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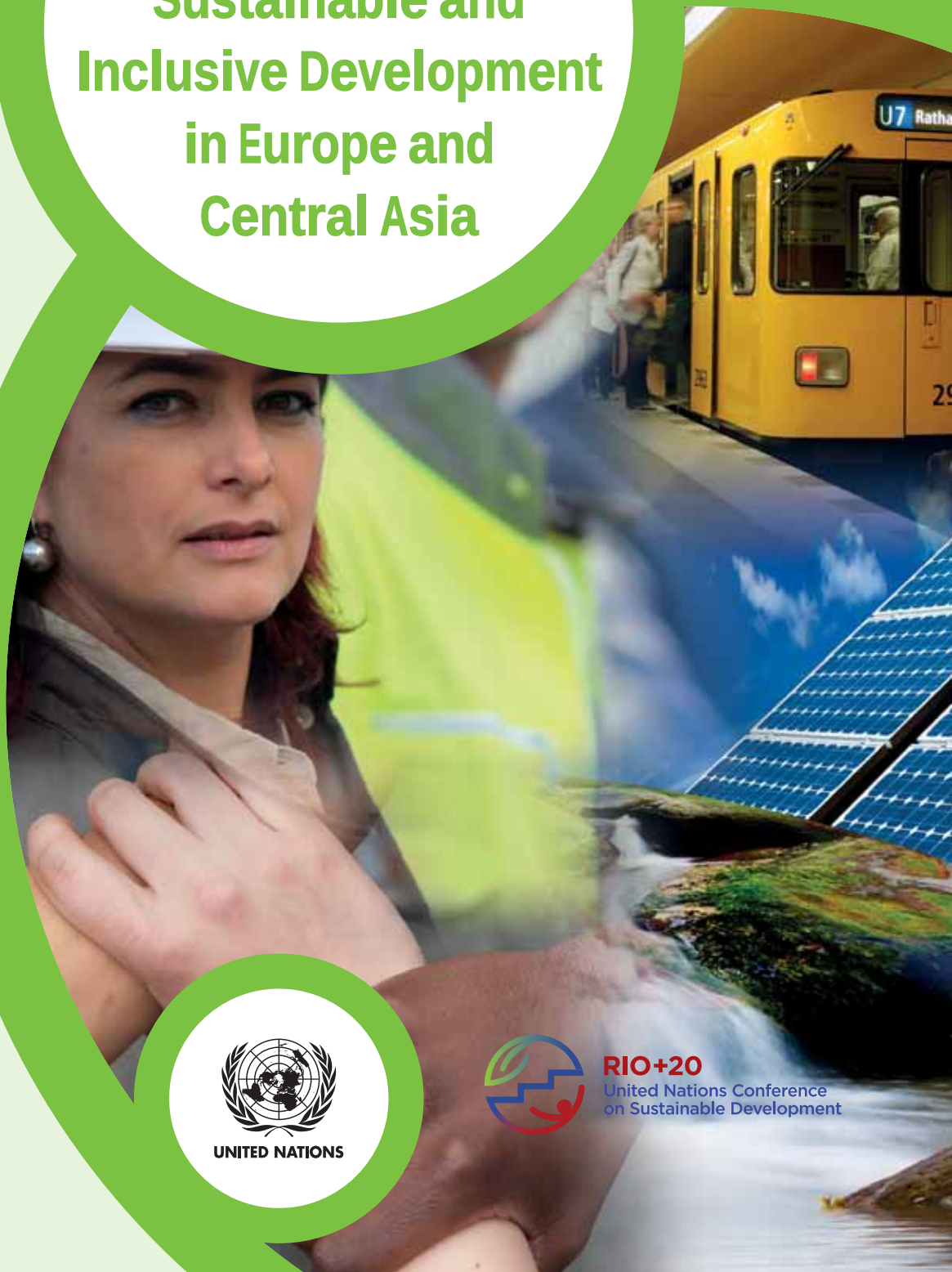
From Transition to Transformation
Sustainable and Inclusive Development in Europe and Central Asia

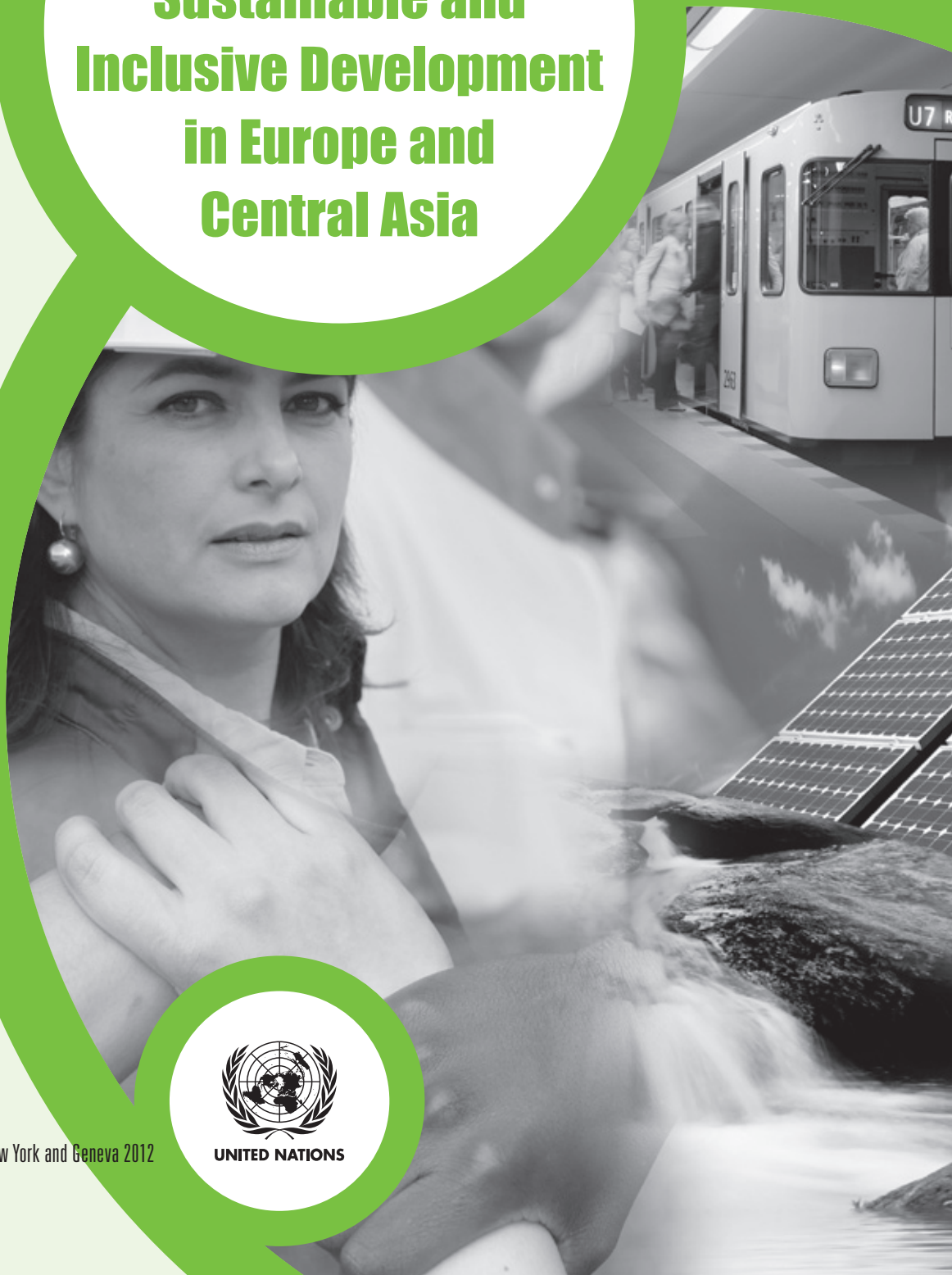


UNITED NATIONS

RIO+20
United Nations Conference
on Sustainable Development

From Transition to Transformation

Sustainable and Inclusive Development in Europe and Central Asia



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UNITED NATIONS

Jointly prepared by:

United Nations Economic Commission for Europe (ECE)

United Nations Development Programme (UNDP)

United Nations Environment Programme (UNEP)

United Nations Industrial Development Organization (UNIDO)

International Labour Organization (ILO)

World Health Organization (WHO)

Food and Agriculture Organization of the United Nations (FAO)

United Nations Entity for Gender Equality and the Empowerment of Women (UN Women)

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Foreword

From the 1972 Stockholm Conference on the Human Environment to the major landmark of the United Nations Conference on Environment and Development in 1992, and now on the eve of the Rio+20 Conference, the United Nations has consistently called attention to the urgent need for global environmental action. It has also been a driving force in raising awareness that such environmental action cannot be isolated from social and economic development. We know now that all the countries of the world need sustainable development — an awareness that has progressed faster than the real change towards this development path.

Moving in such a direction is more than a green transition: it is a sustainable and inclusive transformation which demands a rethinking of economic, environmental and social policies and the way they relate to each other. This is why the United Nations Economic Commission for Europe and the United Nations Development Programme, together with United Nations entities in the region, have joined their analytical and normative capacities to produce the present report.

The report is among the first attempts to take an integrated look at sustainable development in the pan-European region. It argues that a new growth model in this region is both necessary and possible — one which increases human development, advances equality and reduces the ecological footprint.

This highly diverse region warrants attention. It gathers together high-income economies of Western Europe, middle-income new European Union member States from Central Europe and lower middle-income countries of South-Eastern Europe, as well as the countries of Eastern Europe, the Caucasus and Central Asia, which themselves span a range from increasingly prosperous energy-exporting economies to landlocked developing countries. Furthermore, the Eastern part of the region has a very particular history, having undergone 20 years of fundamental socio-economic reforms, which provide the ground for further policy change.

Despite progress in energy efficiency and the use of renewables, the pan-European region, together with North America, still has the highest carbon emissions per capita in the world — over five times the limit which would stabilize global warming by 2050. Some countries of Eastern Europe, the Caucasus and Central Asia remain among the most carbon-intensive economies in the world. Fossil fuel subsidies are still high throughout the region, and artificially low prices of electricity and heat result in a wasteful use of energy in some transition economies. Moreover, despite ambitious commitments to reverse the loss of biodiversity, ecosystems are still under threat.

The record of the past decades is even weaker as regards poverty, which persists among vulnerable groups in many countries while social-protection systems have been eroded throughout the region. Inequalities have increased in all countries. In Eastern Europe the deterioration in income and access to social services was particularly marked during the 1990s and, while it may have improved with the overall high growth rates of the 2000s, it deteriorated again with the onset of the global economic crisis. Today, the number of people living in or on the edge of poverty remains very high. All too often it is the poor who are most affected by environmental degradation and pollution, which further aggravate their income and welfare situation.

Looking forward, policies designed to effect a green transformation will not automatically contribute to greater equity. On the contrary, inequities may even worsen. Some policies, such as the elimination of fossil fuel subsidies and the shift of production from brown to green sectors of activities can directly and disproportionately affect the poor. However, it is possible to design policies that lead to the mutual reinforcement of social equity, economic efficiency and environmental sustainability.

We are not starting from scratch. The report details actions that already produce co-benefits as part of the overall transformation: green investment can increase competiveness; sustainable transport means less air pollution and improved health; more energy-efficient technologies create savings; and a knowledge-based economy combined with active labour market policies can both increase income levels and reduce inequality.

The report thus contains a wide range of policy directions illustrated by national initiatives under way throughout the region. Fundamental steps are:

- Remove subsidies on fossil fuel to send the right signal to both businesses and households. The right pricing of energy, internalizing the environmental cost, will encourage the development of energy-efficient technologies, make renewable energy more attractive and encourage change in consumption behaviour. Regulations and voluntary norms are equally important, as they expand green products and markets.
- Establish a social protection floor to compensate for higher costs of energy for poor households, create an income safety net, retrain people whose jobs are displaced by the green transition and provide universal access to health services. Such a scheme can be made affordable by removing harmful subsidies, creating efficiency savings in public administration and restructuring the tax system.

- Engage in active employment and industrial policies to create green and decent jobs in the sectors where there is greatest opportunity in the region: renewables, recycling, energy-efficient housing and sustainable transport.
- Adopt a governance approach considering sustainability in all major decisions at the national and local levels, and demonstrate public leadership in the sustainable transformation by greening public sector procurement and enabling the private sector to make investments in sustainable development.
- Raise awareness about sustainable consumption and production among all actors in society: producers, consumers, political parties and scientific and cultural communities. Women are critical contributors to this effort because they control household consumption. Through education, youth must be engaged because of their future responsibility in addressing the sustainability challenge. Media, non-governmental organizations and civil society also have a critical role in creating constituencies to call for Governments to adopt sustainable development policies, to resist industrial lobbies in resource-intensive sectors, to fulfil their obligations with regard to the public's rights to information (as protected by the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters) and to comply with the other multilateral environmental agreements.

The more we postpone the transformation, the higher will be the cost. In the medium and long term, new lifestyles, production and consumption patterns will emerge by necessity. It is therefore wise to accelerate the transformation now by taking incremental policy measures or, for low-income countries, by by-passing outdated brown development altogether.

Rio+20 is an occasion for not only reaffirming all the past commitments, but also agreeing on a new path of transformation, combining national policy instruments with a set of international commitments to advance sustainable and inclusive development worldwide.

It is our hope and ambition that the present report will contribute to such an outcome and we, as the United Nations system in Europe and Central Asia, express our readiness and determination to support all our member countries as they move their sustainable transformation forward.

Ján Kubiš

Chair of the Regional Coordination Mechanism
for Europe and Central Asia

Kori Udovički

Chair of the U.N. Development Group for
Europe and Central Asia

Contents

Abbreviations

CBSS	Council of the Baltic Sea States
CIS	Commonwealth of Independent States
CRI	China Radio International
CSD	Commission on Social Determinants of Health
EBRD	European Bank for Reconstruction and Development
ECE	United Nations Economic Commission for Europe
EEA	European Environment Agency
EIA	United States Energy Information Administration
ESDN	European Sustainable Development Network
ETC/RWM	European Topic Centre on Resource and Waste Management
ETUC	European Trade Union Confederation
EC	European Commission
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign direct investment
FLEGT	Forest Law Enforcement, Governance and Trade
GDP	Gross domestic product
GFN	Global Footprint Network
GHG	Greenhouse gas
GPP	Green Public Procurement
HDI	Human Development Index
ICT	Information and communications technology
IISD	International Institute for Sustainable Development
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
ISIC	International Standard Industrial Classification of all Economic Activities
ISO	International Organization for Standardization
ISTAS	Union Institute of Work, Environment and Health of Spain
ITC	International Trade Centre
ITU	International Telecommunication Union
MDG	Millennium Development Goal
NGO	Non-governmental organization
NHS	National Health Service of the United Kingdom
NSSD	National Strategy for Sustainable Development
OECD	Organization for Economic Cooperation and Development

OSCE	Organization for Security and Cooperation in Europe
PES	Payments for ecosystem services
REN21	Renewable Energy Policy Network for the 21st Century
SCP	Sustainable consumption and production
SMEs	Small and medium enterprises
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UN-Women	United Nations Entity for Gender Equality and the Empowerment of Women
VPAs	Voluntary Partnership Agreements
WEF	World Economic Forum
WHO	World Health Organization
WHO/EURO	WHO Regional Office for Europe

Explanatory notes

In addition to footnotes, this publication uses a modified version of the author-date system of referencing. A source is cited by giving the last name of the author or editor and the year of publication in the text within parentheses. The full reference is included in an alphabetical list at the end of each chapter.

Web addresses cited in this publication were last accessed in November 2011.

Please note that, given limitations of space, three-letter International Organization for Standardization (ISO) country codes are used in lieu of country names in the tables and graphs in the present publication.

Subregions and country codes

South-Eastern Europe (SEE)

Albania (ALB)	Montenegro (MNE)
Bosnia and Herzegovina (BIH)	Serbia (SRB)
Croatia (HRV)	Turkey (TUR)
The former Yugoslav Republic of Macedonia (MKD)	

Eastern Europe, Caucasus and Central Asia (EECCA)

Armenia (ARM)	Republic of Moldova (MDA)
Azerbaijan (AZE)	Russian Federation (RUS)
Belarus (BLR)	Tajikistan (TJK)
Georgia (GEO)	Turkmenistan (TKM)
Kazakhstan (KAZ)	Ukraine (UKR)
Kyrgyzstan (KGZ)	Uzbekistan (UZB)

New European Union post-transition member States (NMS)

Bulgaria (BGR)	Lithuania (LTU)
Czech Republic (CZE)	Poland (POL)
Estonia (EST)	Romania (ROU)
Hungary (HUN)	Slovakia (SVK)
Latvia (LVA)	Slovenia (SVN)

Emerging Europe and Central Asia = EECCA + NMS + SEE

Advanced ECE Economies

Andorra (AND)	Liechtenstein (LIE)
Austria (AUT)	Luxembourg (LUX)
Belgium (BEL)	Malta (MLI)
Canada (CAN)	Monaco (MCO)
Cyprus (CYP)	Netherlands (NLD)
Denmark (DNK)	Norway (NOR)
Finland (FIN)	Portugal (PRT)
France (FRA)	San Marino (SMR)
Germany (DEU)	Spain (ESP)
Greece (GRC)	Sweden (SWE)
Iceland (ISL)	Switzerland (CHE)
Ireland (IRL)	United Kingdom of Great Britain and Northern Ireland (GRB)
Israel (ISR)	United States of America (USA)
Italy (ITA)	

Pan-European region = Emerging Europe and Central Asia + Western Europe

Introduction

The 2012 United Nations Conference on Sustainable Development (Rio+20 Conference) provides the pan-European region with the opportunity to assess its progress towards sustainable development and plan for the actions needed in order to place this part of the world more firmly on a sustainable development path. While many countries in this region are taking action towards environmental, social and economic sustainability, these efforts are not yet sufficient to significantly accelerate the pace towards a development model with a strong sustainability dimension. Therefore, this report aims to present the challenges linked to sustainable development in the pan-European region and to make concrete policy proposals for managing the green transition to ensure the greatest benefit for the people of the region.

Consideration for the human dimension is at the core of the development paradigm advocated in the report. Such an integrated approach has been made possible due to the wide range of expertise and experience of United Nations entities active in the region. It is also a demonstration of the United Nations commitment to work with countries on policies and strategies to advance green economies and sustainable development in Europe and Central Asia.

Three concepts underpin this report:

Resource depletion and environmental degradation. While there is some good news in terms of energy efficiency in fossil fuel consumption and use of renewable energy, the region is still one of the most energy intensive regions in the world. Similarly, progress has been made in preserving natural resources, with an overall increase in forest areas and the establishment of protected areas, but ecosystem services and biodiversity continue to be depleted and degraded, and the value of natural capital is not recognized yet in national accounting systems.

Poverty. This report emphasizes the synergies between the goals of poverty eradication and sustainable development. In the long run, transformation to inclusive and sustainable development will reduce the vulnerability of the poor to environmental degradation and create the necessary basis for their development. However, during the transition specific prevention and protection measures are necessary to compensate the adjustment costs which will likely affect poor households and other vulnerable groups. Structurally, a social protection floor is a critical investment. In order to finance these social mechanisms, the fiscal space needs to be expanded; on the revenue side through the removal of subsidies and increasing taxes on fossil fuel, cap-and-trade quota allocations and better capital taxation, and on the expenditure side through public savings from administration reforms and better targeting of social protection measures.

Inequality. During the past two decades, inequality has increased rapidly in both the Eastern and Western parts of the ECE region. This trend has aggravated living conditions in some areas due to lack of employment, inadequate housing, education, health and social services, and the degradation of natural resources — in particular soil and water. In order to reduce social and geographical inequalities, the report reviews the policies aimed at ensuring a just transition, in particular by generating green and decent jobs and providing equal access to health services.

Chapter I.

Overview

A. The United Nations calls for a sustainable development paradigm

Since the 1992 United Nations Conference on Environment and Development in Rio de Janeiro (Earth Summit), the world has seen progress in economic growth. But this progress has come at the expense of natural resources, social equity and, for parts of society, human welfare. Many countries' economic growth brought with it widening income gaps between the rich and the poor, deteriorating social cohesion and increased rates of disease. As a result of this growth path, the world is facing concurrent crises cutting across the environmental, economic and social spheres: global warming, depletion or degradation of natural capital, persistent high levels of pollution, high unemployment, pervasive poverty, inequality and social exclusion. These crises are clearly interrelated: when the natural resource base is destroyed, ensuring economic development and social equity becomes ever more difficult.

Rather than working at the margins, this diagnosis calls for completely revisiting the conventional model of economic progress. As the United Nations Secretary-General states: "We all aspire to reach better living conditions. Yet, this will not be possible by following the current growth model… We need a practical twenty-first century development model that connects the dots between the key issues of our time: poverty reduction; job generation; inequality; climate change; environmental stress; water, energy and food security."

What is needed is a dramatic shift from the growth model of the past, whereby industrial revolution fuelled rapid growth that hinged on the exploitation of natural resources and generated large but unequally distributed wealth. This model has led to unsustainable patterns of consumption and production. It is time for a profound questioning of the prevailing economic approach to development, not only for the planet, but more importantly for the sake of its women and men, especially the most marginalized and vulnerable.

What is Sustainable Development? Meeting the needs of the *present* generation without compromising the ability of *future* generations to meet their needs. It involves three interdependent and mutually reinforcing pillars — the economic, social and environmental pillars of sustainability. The three pillars cannot work if they are seen as competing agendas. A sustainable development paradigm changes how investments and public policies are made: take, for example, energy policy which has implications not only for industry and the environment, but also for public health and equity, in terms of access to energy and employment.

In the medium and long term, this kind of transformation will imply a radical change in how economies produce goods and services, how growth is constructed and how we lead our lives. Looking forward, behaviour of both producers and consumers will evolve, both by necessity (depletion of natural resources, increased extreme weather events and high levels of pollution) and under the impulse of policies stimulating the move towards sustainable production and consumption patterns. While change is imminent, we need to move beyond the perception that sustainable development will decrease our quality of life. It has already been proven that one can have a high quality of life without, for instance, high carbon emissions: while Costa Rica has a high life expectancy with carbon emissions levels below the world average, Croatia is also noteworthy for its relatively high life expectancy while emissions are hovering just above the world average (Wilkinson and Pickett, 2009).

This report holds that some forms of environmental degradation are irreversible, and therefore espouses a "strong sustainability model". In this vein, a core operational objective of the green economy is to place a higher value on natural capital. It implies an ever more flexible and dynamic economy, a strong shift of the production structure towards less carbon-intensive activities and a sound management of biodiversity and ecosystem services. According to a study conducted by the Global Footprint Network in 2011, demand for ecological assets is growing unabated as global population grows, consumption rises and the size of the global economy increases. As citizens of the world, we are in overdraft — living off of borrowed resources that we do not have.

The good news is that sustainability can drive economic competitiveness. In the future, the demand for brown products will decrease as production processes making extensive use of dwindling resources become increasingly costly. Some countries, such as Germany, have started to position their economic development strategies for the eventual greener market. The sooner countries take a position on sustainability consistent with global constraints, the better placed they will be to harness an eventual shift in market incentives.

The development of greener markets must also decisively benefit the poor whose livelihoods depend far more on natural capital assets than richer households. If the green economy is approached with the right policy framework, it can reduce inequalities. A more inclusive society is more likely to be sustainable: first because better access to quality education, health services, housing and clean water means that the poor and vulnerable people are better equipped to contribute to economic growth, care for their children and embrace the new low-carbon approach to production and consumption. Secondly, greater equity and better chances of social mobility help reduce social bads, such as criminality, mental illness and drug abuse, which in turn also fosters productivity and sustainable development.

For this complex web of changes to take hold, the incentives that underpin and influence the behaviour of women, men and all economic actors must change. This starts at the individual and household level. Responsible for buying 80% of household goods, women are critical for advancing a shift to sustainable consumption.[1] Public authorities have a decisive responsibility to advance a change in incentives; resistance to pressure from lobbies — particularly the energy-intensive industrial sectors — is key to enforcing the policies necessary to shift towards sustainable development. The private sector must also be a driving force of change through sustainable business models, technology innovation, greener products and services. Civil society organizations also have a key role in mobilizing public opinion and advocate for a more environmentally sound, inclusive and just society, which is the ultimate goal of the new sustainability paradigm.

Box 1.1 Sustainable development: incremental change as part of transformation

This report argues that changes at the margins will not yield the necessary turnaround to avoid growth and demographic patterns that outpace the Earth's available resources. While a paradigm shift is needed, not all countries, economies, economic sectors and localities are immediately ready for a full paradigm shift. Incremental changes that can lead to positive results include:

Sustainable energy access for all: A particular sustainability challenge will be ensuring stable, secure, safe and affordable energy access and availability in low-income countries as well as remote areas of middle-income countries of the ECE region. Well-targeted subsidies for the poor will be needed to ensure access to energy to support human development in remote areas.

Green economy transition: In a green economy, increasing income and employment should be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency and prevent the loss of biodiversity and ecosystem services. A green economy is not a luxury for wealthy countries. There are growing examples of green transitions in developing countries. One quick productivity win for Europe and Central Asia is to upgrade production with state-of-the-art technology to make current industry and residential housing more energy efficient. A social protection floor is needed to help vulnerable groups cope with changes in labour markets and prices, while building and updating skills.

Sustainable development paradigm: This transformation is akin to a revamped industrial revolution, one that seeks a better use of natural resources for a more equal and healthy society. Economically, this means changing the composition of an economy towards an increasing range of green and resource-efficient sectors. For every economic policy or investment, decision makers must ask themselves: on balance, is this negatively affecting our people or depleting our natural resources? This transformation does not necessarily imply increased Government deficits: elimination of harmful subsidies, fossil fuel tax revenues and budgetary incentives can provide funds for promoting a business-friendly environment. Governments will also see reduced costs by preventing respiratory and cardiovascular disease owing to healthier environments.

[1] http://www.unpac.ca/economy/consumers.html.

Box 1.2 Strong or Weak? Two visions of sustainability

Weak sustainability: Proponents of weak sustainability believe that technology can be a substitute for the loss of natural capital. As a natural resource becomes scarcer, its rising relative price encourages innovators and owners of assets that can be substituted for the diminished scarce resource.

Strong sustainability: Advocates of strong sustainability believe that the accumulation of physical or other kinds of capital cannot compensate for the warming of the Earth, the depletion of the ozone layer and major biodiversity losses. Societies should strive to sustain the flow of services from natural capital because natural materials and services cannot be duplicated.

Source: ***UNDP (2011)***

B. Europe and Central Asia and sustainable development

The diverse ECE region demonstrates how the current model of economic growth needs to be transformed in order to achieve the goal of social equity and sustainable use of natural resources.

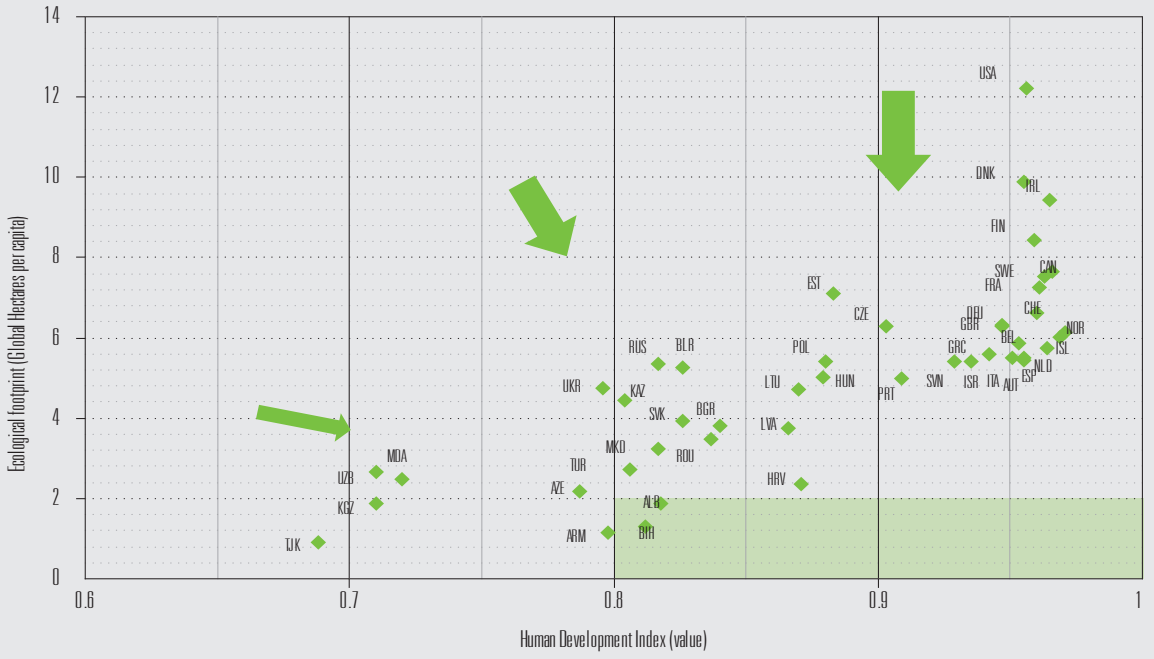
However, there is no mandatory one-size-fits-all action to be taken on sustainable development, regardless of a country's economic growth.

Highly diverse, the pan-European region includes high-income economies of Western Europe; middle-income countries from Central Europe which have joined the European Union (EU); lower middle-income countries of South-Eastern Europe, many of which are undergoing an integration process to the EU; and countries from Eastern Europe, the Caucasus and Central Asia, some of them emerging and energy-exporting economies, while others are low-income countries which share many of the same challenges as landlocked developing countries.

For the higher-income countries in the pan-European region, the green transformation challenge will be to maintain their high levels of human development with much smaller ecological footprints.[2] For the energy exporting countries, the challenge will be to reduce the use of fossil fuel energy while consolidating human development. For the lower-income countries the challenge will be to maintain their low ecological footprints while accelerating sustainable growth and human development. The following graph illustrates this point.

[2] Ecological footprint provides a measure of the human demand on natural resources or assets — biocapacity (GFN, 2011).

Figure 1.1 Towards sustainable development in the ECE region



Source: ***UNECE, based on national footprint accounts of the Global Footprint Network and HDI values provided by UNDP***

The Eastern part of the ECE region brings a unique perspective to the global debate. Several features stand out:

- **The region's transition experience — like many major shifts in recent economic history — has been associated with rapidly increasing inequality.** No other region in the world has seen such a rapid surge in income inequality as the transition economies of the region have experienced in the past two decades. With the global shift toward climate change mitigation and adaptation shaping up as a similarly fundamental change, there is a need for policies to ensure that it does not exacerbate inequality further from today's already very high levels.

- **Emerging Europe and Central Asia has been the only part of the world that has seen a large absolute decline in carbon emissions in the past two decades.** The European Bank for Reconstruction and Development's special report on climate change highlights the 28% fall in carbon emissions in this region even as gross domestic product (GDP) rose by 22% during the period 1990–2008. The extremely wasteful starting position has certainly been a factor explaining this. But the predominant role was played by the huge shift in energy prices and relative prices, coupled with a sharp reduction in non-price energy subsidies. These have provided economic incentives to change the structure of economic activity and invest in more energy-efficient production. That said, the region still includes several countries with a comparatively high energy intensity of output, notably Uzbekistan, Turkmenistan and Kazakhstan. Given the continued predominant role of fossil fuels, this translates directly into very high carbon intensity of output.[3] (See annex tables 1 and 2.)

[3] Climate change is about more than carbon dioxide. A full analysis would need to cover all human-related net greenhouse gas emissions (chlorofluorocarbons, methane, nitrogen oxides, perfluoronated carbon compounds, ozone, burning of rainforests, etc.), plus those from non-anthropogenic sources, as well as connections among them and the feedback loops.

- **Sustainability issues are already at the forefront in Central Asian countries.** The devastation of the Aral Sea is a visual reminder of the consequences of unsustainable practices. Discussions about United Nations-regulated, safe, transboundary transit of energy supplies and problems in water supply and agriculture have highlighted binding constraints. This region is thus a "laboratory" where the main elements necessary for real-life solutions could emerge as an integral part of a regional green economic vision.
- **Finally, Eastern Europe can provide a good return on green investments:** The region's relatively skilled labour force can be absorbed by a dynamic green economy, supported by an increasingly vibrant private sector to multiply the level and impact of green investment. There is thus a solid potential in this region to create decent jobs in green or newly greened activities, such as renewable energy, waste recycling or energy-efficiency retrofits. Green market products could be a source of wealth creation which, combined with anti-poverty measures, would result in improved quality of life for many people in underdeveloped areas and among vulnerable groups. If targeted well, the green economy could also mitigate the gender gap in employment and create opportunities for greater gender equity in this part of the region.

For the pan-European region, catalysing a transformation towards sustainable development would have many clear-cut benefits: a reduction of the ecological footprint, more resilient ecosystems and ecosystem services, increased natural capital, carbon materials and eco-efficiency and new areas for growth and innovation. In a sustainable development paradigm, the pan-European region would be healthier due to reduced non-communicable and communicable diseases, lower pollution and noise, improved diet and physical activity. Sustainable lifestyles would allow for many new goods and services to be produced, consumed and traded among countries of the region. Finally, moving towards sustainable development would enhance the livability of the region, by retrofitting and building greener cities and through environmentally friendly transport and improved waste and water management.

C. Situation of the region

The pan-European region has seen huge progress both in social and economic development, reflected by the increase in its position on the Human Development Index. Since 1999, nearly 90 million of the 480 million people in Emerging Europe and Central Asia — about 18% of the population — have moved out of poverty. Yet poverty is not yet a relic of the past: almost 30% of the people living in the region are considered poor or vulnerable, and this is expected to increase by about 5 million people for every 1% decline in GDP (World Bank, 2009). The recent financial crisis has set the region back considerably. Even in the EU countries poverty has been on the rise again in recent years. Attention needs to be paid to the risk of further impoverishment resulting from unemployment, increased food prices, health expenditure and energy costs which affect in particular the low-income households in Eastern Europe and Central Asia. Women have been particularly hard hit by the crisis — not only because of increased unemployment and declining incomes, but also because of an increasing burden of unpaid work.

The region has also taken important steps to reduce environmental degradation with impressive results: improved urban air quality; the phase-out of ozone-depleting substances; a larger use of renewable sources of energy; improved water management; and increased coverage of protected areas. Most Governments of the region are signatories or parties to the major global and regional environmental and climate change conventions and protocols. Overall, tangible progress has been made in reaching the Millennium Development Goal (MDG) 7 targets,[4] particularly in integrating the sustainable development dimension into policymaking in key sectors such as agriculture, transport and housing, reducing carbon dioxide (CO_2) emissions, increasing energy efficiency and strengthening the sustainable management of forests.

[4] MDG 7 is to ensure environmental sustainability. For the targets on this Goal, as well as other information on the MDGs, see http://www.undp.org/mdg/goal7.shtml.

However, Europe and Central Asia are still far from achieving sustainability. Growth in income has been associated with deterioration in key environmental indicators, so much so that the pan-European region has the highest ecological footprint [5] compared with the rest of the world. Indeed, most countries in the region are running on a biocapacity deficit, [6] i.e., they use more resources than they have in their territories.

Depletion of natural resources is not only disastrous for the environment, it is a problem for the women and men of the pan-European region. It is often the poorest of the poor who are affected by environmental degradation, as they are heavily dependent on natural resources (almost three quarters of their income) and thus more vulnerable to environmental shocks. Particularly in Eastern Europe, many families depend on non-network energy such as solid fossil fuels for heating and cooking. This has drastic human consequences: in 2004, more than 14,000 people lost their lives due to reliance on these kinds of dangerous heating and cooking sources (WHO/EURO, 2010).

Greenhouse gas emission trends

The pan-European region has historically been a large emitter of greenhouse gases (GHGs) that contribute to global warming — it currently accounts for around half of global GHG emissions. According to the European Environment Agency (2010), annual emissions of GHG in the European Union in 2008 — the year of the latest available data — amounted to roughly 10 tons of CO_2-equivalent per capita, well above the sustainable per capita target of 2 tons that would limit a rise in global temperatures to 2° C by 2050 (see King et al, 2011).

Despite progress, a number of countries in Eastern Europe, the Caucasus and Central Asia remain among the least energy-efficient and most carbon-intensive economies in the world. Triggered by industrial restructuring, significant energy-efficiency improvements have taken hold in the formerly centrally planned, and resource-intensive, economies of the Soviet Union. Energy intensity of production declined on average by 40% between 1990 and 2007 in the transition economies and by more than 60% in the NMS. While initial improvements were due to the transition recession, in the second half of the 1990s, "decoupling" started to occur whereby output levels increased while the energy use continued to decline. Since the early 2000s, energy use has grown at a slower pace than production, but this energy-saving tendency has been overwhelmed by robust output growth.

Most of the economies in the region have achieved sizeable reductions in energy intensity and GHG emissions per $1 of GDP. The energy intensity of GDP in Western Europe is approximately a third lower than in North America and less than half than in the Eastern part of the pan-European region (see annex table 1). There is considerable potential for reducing emissions in Eastern Europe and Central Asia by increasing their efficiency to the levels of Western Europe. The challenge is to deliver the mix of appropriate policy instruments, technological innovation and financing which can lead to such significant energy-efficiency gains. This policy mix is described in chapter 2 of this report.

Despite the failure to reach an agreement at the fifteenth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in Copenhagen in December 2009, most of the economies of the pan-European region are making commitments to further reduce their GHG emissions and many have implemented programmes and regulations to achieve these objectives. For example, the EU has committed to a 20% reduction in GHG emissions from 1990 levels by 2020. However, the pledges made at Copenhagen and other proposed national policies, even if fully implemented, are not enough. These policies may stabilize GHG emissions by 2020, but world emissions must decline by at least 50% in order to limit global temperature increases to a manageable level (i.e., about 2° C). None of the economies of the region have put forth a national agenda that will be sufficient to reduce emissions to a level that is sustainable over the long run. In order to achieve the necessary large reductions in GHG emissions, a major restructuring is needed in many sectors of activities, including energy-intensive industries, agriculture, energy production, transportation, housing/building design and urban planning. In order to offset potential job loss and support sectors directly affected by climate change, Governments of the region will need to put in place incentives for green enterprise and establish social protection and retraining schemes for women and men currently employed in carbon-intensive or environmentally hazardous sectors.

[5] Essentially an attempt to quantify and produce a measure of human demand on biocapacity.

[6] These deficits are made possible by liquidation of ecological assets, net importing biocapacity, or using global commons.

