomy. All in all, this makes up for a different kind of *knowledge society*, where people know how to handle consciously the items of everyday use. Identifying and using this kind of bifurcation, departing from the high throughput, Fordist mass consumption society towards a low throughput, quality consumption-based one is the ultimate objective of environmental sustainability policies.

In this context it must be stressed again that sustainable consumption is not lowering the standard of living, but increasing its quality and thus the quality of life. We are just beginning to learn that lesson.

NOTE

1. Figures from Germany, with one oil or gas field considered one point of entry.

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