

1 Background, scope and methodology

1.1 Introduction

Unsustainable patterns of production and consumption are recognised as one of the major contributors to environmental problems, including climate change, degradation of natural resources and loss of biodiversity, and environmental impacts caused by emissions and waste.

The challenge of achieving sustainable consumption and production (SCP) patterns has been addressed at global level since the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. Ten years later the Johannesburg World Summit on Sustainable Development in 2002 recognised that:

fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development.

All governments were invited to promote sustainable consumption and production, and the Johannesburg Plan of Implementation called for the:

development of a 10-year framework of programmes in support of regional and national initiatives to accelerate a shift towards sustainable consumption and production patterns that will promote social and economic development within carrying capacity of ecosystems.

In the follow-up, the so-called 'Marrakech Process' was launched at the first international meeting on the 10-year framework held in June 2003 in Marrakech, Morocco. The process is intended to strengthen international cooperation, increase exchange of information and facilitate the implementation of national and regional SCP programmes.

Sustainable consumption and production will be one of the key focus areas of the UN Commission on Sustainable Development's round of meetings in 2010 and 2011.

At the Fifth Ministerial Conference 'Environment for Europe' in Kiev in 2003, the European Environment Ministers recognised:

the importance of a shift towards sustainable production and consumption patterns' and committed themselves to 'encourage regions, sub-regions and countries as appropriate, to devise programmes to accelerate this shift.

Since then, work has been carried out in the European Union to analyse consumption and production patterns and their effects on society and the environment. The European Commission (EC) is to propose an SCP Action Plan for the EU during 2007. Several European Union countries have also developed Sustainable Consumption and Production strategies and action plans. On the other hand, SCP has still to be placed on the political agenda in much of South East Europe (SEE) and Eastern Europe, the Caucasus and Central Asia (EECCA).

This report, jointly prepared by the United Nations Environment Programme (UNEP) and the European Environment Agency (EEA) for presentation at the Sixth Conference of European Environment Ministers in Belgrade in 2007 (hereafter Belgrade Conference), is intended to support the development of SCP policies and implementation activities in SEE and EECCA. It provides detailed information and analysis of key thematic issues from an SCP perspective and identifies opportunities to achieve greater sustainability within these sectors.

The EEA has prepared an assessment of the state of the environment in the pan-European region for the Belgrade Conference. This includes a chapter on SCP, providing data and analysis throughout Europe at an aggregated regional level. In addition, the Organization for Economic Co-operation and Development (OECD) has compiled an overview of progress in implementing environmental policies in the EECCA region. This joint UNEP-EEA initiative will complement those two reports, by providing

more detailed information on the status of SCP implementation in EECCA and SEE countries, and an analysis of policy relevant to cross-sectoral SCP issues. In addition to country-level and regional (i.e. country-grouping level) analysis, the report also includes examples of activities on the local level. Eighteen city-based studies were carried

out to support this report, illustrating more detailed SCP issues and providing examples of implementation practices at the local level. The report can provide an input to the development of regional and national strategies and implementation mechanisms under the Marrakech process.

Box 1.1 Sustainable consumption and production — implementation strategy for sustainable development

Sustainable consumption and production is a holistic perspective on how society and the economy can be better aligned with the goals of sustainability. Sustainable consumption and production (SCP) has been defined as:

a holistic approach to minimizing negative environmental impacts from the production-consumption systems in society. SCP aims to maximise the efficiency and effectiveness of products, services, and investments so that the needs of society are met without jeopardizing the ability of future generations to meet their needs (Norwegian Ministry of Environment, Oslo Symposium, 1994).

SCP is a practical approach to achieving sustainable development which addresses the economy, society and environment.

SCP aims to reduce emissions, increase efficiencies and prevent unnecessary wastage of resources within society, through the stages of material extraction, investment, production, distribution, consumption, to waste management. In addition to these environmental and economic goals, the social component is concerned with equity within and between generations, improved quality of life, consumer protection and corporate social responsibility. Some key principles and challenges include:

- i) improving the quality of life of populations without increasing environmental degradation, and without compromising the resource needs of future generations;
- ii) decoupling the link between economic growth and environmental degradation, by
 - reducing the material intensity and energy intensity of current economic activities and reducing generation of emissions and waste during extraction, production, consumption and disposal
 - encouraging a shift of consumption patterns towards groups of goods and services with lower energy and material intensity without compromising quality of life;
- iii) applying life-cycle thinking (Box 3.5), which considers the impacts from all life-cycle stages of the production and consumption process and guards against unforeseen shifting of impacts from one life-cycle stage to another, from one geographical area to another, or from one environmental medium to another;
- iv) guarding against the rebound effect, where technological efficiency gains are cancelled out by resulting increases in consumption.

Cross-cutting in character, SCP needs the active involvement of all stakeholders and a wide range of locally-adapted policy responses. These can range from introduction of more eco-efficient technologies, holistic policy approaches which combine regulatory frameworks, the use of economic instruments, dissemination of environmental information, development of physical and social infrastructure and improved education and public awareness.

1.2 Scope of the report

Objectives and geographic coverage

In order to map out SCP activities in the SEE and EECCA regions, and to support the implementation of SCP activities in countries, this report sets out to:

- provide an overall picture of the current state and recent trends in consumption and production patterns in EECCA and SEE, focusing on the key thematic issues from an SCP perspective, including selected economic sectors with high environmental impacts;
- identify key existing policies aimed at reducing the environmental impacts of these activities while maintaining their economic viability;
- discuss options for achieving more sustainable consumption and production patterns, including opportunities presented by behavioural and infrastructural characteristics; and
- review existing economic, social and institutional barriers to the realisation of these opportunities, and to provide information on on-going and completed initiatives aimed at overcoming these barriers.

The report's geographical coverage extends to the regions and countries in the Table 1.1.

Serbia and Montenegro are considered as separate countries, even though until 2006 data were jointly reported for Serbia and Montenegro. Bulgaria and Romania, which joined the European Union in January 2007, are used in some chapters as reference points for comparison. Comparisons are also made with other Member States of the European Union, or with the EU as a whole.

Structure of the report

Chapter 2 sets the scene for further analysis by providing an overview of the economic, demographic

and social situation and trends which have relevance for SCP. Chapter 3 begins with a review of SCP policy developments in the region, followed by a more detailed discussion of current status and future prospects for Green Public Procurement, the policy instrument considered effective in stimulating more sustainable government consumption patterns. Chapters 4 to 8 look in more detail at the developments in five key theme areas relevant for SCP in the region: industrial production, food production and consumption, residential, public and commercial buildings, transport services, and waste generation and management. The chapters consider the relevance of each theme to SCP, current status and trends, resulting environmental and social impacts, and the status of SCP-relevant policies related to the theme. In addition, opportunities for greater sustainability are examined, and positive initiatives presented. Barriers to the spreading of positive initiatives are investigated and options for breaking down these barriers are suggested. Finally, Chapter 9 concludes the report by identifying some possibilities for future work.

In chapter 2 and the five theme chapters, information and data are presented at sub-regional and country levels, where relevant. It is beyond the scope of the report to provide data on every indicator, individually, for every country within the two regions.

A number of theme chapters focus on implementation initiatives taking place in cities. There are several reasons for this approach:

- cities are increasingly becoming the driving engines of national economic growth and in much of the region urban populations are growing at the expense of rural populations (with the exceptions of Kyrgyzstan and Tajikistan);
- there is evidence that a growing wealthy urban middle class are beginning to adopt some of the more impacting consumption patterns of western European countries. At the same time cities typically show the greatest levels of social and economic disparity, and this disparity is increasing, putting the sustainability of cities under pressure;

Table 1.1 Countries covered in this report

South East Europe (SEE)	Albania, Bosnia and Herzegovina, Croatia, former Yugoslav Republic of Macedonia Montenegro, Serbia
Eastern Europe, Caucasus and Central Asia (EECCA)	Eastern Europe Belarus, Republic of Moldova, Russian Federation, Ukraine
	Caucasus Armenia, Azerbaijan, Georgia
	Central Asia Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

Note: Due to data collection practices prior to 2006, data is available for Serbia and Montenegro jointly.

- large cities can act relatively independently and, in the right circumstances, act as drivers for change and test-beds for sustainability initiatives;
- the opportunity for large-scale environmental and social gains may be greater in cities through more integrated and efficient spatial planning, investment in collective transport, the multi-apartment housing stock, energy services, waste collection and management, and the provision of environmental information to the public.

1.3 Data collection methods

A number of strategies have been pursued to gather data and look at case studies used in this report. These include:

- secondary statistical data sets and qualitative information available from international institutions which have been used for economic,

demographic and consumption overviews in Chapter 2, and for national and regional data and internationally-funded initiatives in the theme chapters. Sources include the European Environment Agency, the World Bank, the International Energy Agency, the Commonwealth of Independent States Statistics Committee, the UN Economic Commission for Europe, the UN Development Programme, the Organization for Economic Cooperation and Development, the World Health Organization, the European Bank for Reconstruction and Development and the UN Food and Agriculture Organization;

- the results of the 2006 EAP Task Force Secretariat questionnaire survey of the development of environmental policies in the EECCA countries, and the 2006/2007 UNEP survey where a questionnaire was sent to EECCA and SEE governments on policies and initiatives related to SCP. At the time of writing, 16 countries had provided a response to the UNEP survey.

Box 1.2 City studies carried out to collect information for this report

During autumn/winter 2006 UNEP and the EEA commissioned and coordinated 18 city studies in 13 cities, under the four theme areas of food, transport, building/housing and waste. The cities are spread throughout EECCA and SEE and represent 11 of the 18 countries covered by the report. These studies were carried out by local NGOs, researchers, and government agencies.