Biodiversity trends

Natural capital, including biodiversity and ecosystem services, is an important economic asset, especially for the livelihoods and security of poor people. In spite of the introduction of biodiversity legislation and nature directives across the region, biodiversity is being lost at an unparalleled pace. The capacity of ecosystems to sustain the delivery of goods and services is being undermined. Further land-cover conversion and intensification of land use may negatively affect the region's biodiversity, directly through resource depletion and natural habitat destruction or fragmentation, and indirectly through pollution (for example eutrophication and acidification).

One quarter of the world's forests are situated in the pan-European region, of which approximately four fifths are in the Russian Federation. In the Caucasus and Central Asia, forest area has been expanding mainly due to major afforestation and reforestation programmes; however, forest cover remains low in most of these countries and must compete with other land uses. The overall area of protected forests is now about 40 million hectares, 17.5 million of which are in the Russian Federation. Forests provide watershed services such as storage, purification and release of water to surface water bodies and subsurface aquifers, while they also contribute to the slowing down of erosion and desertification phenomena. The regions' forest ecosystems are key to sustainable development, contributing to climate-change mitigation through carbon storage in trees, litter and soil and harvested wood products, and providing a renewable construction material and source of energy. While overall forest area is increasing in the region, forest fragmentation is also increasing and is having a detrimental effect on important European habitats.

The region's diverse marine and coastal ecosystems, ranging from the Mediterranean to Arctic habitats, are also under threat, due in large part to overexploitation of fisheries. About 45% of assessed European fish stocks are endangered as a result of unsustainable fishing. At the same time, the impact of climate change has become more obvious in recent years. In the Arctic seas, the impact of climate instability on biodiversity is under way already and much larger impacts are expected (with significant regional variation) over this century. There are places in the Arctic that are warming 5 to 10 times faster than the rest of the planet.

The temperate mountainous grasslands are valuable ecosystems in the agricultural landscapes of the Balkan and Carpathian countries. They are the result of many centuries of stable agricultural management, using the grasslands for grazing animals (pastures) or making hay (meadows) or combinations of both uses. As a result of this sound management over the long term, the ecosystems in these areas are well developed, rich in species and characteristic of their biogeographical region. In some areas of Europe, land abandonment as a result of policy and economic changes can threaten natural habitats and agricultural biodiversity. For example, while the decline of agriculture in countries of the Caucasus and Central Asia has reduced the degradation pressure on the foothills of their mountains, land abandonment through withdrawal of extensive agricultural activities such as traditional livestock grazing has altered the biodiversity composition of these areas and the landscape.

Areas of high nature value farmland have been identified across Europe and there are concerns that, without appropriate incentives for the farmers, these areas with high biodiversity may be lost. Agri-environment measures and other incentive mechanisms under the EU Common Agricultural Policy, the Canadian Agricultural Policy Framework and the United States of America's Natural Resources Conservation Service Programs provide incentives to promote conservation of biodiversity and sustainable farming practices, but these are rare in Eastern Europe and Central Asia.

Reversing the loss of biodiversity has been an explicit part of the MDG agenda since 2006, when the countries of the pan-European region agreed "to halt the loss of biodiversity by 2010". Despite this ambitious goal, the 2010 biodiversity target was not reached. Depending on the issues and the subregion, progress so far shows mixed results. Natural habitats, for example, are increasingly protected in the EU through the Natura 2000 framework (as much as 17% of the land area). Yet 40%–85% of habitats and 40%–70% of species of European interest have an unfavourable conservation status. New targets and a 2020 vision on biodiversity have been agreed globally by the Parties to the Convention on Biological Diversity in 2010, and these are being integrated in national and EU policy in the region.

Water management trends

The sustainable management of water resources is an important part of sustainable development: it can promote water efficiency and channel water resources where they create most value, as well as reduce the spread of disease. Improvements in water management can also contribute to climate-change mitigation (less energy is used to pump water, treat it and treat effluents), and adaptation (as competing demands for water are reduced). Further, wastewater can also be a source of energy (through heat and sludge).

In most parts of Europe water quality has improved over the past 20 years, due to better regulations, enforcement and investments in wastewater treatment plants, mainly in Western Europe, including in the NMS. Throughout the region production has become cleaner, resulting in a decrease of pollution from industrial facilities. However, there are numerous remaining pressures from agriculture, untreated or insufficiently treated industrial and domestic wastewater, mining, old chemical burdens, unsafe landfills and unsafe tailing ponds, and further environmental pressures on water are expected due to increased economic activity, especially in the Eastern part of the region. And, while river hydromorphology and continuity have improved in many European basins through the reconnection of wetlands and flood-plains, hydromorphological alterations are still a major challenge. The EU Water Framework Directive (European Commission, 2000) has helped improve water use and efficiency, which has been uneven across sectors and subregions. In the agricultural sector, some progress has been achieved in alternative technologies (e.g., drip irrigation), crops and farming practices which have resulted in reduced water losses, "more crop per drop" and reduced run-offs. National economic instruments (e.g., water pricing, pollution charges) have contributed to this process, together with education and awareness-raising activities.

Outside the EU, various factors impede progress, including inadequate regulatory and incentive frameworks (low tariffs and insufficient collection of payments for water services), low awareness across a wide range of stakeholders and lack of financial resources to extend or maintain the infrastructure. Coherent financial and investment policies to address water supply and sanitation are often lacking, as are resources to sustain infrastructure at the local level and maintain existing centralized systems. In many countries, more than 30% of water is lost in transfers from supply sources to consumers, such as in open water canals. Special problems relate to the quality and affordability of water services for parts of the population. An increasing number of persons are not able to afford the price of water at full cost recovery, especially if costs charged include collection and treatment of wastewater. Social measures often are ineffective and poorly targeted.

Water quality in most of the region has improved over the past 20 years, due to better regulations, enforcement and investments in wastewater treatment plants, though these improvements are seen mainly in Western Europe, including the NMS. Still, 4 million people living in urban areas and 15 million people in rural areas still use unimproved water sources, and some 35 million women, men and children have substandard sanitation facilities, increasing their vulnerability to water-related diseases. Although infant mortality and morbidity from water-related diseases have been on the decline, significant subregional inequalities remain. Approximately 13,000 deaths in this region occur each year due to diarrhoeal disease from unsafe drinking water (ECE, 2010). This is primarily a problem in the low-income economies in Central Asia.

Approximately a third of the region's population live in countries suffering from water stress. This percentage is expected to rise significantly due to climate change and other pressures on water resources. Such stress is particularly apparent with respect to freshwater resources in arid or semi-arid areas. One of the most important hot spots for environmental stress is Central Asia (Siegfried et al, 2010).

D. Risks for the region of not accelerating the pace towards sustainable development

Failure to take sufficient action will not only affect the environmental situation of the region, it can reduce human development as a whole. The United Nations Development Programme (UNDP) Human Development Report 2011 projects that by 2050 the global Human Development Index (HDI) would be 8% lower than in the baseline in an "environmental challenge" scenario that captures the adverse effects of global warming on agricultural production, on access to clean water and improved sanitation and on pollution. In an even more adverse "environmental disaster" scenario, which envisions vast deforestation and land degradation, dramatic declines in biodiversity and accelerated extreme weather events, the global HDI would be some 15% below the projected baseline.

Box 1.3 Food insecurity and malnutrition remain a threat despite the region's economic progress

Several consecutive years of poor harvests and the rising cost of food have weakened the buying power of families in Central Asia and the Caucasus. This makes it likely that this part of the region will not reach the MDG target to reduce malnutrition by 2015. Even in some EU countries, nutrition may be at risk: in the last 12 months alone, the use of public food banks by people increased by 20%.

Source: ***World Health Organization.***

The risks of delaying the transition towards sustainable development are considerable, given the irreversible nature of biodiversity loss, global warming and the increasing frequency of extreme weather events and other harmful effects of climate change. The ecosystem services that make a direct contribution to human well-being — such as provision of freshwater, pollination and the regulation of meso-climates — are being degraded in most parts of the region. These services are economically invisible, with their contributions neither fully recognized nor valued in markets. Changes in the availability and quality of ecosystem services reduce resources for the poor and vulnerable, while also threatening ecological infrastructure that can protect the most vulnerable from natural disasters. Natural flood defences once provided by forests and wetlands have been lost and this is a direct threat to the region's poorest women and men. Unlike the rich, the poor are unable to replace these services with flood-control infrastructure.

Floods and heat waves increase the likelihood of water-related diseases and other damaging impacts to human health. The impacts of climate change, increasing the frequency of floods and droughts and giving rise to heat and cold waves, affect large areas of the entire region and can undermine economic growth and human development. Water scarcity is increasing and has a direct impact on large populations and many sectors of activities, particularly agriculture. Furthermore, the availability of cooling water is a particular concern for thermal and nuclear power plants, as plant cooling accounts for about a third of European water abstraction. Extreme weather events in the region in recent years have resulted in lower production and higher prices of food, as well as serious damage to transport infrastructure, all of which affects poor households most. The increasing frequency and unpredictability of such events thus pose considerable risks to economic activity in key sectors that are most exposed to climate change, notably agriculture and transport. Moreover, temperatures and more arid climatic conditions could further aggravate problems of desertification, land degradation and falling crop yields already experienced by parts of the region.

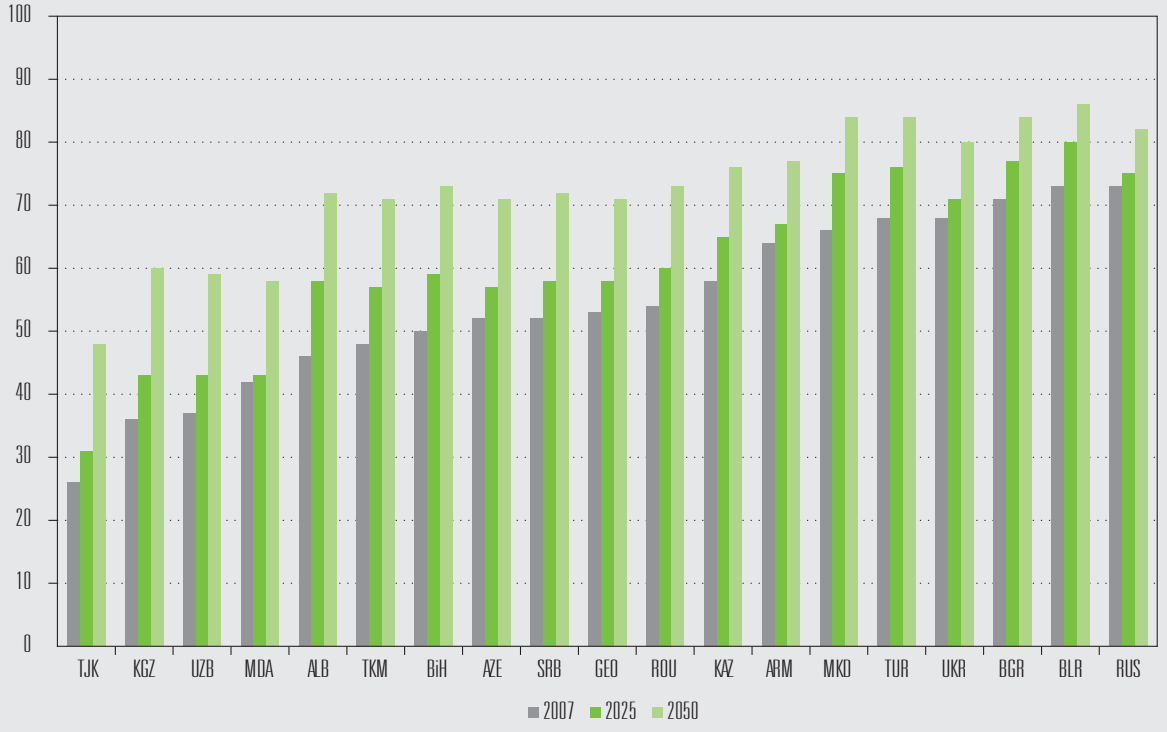
Changes in the sea level will affect the region's four basins (the Baltic Sea, the East Adriatic and Mediterranean coast of Turkey, the Black Sea and the Caspian Sea) and the Russian Arctic Ocean. By 2100, the Arctic is expected to warm by 3° C–5° C over land and 7° C over the oceans, contributing to dramatic changes in its ecosystems. Predicted impacts include a more than 50% decline in the extent of summer sea ice and the displacement of existing Arctic species and ecosystems

(e.g., polar deserts and tundra) as southern species and ecosystems expand northward and all species distributions shift with unforeseen consequences. The other imminent threats to Arctic biodiversity stem from alien species and the impact of hydrocarbon and hazardous material pollution. Along the Adriatic and the Mediterranean, storm surge and saltwater intrusion into aquifers threaten parts of South-Eastern European coasts. Sea-level rise has been highest in the Black Sea, where it is threatening numerous ports and towns along the Russian, Ukrainian, and Georgian coasts. In the Caspian Sea, water levels are projected to drop by approximately six metres by the end of the twenty-first century, due to increased surface evaporation. This will imperil fish stocks and affect coastal infrastructure. Coastal landfills around the Black Sea, notably in Georgia, have been identified as pollution hot spots, and coastal erosion could increase the amount of pollutants flushed into the sea, threatening a fishing industry already struggling with the consequences of overfishing and excessive pollution.

Migration

In transition economies, the adverse impact of climate change on agriculture could cause farmers and their families to experience poverty. Decreased opportunities in rural areas would increase migration flows, both within and between countries. Rural-to-urban migration has been steadily growing in recent years. Urbanization caused by internal migration is already on rise in the region (see figure 1.2) and is likely to continue in coming decades. Climate change's potential impact is especially acute for Central Asian countries, where agriculture is an important sector of the economy, and where the proportion of the young population in need of jobs in relatively high.

Figure 1.2 Growing urban populations



Source: ***United Nations Population Division database.***

Natural disasters

The frequency and costs of natural disasters have risen dramatically in the region over the past two decades. During this period, there has also been a marked increase in drought conditions, even in the subregions experiencing increased mean annual precipitation. Over the past 30 years, natural disasters have cost the countries of Emerging Europe and Central Asia about $70 billion in economic losses. Most of the damage has occurred in Armenia, Romania, Poland, the Russian Federation and Turkey. Meanwhile, climate-change scenarios project even more frequent weather extremes, including increased flooding, heat waves and drought, which will cause even greater losses and may displace people from their homes.

In 2010, the most deadly year in two decades, this region saw the second highest number of natural disaster-related deaths in the world, with the heat wave in the Russian Federation accounting for nearly one fifth (56,000) of 2010's total fatalities. Other extreme climate events in Europe included Storm Xynthia in February 2010, floods in France in June 2010, and the extreme winter conditions all over Europe in December of the same year.

As the climate is changing, special efforts will have to be made with respect to adaptation measures in water use, agriculture and climate-proofing in large investments. Modernized disaster risk reduction strategies are needed to protect the population against heightened volatility and extreme events in the weather and to ensure that vulnerable groups can recover as fast as possible.

Box 1.4 Supporting disaster risk reduction among vulnerable communities and institutions in South Caucasus and Central Asia

The Governments of Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan have started implementing disaster risk reduction and disaster preparedness activities at schools with the following result areas.

- Disaster and education policy addresses needs and concerns of children, thereby contributing to a culture of safety.
- Strengthen capacities of local and national authorities and children's services in implementing disaster preparedness and risk reduction.
- Good practices identified, compiled and disseminated to all disaster risk reduction stakeholders in the subregion and public awareness-raising campaigns organized.
- Education policies and strategies incorporate elements of disaster preparedness and risk reduction, thereby contributing to a culture of safety.
- Improved ability of schools and preschools to undertake disaster preparedness and risk reduction.

E. Main policy messages

The main policy messages contained in the subsequent chapters of the report are outlined below.

Cross-sectoral policies (chapter II)

1. **Sustainable development that reconciles economic growth with equity and the natural environment remains an elusive goal for policymakers in all countries of the region.** A number of ECE member States have achieved high levels of human development at the expense of environmental sustainability, while others have maintained light ecological footprints with persistent poverty. Given the multidimensional task at hand, a balanced policy mix is needed for a successful transition to an equitable society with a high standard of human development and environmental sustainability.

2. **Neither Governments nor markets alone can achieve sustainable development.** The best course of action is to discontinue environmentally harmful policies and correct market outcomes that are environmentally unsustainable or socially unacceptable. Forward-looking policies should address specific sustainability issues by combining economic instruments with laws and regulations. The challenge is to find the right policy mix for each country.

3. **The elimination of environmentally harmful subsidies, excise taxes and other forms of carbon pricing would correct misleading market signals and reduce the wasteful use of energy and GHG emissions.** Adverse impacts of such pricing and tax reforms on poor households through higher energy, housing and public transportation prices should be offset by the establishment of a social protection floor. The latter would be financed by the savings associated with cuts of harmful subsidies and the extra revenue generated by environmental taxes and charges. Increasing the fiscal space would thus generate a social space reaching the double objective of mitigating the adverse impact of the financial crisis and absorbing the social cost of the transition towards a strong sustainable development model.

4. **Major behavioural changes are essential for effectively transforming production and consumption patterns.** Awareness-raising, combined with different forms of incentives, plays a decisive role in this process and must address all actors in society: producers, consumers, political parties, scientific and cultural communities, the media and the public at large. Such changes in behaviour call for a mix of general sensitization campaigns and well-targeted information and education programmes. In particular, education for sustainable development at school and university should be actively promoted, covering all youth categories.

5. **Women are key agents of change in view of their influence on education and household consumption choices.** More broadly, when women participate in all forms of policy- and decision-making processes and have equal access to resources and opportunities, they become drivers as well as beneficiaries of equitable economic growth, environmental sustainability and poverty eradication.

6. **Investments in education are needed to foster the attitudes and behaviours necessary for a new culture of sustainability.** In particular, in Eastern Europe and Central Asia education systems need to become more inclusive, so that children can become effective, productive and responsible members of the society and labour force as they grow up. Education systems also need to improve the quality and relevance of education in order to fill the large knowledge gaps faced by students and enhance their capacity to contribute to sustainable development. In order to be more inclusive and more effective, education systems need to become more efficient, taking advantage of the demographic dividend, as well as potential budgetary gains that can be drawn from the major inefficiencies affecting the sector.

Changing production and investment patterns (chapter III)

1. **The region as a whole is still one of the most energy intensive in the world.** However, significant progress has been made towards more sustainable production patterns through the transformation of the structure of production and increased energy efficiency from environmentally friendly technology improvements. There is a huge potential for further reductions in CO_2 emissions through the use of renewable energy, eco-technologies and investment in energy efficiency, carbon capture and storage, but barriers to the uptake of these new green technologies and practices still persist in the region.

2. **Overcoming residual institutional, market and behavioural barriers to sustainable production requires a comprehensive approach: a national energy strategy, action plans by subsectors, long-term goals and quantifiable energy-efficiency targets.** This approach must be translated into policy action through a mix of policies and processes, such as regulatory standards and fiscal, financial, information and absorptive capacity-building measures, with each country adopting a mix that corresponds to its national competitive and natural advantage.

3. **These policies and tools, specifically targeted to the private sector,** should include agreements negotiated between government and industry on targets, various information and technical assistance programmes promoting energy management practices, recognition programmes that reward firms for implementing energy-efficiency solutions, differentiated corporate taxes according to compliance of firms with energy standards, strategic retargeting of subsidies from high- to low-carbon energy supply and consumption, and guarantees for credit lines and venture capital financing of green investment and technologies.

4. **Boosting the uptake of new environmentally friendly technologies and practices is crucial for shifting towards sustainable production patterns in the region.** This requires a political commitment to adopt a consistent set of policies and measures aimed at supporting research and development and innovation efforts, making maximum use of information and communication technologies, harnessing the local and indigenous knowledge of traditional sustainable techniques, and providing the necessary infrastructure for the use and dissemination of green technologies in all sectors of activities. The policy mix should combine science and technology action plans, increased Government-funded public research and research within the framework of public-private investment, compliance with intellectual property rights and support with the leap from research and development to commercialization. Green procurement and infrastructure investment by the public sector, through the introduction of green criteria in tender processes, is also a powerful tool for generating demand for new green technologies and encourages related investment by industry.

5. **Conventional agricultural methods continue to dominate farming throughout the region, generating high levels of GHG emissions and other environmental pressures.** In addition to phasing out environmentally harmful agricultural subsidies, Governments should dismantle barriers to the development of conservation agriculture that enhances the functioning of the ecosystem while reducing the ecological footprint of farming. Innovative institutional arrangements are needed to reward long-term conservation and biodiversity. Some voluntary mechanisms, such as payments for ecosystem services and ratings, labelling and certification of products, have been used successfully in some ECE countries and could be easily replicated in others.

Changing consumption patterns (chapter IV)

1. **Across the region, the technology-driven energy and material-efficiency gains achieved since the Earth Summit in Rio in 1992 are being more than offset by growing consumption and changing consumption patterns.** This is happening in all the three key areas of household consumption: housing, transport and food.

2. **Policy progress is taking place, although unevenly across policy areas and subregions.** Energy performance standards for housing, economic instruments in transport or provision of food information are all making important contributions though they need to be implemented more broadly. There are also major opportunities to empower consumers to adopt more sustainable lifestyles through wider and more integrated use of investments in public infrastructure, economic incentives and regulations on products and information, but most of them remain untapped.

3. **The next decade requires a more ambitious and sophisticated policy agenda.** In particular, policy solutions in the ECE region need to: place a greater focus on sustainable consumption and sustainable lifestyles, rather than just on sustainable production; adopt an integrated and balanced approach to changing consumption patterns, with greater use of economic instruments; tailor action to specific circumstances, taking into account the different consumption levels but also social, cultural and gender dimensions; and focus first on "low hanging fruit", such as refurbishment of highly energy-inefficient housing.

4. **The public sector can set an example and influence the market place by procuring greener goods and services,** particularly when public purchasers command a large share of the market (e.g., computers, energy-efficient buildings and public transport).

Fostering the social dimension (chapter V)

1. **Sustainable development is about people — their income, employment and equal access to health and other social services — but the transition to a greener economy will not automatically benefit all segments of society, and long-standing inequities will not disappear without deliberate action.** The establishment of a social protection floor, with coverage for all segments of the population, including poor and vulnerable groups as well as those socially excluded is therefore critical to the success of equitable sustainable development. Additional measures can include employment guarantees, minimum wage legislation and the protection of workers' rights, as well as the provision for affordable childcare and social services to reduce women's unpaid work.

The labour dimension

2. **Due to the economic crisis, the region is confronted by increased poverty, precarious jobs and unemployment, as well as by insufficient social security coverage and the limited capacity of trade unions and employers' organizations.** Shifting towards a green economy, if policies and measures to achieve it are appropriately designed and implemented, offers new opportunities for employment in the green sectors but it also raises new challenges related to the distribution of the social and economic costs of such a transformation.

3. **In order to offset the potential job losses in high-emitting and energy-intensive industries and to support sectors particularly affected by climate change (agriculture, fisheries), policies to anticipate and manage the structural change should be consistent with the five principles of the Just Transition Framework of the International Labour Organization (ILO):** (a) assessing the social and employment impact; (b) promoting green jobs and sustainable enterprises; (c) providing training and skills development for green jobs; (d) strengthening social protection systems to cushion impact on workers; and (e) engaging with social partners in all policy steps.

4. **Adequate policies targeting the unemployed and the most vulnerable (youth, women, working poor, rural workers, ethnic minorities and migrant workers)** should be developed in order to ensure that the green transition is also a socially fair transition.

5. **Greening the workplace is a key area for improvement and safeguarding both the natural environment and workers' safety and health.** Manager-worker joint initiatives should be encouraged in this respect as they prove to be effective in promoting safety at work and reducing the use of energy, water and other materials in the work process, as well as in limiting waste generation and increasing recycling.

The health dimension

6. **Demographic shifts, rising levels of inequity, global environmental changes, the growing epidemics of non-communicable diseases and persisting communicable disease threats provide new challenges to sustainable development in the region.**

7. **Addressing the root determinants of these conditions requires reducing socio-economic inequalities and the exposure of people to environmental, biological and behavioural risks to health.** Investment in prevention, health services, and the access to basic needs and social welfare are essential.

8. **Great opportunities for progress lie in fostering healthy and reduced consumption and healthy and green developments in energy, transport, housing, urban management and agriculture, as well as in the health sector.** This, however, requires the development of a better understanding of the implications of green developments on health and its societal co-benefits, thereby preventing undesired effects.

9. **Sustainable development calls for a new health governance approach, introducing the health dimension in decision-making processes cutting across all public policy areas.** The development of this approach requires political leadership, creation and dissemination of know-how across sectors, provision of incentives that promote cross-sectoral work, allocation of resources and clarification of responsibilities.

Strengthening sustainable development governance (chapter VI)

1. **A significant number of countries in the region have established a national sustainable development body and adopted a strategy for sustainable development, but they remain weak in practice.** These bodies lack political power, expertise and financing. Being under such constraints, they are not able to ensure deep integration of the three pillars of sustainable development in policymaking.

2. **Governments at the Rio+20 Conference should commit to strengthening their national institutional frameworks for sustainable development across multiple levels of governance.** This requires a "whole of government" approach, fostering inter-ministerial and local-national level cooperation. Such an approach would lead to the integration of sustainability considerations into all levels and sectors of government planning and decision-making.

3. **Inter-ministerial coordinating bodies should strengthen national strategies for sustainable development, and monitor their implementation, as well as the enforcement of the related legislation and administrative measures.** They should also monitor progress towards fixed targets through appropriate indicators, identify win-win solutions for their scaling up and define relevant trade-offs for decision makers at the highest level (prime minister's office or presidential administration).

4. **Regional and interregional cooperation in sustainable development should be further developed to address issues of a transboundary nature, exchange and disseminate national good practices and promote effective implementation of international legal instruments of the United Nations.** More broadly, the United Nations system remains strongly committed to support countries and regions in their own policy efforts and cooperation initiatives. It does so by pursuing, and strengthening as far as possible, its advisory services and capacity-building activities corresponding to its mandated areas of expertise in the various dimensions of sustainable development.

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Chapter II.

The cross-sectoral policy mix for sustainable development

Chapter II. The cross-sectoral policy mix for sustainable development

This chapter defines a road map for sustainable development, highlighting the key cross-sectoral policies that aim to achieve this goal. It rests on the observation that the current outcome of existing Government policies and incentives for private sector investment is not consistent with long-term sustainability in several aspects. Failures of Governments and markets and weaknesses in civil society all contribute to this outcome. Recognizing the dynamic nature of development, building on the availability of successful measures already taken in countries of the region for coping with many of these failures and weaknesses, this chapter argues for a critical mass of changes in policies, institutions, regulation and incentives in the short, medium and long term. Using instruments such as taxes, incentives, tradable permits and regulations to foster green investment and innovation is essential for a transition to a green economy, but so is investing in eco-innovation, technology, capacity-building, training and education for sustainable development.

A key message of this chapter is that if enough of the elements for effectively addressing substantial components of the overall challenge are available, a "wedge-by-wedge" approach,[7] in aggregate adding up to the necessary critical mass of policies, can be successful. Governments need to create enabling conditions for the transition to a green economy and reverse dysfunctional policies currently pursued (such as massive fossil fuel subsidies), put in place improved institutions and better regulation where markets fail, but also to retreat from areas where markets or civil society work best. At the macro level, they need to build or reverse the depletion of physical, social, and natural capital, while adhering to current as well as future budget and social constraints. This needs to be complemented by micro-level sectoral policies to provide local traction — where civil society actors also have an important role to play — and address social and environmental tensions. Together, these can reset incentives for all to live and invest in line with economic, social and environmental sustainability.

The chapter also provides an overview of relevant policy actions taken so far, the role of United Nations conventions and EU directives and regulations. As the Rio+20 Conference will explore the application of MDG-like targets and indicators for sustainable development, the chapter gives an overview of methods used in the region to measure sustainable development. Finally, education for sustainable development is a cross-cutting approach necessary to inspire young people, consumers, entrepreneurs, the labour force and civil society at large to take the green transition forward.

A. Overview

Because sustainable development involves economic, environmental and social dimensions, there is no single policy decision that can ensure sustainable development. Rather, a balanced policy mix is needed, as individual policy elements implemented separately are insufficient. Such a policy mix would revamp existing policies, reflecting the need for cost-effectiveness and a view of the complementary roles of government, the market, the private sector and civil society. While countries can set the tone through national policy, sustainable development is ultimately a global issue. As such, policy formulation needs to consider the increasingly porous borders between government and private, domestic and international domains; and the emergence of global public goods as a key concern — many of which are discussed in this chapter (See Kaul and Conceicao, eds., 2006).

Often referred to as the "world's greatest market failure", climate change, and hence sustainable development, requires reconsideration of the role of market forces and that of government. This chapter takes the view that both Governments and markets can fail to serve the long-term needs of citizens who rely on the planet's finite resources. The best course of action is to ensure the provision of public goods through collective action, to discontinue distorting interventions and to ensure a smooth functioning of the market where it works best, while ensuring the participation of civil society actors, enforcing laws and regulations that value natural capital and strengthening social inclusion and helping to "keep all players honest". The challenge lies in attaining such a policy mix.

[7] For a discussion of the wedge approach, see section D below, under the heading "Eco-innovation and technology".

The first step is to identify areas where the market works best and where it fails, the extent of these failures and the costs of government intervention. Policymakers should sharply reduce government actions in some areas such as fossil fuel subsidies and strengthen rules that prevent government corruption. Conversely, they should scale up their actions where net benefits can be large: regulating monopolies, addressing externalities, providing public goods, reforming policies and providing new incentives, strengthening market infrastructure and market-based mechanisms, redirecting public investment, greening public procurement and coping with information asymmetries or incomplete markets.

As an integral part of the institutional framework for sustainable development, Governments need to involve civil society by facilitating local collective action, contributing to the provision of public services, providing local-level traction for national and global policies and by acting as a monitoring agent to enhance transparency and lengthen political horizons to ensure sustainable decisions. Women are important drivers as well as beneficiaries of equitable economic growth, environmental sustainability and poverty eradication. For women to become active agents of change and catalysts for sustainable development, their economic, social and political rights need to be strengthened in order to ensure their ability to own land, control rights to natural resources, obtain necessary education and training, access information, raise financing and acquire relevant technology.

Civil society organizations, including community-level groups for youth, women and indigenous people, together with environmental organizations and networks and think-tanks focusing on sustainable development represent an invaluable source of innovation and expertise. Civil society can advocate for government policies towards a green transition by raising awareness about the need for change, thereby adding to momentum towards sustainable development.

Once energy prices and regulatory signals are broadly correct, market forces can provide much of the momentum for sustainable development — green growth will become a matter of economic competitiveness given the need to drastically lower humankind's aggregate GHG footprint over the coming decades. Countries and enterprises that can position themselves to benefit from the future decline in carbon-heavy technologies and consumption and from the surge in green technologies and sectors will be increasingly competitive.[8] The private sector should be prepared to react and respond by providing increased financing and investment in greener sectors and technologies.

A green and sustainable transformation, like any transition, will involve winners and losers. It is critical that part of the policy mix includes measures to ensure that groups who stand to lose from a green transition are compensated and protected — i.e., women and men engaged in "brown" jobs, or the rural poor who rely on natural resources for their basic needs. Fortunately, some of the necessary policy changes, for example, revenues from taxes on fossil fuel or those generated from the allocation of permits in a cap-and-trade system, can create the fiscal space to finance the costs of social transfers to ensure that the benefits of a greener economy are shared widely across groups in society.

Two important global considerations form the background to the policy discussion of this chapter. First, a change is necessary: the current fossil fuel-based path is no longer viable because the result would be a global carbon footprint exceeding the limits of one Earth by many multiples. To this end, it needs to be backed by stable coalitions, able to withstand shocks or changes in circumstances. Second, change is inevitable: humanity *will* have a small global GHG footprint 100 years from now. The only choice we face is whether we get there through a planned and relatively smooth transition, or we wait before being forced to take an abrupt, risk-riddled, and ultimately highly destructive path. The smoother path would be more conducive to large-scale investment and technology transfer. While it requires upfront investment, planned transition would be less costly than sudden shifts in the long run. This would greatly contribute to lowering global costs, shifting the composition of growth toward green activities, while generating — and if done right, more equitably allocating — global benefits.

[8] Sir Richard Branson is quoted in *Scientific American* as saying that "Climate change is one of the greatest wealth generating opportunities of our generation" (vol. 304, No. 5, May 2011, p. 35). Also see www.creatingclimatewealth.com.

Box 2.1 The political economy of climate-change policies

Climate-change costs and benefits typically must be weighed over a period of several decades. This clashes with politicians' short time horizons, and often leads to the rejection of actions that would offer obvious benefits, but only over a longer time horizon. The inherent underrepresentation in these decisions of the interests of generations below voting age or those unborn exacerbates this bias further.

The policy mix proposed in this chapter implies a complicated incidence of costs and benefits within society, across countries, and over time. This could imply a massive redistribution from high- to low-carbon producers and consumers; from those not able to adjust to those with a cushion that facilitates adjustment, such as wealth, or ready access to low-cost financing. This makes it imperative to engage in meaningful, reasonably targeted social transfers within countries, as well as facilitating international transfers to bring all countries on board. Private international transfers, including remittances also play an important role. The move to a low-carbon path could involve a significant income loss to poor households. They most likely have less scope to relocate to less affected areas or to move to jobs that open up or pay more as a result of relative price changes; cannot invest in new technologies for their consumption and housing needs that would afford them large savings; and have to pay a significantly higher share of their total income for energy. It is thus critical for the social pillar of sustainability that there is adequate compensation for the higher costs, and adequate access to training and education, as well as to grants and financing for the necessary investments to adjust to the new reality (e.g., basic insulation of housing, replacement of highly inefficient appliances).

B. Economic Policy Instruments

Economies of the region have considerable first-hand experience balancing the positive results of free market forces with the potential for market failures. A sustainable development transition will require continuation of this balancing act between achieving the right kind of governance by public authorities and harnessing the capacity of market forces to follow a green-growth path. Governments throughout the region have already taken steps to improve social, economic, and environmental outcomes by clearly defining property rights,[9] making the law accessible for the poor (see UNDP and Commission on Legal Empowerment of the Poor , 2008). and by acting directly, e.g., protecting certain areas such as national parks.

Just as markets can fail to serve the aims of sustainability, so too can government policies. Thus, there is a need to markedly *curtail* some Government activities while *expanding and improving others.* The main sources of Government failures — when it worsens, rather than improves the chances for sustainable development — are massive, highly distortive fossil fuel subsidies (including tax advantages and rules that reduce effective energy prices paid by final users);[10] a short horizon

[9] Such Coasian policies were reported by the *Economist* (25 September–1 October 2010 issue, p. 14 of the "Special Report on Forests") as having been a highly effective and substantive contribution to drastically slowing down the rate of habitat losses stemming from the burning of rainforests in Brazil. Nevertheless, effective Coasian-type solutions require an effective legal and enforcement system — lacking in many countries of the region. In addition, the issues are different in countries where land and natural resources are State-owned, and where there has been significant privatization of these and well-regulated secondary markets have emerged. In many countries of Europe and Central Asia that face binding sustainability challenges, the key issue is not whether the Government can clearly define property rights; rather, it is the extent to which the Government is willing and able to prioritize sustainable management of the resources that it owns.

[10] A 2009 Organization for Economic Cooperation and Development-World Bank study using the price-gap method estimates that total direct fossil fuel subsidies in 37 surveyed economies (covering an estimated 95% of the world's subsidized fossil fuel consumption) amounted to US$ 312 billion, with a weighted-average fossil fuel subsidy for final consumers of 22%; meanwhile, the Global Subsidies Initiative (GSI), a programme of the International Institute for Sustainable Development, estimated worldwide fossil-fuel production subsidies at around US$ 100 billion per year (GSI, 2010).

unsuitable for resolving slowly emerging but potentially devastating long-term problems (see box 2.1);[11] and weak (or weakly enforced) legislation and regulation with insufficient or uncertain reach (including unequal access to the law). Finally, many Governments would greatly benefit from enhancing their ability to govern and regulate, and to ensure transparency and broad participation, especially at the local level.

Box 2.2 Fossil-fuel pricing

Current fossil-fuel prices fail to reflect (a) the full direct costs of provision, owing to Government subsidies; and (b) the externalities stemming from their use. As a result, they transmit hugely biased economic signals. The effect of carbon-heavy production and consumption patterns arising from these two sources is massive. It leads to a global trajectory with unsustainably high and rising global emissions owing to: wasteful energy use with distorted consumer choices (large vehicles chosen over hybrid cars, incandescent light bulbs over fluorescent ones); and investment decisions (CO_2–heavy sources of energy and industrial processes prevail over cleaner alternatives, e.g., renewable energy, recycling); and grossly inequitable outcomes disproportionately hurting the poorest and unborn generations.

The single most effective instrument to fundamentally alter the day-to-day consumption, production and investment decisions of billions of people and businesses is to provide them appropriate price signals. This can happen through the elimination of subsidies plus either (a) a "sin tax" directly imposed on CO_2 emissions to equalize energy prices at a higher level in all countries; or (b) if a trading platform with global reach is available, charging for a restricted amount of global carbon credits that would be traded. Setting the tax rate would best be done iteratively, starting with a sizeable initial step. If carbon trading is used, total emissions must be effectively capped, and all Governments should charge for the permits issued (allocating permits below market price is just another distorting subsidy). Eliminating all subsidies and reflecting the externality needs to be phased in to avoid a sudden shock, but on a relatively steep path (over less than a decade) to ensure early impact. That path needs to be pre-announced, to provide predictability over the investment horizon — critical for shaping the mix of energy supply and demand.

In the long term, higher prices for fossil fuels may not work unless the change is globally coordinated, monitored, and reliably enforced to lend the new regime credibility. Producers and users should agree on their relative shares of fossil-fuel rents, which re-pricing would massively affect (freezing the existing shares for some time would be a feasible way to start).

Also in the long term, effective global regulation and enforcement should complement higher energy prices. This can work best for concentrated, already regulated, or immobile sources, i.e., steel, cement industry; road, sea, and air transport; and buildings. But enforcement for billions of other sources — individually small, but adding up to a significant share of total emissions — is next to impossible. Hence, the need for setting price incentives right for actors whose emissions are not tracked individually — they would otherwise tend to free-ride.

Fiscal policy must play a critical role, especially its tax, subsidy, and social protection components. It needs to complement market signals for fostering innovation and redirecting investment and consumption toward a resource efficient economic and environmental model. To this end, the revenue from fossil fuel taxes or cap-and-trade quota allocations should be redistributed to (a) provide targeted support for the poorest to offset the income effect of higher energy costs;[12] (b) provide temporary and declining subsidies for adjustment for producers, and help environmentally friendly technologies more rapidly reach sufficient scale (e.g., with a preannounced rapid decline of subsidies to zero after, say, five years); (c) reduce the

[11] The poor management of transboundary waters in Central Asia during past decades, which contributed to the desiccation of the Aral Sea is an apt example.

