



**SUSTAINABLE  
CONSUMPTION  
AND  
PRODUCTION  
IN THE BALTIC SEA REGION  
– A SECTOR STUDY**

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# SUSTAINABLE CONSUMPTION AND PRODUCTION IN THE BALTIC SEA REGION – *A SECTOR STUDY*

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## CHAPTER 1

# THE CONCEPT OF SUSTAINABLE CONSUMPTION AND PRODUCTION (SCP)

The concept of Sustainable Consumption and Production (SCP) is well established on the global level. It was recognised at the Johannesburg World Summit on Sustainable Development (WSSD) as one of the three overarching objectives of, and essential requirements for, sustainable development (UNDESA, 2015). Together with poverty eradication and the management of natural resources SCP is essential to foster economic and social development. It was recognised that fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development.

### Sustainable Development as well as Sustainable Consumption relies on premises such as

WISE USE OF RESOURCES, AND MINIMISATION OF WASTE AND POLLUTION;

USE OF RENEWABLE RESOURCES WITHIN THEIR CAPACITY FOR RENEWAL;

FULLER PRODUCT LIFE-CYCLES;

**SCP IS ABOUT DOING MORE AND BETTER WITH LESS, AND INCREASING RESOURCE EFFICIENCY AND PROMOTING SUSTAINABLE LIFESTYLES.**

The Rio+20 Conference reaffirmed that Sustainable Consumption and Production is a cornerstone of sustainable development. The well-being of humanity, the environment, and the functioning of the economy, ultimately depend upon the responsible management of the planet's natural resources. The most promising strategy for ensuring future prosperity lies in decoupling economic growth from the rising rates of natural resource use and the environmental impacts that occur in both consumption and production stages of product life cycles (UNEP, 2012).

Sustainable Consumption and Production is about *"the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of further generations"* (IISDb, 1994). It offers important contributions for poverty alleviation and the transition towards low-carbon and green economies. It requires building cooperation among different stakeholders as well as across sectors in all countries.

The concept of sustainable consumption and production is also well studied within the academic community. It is recognised that since about 30 years the global annual use of natural resources is larger than what the planet produces each year - its carrying capacity. The footprints of all countries of the Earth add up to much more than the planet can produce. We are in a state of overshoot. The global society behaves as if we had several planets, but in fact there is only one planet Earth (Global Footprint Network, 2015).

The use of non-renewable resources, e.g. fossil fuels, phosphorus and rare earth

metals, confronts us with the dilemma of what to do when they are used up. But already, since a long time we have had to deal with the massive accumulation of the end products of these resources when being used, such as the carbon dioxide causing climate change. Other resources are renewable, such as fisheries, forests and many ecosystem products. These are used up faster than they can be replenished. All of these resources have essential roles in our present economy and way of life, and their mismanagement put our societies in danger.

The resource flows and the development of our societies was studied in some detail for the first time by a research team at the Massachusetts Institute of Technology on the request of the Commission of the Club of Rome. The results published in 1972 were called *Limits to Growth* (Meadows et al., 1972). The authors predicted that if the trends of increasing resource use were to continue, the world would come to an overshoot, peak, and thereafter collapse. The development they predicted for the so-called business-as-usual scenario turned out to be well made and has been confirmed several times since its publication. Presently we are in overshoot and the global peak is predicted to occur in the period 2020-2030 if business-as-usual applies.

## BOX 1.1 TIMELINE: DEVELOPING GOVERNANCE FOR SUSTAINABLE CONSUMPTION AND PRODUCTION

**1992**

At the United Nations Conference on Environment and Development (UNCED) the concept of Sustainable Consumption (SC) is established in chapter 4 of the Agenda 21.

**1994**

Sustainable Consumption Symposium in Oslo, Norway. Sustainable Consumption and Production (SCP) is about "the use of services and related products, which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of further generations" (IISDb, 1994).

**1995**

SC was requested to be incorporated by the UN Economic and Social Council (ECOSOC) into the UN Guidelines on Consumer Protection.

**1997**

A major report on SC was produced by the Organisation for Economic Co-operation and Development (OECD).

**1998**

United Nations Environment Programme (UNEP) starts a SC programme and SC is discussed in the Human Development Report of the UN Development Programme (UNDP).

**2002**

A ten-year programme on sustainable consumption and production is included in the Plan of Implementation at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa.

**2003**

The Marrakech Process is developed by coordination of a series of meetings and other multi-stakeholder processes by the UNEP and the United Nations Department of Economic and Social Affairs (UNDESA) following the WSSD. The Marrakech Task Forces build North-South cooperation and implementation mechanisms for SCP, and a Ten-Year-Framework Programme 10YFP, mostly on sustainable consumption and lifestyles, is established.

**2008**

The European Commission announces a series of proposals to improve the environmental performance of products and to increase the demand for more sustainable goods and production technologies. The Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan identifies voluntary and required actions to influence consumer behaviour and improve the energy and environmental performance of products.

**2012**

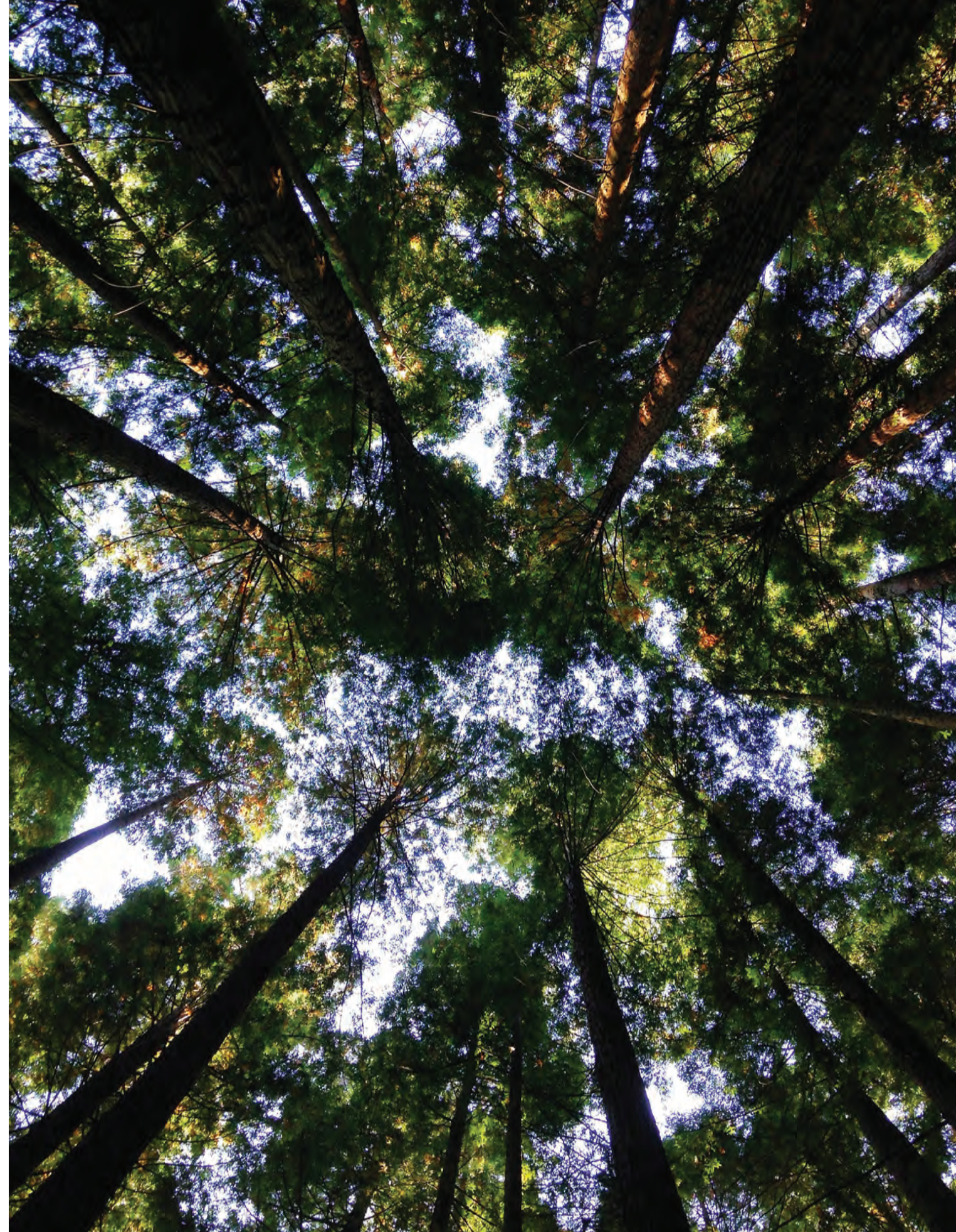
The 10YFP on Sustainable Consumption and Production Patterns is adopted at the Rio+20 Conference to be executed during the period 2012-2022. The goals of the 10YFP are 1) to assist countries in their efforts to green their economies; 2) to help corporations develop greener business models; 3) to encourage consumers to adopt more sustainable lifestyles. The programmes included in the 10YFP are voluntary.

**2015**

The first Global Meeting of the 10YFP is organised in May 2015 at the UN Headquarters in New York, USA.

On the local and regional scale overshoot and collapse has been illustrated several times, e.g. the Norwegian oil production reached a peak (peak oil) in 1999 and has since declined; the Baltic Sea cod stocks reached a peak in the 1980s and have since declined.

Sustainable Consumption and Production requires that we decrease our flow of natural resource to sustainable levels and establish an equilibrium between the capacity of nature to provide for society and our use of resources. To achieve such a balance we need to reduce resource extraction, improve production techniques, develop sustainable consumption patterns and life styles, and finally recycle resources to a much larger extent than today. Governance for sustainable consumption and production focuses on developing policies, strategies, and tools to achieve these goals.





## CHAPTER 2

# THE EUROPEAN UNION POLICY ON SUSTAINABLE CONSUMPTION AND PRODUCTION

In 2008, the European Commission announced a series of proposals to improve the environmental performance of products and to increase the demand for more sustainable goods and production technologies. The *Action Plan Sustainable Consumption and Production and Sustainable Industrial Policy* identifies voluntary and required actions to influence consumer behaviour and improve the energy and environmental performance of products (European Commission, 2015f).

The *Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan* addresses EU goals for environmental sustainability, economic growth, and public welfare. By improving the overall environmental performance of products throughout their life-cycle and supporting the development of more sustainable products and production technologies, it seeks both to foster resource conservation and resource efficiency and to "decouple" economic growth from environmental degradation.

Describing several important concepts provides useful context for understanding the *Action Plan*. "Sustainable Development" was defined by the World Commission on Environment and Development in its 1987 report *Our Common Future* at the Oslo Roundtable 1994 (United Nations World Commission on Environment and Development, 1987). In both cases, a central question is the degree to which improvements in environmental quality can be achieved through the substitution of more efficient and less polluting goods and services (*patterns* of consumption), rather than through reductions in the volumes of goods and services consumed (*levels* of consumption). In both cases, too, these concepts raise broader social questions related, e.g. to poverty, human rights, and global trade.

The *EU Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan* is an important part of the EU's Sustainable Development Strategy, which affirms the United Nations' Marrakech Process on Sustainable Consumption and Production and global 10-Year Sustainable Consumption and Production Framework.

### THE EU SCP ACTION PLAN INCLUDES:

- The *EU Eco-Design Directive for Energy-Using Products*: The Eco-Design Directive provides consistent EU-wide rules for improving the environmental performance of energy related products (ERPs) through eco-design.
- A proposal to extend mandatory labelling requirements related to the energy performance of products, under the 1992 *Energy Labelling Directive*. Under the proposal, this directive, which requires labelling of household appliances to increase consumer awareness about energy and environmental performance, would be applied to a wider range of products.
- A proposal to strengthen the *voluntary EU Eco-Label* by widening the number of products covered (e.g. including food and beverage products) and streamlining the system. The proposal is designed to encourage manufacturers to go beyond mandatory minimum product standards. The Action Plan also proposes that only products attaining a certain level of energy or environmental performance should be procured by EU Member States and institutions and should be eligible for incentives granted by Member States to consumers for the purchase of eco-friendly products.
- A separate *Communication on Green Public Procurement*. This communication

identifies priority sectors of the economy and includes a process to establish common environmental criteria and targets to guide green public procurement by Member States.

- A proposed revision of the *EU Eco-Management and Audit Scheme (EMAS)* to increase the number of companies involved, including companies outside the EU, and reduce the administrative burden and costs for Small and Medium Sized Enterprises (SMEs).

EMAS is a management tool to help firms to evaluate, to report and improve their environmental performance.

The Action Plan integrates and complements a number of existing EU and Member State actions to foster resource efficiency and the use of eco-friendly products. For example, in addition to the specific policies and programmes identified in the preceding section, the Action Plan builds on the EU's *Integrated Product Policy - Thematic Strategies on the Thematic Strategy on the Use of Natural Resources*, and *Thematic Strategy on Waste Prevention and Recycling*. Along with the Action Plan, these initiatives provide strategic direction for the EU in achieving sustainability goals.

## CHAPTER 3

# THE UNITED NATIONS ENVIRONMENT PROGRAMME'S RESOURCE EFFICIENCY PROGRAMME

The United Nations Environment Programme (UNEP) works to promote resource efficiency and sustainable consumption and production in both developed and developing countries. The focus is on achieving increased understanding and implementation by public and private decision makers, as well as civil society, of policies and actions for resource efficiency and sustainable consumption and production. This includes the promotion of sustainable resource management in a life-cycle perspective for goods and services (United Nations Environment Programme, 2015c).

International scientific assessments, such as the Millennium Ecosystem Assessment, the Global Environmental Outlook and the 4th Assessment Report of the Intergovernmental Panel on Climate Change, make it increasingly evident that the world cannot achieve sustainable economic growth without significant innovation in both the supply (production) and demand (consumption) sides of the market.

Decoupling economic growth from resource use and environmental degradation and creating the 'space' for people living in poverty to meet their basic needs will require producers to change design, production, processes and marketing activities. Consumers will also need to provide for environmental and social concerns – in addition to price, convenience and quality – in their consumption decisions.

Economic growth and, the development and human welfare gains it contributes to, cannot be sustained with current consumption and production patterns. At the same time, a large share of the world population is still consuming too little to meet even their basic needs. Responding to this dual challenge will require a combination of new policies, redirected investment, application of environmentally sound technologies, international cooperation, and capacity-building to reshape national economies as well as the global economy. UNEP is well positioned to facilitate and accelerate the

shift to more resource efficient and sustainable consumption and production patterns. UNEP is building on its existing mandates, securing more synergies within the organisation itself, and strengthening and extending partnerships with a broad range of public and private institutions and stakeholders.

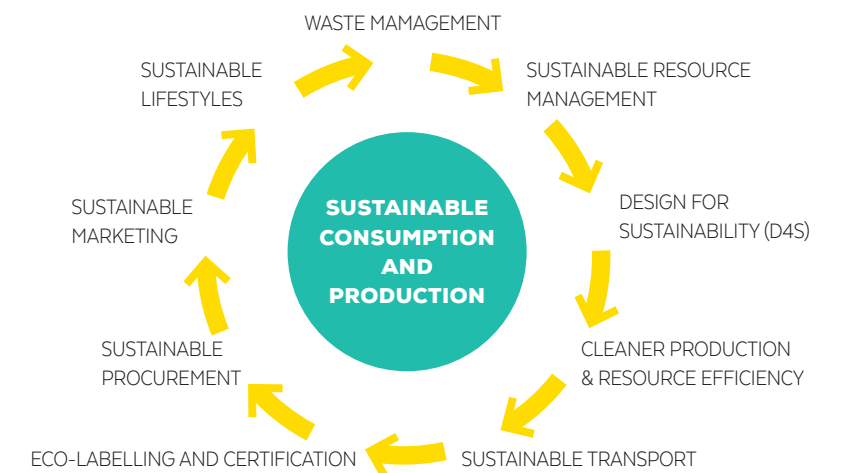
SCP aims at “doing more and better with less,” increasing net welfare gains from economic activities by reducing resource use, degradation and pollution along the whole life-cycle, while increasing quality of life. This change towards SCP involves different stakeholders, including business, consumers, policy makers, researchers, scientists, retailers, the media, and development cooperation agencies, and many more. It requires a systemic approach and cooperation among actors operating in the supply chain, from producer to final consumer. It involves engaging consumers through awareness-raising and education on sustainable consumption and lifestyles, providing consumers with adequate information through standards and labels and engaging in sustainable public procurement, and so forth.

### APPROACH AND TOOLS

A KEY APPROACH TO UNEP'S WORK ON RESOURCE EFFICIENCY is the life-cycle perspective (Fig.1.1). By reducing the environmental impact of goods and services at every stage, from raw material extraction and transportation to manufacturing, distribution, use and disposal, we can achieve more wellbeing with less material consumption. This enhances our potential to meet human needs while respecting the ecological carrying capacity of the Earth.

This is closely related to the decoupling concept used in UNEP: **DECOUPLING ECONOMIC GROWTH FROM RESOURCE USE AND ENVIRONMENTAL DEGRADATION** – or **DOING MORE AND BETTER WITH LESS**. Reforms in government policies, changes in private sector management practices and decisions, and increased consumer awareness are needed to achieve decoupling.