Theme	City	Country	Contributor
Transport	Tbilisi	Georgia	Ministry of Environment Protection and Natural resources ⁽¹⁾
	Almaty	Kazakhstan	Centre for Sustainable Production and Consumption
	Yerevan	Armenia	Ministry of Nature Protection
	Minsk	Belarus	Ivan Narkevitch
	Zagreb	Croatia	Green Action (ANPED)
Buildings and housing	Dnipropetrovsk	Ukraine	Youth Environmental League of Prydniprovye (ANPED)
	Minsk	Belarus	Institute of Regional and Urban Planning
	Ashghabat	Turkmenistan	Batyr Karryev
	Dushanbe	Tajikistan	UNEP NatCom
	Tbilisi	Georgia	CENN — Caucasus Environment network
Waste	Belgrade	Serbia	Young Researchers of Serbia (ANPED)
	Donetsk	Ukraine	EcoClub (ANPED)
	Tbilisi	Georgia	Green Association Alternative
	Dnipropetrovsk	Ukraine	Youth Environmental League of Prydniprovye (ANPED)
	Bishkek	Kyrgyzstan	Independent ecological expertise
Food	Belgrade	Serbia	Young Researchers of Serbia (ANPED)
	Kosiv and Ivano-Frankivsk	Ukraine	Green Dossier (ANPED)
	Ramenskoye	Russia	Aleksandra Mazurova

⁽¹⁾ Used as a background document for a workshop of the UNECE-WHO Transport, Environment and Health Pan-European Programme and funded by the Netherlands and Switzerland.

The results of both surveys have been used for policy analysis in chapter three and in the theme chapters;

- eighteen city studies commissioned by UNEP-EEA to support this report ⁽²⁾, and carried out by local organisations and researchers (Box 1.2 and Map 1.1). The studies have made use of secondary data and information available in local languages including national and municipal policies and plans, publications of local statistics offices, independent reports, papers and PhD studies. In addition, city studies have generated new data through interviews with municipal departments, government enterprises, privatised utilities, transport services, construction and waste management companies, and members of the public (e.g. public surveys and focus group studies on food purchase behaviour);
- the work on the report was carried out in cooperation with EECCA and SEE governments, and with contributions from cleaner production centres, NGOs, local authorities and researchers in the two regions. Extensive consultation on the English and Russian versions of the report took place in May and June 2007, with SEE and EECCA governments and individuals providing comments and suggestions how to improve the draft report.

Map 1.1 Location of the 18 city studies carried out for this report



⁽²⁾ Selected city studies will be published on-line.

2 Broad trends in production and consumption

Facts and figures

- The SEE and EECCA regions cover 16 % of the global land area, contain 4.7 % of the world's population, but generate only 2.4 % of the global GDP.
- Economic restructuring during the first half of the 1990s affected all economies of the region. GDP in most countries in 2005 remained lower than in 1990. Current growth in GDP is rapid, however.
- Share of the service sector has grown in all countries and now exceeds 50 % across Eastern Europe and SEE. The industrial sector has partially or fully recovered from the collapse of the early 1990s. The recovery has been dominated by the relatively polluting and energy-intensive extraction industries producing fuel and minerals for export.
- Despite improvements, energy intensities of most EECCA countries are still significantly higher than in the Member States of the European Union, while energy intensities of the economies of SEE countries are generally similar to the EU.
- Populations have declined significantly in Eastern Europe and SEE since 1995 but have grown in most of Central Asia. Every country is experiencing a declining percentage of children and an increasing proportion of persons over 65.
- Not all segments of the population have benefited from economic growth. The gap between the poorest and wealthiest groups of society is significantly higher than it was pre-transition. In much of EECCA, and to a lesser extent in SEE, the proportion of the population living below the poverty line remains significant.
- In all countries of the region, household expenditure by far exceeds government expenditure and is growing rapidly. Consumption expenditure of households now exceeds 1990 consumption expenditure levels in all sub-regions except Central Asia. Household energy use, private transport and food are likely to be those consumption categories leading to greatest environmental pressures.
- The ecological footprint per capita exceeds sustainability limits for at least half the countries of the regions.
- Whereas in Western Europe much of the focus for SCP needs to address impacts arising from high levels of consumption, SCP policy and action in EECCA and SEE may need to be more weighted towards improving efficiencies of production, infrastructures and municipal services.

The EECCA and SEE regions covered in this report encompass a vast area of widely differing economic, demographic and social situations and development trends. To set the scene, this chapter

provides a brief economic and demographic background to the regions and outlines trends in production and consumption and related environmental pressures.

2.1 Regional overview

The two sub-regions cover 16 % of the global land area, contain 4.7 % of the world's population, but generate only 2.4 % of the global GDP. Table 2.1 gives a breakdown of population, land area and GDP for the countries covered by the report.

Differences among the countries are considerable. Population ranges from 2 million in the former Yugoslav Republic of Macedonia to 143 million in the Russian Federation, population density from 6 persons per km² in Kazakhstan to 128 persons per sq km in Moldova, and GDP per capita from 1 300

in Tajikistan to 13 200 dollars per capita purchasing power parity (PPP) in Croatia. The greatest differences among countries are in their size, ranging from fewer than 30 thousand square kilometres in Albania, Armenia and the former Yugoslav Republic of Macedonia, to 2.7 million square kilometres in Kazakhstan and 16.4 million square kilometres in the Russian Federation.

2.2 Economic restructuring

Economic restructuring during the first half of the 1990s had a significant effect on all economies of the

Table 2.1 Area, population and GDP (2005)

	Population	Land area	Population density	GDP purchasing power parity (PPP)		Agricultural land use*		
	Million	Thousand sq km	People per sq km	Thousand million constant 2000 int. USD	Thousand constant 2000 int. USD per capita	Thousand sq km	% of total land area	Sq km per 1 000 population
Eastern Europe	204.2	17 201	12	1 758	9.6	2 684	16 %	13
Belarus	9.8	207	47	69	7.9	89	43 %	9
Republic of Moldova	4.2	33	128	7	1.9	25	77 %	6
Russian Federation	143.2	16 381	9	1 395	10.9	2 157	13 %	15
Ukraine	47.1	579	81	287	6.8	413	71 %	9
Caucasus	15.9	180	88	68	4.8	92	51 %	6
Armenia	3.0	28	107	14	5.0	14	49 %	5
Azerbaijan	8.4	83	102	42	5.6	48	58 %	6
Georgia	4.5	69	64	13	3.2	30	43 %	7
Central Asia	58.2	3 927	15	-	-	2 828	72 %	49
Kazakhstan	15.1	2 700	6	115	8.5	2 076	77 %	137
Kyrgyzstan	5.2	192	27	9	1.9	107	56 %	21
Tajikistan	6.5	140	46	8	1.3	43	30 %	7
Turkmenistan	4.8	470	10	-	-	330	70 %	68
Uzbekistan	26.6	425	63	48	2.0	273	64 %	10
South Eastern Europe	21.7	262	83	-	-	128	49 %	6
Albania	3.1	27	114	15	5.3	11	41 %	4
Bosnia and Herzegovina	3.9	51	76	27	7.6	21	42 %	5
Croatia	4.4	56	79	52	13.2	27	48 %	6
FYR of Macedonia	2.0	25	80	13	7.1	12	49 %	6
Serbia and Montenegro	8.2	102	80	-	-	56	55 %	7

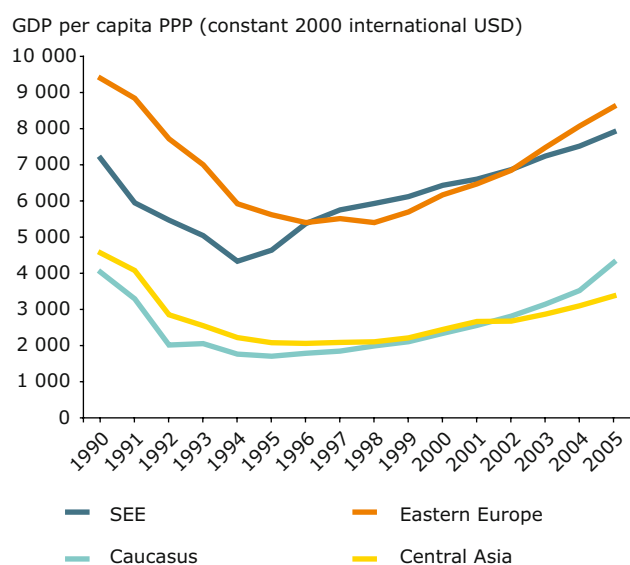
Sources: World Bank, 2006 and * FAOSTAT, 2006.

regions, exacerbated by conflicts in SEE, the Caucasus and other areas. Russia's economic crisis of 1997/1998 caused a further decline in large parts of EECCA. Since the late 1990s economic growth has been rapid in all regions, running at around 4–5 % per year in SEE, 6–8 % per year in Eastern Europe and Central Asia and close to 10 % in the Caucasus (Figure 2.1). Nevertheless, in most countries, GDP remains lower today than it was in 1990 before the transition began. The exceptions are Albania, Azerbaijan, Belarus, Croatia, Georgia and Kazakhstan whose economies are between 17 % and 54 % larger than they were in 1990 (World Bank, 2006).

Growth since the mid-1990s has not occurred evenly across the economic sectors. The industry and service sectors grew in all but one country, while agricultural growth has been limited or even negative in most countries (see Figure 2.2 for details).