[12] Higher energy prices disproportionately hurt the poorest in society, for whom the additional costs often exceed discretionary income left after sustenance needs. Thus, addressing climate change and poverty need to go hand in hand, via a coordinated and sustainable redistribution of incomes and technologies.

most distortive taxes, generally on labour, to bolster green growth and employment; (d) cover additional costs of enhancing regulation and regulatory capacity; and (e) transfer resources across regions, sectors, and even countries to stabilize coalitions in support of sustainability.[13]

Box 2.3 Canada (Ontario) — Green Energy and Economy Act (FIT Programme)

In 2009, the Canadian province of Ontario launched the first North American Feed-In Tariff (FIT) Programme for renewable energies. FITs guarantee specific payments for each kilowatt-hour (kWh) of electricity produced by a renewable energy source during a determined time frame. The aim is to increase Ontario's share of renewable energies to 37% by 2025, and thereby make renewable energies the largest component of its total energy mix. The overall goal of the Green Energy and Economy Act is to foster a clean energy economy in Ontario by helping Ontario phase out coal-fired electricity generation by 2014; attracting new and redirecting existing investments to boost economic activity and the development of renewable energy technologies; and creating green industries and jobs.

Through the FIT Programme, more than 2,000 megawatts (MW) from sustainable, renewable sources have been connected to the grid so far. Coal-fired generation is the single largest source of air pollution in Ontario and eliminating all 19 coal units from the supply mix will be the largest climate change initiative in Canada. Coal plants produce carcinogens, smog, GHGs, acid rain and pollution, which causes 120,000 illnesses a year in Ontario alone and amounts to health costs of about Can$ 3 billion. The removal of coal plants by 2014 is also expected to reduce CO_2 emissions in Ontario's electricity system from 33 to 7 million tons of CO_2 per year, which would be a 79% reduction. So far, Ontario's Green Energy Act has led to the creation of over 20,000 new jobs and the province aims to have a total of 50,000 jobs created by the end of 2012.

Ontario signed or offered more than 21,000 contracts to small, medium and large clean energy projects and about Can$16 billion in private sector investment, as well as investment in manufacturing. The Green Energy and Economy Act targets local municipalities, First Nations and Métis communities to build, own and operate their own renewable energy projects. As a result, nearly 16% of all contracts awarded in the first year went to community groups, representing almost 400 MW of renewable energy capacity. Many of these are owned by First Nations peoples and act today as a stimulus for Aboriginal economies across the province.

Source: ***UNEP (2011 b)***

The Government will be able to substantially influence consumption and investment decisions by creating a predictable business environment that is conducive to inclusive, environmentally friendly markets and effective partnerships involving the public and private sectors as well as civil society. It can also enhance sustainability through transparent and stable rules for procurement and for allocating public investment funds that use sustainability as an additional criterion.

Local and regional policies for sustainable development

Transitioning to a sustainable development path requires not only macroeconomic interventions. To gain traction, national policies need to go hand in hand with micro-level sectoral and regional policies. These typically focus on the supply side of economic activity, while cross-sectoral policies also include policies acting on the demand side: consumption, investment and net exports.

Another critical micro-level contribution to sustainability can come from local community-based collective action rules for common property resources without substantial elements of monopoly or externalities across large areas (Ostrom, 1990). For this distinct subset of resources, the optimal solution thus comes from coordinated local action organized by civil

[13] Such transfers already exist (in the form of ODA, and in the form of newly established climate funds).

society. These situations are very important in aggregate, and civil society's role is critical, since neither the market, nor government has been able to formulate operationally useful rules to ensure sustainable use for these resources to date.

To achieve success, broad ownership of policies related to sustainable development is crucial. This is where civil society organizations, acting as a link between the government and civil society can play an important role. Civil society actors come from all layers of society (urban and rural; national, local and grass roots; formal and informal).

Box 2.4 Austria — National Framework Programme for Climate Protection: klima:aktiv

The klima:aktiv initiative supports the implementation of the Austrian federal climate strategy and Austria's market transformation towards a competitive low-carbon economy based on efficient and sustainable use of resources, the protection of the environment and the establishment of innovative green technologies and production practices. The initiative was launched by the Federal Ministry of Agriculture, Forestry, Environment and Water Management in 2004. The overall objective of klima:aktiv is to decrease energy consumption and to reduce GHG emissions and climate change. To date, the initiative contributes to 1.46 million tons of CO_2 emission savings yearly. The programme has provided support for 43,000 projects in the sectors below.

Mobility. Klima:aktiv mobil promotes climate-friendly mobility. The programme motivates and provides financial support to cities, municipalities and regions, companies, tourism and leisure operations, schools and youth groups to develop and implement ways of reducing CO_2 emissions from transport. Measures implemented to date include the promotion of public transport, mobility management, car sharing, fleet changes to alternative-fuel vehicles and improving facilities for cycling and walking. By July 2011, klima:aktiv mobil had launched more than 1,800 joint projects with companies, regions and cities, while municipalities had received €42.5 million in technical assistance and financial support , which leveraged €271 million in additional funding and created or saved 3,000 green jobs. Awareness-raising and information campaigns inform the media and citizens about the benefits of climate-friendly mobility, and motivate them towards a more environmentally friendly and healthier mobility. Overall, klima:aktiv mobil partners have saved more than 450,000 tons of CO_2 each year.

Buildings. Through financing energy audits and information campaigns, klima:aktiv has enabled 1,600 assessments so far to identify potential energy savings in service and residential buildings. Refurbishment projects have been initiated for 400 large residential buildings with over 13,000 flats. The initiative has developed a building standard as a benchmark for ecologically sound buildings, which serves as an orientation for all stakeholders and as a basis for training. The initiative contributes to a total savings of 400,000 tons of CO_2 e**Renewable energy.** By conveying quality standards and technical know-how, as well as providing information campaigns, klima:aktiv contributed to the doubling of solar thermal collector surface, with 360,000 square metres of new installations per year since 2004. Due to quality management in heating plants, the efficiency of new wood heating plants was increased by 10%. The initiative contributes to over 500,000 tons of CO_2 emission savings annually.

Energy efficiency. Some 200 public and 120 private companies have been given advice free of charge since 2004 on how to change over to energy efficient appliances and IT systems. Energy advisers have been trained to better support companies to make their production processes energy efficient or renovate their facilities. The initiative contributes to a total saving of 160,000 tons of CO_2 emissions per year.

Source: ***UNEP (2011 b)***

They contribute by setting the agenda (the issue of environmental degradation was first tackled in our region through civic action); and by raising awareness and advocating for the rights of the poor in sustainable development.

Cross-country considerations

Globally, least-cost adjustment would require policy actions taken where they imply a unit reduction in carbon emission at the minimum cost. National level optimization unfortunately does not lead to this outcome. Thus, ideally, spending on climate-change mitigation should not be restricted by national borders. While political realities preclude decisively acting on this point at present, it is important to keep it in mind. It may strengthen the argument for emissions permit trading within and across countries, compared with country-specific carbon taxes. The latter have additional disadvantages: they place the decision on the level of carbon prices in the hands of Governments, with no definitive practical guiding principle on where to set it; also, the level of carbon taxes cannot be frequently changed at the country level, especially not in an internationally coordinated manner. In contrast, setting an aggregate level of emissions is easier, and with an effective and well-governed global trading system, the global price can adjust frequently, reflecting demand for such permits.

It is evident that poverty alleviation and the sustainable management of natural resources and ecosystems are linked, as benefits from natural capital are received directly by the poor. In the analysis of the GDP of low-income countries, ecosystem goods and services provide for a large proportion of the livelihoods of poor rural communities and reduce their vulnerability to natural disasters and economic shocks. But the poorest countries in the region. as in other parts of the world, need support to embark on the green development path. If successful, they could effectively leapfrog to a markedly higher development stage without having to trace out the entire development path — involving a carbon-heavy component — followed by countries that have developed earlier. In fact, while the latter may appear individually feasible, in aggregate it is not. Hence the need for leapfrogging, which is in the direct interest of other countries to facilitate, given the constraint of having only one Earth. This in turn raises the need for revamping the structure and flow of international aid towards enhancing sustainability, with rapid and massive technology transfers as a critical component. The additional resources accruing to Governments stemming from reduced waste, tax and emissions permit allocation revenues can in part be used to promote these transfers. It is critical that they take a form that does not counteract emerging diffusion driven by market forces responding to corrected price signals.

C. Social policy instruments to make a green economy work for the poor

Despite an emerging discourse on the definition of the green economy, there is a significant gap in knowledge and evidence of how this concept can be taken forward at the country level. However, due to an increasing perception that the green economy makes economic sense, many activities are under way: investments in clean energy are a prime example. Current green economy investments are often focused on "low hanging fruit" — that is, activities that do not hamper, or can even strengthen, competitiveness. Indeed economic competitiveness can drive the transition towards a green economy, but the full paradigm shift towards sustainable development requires deliberate attention towards reducing poverty and inequity.

Box 2.5 Turkey: Using sustainable energy policy to promote regional equality

Turkey is taking action to transform the economy of the south-east Anatolia region — one of Turkey's most important and challenging regions, bordering Syria and Iraq. Recognizing the potential of organic agriculture and renewable energy in this subregion, the Turkish Government, in partnership with UNDP and the EU, developed the "Competitiveness Agenda" to help this region catch up with the economic development indicators in the western part of Turkey. In 2008, the Government announced the $20 billion South-east Anatolia Action Plan. Prime Minister Erdogan called attention to the development gap in 2008. "As of [the] 1990–2007 period … in 17 years, only 15% of [planned] irrigation projects are under way, 5% of construction projects, and 80% are still in the planning stage." He called for more efforts to accelerate the projects in the field. The South-eastern Anatolia Project (GAP) Regional Development Administration joined forces with UNDP to formulate projects to operationalize the strategies proposed in the Competiveness Agenda. They launched the "Utilization of Renewable Energy Resources and Increasing Energy Efficiency" Project in October 2010. This focused not only on energy-related measures, but also poverty, employment creation, environment and competitiveness. Seven pilot projects were developed. "Solar Water Heating for Industrial Process, Electricity Production from Cotton and Wheat Agricultural Residue" and "Energy Production from Biogas" are two examples of how this good practice uses sustainable energy to spur job growth and reduce the income and welfare gap between eastern and western provinces of Turkey.

Source: ***UNEP (2011 b)***

The recent global crisis and rising inequality make ignoring social concerns unviable. The gap between rich and poor continues to widen, globally and in the region, and the crisis has resulted in the emergence of a considerable number of "new poor". Beyond a concern for social justice, there is increasingly convincing evidence that unequal societies manifest higher levels of social and health problems such as infant mortality, homicides, teenage pregnancies, and drug and alcohol addiction (Wilkinson and Pickett, 2009).

Like any economic strategy, green economies will not automatically benefit the poor, nor will they promote social equity. Governments must take action to channel benefits of green growth to the poorest people in the countries of the region. A green economy must explicitly pursue inclusiveness and poverty reduction as a core objective and strategy, addressing fundamental drivers and factors that interconnect environmental degradation, poverty and social inequity. Special attention must be paid to those key sectors, such as agriculture, fishing and forestry, on which the poor depend for their livelihoods. In this context, an effective social protection floor is essential: a mix of benefits and services that need to be in place to provide such an adequate level of social security to the whole society. This is not only good social policy, it can also help avoid environmentally disastrous coping strategies for the very poor, for example cutting down trees to warm homes in an effort to survive the winter.

In the region, as well in the other parts of the world, a green economy which works for the world's poor could be expected to display the following characteristics (UNDP, 2011a). It would:

- Maintain growth while reducing GHG emissions in the economy as a whole, and promote job creation and other economic opportunities in sectors where the poor seek to build their livelihoods;
- Generate more public revenues to enable investment in quality services, to which the poor would have equitable access;
- Retain biodiversity and ecosystem services, while also maintaining the livelihoods of the poor and other communities who depend on them;
- Establish a social protection floor as a preventative measure to protect vulnerable groups during transition to a green economy. Removal of carbon subsidies can finance the social protection floor;
- Promote equitable access to energy and its efficient use;
- Build resilience to environmental and other risks;
- Empower the poor and marginalized, including women, to play an active role in the investment decisions that determine their well-being;
- Put in place pro-poor environmental fiscal and financial tools, including financing mechanisms that benefit local communities;
- Promote growth in key economic sectors with high poverty reduction potential and especially job creation.

Box 2.6 Belarus: Ecological restoration of peat-lands

Leading scientists warn that carbon sinks will not be able to keep absorbing CO_2 emissions at the current rate. Peat-lands are among the most fragile sites — a sobering fact considering that peat-lands store about one third of global soil carbon. In Belarus, the 28,200 hectares of peat-land (6.4% of the country's surface) were rescued through a nationwide rewetting of the degraded sites and a development and enforcement of a set of by-laws that prevent further peat-land degradation.

A UNDP-supported four-year restoration project, focused on 17 peat-land areas that were drained from 1950–1990s due to large-scale extraction or agriculture works. The peat-land was exploited and biomass used as fuel and insulation material. Draining of the peat-land sites has consequently damaged the soil and vegetation cover and increased the area's vulnerability to long-burning fires, which in turn have released approximately 235,000 tons of CO_2 annually.

By investing US$ 50–US$ 100 per hectare for peat-land restoration, this initiative has filled the drainage ditches and built dams that have further increased the groundwater level, managed fire and led to a reduction in public spending on firefighting by an estimated US$ 1.5 million annually. More importantly, the ecological restoration of peat-lands, has stopped the CO_2 emissions, diversified the local community livelihoods (cranberry picking, fishing, hunting and tourism) and ensured the habitat for endangered species of flora and fauna, including endangered birds such as the Curlew and the Greater Spotted Eagle. The Belarusian Government has now adopted a policy dealing with economically exploited peat-lands, where mining activity has taken place. According to the policy, disturbed areas are to be restored at the end of their "economic life".

For the pan-European region, increasing employment is, and will increasingly become, a top policy priority. In a transition to a green economy, new jobs will be created, which over time will exceed the losses in "brown economy" jobs. In sectors where capital is severely depleted, greening will necessitate the loss of jobs and income in the short and medium term. But, by replenishing natural stocks, a green transition can actually prevent a more permanent loss of income and jobs in the long run. The green transition, as an eventual and emerging criteria for economies to remain competitive, may also require an investment to reskill and re-educate segments of the region's workforce (for more on this, see chap. V).

D. Regulatory and legislative instruments, institutions and technology

In addition to the market-based instruments discussed earlier, such as taxes, charges and fees, tradable permits and green subsidies, there are a number of Government interventions, including regulatory and voluntary non-market based instruments that should be part of the recommended policy mix for a transition to a green economy. Governments also have at their disposal regulatory measures, including technology- or performance-oriented regulations, licensing requirements and bans on certain products or practices.

Reforms to regulations, subsidies and taxes are necessary in order to reflect the true value of natural capital (TEEB, 2009). New mechanisms and markets to reward long-term conservation of ecosystem services and biodiversity are also viable options. There are a range of voluntary mechanisms that are being currently used with good results, such as payments for ecosystem services (PES), ratings, labelling and certification.

These voluntary initiatives complement other instruments, but in many cases still require a legal/regulatory framework to function properly. PES schemes make the value of ecosystem services more obvious and attempt to modify or reverse existing incentives for users to overexploit them. Local PES schemes can be scaled up to the national level for cost-effectiveness. A key aspect of PES schemes is the potential for involving the private sector and to raise additional finance and complement public funds. But Governments need to keep in mind that they may have to provide extra incentives or alternative solutions to cover initial or operating costs.

Providing improved information on the environmental impact of production and consumption should be highlighted as a way to raise awareness of consumers, producers and policymakers so as to make environmentally sound decisions. Tools that provide product information can be applied to both voluntary schemes and market-based instruments. This is because labelling products with information on their environmental impact enables consumers to make decisions that take into account environmental consequences while at the same time providing an incentive to manufacturers to design eco-friendly, more efficient products.

Unfortunately, the regulatory burden that comes with sustainable development would — all other factors remaining unchanged — raise the incentives for informal activities (to evade the regulations). This is no small matter for the pan-European region: it is estimated that the share of informal activities to be at 20% of measured GDP on average in the 27 member States of the EU (EU-27), with countries of Eastern Europe, the Caucasus and Central Asia generally closer to 30% (Schneider, 2010). There are already sound social policy and economic reasons to reduce the share of informal production and employment; to these benefits of reducing informality, we can now add the effectiveness of sustainable development policies.

United Nations and European Union agreements that support sustainable development

The United Nations is contributing in a number of ways toward sustainable development in and beyond regulatory and legislative areas, notably through implementing and monitoring multidisciplinary regional and local programmes and projects aimed at sustainable development; promoting the achievement of the MDGs and building related capacities; peacemaking, conflict resolution and disaster risk reduction; compiling policy-relevant global developmental statistics; providing related analytical and technical advisory services, research, publications and awareness-raising; supporting the enforcement of the United Nations Charter and international law; and preparing relevant global and regional conventions, as well as assisting countries for their effective implementation.

As mentioned before, for some countries outside the EU (most notably for those in the EU Neighbourhood), legislative, regulatory, and policy convergence with the EU could serve as inspiration as they develop environmental policies. EU regulations and legislation may also help countries meet their obligations under United Nations conventions on the environment and jointly they catalyse progress toward sustainable development (table 2.1). Regardless of the framework used, enhanced coordination and additional dedicated financial and human resources will be necessary in order for countries to realize their objectives and meet their obligations. It will also be critical to build capacities in Governments and civil society to enable them to use the potential of these frameworks to bolster sustainable development.

The ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), in force since 2001, grants rights to the public regarding access to information, public participation and access to justice and in governmental decision-making processes on matters concerning the local, national and transboundary environment. The EU has begun applying Aarhus-type principles in its legislation, notably the Water Framework Directive.

Table 2.1.
Overlapping Content of UN Conventions and EU Chapters in the Acquis Communitaire

	Ozone	UNFCCC	Kyoto Protocol	Convention on Biological Diversity	CCD	Persistent Organic Pollutants (POPs)	Aarhus
Chapter in the EU acquis communautaire	Vienna Convention for the Protection of the Ozone Layer. Vienna, 22 March 1985	UN Framework Convention on Climate Change. New York, 9 May 1992	Kyoto Protocol to the UN Framework Convention on Climate Change. Kyoto, 11 December 1997	Convention on biological diversity. Rio de Janeiro, 5 June 1992	UN Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa. Paris, 14 October 1994	Stockholm Convention on Persistent Organic Pollutants. Stockholm, 22 May 2001	Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. Aarhus, Denmark, 25 June 1998
Chapter 11: Agriculture and rural development		✓	✓	✓	✓	✓	✓
Chapter 12: Food safety, veterinary and phytosanitary policy		✓	✓	✓	✓	✓	✓
Chapter 14: Transport policy		✓	✓	✓		✓	
Chapter 15: Energy		✓	✓			✓	✓
Chapter 16: Taxation	✓		✓				
Chapter 17: Economic and monetary policy	✓	✓	✓				
Chapter 18: Statistics	✓	✓	✓	✓	✓	✓	✓
Chapter 20: Enterprise and industrial policy	✓	✓	✓			✓	✓
Chapter 21: Trans-European networks		✓	✓	✓			
Chapter 22: Regional policy and coordination of structural instruments		✓	✓	✓	✓	✓	
Chapter 25: Science and research	✓	✓	✓	✓	✓	✓	
Chapter 26: Education and culture	✓	✓	✓	✓	✓	✓	
Chapter 27: Environment	✓	✓	✓	✓	✓	✓	✓
Chapter 28: Consumer and health protection	✓	✓	✓			✓	✓
Chapter 30: External relations	✓	✓	✓	✓	✓	✓	✓

Source: ***UNDP Bratislava Regional Center, Energy and Environment Practice***

Eco-innovation and technology

In the pan-European region, innovation is already a key driver of increased energy, carbon, water and material efficiency, but more needs to be done. Governments can support green innovation in at least three ways: funding research, alleviating early stage financing barriers and pursuing demand-side policies. Appropriate pricing of environmental externalities is a key element of any environmental technology policy as green innovation benefits from clear and stable market signals. But, in cases where price signals alone are not fully effective, standards, regulations and innovative public procurement can encourage green innovation.

Government regulations that require using the best available technologies push manufacturers and businesses to invest in innovative and green technologies, offer green products, accelerate green innovation and foster clean technology development and diffusion. For example, regulations that set performance standards for vehicles provide the incentive for business to invest in new technologies to reduce emissions for all new cars. Another example is the recent adoption of International Telecommunication Union (ITU) recommendation ITU-T L.1410, which defined a common methodology for the information and communications technology (ICT) sector to measure its environmental footprint. Through the adoption of this methodology, the industry will be able to measure its efforts to improve resource efficiency, and final users will be better able to compare which equipment has a better environmental performance.[14]

Box 2.7 Investing in science, technology and innovation

Albania

In 2009, The Albanian Government launched its *National Strategy on Science Technology and Innovation* (2009–2015) as the country's first concrete step towards a knowledge-based green economy and society. The Strategy plans for a National Technology Programme in order to develop applied research activities with a focus on social and economic impact.

Uzbekistan

With regard to Uzbekistan, the Centre for Development Research at the University of Bonn, Germany, just finished a 10-year research project with Uzbek partners/ stakeholders to improve the economic efficiency and ecological sustainability of the country's agricultural sector. Through this project, sustainable solutions were identified to improve the environment of the Aral Sea Basin and to transition to a greener agricultural workforce. The Uzbek Parliament is now reviewing and disseminating the study's findings.

Both public and private investment in research and innovation are important factors in the transition to a green economy. Innovative technologies can assist Governments and the private sector to reduce the costs of lowering GHG emissions and to develop sustainable technologies. This is the case of ICTs, which play a key role in increasing resource efficiency in many industrial sectors as well as in transport and trade services. Moreover, eco-innovation also offers an area of growth for green jobs.

[14] Further information about ITU activities in the development of green ICT standards is available on the website of ITU-T Study Group 5 (http://www.itu.int/ITU-T/studygroups/com05/index.asp).

The Princeton wedge approach (Pacala and Socolow, 2004, p. 968) is an influential way of thinking about how the climate change challenge can be realistically met. It enumerates available technologies — including fuel switching; forest and soil storage of carbon; carbon capture and storage; raising energy efficiency; and using renewable sources of energy —that can help:

> *Humanity already possesses the fundamental scientific, technical and industrial know-how to solve the carbon and climate problem for the next half-century. A portfolio of technologies now exists to meet the world's energy needs over the next 50 years and limit atmospheric CO_2 to a trajectory that avoids a doubling of the preindustrial concentration. Every element in this portfolio has passed beyond the laboratory bench and demonstration project; many are already implemented somewhere at full industrial scale. Although no element is a credible candidate for doing the entire job (or even half the job) by itself, the portfolio as a whole is large enough that not every element has to be used.*[15]

Table 2.2.
Enabling cross-sectoral policies to set the region on a sustainable development path

	Cross-sectoral policy instruments
Economic instruments	• Reform of GHG-emission pricing and elimination of economically costly and environmentally harmful subsidies, such as fossil fuel subsidies (box 2.2), taking into account impacts on the poor, to rectify market signals in a globally consistent manner. [16] • Elimination of practices exacerbating the spillover from fuel to food prices (e.g., subsidy on ethanol from corn coupled with high tariffs on cheaper imported ethanol). • A fixed-total carbon permit trading system encompassing a critical mass of emitters (notably the United States, the EU, Japan and Brazil, the Russian Federation, India and China (BRICs) that is scalable as others sign up, with rules to reign in free-riding behaviour (e.g., smaller allocated quotas for those signing up later). • Effective use of public expenditure and (time-bound) investment incentives to trigger a transition to a green economy, such as public investments in infrastructure and public services to enable green markets, as well as investment in research and development of environmentally sound technologies and innovation. • Enhancing relevant World Trade Organization rules and regulations, which are an effective defence against monopoly power and abuse of market rules, but are weaker in delivering the externalities-driven regulation needed to effectively combat climate change and biodiversity loss.

[15] Pricing changes discussed above in section B will contribute on the demand side by lowering carbon-heavy consumption and investment in a cost-effective manner.

[16] EBRD (2010), chapter 3, states that the effective introduction of a system-wide price on carbon would result in (a) substantial emission reductions; (b) a major redirection of investment away from carbon-heavy activities (implying a massive cumulative shift over time toward greater energy efficiency in the overall stock of equipment used in production and by households); and (c) additional recurrent government revenue (which they estimate for the Russian Federation and Turkey to be at 1%–2% of GDP).

Table 2.2. (continued)
Enabling cross-sectoral policies to set the region on a sustainable development path

	Cross-sectoral policy instruments
Legal and regulatory instruments	• Direct public role at national level (e.g., retaining control over electricity grid, nuclear power generation, national parks), and at regional and global level (e.g., through EU directives and United Nations conventions). • Coasian laws delineating property rights to allow private bargaining to effectively complement government regulation. • A robust regulatory framework at the national level, as well as the effective enforcement of legislation as a means to drive green investment. • Effective regulatory monitoring and enforcement to address key externalities, provide public goods at the necessary level and limit the market power of monopolies. • Establishing sustainable public procurement practices that create high-volume and long-term demand for green goods and services; public investments in infrastructure and public services to enable green markets. • Technology- or performance-oriented regulations, bans on certain products or practices and licensing requirements; and compliance with global and regional conventions and internationally legally binding directives and rules. • Tax exemption for green products.
Voluntary instruments	• Promoting voluntary schemes establishing payments for providing ecosystem services, such as carbon sequestration, watershed protection, biodiversity benefits and landscape beauty, to influence land-use decisions. • Voluntary standards for labelling and certification schemes.
Information-based instruments	• Improved institutions to deliver effective collective action, to reduce corruption, to lengthen the decision-making horizon and to alleviate information asymmetries. • Sensitization of firms, consumers and media to support sustainable behaviour. • Environmental impact assessments, environmental audits of firms. • Preparing the workforce for a green economy transition with skill enhancement programmes. • Investing in and build capacity for research, data collection and data management.
Supporting actions	• Tax exemption for green products. • Strengthening of Government capacity to analyse challenges, identify opportunities, prioritize interventions, mobilize resources, implement policies and evaluate progress. • Ensuring an enabling environment for civil society action and the inclusion of civil society in formulating, monitoring and implementing policies for sustainable development (as outlined in the Rio Declaration on Environment and Development and Agenda 21) to help gain local-level traction for national and global policies. • Promoting integrated planning at the national level. • Legal empowerment of the poor, combined with an effective social welfare system.

E. Sustainable development indicators as a tool for evidence-based policy formulation, monitoring and evaluation

Measuring progress in achieving sustainable development

In the context of the Rio+20 debate, there is growing interest among United Nations Member States in the prospect of an international framework to measure progress on sustainable development. Both the Brundtland Commission,[17] and subsequently, the 1992 Earth Summit called for practical ways to measure and assess progress toward sustainable development. But, how can the balance between the welfare of current and future generations be measured?

Measuring development sustainably means moving beyond GDP. Green accounting is a technique for assessing and better recognizing the contribution of ecosystems and other natural resources to GDP. If GDP growth is achieved by depleting natural capital, then GDP figures should be adjusted downward by the estimated value of depleted natural resources or the degraded ability of ecosystems to deliver economic benefits or cultural services. Measuring natural capital is of vital importance for the transition to a green economy. Accounting for natural capital and valuing ecosystem services and biodiversity is necessary for sound Government policymaking and reallocating investments. Changes in stocks can be evaluated in monetary terms and incorporated into the national accounts, as in the System of Environmental-Economic Accounts, developed by the United Nations Statistical Division, and in the adjusted net national savings methods of the World Bank (World Bank, 2006). Progress had already been made on accounting for marketed resources, such as minerals, and efforts are under way for valuing non-marketed resources, e.g., flood protection. The wider use of such complementary measures, including net domestic product and genuine savings rates, would provide a more accurate and realistic indication of the level of economic output and total inclusive wealth, including stocks of physical, human and natural capital (UNEP, 2011a, p. 26).

Since 1992, sustainable development indicators have been an area for innovation and advancement. The United Nations Commission on Sustainable Development developed a set of sustainable development indicators, tested by 22 countries[18] along with Eurostat (the statistical office of the EU). The Organization for Economic Cooperation and Development (OECD) focused on integrated economic, environmental and social frameworks to measure sustainable development in order to develop statistical indicators for sustainability (OECD, 2004). A Eurostat task force of national experts established in 2001 set out to develop indicators to support the EU Sustainable Development Strategy, and published sets of indicators in 2005 and in 2007. In addition, many countries have developed their own sustainable development indicator sets to assess progress towards goals in national plans or strategies for sustainable development.

The policy-based approach to measuring sustainable development

In many cases the policy framework in effect determines the indicators of progress. The indicators, which align closely with policy, impose to some extent a bias towards particular policy priorities. Changes in the policy framework can mean that the indicators have to follow suit. For example, in the United Kingdom of Great Britain and Northern Ireland, since 1996 alone there have been three sustainable development strategies and, as a consequence, three associated indicator sets. At the same time, policy indicators are relevant for policymakers and can make communication on a particular sustainable development strategy more effective.

[17] World Commission on Environment and Development, headed by Gro Harlem Brundtland, Norway's Prime Minister in 1987.

[18] Austria, Barbados, Belgium, Bolivia, Brazil, China, Costa Rica, Czech Republic, Finland, France, Germany, Ghana, Kenya, Maldives, Mexico, Morocco, Pakistan, Philippines, South Africa, Tunisia, United Kingdom of Great Britain and Northern Ireland and Venezuela.

Unfortunately, only minor consideration has been given to international comparability in the development of national sustainable development indicator sets, reflecting differing priorities and data availability among countries. In general, there is a broad consistency among countries on some sustainable development indicators that address issues of global or regional importance. According to a study that examined 20 European countries, Australia and Canada (Eurostat, 2007; Kulig, Kolfort and Hoekstra, 2007), the most common indicators are found in the following areas: GHG emissions; education attainment; GDP per capita; collection and disposal of waste; biodiversity; official development assistance; employment and unemployment rate; life expectancy (or healthy life years); renewable energy sources; risk of poverty; air pollution; energy use and intensity; water quality; general government net debt; research and development; organic farming; area of protected land; mortality due to selected key illnesses; energy consumption, emission of ozone precursors; fishing stock within safe biological limits; use of fertilizers and pesticides; freight and passenger transport by mode; intensity of water use; and forest area and its utilization.

The EU indicators set, which was developed through engagement with older member States and those with well-established national indicator sets, has seen considerable convergence among national indicators. The NMS also look to indicators adopted at the EU level when developing their own indicator systems.

The capital approach to measuring sustainable development

Extending the traditional national accounts to better reflect the importance of the environment was a key objective of the London Group on Environmental Accounting.[19] One result of their efforts is the *Handbook of National Accounting, Integrated Environmental and Economic Accounting* (United Nations et al., 2003).[20] Three different concepts of sustainable development are described in the Handbook, including the capital approach:

Sustainable development ensures non-declining per capita national wealth by replacing or conserving the sources of that wealth: stocks of produced, human, social and natural capital. (p. 4)

This definition explicitly connects wealth or well-being and capital stocks (which are necessary to produce all goods and services). Since sustainable development requires taking a very broad view of consumption, it is necessary to take an equally broad view of capital.

Society's capital base thus comprises five[21] sorts of stocks: *produced capital* (machinery, buildings, telecommunications and other infrastructure); *financial capital* (stocks, bonds, bank deposits); *human capital* (an educated and healthy workforce); *natural capital* (natural resources, land and ecosystems providing services like waste absorption); and *social capital* (functioning social networks and institutions).

The capital-based approach clarifies that development can be managed through investments in specific stocks; and that spending income on investments rather than current consumption is necessary to enhance well-being in the future. While stable or growing total wealth per capita is no guarantee of sustainable development, it is a necessary condition: declining per capita capital stocks imply that well-being will in the long run deteriorate and sustainable development will not be possible (Hamilton and Ruta, 2006).

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[19] See: http://millenniumindicators.un.org/unsd/envaccounting/londongroup/default.asp.

[20] The System of Environmental-Economic Accounts is currently being revised; the new version is planned to become a statistical standard in 2012, see http://unstats.un.org/unsd/envaccounting/seea.asp.

[21] For simplicity, a small but important, category (referred to by national accounts as intangible non-produced non-financial capital) was left out. It includes patents, leases and other transferable contacts; and the rights to extract natural resources. The complete asset classification of the *1993 System of National Accounts* can be found at: http://unstats.un.org/unsd/sna1993/tables/table_Annex_13_.pdf.

Box 2.8 Switzerland's approach to measuring sustainable development

In 2000, the Swiss Federal Statistical Office, the Swiss Agency for the Environment, Forests and Landscape and the Swiss Federal Office for Spatial Development launched the Monitoring System for Sustainable Development (MONET) project with the aim of setting up a sustainable development indicator system. Using a participative and iterative procedure involving 25 stakeholders and more than 80 specialists of the federal administration, a system of 135 feasible indicators (and 28 to-be-developed ones) was established and published in an indicator report in 2003 (see de Montmollin et al, 2004). In 2009, the system was revised and now contains 80 indicators.

Thanks to the frame of reference and the systematic framework (see below), subsets can be outlined systematically. For example, 16 key indicators are outlined as a subset of the system to focus on three key questions:

(a) Meeting needs — how well do we live?

- Health: healthy life years
- Income: household income
- Physical safety: violent crime
- Unemployment: unemployment rate

(b) Fairness — how well are resources distributed?

- Assistance to other countries: official development assistance
- Equality: wage gap between men and women;

(c) Preservation of resources — what are we leaving behind for our children

- Teenage reading skills: reading skills at 15 years of age
- Public debt: level of public debt
- Investment: Investment to GDP ratio.

The 2002 Sustainable Development Strategy's plan of action called for a general monitoring system based on indicators to be defined and updated on a regular basis. The 2008 strategy is set to expand the monitoring system's scope, making use of around 55 indicators from the MONET-system to evaluate the strategy's key challenges.

Several developments facilitate movement towards a common conceptual framework. The Joint ECE/Eurostat/OECD Task Force for Measuring Sustainable Development highlighted the importance of the "integrated view" of sustainable development: ensuring the well-being of both the current and future generations, while taking into account distributional aspects. This led to the proposal to include, together with the capital indicators, indicators on the quality of life. In addition, progress is evident vis-à-vis the measurement of human and social capital.

The post-2015 agenda

As United Nations Member States prepare for the Rio+20 Conference, proposals are circulating for how the international system can better target and measure progress on sustainable development. A proposal has been put forward to develop "Sustainable Development Goals", building on the relative success of the Millennium Development Goal model. The MDGs have demonstrated how a set of globally agreed goals can form a clear and feasible agenda for action. While MDGs do not fully cover the entire spectrum of development, they focus on critical aspects of people's life and the most acute forms of deprivation, embracing both income and other human development dimensions.

In the countries of the EECCA and SEE regions, MDGs have proven most effective when nationally adapted and incorporated into national development strategies. The United Nations has successfully supported the design of poverty reduction strategies and national and subnational strategies in Tajikistan, Kyrgyzstan, Uzbekistan, Kazakhstan, Georgia, Ukraine, Serbia, Bosnia and Herzegovina, and the former Yugoslav Republic of Macedonia.

Box 2.9 The growth of education for sustainable development in Armenia

Following achievements of the Rio Earth Summit of 1992, Yerevan State University began organizing a series of lectures on the "Theory and Practice of Sustainable Development". In 1996, based on the existing course, in collaboration with UNDP and the Association for Sustainable Human Development, Yerevan State University developed and published a Russian-language textbook, which has been also used by a range of higher education entities in Commonwealth of Independent States (CIS) countries. In 2006, the textbook, which reviews national, regional and global elements of sustainable development, was translated and published in the Armenian language.

As part of the United Nations Decade on Education for Sustainable Development, sustainable development has been included in the curricula at other universities in Armenia including the State Pedagogical University, the Armenian-Russian University and the European Regional Academy, among others.

Degrees and dissertation works on sustainable development are gradually becoming common practice. At Yerevan State University, for example, a doctoral thesis on "Research of the environmental pillar of sustainable development on global and national levels" was developed and defended in 2009; as was a dissertation on "Regional environmental policy of the Republic of Armenia in the context of sustainable development".

Since 2007, as part of a non-formal educational cycle with support of UNDP, OSCE and the Association for Sustainable Human Development together with Yerevan State University have conducted training sessions on sustainable development. Particular attention is given to members and experts of Parliament, the Constitutional Court, local government and self-government representatives.

While progress in these regions has been formidable, emerging new challenges to global development, including the global economic and financial crisis of 2008–2011, have raised the risk of reversing the gains made so far on MDGs. But this region knows well that even in good times, the achievement of MDGs does not fully resolve development problems. Poverty reduced by half still leaves millions of people critically poor and undernourished, many of them in Eastern Europe, the Caucasus and Central Asia. Child and maternal mortality will remain high in lower-income countries of this region. In the whole pan-European region, progress towards gender equality and empowerment of women has so far been less than desired, amid prevailing inequality. Targets on water supply and sanitation will not to be reached in several countries of the EECCA and SEE regions. Finally, international coordination in human development is needed in all fields, and not only in international aid (MDG 8). Thus, ample scope remains for developing an improved post-2015 agenda to rally for further action covering both existing MDGs and introducing emerging challenges, such as inequality, climate change and the loss of environmental resources.

Post-2015 human development goals, or sustainable development goals, will need to have a universal reach, allowing the world community to take on the sustainability challenge. All three pillars will need to be covered: economic (convincingly addressing market and Government failures — notably through pricing — demographic challenges and fostering green growth); social (equality, access to public services, social inclusion and nutrition); and environmental (increased energy efficiency, access to energy supplied increasingly from renewable sources and maintaining ecosystems).

Given the emerging and persistent challenge of income and other inequalities, sustainable development goals will need to include measures of social inequality (e.g., Gini coefficients), and of social exclusion.[22] Efforts to enhance composite indices like the HDI, e.g., by incorporating inequality measures, are already under way. The HDI captures educational outcomes but welfare measurements need to capture the health and environmental conditions in which people live, as well information on access to water and sanitation. Once the post-2015 agenda is agreed, development indicators will need to reflect new targets of inclusive economic policies, such as support to youth employment and to the active and healthy life of the older generation.

F. Education for sustainable development

Education is one of the best weapons to fight poverty and inequality. Each year of additional schooling can increase individual earnings by 10%. Education must foster the attitudes and behaviours necessary for a new culture of sustainability. It must be the channel for developing and transmitting new skills and knowledge. Technical and vocational education and training must provide the competences and tools necessary for green economies.