FIGURE 1.1 PRINCIPLES OF SCP (SOURCE: UNEP)







## CHAPTER 4

# ORGANISATIONS WORKING WITH SUSTAINABLE CONSUMPTION AND PRODUCTION

The **INTERNATIONAL INSTITUTE OF SUSTAINABLE DEVELOPMENT (IISD)** is working with SCP since the Oslo Roundtable in 1994. The emphasis in regards to sustainable production is on the supply side of the equation, focusing on improving environmental performance in key economic sectors, such as agriculture, energy, industry, tourism and transport. Sustainable consumption addresses the demand side, looking at how the goods and services required can meet basic needs and improve quality of life – such as food and health, shelter, clothing, leisure and mobility – and how they can be delivered in ways that reduce the burden on the Earth’s carrying capacity” (International Institute of Sustainable Development, 2015).

The **UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)** undertakes a number of activities, including activities related to cleaner production, waste management and environmental management tools, to further SCP goals. Since 1998, UNEP’s Sustainable Consumption and Production Branch has worked to develop comprehensive national programmes or action plans on sustainable consumption and production. The UN is responsible for managing the Marrakech Process and the development of the 10-Year Sustainable Consumption and Production Framework through Regional Marrakech Process Consultations. The goal of the Framework is to accelerate the shift towards sustainable consumption and production thus promote social and economic development within the carrying capacity of ecosystems by de-linking economic growth from environmental degradation (United Nations Environment Programme, 2015a).

The **ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)** has done extensive work on the environmental impacts of household consumption and the design of environmental policy targeted at households. One current OECD project is

reviewing evidence on the effects of environmental policies on household behaviour, with respect to energy use, waste, transport, and water use. The OECD has undertaken work to identify measures for sustainable manufacturing production, too (OECD EaP, 2015).

The **COLLABORATING CENTRE ON SUSTAINABLE CONSUMPTION AND PRODUCTION (CSCP)** is a non-profit organisation with limited liability. It was jointly founded by the Wuppertal Institute for Climate, Environment and Energy and the United Nations Environment Programme (UNEP) in 2005 to establish an internationally visible institution for scientific research, outreach and transfer activities on sustainable consumption and production. The Centre contributes to the Plan of Implementation agreed at the World Summit on Sustainable Development in 2002 to promote sustainable patterns of consumption and production (Collaborating Centre on Sustainable Consumption and Production, 2012).

Following the aim of One-Planet-Living, the key areas to accelerate the implementation of SCP are the development of national action plans on SCP, the integration of SCP into urban development planning and the mainstreaming of SCP in poverty eradication efforts. CSCP has thus decided to work on the socio-economic aspects of SCP and strategies for bringing about change by linking SCP to national and local development goals. The CSCP supports new models of economic development such as closed-loop economies, investments in long-term and cost-effective solutions, and creating public/private partnerships that can provide better access to sustainable environmental services for in poverty living people.

The CSCP conducted various projects with and for diverse actors, such as national and European Directorates, the European Commission, UNEP, multinational companies, as well as SMEs, European research institutes and non-governmental and civil society organisations.

The work of the CSCP can be divided into three core areas: 1) Sustainable Lifestyles, 2) Sustainable Infrastructures, Products and Services 3) Sustainable Business Models.

The EU-funded **SUSTAINABLE CONSUMPTION RESEARCH EXCHANGE (SCORE!)** analyses the state of the art in SCP research, and promote cases of (radical) sustainable consumption for mobility, agro-food and energy use. SCORE! has provided important support and inputs to the Marrakech Process and development of the 10YFP. Through its series of workshops and conferences, SCORE! has established a good platform of interaction and cooperation between scientists and researchers and the Marrakech process stakeholders (Sustainable Consumption Research Exchange, 2015).

The **INTERNATIONAL PANEL FOR SUSTAINABLE RESOURCE MANAGEMENT** was launched in November 2007 and is expected to provide the scientific impetus for decoupling economic growth and resource use from environmental degradation (United Nations Environment Programme, 2015b).

Efficient resource use will require that our economies become more circular. The **ELLEN MACARTHUR FOUNDATION** established in 2010 has the aim to accelerate the transition to the circular economy. Since its creation the charity has emerged as a global thought leader, establishing circular economy on the agenda of decision makers across business, government and academia. The Foundation seeks to create a global teaching and learning platform built around the circular economy framework, working in both formal and informal education. The Foundation works with Global Partners (Cisco, Google, H&M, Kingfisher, Philips, Renault, and Unilever) to develop circular business initiatives and to address challenges of implementing them. In 2013, the first dedicated circular economy innovation programme “Circular Economy 100” was created (Circular Economy 100, 2015).

## TRENDS OBSERVED IN THE EU ON SUSTAINABLE CONSUMPTION AND PRODUCTION

The trends observed in Sustainable Production and Consumption have developed favourably in the long term. (Eurostat Statistics Explained, 2015). Since 2002, a considerable improvement is observed in resource productivity. This long-term efficiency gain occurred because the GDP had been growing faster than domestic material consumption (DMC), in particular before the onset of the economic crisis. Since 2008, the EU resource use has dropped sharply, putting the DMC below levels observed a decade ago.

Between 2004 and 2012 the amount of waste excluding major mineral wastes generated per inhabitant in the EU was reduced by about 5.8 %. The amount of hazardous waste generated among the EU-28 increased considerably between 2004 and 2012. The highest increase was in 2012, when hazardous waste generation rose by 3.6 % compared with 2010. Since 2000, waste treatment practices have improved considerably in the EU.

Improvements have taken place in the area of atmospheric emissions of acidifying substances and ozone precursors. Due to almost continuous declines since 1990, man-made emissions of ammonia (NH<sub>3</sub>), sulphur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>) and non-methane volatile organic compounds (NMVOC) in 2013 were lower than in 1990. A strong reduction of emissions occurred in the short-term period between 2008 and 2013.

Electricity consumption of households has risen more or less continuously since 1990. Growth in the number of households has been a main driver of this trend. Final energy consumption in the EU has been rising since 1990. The strong contractions in final energy use in 2009 and 2011 not only brought final energy consumption in 2013 down to pre-2000 levels, but also pushed the EU ahead on its projected path to reaching the 20 % energy saving target.

Production patterns have shown mixed trends in the EU over past years. Although organisations have increasingly implemented certified environmental management systems according to the Eco-Management and Audit Scheme (EMAS) since 2005, this trend has reversed in the short term. Between 2009 and 2014, the number of EMAS-registered organisations fell by 5.8 %.

Farming practices have become more and more sustainable in the EU since 2005, as reflected by the increase in the share of organic farming. This dynamic development has also been reflected in growing sales of organic products on the EU food market.

## CHAPTER 6

# TRENDS OF SUSTAINABLE CONSUMPTION AND PRODUCTION IN THE BSR

## THE GENERAL TRENDS ARE POSITIVE

In the following a summary description of sustainable consumption and production patterns in the Baltic Sea region is given. It is mostly based on statistics from the Eurostat database. Most data refers to the material flows as described in extraction and wasting in the BSR economies. Some data describe the properties of production, mostly in industry and agriculture, and consumption, mostly in households.

The Baltic Sea Region, just as the European Union in general, has a slight positive trend as more economic value is obtained for each unit of natural resources used. There is thus a tendency to decouple economic growth from material flows, as resource efficiency is slowly increasing. Other positive signs include a reduction of polluting substances, especially air pollution, per economic unit. On the waste side we see a reduction of the amount of waste going to landfill, that is, the least favourable alternative of waste management, and a slow increase of recycling and composting.

On the production side the number of companies which has introduced environmental management systems, especially ISO 14001, has increased, and so has the land area cultivated under ecological conditions (organic farming). The consumption still shows increased resource use. Thus energy use per household is increasing, and so is the energy used for mobility. Data on sustainable consumption is however difficult to extract and the way consumers behave is not easily concluded from the available statistics.

Data for the Baltic Sea Region as a whole will be given only occasionally, because when based on national statistics, it is not always relevant. It is dominated by

Germany with 80 million inhabitants which is 50 % of the population in the region, and secondly by Poland, with close to 40 million inhabitants. The Nordic countries – Denmark, Finland, Norway and Sweden – with some 25 million inhabitants account for about 15 % of the region and the three Baltic States – Estonia, Latvia and Lithuania – with about 8 million accounts for 5 % of the total. In most cases national data will be given per capita to be able to compare the countries.

## ECOLOGICAL FOOTPRINTS

Ecological footprints are available for most countries in the BSR since the 1960s and for all countries since 1991. There is a mixed picture (countries collected in Fig 1.2 A-J) Some countries have increased their footprint, such as Germany, Latvia and Lithuania. Some have a decreased footprint, e.g. Norway and the Russian Federation, while most countries remain on the same level, in spite of increased population, and a larger national economy.

Total footprints are calculated as the sum of five partial footprints: Cropland Footprint, Grazing Footprint, Forest Product Footprint, Carbon Footprint, Fish Footprint, and Built up land. In most countries in the region carbon footprints, mostly caused by the use of fossil fuels, make up almost half of the total footprint (Table 1.1).

TABLE 11 **ECOLOGICAL FOOTPRINT IN 2011** (Global hectares per capita, Source Global Footprint Network)

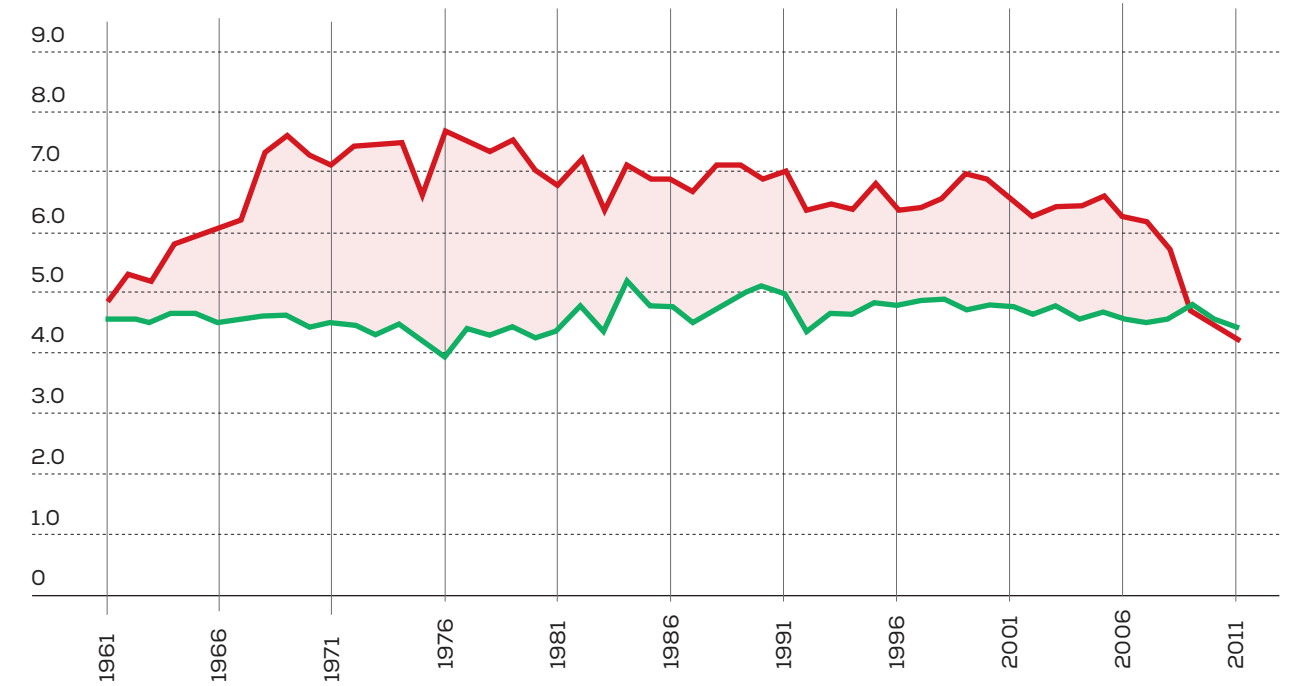
COUNTRY/REGION	DK	EE	FI	DE	LV	LT	NO	PL	RU	SE
HDI	0,90	0,84	0,88	0,91	0,80	0,83	0,94	0,83	0,78	0,90
PER CAPITA GDP (USD)	41.906	23.540	40.183	41.730	19.826	22.521	61.648	21.751	22.564	41.615
POPULATION (MILLIONS)	5,6	1,3	5,4	82,9	2,1	3,0	4,9	38,2	143,4	9,5
CROPLAND FOOTPRINT	0,6	1,1	-	1,0	2,2	1,1	1,2	0,8	0,9	1,4
GRAZING FOOTPRINT	0,5	0,1	-	0,2	0,1	0,3	0,2	0,0	0,1	0,3
FOREST PRODUCT FOOTPRINT	1,0	1,9	-	0,5	1,8	1,2	1,1	0,8	0,4	1,4
CARBON FOOTPRINT	1,8	2,2	-	2,5	1,2	1,6	0,7	2,0	2,8	3,0
FISH FOOTPRINT	0,2	0,0	-	0,1	0,2	0,3	1,1	0,1	0,2	0,1
BUILT UP LAND	0,2	0,1	-	0,2	0,1	0,1	0,4	0,1	0,1	0,3
TOTAL ECOLOGICAL FOOTPRINT	4,1	5,5	4,8	4,4	5,4	4,2	3,7	4,0	4,3	6,4

FIGURE 1.2 **ECOLOGICAL FOOTPRINTS OF THE COUNTRIES IN THE BSR**

The red line is the footprint and the green line describes the biocapacity, expressed in global hectares. (Source: Global Footprint Network, 2015)