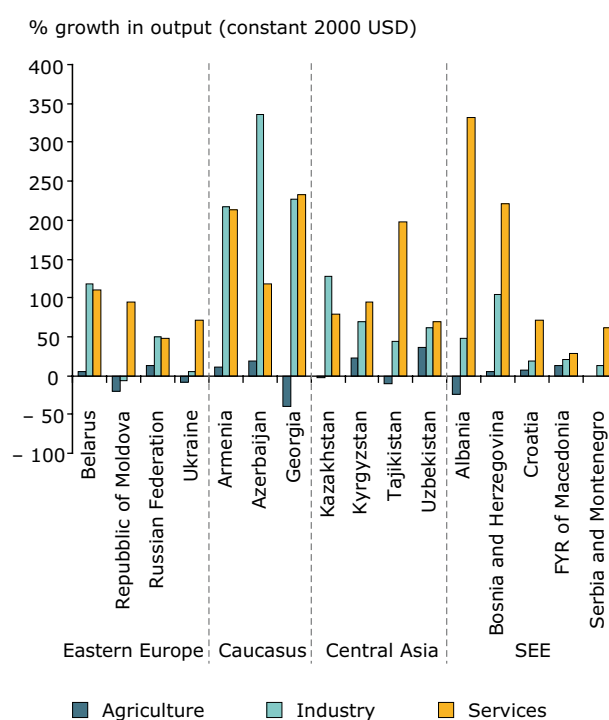
These developments have strongly affected the structure of the economies across the region (Figure 2.3). The share of services now exceeds 50 % in all economies in Eastern Europe and SEE. The share of agriculture has fallen in all but one country although it still represents a key sector in most Central Asian countries as well as in Moldova and Albania. In Armenia, agriculture, while still important, has fallen back to pre-1990 levels and industry has again begun to dominate. Industry also dominates in Azerbaijan and Turkmenistan primarily

Figure 2.1 GDP in purchasing power parity (PPP) per capita by region, (1990–2005)



Source: World Bank, 2006.

Figure 2.2 Growth in the main economic sectors (1995–2005)



Note: Turkmenistan not included due to lack of data since 2003.

Source: World Bank, 2006.

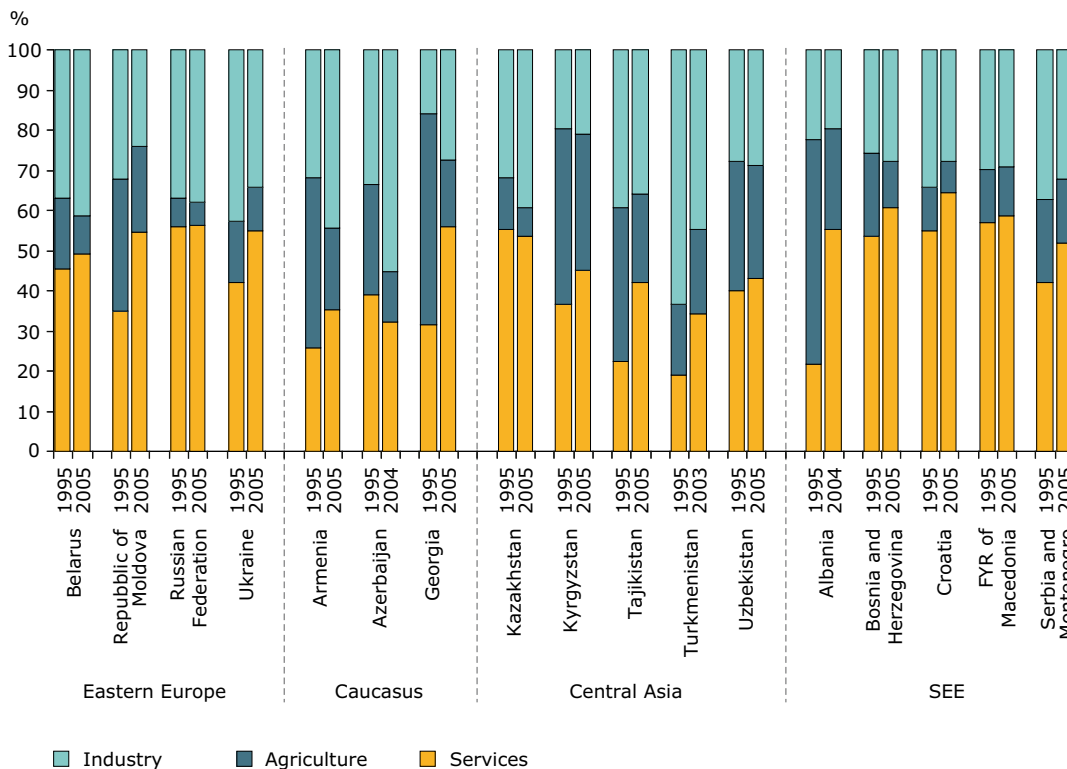
within energy. However, in most countries growth in industry since 1995 represents only a partial return to its pre-transition strength (see Figure 4.1 in Chapter 4). Only in three countries, (Azerbaijan, Belarus and Uzbekistan) is current industrial output greater than it was in 1990. (World Bank, 2006). On the other hand, the dominance of the service sector in Eastern Europe and SEE is a relatively new phenomenon.

Economic structural changes may partially reflect changes in national consumption patterns and a greater demand for services. However, structural changes in national economies have also been significantly influenced by growth in international trade, particularly exports of fossil fuels and metals, and increasingly, the import of manufactured goods from other parts of the world (CISSTAT, 2006).

2.3 Increasing international trade and impacts on production

Increasing levels of globalisation since the mid-1990s has affected both EECCA and SEE, with all countries showing upward trends in imports and exports. While trade within the EECCA region has increased

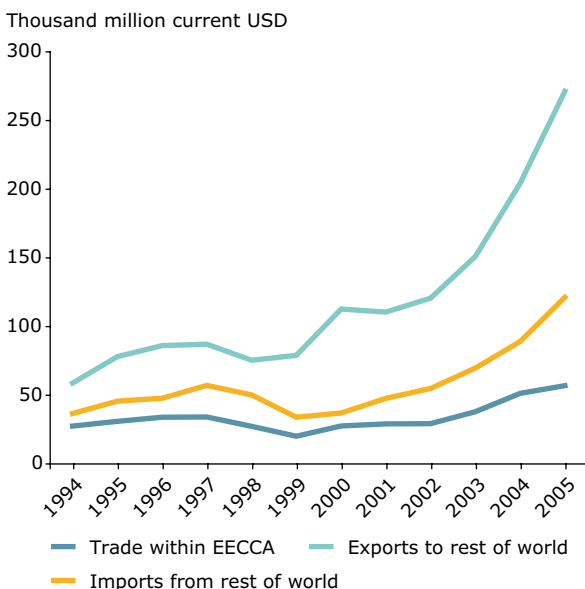
Figure 2.3 Economic structural change, shares in gross value added (1995–2005)



Source: World Bank, 2006.

at similar rates to economic growth, exports to the rest of the world have grown rapidly rising from 11 % to 28 % of regional GDP between 1994 and 2004 (CISSTAT, 2006). Figure 2.4 shows the growth

Figure 2.4 International trade in the EECCA region (1994–2005)



Source: CISSTAT, 2006.

in international trade within EECCA and between EECCA and the rest of the world.

Foreign investment and the increasing demand for exports have been the driving forces of economic growth in a number of EECCA and SEE countries. However, foreign investment and exports have tended to focus on a few key sectors and products, ensuring strong growth in these industries but less elsewhere.

In Ukraine, economic growth was catalysed by the export of steel and chemicals (Kolesnichenko, 2005). In Russia (UNEP, 2006), Kazakhstan (Embassy of the Republic of Kazakhstan in Japan, 2005), Azerbaijan and Turkmenistan growth has been largely based on exports of energy-carriers. In 2005 fossil fuels and mining products represented 65 % of all exports from EECCA to the rest of the world, compared to 24 % for manufactured products and 7 % for agricultural products (WTO, 2006). Around two thirds of the total export of fossil fuel and mining products goes to the EU. More information about exporting industries is given in Chapter 4.

Meanwhile, imports to EECCA from the wider world are dominated by machinery and transport equipment, chemical, mineral and metal

manufactured products, and processed foods (CISSTAT, 2006).

Due to exports, the industrial sector, especially in the EECCA region, is now dominated by one or a few industrial sub-sectors. Typically, these dominating sub-sectors are polluting and resource-use intensive. Examples include extractive industries in Azerbaijan (oil), Kazakhstan (oil and metals), Kyrgyzstan (gold), the Russian Federation (oil, gas, metals), Ukraine (metals and oil), Tajikistan (aluminium), and Turkmenistan (gas and oil). In Uzbekistan and Tajikistan, cotton industries account for large shares in industrial production (see Chapter 4 for more details).

The specialisation of countries as exporters of one or two dominant commodities can have a detrimental effect on efficiency in other sectors. These commodities begin to attract an ever-increasing share of capital investment at the expense of improvements in other industry sectors. This has occurred even in the large diverse economy of Russia. Here the share of fuel extraction in total investments increased to 20 % by 2003, while investments in other industries dropped, e.g. the chemical industry, machine building and processing of metals, construction materials and light industry (UNEP, 2006). A number of heavy industries (e.g. steel production, mining) are in urgent need of modernisation. Currently, a considerable part of the industrial sector uses equipment and processes which are 30 years or more out of date.

2.4 Resource and energy consumption and greenhouse gas emissions

Moving towards more sustainable consumption and production requires a *decoupling* ⁽¹⁾ between economic growth, on the one hand, and resource and energy use and their associated environmental impacts, on the other (see Section 2.10).