Education at all levels is key to encourage the region's populations towards greener economic decision-making. Shifting people's attitudes towards sustainable development will facilitate the region's transition to a green economy by raising awareness, increasing public participation in environmental public policy and influencing consumer and voter choices. On a more technical level, education creates a cadre of skilled professionals necessary for the transition to a sustainable development paradigm.

Access to primary education in Emerging Europe and Central Asia

In order for education to lay the foundation for sustainable choices, it needs to reach all children at a minimum at the primary level. While many countries in Eastern Europe and Central Asia have net enrolment rates higher than 90%, about 1.5 million children of primary school age remained out of school in 2008 (UNESCO, 2011). This figure does not include out-of-school adolescents of lower and upper secondary education, which is estimated at about 12 million, and 1.1 million children with disabilities who remain unaccounted for and are likely to be out of school. Specific groups of children continue to be excluded from school, particularly children affected by conflict, children from ethnic and/or linguistic groups (especially the Roma in Central and South-Eastern Europe), children with disabilities and those from economically disadvantaged families. This situation reflects serious equity issues and represents a challenge to social inclusion, economic development and social cohesion in a number of countries in Emerging Europe and Central Asia.

[22] For operational measurement of social exclusion, see the latest UNDP Regional Human Development Report (UNDP, 2011 b).

Sustainable development in university education

Since the Rio Summit in 1992, a series of universities in the pan-European region have established university chairs in fields relating to sustainable development The 40 chairs in Europe and Central Asia are included in a United Nations Educational, Scientific and Cultural Organization (UNESCO)-supported network, facilitating the twinning of universities in specific research and higher education fields worldwide.[23] Sixteen chairs have been established in Central and Northern Europe, 16 in Mediterranean countries and 8 in Eastern and South-Eastern Europe and Central Asia.

The chairs focus on social and human sciences (habitat and cities, social and human dimension of sustainable development, sustainable tourism), natural sciences (e.g., biodiversity, energy, environment, engineering, oceanography, water), education (value education, education for sustainable development and higher education) or cultural heritage and sustainable development. An increasing number of universities are applying to become members of the Network thus widening research cooperation, exchange of knowledge as well as the mobility of students and researchers.

Building awareness for green policy priorities through the media

Green jobs are not self-evident; they are the subject of intense political and policy contestation, requiring a constant flow of information and analyses, to facilitate dialogue and informed decision-making. There should be vigorous public debate to lay bare the underlying assumptions of all policy choices available. The media plays a major supporting role in making informed policy choices for green economies.

Given the inherent behaviour-change factor, sustained public support is critical to moving forward on sustainable development. Actions to raise awareness are essential: people need to understand the dramatic consequences of "doing business as usual", as well as the benefits resulting from speeding up the transition process — including improving health, avoiding the emergence of new forms of vulnerability, higher employment, keeping fossil energy for a longer period, reducing resource dependence and increasing competitiveness in the medium and long term.

Both formal education and information campaigns to promote climate-change awareness are critical for ensuring a shift in public opinion towards more sustainable choices. An educated public can exert effective pressure on politicians to look beyond short horizons — a key stumbling block for sustainability to date.

Leveraging culture for sustainable development

As a repository of knowledge, meaning and value, culture is central to shaping the relationship between people and the natural environment. Moreover, it is an area offering large possibilities of developing sustainable activities. For instance, sustainable tourism, cultural as well as creative industries, and heritage-based urban revitalization are powerful economic subsectors that can generate green employment, stimulate local development and foster creativity. The culture sector, encompassing cultural heritage, creative and cultural industries, cultural tourism and cultural infrastructure, generates substantial socio-economic benefits, including green jobs and strategic outlets for creativity. Cultural industries represent one of the most rapidly expanding sectors in the global economy. Sustainable tourism, as well as culture and creative industries, are strategic outlets for income generation and poverty reduction. Culture is a powerful economic engine generating jobs and income with a value of US$ 1.3 trillion in 2005 (globally). In Europe, arts, cultural heritage, film, music, publishing, design and new media are part of a growing industry which accounts for 2.6% of Europe's GDP, a high growth potential, and providing quality jobs to around 5 million people across EU-27 (European Commission, 2010). In the non-EU member States in Europe and Central Asia, it is estimated to be growing at even faster rates.

[23] The UNITWIN or University Twinning and Networking Programme of UNESCO.

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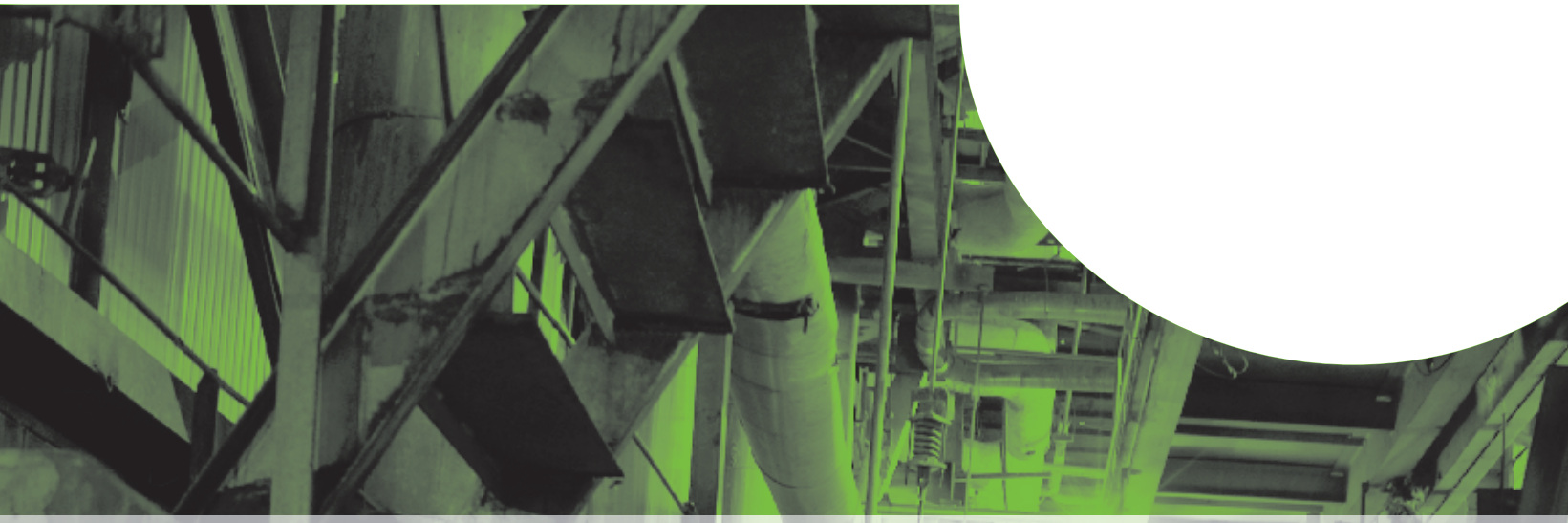
Chapter III.



Changing production and investment patterns

Chapter III. Changing production and investment patterns

In Europe and Central Asia, due to the divergence in the levels of economic development, many countries are still witnessing dramatic shifts in their structure of production. The main producing sectors, i.e., industry, agriculture and transport, remain relatively energy inefficient in most transition economies, while the EU member States have developed dynamic high-tech sectors, increasing their capabilities to innovate and to transfer their technologies to other countries through foreign direct investments (FDIs) and regional cooperation. Low-carbon transition thus presents a window of opportunity for the entire region: targeted investments in new environmental technologies and projects will boost a qualitatively different structural transformation with new green technologies leading to the emergence of new innovative industries and new jobs. In other words, the region has a great potential for energy-efficiency savings and for renewable energy production which can be integrated into a diversified pan-European energy market. Such potential can drastically change production and consumption patterns, which are at the core of the transition towards a green economy.

While it is important to link the production side with the consumption side through a life-cycle approach, it is also important to consider production and consumption patterns distinctly. This chapter focuses on production patterns: it analyses their evolving structure over time in the region and its subregions, as well as the impact of such changes in terms of energy use and CO_2 emissions; it then reviews progress made in moving toward more sustainable production patterns; finally, it delineates policies and measures aimed at accelerating this shift towards greater sustainability.

A. Sustainable production: regional trends

Energy intensity

As outlined in chapter I, despite downward trends, energy intensity (defined in box 3.1, together with carbon intensity and energy efficiency) remains well above the EU levels in emerging economies of the region (figure 3.1). Levels remain particularly high in countries of Eastern Europe, the Caucasus and Central Asia because of the dominant role of energy-intensive industries, outdated production technology and low energy prices. However most of these countries have made impressive progress since the 1990s. Such progress can be attributed to a structural change towards less energy-intensive economic activities and the increased use of less carbon-intensive energy sources, such as gas and nuclear power.

Furthermore, economic activity in the pan-European region increased faster than energy consumption over the past two decades, due to significant energy-efficiency improvements. Technical progress and energy efficient investments are the principal sources of such improvements.

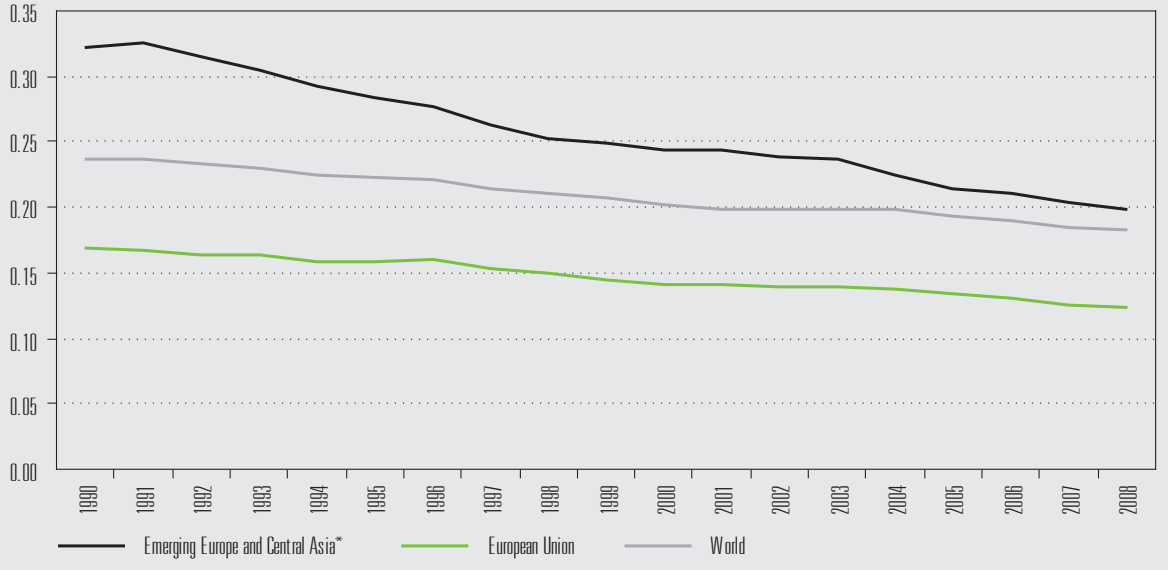
Box 3.1 Energy intensity and energy efficiency

Energy intensity is the amount of final energy (or end-use energy) used to produce a certain amount of physical output. Similarly, CO_2 intensity is a rough measure of a country's potential to switch from high-carbon fuels to low-carbon fuels, such as gas or renewable energy (World Bank, 2010). Energy-efficiency refers to an output that can be produced with a given amount of energy. It is measured as the ratio of useful outputs to energy inputs for a system, where the latter may be an individual energy conversion device, a boiler, or a building, an industrial process, a firm, a sector or an entire economy (Sorrell, 2010); for example, the number of tons of steel that can be melted with a megawatt hour of electricity.

The notion of energy efficiency is closely related to energy productivity, or the level of output achieved from the energy consumed. Whereas energy efficiency is the overarching idea of doing more or the same with less energy, energy productivity refers to increasing the cost-effectiveness of the use of fuel or electricity either through raising the technical efficiency of fuel conversion, or lowering the cost of energy input (Brookes, 2000). Energy productivity combines energy efficiency and the curbing of energy demand (or energy conservation).

At the level of a specific technology, the difference between energy efficiency and intensity is insignificant — one is simply the inverse of the other. High levels of energy efficiency are associated with low levels of energy intensity (Stern, 2009). The level of energy intensity can be influenced by the "economic structure" (i.e., the contribution of various sectors to GDP), the primary energy mix (i.e., the shares of coal, oil, gas, biomass, other renewables and nuclear), climate conditions, the level of economic development and lifestyles, the transport and logistics sector performance and the technical energy efficiency.

Figure 3.1 Energy intensity of GDP: units of energy use per GDP, 1990-2008 (kilogram (kg) of oil equivalent per US$ of GDP)



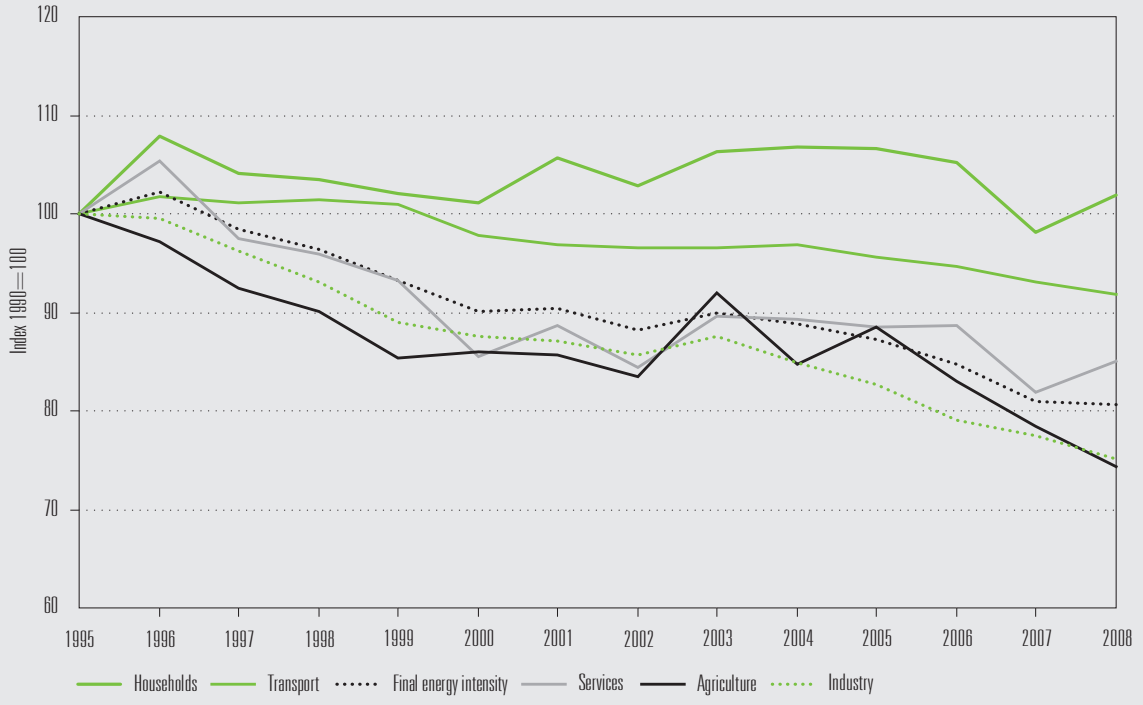
Source: ***Bank database, United Nations Industrial Development Organization (UNIDO) calculations.***

Note: ***GDP at purchasing power parity exchange rates and 2005 prices.***

** Excludes Montenegro and includes Cyprus and Malta.*

Figure 3.2 shows sectoral trends in energy intensity in the EU-27 area. Agriculture and industry are the producing sectors with the greatest energy-intensity improvements, amounting to about 25% between 1995 and 2008. Over the same time period, energy intensity in the service sector and transport declined by 15% and 8%, respectively. By contrast, the household sector has increased energy intensity by 2% due to the larger and more numerous dwellings, as well as the growing use of electrical appliances (EEA, 2011).

Figure 3.2 Energy intensity by sector, EU 27 (1995-2008)



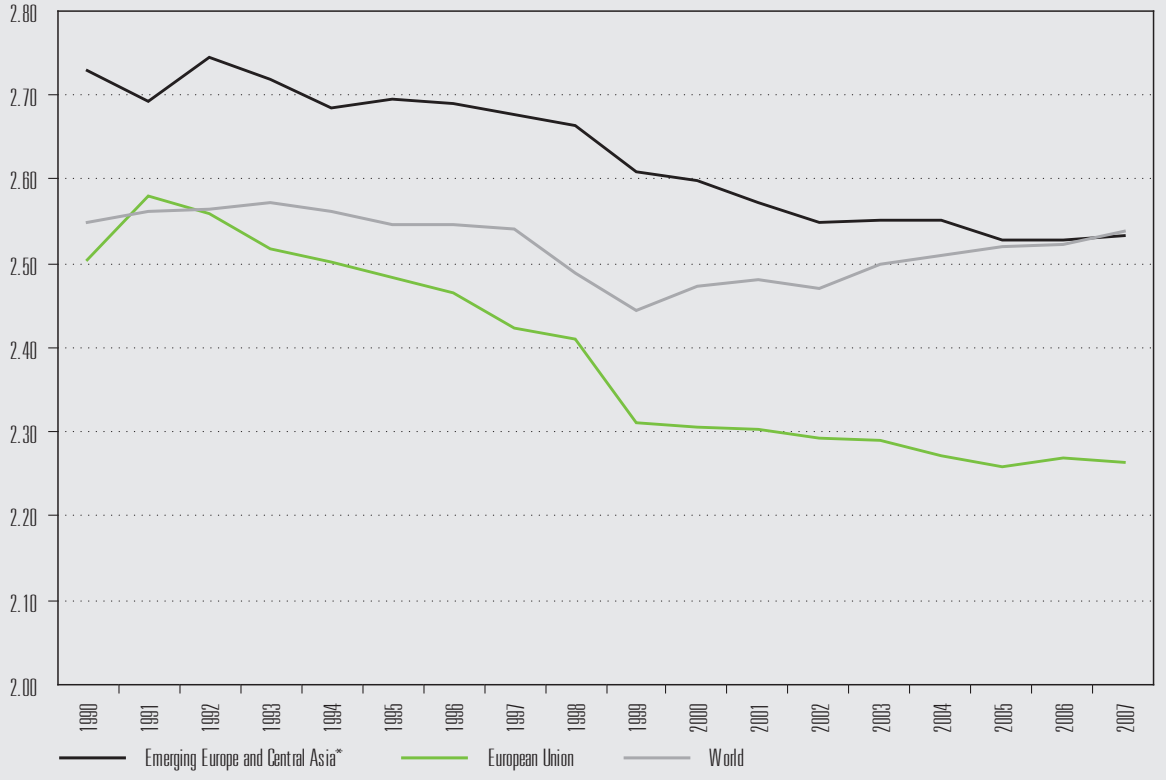
Source: ***EEA (2011).***

At the global level, the amount of primary energy used per unit of GDP is decreasing. This is the result of the combined effect of higher energy prices, energy efficiency and CO_2 abatement policies and programmes, and the structural change towards services. While there is a convergence among regions over time, countries of Eastern Europe, the Caucasus and Central Asia have the highest primary energy intensity after China and they use 2.7 times more primary energy per unit of GDP than Europe, the world region with the lowest energy intensity.

CO_2 intensity

Since the mid-1990s, the CO_2 intensity of energy use of the EU-15[24] has been well below the global average and has decreased significantly over the period, diverging from the global trend since 1999 (figure 3.3). The carbon intensity in Emerging Europe and Central Asia remained well above that of the EU as a whole, although with a declining trend and convergence towards world levels as of 2005. Between 1990 and 2008, carbon emissions in Emerging Europe and Central Asia fell by around 28%. However, despite this trend it is predicted that CO_2 emissions in the region will exceed the 1990s levels by 2015 (World Bank, 2010).

Figure 3.3 CO_2 intensity of the economy (energy-related CO_2 emissions), 1990-2007
kg per kg of oil-equivalent energy use



Source: ***World Bank database, UNIDO calculations.***

* Excludes Montenegro and includes Cyprus and Malta.

The reduction in the carbon intensity of energy use has been driven by a shift from coal and oil towards natural gas, nuclear power and renewable sources (EBRD, 2011). The key factor has been changing demand of industry and power generation for carbon-intensive fuels, namely coal-based power and heat generation.

Within the region there is a considerable divergence between countries in terms of carbon intensity. In 2008, the carbon intensity of Uzbekistan, Kazakhstan and Turkmenistan was the highest in the region (annex table 2). A national endowment of natural resources has impacted upon CO_2 emissions. Carbon-energy intensive countries such as the Russian Federation

[24] The 15 member countries in the EU before the enlargement on 1 May 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

and Kazakhstan have much higher emissions than the EU despite their lower economic activity. Conversely, countries with a higher share of energy from renewable sources, but which are less affluent, such as Tajikistan and Kyrgyzstan, emit very low levels of CO_2 per capita (figure 1.1, chap. I).

Impact of international trade flows on carbon intensity

The relatively good performance of the EU with respect to carbon emissions results partly from international trade. In many countries, there is a significant difference between the emissions resulting from domestic production (territorial emissions) and the emissions embodied in domestic consumption (consumption emissions) because of net imports. A decrease in the emissions from production within a country or region may therefore reflect a shift of carbon-intensive activities to other economies rather than more sustainable consumption patterns. Empirical studies confirm that large flows of carbon emissions are embodied in international trade. For instance countries like the Russian Federation, Ukraine and Kazakhstan are major net exporters of carbon, whereas the EU-15 and the United States are major net importers of carbon (EBRD, 2011).

The available data show that reductions of territorial CO_2 emissions in a number of high-income countries of the ECE region have been made possible by energy-intensive imports (annex table 3). For instance, the territorial CO_2 emissions of the EU-15 countries in 2008 were 67 million tons below the 1990 level, while the emissions embodied in consumption of the EU-15 in 2008 were 89 million tons above the comparable 1990 level. More generally, the territorial carbon cuts in high-income ECE economies have been made possible by carbon-intensive imports of goods and services from low- and middle-income countries. By contrast, the territorial CO_2 emissions and consumption-related emissions in the countries of Eastern Europe, the Caucasus and Central Asia declined by 1,230 and 565 million tons, respectively, over the same time period, contributing decisively to the reduction of the carbon footprint of the pan-European region as a whole. The high carbon content of exports of the large economies of the subregion reflects their resource endowments, as well as the artificially low domestic energy prices.

B. Progress in shifting towards more sustainable production and investment patterns

Environmental impact of the changing production and investment pattern in the pan-European region

The tertiarization process, involving a structural shift from goods-producing industries to less energy-intensive service sectors, can contribute to a reduction in the energy intensity of the economy. In the pan-European region, this tertiarization process, shown by the rising value added share of services (from 47%–71% between 1970 and 2005), slightly receded in the last three years, to the advantage of "mining and utilities" and construction industries. The shares of agriculture and manufacturing, with declining trends in the previous decades, stabilized at 2% and 17% respectively (table 3.1).

Table 3.1
Sector distribution of total value added in the pan-European region (percentage shares at current prices)

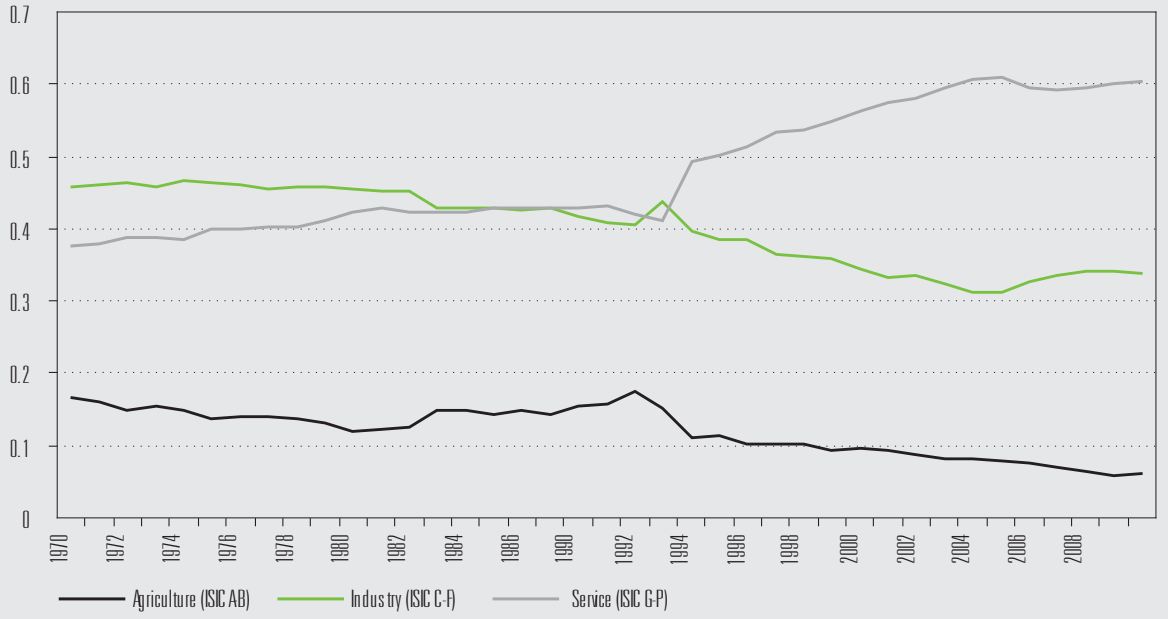
	1970	1975	1980	1985	1990	1995	2000	2005	2008
Agriculture	10.4	8.0	6.3	6.9	5.1	3.3	2.6	2.2	2.2
Industry	43.0	41.0	39.4	37.3	34.1	30.1	28.5	27.2	27.9
Mining and utilities	2.5	2.6	3.5	3.8	4.3	3.7	3.6	4.1	4.4
Manufacturing	32.4	30.3	28.5	26.9	23.0	20.3	19.3	17.2	17.2
Construction	8.1	8.0	7.4	6.6	6.8	6.2	5.6	5.9	6.4
Services	46.7	51.1	54.3	55.8	60.8	66.6	68.9	70.6	69.9
Wholesale and retail trade, restaurants and hotels	11.5	12.2	13.2	13.5	13.5	14.6	14.9	14.6	14.7
Transport, storage and communications	5.9	6.1	6.2	6.1	7.0	7.0	7.0	7.2	7.2
Other activities	29.3	32.8	34.9	36.2	40.3	45.0	47.0	48.8	48.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Source: **UNIDO (2009a).***

Trends in Emerging Europe and Central Asia also show the growing importance of services, the rising shares of mining and utilities and, conversely, the decreasing share of agriculture and manufacturing. As illustrated in figure 3.5, the share of services significantly increased from 41.9% in 1990 to 57.9% in 2000 and stabilized during the 2000s, reaching 60.3% in 2008.

In the 1990s and 2000s, the most important drivers of structural change were transport and communication, followed by "other activities", which include research and development, computer activities, financial intermediation and public administration. The share of non-tradable services (wholesale and retail trade, restaurants and hotels) decreased in the early period of transition (in the early 1990s), but later became a major element in the displacement of industry and agriculture in the overall economic structure.

Figure 3.4 Value added by agriculture, industry and services in Emerging Europe and Central Asia, 1970–2008



Source: ***UNIDO database (Indstat2 2011), UNIDO calculations.***

Note: ***ISIC = International Standard Industrial Classification of all Economic Activities.***

In terms of international competitiveness, economic diversification and growth based on high value added sectors in manufacturing still remain elusive development goals. Several countries, particularly in Central Asia, are mainly oriented towards low value added agriculture and extractive industries such as oil, gas and metals, which are vulnerable to global price shocks.

The changing investment pattern is a key driver of this structure of production. As shown in table 3.2 below, the most attractive sector for foreign investors is raw material extraction (mainly gas and petroleum) which reached 12% of world inward FDI flows in the countries of the EECCA and SEE regions, as compared to 4.1% for the services sector and 2.8 for manufacturing.

Table 3.2.
Estimated world inward FDI flows, by sector, 1990–1992 and 2007–2009 (shares)

Sector/Industry	1990–1992				2007–2009			
	Developed countries	Developing countries	EECCA and SEE	World	Developed countries	Developing countries	EECCA and SEE	World
Primary	65.8	28.3	5.9	100.0	47.7	40.1	12.2	100.0
Agriculture, hunting forestry and fishing	1.8	98.2	0.0	100.0	6.9	84.3	8.8	100.0
Mining, quarrying and petroleum	68.9	24.9	6.2	100.0	49.3	38.3	12.3	100.0
Manufacturing	65.6	33.9	0.5	100.0	61.3	35.9	2.8	100.0
Services	79.9	19.9	0.2	100.0	69.5	26.4	4.1	100.0
Total share	72.7	26.5	0.8	100.0	65.5	30.0	4.5	100.0

Source: ECE calculations based on UNCTAD/WEF (2011).

Greening the energy sector

From the production perspective, the generation of electricity and heat is the largest source of global GHG emissions, followed by transport, manufacturing and construction, and agriculture. In Europe and Central Asia, these sectors generate about four fifths of GHG emissions. Energy industries alone account for one third of GHG emissions in the EU (31% in the EU-15 countries and 47% in the NMS), more than one third in Turkey and the United States, and almost three fifths in the Russian Federation (table 3.3).

Table 3.3
Distribution of GHG emissions by sector, 1990–2009 (percentage shares)

	EU-15	NMS	Russian Federation	Turkey	United States
1990					
Agriculture	10.9	14.0	9.3	20.9	7.2
Energy industries	28.9	43.1	34.3	24.0	34.5
Manufacturing and construction	15.8	16.0	6.3	26.5	16.0
Transport	17.2	6.4	10.0	18.5	27.9
Other sectors	27.2	20.5	40.1	10.0	14.3
2009					
Agriculture	11.0	13.0	9.5	8.9	7.5
Energy industries	30.9	46.6	57.7	35.8	38.7
Manufacturing and construction	13.2	11.2	8.8	19.3	13.1
Transport	23.6	16.2	13.2	16.5	30.7
Other sectors	21.2	12.9	10.8	19.4	10.0

Source: ECE calculations based on the United Nations Framework Convention on Climate Change (UNFCCC) GHG emission data.

Current data on national energy mixes show that development of alternative energy sources is still nascent in most countries, despite vast potential. The energy mix varies widely among the countries of the region. Half the countries are net energy exporters, some countries are highly dependent on high carbon fuels such as oil and coal, and several countries are heavily reliant on energy imports. The share of renewables in the energy mix varies considerably among countries of the region, ranging from close to 100% in Albania and Tajikistan to a negligible contribution in Poland. Estonia, Poland and the former Yugoslav Republic of Macedonia are heavily reliant on coal. Others have a more diverse energy mix. For instance, Hungary gets a quarter of its electricity from coal, a quarter from natural gas, nearly 40% from nuclear power and 10% from oil. Hydroelectric power represents only 1% of the country's electricity supply. Turkey relies on imports for more than half its energy and has been trying to diversify its energy sources, for instance by recently introducing natural gas. Its energy demand is predicted to grow substantially, as it has for several decades, due to a fast growing population, urbanization and economic growth. There are also plentiful renewable sources of energy, including hydro, solar, wind, geothermal and biomass, and these represent the second largest domestic source after coal. Both Western and Eastern Europe (including Armenia, Bulgaria, France, Hungary, Lithuania, Slovakia, Slovenia and Ukraine) remain heavily dependent on nuclear power.

The energy sector in many countries in the region relies on imports of natural gas, oil and electricity. Growing populations, urbanization and economic growth in some countries will raise energy demand further, putting additional pressure on regional energy security. How to meet ambitious targets for cutting GHG emission set out by the EU for its members and potential members and how to deal with the issue of energy security have hence become major policy concerns for economies in the region.

If countries are to gain the maximum potential from renewable energy, they will require investment in new technologies. Already, electricity systems in many countries are under stress from ageing infrastructure and growing demand. The vision of an era of clean energy, as described by proponents of the "third industrial revolution" involves the transformation of millions of buildings into power stations, linked to "smart grid" networks that regulate the flow and supply of energy. Smart grids are an essential element of the transition to a carbon-free economy, enabling efficient and reliable energy delivery. At present, however, there is little evidence of public investment in renewable energy in emerging economies of the region and there are insufficient positive incentives for private sector investments (WEF/Accenture, 2009).

Box 3.2 Smart grids

A smart grid is an electrical grid that gathers and distributes electricity based on digital information about the behaviour of all participants (suppliers and consumers) in order to improve the efficiency, reliability, economics, and sustainability of electricity services. Renewable energy and smart grids go hand in hand. As more and more countries diversify their energy sources to include solar, hydro, biomass and wind, grids must adapt to manage variability issues (e.g., wind speed is not constant). Smart grids are becoming more sophisticated and intelligent through the extensive use of ICTs, and many foresee an expansion towards energy storage facilities in electric vehicles, which will help to accelerate the expansion of renewables (REN 21, 2011, p. 58). The market in Europe in smart grids is expected to reach almost $10 billion in 2015. Smart grids represent a solution to two critical challenges: they encourage renewable power while helping to prevent blackouts, and they revolutionize energy production, distribution and use, enabling developing countries without conventional grids to fast-track development. They promise to increase the supply of energy and provide an opportunity to invest in ageing infrastructure. Investment can also be used to boost innovation, jobs and green growth, increasing the reliability, security and diversification of energy sources.

The following factors are contributing to the development of smart grids (EC, 2006, p. 11):

- Targets at European and national levels on reducing carbon emissions and expanding renewable energy sources.
- The need to tackle technical challenges and limitations of existing grid networks.
- Existing grids are nearing the end of their operational and functional life spans.
- Grids are becoming congested due to rising demand.
- Desire to bring benefits to customers at the earliest possible point.
- To reduce the risk associated with investment decisions.
- Technological improvements are lowering costs.

Smart grids also have an important role to play in sustainable development, and in connecting regions. The European Commission predicts that smart grids will connect different but complementary energy sources from regions, allowing for trading opportunities and exchange between EU States, countries in Eastern and South-Eastern Europe and even Africa (EC, 2006, p. 22). The development of smart grids is likely to be incremental with OECD economies leading the way (WEF/Accenture, 2009), but the massive potential for renewable energy production is likely to lead to a rapid expansion into the region.

In the Russian Federation, despite its vast renewable energy potential (thanks to a geography that is suitable for wind, geothermal and solar energy generation), mineral resources continue to dominate the energy sector. In 2009, around 1% of power was generated from renewables. The Russian leadership has, however, shown interest in high-value and high-technology sectors, such as the manufacture of wind turbines. The latest Government energy strategy aims for 4.5% of energy from renewables by 2020.

Renewable energy sources and new technologies allow countries to meet EU targets without sacrificing geopolitical and economic security in the region. There are calls for the diversification and localization of energy supply linked to pan-European energy networks, involving millions of local micro-producers sharing energy from renewable sources, such as wind and solar, in the same way that information is produced and shared on the Internet through open source (Rifkin, 2011). A decentralized network of micro-producers will require intelligent approaches to distribution and storage, such as the use of smart grids (see box 3.2) involving ICTs, whereby energy that is generated locally can be fed into an "inter-grid" and consumed where and when it is needed, increasing the efficiency and flexibility of supply. Advanced energy storage can also be used to reduce the variability of generation associated with renewable energy sources.

Most of the new technologies and smart solutions for greening the power sector will come with high initial price tags, as economies in the eastern part of the region are technologically weak and hence dependent on Western European countries' supply of these new green technologies. The OECD **data** on patents and Government expenditure shows that, from a relatively low starting point, investment in green technologies is expanding rapidly, although in emerging economies of the region for which there is data, there is substantially less innovative activity than in market leaders. The Russian Federation, for instance, spent around 2% of its budget on energy and environment priorities, compared to 14% in New Zealand (OECD, 2011b).

Greening the manufacturing sector

The manufacturing sector in advanced economies of the region experienced a rapid growth of energy efficiency and declining carbon intensity over the past two decades. These improvements have resulted from a combined effect of cost-reducing technical progress and the changing composition of manufacturing output that has increased the share of technologically advanced subsectors. These trends have also materialized to some extent in emerging economies of the region. Generally, the progressive transformation of the manufacturing sector has taken place more rapidly in new EU member States than in other transition economies. The relatively carbon-intensive manufacturing sector in EECCA and SEE economies continues to be characterized by outdated production technology and high output shares of heavy industry. The low prices of domestic energy in economies of the subregion reduce the incentives for adopting more energy-efficient production techniques in the iron and steel industry where the Russian and Ukrainian firms are already price competitive on the world market (EBRD, 2011).

Manufacturing energy-intensity classifications developed by the United Nations Industrial Development Organization (UNIDO) show that in Emerging Europe and Central Asia high-energy intensive sectors continue to represent more than 30% of manufacturing value added. Around 30% of manufacturing value added is produced in moderate energy-intensive sectors. During the 1970s and 1980s the share of high and medium energy-intensive sectors gradually increased, but fell after 1990, following the collapse of central planning that led to a reduction in heavy industrial activity. The maximum share (nearly 80%) of high and moderate energy-intensive sectors was achieved in 1995, as regional economies started to recover. Subsequently, the share of those sectors started to decline, owing to changes in the structure of manufacturing. However, low energy-intensive sectors still account for less than 35% of total manufacturing value added. This manufacturing structure affects the overall standing of the region by energy intensity, contributing to its poor performance in comparison with other regions of the world and the global average. Nevertheless, a convergence process of energy intensity between Western Europe, new EU members and the EECCA and SEE transition economies can be observed (UNIDO, 2009a).

Policies for sustainable industry

A number of countries of Emerging Europe and Central Asia adopted energy-efficiency programmes with ambitious targets (annex tables 4 and 5). Moving away from fossil fuels to renewable energy sources, such as nuclear, carbon capture and storage, and developing of energy networks, will therefore require the promotion of low-energy demand lifestyles and investment in new energy technologies and supporting systems, including new infrastructure to transmit, store and produce energy, which can raise energy efficiency, diversify production and cut energy demand. But this will require substantial external financial and technical assistance.

Table 3.4
Policies for sustainable industrial production

National action plans	• **EU.** National Energy Efficiency Action Plans (NEEAPS) adopted by EU member States combine a range of tools, including financial incentives, technical assistance tools, information provision, recognition programmes, mandatory auditing and research and development support. • **EECCA and SEE.** Most EECCA and SEE countries have adopted legislation or national programmes for the rational use of energy.
Regulatory instruments	• **Western and Central Europe and North America.** Integrated environmental permitting for large industry specifies major pollutant emission limits and on-site monitoring procedures. • **Western and Central Europe and North America.** Construction companies have to comply with minimum energy-efficiency standards for new buildings. • **EECCA.** Environmental permitting based on detailed pollution limits for numerous individual substances.
Economic instruments	• **Western and Central Europe and North America.** Cost-reflective energy prices stimulate producers to introduce energy-saving innovations. • **EU.** Cap-and-trade system puts a price on carbon emissions of major producers. • **Western and Central Europe.** Subsidies for low-carbon producers.
Voluntary agreements	• **Western and Central Europe.** Many firms adopted voluntarily International Organization for Standardization (ISO) environmental management and product standards, as well as agreements for energy efficiency at the industry level.
Innovation policies	• **EU.** The European Commission has established an eco-innovation initiative to bridge the gap between research and development and commercial application. The initiative is based on the idea that the best eco-innovation products or processes are those which can be replicated across the whole EU. • **EECCA and SEE.** Some EECCA and SEE countries in Eastern Europe have adopted eco-innovation initiatives similar to the EU initiative.