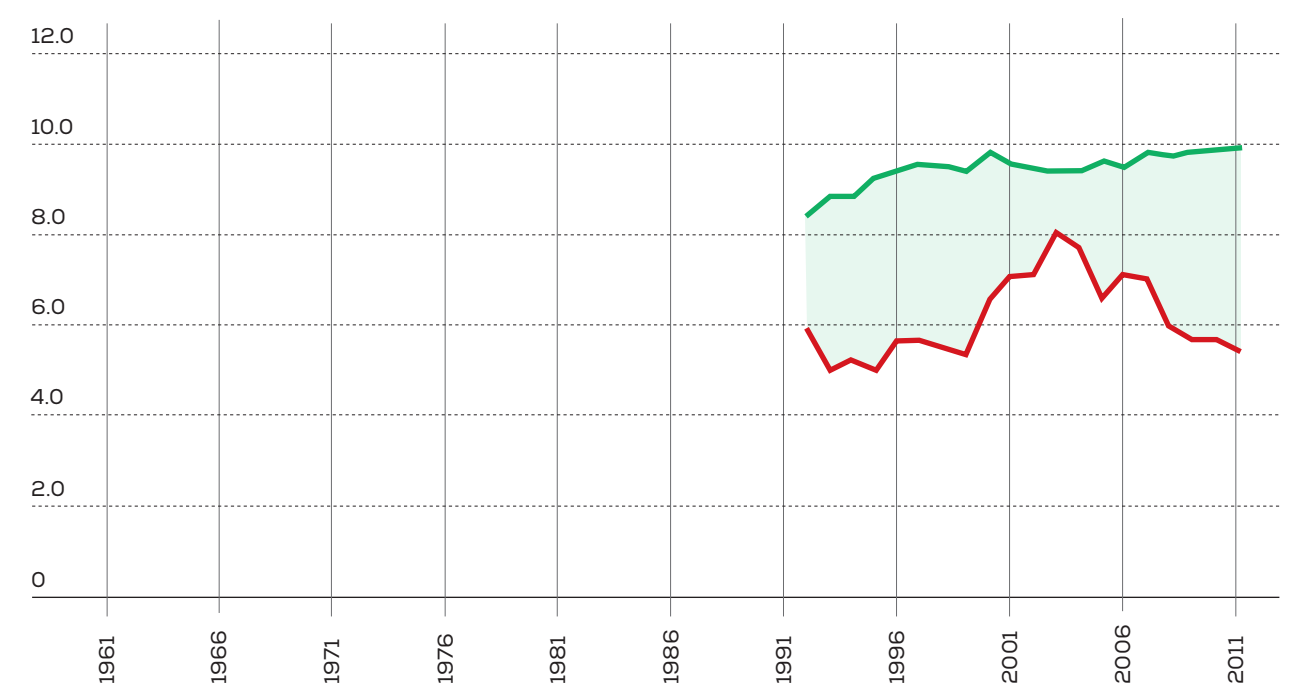
**A) DENMARK**

Global Hectares per capita



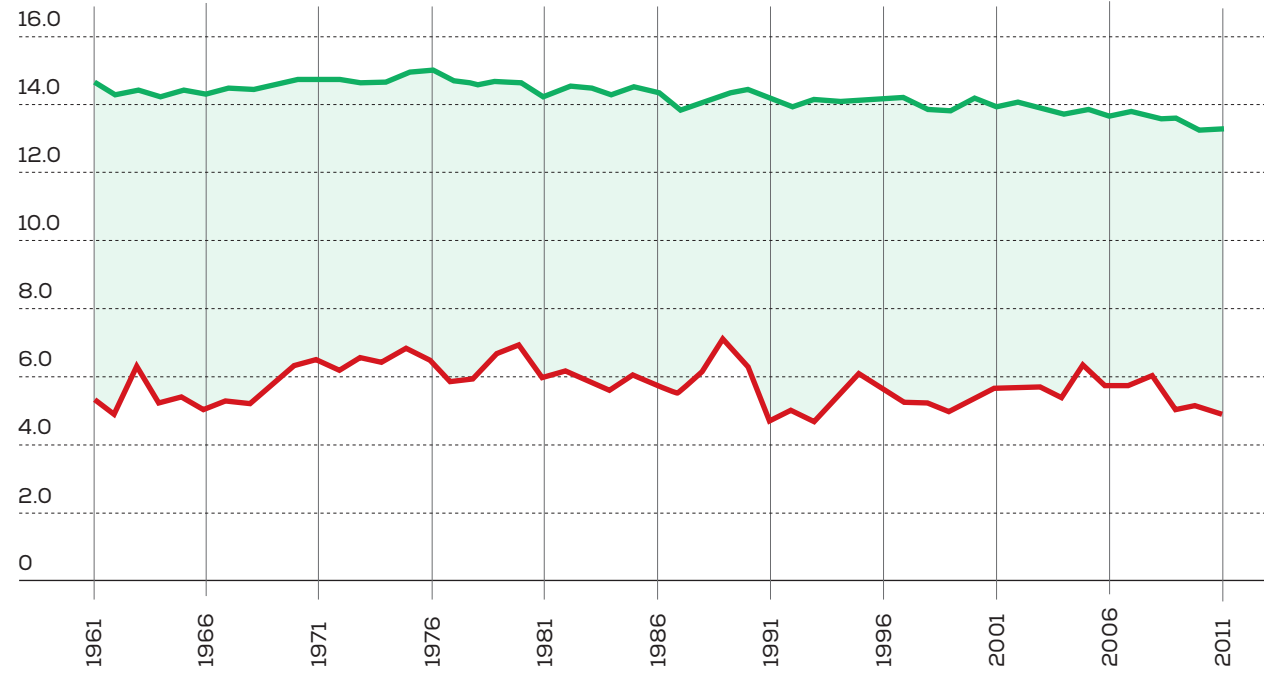
**B) ESTONIA**

Global Hectares per capita



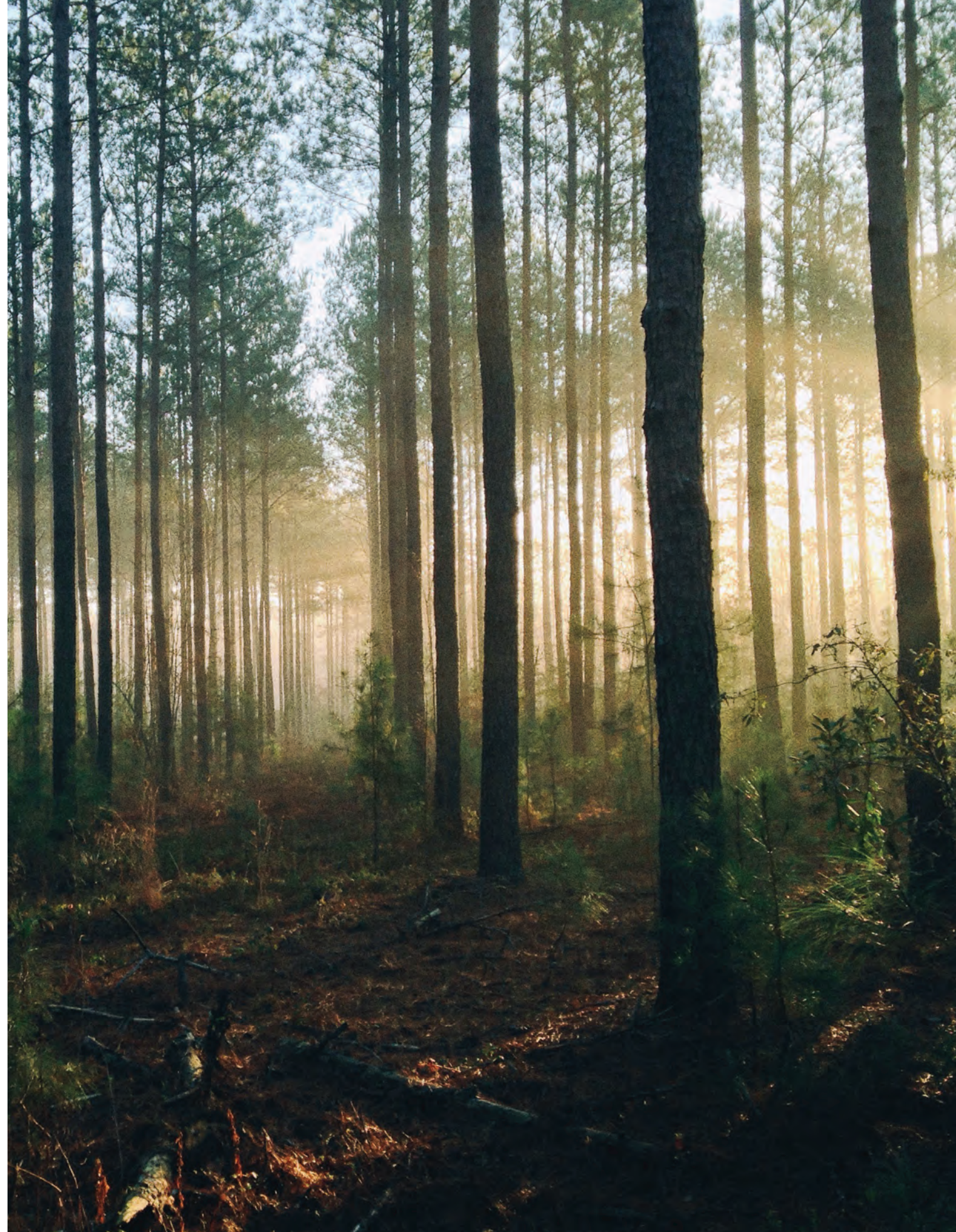
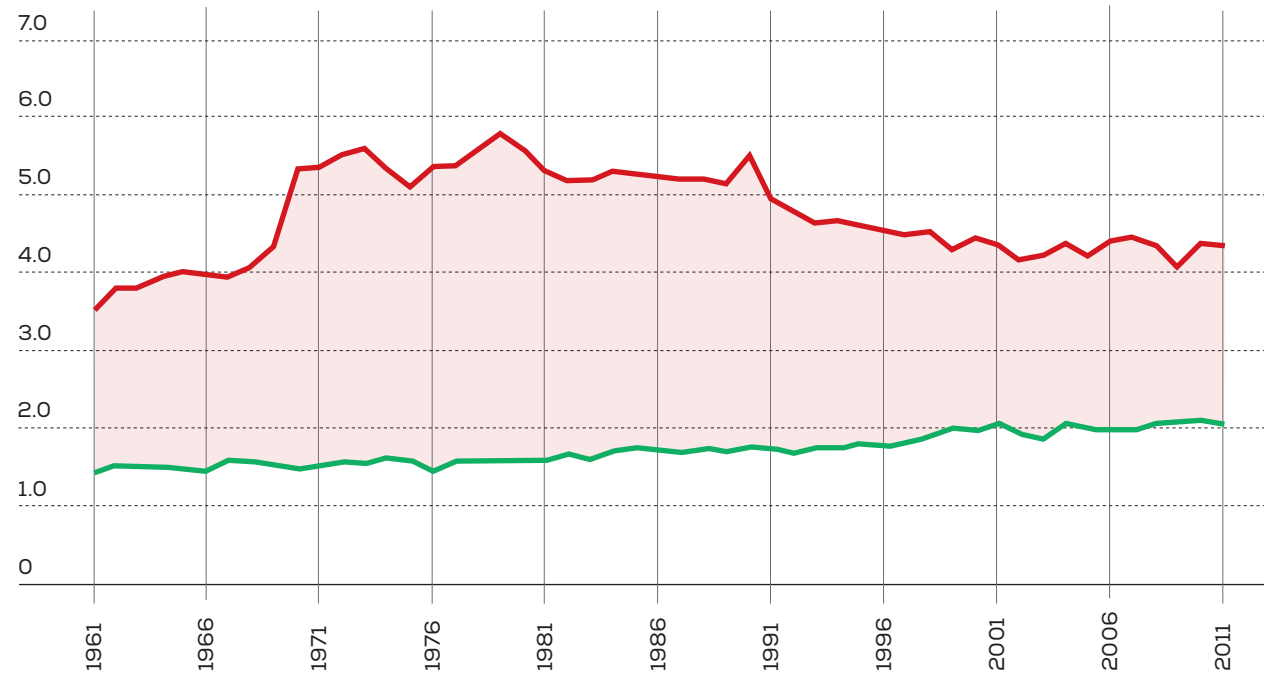
### C) FINLAND