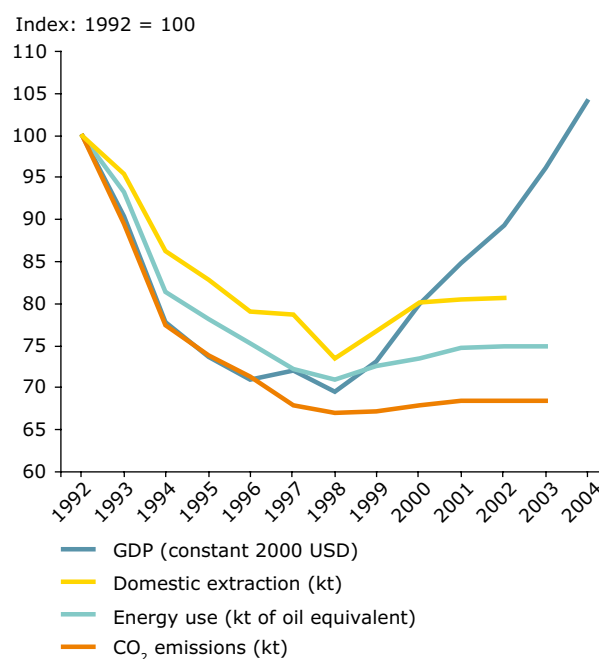
In EECCA countries a number of counteracting trends are affecting any potential decoupling. The first trend is the increasing dominance of the service sector in most economies (see Figure 2.3). This potentially has a positive decoupling effect because services generally tend to have lower energy and materials use per unit of output than industry and agriculture. Notable exceptions to

this rule are transport services (see Chapter 7), and some social and communal services, such as the provision of drinking water and sanitation which have high energy intensities. The second trend is the gradually improving efficiency of some established industries. Like the first trend this is also having a positive decoupling effect. However, the shifting of industry from manufacturing and light industries to the exploitation and processing of fossil fuels and minerals may be pulling in the opposite direction.

It would appear that the first two trends dominated the third during the growth years of 1999 to 2004. As a result these years saw a relative decoupling of resource use, energy use and CO₂ emissions from economic growth across EECCA as a whole (Figure 2.5). Resource use and energy use in 2004 were 20–25 % below 1992 levels despite a higher GDP.

Nevertheless, energy intensities of most EECCA countries are still significantly greater than the

Figure 2.5 Relative decoupling of resource use (energy, material extraction) and environmental pressures (CO₂) from economic growth, EECCA (1992–2004)



Sources: World Bank, 2006; Mosus-project, 2006.

⁽¹⁾ Decoupling, which can be relative or absolute, occurs when the growth rate of an environmental pressure is less than that of a given economic driving force (e.g. GDP) over a certain period. Relative decoupling occurs when an environmental pressure grows, but more slowly than the underlying economic driver. By contrast, absolute decoupling is achieved when an environmental pressure decreases while the economy grows.

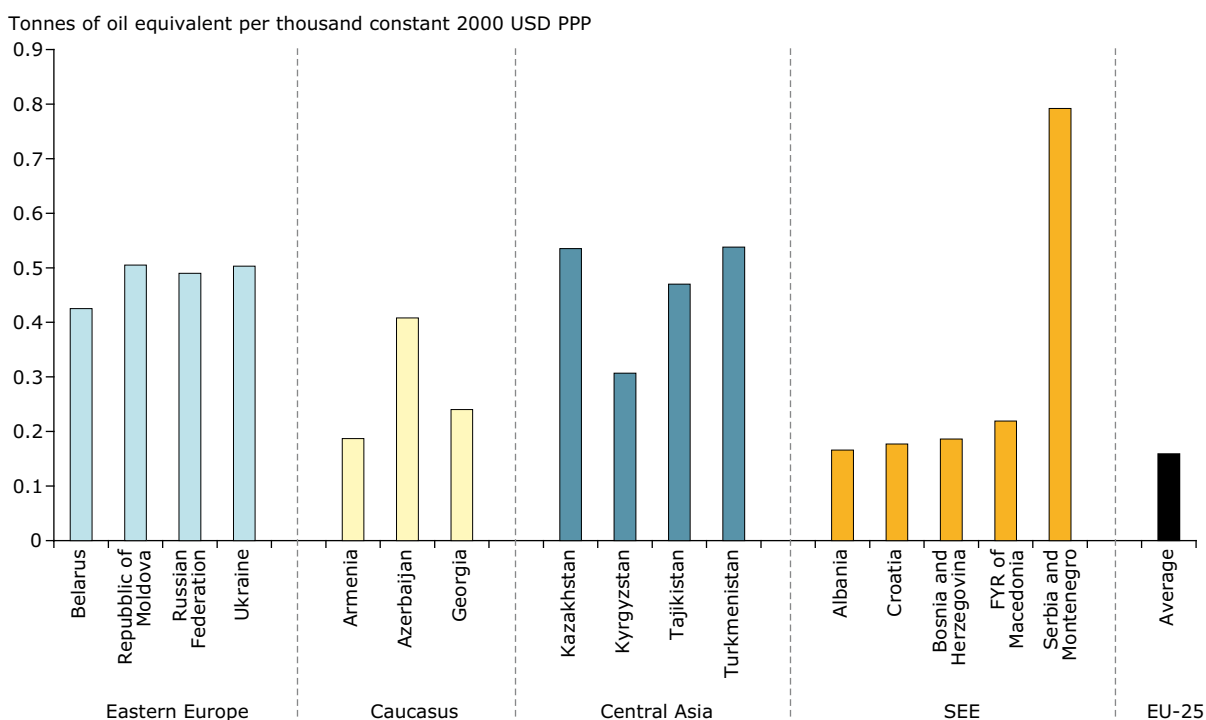
European Union (Figure 2.6). This is due in part to the structural differences between those economies (i.e. a larger share of resource and energy-intensive industries). However, lower energy efficiencies of industries and municipal services resulting from long-term lack of investment are also significant factors in the higher energy intensities of many EECCA countries. Meanwhile, most economies of SEE countries show much lower energy intensities, comparable to those of EU Member States.

Energy intensity of the economy is one key factor in overall greenhouse gas emissions per capita. A second influential factor is the proportion of energy coming from non-fossil fuels (see Figure 2.7 for the proportion of electricity produced using non-fossil fuels). Fossil fuel-rich nations (Russia, Kazakhstan, Uzbekistan, Turkmenistan, Azerbaijan, Ukraine) tend to have low shares of renewable energy

although the availability of renewable resources is also a key factor (e.g. Moldova is poor in fossil fuels but also in hydro-energy potential).

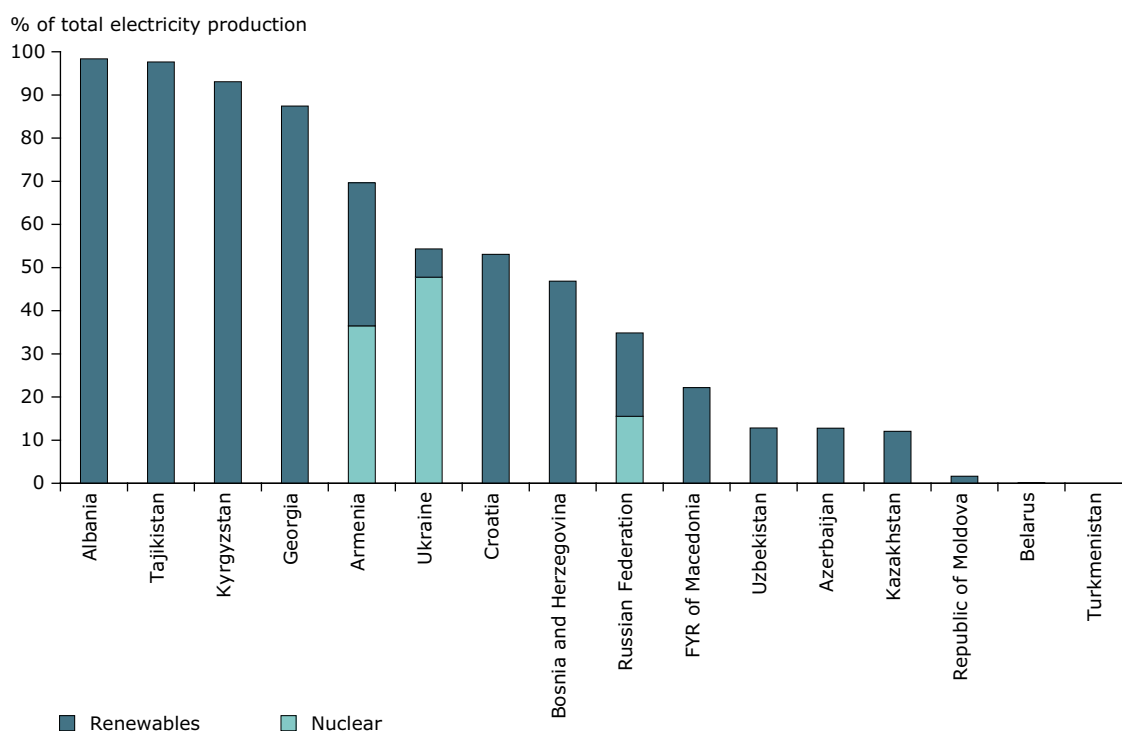
The wealth of a country (Table 2.1) and the resulting patterns of consumption are the third major driving force in pushing up energy use and greenhouse gas emissions per capita. The wealthier fossil fuel-rich nations with high energy intensities (e.g. Russia and Kazakhstan) have higher CO₂ emissions per capita than the European Union despite significantly lower levels of economic activity (Figure 2.8). Similarly, fossil fuel-rich Azerbaijan has more than double the CO₂ emissions per capita of its Caucasus neighbours with similar GDPs per capita. Finally, some less affluent countries with high levels of renewable energy have very low CO₂ emissions per capita (Armenia, Georgia, Tajikistan, Kyrgyzstan).