Greening the transport sector

Transport is an increasingly important source of GHG emissions in all parts of the ECE region. This reflects the rapid expansion of transport activity that has overwhelmed considerable improvements in energy efficiency of all transport modes. Despite the comparatively strong growth of civil aviation and navigation subsectors, road transport continues to produce more environmental pressures than any other mode, accounting for about three quarters of CO_2 emissions from transport.

Technological progress has strongly reduced the energy and carbon intensity of transport over the past two decades. Road vehicles have become more energy efficient, less polluting and less noisy. Transport infrastructure materials are more sustainable and environmental impact assessment studies have become sounder. Nevertheless, technological advance by itself is unlikely to achieve sustainable transport. On average, vehicles have increased in size, weight and power, but, even more important, they have increased in quantity as have the distances driven. As a result, the overall impact of road transport on the environment has worsened over the past 20 years.

The supply of transport services has become greener, mainly through the technological development. Governments have at their disposal a number of policy instruments to "green" the transport sector. These policies are on both the supply and demand side. Providing greener road infrastructure and services is becoming a reality in many ECE countries (e.g., Austria, Sweden and the United Kingdom) and their best practices could be studied for wider implementation. On the demand side, many Governments experiment with demand management policies to curb excessive motor vehicle traffic and promote non-motorized transport modes (cycling and walking) and public transport in urban areas (for more details, see chap. IV).

Although controversial, taxation of fuels is used as a policy instrument in a number of countries. The fuel tax increases to some extent the internalization of externalities linked to road transport. The increased operational costs of vehicles could result in a shift to more environmentally friendly transport modes, such as rail or inland waterways, providing that such alternatives are available and can compete with road transport in terms of cost and quality of service (e.g., timelines, reliability).

A relatively new policy instrument aims to change the modal split of freight transport from road to rail with the aid of tolling charges on trucks. In 2001, Switzerland introduced a performance-related heavy-vehicle fee levied on all trucks of more than 3.5 tons. They are charged on the whole Swiss road network, according to the kilometres driven, the total weight and the vehicle's emission levels. Germany introduced tolling charges for trucks in 2005, followed by the Czech Republic and Slovakia within a few years. In the new system trucks are charged according to the distance travelled and emission levels.

The financial instruments can be combined with a number of regulations pertaining to the technical performance of new vehicles. For example, the ECE regulations on vehicle emission limits are shown in figure 3.6. These limits combined with the EURO standards introduced by the EU have had a great impact on reducing the emission of especially local pollutants.

These regulatory instruments usually target only new vehicles. Combined with increasing taxes on vehicles, such regulations make new vehicles more expensive and as a result national vehicle fleets are not getting renewed rapidly. This is a major issue in many countries of the region. However, the so-called *bonus-malus* system has therefore been introduced in some jurisdictions. This system provides financial incentives for buyers of new vehicles when they replace an old car with a more environmentally efficient model. This example also shows that there is not one single instrument to improve sustainability; instead a mix of measures must be used to achieve the best results.

Greening the agricultural sector

On average, agriculture accounts for about one tenth of GHG emissions in the ECE region (see table 3.3). Europe and Central Asia are characterized by diverse social, economic and environmental problems resulting from agricultural policies and practices. In parts of the region, the unsustainable use of natural resources and adverse consequences of global changes have significant effects on everyday life. Such impacts hit hardest on the poorest and most vulnerable communities in the region (e.g., in Central Asia), which have limited natural resources and opportunities for growth. There are significant differences in agro-ecological conditions among the farming systems in the region. The agro-ecologies vary from one of the world's most fertile regions in South-Eastern Europe to poor, water-scarce regions of Central Asia. This agro-ecological diversity, plus the heterogeneity of political, economic and social conditions in the region, has resulted in the development of a wide variety of farming systems as shown in table 3.5 below.[25]

[25] See http://www.fao.org/farmingsystems/EU_leg_en.htm; ftp://ftp.fao.org/docrep/fao/003/y1860e/y1860e00.pdf.

Table 3.5
Major farming systems in Eastern Europe and Central Asia

Farming systems	Land area (% of region)	Agricultural population (% of region)	Principal livelihoods	Prevalence of poverty
Irrigated	1	4	Cotton, rice, other cereals, tobacco, fruit, vegetables, off-farm	Moderate- extensive
Mixed	4	18	Wheat, maize, oilcrops, barley, livestock	Low-moderate
Forest-based livestock	3	5	Fodder, hay, cereals, industrial crops, potatoes	Moderate
Horticulture mixed	3	11	Wheat, maize, oilcrops, fruit, intensive vegetables, livestock, off-farm income	Moderate - extensive
Large-scale cereal vegetable	4	16	Wheat, barley, maize, sunflower, sugarbeet, vegetables	Moderate - extensive
Small-scale cereal livestock	1	4	Wheat, barley, sheep and goats	Moderate
Extensive cereal-livestock	18	15	Wheat, hay, fodder, cattle, sheep	Moderate - extensive
Pastoral	3	10	Sheep, cattle, cereals, fodder crops, potatoes	Moderate - extensive
Sparse (cold)	52	2	Rye, oats, reindeer, potatoes, pigs, forestry	Extensive
Sparse (arid)	6	8	Barley, sheep	Extensive
Urban-based	<1	7	Vegetables, poultry, pigs	Moderate

Source: ***Food and Agriculture Organization of the United Nations (FAO) data (http://www.fao.org/DOCREP/003/Y1860E/y1860e06.htm#P3_34) and expert knowledge.***
Note: ***Prevalence of poverty refers to number in poverty, not depth of poverty, and is a relative assessment for this region. Water bodies account for 5% of the total regional land area.***

The pan-European region is characterized by a stagnating population of about 900 million people. This is the result of divergent national developments, with the countries of Eastern and Western Europe experiencing stagnant or declining populations while Turkey, Azerbaijan and the Central Asian Republics are still experiencing a considerable growth in their populations. Food security is not a problem in most countries of the region, with the exception of some countries of Central Asia which have a relatively high incidence of chronic undernourishment. In these countries, women play an important role in food security (box 3.3). Most European countries have eliminated hunger; however, overnourishment (obesity) has been increasing in both Eastern and Western Europe.

Production trends in Europe and Central Asia reflect the adaptation of agriculture to a demand-constrained environment, reflecting subdued population growth and the fairly high per capita level of food consumption, beyond which the scope for further increases is rather limited. Agricultural production has been supported by demand for biomass to be used as feedstock in biofuel production and exports to other regions. Nevertheless, Europe as a whole is expected to remain a net importer of agricultural products. Given the uncertainties surrounding future developments and the economic viability of biofuels, most projections assume a modest expansion of biofuel demand over the next decade.

Box 3.3 Women and food security in Central Asia

Women's role in local food security is profound in Central Asia. As the predominant part of the agricultural workforce in rural areas, women are exposed to adverse impacts related to climate change. Being primarily responsible for managing household food consumption, women have to deal with rising food prices. Securing water for rural households is also a task largely performed by women. This reality raises two issues: first, the value of the knowledge and insights being acquired by female farmers through their engagement in agricultural production for the effective design of climate-change coping strategies and mechanisms is lost. Second, the importance of women's access to, and control over, economic assets, including land and land use-related decisions, is neglected. Without economic means, women cannot apply their choices in controlling their own consumption and production patterns, especially when making greener choices may be a costly affair. Furthermore, women in those countries are excluded from policymaking. Their insights are not fully utilized in policy decisions related to more sustainable agricultural activities. Thus, the following issues need to be urgently acted on, particularly in the context of rural Central Asia:

- De facto equality between men and women in control over their property and land rights.
- Improvements in the gender balance in decision-making processes at the household, community and local government levels;
- Provision of inexpensive social services to facilitate women's equal access to and rights regarding the labour market.
- Changes in the social perception of gender norms and stereotypes.

Conventional production methods predominate in the region. In addition to high levels of CO_2 emissions, conventional agriculture increases environmental pressures through soil erosion; eutrophication; pollution of drinking water with nitrates; water-logging and salinity; pesticide contamination; biodiversity degradation; and rangeland degradation. Even in the EU, where approximately half of the land is farmed and contributes to the maintenance of a unique countryside and ecosystems, environmental problems such as pollution of surface waters and seas by nutrients, loss of biodiversity and pesticide residues in groundwater persist (EEA, 2009).

Many key ecosystem services provided by biodiversity, such as nutrient cycling, carbon sequestration, pest regulation and pollination, sustain agricultural productivity. Promoting the healthy functioning of ecosystems ensures the resilience of agriculture as it intensifies to meet growing demands for food production. Climate change and other stresses have the potential to make major impacts on key functions, such as pollination and pest-regulation services. Learning to strengthen the ecosystem linkages that promote resilience and to mitigate the forces that impede the ability of agro-ecosystems to deliver goods and services remains an important challenge.

This situation calls for sustainable crop production intensification, a new paradigm which aims at enhancing sustainable use and management of natural resources by producing more from the same area of land while conserving resources, reducing negative impacts on the environment and enhancing natural capital and the flow of ecosystem services. This new paradigm can be summed up in the words "save and grow", meaning a productive agriculture that conserves natural resources. Along the same line, climate-smart agriculture, promoted by the Food and Agriculture Organization of the United Nations (FAO) and other partners, includes interventions that would increase yields (poverty reduction and food security), make yields more resilient in the face of extremes (adaptation) and make the farm a solution to the climate-change problem rather than part of the problem (mitigation).

Thus, farming systems for sustainable intensification offer a range of productivity, socio-economic and environmental benefits to producers and to society at large, including high and stable production and profitability; adaptation and reduced vulnerability to climate change; enhanced ecosystem functioning and services; and reductions in agriculture's GHG emissions and carbon footprint.

Conservation agriculture is now practised on about 117 million hectares (ha) worldwide, or about 8% of total crop-land. However, in order to achieve the sustainable intensification necessary for increased food production, the conservation practices need to be supported by four additional management practices:

- *The use of well-adapted, high-yielding varieties* with resistance to biotic and abiotic stresses and improved nutritional quality;
- *Enhanced crop nutrition based on healthy soils*, through crop rotations and judicious use of organic and inorganic fertilizer;
- *Integrated management of pests, diseases and weeds* using appropriate practices, biodiversity and selective, low-risk pesticides when needed;
- *Efficient water management*, by obtaining "more crops from fewer drops" while maintaining soil health and minimizing off-farm externalities.

In spite of the large agricultural potential of the Caucasus and Central Asia, agricultural productivity and profitability vary widely across the countries of the subregion. This is mainly due to low and variable rainfall, scarcity of arable land, fragmented landholdings and serious degradation of natural resources in terms of soil erosion, salinity, loss of soil fertility and organic matter, overgrazing and desertification, all of which undermine agricultural growth and sustainable food production. To improve rural livelihoods and food security through increased productivity of irrigated farming systems in the subregion, the practices of conservation agriculture can provide a strategic entry point for sustainable land and water management. Furthermore, improved productivity through conservation farming practices has a great potential to revitalize the economies of the Caucasus and Central Asia while enhancing and conserving the quality of natural resources.

Strengthening sustainability in agriculture requires also the reduction of very high spillage and wastage all along the food production and consumption chain. For example, in Central Asia, over 20% of production is lost or wasted in harvest, storage, transport, processing and distribution of food. Better management systems and techniques for these different stages of the value chain would thus increase profitability substantially while reducing pressure on the environment.

Organic agriculture systems have a strong potential for building resilient food systems in the face of uncertainties, through farm diversification and building soil fertility with organic matter, especially in Europe and Central Asia (box 3.4). Additionally, organic agriculture offers alternatives to energy-intensive production inputs, such as synthetic fertilizers. Certified organic products provide higher income options for farmers and, therefore, encourage climate-friendly farming practices.[26] Worldwide sales of organic produce reached nearly $5 billion in 2009, with Western Europe and North America accounting for 96% of the market (48% each). There are about 260,000 organic producers, 35,000 processors and 2,500 importers of organic produce in Western Europe. In Eastern Europe, the Caucasus and Central Asia, organic agriculture is still at a rather early stage of development except for the Republic of Moldova and Ukraine, where it covers 2% and 1% of farmland respectively (see also chap. V, box 5.2).

[26] See http://www.fao.org/docs/eims/upload/275960/al185e.pdf; http://www.fao.org/organicag/oa-home/en/.

Box 3.4 Organic farming in Romania

Organic farming in Romania is a dynamic sector with more than 3,000 producers and over 100 processing operators in 2010. The Romanian Ministry of Agriculture expects the number of producers to triple by the end of 2011. Renewable energy and smart grids go hand in hand with this growth. Romanian exports of organic produce to Western Europe amounted to €150 million (150,000 tons) in 2010. Moreover, the domestic market for organic products has been experiencing annual growth rates of 20% in recent years. Domestic production has been unable to satisfy domestic demand, resulting in a rise in organic imports to €35 million by 2010. Converting conventional farms to organic producers is a high priority for the Romanian Government. Since 2010, the Government has been allocating small subsidies for farms in the process of conversion, amounting to €400 per hectare.

Over 100 indigenous peoples live in Eastern Europe, the Caucasus and Central Asia (Laletin and Bocharnikov, 2010). Traditional local and indigenous knowledge of sustainable production techniques continues to be lost throughout the region, particularly in rural and mountain areas. Sustainable aboriginal practices such as berry gathering, hunting, fishing, mountain farming and raising of livestock, reindeer farming and harvesting of medicinal plants are thus in danger of being lost forever. At the same time, unsustainable exploitation of natural resources in traditional indigenous territories continues. These adverse trends need to be reversed with policies that respect the international requirements for indigenous land rights and provide the marginalized indigenous populations with the support needed for the continuation of their traditional livelihoods.

Continuous progress in the development and implementation of sustainable agriculture policies has been made in the pan-European region, especially in Western Europe. Strategic approaches for the promotion of sustainable forms of agriculture that address the interlinked problems of rural poverty and environmental degradation are under preparation in a number of the countries of Eastern Europe, the Caucasus and Central Asia and SEE. Nevertheless, a lack of institutional capacity still hampers effective implementation of targeted agricultural and rural development policies and support programmes in the region.

Table 3.6
Sustainable agricultural policies: examples of good practice

Regulatory instruments	**Western and Central Europe:** • Good Agricultural Practices (GAP) codes, standards and regulations address environmental, economic and social sustainability for on-farm processes, resulting in safe and quality food and non-food agricultural products. • The EU Water Framework Directive assists member States in the sustainable management of their water resources and in addressing water pollution, including in the agricultural sector. • EU food safety policy and the "from the farm to the fork" approach endeavour to ensure that control standards are established and adhered to as regards food and food-product hygiene, animal health and welfare, plant health and preventing the risk of contamination from external substances. It also lays down rules on appropriate risk assessment for food and feed and their labelling. • The EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) Voluntary Partnership Agreements (VPAs) are voluntary schemes to ensure that only legally harvested timber is imported into the EU. Once agreed, the VPAs will include commitments and action from both parties to halt trade in illegal timber, notably with a licence scheme to verify the legality of timber exported to the EU. The agreements also promote better enforcement of forest law and promote an inclusive approach involving civil society and the private sector. • The FAO Code of Conduct for Responsible Fisheries sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for ecosystems and biodiversity.
	EECCA and SEE: • Legal basis for the development of organic agriculture established by Croatia, the former Yugoslav Republic of Macedonia, the Republic of Moldova, Bosnia and Herzegovina, Serbia, Montenegro and Kazakhstan. • Countries of Central Asia have established Water Resources Management Plans. • Regulations on pesticides and agricultural chemicals in Ukraine, Albania, Armenia, Bosnia and Herzegovina and Croatia. • Regulations on food product hygiene, animal health, vaccinations, plant health and preventing the risk of contamination from external substances. • Many countries in the subregion have developed biosecurity and biosafety frameworks for risk assessment, management and communication for food and feed. The Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE) has elaborated common principles, criteria and guidelines for implementation of sustainable forest management.
Economic instruments	**Western and Central Europe:** • Direct payments to farmers are to be linked to sustainable land management from 2013 onward. • Mitigation of climate change is now considered as an environmental service that agricultural producers can provide and which is often synergistic with improvements to agricultural productivity and stability.
	EECCA and SEE: • Most EECCA and SEE countries have implemented agricultural and trade policies that employ Government market intervention in agriculture to alleviate the pressures for structural adjustment and to assure some self-sufficiency in food production.[27] • Most countries of the subregion have implemented trade policies and frameworks concerning imports of live animals and products of animal origin. • Social safety nets are increasingly considered by many countries in Eastern Europe, the Caucasus and Central Asia and SEE as an instrument to ease the transition towards sustainable agricultural practices. Linking food-based safety nets to local agricultural markets is one element of a comprehensive approach to sustainable agriculture and food systems.

[27] See "Agriculture, rural development, drought, desertification, and land issues affecting sustainable development in the UNECE region: achievements, trends and challenges" (ECE/AC.25/2008/3), p. 5, available from http://www.un.org/esa/sustdev/csd/csd16/rim/ece_bg1_en.pdf.

Table 3.6 (continued)
Sustainable agricultural policies: examples of good practice

Information-based instruments	**Western and Central Europe:** • The European Action Plan for Organic Food and Farming sets out 21 initiatives, such as improving information about organic farming. Many countries have organized public events, fairs and information campaigns for the promotion of organic foods.
	EECCA and SEE: • In the Republic of Moldova advisory and training facilities as well as education programmes in organic farming are available. Croatia, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro and Serbia have introduced systems for the certification of organic farms and the labelling of products from organic production. • All countries in the region take full advantage of the FAO Emergency Prevention System/Global Early Warning System (EMPRES/GLEWS) which promotes prevention and early warning across the entire food chain, covering in particular animal health, plant protection and food security.
	North America: • In the United States, the National Organic Program oversees the implementation and development of organic agricultural production, labelling, and inspection.

C. Moving forward

Key objectives for sustainable production

In order to accelerate the transition towards sustainable production, countries of the region need to develop their policies with a view to reaching the following key objectives:

- Diversifying the energy mix and increasing the share of renewables;
- Boosting energy efficiency through green investment in the energy-consuming industrial sectors (mining/extraction, manufacturing, construction) as well as in the agricultural sector;
- Using modern services such as telecommunication and new green technologies to modernize other services and manufacturing;
- Shifting industrial production towards energy-saving sectors;
- Promoting sustainable agricultural practices through conservation agriculture and crop production intensification, climate-smart agriculture and sustainable land, water and forestry management;
- Developing indicators and baselines for sustainable agricultural production, taking into account yield increase (poverty reduction and food security), environmental safety (less chemicals, less natural resources, conservation of biodiversity) and social and cultural benefits for agricultural producers and consumers;
- Strengthening ecosystem services provided by biodiversity and facilitating the establishment of compensation for ecosystem services schemes; promoting land planning at the landscape scale to optimize the delivery of ecosystem

goods and services from sustainably managed natural resources;

- Developing sustainable transport systems;
- Greening the value chain between producers and consumers by promoting demand for legal and sustainable products and building capacities for good regulatory governance and law enforcement.

A huge potential for greening production patterns in the pan-European region

While significant progress has been made in the pan-European region towards reducing energy intensity and increasing energy efficiency, this has occurred from a low starting level in the EECCA and SEE countries. Additional advances require strong proactive approaches, and there is a potential for moving ahead along this line. Studies on industrial energy efficiency and conservation in the region highlight that it will be possible for countries in the region to realize high levels of growth without concomitant increases in GHG emissions. The emerging part of the region can use new technologies to reduce emissions, and not simply by moving up production chains and increasingly consuming products manufactured elsewhere ("exporting" CO_2 emissions), like many countries in Western Europe. These studies often present a variety of scenarios towards cutting CO_2 emissions that countries can follow by using low-carbon energy supplies, improved energy efficiency, or carbon capture and storage. Poland, for instance, could realize a 31% reduction in CO_2 emissions from 2005 levels by 2030 (McKinsey, 2009). Similarly, the Russian Federation, with its huge natural resources and potential for raising energy efficiency in industry and buildings, could double its GDP by 2030 while keeping its GHG emissions close to 1990 levels (ibid.).

Thus the prospect of energy and resource efficiency and the application of eco-technologies are huge in the region, given its population and demand for new technologies. There is evidence that these technologies are diffusing into the region (for instance in the steel industry), but there is great variance among countries.

Developed countries are currently leading the way in green technological advancements, but with focused strategy development, targeted knowledge transfer and improved access to finance, other countries in the region could leapfrog the transitional stage by leveraging high-tech eco-innovation and ICT to achieve greater industrial diversification and productivity.

Overcoming institutional, market and behavioural barriers

Numerous case studies carried by UNIDO and other international organizations point to the existence of various barriers and failures that are inhibiting firms from investing in profitable energy-efficiency projects. How can transition economies overcome these barriers? A useful lesson from newly industrializing economies to keep in mind is that all obstacles to energy and resource efficiency result from transaction costs, information asymmetries, behavioural failures and lack of modern collective actions to deal with interdependencies among segments and actors involved in the product value chain. These barriers exist in developed countries as well, but are more pronounced in transition economies because of weak institutions, budgetary constraints and lack of skills in government administration. A comprehensive institutional framework, as well as specific sets of policies, need to be designed to overcome these barriers.

The need for a comprehensive institutional framework

Countries that have succeeded in improving their energy and environmental performance have done so through creating an enabling governance framework for the uptake of new environmentally friendly technologies and practices in industry, such as energy efficiency, waste management and recycling services, renewable energy technologies and environmental

analytical and advisory services. The structure of such a framework can be outlined as follows:

- At the *national level*, the central responsibility for the public management of energy and environmental strategy and policy is often with a dedicated Government body, such as a national energy or environmental agency. This Government body requires strong technical skills and dedication to implement national energy policies;
- At the *subnational* level, many countries have also set up local or regional government bodies to provide more targeted measures and to collaborate closely with local industry players, academia and local intermediary institutions (such as energy and information centres);
- An array of *intermediary organizations and institutions* can also help firms implement green projects and meet nationally established targets. Support institutions — such as industry associations, energy conservation centres, cleaner production centres, energy research and development laboratories, energy technology and information centres and cluster development institutions, as well as metrology, standards, testing, and quality control centres — are still weak in many countries of the region. Such institutions need to be strengthened in order to create a business environment conducive to the development of energy-efficiency projects, the uptake of existing green technologies and compliance with targets mutually agreed between public authorities and the various industry sectors;

The above-mentioned institutions should play a key role in:

- Adopting national energy strategies, programmes and sectoral action plans with the purpose of integrating energy and environmental goals with developmental goals;
- Within the framework of these strategies, establishing long-term goals and quantifiable and achievable efficiency targets, both for the economy as a whole and for different sectors, with a view to creating incentives for investment in green technologies and practices;
- Transforming the strategy and its related goals and targets into policy action through a mix of policies and processes, such as regulatory, fiscal, financial and information measures. Each country needs to adopt an appropriate policy mix that reflects specificities of its national competitive and natural advantages;
- Ensuring the effective implementation of these policy tools through legal enforcement provisions, economic incentives and various encouragement and rewarding measures. Education, training and outreach are also an important feature of compliance regimes; in other words, effective compliance regimes should include a combination of enforcement, promotion and assistance tools, which are mutually supportive;
- Benchmarking the performance of a given sector or country and establishing monitoring and reporting systems to identify violations and to assess whether policies have been effective over the long term. Indicators should form part of all monitoring and enforcement regimes, as a tool to simplify, quantify and communicate environmental data.

Designing specific policies targeted to the private sector

In designing specific policies targeted to the private sector the following should be taken into consideration:

- Within a given sector, targets can be negotiated between Government and industry, based on assessments of energy efficiency and energy conservation potentials at the business level. These agreements can be used to raise awareness of industrial energy efficiency and the engagement of all relevant stakeholders — businesses, industry associations, financial institutions and governments;

- Governments and support institutions should develop information programmes for entrepreneurs to present the advantages and opportunities arising from investments in efficient technologies, as well as information on the estimated costs, benefits, risks and duration of industrial energy-efficiency investment projects, together with the financing schemes available for such investments;
- Concerned institutions should promote energy management practices in industry through establishing and supporting various technical assistance programmes;
- Governments can introduce minimum efficiency performance standards for industry in order to increase demand for energy-efficient equipment and can also encourage companies to establish energy management standards to improve energy performance through changes in how energy is managed in industrial facilities;
- Recognition programmes should reward firms that make an effort to implement energy-efficiency solutions. Such programmes, consisting of a contest and awards ceremony, a media event and exposure, and a recognition certificate, have been proven to be effective in promoting a more positive perception of energy efficiency by highlighting the potential benefits and publicizing successful outcomes. Using energy-efficiency rewards to garner a competitive advantage can assist in embedding the pursuit of energy efficiency into an organizational culture. And, at the company level, energy awards provide a platform for companies to audit their energy usage, identify possible energy savings projects, and ultimately increase company profitability and productivity;
- Corporate taxes could be differentiated according to the compliance of firms with energy standards and well-targeted subsidies could be provided for investment leading to high energy efficiency;
- Direct and indirect (e.g., reduced value added tax rates) subsidies on carbon-intensive energy (fuel and electricity) should be progressively removed in order to stimulate firms to invest in energy-efficiency equipment;
- Soft loans, credit lines, publicly backed guarantees and revolving funds, as well as venture capital funds, are key for financing green investment and decreasing perceived risk. Such financing schemes by public and commercial institutions are particularly needed for small and medium enterprises (SMEs) which presently lack access to funds.

Boosting eco-innovation and green investment

For industrial eco-innovations to take-off in the region, there needs to be a political commitment through designing a coherent policy framework to support research and development and innovation efforts, provision of infrastructure and public funding.

In this respect, many countries of the region have established dedicated bodies that are charged with developing strategies and policies to boost eco-innovation, or have produced action plans on science and technology. Eco-innovation is thus increasingly incorporated into national strategies for economic competitiveness and growth (for example in the Russian Federation and Serbia).

Green procurement and investment by the public sector (still lacking in low- and middle-income countries) can be a tool for generating demand for new green technologies among local businesses, and encourage investment by industry in such energy-efficiency technologies This can also form the basis for increasing productivity and boosting innovation in State-owned enterprises. Incorporating a green-growth agenda into government procurement and green criteria in all tender processes is particularly important in emerging economies, where the State has a greater role in boosting demand in order to make up for weaknesses in the private sector;

On the supply side (technology push), there is a need to develop a policy mix combining increased Government-funded

research, subsidized research in the private sector within the framework of partnership agreements and compliance with intellectual property rights.

Eco-entrepreneurs face a particular problem in convincing potential funders of the attractiveness of the growing market in eco-technologies. SME surveys have found that critical barriers include a lack of finance tailored to SME investment needs, and inadequate synergies between the technology and commercial aspects. Particular needs of SMEs can be met through participation in global and regional value chains, and these practices are becoming more pronounced in the ECE emerging economies. Lead firms in the value chain can be important agents providing access to new knowledge, skills and technology and can also ensure compliance with standards.

Initiatives should be taken to learn from and incorporate foreign knowledge and technology upgrading. This would complement indigenous areas of scientific expertise. An emerging trend is for clean-technology FDI to target emerging markets but, to take full advantage of this trend, the leap from research and development to commercialization calls for an innovation-conducive environment.

Raising awareness within businesses

As a legacy of previous energy regimes in the eastern part of the region, there is an underdeveloped culture of energy efficiency in societies and economic sectors. Developing and encouraging concepts of responsible behaviour are therefore important. Embedding climate-change, energy- and resource-efficiency concerns in national and regional policymaking can play an important role in changing how industry, business and government work together to better manage resources (McKinsey, 2009). Along this line the following measures should be promoted:

- Organize campaigns to disseminate energy-efficiency information, offering the possibility to choose among all possible technical options, and make the costs of available technologies transparent. Such campaigns have no direct impact on GHG emissions or production costs, but they do have the potential to change stakeholders' perceptions. Though relatively easy to implement, they do require an organizing structure and public funding — which again, may constitute an obstacle for a number of countries with transition economies;
- Complement such information on energy-efficiency opportunities through a variety of technical information sources including fact sheets, brochures, guidebooks, technical publications, energy-efficiency databases, energy-efficiency assessment and self-auditing tools, case studies and industry- and technology-specific energy-efficiency reports and benchmarking tools;
- Design institutional arrangements for raising awareness of potential savings and efficiency benefits to be gained from energy-efficiency investments with a view to boosting industries' capability and willingness to adopt what had previously been seen as high-cost and risk technologies.

Regional cooperation

Although established in many countries of the region, the government bodies charged with the implementation of industrial energy-saving programmes still lack the necessary capacity and technical skills to design, implement, and evaluate energy-efficiency programmes, to interact with concerned stakeholders at the national level (such as businesses and local governmental authorities) and to ensure coordination with other government bodies, foreign donors and international financial institutions. In most countries with economies in transition, including those that are resource rich, such international technical assistance is still critical to support the design and implementation of national energy strategies and policies, as well as regional energy programmes and networks. The EU should therefore consider developing portfolios of activities to

assist the EECCA and SEE countries in these areas, with a view to extending energy efficiency and conservation throughout the region.

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Chapter IV.

Changing consumption patterns

A. Sustainable consumption

The sustainable consumption challenge

In most countries, household consumption accounts for at least 60% of the consumption-driven environmental impacts (UNEP, 2010). The remaining share of these impacts is due to public consumption of goods and services. The most important household consumption activities in terms of environmental impacts are food consumption, mobility/transport and housing (including energy use for heating and electrical appliances). Each of these consumption clusters are responsible for 20%–30% of the environmental impacts and pressures linked to household consumption.

Although the direct environmental impact of individual households is relatively small compared to that of major production activities, millions of households all over the world are major contributors to problems such as climate change, air pollution, water pollution, land degradation and waste. As incomes rise so does consumption and demand for more food and beverages, for larger, warmer and more convenient living spaces, for appliances, furniture and cleaning materials, for clothes, transport and energy. In Europe, the affluence of the majority of the population has moved them beyond consumption patterns dictated by need alone, and even, for some products and services, beyond convenience and in many cases beyond environmental sustainability (EEA, 2007).

Policies aimed at promoting sustainable consumption should look at both the environmental impacts of consumption and its social dimension. Examples can be found in the areas of housing, transport and food. In the area of housing, we need to ensure that families are lodged in decent housing, which should include enough heating and at least basic water and sanitation services. In the area of transport, we need to ensure that all members of society have access to adequate transport options — for example, ensuring that public transport is available for people living in rural areas who cannot make use of private transport for financial or other reasons, or ensuring that public transport is also accessible to the handicapped. In the area of food, we need to ensure that households have access to healthy and nutritious food. Sustainable consumption policies need to also adopt a gender perspective — women and men often have different consumption needs (for instance in terms of time of day availability and safety requirements of public transport) and women and men often control different shares and parts of a family's budget.

Box 4.1 The global and region-specific policy framework for sustainable consumption (and production)

Sustainable consumption was put on the global policy agenda at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. Agenda 21 called for "new concepts of sustainable economic growth and prosperity which allow higher standards of living through changed lifestyles and are less dependent on the Earth's finite resources". In 2002, the World Summit on Sustainable Development Plan of Implementation called for the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production patterns, and launched the "Marrakech process" to develop and promote the framework. In the pan-European region, the 2003 Kyiv and 2007 Belgrade Declarations of the "Environment for Europe" process stressed the importance of the shift towards sustainable consumption (and production) patterns and encouraged the adoption of programmes to accelerate this shift. In the EU, the EU Sustainable Development Strategy, revised in 2006, identified sustainable consumption (and production) among its seven key challenges.

Household consumption in the pan-European region

In the pan-European region, household consumption and public sector consumption represent 55%–75% and 15%–20% of GDP, respectively, while the remaining share corresponds to investment and net exports. In the past decade, household consumption has been growing in all subregions of Europe and Central Asia, but its levels and patterns vary widely across the region. Household consumption expenditure per capita in Western Europe is three to four times that of the countries of Eastern Europe, the Caucasus and Central Asia (EEA, 2007). This has an important impact on the structure of household spending. Take the example of food. Across the EU-25,[28] expenditure on food has remained constant even with increasing incomes, and thus presents an ever decreasing proportion of household expenditure, approaching 10%. Meanwhile, in the low-income and lower-middle-income countries of the Caucasus and Central Asia food still dominates household expenditure, particularly in rural areas where there is little or no surplus income for non-essentials (EEA, 2007).

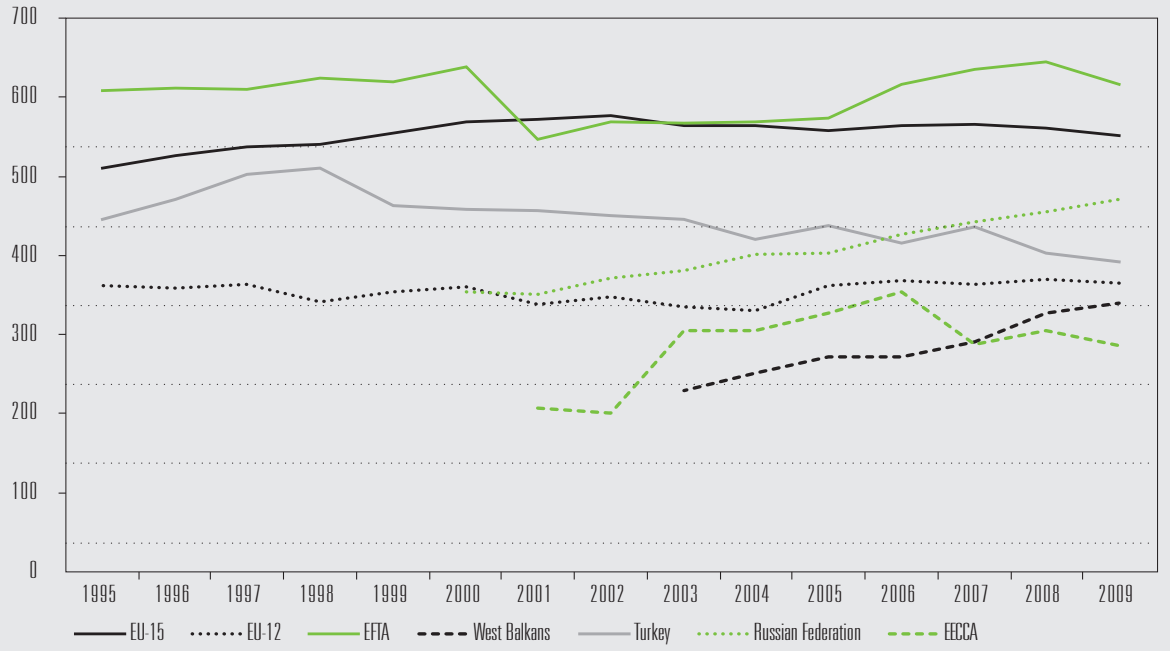
Patterns of consumption are changing rapidly. The food component is decreasing, and the shares for transport, communication, housing, recreation and health are on the rise. In the eastern part of the region, a small but growing urban middle class is increasingly adopting the consumption patterns of Western Europe. Changing consumption patterns are causing increased impacts as spending shifts to more impact-intensive categories of goods and services (transport and household energy use) within which growth in physical consumption (not just spending) has more than offset benefits from improved technological efficiency (EEA, 2007). Overall, while consumption in the EECCA transition economies and parts of SEE remains low by OECD standards, these countries are following similar development patterns to those of the richer economies of the ECE region, with the growing middle class in urban areas mirroring unsustainable Western trends in consumption (UNEP and EEA, 2007). Since unsustainable consumption patterns in the EECCA and SEE countries are still restricted to a relatively small middle class in urban areas, effective sustainable consumption policies can release the potential for leapfrogging to sustainable patterns without the need to follow the intermediate path of unsustainable consumption being experienced by OECD countries.

The environmental effect of growing household consumption can be seen, for instance, in municipal waste generation data. Figure 4.1 shows how in recent years the West Balkan countries have reached the waste generation levels of the new EU member States (EU–12),[29] and suggests that EU waste policies have at least managed to contain growth in municipal waste that remains unchecked in Western Balkans.

[28] The 25 countries belonging to the EU before 2007 (i.e., the EU-15 plus Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia).

[29] Belgium, Greece, Luxembourg, Denmark, Spain, Netherlands, Germany, France, Portugal, Ireland, Italy and United Kingdom.

Figure 4.1 Municipal waste generation



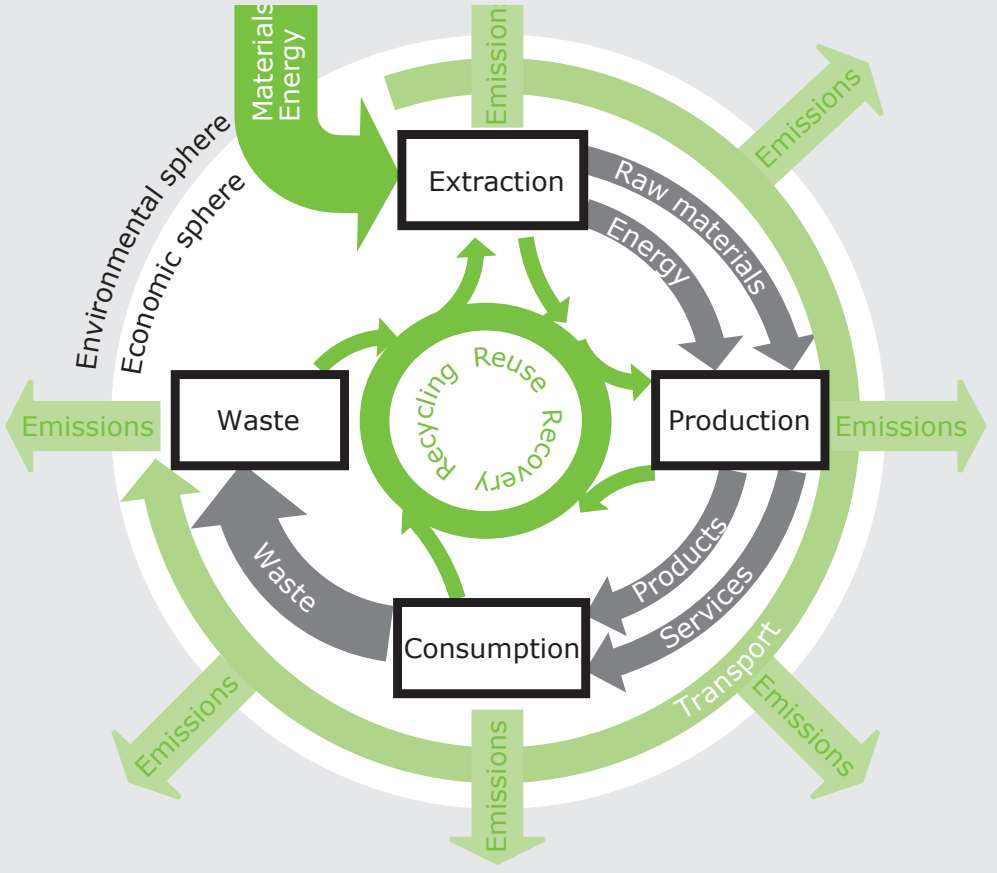
Source: ***UNEP calculations based on Eurostat, OCDE and national data.***

Many variables drive changes in the patterns of household consumption. In Europe, in addition to increasing incomes and growing wealth, other significant drivers include the globalization of the world economy with the opening of markets, increasing individualism, new technologies, targeting of marketing and advertising, smaller households and ageing populations in some subregions (EEA, 2005).