Global Hectares per capita



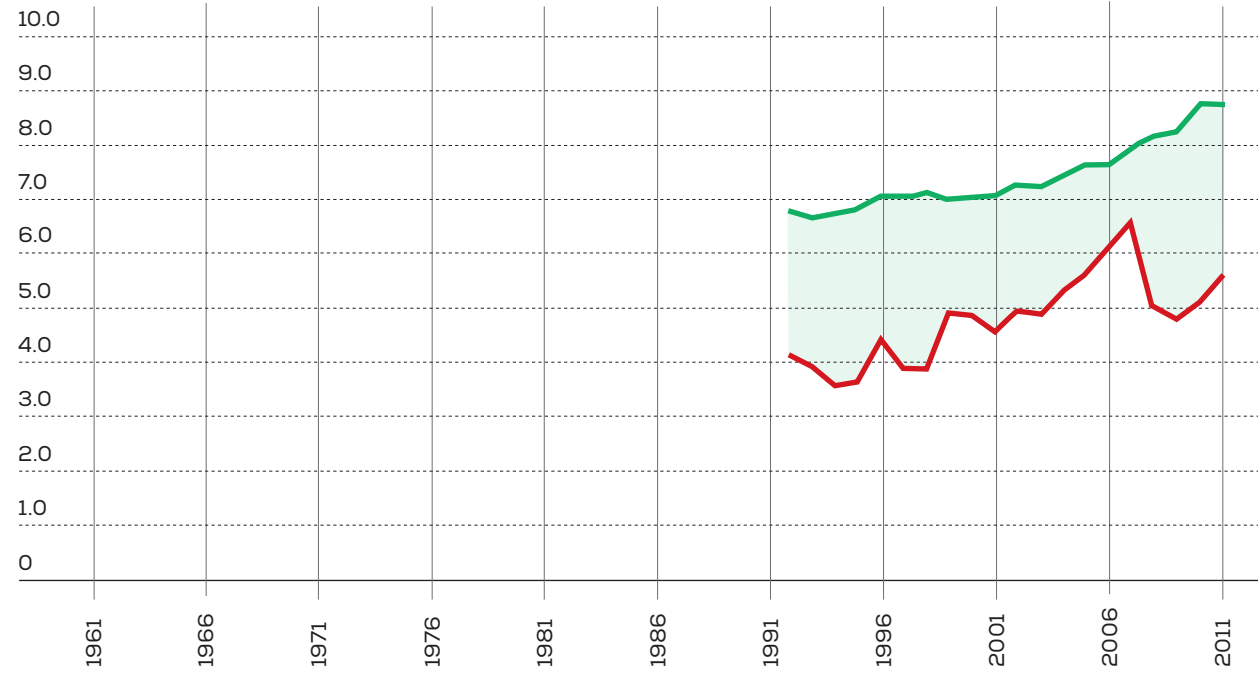
### D) GERMANY

Global Hectares per capita



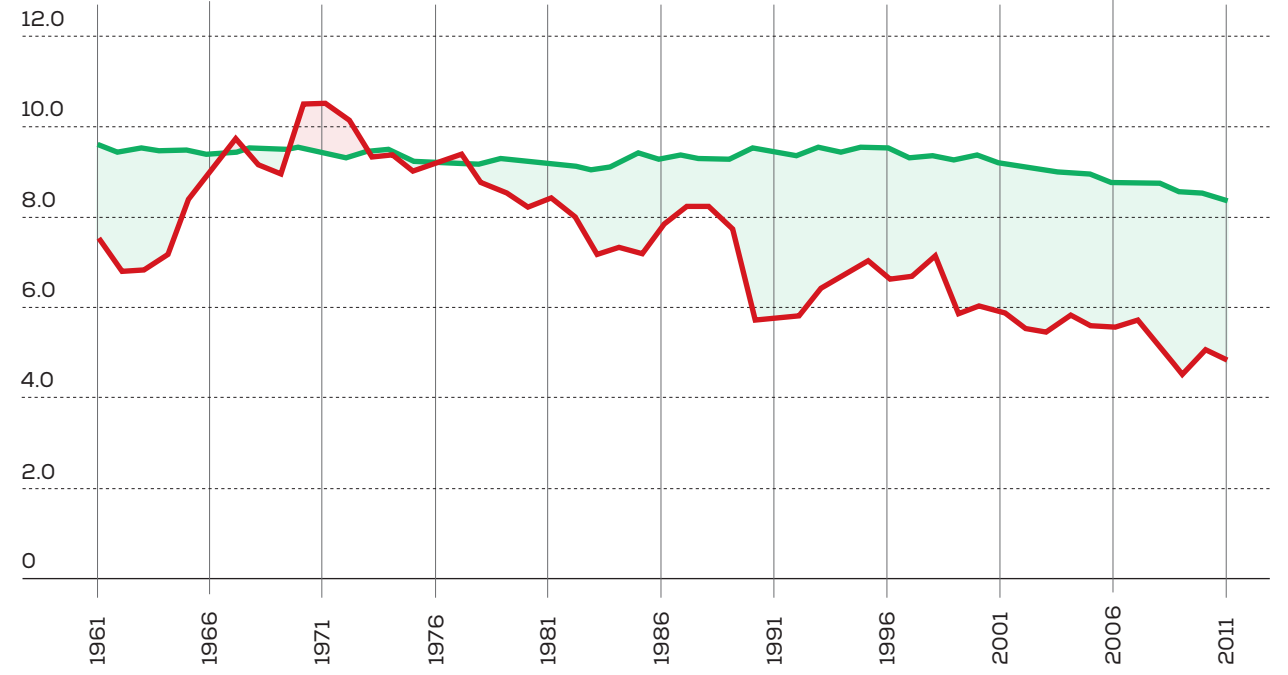
### E) LATVIA

Global Hectares per capita



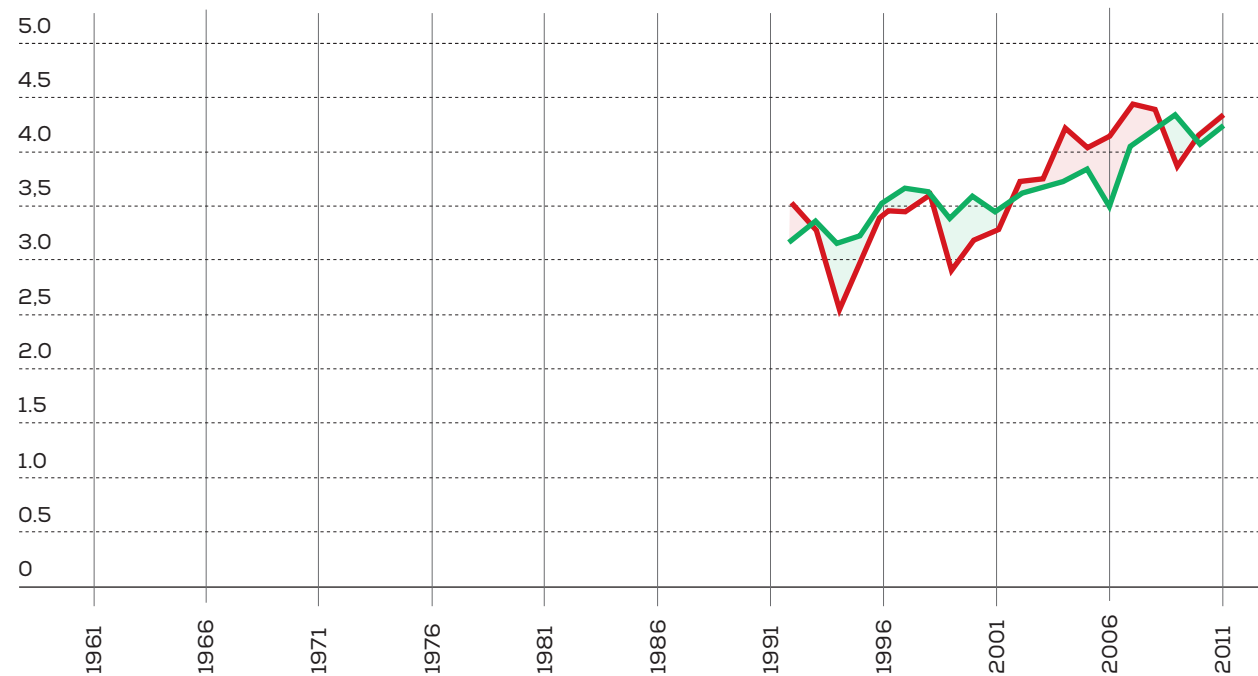
### G) NORWAY

Global Hectares per capita



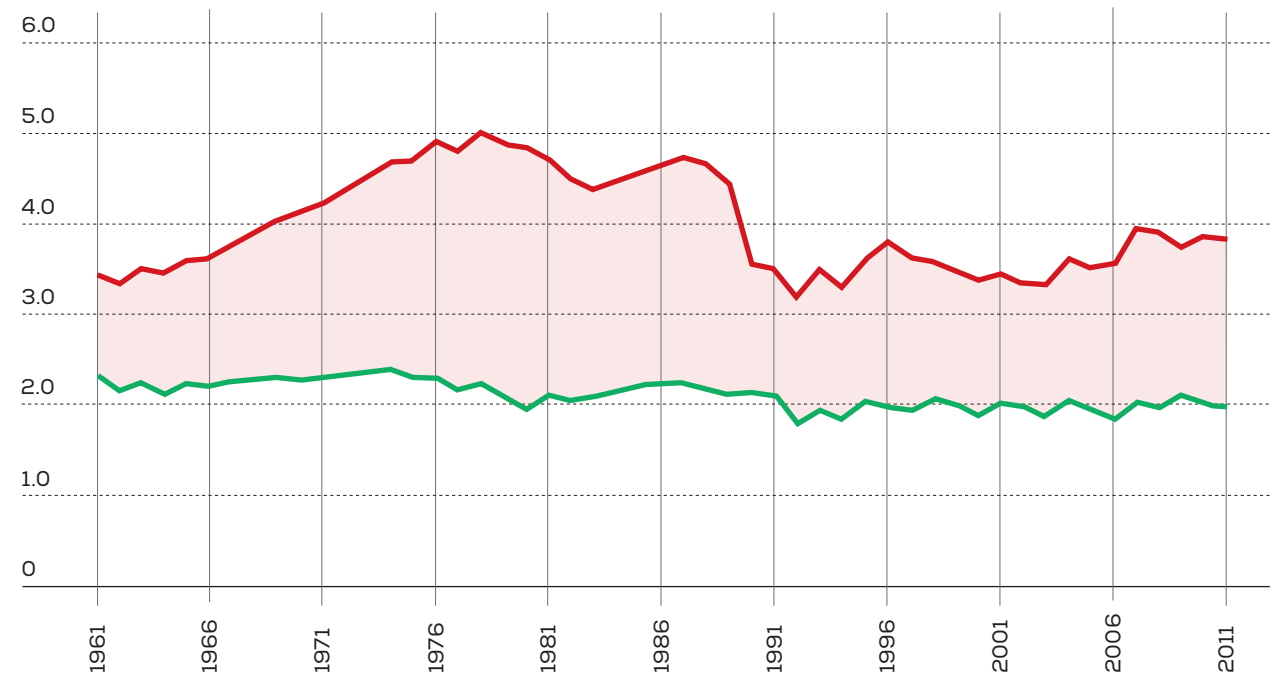
### F) LITHUANIA

Global Hectares per capita



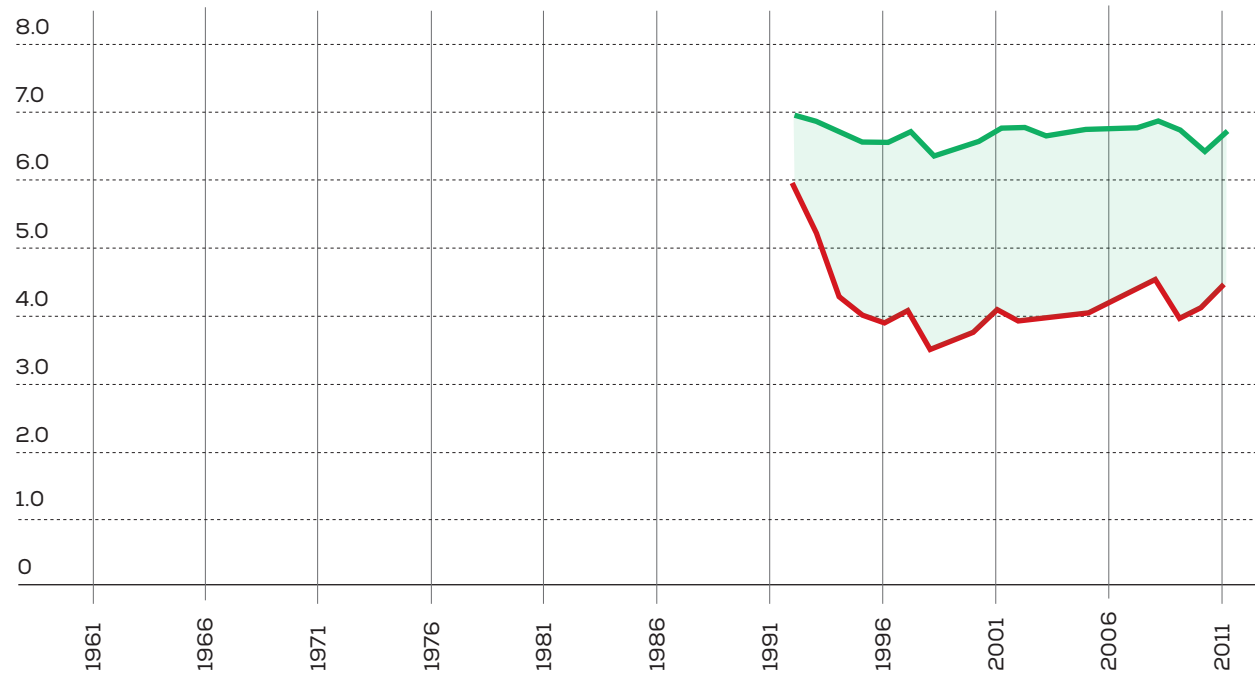
### H) POLAND

Global Hectares per capita



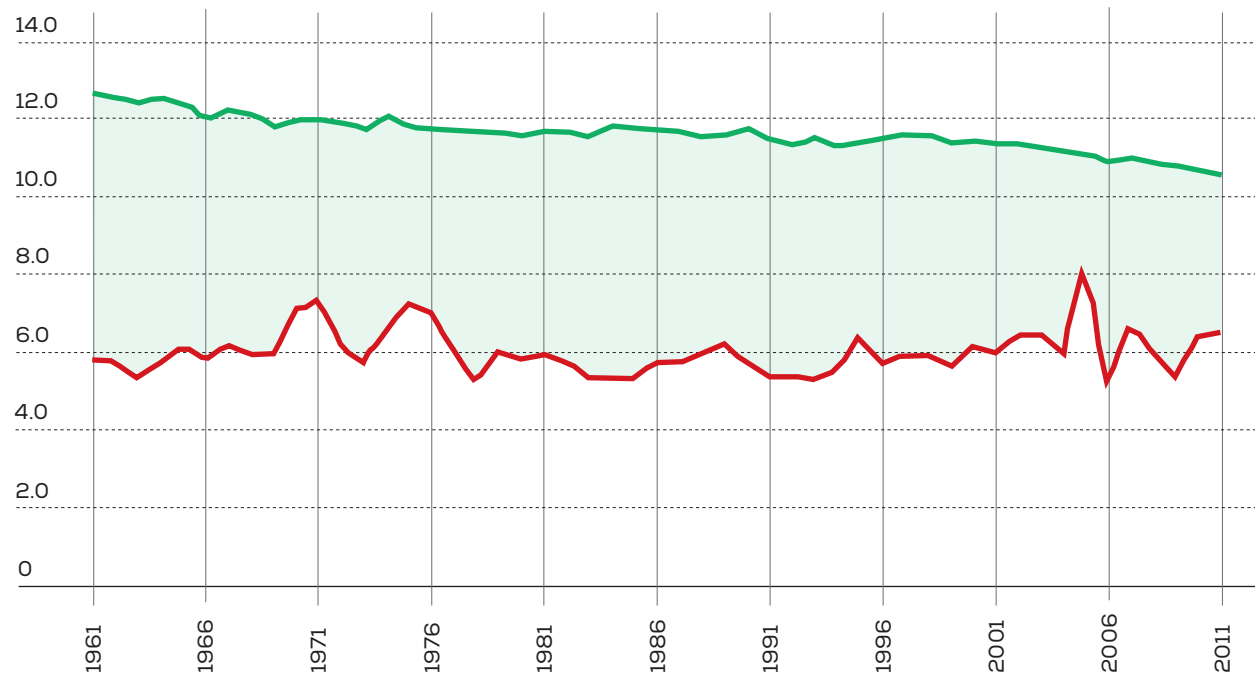
### I) RUSSIAN FEDERATION

Global Hectares per capita



### J) SWEDEN

Global Hectares per capita



## TOTAL MATERIAL FLOWS

Footprints may be seen in the perspective of the biocapacity of the country, that is, the natural resources available within the state. Estonia, Finland, Norway, Russia and Sweden have a biocapacity, which is larger than the total footprint, that means that these countries are keeping their footprints within themselves. Denmark, Germany and Poland use much more resources than those available within the country.

If instead compared to the global biocapacity, the footprint available is about 1.8 Gha/capita. Thus the Baltic Sea Region - with a footprint from 3.7 to 6.4 Gha/capita -

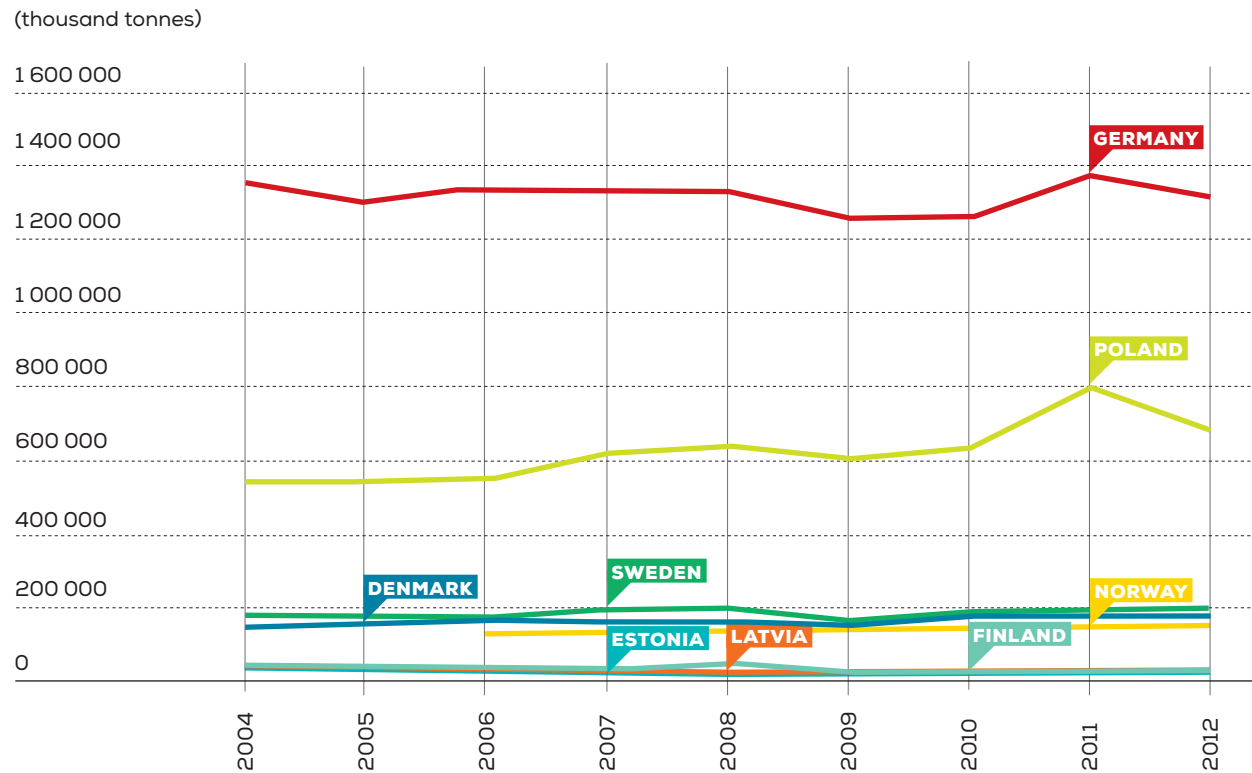
corresponds to the use of natural resources requiring 2 - 3.5 planets.

Data for natural resource extraction reflects the total resource flows in our societies. Only a fraction of the extracted resource continues to the production stage. Left behind is the so-called ecological rucksack. This typically corresponds to close to 90 % of the resources extracted. The ecological rucksack is to a large extent reported as mining waste.

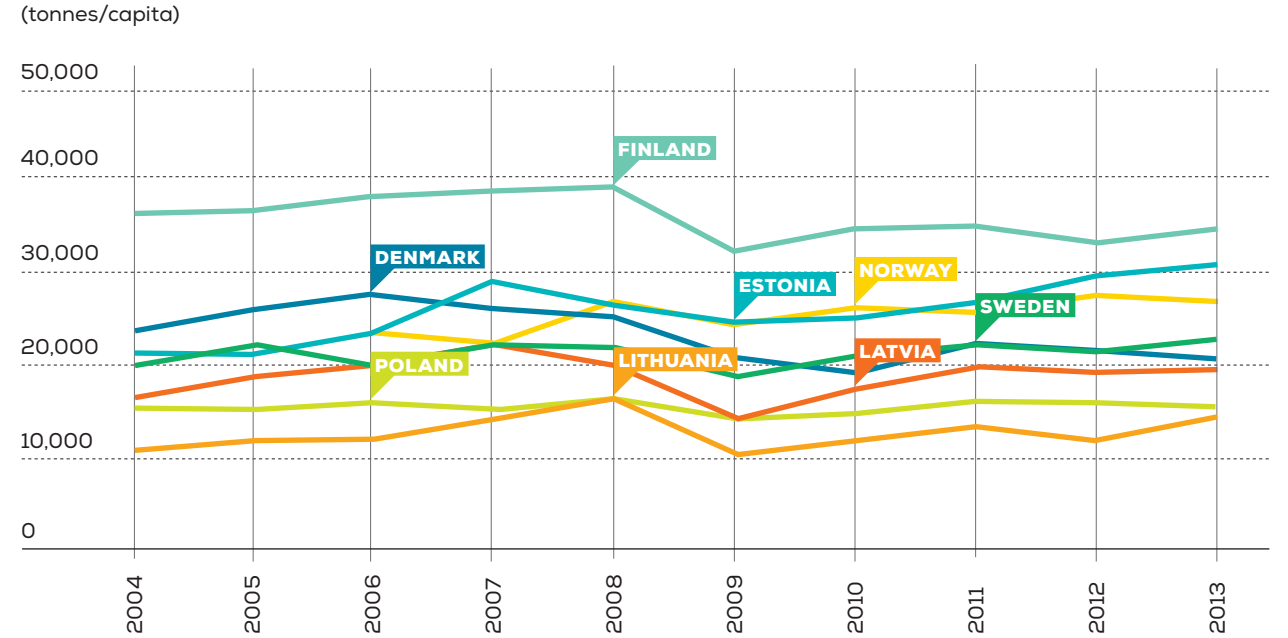
Domestic material consumption, which is the total of material used in the economy, was about 25 000 tonnes annually per capita, with slightly smaller values for the less advanced economies (Fig. 1.3 A-B).

A larger resource efficiency was seen in Germany and Sweden. Domestic material consumption had a small decrease, mostly explained by the reduction in Germany. Poland showed a small increase. Much of this is probably explained by an increase in the service sector, requiring fewer resources, in the more advanced economies. Most of the changes are explained by changes in the domestic material extraction, i.e. the import and export is much smaller. As a total the domestic material consumption in the BSR increased from 2.49 to 2.75 billion of tonnes yearly in the period.

FIGURE 1.3 DOMESTIC MATERIAL CONSUMPTION (SOURCE EUROSTAT)  
A) DOMESTIC CONSUMPTION TOTAL

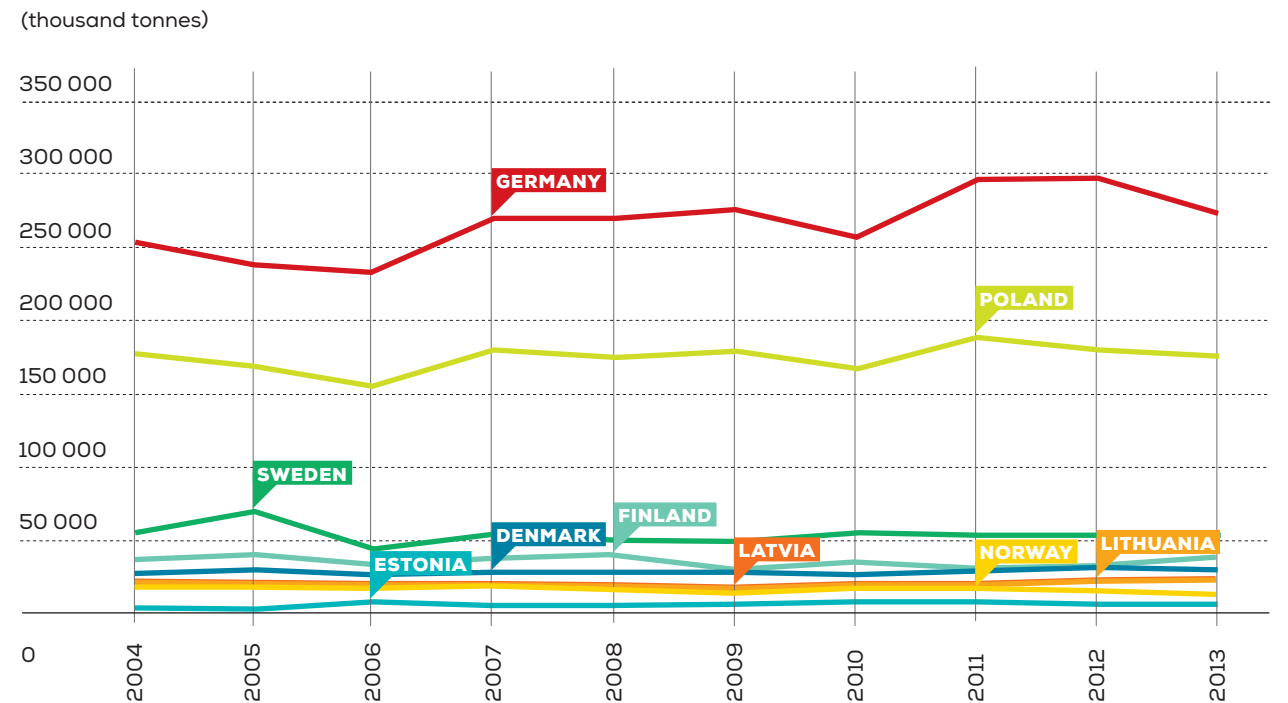


## B) DOMESTIC MATERIAL CONSUMPTION PER CAPITA



The main components in the material flows are metallic materials (dominated by iron), non-metallic materials, mostly sand and gravel, biomaterials, and fossil energy materials (Fig 1.4 A-D). The largest fraction, the non-metallic materials, and the next largest fraction, the fossil energy flows, are both decreasing. Biomass use is stable.