Figure 2.6 Energy intensities of EECCA and SEE countries measured in tonnes of oil equivalent per unit GDP in purchasing power parity



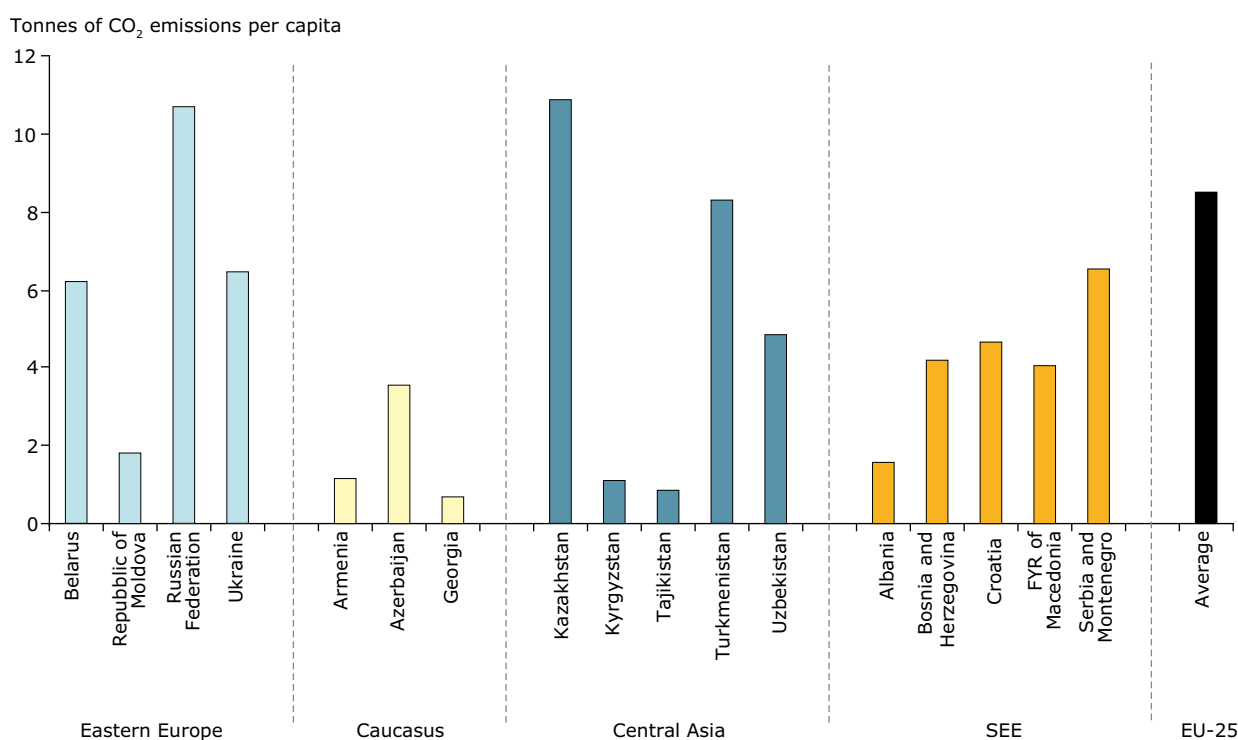
Source: IEA, 2006.

Figure 2.7 Non-fossil fuel contribution to total electricity generation



Source: IEA, 2006.

Figure 2.8 Carbon dioxide emissions per capita in EECCA and SEE countries (2004)



Source: IEA, 2006.

2.5 Economic growth, welfare and increasing inequality

Economic development can, and should, bring with it improvements in human well-being and quality of life. The UN's Human Development Index (HDI), which takes into account life expectancy, literacy, education, and standard of living, shows a reasonably strong correlation with GDP in SEE and EECCA (Figure 2.9). Thus, economic growth in SEE and EECCA since the mid- to late-1990s is likely to have led to an increase in well-being.

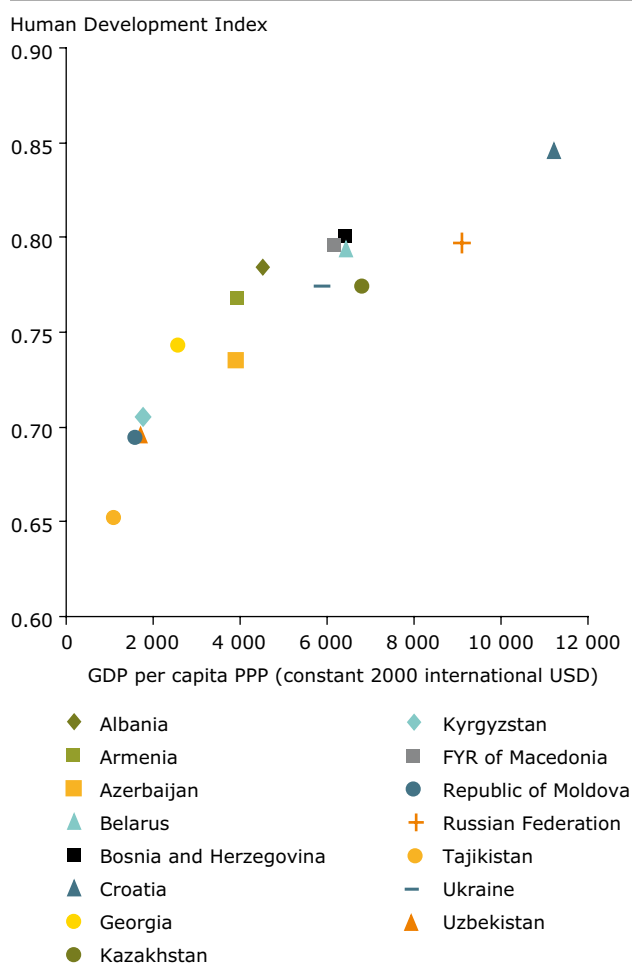
HDI increases most rapidly with rising GDPs for the poorer economies. In more affluent economies, however, further growth in economy brings less rapid improvements in HDI. The HDI of most of EECCA fell during the early- to mid-1990s and in some countries was still well below 1990 levels by 2004 (Moldova, Russia, Tajikistan, Ukraine). Other countries have improved their HDI significantly since 1990 (Albania, Armenia, Croatia) (UNDP, 2006). These trends are in most, but not all, cases similar to trends in GDP.

Some countries appear to be less successful than others at transferring economic wealth into quality of life. The Russian Federation, Kazakhstan, Ukraine and Azerbaijan fall into this group (Figure 2.9). Russia has a similar HDI score as Bosnia and Herzegovina, Belarus and the former Yugoslav Republic of Macedonia despite a 50 % higher GDP.

The positive impacts of economic growth on quality of life are limited if the increasing wealth is not distributed evenly across society. The gap between the poorest and wealthiest groups of society has increased in much of EECCA and is significantly higher than it was pre-transition. For example, in Russia in 1991 the poorest 20 % received 12 % of total national income, while the richest 20 % received 31 % (Simai, 2006). By 2003 the income gap had widened significantly with the poorest 20 % receiving only 6 % and the richest 20 % receiving 47 % (World Bank, 2006).

In many EECCA countries, and to a lesser extent in parts of SEE, the proportion of the population living below the poverty line is still significant (UNECE, 2006). In Armenia, 43 % of the population was still living in poverty in 2004, although this had decreased from 55 % in 1999 (International Monetary Fund, 2005). Even in Ukraine some 29 % of the population live below the poverty line with 3 % in extreme poverty (UNICEF, 2006).

Figure 2.9 Human Development Index versus GDP in EECCA and SEE (2004)



Sources: UNDP, 2006; World Bank, 2006.

Differences in incomes between urban and rural areas also remain high in most countries of EECCA although there is no consistent trend. Some countries (Moldova, Russia, Georgia and Tajikistan) show a widening gap between urban and rural incomes, while other countries show the opposite trend (Belarus, Azerbaijan, Kazakhstan) (CISSTAT, 2006).

Access to basic needs such as supplies of clean water and sanitation remains limited for a large part of rural populations particularly in Central Asia where between 25–50 % of mostly rural population has no sanitation (WHO, 2005). According to WHO estimates, more than 13 000 children under the age of 14 die every year in the pan-European region due to bad water supply and sanitation, most of them in

EECCA countries (WHO, 2005). While improvements have been recorded in the larger cities, the situation remains critical in rural areas, where water services have effectively collapsed (OECD, 2007).

Access to clean energy sources is also limited for many, especially in rural areas. According to WHO, over 50 % of the population of Ukraine, Moldova, Armenia and Georgia and most of Central Asia use wood or coal for cooking on open fires or rudimentary stoves, although this situation tends to be limited to rural areas (WHO, 2005), leading to bad indoor air quality and associated respiratory effects.

Meanwhile in the large cities, there is evidence of a growing urban nouveau riche and middle class. Their adoption of western European consumption patterns (Myers and Kent, 2003; Vendina, 2007) have environmental consequences, such as increasing private car ownership in cities (Chapter 7), an increase in meat consumption (Chapter 5) and the emergence of low density detached housing developments in suburban areas (Chapter 6).