To date, sustainable consumption and production (SCP) efforts have been more focused on the production side than the consumption side. There are two major reasons why a more balanced approach is needed:

- **Sustainable consumption is a driver for sustainable production**. The consumer makes the final choice about which goods and services to demand. Providers of final goods and services will move more decisively towards sustainable production patterns if consumer purchasing decisions show a preference for sustainable products and producers. This can impact all producers through the life-cycle chain. In particular women can play a key role in driving consumption, and therefore production, towards more sustainable patterns since studies show that they are responsible for buying 80% of households goods; and
- **Sustainable production is not enough.** The sustainability challenge cannot be solved only by better product design and more efficient production processes, as the gains generated may be more than compensated by the absolute increase in consumption. Indeed, in the developed countries of Western Europe (EU and the European Free Trade Association) and North America, increases in consumption of material goods and services have outpaced efficiency improvements on the production side (UNESCO, 2009).

Figure 4.2 Consumption in the life-cycle chain



Source: EEA (2010)

Policy instruments to promote sustainable consumption

There are two strategies for reducing the environmental impacts of consumption: reducing the environmental and social impacts of "business as usual" consumption (by reducing impacts at the production, use and disposal stages of common consumer goods and services) and promoting changes in consumption patterns (transferring demand from goods and services of higher to lower material and energy-use categories). A strong sustainability approach asks for pursuing both strategies.

A large number of policy measures can be adopted to promote sustainable consumption. They can be classified in the following "families":

- **Direct provision.** Direct provision of infrastructure and services affects consumer behaviour by widening the choice set. Examples include the provision of public transport services or city bike systems;
- **Regulatory instruments.** Regulatory instruments affect consumer behaviour by redefining the choice set. Traditional examples include bans (such as the phase-out of leaded petrol or incandescent lighting) and product standards (such

as energy performance standards for washing machines or emission standards for cars), but there are many others, such as building codes, speed limits, restrictions on cars with certain plate numbers from driving into the city centre,[30] norms for the separation of household waste, or spatial planning rules to reduce urban sprawl;

- **Economic instruments.** Economic instruments alter relative prices and thus change the incentives faced by consumers when making consumption decisions. Examples of economic instruments include user charges (such as water and electricity tariffs and parking fees), taxes (such as fuel taxes), subsidies (such as public transport subsidies or subsidies for undertaking insulation works in private dwellings) and deposit-refund systems (such as for bottles). Economic instruments combine an economic incentive and an informational component. Just metering and introducing a price on the use of environment-related resources has an effect on people's decision-making, even if the price is very low, because it provides a signal to households about consumption levels (OECD, 2011);

- **Information-based instruments.** Information-based instruments work in two different ways. They empower consumers to act on their preferences — examples include eco-labels on organic food or energy-efficient appliances and campaigns to inform car drivers of the savings of driving at a reduced speed. But these instruments can also alter behaviour by modifying the preferences of consumers — such as awareness-raising campaigns to reduce household water consumption or to reduce beef consumption. Recent research shows that the role of soft policy measures is more significant than earlier thought (OECD, 2011). Eco-labels need to be clear and comprehensible as well as trustworthy, and are most effective when the environmental benefits coexist with more direct personal benefits for the consumer, such as reduced energy bills resulting from energy-saving behaviour or personal health benefits associated with the consumption of organic food (OECD, 2011);

- **Voluntary approaches.** Voluntary approaches include agreements on environmental performance negotiated with industry and public programmes in which firms can volunteer to participate. While voluntary approaches are increasingly popular in environmental policy, they are not yet very common in the consumption area. One exception is public-private collaboration to promote choice editing,[31] such as the French convention on the withdrawal of incandescent bulbs and the promotion of low-consumption lamps. Voluntary approaches have been criticized (see OECD, 2003) because even though the environmental targets are usually met, they do not usually contribute to environmental improvements beyond what would have happened in the first place. This can be attributed to regulatory capture and the absence of "credible threats".[32] On the other hand, voluntary approaches can offer higher economic efficiency than regulatory instruments by providing businesses with increased flexibility in how they achieve environmental improvements and there are cases where voluntary approaches represent the only policy option available — for example, when there is no authority in place that could adopt and enforce a "compulsory policy" (OECD, 2003).

Policy measures can be combined in policy packages to increase their effectiveness. For example, higher fuel taxes can be combined with the provision of public transport, or increases in electricity tariffs can be combined with the obligation to provide information about the energy efficiency of electric appliances.

[30] For example, cars with registration plates ended in an odd number can only circulate in the city centre on odd-numbered days of the month, those ending in an even number, on even-numbered days.

[31] Generally, Governments can edit citizens' choices through laws, taxes, subsidies and voluntary bans. The process entails either the removal of environmentally offensive products from commercial consideration or it discourages their sale or use by making them expensive. Choice editing is thus a direct or indirect control of the environmental impact from consumption and aims to only provide sustainable products to consumers.

[32] Regulatory capture occurs when a State regulatory agency created to act in the public interest instead advances the commercial or special interests that dominate the industry or sector it is charged with regulating.

Key consumption sectors

Section B of this chapter will look more in depth at three key sectors of household consumption: housing (including utilities); food and beverages; and transport. They are the dominant consumption sectors, although their importance varies across the pan-European region. Food remains the most important household expenditure item in the EECCA and SEE countries, while housing is most important in the EU. Transport is the third most important consumption sector in the EU and SEE countries. As previously stated, these three sectors represent the bulk of household spending and environmental impacts. At the same time, increasing attention needs to be paid to other consumption sectors as consumption patterns change — for example, recreation has climbed to number two among consumption sectors in Western European countries.

B. Progress in the pan-European region

Progress with overarching sustainable consumption and production policies

Western and Central Europe. The EU has made significant advances since the World Summit on Sustainable Development (Johannesburg Summit) in Johannesburg in 2002. The 2006 EU Sustainable Development Strategy identifies SCP as one of seven key challenges to be tackled in the EU. The EU Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan, approved in 2008, includes a series of proposals on SCP that will contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies. It also seeks to encourage EU industry to take advantage of opportunities to innovate. "EUROPE 2020: A European Strategy for Smart, Sustainable, and Inclusive Growth" includes a flagship initiative on resource efficiency that in 2011 generated a road map for a resource-efficient EU. Moreover, an increasing number of EU member States are addressing SCP explicitly and comprehensively in their National Strategy for Sustainable Development (NSSD). Examples of countries that have prepared dedicated SCP action plans include the United Kingdom (2003), Poland (2003), the Czech Republic (2005) and Finland (2005). Examples of countries addressing SCP explicitly and relatively comprehensively in their NSSDs include Belgium, the Czech Republic, Denmark, Greece, Italy, Hungary, Malta, the Netherlands, Norway and Romania.

South-Eastern Europe and Eastern Europe, the Caucasus and Central Asia. In SEE countries there has been a rapid emergence of SCP strategy since 2007 as part of the development of NSSDs — in particular in Croatia, Serbia, the former Yugoslav Republic of Macedonia and Montenegro. The NSSDs of Croatia and Serbia include indicators for SCP. In countries of Eastern Europe, the Caucasus and Central Asia, SCP is yet to emerge on the political agenda, but some progress is taking place. Kazakhstan's Strategy on Sustainable Development (2007–2024) has some elements of SCP. Belarus has adopted a NSSD which includes some SCP concepts. The Republic of Moldova's National Strategy of Social and Economic Development from 2005 refers directly to SCP and includes a number of SCP-relevant concepts. Ukraine's Concept of National Environmental Policy to 2020 includes SCP-related issues such as the need for reduced resource intensity and the introduction of environmental priorities into industry. The Russian Federation includes resource-use decreases and energy-efficiency improvements among environmental policy priorities (Golubovska-Onisimova and Ignatenko, 2008).

North America. Canada and the United States have implemented and are still actively developing a wide spectrum of policies and programmes at the national, state/provincial and local levels which have SCP relevance. The United States and Canada's first-ever meeting concerning SCP occurred at the North American Workshop on Sustainable Consumption and Production in 2008, which lent support to the Marrakech Process by suggesting complementary policy initiatives for promoting SCP patterns in the region.

Greening public sector consumption

While this chapter focuses on household consumption, the public sector is also an important consumer: consumption by the public sector represents 15%–20% of GDP in most countries of the pan-European region (EEA, 2007). As a consumer, the public sector can do much to green its own behaviour and encourage the private sector to produce greener products and services. For example, in the United States, the Federal Government is providing US$ 4.5 billion for greening federal buildings by increasing energy efficiency. Western European countries are progressing in the strengthening of Green Public Procurement (GPP) practices. In Sweden, government agencies are only allowed to buy vehicles that are environmentally friendly. There are many other examples, including the construction of energy-efficiency schools in Malta, the purchasing of energy-efficient lighting in Portugal and the purchasing of energy-efficient information technology equipment in Spain.[33]

GPP is not practised to a great extent either in the EECCA and SEE regions, but some countries are making steps in creating legal and policy frameworks for GPP — for example, Uzbekistan's Decree on Procurement of Chemical Substances for Agriculture demands that ecological and social factors are taken into account in procurement decisions. Bosnia and Herzegovina and Montenegro's Public Procurement Laws also include environmental provisions, though no target (UNEP, 2009).

Greening housing

Impacts. The most important environmental impacts of housing are related to energy consumption for space and water heating. Typically, 80%–90% of total energy used during the whole life of a building is consumed during the use phase (EEA and UNEP, 2007). In the EU, space heating accounts for some 70% of household energy consumption and water heating for some 14% (Eurostat data in EEA, 2007), with similar proportions estimated for Eastern Europe, the Caucasus and Central Asia and South-Eastern Europe. For many smaller electric and electronic goods, the most critical environmental impacts arise from disposal rather than usage because of their high content of heavy metals and other hazardous substances. Other environmental impacts of housing relate to water consumption.

Trends. Energy efficiency of interior heating and electric devices has been increasing, but those gains have been more than offset by rising demand from behavioural changes. Growth in the number of dwellings, floor area per dwelling and increased average room temperatures are increasing total energy demand for space heating in most EU-15 countries, and while in some EU–1034 countries the total energy demand for space heating has decreased, in per capita terms it is still significantly higher than in the EU-15. In most Central and Eastern European countries there is still a major potential for energy savings by providing the large stock of poorly insulated apartment blocks with improved insulation and introducing greater levels of control over heat consumption (as well as by rationalizing and upgrading district heating systems and insulating distributions networks). The electric and electronic goods waste category now represents one of the fastest-growing waste fractions in the EU (EEA, 2007). The quantity of electric and electronic goods for disposal is dependent both on ownership levels in the population and their replacement rates. Today, replacement is more often driven by changing fashion and small technical advances than by the useful lifespan of an appliance (in particular for mobile phones and computers). Replacement rates of electronics are lower in EECCA and SEE countries, but ownership is rapidly increasing (EEA and UNEP, 2007).

Consumer options. To reduce the environmental impacts of housing, households can invest in home insulation, buy water-saving devices (power showers, dishwashers, washing machines) and energy-saving appliances (dryers, televisions, light bulbs), buy electricity from low-polluting sources (when available) and change their behaviour (reduce the number of rooms to be heated and the target temperature, take showers instead of baths, use dishwashers and washing machines at full charge, avoid leaving appliances in stand-by mode).

[33] See "GPP in practice". Each case includes a description of the criteria set for procurement procedure. Available from http://ec.europa.eu/environment/gpp/case_en.htm.

[34] The group of 10 countries that joined the EU in May 2004: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

Policy progress. During the past decade there has been considerable progress in terms of policy awareness and action, in particular in the area of space heating. For example, a wave of new national and regional building standards and energy labels for buildings in Albania, Armenia, Croatia, Kazakhstan, Tajikistan and Ukraine have led to new buildings with thermal efficiencies 35%–40% greater than buildings constructed in the 1990s (UNEP/EEA, 2007).

Table 4.1
Sustainable housing: examples of policy progress

Regulatory instruments	• **Western and Central Europe.** Since 2006, EU member States must apply minimum requirements regarding the energy performance of new and existing buildings and must ensure the certification of their energy performance. • **EECCA and SEE.** Updates of old building standards for insulation and heating envelopes (e.g., Albania, Russian Federation, Tajikistan) • **North America.** In the United States, the Vice-President's 2009 "Recovery through Retrofit Report" recommended establishing standards for national retrofitting training and measuring home energy efficiency.
Economic instruments	• **Western and Central Europe.** Financial support in building eco-efficient (or energy-efficient) construction, rehabilitation and heating (Austria, France, Greece). Eco-loans at zero rates (France). • **EECCA and SEE.** Gradual introduction of water meters and increases in tariffs for water and other communal services in several countries. • **North America.** In the United States the Federal Government has set aside US$ 5 billion to subsidize low-income home weatherproofing projects.
Information-based instruments	• **Western and Central Europe.** At the EU level, introduction of carbon calculators (e.g., Mycarbonfootprint.eu) and awareness-raising campaigns (e.g., the "You Control Climate Change" campaign). [35] At national level, development of guidelines and information portals (e.g., the Czech ToptenCZ website and database on the energy-efficiency characteristics of household appliances) and introduction of labels for low-energy buildings (e.g., the French High Energy Performance label). • **EECCA and SEE.** Several countries have introduced mandatory energy labelling for household appliances (Albania, Armenia, Croatia, Turkey) and buildings (Croatia, Kazakhstan, the Russian Federation, Kazakhstan, Turkey). Information campaigns about energy use in buildings have taken place in Moscow (Plus 20 pamphlet) and Serbia ("Use energy rationally" campaign). • **North America.** The United States and Canadian Green Building Councils oversee the certification of green buildings and the setting of rating systems and guidelines. In the United States, the Energy Star labelling programme provides reliable information regarding the energy-efficiency performance of appliances for consumers.
Voluntary agreements	• **Western and Central Europe.** Public-private collaboration to promote choice editing (e.g., the French convention on the withdrawal of incandescent bulbs from the market and promotion of low consumption lamps).
Direct provision	• **Western and Central Europe.** Strategies to promote cycling and walking in cities are becoming common in many countries (e.g., improved cycling lanes and storage facilities in cities such as Krakow, Amsterdam, Copenhagen, Freiburg, London, Paris, Venice and Vienna). Dedicated lanes to encourage car-pooling (e.g., Belgium). • **EECCA and SEE.** The need for sustainable transport investment is being increasingly recognized and Government expenditure in Belarus, Albania, Croatia and Armenia has been growing in recent years. • **North America.** In the United States, the Federal Government is allocating US$ 13 billion in funds to sustainable transportation infrastructure projects.

Source: ***Adapted from UNEP-CRI (forthcoming).***

[35] See http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/06/218

Box 4.2 Case study on sustainable housing: promoting energy efficiency in buildings in Croatia

As in other transition countries, there is a great potential for increasing energy efficiency in buildings in Croatia. Croatia's housing stock exceeds 2 million apartments, of which 45% were built before 1970, and it increases at a rate of 1% per year. Energy consumption in the building sector represents around 25% of the total primary energy supply or around 40% of the final energy demand in Croatia.

As part of its energy-efficiency efforts, in 2003 Croatia established the Environmental Protection and Energy Efficiency Fund, which provides loans and grants to reduce energy consumption and increase the competitiveness of green technologies. In 2004–2010, EUR 3.2 million were disbursed for 78 projects in the building sector that aimed to improve energy efficiency through lighting and heating systems, building envelopes, substitution of the primary energy source in boiler plants and optimization of combustion systems.

More recently, as part of the EU accession process, in 2008 Croatia introduced a framework for compulsory energy certification of buildings. Currently, this includes the 2008 Act on Energy Efficiency in Final Consumption (which regulates energy-efficiency programming on the national and local levels, obligates the public sector to introduce energy-management practices and sets limits for the direct consumption of energy by each sector), the National Energy Efficiency Programme 2008–2016 and the First National Action Plan on Energy Efficiency. As a result, requirements for minimum energy performance have been set for new buildings and for major renovations, and energy performance certificates are required for all buildings when constructed, sold or rented. Energy certification of buildings started in April 2010 with new residential and non-residential buildings. In 2009, the ministry in charge launched a programme to train energy certifiers (more than 650 engineers had completed it by the end of 2010) and between April and November authorized more than 150 experts for the implementation of the energy certification.

Next steps include revisiting the legislation on energy efficiency in building legislation to accommodate the EU Energy Performance of Buildings Directive and make improvements based on the experiences so far. In addition, it is planned to launch new national information and communication campaigns to raise awareness of building owners and users.

Source: ***UNEP (2011b).***

* Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings.

Greening transport

Impacts. The most important environmental impacts of transport are GHG emissions and local air pollution. Serious health impacts are caused by traffic accidents and noise, in addition to air pollution. While private cars offer benefits in rural areas where public transport is sparse, in urban areas the private car is the most polluting and least energy-efficient method of transportation per passenger. And after a certain threshold, private cars also generate additional social costs in terms of congestion. The cost of traffic congestion, pollution and accidents in the EU well exceeds EUR 500 billion per year, and overall costs due to road traffic deaths and disability make up to 3% of Europe's GDP (UNEP, 2011b).

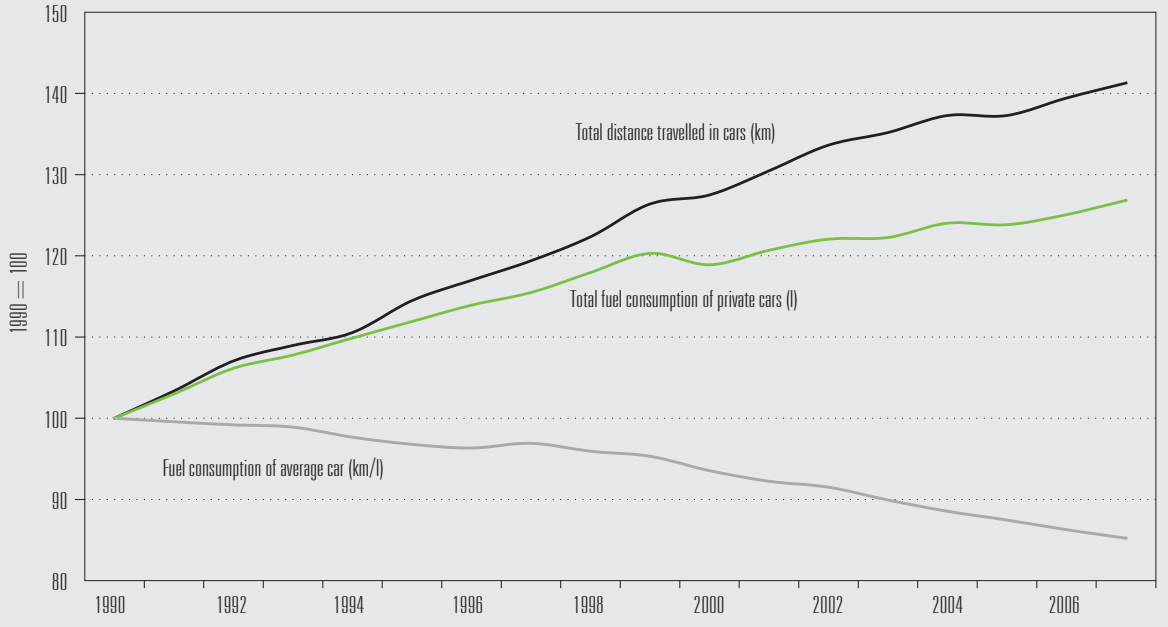
Trends. The environmental impact of private transport is growing. Technological improvements are making all transport modes more environmentally friendly — for instance car fuel efficiency increased by 15% in 1990–2006 in the EU-27 countries (see figure 4.3) — but energy consumption and emissions from road transport keep increasing. Growing incomes are driving an increase in private motorization (shifting away from public transport and non-motorized transport such as walking and cycling) because it provides increased flexibility, but also because it indicates wealth. Car ownership in EU-15 countries and the number of kilometres travelled have increased at the same rate as GDP growth since 1990, and in many countries consumers have shown a strong preference for larger and less fuel-efficient cars despite unfavourable differential road taxes (EEA, 2007). These trends more than offset voluntary efforts by manufacturers to improve average fuel efficiency.

Private car ownership, albeit starting from a much lower base, is increasing even more rapidly in Central and Eastern European countries. Capacity utilization is decreasing as incomes rise — average car occupancy in many developed countries is around 1.5. The growth in private car use has resulted in some rural areas in the discontinuation of public transport services, thus reducing the access to mobility of people that cannot drive or cannot afford to drive.

Consumer options. Individual choices can reduce the environmental impact of a given "quantity" of transport use. They can do it through choice of mode (choosing the most environmentally friendly transport mode); capacity utilization (exploiting the capacity of vehicles); and choice of car and driver behaviour (choosing an environmentally friendly car and driving it in an environmentally friendly way).

Policy progress. Over the past decade, there have been an important number of new initiatives to reduce the environmental impacts of transport, spanning all policy instrument categories, but in particular through the expanded use of economic instruments (see table 4.2) and technological change, in particular the development of intelligent transport systems.

Figure 4.3 Fuel efficiency of cars in EU-27 countries



Source: **EEA (http://www.eea.europa.eu/data-and-maps/figures/growth-in-private-car-travel).**

Table 4.2
Sustainable transport: examples of policy progress

Direct provision	• **Western and Central Europe.** Strategies to promote cycling and walking in cities are becoming common in many countries (e.g., improved cycling lanes and storage facilities in cities such as Krakow, Amsterdam, Copenhagen, Freiburg, London, Paris, Venice and Vienna). Dedicated lanes to encourage car-pooling (e.g., Belgium). • **EECCA and SEE.** The need for sustainable transport investment is being increasingly recognized and Government expenditure in Belarus, Albania, Croatia and Armenia has been growing in recent years. • **North America.** In the United States, the Federal Government is allocating US$ 13 billion in funds to sustainable transportation infrastructure projects.
Regulatory instruments	• **Western and Central Europe.** Dynamic and flexible speed limits (e.g., Austria, Belgium). • **EECCA and SEE.** Tighter standards for fuels in Belarus and the Russian Federation. Bans on imports of used vehicles older than a certain age or without catalytic converters (e.g., Armenia). Since 2003, leaded petrol banned in additional countries (e.g., Kazakhstan, Kyrgyzstan, Republic of Moldova, Uzbekistan). • **North America.** In the United States, new regulation allows various states to increase fuel-efficiency standards for 2011 model automobiles.
Economic instruments	• **Western and Central Europe.** Differentiated vehicle taxes (e.g., Austria, Denmark, France, United Kingdom). Bonus systems for replacing vehicles (e.g., Belgium). Scrappage schemes (e.g., France, Germany). Tax exemptions for electric cars (e.g., Denmark). Road tolling (e.g., Austria, Bulgaria, Czech Republic, Hungary, Romania, Slovakia, and Slovenia). Congestion charging (e.g., London, Stockholm). • **EECCA and SEE.** In some countries fuel taxes have increased rapidly in recent years (e.g., Belarus). Croatia has introduced motorway tolls. Kazakhstan has differentiated annual vehicle taxes based on engine capacity. Several countries use tax differentials between leaded and unleaded fuels. • **North America.** In the United States the "cash for clunkers" programme subsidized the substitution of older cars for newer, more efficient cars.
Information-based instruments	• **Western and Central Europe.** Car-labelling (e.g., Israel, Switzerland). Eco-driver training (e.g., Austria). • **North America.** Provision of environmental information to motorists (e.g., Canada). • **ECE region.** The ECE/World Health Organization Transport, Health and Environment Pan-European Programme (THE PEP) is the platform to support sustainable mobility through tools, information, knowledge and capacity-building.

Source: **UNEP-CRI (forthcoming), OECD (2007), UNEP (2011b).**

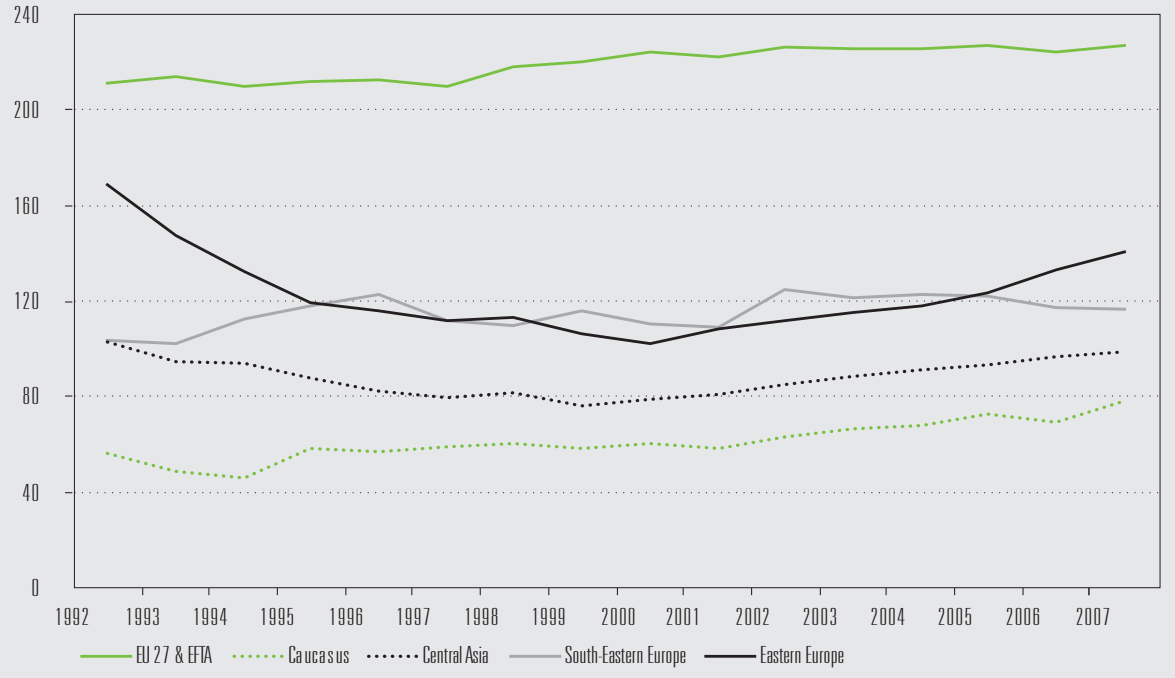
Greening food and beverage consumption

Impacts. The most significant environmental impacts of food consumption are indirect, and relate to agricultural production and industrial processing. Direct impacts of food consumption are lower in magnitude and relate to travel for shopping trips, energy use for cooking and cold storage and the production of organic and packaging waste (EEA, 2005). The dietary options of consumers, such as increasing consumption of organic fruit and vegetables and decreasing consumption of meat, can also have significant health impacts (in particular as regards the prevention of non-communicable diseases) in addition to the narrow environmental impacts.

Trends. Agriculture has been undergoing efficiency improvements over recent decades. But several trends in food consumption are partially offsetting those efficiency improvements, in particular a shift in demand from local and seasonal towards imported, non-seasonal fruit and vegetables, and a general globalization of the food market, as well as the increased use of processed foods and pre-prepared meals (EEA, 2007). A small but growing group of consumers in Western and Central European countries are switching to organic and/or locally produced foods. While the environmental consequences of food production and food safety have gained considerable attention in the EU, providing food that fulfils elementary nutritional needs remains a challenge in a number of countries in the Caucasus and Central Asia — which is related to the fulfilment of the human right to food, as in some countries chronic malnutrition (stunting) still affects from one fifth to one third of the children.

Consumer options. In comparison with, for example, space heating, consumers have a relatively large control over their food and beverage purchases. They can usually opt for diets with lower environmental impacts, although this often faces economic and cultural barriers (organic food tends to be more expensive, healthy foods are not always available in all neighbourhoods, and as income grows, so does meat consumption (figure 4.4)). They could also change their habits in terms of optimizing grocery-shopping trips and opting for low-packaging food. In many cases, given the multiplicity of products in the market, consumers face a constraint in terms of the time they can devote to acquire and process information about the environmental and health consequences of their food and beverage purchases, while they are at the receiving end of intense marketing efforts. However, fair trade and similar initiatives provide consumers with the opportunity to support sustainable development (box 4.3).

Figure 4.4 Meat consumption trends



Source: ***EEA and UNEP (2007).***

Box 4.3 Fair trade

Fair trade is a market approach that aims at paying fair prices to producers and promoting sustainable production methods. Fairtrade Labelling Organizations International is the biggest fair-trade labelling organization, although numerous other certification programmes also exist. Global market shares in fair-trade products remain very small; nevertheless, certain commodities such as bananas and coffee represent large shares of sales in specific countries. For example, in Switzerland 55% of bananas sold in 2005 were fair-trade certified. In the United Kingdom, the estimated retail value of fair-trade products was £1.17 billion in 2009. Fair trade offers several opportunities from a sustainable development perspective, helping small producers access international markets for commodities that are largely dominated by large corporations and empowering people to enhance their opportunities and to support broad-based, sustainable development. Fair trade requires meeting minimum criteria for environmentally friendly soil and water resource management. The label has rules on the use of chemical fertilizer and does not allow the use of genetically modified plants, in addition to other environmental rules and regulations. The inclusion of environmental concerns is to ensure a profitable yet sustainable use of natural resources.

Policy progress. Unsurprisingly, given the nature of the problem, most public policy efforts have focused in the provision of information to consumers, but it is unclear to what extent this has resulted in more sustainable options and actual consumer empowerment (see table 4.3).

Table 4.3
Sustainable food: examples of policy progress

Economic instruments	• **North America.** In the United States and Canada, several states and provinces are implementing deposit-refund systems. Several cities (such as Toronto and New York) have introduced a tax on plastic bags.
Information-based instruments	• **Western and Central Europe.** National campaigns aimed at sustainable food and diets in several countries (e.g., Austria, Czech Republic, Germany, United Kingdom). Eco-labelling systems for organic food (e.g., Denmark, Germany, Sweden). • **EECCA and SEE.** Croatia has implemented much of the EU legislation on environmental certification and labelling of organic food, with a policy package that includes the creation of a certification scheme for organic food and information campaigns promoting organic products to consumers (as well as economic incentives to farmers to take up organic farming). Kazakhstan has engaged in the process of environmental labelling of food products. • **North America.** In Canada, the Extended Producer Responsibility Task Group informs the public about the amount of waste created by packaging.

Source: ***Adapted from UNEP-CRI (forthcoming).***

C. Moving forward

The previous sections have outlined the state of policy and action in the various subregions of the pan-European region. Progress to date and the future agenda varies widely not only between subregions (see table 4.4), but also within subregions.

Table 4.4
Regional overview

Subregion	Recent progress	Moving forward
Western and Central Europe	General progress on the production of sustainable products and encouraging consumers to purchase them through information-based instruments. However, the progress has not led to a reduction, in absolute value, of materials and energy consumption.	Need to promote changes towards sustainable lifestyles, e.g., in the area of food (lower caloric intake and meat consumption), transport (increased use of public transport), housing (improved energy efficiency) and recreation (sustainable tourism).
EECCA and SEE	Some progress in sustainable housing policies, less in other areas.	Need for increased attention to develop a policy agenda for sustainable consumption, with a continued focus on housing and transport in particular.
North America	Policies relevant to sustainable consumption are being implemented in various areas, in particular housing.	Need for increased coordination of initiatives and for increased attention to sustainable transport. Need to promote changes towards sustainable lifestyle (same as in Western Europe — see above).

Source: Elaborated based on information provided in UNEP (2009).

Nevertheless, a regional agenda for the next 10 years could be articulated around the following points:

1. **Place a greater focus on sustainable consumption and sustainable lifestyles.** Although at different levels of progress, all subregions focus most efforts on production, fewer on products, and very few on changing consumption patterns. Even in the most advanced subregion, Western and Central Europe, SCP quantitative targets reflect a predominantly production-oriented approach (UNEP-CRI, forthcoming). Yet, experience shows that production and product-efficiency gains are often more than offset by consumer behaviour — whether in terms of space heating, private car use or demand for non-traditional foodstuffs. Thus, more efforts need to be made to develop and implement policies to promote sustainable lifestyles, particularly in affluent countries, so as to transfer demand from goods and services of higher material and energy-use categories to lower ones.

2. **Adopt an integrated and balanced approach to changing consumption patterns**. Many different measures are being used across the pan-European region, spanning different sectors and categories of policy instruments. Those measures could be better articulated around policy packages while aiming to exploit synergies between actions in different consumption sectors. Policy packages should be well balanced — more attention to economic instruments is probably needed in some sectors and subregions. For example, water and energy charges should be increased as part of a package that should include installing individual meters for households and awareness-raising campaigns on how to reduce water and energy consumption. Such measures need to be implemented jointly with policies to mitigate financial burdens on low-income and other vulnerable groups in society so that inequalities do not increase. While Governments keep playing a traditional role as controllers (through regulations and standards), they need to look towards a wider role

in terms of governance or "change management", recognizing that collective action and engagement by producers, consumers and civil society are key in achieving sustainable consumption (UNEP-CRI, forthcoming). It is particularly important to adopt a gender perspective when aiming to affect consumer decisions, since in many countries a large portion of the household budget is controlled by women.

3. **Tailor action to specific circumstances.** The countries of the pan-European region vary widely in terms of per capita income and cultural norms. These differences are reflected in the strength of civil society, the green movement, education for sustainable development, corporate responsibility and other factors that influence social values and consumer choice. Moreover, evidence shows that consumption-oriented policies can be effective only if they are differentiated according to the particularities of the different social segments in terms of values, attitudes and behaviour (UNEP-CRI, forthcoming). Particularly in the Eastern European and Central Asian countries, attention needs to be paid to managing the trade-offs between environmental and social aspects — for example, in terms of the potential impact of tariff increases for communal services on the utility bills of the poorest segments of the population. At the same time, those countries are the most likely to offer opportunities for leapfrogging to sustainable consumption patterns. In all cases, policies aimed at promoting sustainable consumption need to look not just at the environmental impacts of consumption, but also at the social dimension, and to adopt a gender perspective.

4. **Focus first on the low hanging fruit.** Particularly in EECCA and SEE countries, there seems to be a growing implementation gap as new strategies are in many cases not backed up by financial resources, institutional capacity and political will. Yet, there are huge opportunities for advancing towards sustainable consumption while achieving economic savings (win-wins), most clearly by reducing energy use through refurbishment of inefficient housing (and of district heating networks). While there are many examples of successful greening projects in key sectors, they represent only a very small part of the potential and have been in most cases initiated by foreign donors. National Governments could consolidate progress in these areas and use such progress (for instance in terms of consumer education) as a basis for launching initiatives in more difficult sectors.

A key requirement for inducing substantial changes in sustainable consumption patterns along the lines mentioned in table 4.4 is the involvement of **all actors within society**: the youth through education for sustainable development in schools and universities; women through the choice of green household consumer goods; the private sector through the improved supply of green products and services; the public sector through green procurement; non-governmental organizations (NGOs) through awareness-raising about environmentally harmful consumption behaviours; and the media through providing information about the ecological footprint of unsustainable consumption.

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Chapter V.

The social dimension of the green economy

Chapter V. The social dimension of the green economy

This chapter advances the idea that sustainable development is about people: their health, equity and employment. While a greener economy is needed, the required adjustments will not automatically benefit all segments of society. Likewise, long-standing inequities will not necessarily disappear during the green transition, and some have the potential to worsen. High unemployment rates, rising levels of inequity, the growing epidemics of non-communicable diseases and persisting communicable disease are all existing challenges in the region. Therefore, it is even more necessary to ensure the benefits of transition reach the social groups most affected by the specific social, economic and environmental challenges.

Social protection mechanisms, deliberate investments in preventive health measures, access to basic needs and policies targeted to the most vulnerable workers, communities, regions and industries are all necessary components for taking advantage of the economic and social opportunities presented by sustainable practices in labour and health in the region. A key policy direction in this regard is the establishment of a social protection floor, with coverage for all segments of the population, including poor and vulnerable groups as well as those that are socially excluded. Additional measures can include employment guarantees, minimum wage legislation and the protection of workers' rights, as well as provision for affordable childcare and social services to reduce women's unpaid work

Opportunities for a transformation to sustainable development lie in fostering healthier and reduced consumption. They also lie in healthy and job-creating green developments in energy, transport, housing, urban management and agriculture, as well as in the health sector. This, however, requires the development of a better understanding of the implications of green developments on employment and health and their societal co-benefits, thereby preventing undesired effects. Large public health savings are possible by investing in transport, cleaner air, water and greener energy.

Introduction

Over the past 20 years, the world has witnessed strong economic growth and significant progress towards attaining a number of the MDGs, including improvement in health. It is of grave concern, however, that these positive trends have been accompanied by increasing disparities, persistent gender inequality, unemployment, social inequity, a growing deterioration of the environment and recurrent economic, financial, energy and food crises, all negatively affecting people.

It is the young people that are facing the biggest consequences of backsliding in terms of human development in the region: difficulties in finding decent work due to their lack of work experience and appropriate skills; exposure to unsustainable consumption patterns; environmental consequences of decades of pollution, climate change and other global environmental changes; and a more rapid distribution and patterns of diseases.

However, youth are also born in a world of wide-ranging technological progress — from renewable energy and energy efficiency, to innovative measures for adapting to climate change impacts to new and efficient means for social networking, dialogue and participatory engagement — providing opportunities that were not available 20 years ago. The creation of green jobs could represent new opportunities for youth employment. A social protection floor and a more sustainable management of natural resources could help to create greater equity between men and women and ensure food, electricity, water, education and health care to the working poor, rural workers, ethnic minorities and migrant workers.