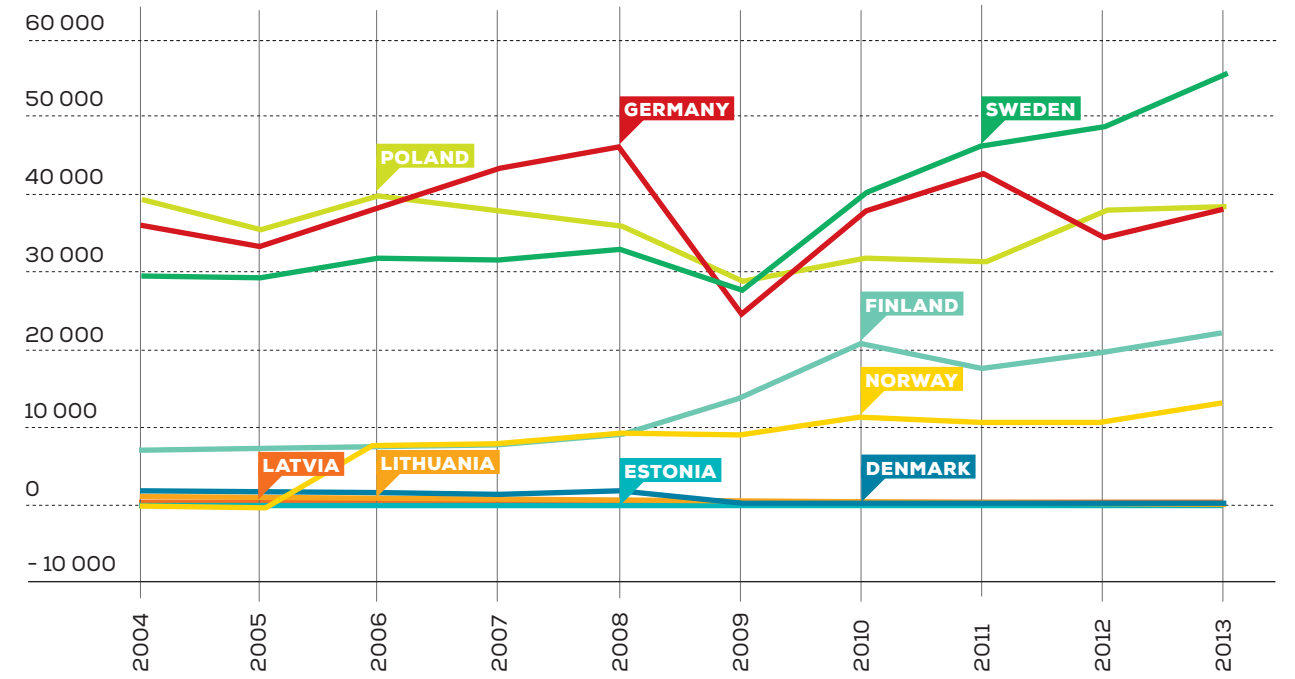
FIGURE 1.4 DOMESTIC MATERIAL CONSUMPTION CATEGORIES (SOURCE: EUROSTAT)  
A) BIOMASS



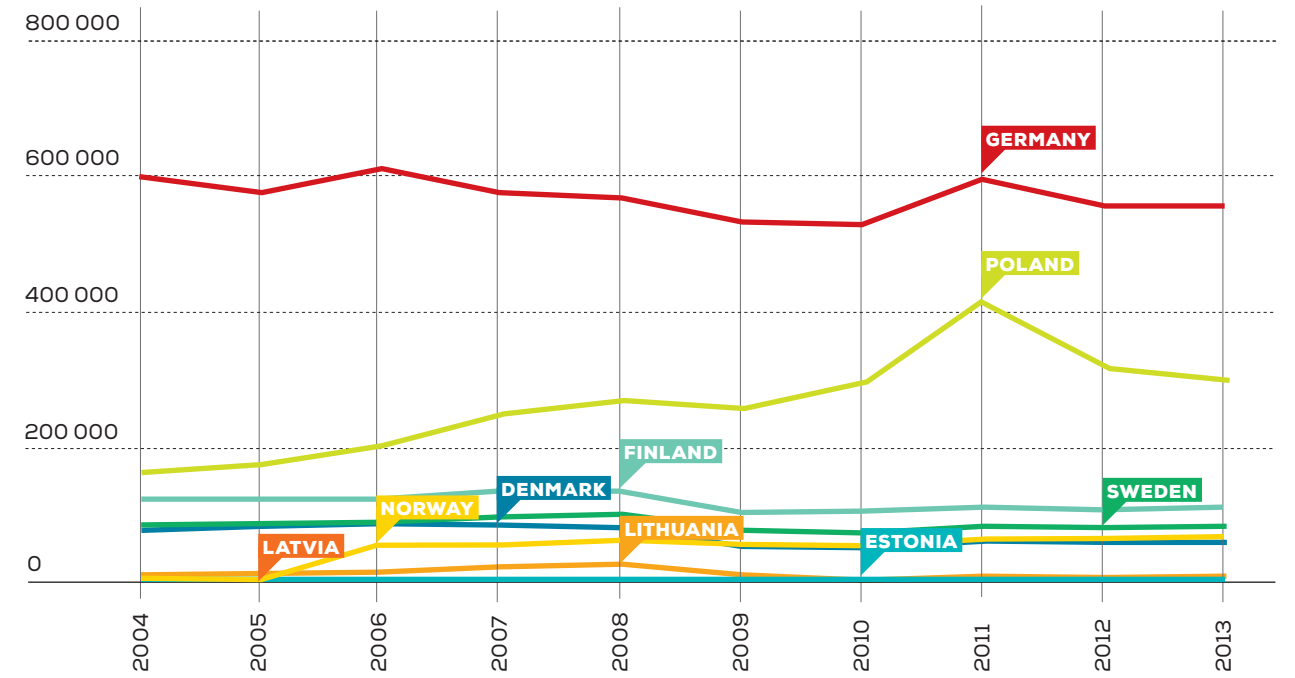




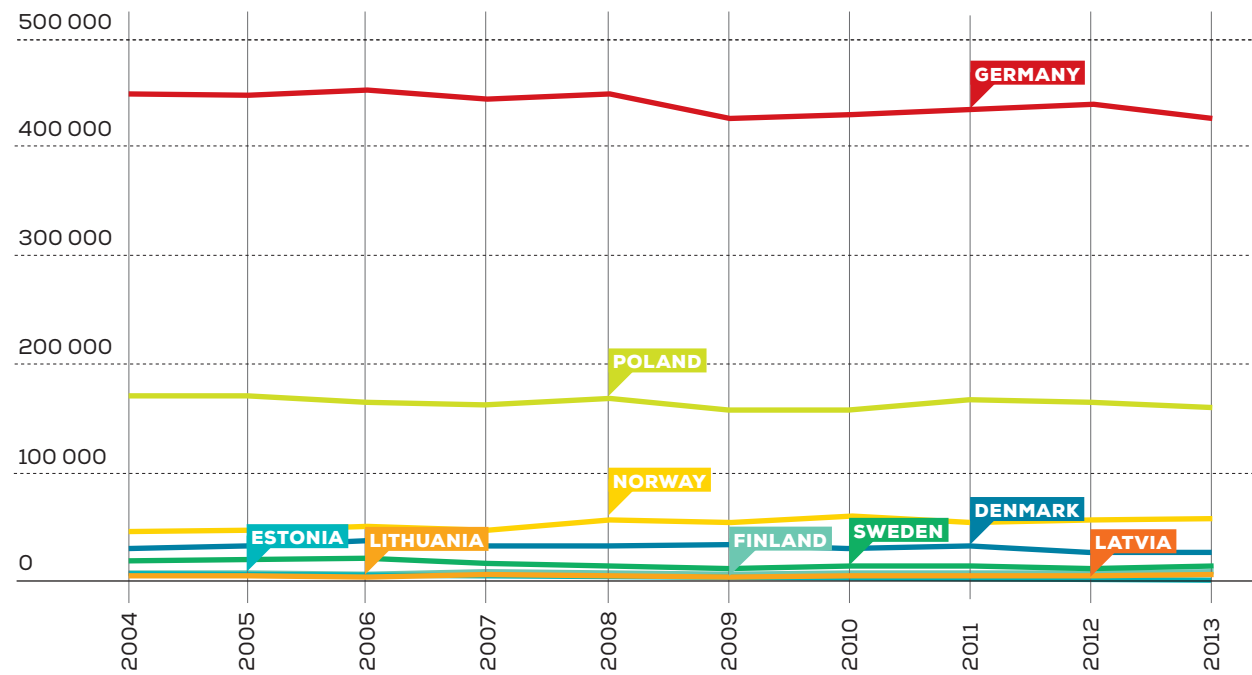
## B) METAL ORES



## C) NON-METALLIC MINERALS



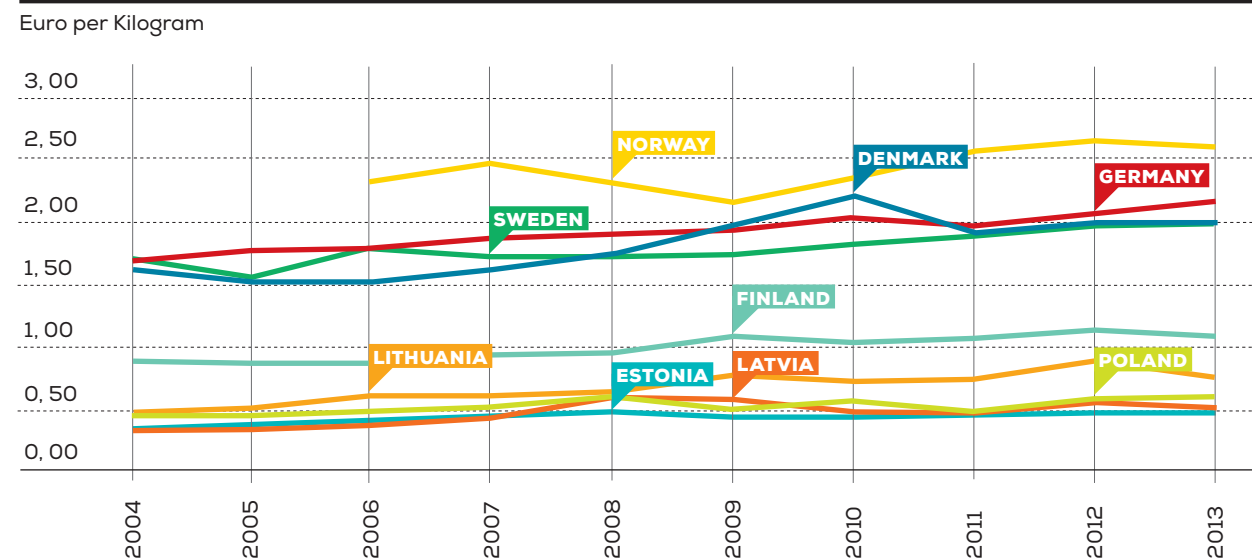
## D) FOSSIL ENERGY MATERIALS/CARRIERS



Economic value per amount of material flow, the resource efficiency (Fig. 1.5) is on the average EUR 1.52 per kg in the Baltic Sea Region, with very large variations. In 2013 Norway had the highest value with 2.63 EUR/Kg followed by Germany 2.17 and Sweden and Denmark 2.00 EUR/Kg.

The three Baltic States and Poland have values between 0.4 and 0.7. There are thus large potentials for improvements for most countries in the region. The resource efficiency has in general an increasing tendency.

FIGURE 1.5 RESOURCE EFFICIENCY (SOURCE: EUROSTAT)



## WASTING

For the downstream end of the material flows, the wasting phase, there is a decreasing trend ascertained (Fig. 1.6). The by far largest amount of waste in our societies is mining waste which is landfilled. Other large categories of waste come from the building and energy sectors (Table 1.2).

Data for the RUSSIAN FEDERATION were extracted from *State Reports*. The categorisation of waste in Russia is however different from the EU one and not all figures can be transferred. It is reported that 2 348 000 tonnes were recycled or reused out of 5 008 000 that is 47% (2012 data), a surprisingly high number when compared to our experience, while 58 % is reported as "sent to burial"; interpreted as landfilled.

Municipal waste is the most visible waste category. This is slowly increasing in the region, probably explained by increasing economy and ranged in 2013 from 300 to 700 kg/capita (Fig. 1.7 A-B). This indicates that it is possible to reduce municipal waste.

FIGURE 1.6 GENERATION OF WASTE EXCLUDING MAJOR MINERAL WASTES (SOURCE: EUROSTAT)

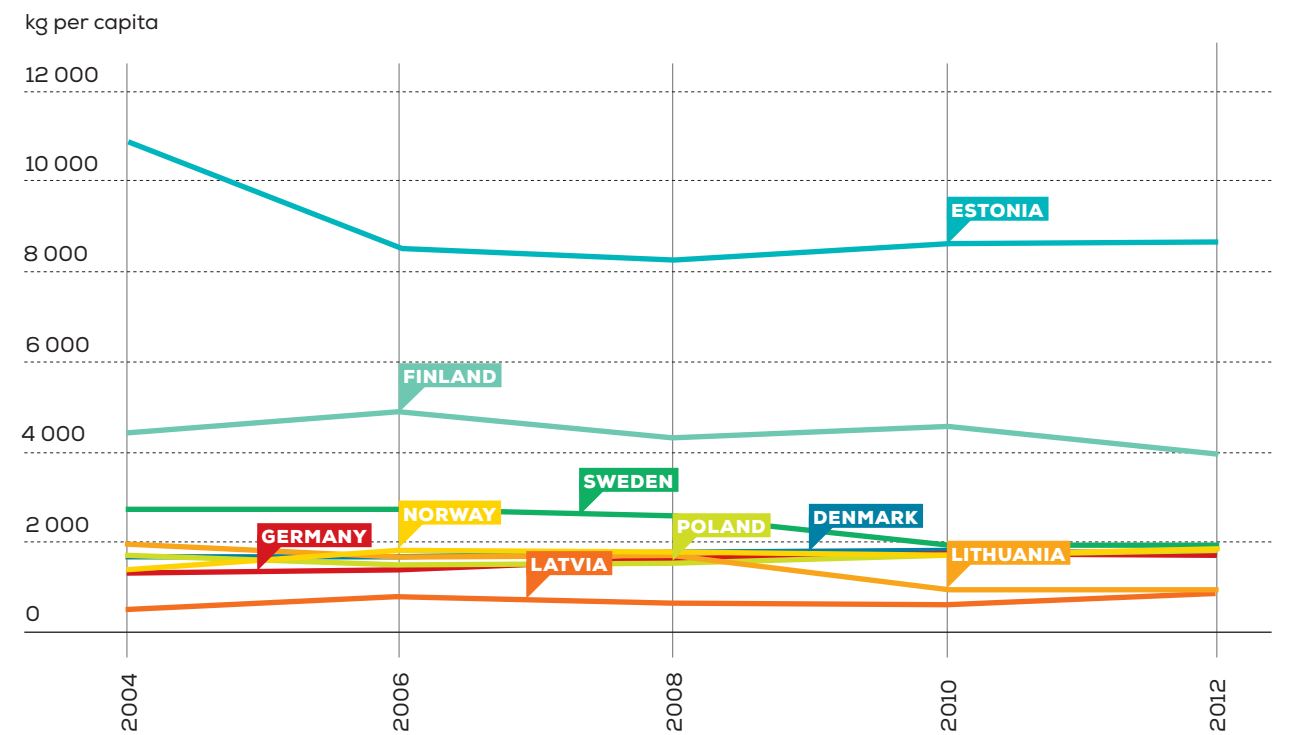


TABLE 1.2 WASTE CATEGORIES THOUSAND TONNES, YEAR 2012 (SOURCE: EUROSTAT)