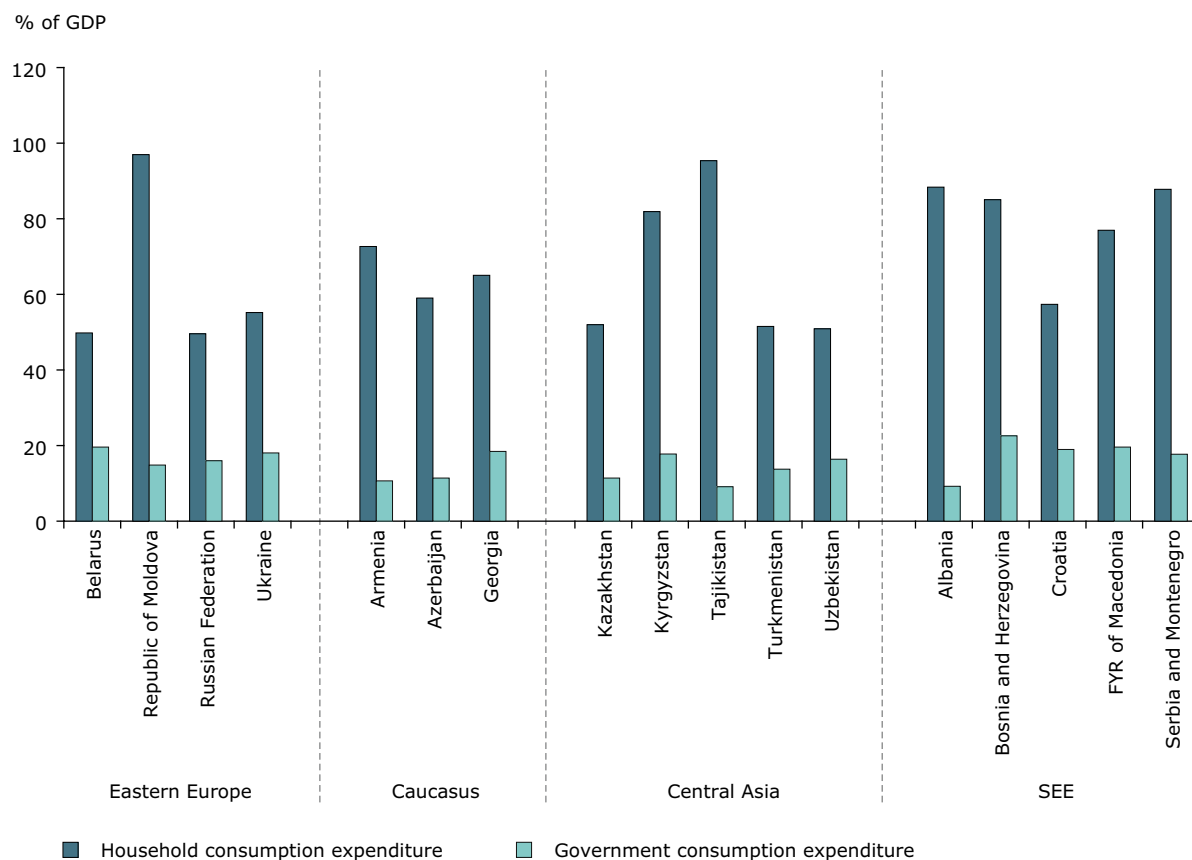
2.6 Consumption by state and households

In all countries of the region, household expenditure exceeds government expenditure by far (Figure 2.10). The ratio of household-to-government expenditure ranges from 2.5 in Belarus, to over ten in Tajikistan.

Absolute levels of consumption expenditure since 1990 have followed similar trends to those of GDP. However in terms of purchasing power parity (the best proxy for comparing material welfare) consumption expenditure of households recovered more rapidly than GDP and now exceeds 1990 consumption expenditure levels in all regions except Central Asia (Figure 2.11). Household consumption expenditure in Eastern Europe is growing particularly rapidly and by 2005 was already 40 % higher than in 1990.

Government consumption expenditure per capita has recovered less rapidly and remains lower than 1990 levels in all regions (Note: this is partly to

Figure 2.10 Household expenditure and government expenditure as a percentage of GDP



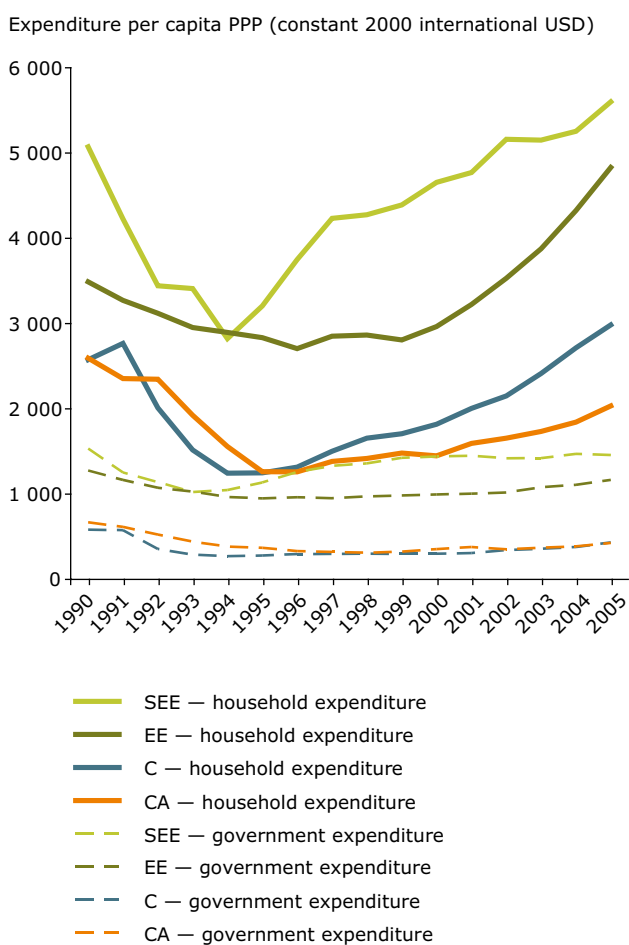
Note: The graph does not include all elements contributing to GDP: exports, imports and investments are not shown. Hence the two bars shown here can add up to less than or be greater than 100 %.

Source: World Bank, 2006.

be expected in transition economies undergoing decentralisation and privatisation). There are exceptions to this at country level — the former Yugoslav Republic of Macedonia, Tajikistan, Ukraine and in particular Georgia have seen increases in governments' expenditure share of GDP, and government expenditure per capita is higher in these countries than it was in 1990. With respect to government consumption, the potential benefits of sustainable procurement policies remain significant in these countries (see Chapter 3).

A rise in income levels and household expenditures has potentially positive social implications, provided that the majority of the population is benefiting (see Section 2.5 above). However, it also tends to lead to an overall rise in environmental impacts related to household consumption.

Figure 2.11 Trends in household and government final consumption expenditure per capita in PPP (1990–2005)



Source: World Bank, 2006.

2.7 Socio-demographic trends with relevance for consumption

Populations have declined significantly in Eastern Europe and SEE since 1995 (Table 2.2), with Ukraine having the third most rapidly falling population in the world (UNICEF, 2006). Russia's population decline is a result of increasing mortality rates and a declining birth rate (Lissovlik, 2005), while the Moldovan decline is mostly a result of the mass emigration of workers. The Ukrainian population decline results from both factors; approximately three-quarters due to increasing death rates and one-quarter to emigration of people of working age (Shanghina, 2004). By contrast, populations in Central Asia have increased by over 10 % in all countries except Kazakhstan.

Every single country covered by this report is experiencing a declining percentage of children born and an increasing proportion of persons over 65. However, while populations in the Caucasus and particularly in Central Asia remain relatively young, populations in Eastern Europe (except Moldova) and SEE (except Albania and the former Yugoslav Republic of Macedonia) have a higher percentage of older people. This is particularly true of Russia. Besides causing major societal effects and changing patterns of consumption, this trend will have economic consequences as the percentage of the population of working age begins to decline over the coming years.

Eastern Europe, except for Moldova, is highly urbanised, with levels of urbanisation comparable to those of Western Europe. The level of urbanisation has a strong impact on the patterns and impacts of consumption. Dense urban areas can benefit from more efficient provision of services such as multi-apartment housing, heating, collective transport, or waste collection and treatment. On the other hand, in sprawling urban areas the demand for transport can be high and the provision of collective services more difficult to organise. In addition, consumption of processed food and goods, electronics etc. and generation of household waste is generally higher in urban than in rural areas.

In most of Central Asia, Moldova and parts of SEE, the majority of the population is rural. While in general populations are rapidly becoming more urbanised, in Tajikistan and Uzbekistan the situation is quite the opposite; rural populations are growing faster. It has been suggested that this de-urbanisation process is due to the closure of mines and other industrial activities during the 1990s and the subsequent return of workers to agrarian livelihoods (UN Secretariat, 2002).