This chapter looks in particular at enhancing equity, employment and health, while protecting the planet and its ecosystems that support us so that all people, women, men and children, can live in dignity. It provides examples of both the challenges for employment and health, and how development in these and other sectors and settings can contribute to equity in health and employment. The shift to sustainable development presents challenges, but also offers opportunity for substantial returns on investments, both public and private, in productive infrastructure, technological transformation, science, education and human capital development.

A. The labour dimension of the transition to a green economy

This section focuses on green jobs in a just transition to a green economy, and the actions that must be considered in order to achieve sustainable development and economic growth. The main challenges and opportunities of green job creation in the pan–European region, achievements and future prospects are reviewed. Finally, a set of policy recommendations are presented with a view to ensuring an economically smooth and socially just green transition.

Green and decent jobs

Moving towards a green economy is a strategic goal to address the challenge of global warming and achieving sustainable development. The social, environmental and economic pillars of sustainable development are closely interlinked and should be pursued in unison as part of a coherent package of green economy policies and measures. In terms of labour, this means that all efforts to reduce the environmental impacts of economic activities should be linked with efforts to improve the working conditions of workers newly employed in green sectors and those whose jobs should be adapted to this new development paradigm. The aim of a green economy is therefore twofold: on the one hand it creates new green jobs for all, including the most vulnerable; and, on the other hand, it greens the labour market. Inclusive and green jobs policies lead to increased employment rates and become self-sustaining by widening the tax base and providing additional financing for public health and all other social security systems.

Jobs are green when they help reduce the negative environmental impact of economic activities and lead to environmentally, economically and socially sustainable enterprises and economies. They reduce consumption of energy and raw materials, limit GHG emissions, minimize waste and pollution and protect and restore ecosystems. Green jobs should be decent jobs, with regard to the four strategic pillars of the ILO decent work agenda (rights, employment, social protection and social dialogue). International Labour Standards are essential during the green transition in order to provide equal employment opportunities for all by strengthening the social protection system and protecting those negatively affected by a green transition; engaging workers and employers' associations in decision-making and the implementation of green economy policies and programmes; and implementing coherent labour market policies. Green jobs therefore provide a double social and environmental benefit. First, they improve working conditions, provide incomes and thus reduce poverty. Second, they improve the environmental situation through the reduction of water and air pollution, erosion and desertification and biodiversity loss. Both of these gains are mutually reinforcing.

Part of the process of greening the economy is also greening workplaces. Workplaces consume energy, use resources and generate waste and travel and are thus an obvious place where greening can be achieved. More broadly, the greening of workplaces can also encompass environmental considerations in relation to finance and investment, as well as procurement and supply-chain policies.

It should be noted that there are different shades of green; meaning that the positive effect of any job in terms of environmental impact reduction can evolve. All jobs in all sectors and all countries have the potential to be greener, for example by reducing energy, water and raw material consumption, decreasing waste generation or increasing recycling. In terms of green jobs, the full transformation advocated by this report would enhance decent work conditions together with the environmental performance of all jobs.

A green and just transition

In the low-emission world that the green economy promotes, polluting sectors will face reduction and eventually might disappear. Therefore it can be assumed that only environmentally sound jobs will be sustainable in the long term. It is

important to question the assumption that reducing CO_2 will mean a proportional reduction in jobs. A recent report by the International Institute for Labour Studies finds that 12% (or 24 million) of all workers in the EU-25 are employed in the top 15 carbon-emitting industries (which account for roughly 85% of all CO_2 emissions from production). The report goes on to point out that there is some level of predictability. Thus, there is also considerable scope for Governments and social partners to work together well before the onset of adjustment to develop strategies to smooth any transition over time for both workers and employers. The ILO report *Skills for Green Jobs: a global view* (Strietska-Ilina et al., 2011), also highlights that the transition to a green economy will bring both job opportunities in sectors that will be promoted (renewable energies, energy efficiency, etc.) and job losses in declining sectors (e.g., coal mining, unsustainable forest harvesting), as well as in economic sectors particularly affected by climate change such as agriculture or fisheries. The different mechanisms impacting the labour market are summarized in table 5.1 below.

Table 5.1
Employment impacts of the green economy

Jobs creation	**Direct jobs**	New positions in promoted sectors such as renewable energy, energy-saving industries, waste and recycling.
	Indirect jobs	New positions in sectors that are part of the value chain of the promoted green sectors.
	Induced jobs	New positions resulting from the income expenditure increase in communities.
Jobs loss	Old positions suppressed in declining sectors, such as energy-intensive industries, energy extraction, the power sector, the auto industry, etc.	
Job substitution	Existing positions shifted from declining sectors to promoted sectors such as automobiles to public transport, waste disposal to recycling, fossil fuels to research and development.	
Jobs redefinition	Existing positions redefined according to new performance and skills requirements.	

Source: Adapted from OECD (2004), pp. 9–10, and Strietska-Ilina et al. (2011), p. 56.

It is widely acknowledged that the green transition's impact on the labour market is likely to be positive in the long term (UNEP, 2008). If we widen our view to consider the social gains in addition to economic growth benefits, green economy investments can have significant returns even in the short term. The social benefits of green economy policies and investments come from three sources: (a) direct, indirect and income-induced jobs; (b) savings from reduction of energy and raw material consumption; and (c) social benefits in terms of health improvements. (See the health section of this chapter for more on this.) In some sectors, such as clean energy, the number of jobs created in the indirect and income-induced job creation categories would outnumber those created as a direct effect of a green economy transition. A cost-benefit analysis which considers social effects of the green transition demonstrates that green jobs are feasible and cost-effective. This point was made for example by the World Bank (2003), which argues that the Bank's lending on mining projects should be directed towards projects with the potential to both alleviate poverty and limit environmental damage.

As detailed in table 5.1, labour market dynamics in a green transition will have different outcomes depending on the economic sectors under consideration. Those changes, though beneficial, can have unfavourable effects on workers and their families in the short term. The uncertainties during the transition, such as risks of job losses or risks of economic downturn are addressed in the ILO "Just Transition" framework policy proposals. A Just Transition needs to take into account several policy areas:

- Early assessment of social and employment impacts should be developed to better prepare for change;
- Green jobs promotion and sustainable enterprises creation programmes should be linked to economic diversification programmes and green economy investments;
- Labour policies need to be coherent with green economy objectives. Active labour market policies, training and skills development is crucial to prepare workers for new jobs and provide opportunities for acquiring new skills to those who are at risk of losing jobs. A labour-intensive approach can be applied in some relevant sectors, such as water and sanitation infrastructure, reforestation, or adaptation to climate change-related infrastructures;
- Social security policies and other social protection policies are needed to cushion the impacts on both workers and companies of climate change and the policies to address it;
- Social dialogue and democratic consultation of social partners and stakeholders should be fostered to promote consensus-building in policymaking and implementation.

The sustainable development transformation

As outlined in chapter one of this report, there is a close link between a green economy, green jobs and poverty reduction due to different factors: (a) low-income households depend to a large extent on natural resources, which is why environmental degradation represents a greater risk to them (e.g., in the Russian Federation and Central Asia); (b) poverty is often a driver for environmental degradation and the reason for unsustainable management of natural resources (e.g., deforestation in the Russian Federation, land degradation in Central Asia and the Caucasus); and (c) waste management and recycling processes are frequently carried out by the poorest in society, usually in dangerous working conditions and particularly by women and children. However, if working conditions are improved, jobs in these sectors could become increasingly decent and green. This would, in turn, reduce poverty by providing additional incomes and improving the environment overall.

In order for green economy policies to contribute to poverty reduction, policy measures should clearly target the social groups most affected by social, economic and environmental problems. Vulnerable social groups include the following:

- **Young people** face difficulties finding decent work due to their lack of both work experience and appropriate skills. In Commonwealth of Independent States (CIS) countries and Central and South-Eastern Europe the youth unemployment rate was 20.8% in 2009 (ILO, 2010). Green jobs can create opportunities to bridge the youth employment gap. The green economy requires new skills that should be promoted throughout the education system and training programmes to link young people entering the labour market with the needs of employers. It is therefore important to factor youth into green employment strategies and green entrepreneurial initiatives;
- **Women** frequently face inequalities in terms of job opportunities and equal incomes. Inequalities will persist in a green economy unless specific measures are taken to promote greater equity. The energy industry has so far been male dominated, and the involvement of women in science and technology-related jobs is still marginal. Gender stereotypes and lack of skills for newly created jobs in the energy sector are barriers to the participation of women in the green transition (Rustico and Sperotti, 2011); and
- **Unemployed and underemployed,**[36] the working poor, rural workers, ethnic minorities and migrant workers who depend on natural resources for their income, are strongly impacted by deforestation, forest degradation, erosion and water scarcity. A more sustainable management of natural resources (water, soil, forestry) is therefore not only beneficial in environmental terms, but also in social and economic terms.

[36] Note that the share of the informal economy in Eastern Europe, the Caucasus and Central Asia is high (22.3% in Ukraine in 2007, 17% in the Russian Federation in 2006, 33.2% in the Republic of Moldova in 2007), and underemployment is an important feature (8.7% in the Russian Federation in 2004, 8% in the Republic of Moldova between 2005 and 2008), especially in the rural areas (Nesporova and Nero, 2009).

Europe and Central Asia and green jobs: challenges and opportunities

The green transition offers countries of the region opportunities to mitigate concurrent challenges arising from climate change and the unfolding economic crisis. Most prominently, increasing energy efficiency and reducing energy intensity offers great potential. Countries in SEE and EECCA regions are still some of the most energy-intensive in the world. Taken together, the use of primary energy by these subregions, per euro of GDP, is 2.7 times higher than in the EU. (See chapter III of this report for an analysis on the energy intensity in the region.) The region has great potential for energy-efficiency savings in construction, industry and transport that could be realized at relatively little cost, as discussed below. Moreover there are important opportunities in renewable energy production for both net energy exporters and importers across the region. If potential is exploited in wind, solar, hydro and geothermic production, countries which are net importers of energy could reduce their reliance on external supplies and increase their energy security. By increasing production of renewable energy, countries which are net exporters of energy could be better able to meet current or future emissions reduction targets without relying on nuclear energy, which, in addition to having safety concerns, is also capital intensive. The transition to a green economy therefore has the potential to expand innovative industries, increase economic diversification, improve the resource efficiency of the economy and create new jobs.

While the green transition offers great opportunity, a key challenge for countries in Central and Eastern Europe, as well as in Central Asia, is the unfavourable labour market, visible through high unemployment and underemployment, widespread informal employment, low employment security, low wages, insufficient social security coverage and high poverty. Economies of the region conceal vast structural imbalances and institutional weaknesses (e.g., reliance on hydrocarbons, minerals and steel production as the principal drivers of growth and remittance-dependency). The global financial and economic crisis has further deteriorated the situation since these shortcomings contributed to deepening the negative impacts on labour markets and the population (Nesporova and Nero, 2009). The economic downturn has deprived many workers of their jobs, impedes the creation of new jobs and aggravates the situation of workers who have lost their jobs and their families, as well as the poor in general. While unemployment declined considerably in all countries except for Georgia and Serbia in the 2000s, this positive trend was interrupted by the financial crisis. In 2009 the unemployment rates increased in 10 of the 18 countries of the region on average by 2 percentage points, and remained elevated or even further increased in 2010. The level of unemployment is very high, in double digits, in the Western Balkan region as well as in Armenia and Georgia. It even exceeds 30% in Armenia and the former Yugoslav Republic of Macedonia and is close to this level in Bosnia and Herzegovina. In Eastern Europe and Central Asia, the level of unemployment is lower, below 10%, but these countries are experiencing considerable underemployment, in particular in the rural sector.

Green packages, including investments in reducing the demand for energy through the promotion of energy-efficient buildings, public transport, electrical appliances and cars, as well as diversifying the supply of clean and renewable energy, could efficiently revive the economy and lead to the relatively fast creation of a large number of jobs. Germany, for example, created more than 200,000 new jobs in the renewable energy sector between 2004 and 2008. If invested wisely, investments made in order to overcome the economic crisis could leave a legacy of energy-efficient infrastructure, renewable energy sources and workplaces that are more resilient to climate change. In order to maximize the benefits of a green transition, green jobs must also be decent jobs. Skills development, labour market policies, social protection, social dialogue, the strengthening of labour market governance and workers' rights protection are all important essential components of the move to a sustainable, economically sound, socially fair path to development.

Effects of climate change on employment

Climate change will have significant and irreversible consequences across the pan-European region. Although the effects will be very diverse depending on the country in question, it is likely to alter the fundamental components of production, such as the use of land, fish stocks, food and water, as well as disrupt production processes through droughts or floods (IPCC, 2007). This in turn will lead to a rearrangement of labour and capital across and within sectors and subregions. While the effects of climate change will be felt deepest in the developing world, industrialized countries are far from being immune and the damages to markets may be particularly significant in Western Europe and the former Soviet Union (ETUC, 2007). The potential effects of climate change on economic activity and employment in the agricultural, forestry and fisheries sectors are presented in table 5.2 (ETUC, 2007; World Bank, 2007):

Table 5.2
Potential effects of climate change on economic activity and employment

Geographical location	Main climatic drivers	Expected potential effects on economic activity and employment
General	Increase in frequency and intensity of extreme weather events	Negative impact on forestry productivity Negative impact on employment
Northern Europe — mid- and high-latitude regions	Rising temperature, high atmospheric CO_2 concentration	Positive impact on agricultural productivity Positive impact on employment overall
Southern Europe, Mediterranean region, Caucasus, Central Asia	Rising temperatures, droughts	Negative impact on agricultural productivity Negative impact on employment at local level
Southern Europe, Caucasus, Central Asia	Rising temperatures	Negative impact on livestock productivity Negative impact on employment at local level
Mediterranean regions	Higher fire risk due to rising temperature, drought	Negative impact on forestry productivity Negative impact on employment at local level
Fisheries communities (Iceland, Baltic Sea, Spanish and Portuguese coast, Caspian Sea, Black Sea)	Changes in sea surface temperature, wind regime, water run-off, ice melt, or marine currents	Negative impact on fisheries productivity Negative impact on employment, possibly significant at local level

Although information about the impact of climate change on the world of work is still insufficient, there is a growing consensus throughout the region that preventative actions including both climate mitigation and adaptation measures must be taken and that the cost of taking action now will be much less than if taken later.

Transition towards a green economy

There are no coherent and comparable statistical databases in terms of green jobs (common definition, study by sector, future forecasts, impact on current labour, etc.) in Europe. Despite this, core environmental activities including pollution control management, natural resource-based activities such as organic farming and sustainable forestry, environment-related tourism, renewable energy and water supply in the EU are estimated to employ 4.4 million people directly, along with a further 4.3 million people through indirect and induced jobs (GHK, 2009). The number of green jobs in the EECCA and SEE countries is much more difficult to assess. While no national statistics are available for this category of employment, ambitious initiatives fostering these kinds of jobs are increasingly common, for example:

- **Bulgaria** launched a programme in 2011 to subsidize companies offering green jobs to unemployed people, a measure that will secure 2,100 new jobs with a decent salary;
- An assessment by UNDP of the **Croatian** energy sector potential estimates that 65,000 indirect and induced jobs could be created by 2020;
- **Serbia** has already created 8,000 green jobs in the past several years — primarily in the recycling sector, and foresees the creation of 3,000 additional positions by the end of 2011;
- In **Kazakhstan**, the construction of the first building in the framework of the "Energy-efficient design and construction of residential buildings" initiative has started and should be achieved in 2012, which will foster green jobs creation;
- **Armenia** has launched a programme jointly with UNDP called "Beautiful Yerevan", aimed at regenerating the urban environment and addressing the increasing unemployment in the construction sector.

Policies such as the "20-20-20" climate and energy targets or the Emissions Trading Scheme in the EU aimed at combating climate change will continue to have a positive impact on national, European and global economies. Another instrument that interacts with the EU Emissions Trading Scheme is the Joint Implementation mechanism. This mechanism allows every one of its projects being implemented in Eastern and Central Europe[37] which successfully reduces emissions to receive the equivalent reduction in Emission Reduction Units. These units can be traded in the EU Emissions Trading Scheme, which also creates opportunities for green initiatives and investments in countries of Eastern Europe. Projects such as the rehabilitation of the district heating system in Donetsk region in Ukraine, or a coal-to-waste-wood-energy switch in the town of Onega in the Russian Federation, for example, created numerous green jobs.[38] Kazakhstan also published a "National report on integration of the 'Green Growth' tools in the Republic of Kazakhstan" in 2010".[39]

Although the overall impact on labour is still not well documented, the transition towards a green economy will have tremendous impact on employment across economic sectors (European Commission, 2009a). The sectors most impacted by a green transition would be the energy sector; agriculture; construction of energy-efficient buildings, transport, recycling and waste, and basic industry. Below, further consideration is given to each of these areas.

Employment in the energy sector

The renewable energy sector has grown considerably in the past decade throughout the region. Renewable energy development policies, such as the EU target to progressively increase its energy consumption of renewable resources to 20%, will create a large number of new jobs.40 In 2005, 1.4 million people were employed in the renewable energy sector in the EU, and this number should grow to 2.8 million in 2020 (Ragwitz et al., 2009). From 1991 to 2005, total employment in the sector increased by around 40%, with 775,000 directly employed in the sector. The strongest growth has been in wind (0.1%–6.5% of total EU electricity production mix) and solar energy (0.2%–0.9% of total EU electricity production mix) from 1990 to 2007, although biomass, wastes, and hydropower remain the most commonly used sources of renewable energy (European Commission, 2009a). In 2010, through successful policies such as the privileged grid access for renewables,

[37] The countries targeted are Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Russian Federation, Slovakia, Slovenia, and Ukraine.

[38] Source : http://ji.unfccc.int/index.html.

[39] See http://aoa.ew.eea.europa.eu/virtual-library-viewer/answer_8565329228.

[40] A recent study commissioned by the German Federal Ministry for the Environment, Natural Conservation and Nuclear Safety (2011) concludes that if climate targets were raised from 20% to 30%, up to 6 million new jobs would be created throughout Europe.

attractive remunerations and feed-in tariffs,[41] the share of the renewable energy sector in the Spanish electricity production mix (including hydropower) grew to 32.6% (from 20.7% in 2008) and the sector employs 109,368 people today. In Germany, this sector has grown to 18.8% of the total electricity produced and employed 367,400 people in 2010.

The pace of green jobs creation in Germany is promising for employment in the renewable energy sector throughout the region: 160,000 people were working in the sector in 2004 and this number increased to 370,000 in 2010. Making an estimate of a linear relation between employment and installed renewables capacity (23.7 gigawatts (GW) in 2004 and 55.2 GW in 2010), we can assume a rate of 6,660 jobs per GW of energy installed.

Although the shares of renewables in the energy mix are quite high in Romania, Turkey and Uzbekistan, Eastern European and CIS countries have not yet fully explored their renewable potential, as we can see in the following table (Table 5.3)

Table 5.3
Renewables in electricity consumption mix (percentage)

	1990	2000	2005	2010
Czech Republic	2.3	4.1	4.6	7.6
Kazakhstan	8.4	14.7	11.6	11.4
Poland	2.6	3.2	3.7	7.6
Romania	17.7	28.5	34	34.1
Russian Federation	15.3	19.1	18.6	15.1
Turkey	40.4	25	24.6	26.2
Ukraine	3.6	6.7	6.7	6
Uzbekistan	11.8	12.5	17.5	22.4

Source: Enerdata (2010).

Good results in the wind sector — largely unexploited so far — should be emphasized: the Czech Republic increased the wind power sector by 150% in 2008, Poland's wind capacity augmented by 71% in 2008, and Bulgaria foresees an increase in wind capacity from 16.5 MW in 2009 to 220 MW in 2012 (European Commission, 2009a).

Opportunities for job creation are significant if we consider the potential for increased investment in renewable energy. Following the European Bank for Reconstruction and Development (EBRD) report on renewable energy resource assessment of the region (EBRD, 2003), the countries with transition economies could cumulate a total potential of 315 GW of renewable (excluding photovoltaic) installed capacity by 2020 (Hydro: 172 GW; Wind: 108 GW; Biomass: 34 GW; Geothermal: 1 GW).

[41] The downside of feed-in-tariff policies explored in Western Europe, in particular in Spain and Germany, is the potential for a rise in electricity taxes. In the case of Germany, the Renewable Energy Sources Act caused an increase to 35€/MWh in 2011, accounting for nearly 30% of an average SME manufacturing site electricity invoice. These high taxes clearly represent challenges for energy-intensive economies with rapid growth targets such as the countries of Eastern Europe, the Caucasus and Central Asia.

Based upon the German study mentioned above, there is potential for the creation of 2.1 million green jobs if this target is met.

The example in box 5.1 from the Navarre region in Spain demonstrates the potential for job creation, even during a severe economic downturn, of the renewable energy sector.

Box 5.1 Green restructuring in Navarre: A successful shift to renewable energies

In the 1980s and 1990s, the Spanish region of Navarre suffered from a severe economic downturn when high oil prices impaired the competitiveness of its single largest industrial employer, a Volkswagen car plant. Unemployment soared to a peak of 13% in 1993. The regional government responded with active industrial policy measures, including worker retraining, to expand the renewable energy sector. A rapid and successful development of the wind power industry followed, facilitated by the favourable geographical and climatic conditions of the region alongside a clear corporate and public strategy. The region expanded the share of its electricity production derived from renewable sources to 65%, with an eventual target of 100%. This small region of Spain, with a population of just 620,000, is now Europe's sixth largest producer of wind power.

From 2002 onwards, Navarre has been implementing its Environmental Training Plan. In cooperation with the Confederation of Entrepreneurs of Navarre and the Navarre Industry Association, the regional government identified the main skills' shortages in the region through a project entitled "Strategic talent in the renewable energy sector", and on the basis of its findings set up CENIFER, a public training centre for renewable energies, which became a major training provider for the sector. In 2006, the country's first graduate programme for electrical engineers in wind and solar electricity was launched at the Public University of Navarre.

Between 2002 and 2006, employment in renewable energies across Navarre increased by 183%. In 2007 alone, 100 companies and over 6,000 jobs in renewable energies were created. Unemployment dropped to 4.76%. Even in the economic and employment downturn of 2009, Navarre maintained the lowest unemployment levels in Spain. This achievement bears witness to the success of a policy mix which incorporated environmental and skills measures in a proactive response to an economic crisis with a view to long-term development (Strietska-Ilina et al., 2011).

Employment in agriculture

Agriculture, forestry and fisheries are very climate-sensitive production activities; they are also substantial areas of employment in the region. In 2007, around 2 million people were employed full time, and 4 million temporarily, in agriculture and forestry in rural areas in the EU.[42] If we consider the EECCA and SEE countries, the number of employees in the agricultural sector reaches 25 million.

While an important source of employment, conventional agriculture produces high levels of CO_2 emissions, degrades land and depletes natural capital. In the process of climate change, water shortages and extreme weather events will have tremendous impacts on the labour market in those countries. Organic agriculture could play an important role in the green economy transition by improving the farm sector and creating employment that provides better returns per unit of labour input all along the value chain (UNEP, 2011). To this end, many countries have adopted growth targets for the organic goods sector (e.g., in Austria 20% by 2010, in Bulgaria 8% by 2013), others have set organic certifications (Organic Standard Ltd in Ukraine) and started regional initiatives and standards (Green Caucasus). As detailed in the box below, organic farming in the Republic of Moldova is a growing sector with huge potential to contribute to greening the economy and promote sustainable development more generally.

[42] Source : www.agri-info.eu/english/t_employment.php.

Box 5.2 Organic agriculture in the Republic of Moldova

Soils are the main natural resource of the Republic of Moldova. Half of the people live in rural areas, and employment in the agricultural sector reaches 40% in the country. The Republic of Moldova is the country in Eastern Europe, the Caucasus and Central Asia with the most developed organic sector, both commercially and in terms of policy and government involvement. Developing organic farming could create numerous green jobs in the sector, as the employment opportunities can increase between 10% and 30% as a result of conversion from traditional to organic agriculture, depending on farm size and crop (UNEP/UNCTAD, 2010).

A regulatory framework for organic farming was set in 2005 with the approval of the Law on Organic Agri-food Production and a series of Government regulations and action plans on organic food production, marketing methods, inspection and certification systems, and import and export rules. The Agricultural and Food Sector Development Strategy (2006–2015) set the ambitious target of doubling Moldovan organic production and tripling certified farmed areas by 2015. Since 2005, approximately 11,000 ha (including 5,000 ha of vineyards) have been certified as organic nationwide. The Republic of Moldova exported around 32,000 tons of organic produce, from 211 producers, at a value of US$ 48 million in 2009, representing 11% of its total agricultural exports. (World Bank, 2007; UNEP, 2011b)

Employment in the construction of energy-efficient buildings

Studies linking employment and energy efficiency estimate that between 40 and 100 new jobs could be created per petajoule of primary energy saved (Jochem and Madlener, 2003). The jobs created would encompass positions such as green building architects and designers, auditors, engineers, estimators, project managers, pipe fitters, sheet metal workers, heating, ventilating and air-conditioning technicians, electricians and general construction workers. Green buildings, retrofitting or energy-efficient building components lead to benefits in terms of direct, indirect and induced jobs. Many initiatives towards better efficiency in buildings at the country level have been implemented, such as the formation of green building councils (Germany, Romania), energy-efficiency standards (e.g., *Passivhaus*/Passive House in Germany and the United Kingdom, *Haute Qualité Environnementale* in France, *Minergie* in Switzerland), and retrofitting programmes (e.g., German Alliance for Work and the Environment's Initiative to Retrofit German Homes). The German Alliance for Work and the Environment's retrofitting programme, launched in 2001, has created around 140,000 new jobs and reduced annual CO_2 emissions from buildings by about 2%. Given the high percentage of emissions caused by conventional buildings, this retrofitting programme is one of the important strategies adopted by Germany to reduce emissions by 40% in the period from 1990 to 2020.

The Global Environment Facility and UNDP are partners to promote Energy Efficiency in the Construction Sectors of Armenia, Kazakhstan, Kyrgyzstan, Turkmenistan and Uzbekistan. This project was launched in 2008/09, with an overall objective to reduce energy consumption and GHG emissions in construction sectors by 30%–40% against the starting level. As we can see in the example in box 5.3 below from Hungary, the number of green jobs created, along with the associated social and environmental benefits, has the potential to outweigh the initial costs of such energy efficiency programmes.

Box 5.3 Potential employment impacts of a large-scale deep building energy retrofit programme in Hungary

In Hungary, buildings are key in the response to the climate challenge since they are responsible for approximately half of energy-related CO_2 emissions and have the highest cost-effective climate change mitigation potentials in Hungary. If their efficiency were improved, it would reduce up to 85% of the Hungarian heating energy use and the corresponding CO_2 emissions, but also advance energy security, social welfare, reduce fuel poverty and create new business opportunities, as well as improve air and life quality and health.

The annual net employment benefit would reach 131,000 jobs by 2020, including the losses in the energy supply sector. Up to 38% of the employment gains would be due to the indirect effects on other sectors that supply the construction industry and the induced effects from the increased spending power of higher employment levels. In addition, the length of the programme would ensure that the jobs created would be long term, and the fact that the whole building stock would be considered for renovation implies that the new jobs would be likely to be distributed throughout the country as renovations are usually carried out by local SMEs.

Source: ***Centre for Climate Change and Sustainable Energy Policy (2010).***

Employment in transport

Transportation is responsible for around 20% of GHG emissions, and the reliance on cars, trucks and airplanes for private and freight movement is growing in the pan-European region. Direct and indirect employment in the transport sector in the EU, mainly in road transport, accounts for around 15 million jobs (including 900,000 public transport jobs), which represent more than 7% of total employment (ETUC, 2007). There are significant differences between countries of Eastern Europe, the Caucasus and Central Asia and Western Europe: (a) freight transport is mostly performed by rail (80% in EECCA versus less than 15% in the EU); (b) the use and ownership of private cars has increased, but it still remains low compared to Western Europe (below 180 cars per 1,000 persons versus 400–600 in Western Europe); and (c) although public transport developed considerably between 1970–1990 in EECCA countries, the lack of funding limited the recovery from the decline experienced between 1990–2000 (EEA/UNEP, 2007).

Alternative fuels, a shift in transportation models, car-sharing programmes, development of hybrid cars and development of fuel-efficient engines or materials incorporated in today's vehicles are part of a broad array of measures that will have different employment outcomes. In Spain, direct and indirect jobs in sustainable transport (public transport in all its modalities and car-sharing, bicycle users, pedestrians) were estimated to amount to 297,109 in 2008. According to different scenarios, projections for 2020 can lead to the creation of between 307,114 and 429,370 jobs. When supported by public policies (promotion, fiscal measures, taxes, etc.) the more ambitious scenario creates 39% more green jobs and decreases energy consumption in transport by 13% (ISTAS, 2011).

Policies which restrict transport activity and rebalance transport modes in favour of rail for both freight and passenger transport would lead to a growth, rather than a decline as many perceive, in overall employment (ETUC, 2007). For these positive effects to materialize, policies must be integrated, combining regulatory, economic and market-based instruments, research and development, demand restraint, the provision of alternatives, improvement of social conditions in the road transport sector, investment in training and social dialogue. (For more on the policy mix required for a green transition, see chapter II of this report.)

Employment in the recycling and waste sector

Waste has a real impact on the environment and recycling is an efficient tool in energy consumption reduction, as well as for the improvement of the overall quality of life (cleaner air, water, etc.). Differences in recycling regulations, sorting mechanisms, material recovery, processing or separation make it difficult to assess the number of employees in this sector in the pan-European region. According to a study performed by Ernst and Young in 2006, current employment in the waste management and recycling sector amounts to 1.8 million in the EU–27. It is, however, difficult to estimate the number of employees for the whole region due to widespread informal employment in this sector in EECCA and SEE countries. Total per capita waste generation in these subregions was higher than in the EU (14 tons and 4 tons respectively in 2007 according to an EEA/United Nations Environment Programme (UNEP) report). Hazardous waste represents an important part of total waste generated (12%–18%). Moreover, only a small part of the landfills are equipped with gas collection system (EEA/UNEP, 2007). Part of a global phenomenon, in Central and Eastern Europe there is a growing informal recycling sector. These workers are often found among minorities and especially in the Roma communities. The TransWaste programme in the Danube region (2009–2012), co-financed by the European Regional Development Fund, is working to evaluate the real amount and environmental effects of waste within the informal waste collection sector and to formalize the informal waste collection in the region. In cases where waste pickers are organized, and able to transfer from the informal to the formal economy, they not only contribute to waste management of both cities and enterprises, they are also able to (a) improve their working conditions, including health and safety at work; (b) triple their incomes (or more); (c) promote gender equity, empowering both women and men and giving them a voice in the decision-making and policy implementation; and (d) reduce the risk of child labour and promote sustainable livelihoods for adults. Box 5.4 below also demonstrates how formalization of waste picking can have environmental and social benefits.

Box 5.4 Recycling and waste pickers in Serbia

During the past few years Serbia accelerated the pace of reforms in addressing its environmental issues. In 2009, modern environmental laws introduced obligations, for the first time, for major waste producers and companies in different sectors to dispose of waste through a system of collection and recycling. Recyclable waste (aluminium cans, polyethylene terephthalate (PET), cooking oil, paper, etc.) has to be disposed of by certified collection and recycling companies, which in turn issue the certificates confirming that the waste was properly collected and recycled. Over the past 18 months the process of mapping and certification of recyclers of various kinds of waste has been carried out by the Ministry of Environment, resulting in certification of a number of recyclers and collectors and creating the basic preconditions for the implementation of the 2009 environmental legislation.

Another positive development has been the creation of the first trade union of collectors of secondary raw materials, almost entirely composed of the members of the Roma ethnic community, which represents the basic step in the transformation of what used to be an informal sector into a sector that generates decent employment. This trade union has some 6,000 members who still work as unregistered or "invisible" labour, but its determination to build up its capacities and actively engage in social dialogue in this branch is beyond doubt.

In parallel, a number of newly established recycling companies, albeit still at the stage of "infant industry", represent a considerable potential for decent employment, as well as for establishment of an entire sector of new employers with potential to join the existing employers' organizations and thus reinforce their relevance and their overall position in tripartite social dialogue.

Source: ***Serbia ILO office.***

Employment in industry

As described in chapter three, the industry sector is very energy intensive, and accounts for 37% of energy use throughout the world. The pan-European region has been an important actor in industries producing basic materials (iron, steel, chemicals, cement, aluminium, pulp and paper). In EECCA and SEE countries, the industry sector, and more specifically extractive industry, metallurgy and food production, accounted for 20% to 45% of GDP in 2007 (UNEP, 2007). During the green transition, such industries will likely eventually experience job losses. Making those industries greener can limit this tendency and create a number of jobs in research and development.

The high coal consumption used in steel processing is very polluting. The top steel producers in the region are the Russian Federation (72 million tons of output in 2007) and Germany (49 million tons in 2007). Employment in the sector decreased significantly over the past 30 years. In the EU it has shrunk by around 70% from 1974 (996,000 employees) to 2000 (278,000 employees), and it is predicted to further decrease by 80,000–120,000 jobs in the coming 20 years because of gains in labour productivity, international competition and rising input costs that reduce the industry's profitability. Additional climate targets could accelerate this trend. Greening the steel-making process, modernizing technologies (especially in CIS countries), and developing research and development are all strategies that could save jobs in the industry (EEA/UNEP, 2007).

Extractive industries (coal, oil, natural gas, etc.) are of great importance in the CIS countries. In terms of coal, major deposits in the pan-European region can be found in the Russian Federation, Germany, Poland, the Czech Republic, Ukraine and Kazakhstan. All of them, except Ukraine, are ranked among the top-10 coal producers (brown and/or hard coal) by the World Coal Association (2011). The level of employment in mining and quarrying in 2008 was 56,000 in the Czech Republic, 109,000 in Germany, 200,000 in Kazakhstan, 248,000 in Poland (2007 statistics), 1,350,000 in the Russian Federation, and 618,000 in Ukraine (2000 statistics). The trend in employment in the sector is declining in Germany and the Czech Republic, increasing in the Russian Federation and Kazakhstan and stagnating in Poland (Laborsta). In the long term, however, this decreasing trend will probably be more widespread due to the increasing adoption of regional emission targets. In CIS countries, attention should be drawn to modernizing current infrastructures, developing environmental management policies and improving working conditions. This direction, however, may create job loss in some sectors. The example below from Poland (box 5.5) demonstrates how social policies can minimize the adverse social effects of a transition to a green economy.

Box 5.5 Restructuring Poland's coal mining industry: the role of social protection measures

Poland is one of only a few countries in the world with a coal-based energy economy. Hard coal and lignite provide more than 55% of Poland's primary energy supply, and 95% of its electricity is generated from coal. During the early 1990s, the coal sector started to experience the challenges of Poland's economic transition. Starting from a situation of over-employment, low productivity and poor economic conditions, the industry required immediate restructuring. A programme endorsed by the Solidarity trade union and backed by substantial public funds was implemented. While the main objectives were to close inefficient mines and reduce employment, a number of social measures were undertaken to mitigate the impact of the reduction in employment on dismissed workers' income or welfare. There were two groups of programmes. The first was intended to redeploy younger coal workers elsewhere in the economy. The second provided welfare benefits to dismissed workers while they looked for a new job. Under the social programme of 1998–2002, more than 53, 000 workers left coal mining, of which 33,000 received some form of support.

Source: ***Suwala (2010).***

Policy recommendation

The transition to a green economy should be implemented without further delay, and the underlying economic, environmental and social components of such a shift should be carefully considered. It will involve new policies, innovative investment, different business schemes and technical innovations, and will result in the creation of new green jobs and the greening of existing jobs, but also job losses. As explored here, energy-intensive industries, extractive industries and transport will be particularly exposed to the decrease in employment. Therefore a green transition should be a fair and just transition. The most vulnerable workers, communities, regions and industries in the process should be assisted, while the costs and benefits should be shared widely across all levels of society. There are a number of concrete steps that need to be considered in order to ensure a economically smooth and socially just transition.

1. Research and information

There is only limited information about the impact of a green transition on employment. Governments must assess such a transition pragmatically and disregard the myths that there is an "either/or" choice between economic growth and environmental protection — and that green jobs are always costly. As there is no one-size-fits-all solution, an in-depth analysis of regional opportunities, identification of leverage points and an assessment of impacts on the labour market (conditions and levels of employment, skills required, job equity and regional impact) is a prerequisite for an effective move towards a green economy (Seed Initiative, 2011). Good examples of outcomes of such research are the Employment in Europe 2009 report of the European Commission (2009a), and the Renewably employed! Short and long-term impacts of the expansion of renewable energy of the German labour market report (2010) of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany.

2. Strengthening labour market governance

In order to maximize the social benefits of a transition to a green economy and ensure that green economy policies promote poverty reduction, social cohesion and inclusive development, employment and labour policies should be designed and implemented in a coherent way with green economy policies. Workers' and employers' associations should be actively engaged in these policies. A number of measures are fundamental to strengthening labour market governance within the local, national and supranational arenas. First, at a societal level, social partners should be actively involved in the design and implementation of green job policies. This can also be done in partnership with civil society organizations active in the area of environmental policy. Second, at government level, tripartite inter-ministerial committees and consultative multipartite bodies constitute valuable forums whose use should be promoted within the region. For instance, the Social Dialogue Tables Initiative conducted in Spain since 2006 constitutes a valuable mechanism for trade unions and employers' organizations, together with industry, environment and labour institutions, to collectively assess the effects on the competitiveness, employment and social cohesion of the Kyoto Protocol to the United Nations Framework Convention on Climate Change in Spain. Finally, at a more structural level, greater emphasis should be placed on streamlining green job considerations throughout national labour institutions (public employment services, vocational training institutes, programmes to promote and enable a business environment for green jobs).

3. Ensuring a just transition

The road to a green economy will have a significant impact on the labour market. This change will impose an unequal burden on countries and economic sectors, as well as on workers and employers. This fact must be recognized and planned in order to provide opportunities for the most affected. A green economy should place the social component at its very core, and the five principles (impact assessments; social dialogue; green jobs and sustainable enterprises promotion; training and skills development; social protection) of a just transition should be carefully considered. On a practical level, this could be

done through the creation of a body (or bodies), which would plan the transition and advise on its implementation, or the realization of mechanisms for regular consultation of regional groups or companies involved (ETUC, 2008). Good initiatives in this respect are demonstrated in Spain, where trade unions (CC.OO, UGT) have signed an agreement with the Government to promote a sustainable industrial structure. This step enables trade unions to engage in environmental participative bodies and grants workers the possibility to take part in the implementation process of environmental regulations (TUC, 2008b).