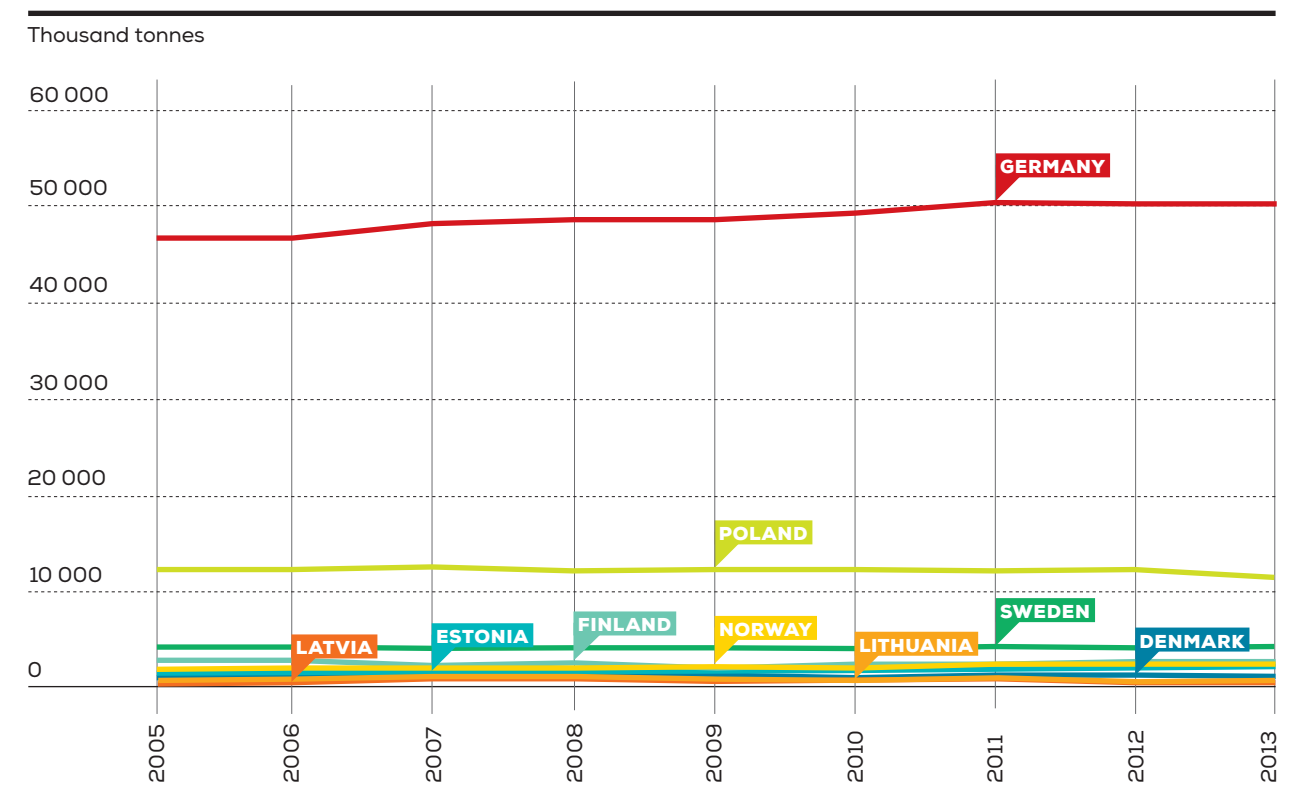
COUNTRY	AGRICULTURE, FORESTRY & FISHING	MINING & QUARRYING	WASTE COLLECTION, TREATMENT, DISPOSAL AND RECOVERY	CONSTRUCTION	HOUSEHOLDS	ALL NACE ACTIVITIES & HOUSEHOLDS
DENMARK	223 015	18 005	2 462 266	3 867 209	3 867 209	16 332 249
GERMANY	648 869	8 625 187	42 447 444	197 527 868	36 471 810	368 022 172
ESTONIA	77 404	9 354 964	536 466	657 089	436 420	21 992 343
LATVIA	2 767	1 968	198 880	7 509	1 213 193	2 309 581
LITHUANIA	481 708	25 911	250 906	419 136	1 176 825	5 678 751
POLAND	1 952 782	68 035 432	10 355 011	15 367 995	9 324 197	163 377 949
FINLAND	3 157 813	52 880 000	147 438	16 033 874	1 733 525	91 824 193
SWEDEN	273 071	129 480 919	3 718 966	7 655 935	4 193 105	156 306 504
NORWAY	150 002	470 295	256 057	1 880 543	2 437 776	10 720 872
RUSSIAN FEDERATION	26 200	4 629 300	-	14 600	-	5 007 900
BSR (EXC. RF)	6 967 431	268 892 681	60 373 434	243 417 158	60 714 345	836 564 614
% OF TOTAL	1 %	32 %	7.2 %	29 %	7.3 %	100 %

Russian data from State Report "On the State and Protection of Environment of Russian Federation in 2013", Russian Federation, 2013

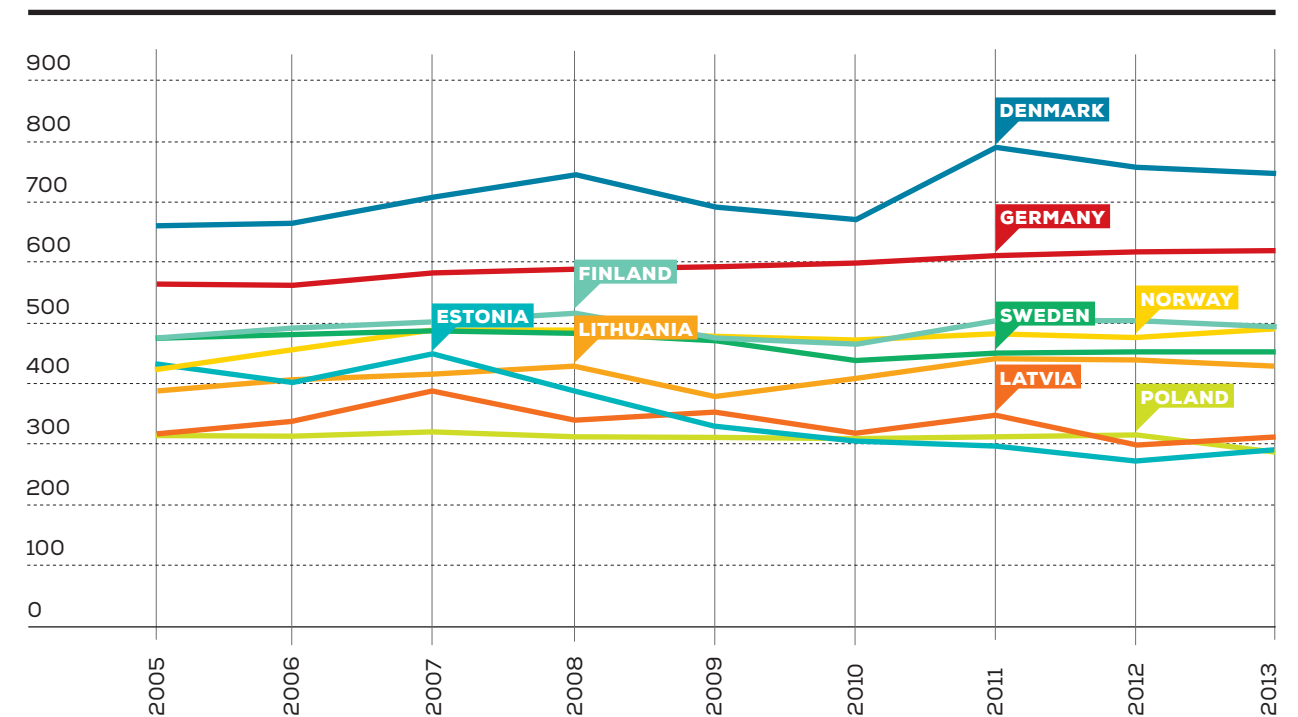
NACE: Statistical classification of economic activities in the European Community, abbreviated as NACE, is the classification of economic activities in the EU (Nomenclature statistique des activités économiques dans la Communauté européenne).

FIGURE 1.7 MUNICIPAL WASTE GENERATION (SOURCE: EUROSTAT)

A) TOTAL



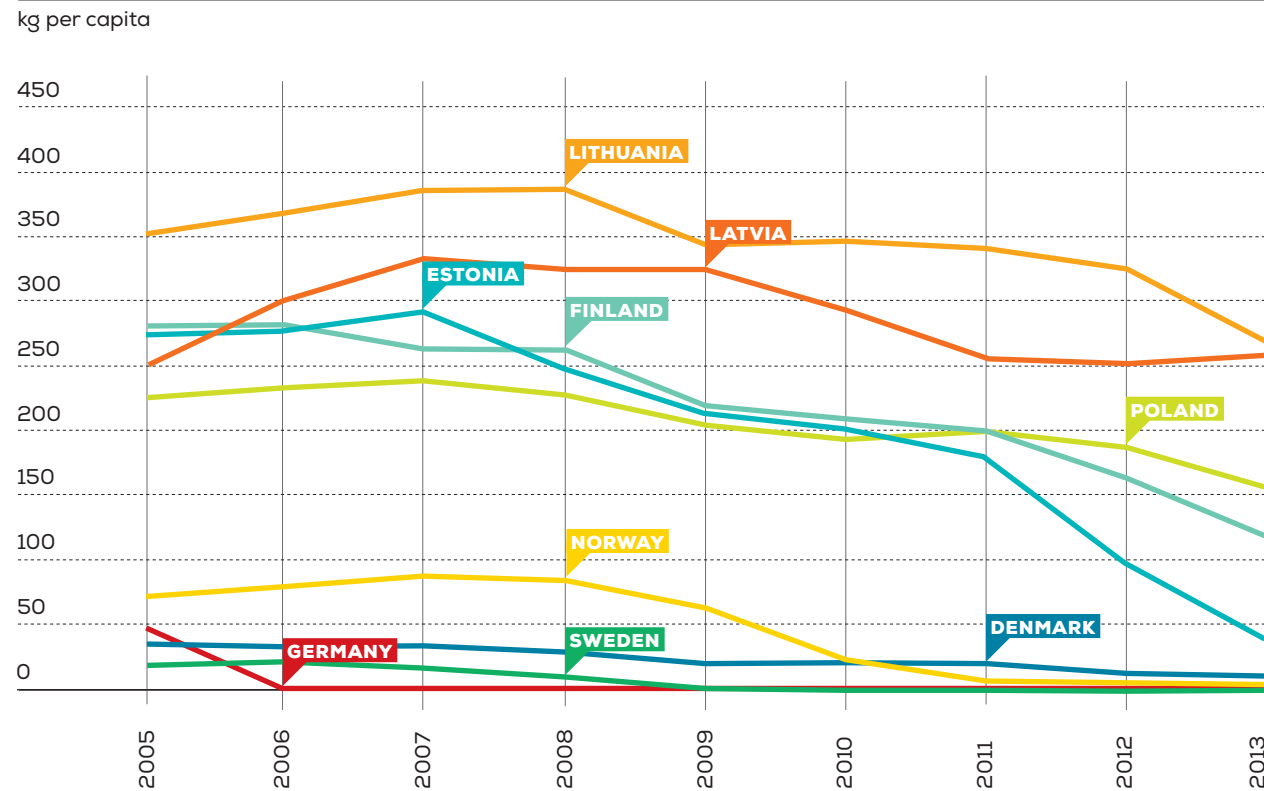
B) KG/CAPITA



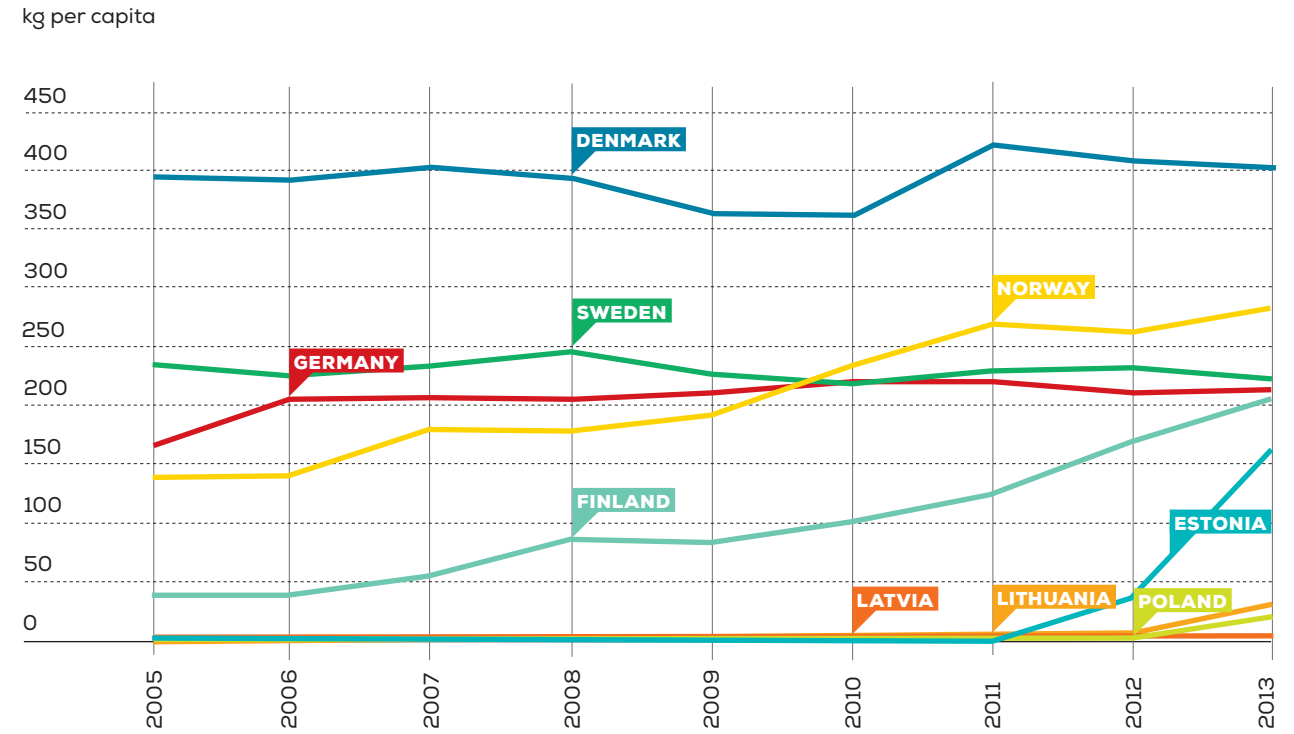
The least preferred management option, **LANDFILLING**, was used for up to 50 % of waste in several the countries, but with large variations and decreasing values (Fig. 1.8A). The lowest ones - for Germany and Sweden - were about 1 %. We may conclude that landfilling can be almost entirely phased out as a management option when waste management develops further. It is however still very dominant in countries where alternatives have not been developed. The next largest management option, **INCINERATION**, is also around 50 % but with large variations and increasing in most countries (Fig. 1.8B). Incineration can be made with or without energy recovery, which is not shown in the statistics. Incineration with energy recovery is dominating in Sweden, which also imports waste from the neighbouring countries to produce enough district heating. It is increasing in several other countries, too. Burnable municipal waste is thus a mostly renewable resource (although it has some plastic content) for district heating.

The most preferred option is **RECYCLING** of the resources. The data on recycling (Fig. 1.8C) demonstrates that the percentage of waste recycled is 30-60 % in several countries.