Table 2.2 Socio-demographic trends in EECCA and SEE countries (1995–2005)

	Population change 1995–2005	Percent population under 14		Percent population over 65		Urban population %		Housing space per capita m ²		Change in total housing space
		1995	2005	1995	2005	1995	2005	1995	2005	
Eastern Europe	– 5 %	21 %	15 %	12 %	14 %	71 %	71 %	18.4	21.2	10.1 %
Belarus	– 4 %	22 %	15 %	13 %	15 %	68 %	72 %	19.5	22.6	11.1 %
Republic of Moldova	– 3 %	27 %	18 %	9 %	10 %	46 %	47 %	19.9	21.4	4.2 %
Russian Federation	– 3 %	21 %	15 %	12 %	14 %	73 %	73 %	18	20.9	12.2 %
Ukraine	– 9 %	20 %	15 %	14 %	16 %	67 %	68 %	19.2	22	4.8 %
Caucasus	0 %	30 %	23 %	8 %	10 %	56 %	54 %	-	-	-
Armenia	– 7 %	30 %	21 %	8 %	12 %	66 %	64 %	17.5	23.1	23.4 %
Azerbaijan	9 %	34 %	26 %	5 %	7 %	52 %	51 %	12	12.6	14.6 %
Georgia	– 11 %	24 %	19 %	11 %	14 %	54 %	52 %	19.8	-	-
Central Asia	9 %	37 %	31 %	5 %	6 %	43 %	41 %	-	-	-
Kazakhstan	– 4 %	30 %	23 %	7 %	9 %	56 %	57 %	15.4	17.5	8.8 %
Kyrgyzstan	12 %	38 %	31 %	5 %	6 %	36 %	36 %	12.5	12.3	10.5 %
Tajikistan	13 %	44 %	39 %	4 %	4 %	28 %	25 %	9.1	8.6	6.6 %
Turkmenistan	15 %	40 %	32 %	4 %	5 %	45 %	46 %	10.8	-	-
Uzbekistan	16 %	40 %	33 %	4 %	5 %	38 %	37 %	12.8	-	-
South East Europe	– 9 %	23 %	19 %	10 %	14 %	50 %	52 %	-	-	-
Albania	0 %	32 %	27 %	6 %	8 %	39 %	45 %	-	-	-
Bosnia and Herzegovina	14 %	22 %	17 %	8 %	14 %	41 %	46 %	-	-	-
Croatia	– 5 %	19 %	16 %	13 %	17 %	55 %	57 %	-	-	-
FYR of Macedonia	4 %	25 %	20 %	9 %	11 %	61 %	69 %	-	-	-
Serbia and Montenegro	– 23 %	22 %	18 %	11 %	14 %	51 %	52 %	-	-	-

Sources: World Bank, 2006; CISSTAT, 2006.

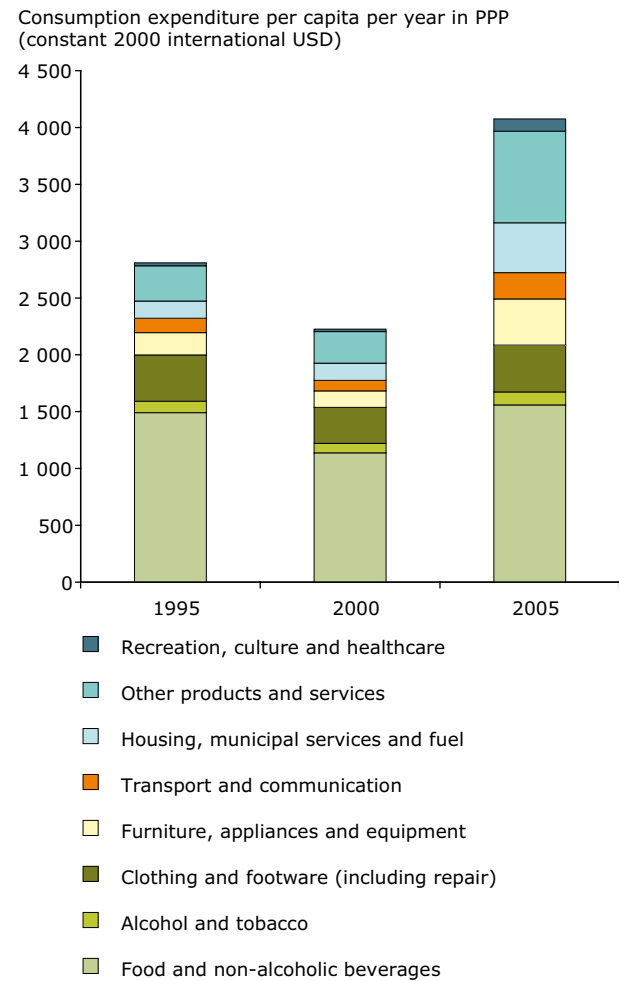
In eastern European countries and Armenia and Kazakhstan the housing space per capita is increasing. In absolute terms, total residential space in all EECCA countries increased by between 4 % and 23 % between 1995 and 2005. In Russia alone total residential space increased by some 340 million m² during the same period, equivalent to the entire residential space of Austria (ENERDATA, 2006). Such development leads to increased energy required for heating. In addition, the resulting construction boom across EECCA is likely to consume significant quantities of raw materials and energy.

Meanwhile, in the less affluent countries of Tajikistan and Kyrgyzstan, the housing situation, which is already squeezed, cannot keep up with population growth and increasing family size. In Tajikistan the space available per person is falling below sanitary norms of other countries.

2.8 Household consumption patterns and environmental pressures

Figure 2.12 shows how the share of household expenditure on various goods and services has changed in EECCA between 1995 and 2005. Basic food and clothing still dominate household expenditures across the EECCA region although their consumption decreased from 65 % to 48 % of overall household consumption expenditure between 2000 and 2005. Total household expenditure grew by more than 80 % over the same period. This additional income was used increasingly on housing and utilities, transport and communication, home appliances and recreation — all categories with significant environmental implications. Spending on recreation increased by a factor of 5 between 2000 and 2005, but still remains a relatively small consumption category.

Figure 2.12 Changing household consumption patterns in EECCA (1995–2005)



Note: Consumption categories are presented in the order of the most rapidly growing — most rapidly growing at top.

Sources: CISSTAT, 2006; World Bank, 2006.

Household consumption patterns vary widely across countries (Figure 2.13). In the lower-income countries of Central Asia and the Caucasus, greater proportions of household expenditures are set aside for food. This is most pronounced in Tajikistan and Armenia where food represents 64 % and 57 % of average household expenditures, respectively. In Tajikistan, despite increases in incomes since the mid-1990s, there remains little surplus for non-essentials in the average household.

At the other extreme, Croatia, which has the highest household expenditure per capita across the regions, uses the smallest proportion on food (33 %) and the highest on transport and communication and recreation, culture and healthcare. The expenditure patterns of Croatian

and Serbian households are much closer to the consumption patterns of EU households, demonstrating surplus wealth for non-essentials.

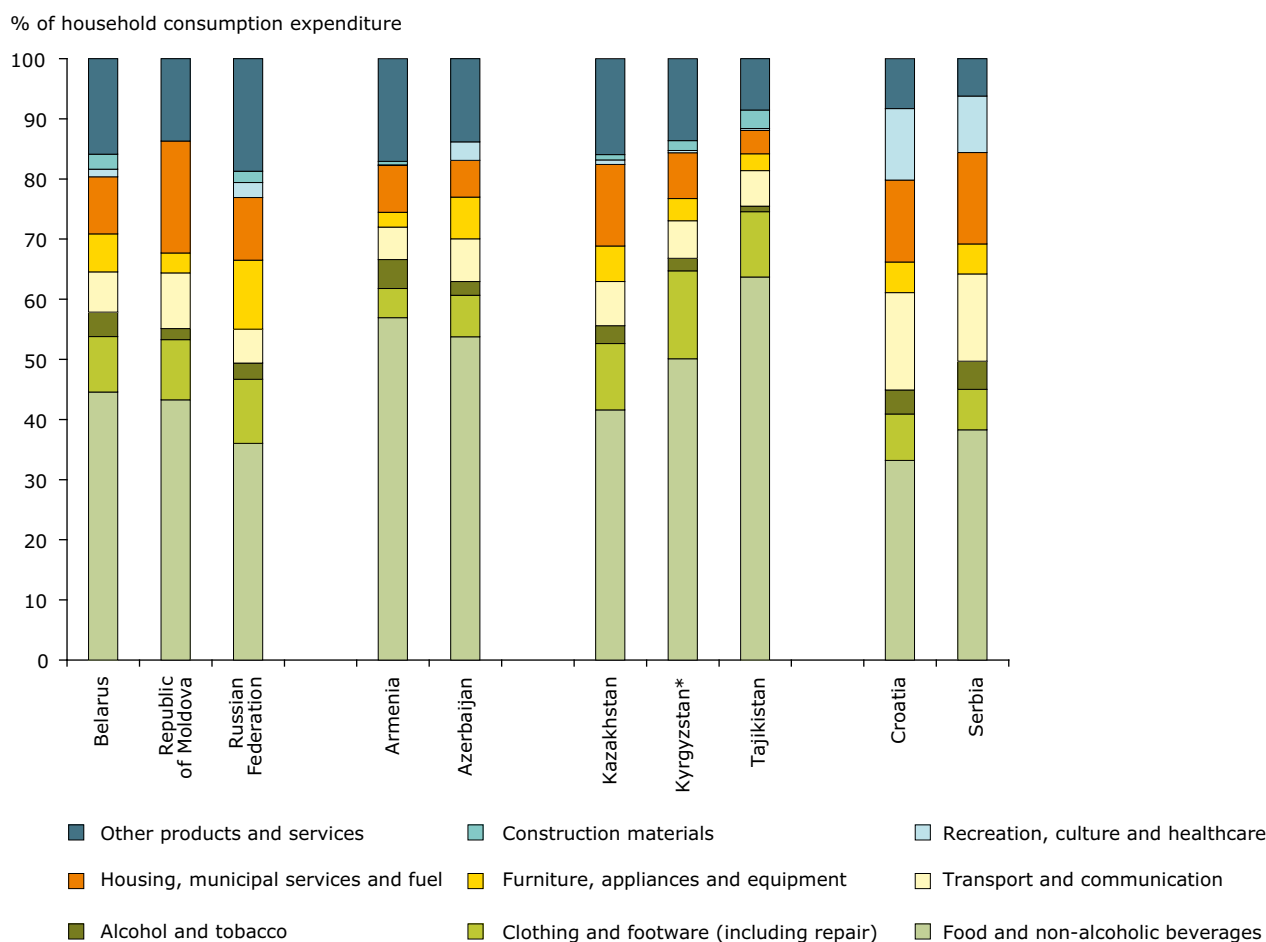
The level and type of environmental pressures (see Box 2.1) associated with household consumption depend both on absolute levels of consumption (how much is consumed) and on patterns of consumption (what products and services) as well as on the various pressure intensities of these products and services (i.e. environmental pressures per unit of consumption). For some goods and services, environmental pressures dominate during the consumption phase of the life cycle and can be directly attributed to households. For other goods, such as food, the majority of pressures can be associated with production (or disposal).