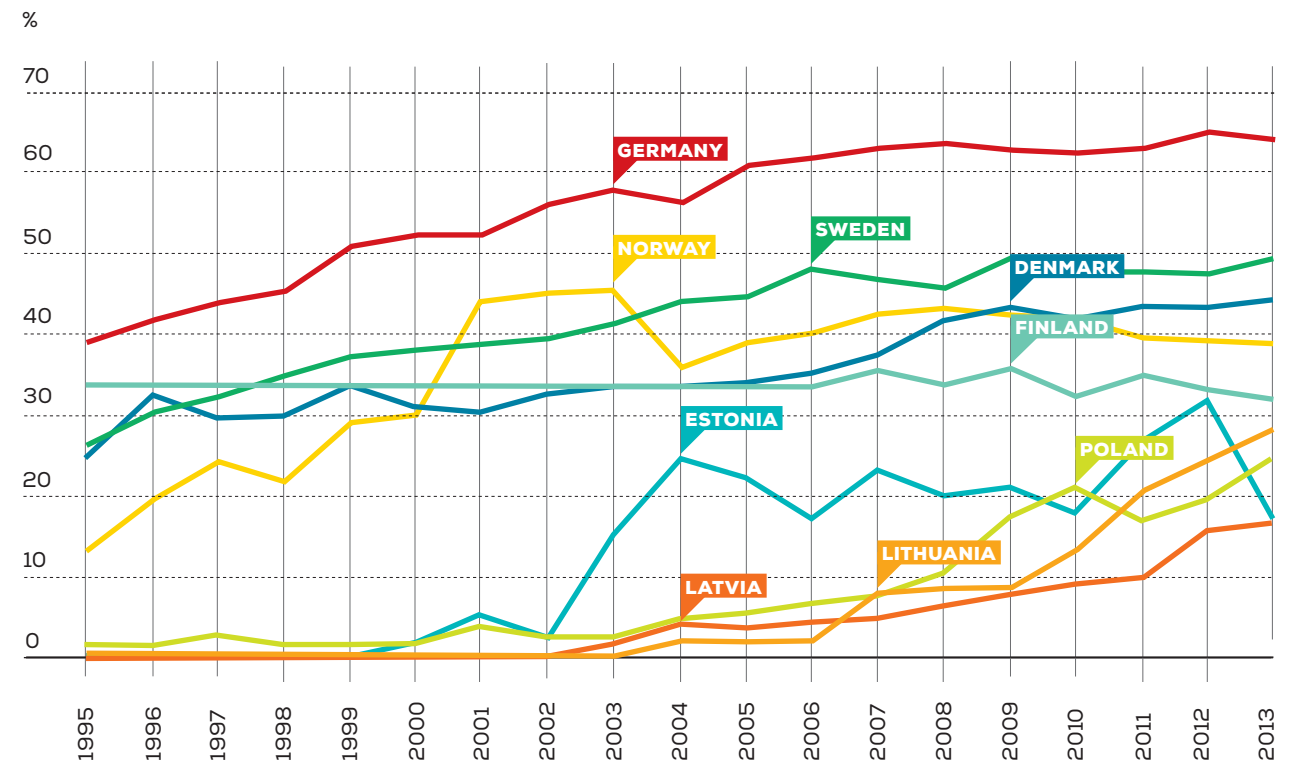
FIGURE 1.8 MANAGEMENT OF MUNICIPAL WASTE (SOURCE: EUROSTAT)  
A) LANDFILLING



B) INCINERATION



C) RECYCLING



## PRODUCTION

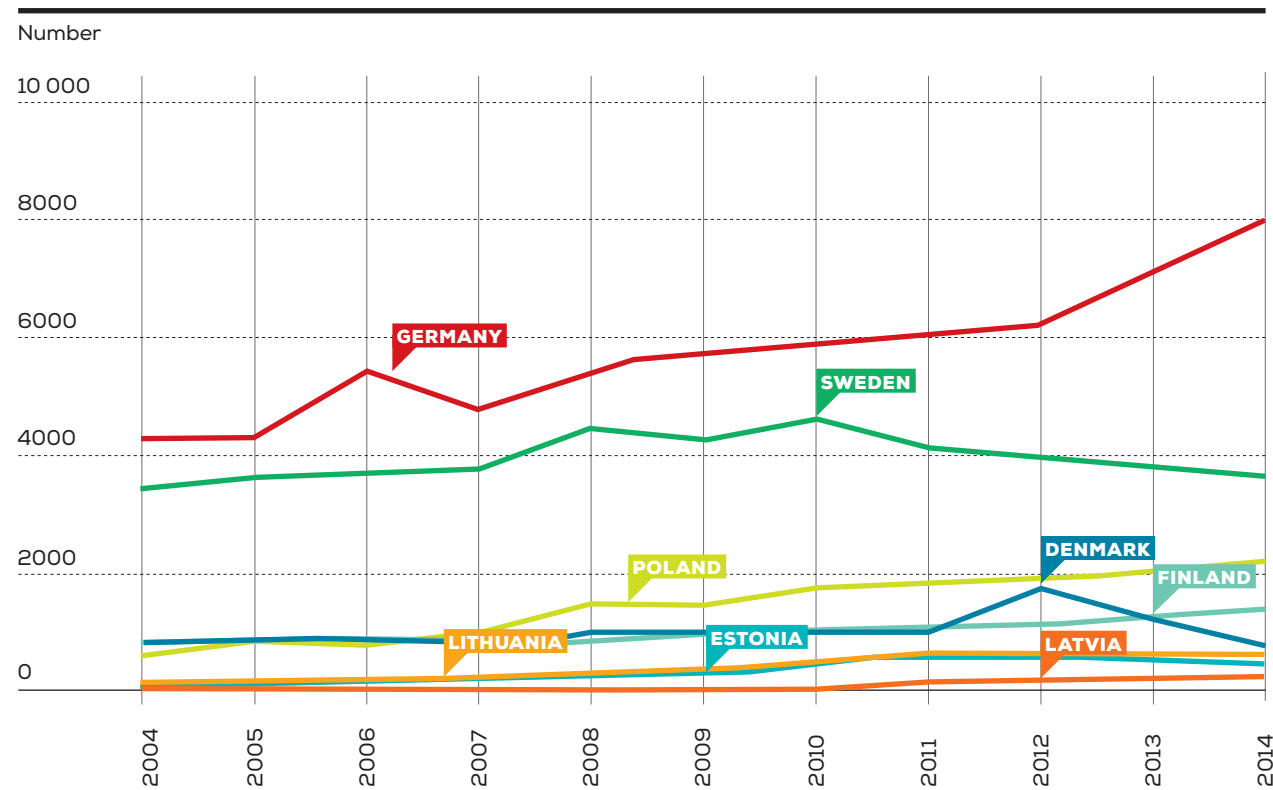
For production there are much fewer indicators available. Eurostat reports on organisations and sites with eco-management and audit scheme (EMAS) certificates. In most countries in the Baltic Sea Region the ISO 14001 environmental management scheme is more used and data on that is more relevant. The number of companies with ISO 14001 certificates in the BSR has been increasing for many years (Fig. 1.10). In the entire BSR (including Russia) the number of ISO 14001 certified companies increased from 2004 to 2013 by 80 %. The largest increase is seen in Germany.

This increase may reflect the tendency to include a more environmentally and resource efficient production, thus cleaner production practices. It is also reflected in a decreasing trend of air pollutants in

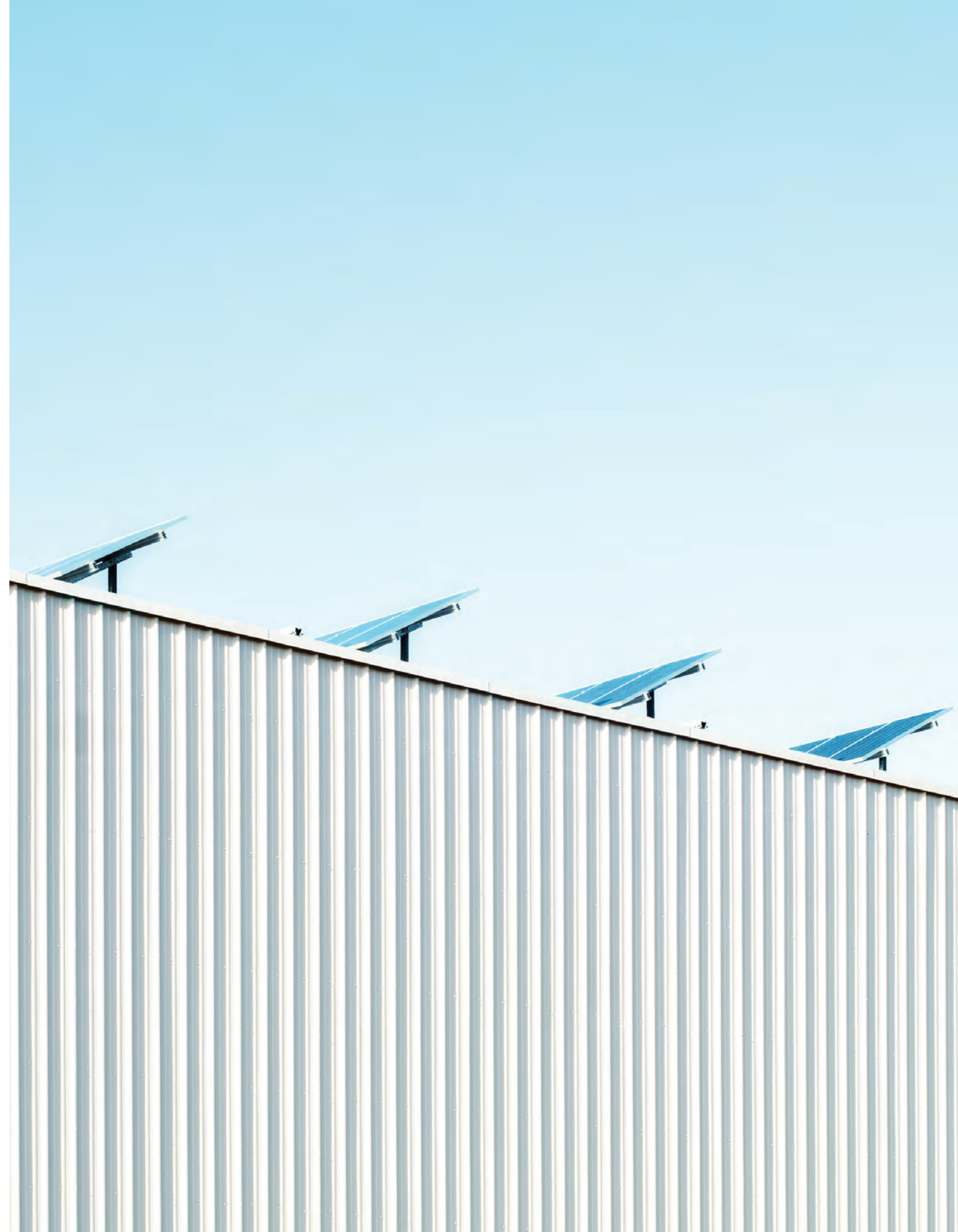
the region, as shown by decreasing amounts of sulphur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs). The introduction of integrated permits for larger industries in the region since 2004, as required in the Directive concerning integrated pollution prevention and control (IPPC Directive)<sup>1</sup> is another important factor for improving sustainability in the industrial sector.

Industry remained the largest electricity consuming sector in the EU28 (36% in 2012, compared to 46% in 1990). Between 1990 and 2005, the electricity consumption in the industry sector increased by 0.9%/year; it decreased by 1.7%/year, on average, from 2005 to 2012.

FIGURE 1.10 NUMBER OF ISO 14001 CERTIFICATES (SOURCE: ISO)



<sup>1</sup> IPPC Directive: <http://ec.europa.eu/environment/archives/air/stationary/ippc/summary.htm>

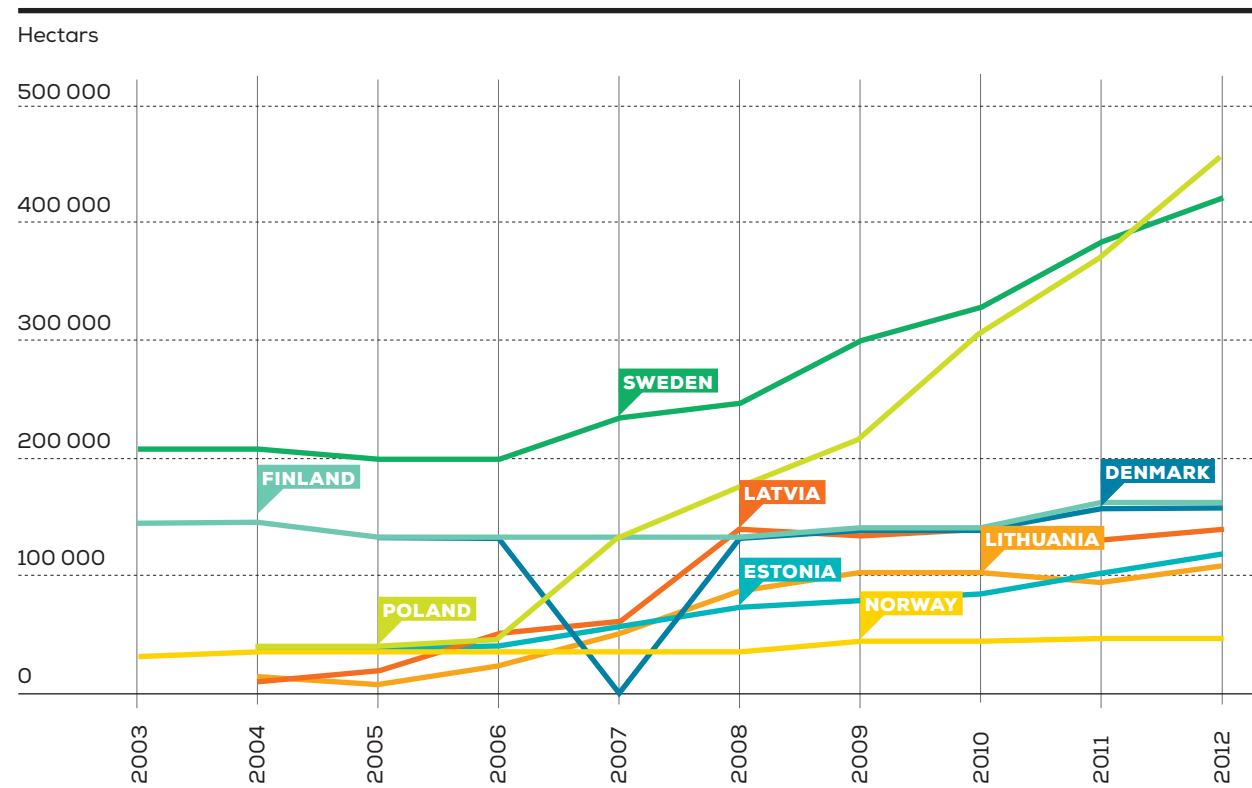


In the **AGRICULTURAL SECTOR** a similar development is shown by the areas under organic (ecological) farming (Fig. 1.11). This area is increasing especially in the Nordic countries, although also Poland demonstrates a large increase. In the entire Baltic Sea region (excluding Germany and the Russian Federation for which data is lacking) the areas under organic farming increased during 2003 to 2012 from 529 371 ha to 1 631 526 ha, that is three-fold. Sweden has relatively the largest area under organic farming in the BSR which is still not more than 15 % of the total area.

a valuable fertiliser and thus recycling of nutrients is maintained. Biogas production on farms is strongly increasing in Denmark, Germany and Sweden, but seems to be rare in central and eastern Europe. On the whole the meat production in the region is too large to be sustainable and a reduction of meat in the diet can be viewed as an important step for increasing sustainability.

Organic farming requires that nutrients are recycled, that is, manure is used for the fertilisation on the farm, which is well in line with sustainable production. The more efficient approach is to use manure and other agricultural residues for biogas production and thus create a new energy resource. The residue from the fermentation is then still

FIGURE 1.11 **AREAS UNDER ORGANIC FARMING** (SOURCE: EUROSTAT) (excluding Germany and Russia)



## CONSUMPTION

For consumption good data to follow the development is mostly lacking. The largest categories of resource use in the consumption phase are caused by the house and building sector, the transport sector, and the food sector. Statistics for energy efficient buildings (low energy buildings, or near-zero-energy buildings according to the European Commission) does not exist; nor does Eurostat provide any data for food consumption.

The resource use in the household sector is at least partly expressed by electricity consumption (Fig. 1.12). This is slowly increasing during the period studied. Resource use in households is also increasing because of the increased use of cars. During the period 2004-2011 the number of cars per 1000 inhabitants in the Baltic Sea Region increased from 405 to 541 (Fig. 1.13).

The number of households living in poor or very poor conditions decreased during the period (Fig. 1.14). Living in poor/very poor conditions is here defined according to Eurostat: "Share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor." This share decreased in the Baltic Sea Region from 20.1 in 2005 to 13.9 in 2013, that is, by 31%.

FIGURE 1.12 **ELECTRICITY CONSUMPTION BY HOUSEHOLDS** (SOURCE: EUROSTAT)

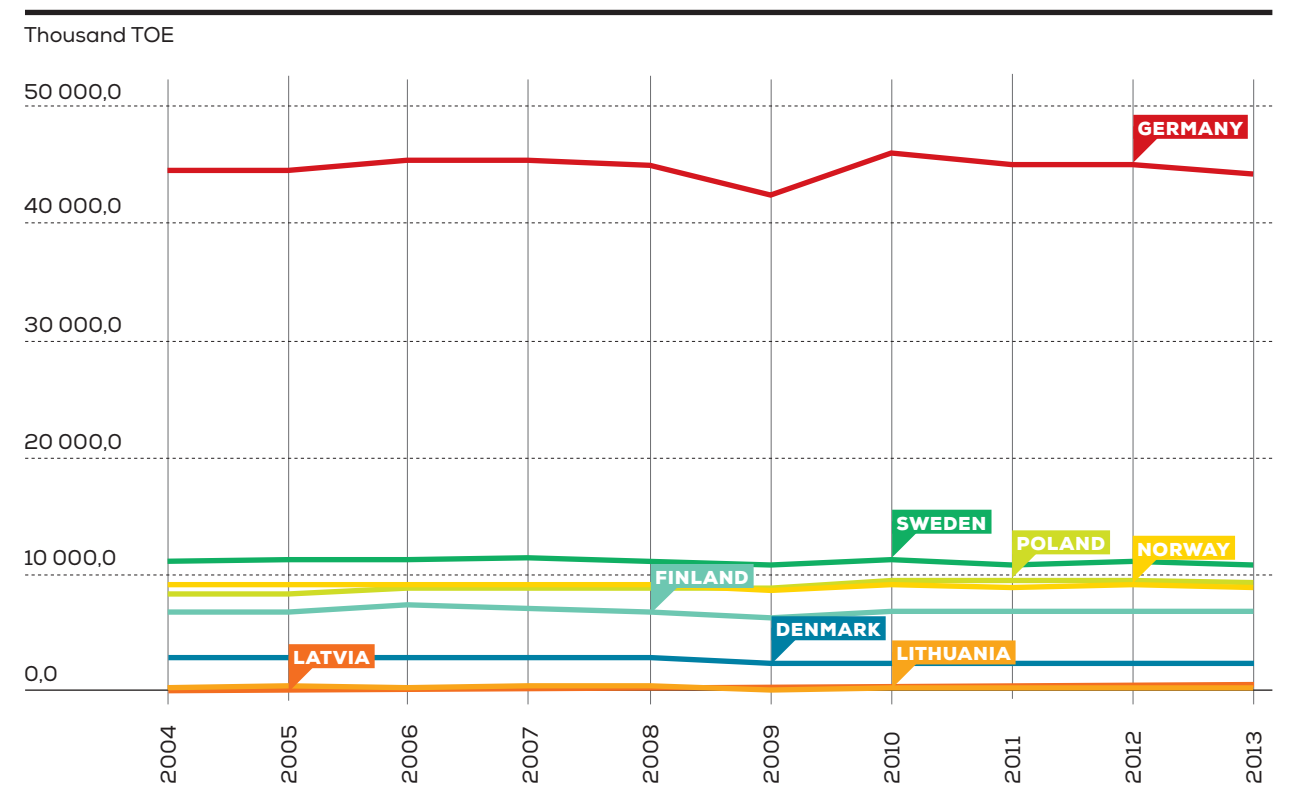


FIGURE 1.13 CARS PER 1000 INHABITANTS (SOURCE: EUROSTAT)

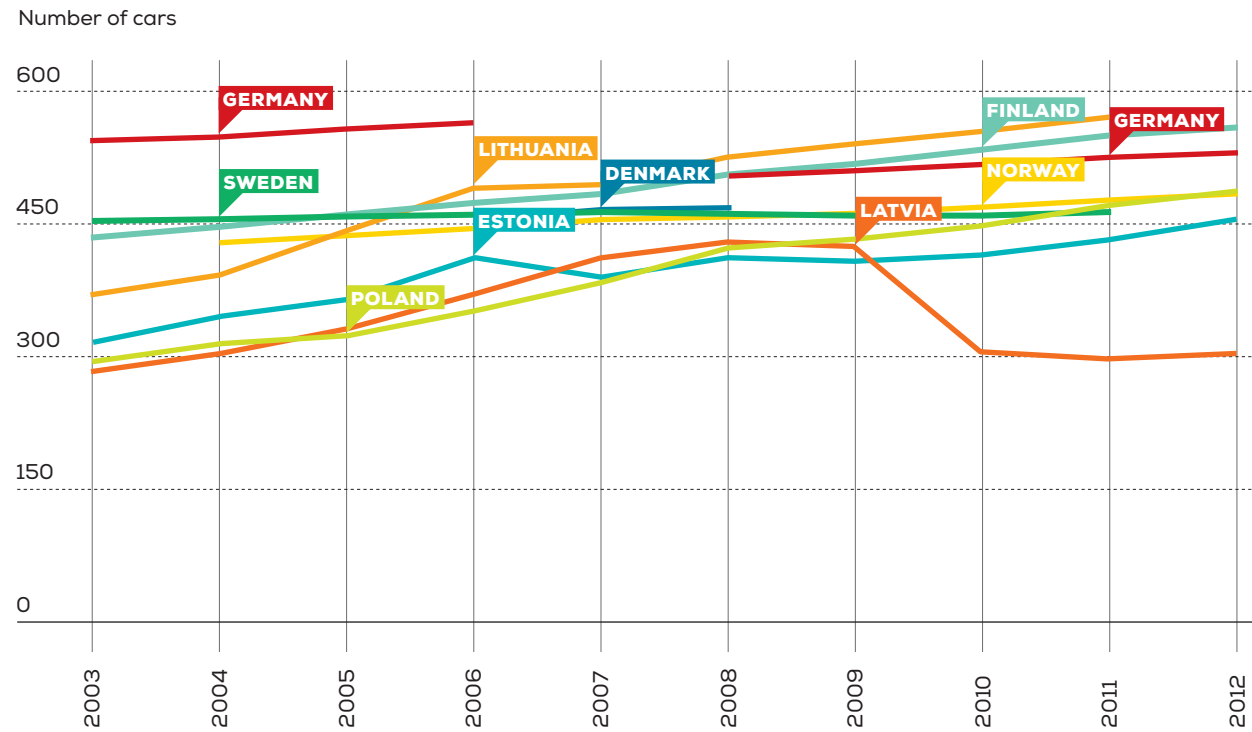
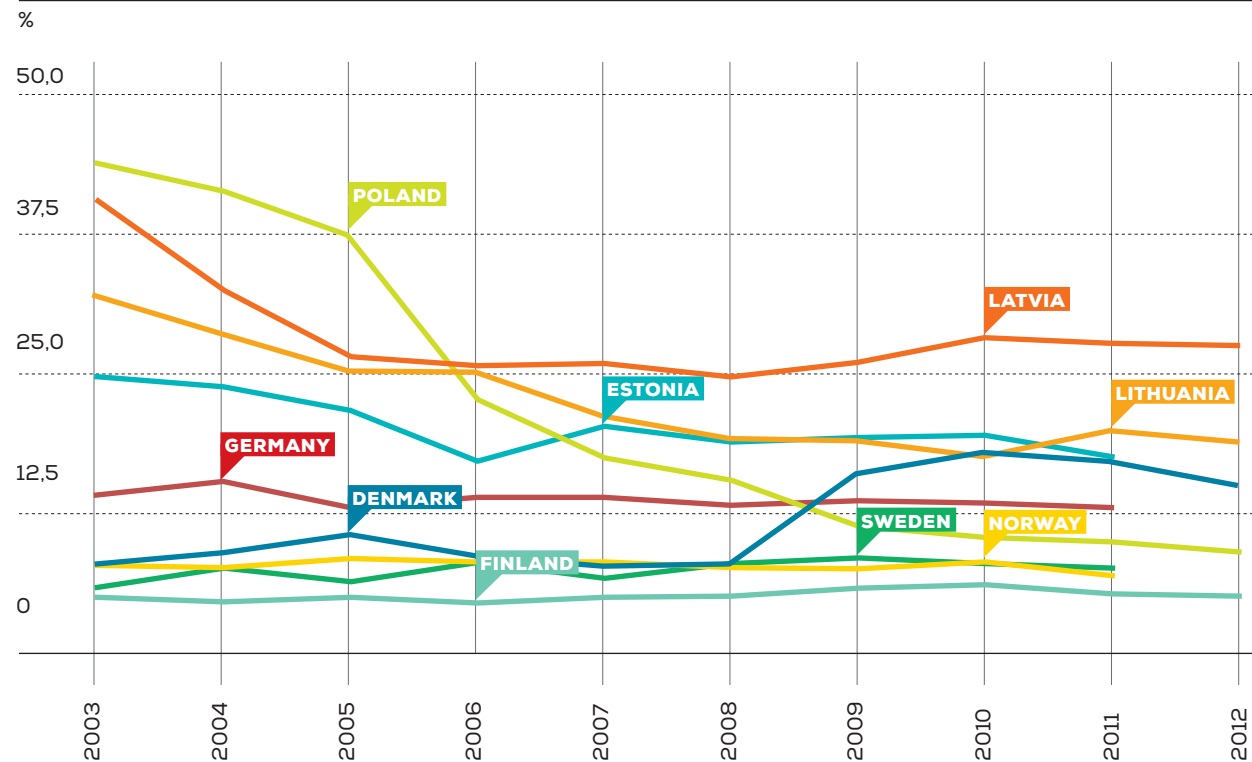


FIGURE 1.14 SHARE OF POPULATION LIVING IN POOR CONDITIONS (SOURCE: EUROSTAT)



To get an overview of how resource efficiency is established and developed in a society we need data on how products are reused, that is, the share of cyclic economy in the countries. **THE EUROPEAN COMMISSION** adopted an ambitious new Circular Economy Package on 2 December 2015 to transform Europe into a **MORE COMPETITIVE RESOURCE-EFFICIENT ECONOMY**, addressing a range of economic sectors, including waste (European Commission, 2015e). **HOWEVER, DATA ON CYCLIC ECONOMY IS STILL MOSTLY LACKING.**

We also need data on how households manage waste, that is, separation and sorting of waste at the household level, and the level of recycling of waste (see Fig. 1.8C).

Extended Producer Responsibility (EPR) requests producers to take responsibility of their products also for the end-of-life or wasting stage. This can be and are used for anything from beverage cans to cars. Several EU Directives request companies to take back electric and electronic products, including batteries, from households after their use. A significant percentage of cans, bottles and other packaging in general are returned when EPR is applied, e.g. by using a deposit for all or some of these products. Another case of cyclic economy addresses the sharing of products, e.g. in car pools.

In the Marrakech Process much emphasis is put on lifestyle issues. This strategy however is not reflected in any indicator, except those mentioned above. At present Sweden is responsible for implementing the Marrakesh process regarding lifestyle issues. Neither the Ministry of Environment nor the Environmental Protection Agency in Sweden has introduced any indicators to follow this.

**READ MORE ABOUT THE EU'S INIATIVE 'TOWARDS A CIRCULAR ECONOMY': [HTTP://EC.EUROPA.EU/PRIORITIES/JOBS-GROWTH-AND-INVESTMENT/TOWARDS-CIRCULAR-ECONOMY\\_EN](http://ec.europa.eu/priorities/jobs-growth-and-investment/towards-circular-economy_en)**







## CHAPTER 7

# SUSTAINABLE CONSUMPTION AND PRODUCTION IN THE UN'S SUSTAINABLE DEVELOPMENT GOALS

The SDGs adopted by the UN General Assembly on 25 September 2015 includes SDG 12 “Ensure Sustainable Consumption and Production Patterns”. This goal has eight targets (Table 1.3). These are directions for policy-making but of course also the starting point for formulating indicators to follow the development towards Sustainable Consumption and Production patterns. UNEP has together with IISD published in March 2015 a guidebook on indicators for SDG 12, titled ‘Sustainable Consumption and Production indicators for the future SDGs. Discussion paper – March 2015’ (United Nations Environment Programme, 2015c).

The publication intends to “provide information to assist Member States to identify indicators for targets proposed under SDG 12 and for some of the SCP-related targets in the other proposed SDGs.” SCP is reflected as a crosscutting enabler (in the form of both targets and means of implementation) for the achievement of many of the SDGs as well as in a stand-alone goal 12 on ensuring Sustainable Consumption and Production patterns.

The proposed indicators started with a very extensive set of proposals, which were filtered and prioritised to reach a more manageable set of indicators, organised into six domains which can support a shift to SCP patterns. These domains include (1) scale of resource use, (2) decoupling, (3) environmental impact, (4) technology and lifestyles, (5) financing and investing for SCP, and (6) policy support for SCP (Table 1.4).

When comparing the indicator proposals in Table 1.4 to the data collected for the Baltic Sea region we discuss this divided in three areas.

**FIRSTLY** resource flow: here, several of the recommended indicators have been used. Thus for the domain scale of resource use, Domestic Material Consumption (DMC), absolute and per capita values are available as well as material footprints. For the domain of decoupling economic activity from resource use, resource productivity and energy productivity is available. For the domain of impact, the very established area of environmental impact data reaches back a long time for all countries. It is noted that data on waste is not included, which we believe is a shortcoming since waste management necessarily will be an important part of the SCP. It is also noted that decoupling may be achieved with increased recycling, that is development toward a cyclic economy, neither of which is included in the proposed set of indicators.

**SECONDLY** for the domain technology and lifestyles, indicators on material and energy efficiency are partly available while the data on market share of certified goods and services is not. It is noted, however, that several of the more recent EU Directives on products address exactly this issue and future reports are expected. The performance of industry and agriculture is important for sustainable production but not included in the UNEP processes, neither are the data for consumer behaviour, especially in the areas of mobility, housing and food prefer-

ences, although these are the key areas to be addressed in lifestyle issues asked for in e.g. the Marrakesh Process.

**THIRDLY**, the financing and investing domain is not addressed in this report and neither is the domain policy support for SCP. These are part of the implementation work and of course relevant for governance for sustainable development.

**TABLE 1.3 TARGETS UNDER SDG GOAL 12 ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS** (UNDESA, 2015)

TARGET	
12.1	Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries
12.2	By 2030, achieve the sustainable management and efficient use of natural resources
12.3	By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
12.4	By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment
12.5	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse
12.6	Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
12.7	Promote public procurement practices that are sustainable, in accordance with national policies and priorities
12.8	By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature
12.a	Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production
12.b	Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products
12.c	Rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimising the possible adverse impacts on their development in a manner that protects the poor and the affected communities

**TABLE 1.4 PROPOSED SET OF INDICATORS FOR SDG 12 “ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS”** (UNITED NATIONS ENVIRONMENT PROGRAMME, 2015B)

DOMAIN	INDICATORS	RELATED TARGETS IN SDGS
SCALE OF RESOURCE USE	<ul style="list-style-type: none"> <li>→ Domestic Material Consumption (DMC) - Absolute and per capita values</li> <li>→ Material Footprint (MF) - absolute and per capita values</li> </ul>	Target 12.2
DECOUPLING ECONOMIC ACTIVITY FROM RESOURCE USE AND ENVIRONMENTAL IMPACT	<ul style="list-style-type: none"> <li>→ National material efficiency – material productivity (GDP per unit of material use). <i>Production side:</i> Material use measured through Domestic Material Consumption (DMC) <i>Consumption side:</i> material use measured through Material Footprint (MF)</li> <li>→ National energy efficiency – Energy productivity (GDP per unit of energy use)</li> </ul>	Targets 8.4, 12.2  Targets 7.3, 8.4, 12.2
IMPACTS	<ul style="list-style-type: none"> <li>→ Contaminants in air, water, and soil from industrial sources, agriculture, transport and wastewater and waste treatment plants</li> <li>→ Number of persons killed or injured by a natural and technological disaster and economic losses in USD</li> <li>→ Ocean health – Ocean Health Index</li> </ul>	Targets 2.4, 3.9, 6.3, 12.4  Targets 1.5, 3.9, 11.5, 12.4  Targets 14.7, 12.b
TECHNOLOGY AND LIFESTYLES	<ul style="list-style-type: none"> <li>→ Sectorial material and energy efficiency</li> <li>→ Market share of goods and services certified by independently verified sustainability labelling schemes</li> </ul>	Targets 7.3, 8.4, 12.2 Targets 4.7, 12.6, 12.8
FINANCING AND INVESTING TO TRANSFORM THE ECONOMY TO SCP	<ul style="list-style-type: none"> <li>→ Amount of R&amp;D spending on environmentally sound technologies</li> <li>→ Amount of fossil fuel subsidies, per unit of GDP (production and consumption), and as proportion of total national expenditure on fossil fuels</li> </ul>	Targets 12.a (impact on 12.1, 12.2, 8.4) Target 12.c (impact on 12.2, 7.2)
POLICY SUPPORT FOR SCP	<ul style="list-style-type: none"> <li>→ Number of countries with SCP National Actions Plans or SCP mainstreamed as a priority into national policies, poverty reduction strategies and sustainable development strategies</li> <li>→ Number of countries with inter-ministerial coordination and multi-stakeholder mechanisms supporting the shift to SCP</li> </ul>	Targets, 12.1, 12.7, 11.b, 17.16 (impact on 2.4, 4.7, 8.4, 8.9, 9.a, 12.2, 12.3, 12.8, 12.a, 12.b)  Target 12.1, 12.4, 12.6

## CHAPTER 8

# POSSIBLE GOVERNANCE INITIATIVES IN THE FIELD OF SUSTAINABLE CONSUMPTION AND PRODUCTION FOR THE BSR

Sustainable Consumption and Production requires that the resource flows in our societies are reduced and we become more resource efficient, i.e. we need “to do more with less”. Even if the tendencies are positive in the region the development is slow and varies in the BSR countries. **A FEW DIRECTIONS ARE POSSIBLE TO INDICATE:**

**FIRSTLY**, the reduction of fossil energy use and increased use of renewable energy resources will improve the situation significantly. Fossil energy is a main component in the resource flow in the region and makes up almost half of the footprints of most countries of the BSR. Reduction of fossil energy use is also necessary for mitigation of climate change. The main tools to achieve the transition to a new energy regime includes increased energy efficiency, such as improved insulation of buildings and turn to low energy houses, as well as different patterns of mobility and transport. Reduced fossil energy needs to be replaced with an increased share of renewable energy resources.

**SECONDLY** increased recycling of resources is necessary. Recycling is already well established for metals, but it is also needed for other categories of material, such as paper, organic residues, that is composting, as well as recycling of nutrients in agriculture. The greening of the economy means not the least an increase of cyclic economy as well as the economy of sharing. This is already on its way in some of the countries in the region. All this will reduce the resource flows and still allow economic growth.

For production phase improvements, state support support for an increased use of *Cleaner Production Strategies* are needed. When this concept was introduced in the 1980s typical industries which started did so because of generous state guaranteed loans. Today this is supported by the introduction of management systems and more recently with *Cooperate Socially Responsibility Regimes* as well as sustainability reporting. For the state the long-term solution includes that taxation is moved from income taxation to taxation of the resource flow, the so-called green tax shift. This will decrease unemployment and reduce the resource flow.

In the consumption phase life style issues are central and it is also underlined in many of the documents on SCP. However it is difficult to measure with traditional data. Still many municipalities do have good and relevant data. This includes the use of public transport and biking rather than driving cars, the use of energy for heating and cooling houses and work places, the composition of food, especially the amount of red meat in a healthy daily nutrition since the red meat industry has a very high environmental impact. Finally waste fractionation, separation and sorting, at the household level is essential for proper recycling, composting and in general good waste management. All this is mirrored by data at the municipal level and at least in some countries these data are collected and reported for the whole country by municipal associations.





EUSBSR  
EU STRATEGY  
FOR THE BALTIC  
SEA REGION