A number of economy-wide studies have identified the consumption categories with the highest pressures in the European Union (EU Commission, 2006; EEA, 2005; Moll *et al.*, 2006). These studies

Box 2.1 From environmental pressures to impacts

One of the main concerns about production or consumption activities is the environmental impact that they cause. Environmental pressures include: emissions of air pollutants such as greenhouse gases, solid waste and waste-water production, releases of toxic substances to air, soil and water, consumption of resources beyond reproductive capacities and conversion of natural land into built-up areas. These cause changes in environmental conditions which in turn lead to impacts on human beings, ecosystems and infrastructures.

Environmental pressures can be expressed in terms of quantities of pollutants discharged, weights or volumes of resources extracted or material consumed, volumes of fish or timber harvested, or, at the most aggregated level, presented as material flows in tonnes. However, with current knowledge, pressures from production or consumption cannot easily be converted into information on specific environmental impacts. As a general rule of thumb, the higher the use of materials, energy and land, the higher the resulting impacts on the environment. However, more research is needed to express environmental impacts and link them to specific environmental pressures. Throughout the remaining chapters of this report, environmental pressures are generally used as a proxy for environmental impacts.

Figure 2.13 Patterns of household expenditure in individual countries (2005)

Note: * Kyrgyzstan data are for 2003.

Sources: CISSTAT, 2006; Statistical Office of Serbia, 2006; Croatian Central Bureau of Stats, 2006.

have consistently identified food and drink, private transport, and housing as the consumption categories with highest overall environmental pressures. They are also consumption categories with the highest pressures per unit consumption (i.e. pressure intensive). Within the housing category, energy use (for heating and hot water) dominates, followed by structural work (i.e. construction and refurbishment) and use of electrical appliances.

Economy-wide analysis of environmental pressures from households is yet to be carried out in EECCA and the SEE countries. It is expected, however, that the life-cycle impacts of food consumption (Chapter 5), electricity, heating and hot water (Chapter 6), and transport (Chapter 7) will be of greatest concern. These consumption groups are covered in some of the theme chapters later in this report.

2.9 Ecological footprint

An ecological footprint provides a useful indicator of the degree to which a country's consumption is sustainable. Resources consumed to meet the country's demand for food, energy and goods are translated into equivalent land area in hectares per capita to provide those resources and to absorb emissions such as CO₂ without permanent change. These can then be compared to the total global available bio-capacity per person. Countries whose footprint significantly exceeds the global available bio-capacity (1.8 hectares per person in 2003) can be considered to have unsustainable consumption and production patterns.

By 2003, Eastern Europe (excluding Moldova), Kazakhstan, Turkmenistan and all SEE countries except for Albania show indications

of unsustainable consumption and production. Among them, Russia and Kazakhstan have footprints which are twice the available global bio-capacity per capita, though they still remained below the average figure for EU-25, at 4.8 hectares per capita in 2003.

A country's ecological footprint is influenced by levels of wealth per capita, but is not firmly linked to it. For example, Croatia despite a 40 % higher GDP per capita than Kazakhstan, has a significantly smaller footprint. The difference is the result of higher energy consumption and energy-related emissions in Kazakhstan, due mainly to higher energy intensities of industry and communal services, etc., (Figure 2.6) and also to the more limited use of renewable energy sources. The differences between Croatia's and Kazakhstan's footprints and GDPs would suggest that economic growth can be achieved while simultaneously reducing the ecological footprint.

2.10 SCP perspectives for SEE and EECCA countries

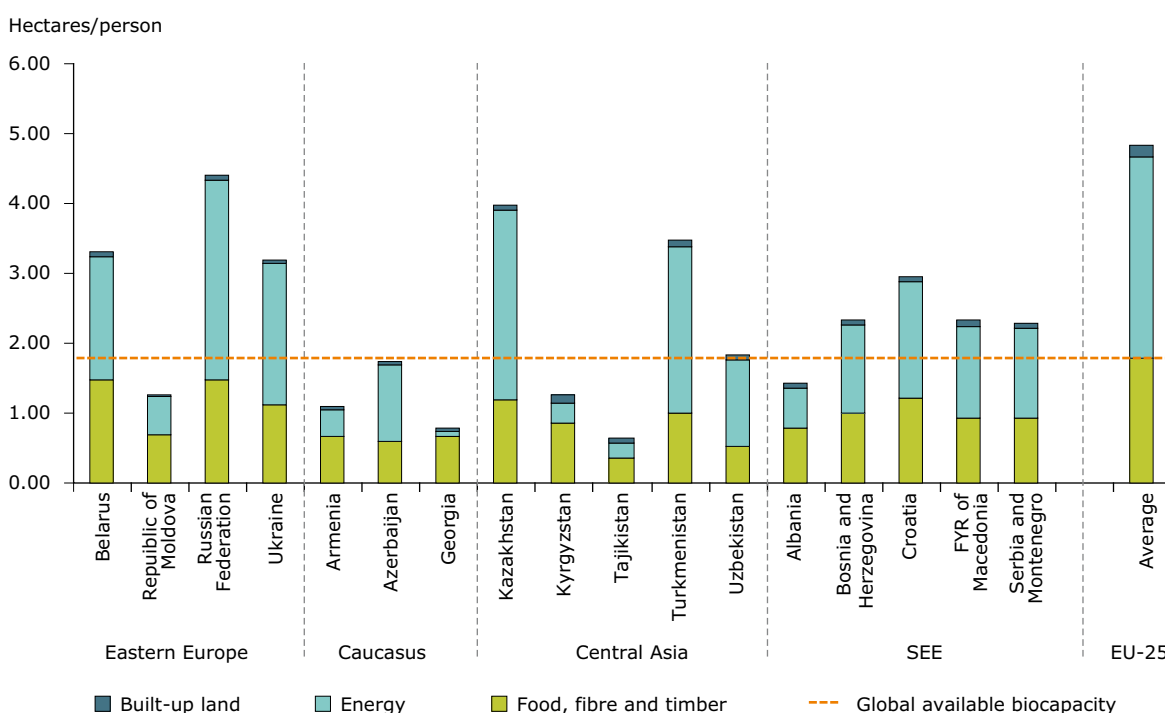
In every society, production, consumption and investment patterns should be managed with due

consideration to environmental, economic and social elements of sustainability. SCP provides such an integrated approach to policy-making, requiring close collaboration among different sectors and a wide participation of stakeholders.

The EECCA and SEE regions as a whole face very different SCP challenges than those faced by Western Europe. The majority of the population in Western Europe and increasingly in Central Europe has access to 'reasonable' income levels and can afford goods and services which exceed their basic needs. The focus of current and future SCP action in those countries is on the environmental pillar of sustainability — improving efficiency of production and using economic incentives and various other means to orient consumption towards less pressure-intensive goods and services.

In contrast, in much of SEE and EECCA there is a clear need to address the social pillar of sustainability. Significant segments of the population live in poverty and many, particularly in rural areas, do not have reliable access to basic needs, such as clean water, energy for household and adequate nutrition levels. The main challenge in a number of countries will be how to satisfy the basic needs of the population.

Figure 2.14 Ecological footprint versus global available bio-capacity per person (2003)



Source: Global Footprint Network, 2006.

At the same time the environmental pillar of sustainability also needs to be addressed. At least half the countries of the region have higher ecological footprints than the global available bio-capacity per capita, and rapid economic growth is likely to further increase ecological footprints in the future. For these countries, as in Western Europe, achieving sustainability will require an absolute decoupling of resource use and impacts related to energy consumption from economic growth.

While overall levels of consumption are lower than in Western Europe, energy intensity (i.e. energy consumption per unit GDP) is generally higher. In Russia, Belarus, Ukraine, Kazakhstan and Turkmenistan, energy intensities are very high (Figure 2.6). This is due in part to a greater dominance of industry in economic structure, in particular the resource extraction industry, but also to serious inefficiencies in industry as well as community and housing services, such as the provision of heat (See Chapters 4 and 6). There are major opportunities for decoupling in these countries through steady improvements in efficiencies. The on-going economic and social restructuring offers a unique opportunity to establish more resource-efficient and sustainable production patterns.

Moreover, there are many opportunities in EECCA and SEE to 'leapfrog' towards more sustainable consumption patterns before consumption-driven impacts reach the levels observed in Western Europe. There is already evidence of an increase in environmentally unsustainable consumption patterns, such as private car ownership, consumption of electronic consumer goods and highly processed and packaged food, and the increasing generation of household waste. These trends will spread to a greater proportion of the population as economic growth continues. SCP strategies applied now will safeguard against unsustainable patterns of consumption and production in the future.

National differences give varying priorities for future SCP action, and require the use of a range of SCP policy instruments. However, there are also many similarities in the problems faced by countries in EECCA and SEE, some of which are also shared by EU Member States. This creates opportunities for the exchange and transfer of experiences among EECCA and SEE and other countries. A large array of such opportunities are identified and presented in the following chapters.

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