4. Fostering social dialogue and industrial relations

Social dialogue has a key role to play in creating consensus and establishing coordinated strategies that will be crucial to seize the opportunities and minimize the potential social costs of a transition towards a green economy. Three functions are of particular significance in this regard (European Commission, 2009b). First, trade unions and employers' organizations can contribute to national debates by pressing for a just transition that includes the respect of workers' rights, dialogue, skills adaptation and investment in green job creation and infrastructure. Another promising avenue for social partners' involvement relates to their participation in multipartite bodies (i.e., Sustainable Development Councils, Environmental Councils, or advisory bodies of Governments or parliaments), which have been put in place in half of all EU member States. Second, social partners may push for better regulation of employment relations through binding agreements and softer guidelines. Third, trade unions and employers have a key role to play in the implementation of green policies and practices. Three types of activity are notable in this regard, (a) training and counselling on issues such as energy and resource efficiency, pollution prevention, new green technologies and green skills; (b) awareness-raising, including conferences and workshops, publishing brochures and leaflets or creating websites; and (c) other promotional activities, where social partners promote research on environmental issues. A good example is the Climate Change Task Force established by the Confederation of British Industry, which is involved in making concrete recommendations on how to improve the supply of science, technology, engineering and mathematics skills (Brougton, 2009). More broadly, in order to ensure a strong role of social partners in this transition process, emphasis should be placed on establishing representative trade unions and employers' organizations and improving national legal frameworks and procedures in line with the ILO fundamental conventions on freedom of association and the right to collective bargaining.

5. Developing the necessary skills

The transition to a green economy will be successful only if appropriate structural change and the transformation of existing jobs is achieved. Skills development is one of the keys to unlocking this job potential. The timely supply of relevant and quality skills is indispensable for successful transformations that boost productivity, employment growth and development.

The transformation brought by greening economies (jobs creation, losses, transformation or substitution) affects skill needs in several ways. Preparation for new occupations, or for growth in demand for some occupations at the expense of others, is particularly important in preparing young men and women for entering the labour market. Workers already in the labour market, midway through their careers or older, will need access to retraining to enable them, and enterprises, not only to move from declining industries and occupations into growing ones, but also to keep their skills up to date with, for example, new technologies (Strietska-Ilina et al., 2011).

6. Establishing social protection

Adequate policies targeting the unemployed and the most vulnerable should be developed in order to guarantee that the green transition is also a fair transition. Strategies aimed at minimizing job losses and establishing flexible transition packages for workers who have lost their jobs should be elaborated. A range of measures to this end are available: social insurance, public employment guarantee schemes, job placement services and job-creating public programmes for the un- or underemployed. Moreover, specific programmes should be elaborated in communities or regions at risk (ILO, 2010b). The EU project "From

Restructuring to Employment" in Romania, developed by local companies and supported by the European Social Fund, which supports people who have been laid-off from the energy sector serves as a good example of such policies.

7. Greening of workplaces

The environmental impact of workplaces is also an area where improvements can be made. Workplaces consume energy, use resources, generate travel and waste, and are thus an obvious place where greening can be achieved. The list of issues that need to be considered is long and includes savings in workplace heating, cooling, ventilation and insulation, lighting and electrical equipment, increased use of renewable energy, carbon offsetting, reduced work-related transport, reduction and recycling of waste and materials, and saving of water. More broadly, the greening of workplaces can also encompass environmental considerations in relation to finance and investment, as well as procurement and supply-chain policies. The Eco-Management and Audit Scheme set up in the EU in 1995 with a view to reducing companies' environmental impact, and as a management tool for business and institutions to evaluate, report and improve their environmental performance, is a good example in this area.

B. The health dimension of the transition to a green economy

"Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature", so states the Rio Declaration on Environment and Development (United Nations, 1992b). Health — a complete state of physical, mental, and social well-being and not merely the absence of disease (WHO, 1948) — is therefore a key goal and output of sustainable development. The links between better health, the economy and environmental sustainability are well established: people who are healthy are better able to learn, to earn and to contribute positively to the societies in which they live. Conversely, a healthy environment is a prerequisite for good health (WHO, 2011a).

Rio+20 offers an opportunity to re-examine the relationship between health and sustainable development. It happens at a time when the world is reacting to the ongoing impact of financial and other crises. In this time of crises, a renewed focus on sustainability — through a better balance and integration between health, economic and environmental development — can help to ensure that future generations do not suffer because of the way people live today (United Kingdom, NHS Sustainable Development Unit, 2011).

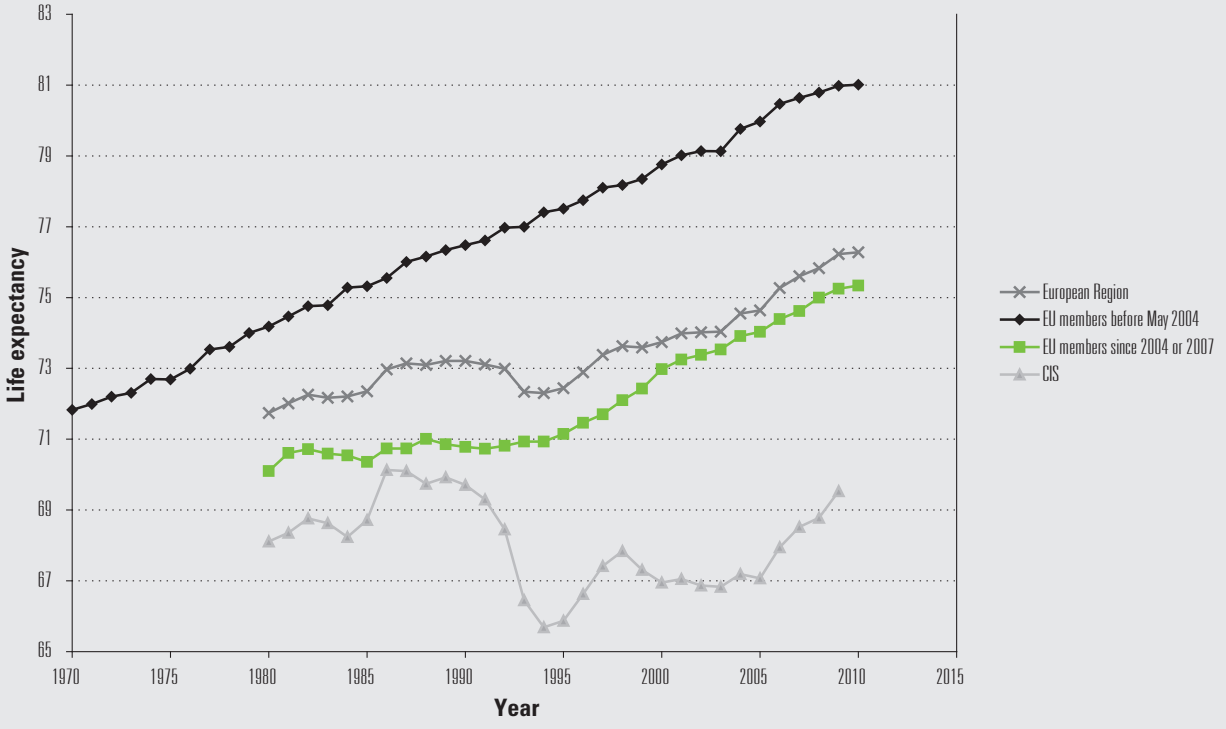
Many health risks can be prevented and health benefits enhanced by further investment in health, social protection, greater equity, and a more health focused approach to policymaking. The problem is to get the balance right — with human beings and their well-being at the centre of development. Only then can we protect the next generation from, for example, reduced life expectancy, non-communicable diseases, disease outbreaks or health determinants such as obesity. Such investment involves working on many levels and in many sectors that are not always directly focused on health under the principle of "common but differentiated" responsibilities across ministries of Government.

For a society under pressure, a healthy green economy is not a luxury. It is an essential opportunity to increase the population's quality of life, well-being, public health and health equity. It will require a full understanding of the possible implications of developments in different economic sectors, and support for green developments that maximize the benefits for health. This in turn requires a whole-of-government approach to health and equity, to change the norms of societies, strengthen their relationship to the natural environment and increase their commitment to health and well-being. This requires the promotion of tools such as regulations, incentives, accountability, participation and knowledge sharing across all strata of society. The challenge is to bring to bear the growing body of knowledge that links economic and environmental development with better health, and to ensure that this information can be accessed in usable, practical form by policymake.

B.1. Health and well-being: progress and challenges

The past 20 years have seen significant improvements in population health, particularly increased life expectancy at birth and reduced child mortality (figure 5.1). This has contributed to economic, social and environmental development and thus to greater prosperity (WHO, 2001, 2002).

Figure 5.1 Life expectancy at birth in the pan-European region



Source: ***WHO/Europe, European HFA Database, January 2012.***

Cancer, heart disease, stroke, diabetes and respiratory disease, otherwise known as non-communicable diseases. are the main killer diseases in the pan-European region today, and account for the largest share of the health burden — the biggest cause of overall morbidity, disability, mortality and premature death.[43] Annual costs of cardiovascular disease are estimated to be €168 billion per annum in the EU-25 (WHO/EURO, 2011a). Emerging and re-emerging communicable diseases remain a priority in many countries in the region. Of special concern to all countries in the region are global disease outbreaks such as pandemic H1N1 influenza in 2009 and silent threats such as the growing antimicrobial resistance.

Many factors will further determine the sustainability of the way people will live, work, grow and age, today and in future years.

[43] Mortality from cardiovascular diseases accounts for nearly 50% of all deaths; cancer, for 20%; and injuries and violence, for 8%; all show a sharp gradient between western and eastern countries, and between social classes.

Lifestyle

The main causes of non–communicable diseases are avoidable, and of society's own making. They lie to some extent in lifestyle factors such as tobacco and alcohol use, diet and physical inactivity. A group of four diseases and their behavioural risk factors account for the majority of preventable disease and death in the pan-European region: cardiovascular diseases, cancer, diabetes and chronic respiratory diseases.

Environmental risk factors

The need for a new, more coherent approach to environmental policy is illustrated by the fact that 20 years after the first Rio Summit, the key decisions in many countries that guide environment development, urban planning, transport, energy and agriculture choices and housing development *create* rather than *reduce* air pollution, noise, chemical pollution and traffic injuries.[44] For example, the transport sector provides employment for more than 16 million people in the EU alone and directly contributes 11% of its GDP, but its external costs are estimated at about 8% of GDP. Most of these external costs are health related, through road traffic injuries, air pollution, noise and reduced opportunities for physical activity. For example, road traffic crashes cause about 120,000 deaths, and 2,500,000 injuries per year in the pan-European region; tens of thousands of premature deaths are attributable to transport-related air pollutants; and more than 1 million disability adjusted life years (DALYs)[45] are lost every year from traffic-related noise in the western part of Europe (WHO/EURO, 2011f). This provides a powerful incentive to re-examine how the transport sector can do more to contribute to human health.

The energy sector is another example of an area where transformation towards sustainable development is necessary. While energy is essential for health, continued use of fossil fuels contributes to the overall burden of disease, particularly through air pollution and accidents affecting workers and communities. The health burden from fossil-fuel use in energy systems is expected to rise, rather than decrease, under current projections of GHG emissions. The transition towards green energy systems has dual benefits: energy security and improved health in the pan-European region.

The reduction of key air, water and chemical pollution risks can prevent up to one fifth of the total burden of diseases, and a large proportion of childhood deaths, in the pan-European region[46]. Lack of progress is not due to a lack of policies: norms, regulations, standards and guidance are available on pollutants of water and air, but these policies are not systematically implemented across and within countries in the region. For example, the air we breathe can be contaminated by emissions from motor vehicles, industry, heating and commercial sources (outdoor), as well as tobacco smoke and household fuels (indoor). In the region , exposure to particulate matter decreases the life expectancy of every person by an average of almost 1 year, mostly due to increased risk of cardiovascular and respiratory diseases and lung cancer. Some 40 million people in the 115 largest cities in the EU are exposed to air exceeding World Health Organization (WHO) air quality guideline values for at least one pollutant. Particulate matter exposure is estimated to account for 348,000 premature deaths in the EU-25 each year. The implementation of new EU legislation on the emission of air pollutants is promising in this regard, as it is expected to reduce adverse health effects exposure by one third.

[44] Recent studies show how the cost of selected interventions vastly outweigh the potential economic impact of non-communicable diseases (see www.who.int).

[45] One DALY can be thought of as one year of «healthy» life lost. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. See http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/.

[46] The environmental burden of disease from environmental risk factors and pollutants has been estimated to be 15%–20% of total deaths and 10%–20% of DALYs lost.

In Western Europe, including new EU member States, water quality has improved over the past 20 years, due to better regulations and enforcement, and increased investment in wastewater treatment plants. Nevertheless, 4 million people in urban areas and 14.8 million in rural areas still use unimproved water sources, and 34.6 million have unimproved sanitation. This makes them vulnerable to water-related diseases. Although infant mortality and morbidity from water-related diseases have declined, significant subregional inequalities remain. Approximately 13,000 deaths occur in the region each year due to diarrhoeal disease from unsafe drinking water, mainly in Central Asia (WHO/EURO, 2011d).

Cities are the crucible of inequity. More than 70% of the population in the EU and over 60% of that in Eastern Europe live in urban areas, which are subject to high levels of air pollution and environmental noise. Environmental noise causes the loss of 2 million to 3 million DALYs through risks for ischaemic heart diseases, cognitive impairment of children, sleep disturbance, tinnitus and annoyance (WHO/EURO, 2011b).

Climate change

Beyond the apparent challenges climate change poses to poverty, inequity, food availability, income and livelihood, it also aggravates environmental determinants of health (e.g., water and air) and will provide a significant burden to health services (Confalonieri, et al., 2007). While climate change is often framed in terms of environmental and economic concerns, it is the health sector that has to deal with immediate and projected health consequences. In the pan-European region some of the impacts of climate change are already seen:[47] changes in vector and allergen distribution, as well as more frequent and intense heat waves and heavy precipitation events. The 70,000 deaths of the 2003heat wave provided a wake-up call as to what could happen if no action is taken (Robine et al., 2008).

The largest climate change public health risks for the pan-European region are: an increase in the frequency of extreme weather events (heat waves, droughts, floods, fires); sea-level rise, with consequences for coastal areas and settlements; permafrost melting in the north, with risks to infrastructure, viability and access to health services and aggravation of some of the current environmental problems (regarding air quality, water quality, etc.); risks to food security; and a change in the geographical distribution of infectious diseases, with possibilities of localized outbreaks of new or re-emerging infectious diseases (e.g., dengue) (Menne et al., 2009). A change in the distribution and spread of communicable diseases is anticipated, in particular for those spread through water, food and disease vectors. They may sometimes threaten international health security. Many of the impacts of climate change can be felt far beyond the locations in which they originally occur. They can also create conflicts and competition for resources, as well as migration (Stern, 2007).

Inequities[48]

Of the 480 million people in Eastern Europe and Central Asia, nearly 90 million (about 18%) have moved out of poverty since 1999, but almost 30% are considered poor or vulnerable. This number is expected to increase by about 5 million for every 1% decline in GDP (World Bank, 2009). Poverty has also increased in the EU over the last couple of years and is likely to increase as economic crises take hold, bringing unemployment, rising energy and housing costs, risks to water and food security and diminished health-system expenditure.

[47] Climate change refers to a change in the mean and/or the variability of climate and its properties, and that persists for an extended period, typically decades or longer. UNFCCC, in its article 1, defines climate change as: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods". (IPCC, 2007, Glossary)

[48] Health inequities are defined as avoidable and unjust systematic differences in health status between different groups (Whitehead and Dahlgren, 2007).

Health and life expectancy in the countries in the pan-European region show significant, persistent and avoidable discrepancies in people's opportunities to be healthy and avoid illness and premature death. Health outcomes vary both between and within countries in the pan-European region, according to such social factors as income, education, social position, social networks and employment (CSD, 2008). For example, men live 20 years less in the Russian Federation than in Iceland, and maternal mortality ranges from 70 per 100,000 live births in Kyrgyzstan to less than 5 per 100,000 in other countries in the region. There are health inequities within all countries in the region: for example, life expectancy at age 30 in Norway in 2001 was around five years higher for men with university education than for those with lower secondary education (Jakab and Marmot, 2011). These inequities can also be costly. It is estimated that, in EU countries alone, the persistence of existing health inequities has annual costs equivalent to 15% of social security expenditure and 20% of health care expenditure (Mackenbach, Meerding and Kunst, 2007).

Clean, sustainable and affordable energy are necessary for human life and well-being, but household energy insecurity still exists in the pan-European region, where some households cannot afford sufficient amounts of energy, energy-efficient housing or heating equipment. Some people, particularly in Eastern Europe, depend on solid fossil fuels for heating and cooking. This is estimated to have contributed to more than 14,000 deaths in 2004 (WHO/EURO, 2010a). In some countries, the rising cost of food and several consecutive years of poor harvests have weakened families' buying power and, although undernourishment has been reduced in countries of Central Asia and the Caucasus, it has not been sufficient to meet the MDG target (ibid.).

These avoidable differences in the opportunity to be healthy and avoid premature mortality and morbidity are a major public health challenge and a fundamental part of sustainable development. Inequities in health are also a marker of the fairness and degree of social justice in a given society. Where social inequities exist, these also constitute significant losses to social and productive capital that are felt by individuals, the community and the society as a whole.

Demographic shifts

The unprecedented longevity of people in the pan-European region is a success story for advancing human health. Today, the percentage of the population aged over 65 years is around 18% in EU countries and is expected to reach around 25% in the EU by 2030. It is around 12% in the rest of the region. The share of the region's population over the age of 80 is expected to more than double by 2050. This demographic shift is accompanied by changing social patterns — such as smaller families, different housing patterns and increased labour-force participation by women — all of which will increase the need for paid care and different social, health and environmental services. Larger health and economic challenges are expected given the high costs of health, social care and welfare systems and the societal loss due to increased disability and morbidity. It is therefore very important from a cost perspective to focus on healthy ageing. Healthy ageing enables people to live longer productive lives and contribute economically to society for much longer than before.

The ageing of the population in Europe, combined with a decreasing fertility rate, is reducing the population of many European countries. Demographically, Eastern Europe and Central Asia are facing the combination of population decrease and emigration. For instance, most countries in South-Eastern Europe, including Albania, the former Yugoslav Republic of Macedonia and Serbia, had a natural demographic increase between 2000–2005, but lost these gains subsequently through emigration. Some countries, including Bulgaria, Romania, Ukraine and the Republic of Moldova, are facing both decreasing fertility rates and emigration. In other countries, such as the Russian Federation, the natural decrease in population is partially offset by net immigration.

Globally, population growth in the poorest and developing countries increases the pressure on resources such as food, water, minerals and energy, which are unequally distributed. In this respect, sustainable development has to include the fulfilment of people's sexual and reproductive rights, to enable them to plan their families.

Health delivery systems

The combination of ageing populations, growing public expectations, rising technology costs, the increasing burden of chronic disease, risks of infectious disease outbreaks or extreme events threatens not just the financial sustainability of health systems but of whole economies.[49] Many European countries have achieved universal health coverage, providing reasonable levels of financial protection and access to services for the whole population, but out-of-pocket health expenditures place a burden on the household budgets of 18.6 million people and have impoverished 6.5 million. Medicines account for a substantial part of health-care costs: 10%–20% in EU countries and up to 40% in Eastern European countries. Health financing arrangements contribute directly to social solidarity and equity, and indirectly to health outcomes (WHO/EURO, 2011b). Policy needs to link measures across several sectors that can contribute to reducing the burden of chronic conditions; to changing behaviours among health-care providers, patients and financiers (including insurance companies); and to ensuring that incentives drive greater efficiency.

B.2. Opportunities for health, equity and well-being in the transformation towards sustainable development

Those are the challenges. How can they be met? This section builds on priorities in earlier chapters and gives examples from the pan-European region of how focusing on health and equity in a variety of productive sectors and settings is a win–win situation for society.

Healthy sustainable consumption

Without real action to address levels of consumerism (United Nations, 2010a) and resource use, the systemic changes needed for a sustainable transformation are hardly possible. Actions like reduction of overconsumption of energy, limiting the use of some hazardous substances and promoting changes in consumption patterns would contribute to improving lifestyle and reduce non–communicable diseases such as type II diabetes and cardiovascular diseases.

WHO and FAO recommend the daily consumption of about 2,200 calories (kcal) for women and 3,000 for men. However, in 2007, consumption was running at an estimated 3,466 kcal per day for adults in Western Europe and 3,255 kcal per day for Eastern Europe (WHO/EURO, 2008). Since 1998, energy intake has increased across the region by about 12%. The difference between availability and requirements represents not only a waste of food and energy, it contributes to obesity and is a risk factor for cardiovascular mortality and diabetes.

Reducing obesity-related illness in the EU would contribute to reducing health-care expenditure by 4.5% annually. Reducing overall energy intake would not only improve health and reduce obesity, it could also improve the environment by reducing GHG emissions. Reducing the consumption of animal fat and protein would further increase the benefits, considering the land, water and energy required for their production. Many efforts are under way to enhance public understanding, promote and make healthy diets the easy and popular choice.

Policymakers in the region are supported by internationally agreed plans to reduce the consumption of trans-fat and salt, such as the Action Plan for Implementation of the European Strategy for the Prevention and Control of Non-communicable Diseases 2012–2016 (WHO/EURO, 20011a). Decreasing salt intake reduces the long-term risk of cardiovascular disease; it is estimated that cutting intake by half (from 10 grams (g) to 5 g per day) would reduce the overall stroke rate by 23% and rates of cardiovascular disease by 7% (Beaglehole et al., 2011).

[49] In all OECD countries health-care costs have consistently outgrown GDP for the past 40 years, often without a commensurate increase in health outcomes (WEF, 2011).

The WHO Framework Convention on Tobacco Control (WHO, 2003) and a new European action plan (WHO/EURO, 2011g) advocate reducing tobacco use and harmful alcohol use, respectively. Multiple human development benefits would ensue from putting these policies into action. Reduced tobacco use would prevent up to 1.6 million premature deaths a year in the pan-European region, and reduced alcohol use would cut the costs (€125 billion per annum) of lost employment, violence and crime.

Better health from policies in productive economic sectors and settings

A growing body of literature describes the immediate health benefits of policy measures to improve health and social cohesion, as well as the environment. Many of them use green-economy approaches and are linked to the reduction of GHG emissions. Many of them also entail public savings by preventing disease and other social bads. The following examples link decisions in one area (such as urban planning or climate change mitigation) with better health and well-being.

Active transport

A key area for action as part of the transformation to sustainable development is the promotion of active mobility and public transport. There are numerous examples of how public transport can reduce air pollution, noise and GHG emissions, energy consumption and congestion, as well as improve road safety and offer better protection of landscapes and urban cohesion. Increasing mobility and physical activity reduces the risk of cardiovascular disease, type II diabetes, some forms of cancer and hypertension. Evidence is now emerging that this mix of transport policies can also provide opportunities to create new jobs or to green existing jobs (see box 5.6).

Box 5.6 Promoting active mobility and public transport: opportunities for green growth

The WHO/ECE Transport Health and Environment Pan-European Programme recommends replacing short (less than 5 kilometre) trips by car with increased walking, cycling and public transport, to counteract the negative health effects of sedentary lifestyles and physical inactivity. Investing in these policies may have good economic returns:

- A 2005 **EU** study across 13 cities showed that every €1 invested in public transport provided €2 to €2.5 in local GDP (EU, 2005).
- In **Switzerland**, the economy benefited from an added value of €4.6 for every €1 spent on public transport, measured by additional regional GDP, extra employment of persons per year, and additional regional income (EC, 2003).
- In **Austria**, government programmes to encourage cycling have contributed €900 million to the economy , largely through expected savings resulting from the health benefits of increasing physical activity and 18,000 jobs.
- In the **Czech Republic** it was estimated that an increase of 2% in cycling would lead to reduced mortality, which in turn would result in discounted annual savings of €882,000.

Healthy housing

Improving energy efficiency in housing is not enough for a sustainable transformation; a mix of actions and policies are needed. Indoor air quality is a key consideration. More effective use of active and passive natural ventilation for cooling, measures to reduce mould and damp, energy-efficient home heating, appliances and cooking, provision of safe drinking water and improved sanitation and stronger building are all part of the essential components to promote sustainability. This combination is recognized to reduce cardiovascular disease, injuries and respiratory and infectious diseases. Many countries, regions and cities are experimenting with cost-effective healthy strategies for climate-change mitigation for housing; these should be systematically studied and evaluated for their health benefits (WHO, 2011b).

Green spaces in urban areas

People love green spaces for all sorts of reasons, and they have been shown to have a positive impact on health. Where there are public green spaces and forests, people use them. They do a lot more: they walk, they play, and physical activity becomes part of their daily lives, reducing the risk of injuries and the urban heat-island effect, reducing stress levels and noise pollution and increasing social life. Green spaces can also contribute to flood management. They work best when some thought has gone into ensuring that specific groups of citizens can benefit fully from public places and networks in which to be physically active, bearing in mind the need for protection from threats to their safety in the urban, transport, home and leisure environments (WHO/EURO, 2011b).

Double benefits: improving health while reducing greenhouse gas emissions

Taking action on climate change not only improves our future, it can also achieve immediate and local health benefits. GHG reduction in housing, energy, transport, agriculture and health care can have significant health gains, such as reducing non-communicable diseases, while the benefits to health and development can at least partly offset the varying costs of implementing such measures (see box 5.7) (IPCC, 2007). For these multiple reasons, health should be considered in international negotiations and action at the national and local levels to benefit the generations of both today and tomorrow (WHO, 2011).

Box 5.7 Double benefits: reducing GHG emissions improves people's health

Energy: In the EU, a 20% reduction in GHG emissions by 2020 would lead to a 10%–15% reduction in harmful toxins, including sulphur dioxide and nitrogen oxides, compared with the 1990 baseline. This GHG reduction would improve life expectancy by 3.3 months and reduce health damage costs by €12 billion– €29 billion (EC, 2008).

Transport: In London, reducing CO_2 emissions by at least partly replacing trips by car with active travel (walking and cycling) was estimated to have larger health benefits per million people than the increased use of lower-emission motor vehicles. A combination of active travel and lower-emission motor vehicles would deliver the largest benefits, however, notably an estimated reduction of 541 premature deaths per year (Woodcock et al, 2009).

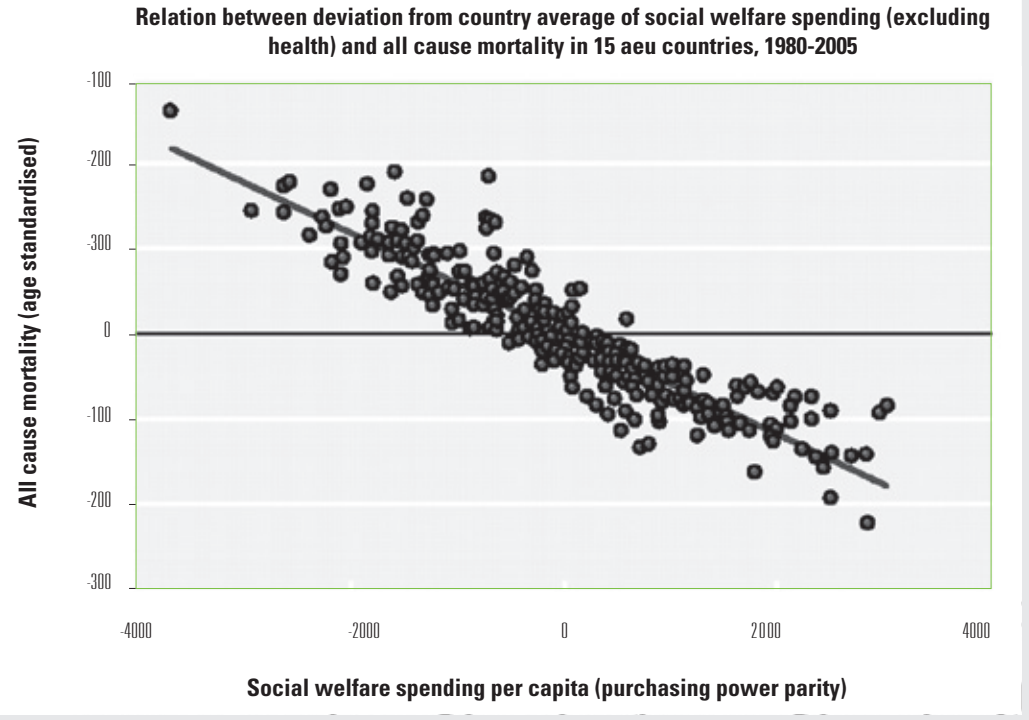
Agriculture: In the United Kingdom, the reduction of meat consumption has been proposed as one of the measures to reduce the GHG emissions from livestock production. Although livestock products are a source of some essential nutrients, they provide large amounts of saturated fat. It has been calculated that the potential benefits of a 30% reduction of livestock production would include a decrease by about 15% of ischaemic heart disease in the United Kingdom (Friel et al., 2009).

Housing: In London, using a strategy of combined fabric, ventilation, fuel-switching and behavioural changes could save 0.6 megatons of CO_2 per million persons in one year and 850 DALYs (Wilkinson et al, 2009).

Social protection and promotion

Maintaining social peace, enhancing human and social capital and raising the employment rate are important for social, health and economic sustainability. These can be casualties of the economic downturn, and the health and social sectors are particularly vulnerable to budget cuts. The recent global financial/banking crisis illustrates the wide-ranging consequences for health and social systems. Countries with sufficient reserves or the willingness to increase borrowing (deficit financing) have been able to deal with the resulting fiscal imbalance without having to take drastic measures. In those European member States where the commitment to equity, solidarity and health was strong, Governments have so far been able to take careful steps to maintain a balanced budget and avoid adverse effects on these objectives (WHO, 2011b). This is confirmed by research that shows how a modest increase in social welfare spending can exert a substantial protective effect. Notably, a rise in social welfare spending was associated with a sevenfold greater reduction in mortality than a rise of similar magnitude in GDP (Stuckler, Basu and McKee, 2010) (see figure 5.2 below).

Figure 5.2 Social welfare spending has major health impact



Source: ***Stuckler, Basu and McKee (2010).***

Green growth and prosperity will not necessarily be inclusive or catalyse poverty reduction unless accompanied by pro-poor and pro-health approaches integrated into a green development approach. Economic affordability is but one component of inclusive growth and equitable access. A number of economic measures have been proposed, across a variety of sectors, to deal with access to water, food, sanitation and household energy. These range from direct financial support and technological improvements, to ensuring minimum service provision for those most in need (see box 5.8).

Box 5.8 Case study United Kingdom: Warm Front

The United Kingdom has a large burden of excess winter mortality, which appears to be related to low indoor temperatures. In part motivated by health considerations, in 2000 the Government launched a home energy-efficiency scheme in England, now known as "Warm Front". This grant-funded programme for tackling domestic fuel poverty provides packages of insulation and heating system upgrades to low-income households.

The scheme was carried out over the 2001/02 and 2002/03 winters. Energy-efficiency improvements were associated with:

- Increased living room and bedroom temperatures, often above the level that poses a risk to health.
- Reduction in relative humidity, condensation and visible mould growth.
- Indirect evidence of reduction in vulnerability to winter- and cold-related mortality from cardiovascular disease.
- Reduced prevalence of anxiety and depression.

Paradoxically, however, little evidence indicated that Warm Front improvements reduced fuel consumption, even though theoretical considerations suggest that there should be significant savings (Green and Gilbertson, 2008).

In addition, a gender-focused and lifelong approach is very important. For example, early child development has a critical impact on overall well-being throughout life, particularly on obesity, stunting, mental health, cardiovascular disease, literacy and numeracy, criminality and economic participation. The WHO Commission on Social Determinants of Health (CSD) recognized investment in early childhood as having one of the greatest potentials to reduce inequities in health (CSD, 2008). The brain development of young children is highly sensitive to the external environment and requires good nutrition, a continuum of care though pregnancy, childbirth and the early days and years of life, as well as a safe, healthy, nurturing, stimulating and responsive living environment. Ensuring high quality early-childhood programmes and services for mothers and children, regardless of ability to pay, is of paramount importance for ensuring sustainable development and improving equity in health and development.

A sustainable and resilient health sector

Strong, well-designed health delivery systems not only protect individuals from illness but contribute to the resilience of societies against numerous threats. On average, the health sector accounts for about 5.68% of GDP in the eastern part of the pan-European region, and 9.56% in the EU. Strengthening the performance of health systems has been high on the agenda of countries throughout the pan-European region, with new approaches and many innovations for improving equity and health. Improving the delivery of public health and health-care services, generating key health system inputs, such as human resources and medicines in higher quality, strengthening health funding arrangements and enhancing governance are key objectives of a new European health policy, "Health 2020" (Jakab, 2011). Currently, Health 2020 is focusing mainly on the added value of a climate resilient and sustainable health sector.

Health care is often technologically and resource intensive, so some advances in health and population well-being can be assumed to have come at the expense of the environment. As outlined in the report of the United Nations Secretary-General (United Nations, 2011b), "economic sectors often mentioned as candidates for their 'greenness' include health, education [and] cultural activity …. To the extent that there is scope for growth concentrated in those sectors, with a concomitant decline of growth in energy and resource intensive activities, this would introduce a fundamental change in the nature of growth". Increasing evidence indicates that becoming greener would lead to further growth in the health sector with a concomitant decline in energy- and resource-intensive activities. For example, a sustainable-development approach

focusing on changes through innovation, standards and behavioural measures has been proposed for the National Health Service (NHS) of the United Kingdom (United Kingdom, NHS Sustainable Development Unit, 2011). Applying the same approach in 49 European countries would lead to significant reductions in GHG emissions and improvements in health (see box 5.9).

Box 5.9 The health and environmental benefits of reducing GHG in the health sector

For the pan-European region as a whole, it is estimated that the health sector produces 287 megatons (Mt) of CO_2, equivalent to 4.2% of European GHG emissions. Some 30% arise in countries outside the EU. Appropriate measures could save 28 Mt–68 Mt each year, equivalent to about 0.6% of European GHG emissions in 49 European countries. Associated annual health benefits are estimated to include savings of 15,000–36,000 DALYS lost to air pollution, 16,000–38,000 fewer consultations for asthma and upper respiratory disease, and 1.4 million–3.3 million fewer days of restricted activity. In addition, money saved by many of these measures can be reinvested to improve health care (Holland and Menne, unpublished).

Investment in low-carbon technologies will help to drive some of the transformations required for more sustainable health systems. Nevertheless, the potential and capacity for greening health services varies very much between countries, with a west-east gradient. Proper legislation, incentives to increase the institutional capacity of initial investments, provision of renewable and energy-efficient technology and raising awareness can help to overcome the obstacles to implementation in the east.

Health systems are faced with the challenge of providing comprehensive approaches to reducing the disease burden by integrating health promotion, disease prevention and chronic care management, responding to acute episodes of illness and providing rehabilitation and palliative care when needed. Although effective, and even cost-effective, interventions are well known for most of these conditions, but today many are not used at scale. For example, as a result of climate change, health systems and services will need to prepare for gradual changes in health outcomes, sudden extreme events (e.g., heat waves, outbreaks of infectious diseases) and an extra burden of disease and potentially new conditions. More needs to be done to strengthen the health sector resilience.

Rapid and accurate disease notification, in compliance with the International Health Regulations (WHO, 2005) is an essential basis for planning disease control. In some countries, concerns persist about the ability of publicly funded institutions to provide even basic health services to most of the population. Their public health services will require substantial investments to address the added burden posed by climate-related threats. Acute shocks, such as natural disasters and disease epidemics, can overload the capacities of health systems in even the most developed nations. Reinforcing disaster-risk reduction, giving early warnings and taking health action in emergencies can help to ensure that people are better protected from the increasing hazards of extreme weather, and help communities recover faster following a disaster. Improving access to basic health care means faster treatment for patients, alleviating suffering and containing the risks of spread of disease. Greater emphasis will need to be placed on protecting the health of particularly vulnerable groups, in order to ensure that this emerging risk does not further widen the gaps in health outcomes between the most and the least privileged (WHO/EURO, 2011e).

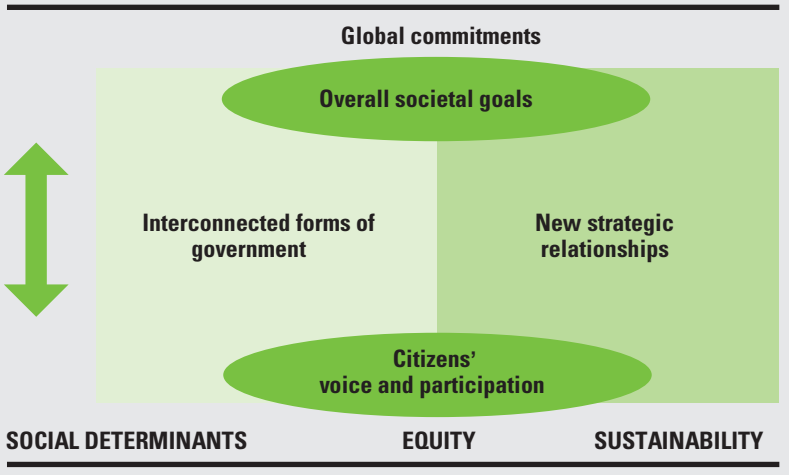
B.3. Health Governance as a component of sustainable development

Many policies relevant to health lie outside the remit of the health ministry, and most social, environment and economic determinants are found in other sectors. So ministries of health have to avert the (often unintentional) consequences for health of other sectors' activities. Therefore the health sector can play a central role both in being more sustainable and in promoting new modes of governance for sustainable well-being and green prosperity.

What does this mean? In health governance, the aim is to reach out to other ministries and sectors in society, to develop and sustain dialogue on the health-related aspects of all policies across government, as entry points for changing the determinants of health and reducing health inequities.

Governance for health is one of the pillars of the WHO long-term vision for the new European health policy, Health 2020 (WHO/EURO, 2011h). The goals of Health 2020 are to achieve better and more equitable health for the people of Europe through shared vision, greater awareness, improved governance and collaborative working across the region towards common strategic goals. Accelerating knowledge sharing, innovation and enhanced citizen participation in health is important to achieve better, more equitable health (Jakab and Marmot, 2011) (see figure 5.3).

Figure 5.3 The twenty-first century approach to governance for health



Source: Kickbusch and Gleicher (2011).

1. Implementing the Parma Declaration on Environment and Health and the Commitment to Act

The pan-European region countries launched the European Environment and Health Process 20 years ago. The European Environment and Health Process is an example of a unique governance mechanism, as it involves ministries responsible for health and environment on equal footing, amplifies the links and synergy with a number of MEAs and enhances the partnership with other intergovernmental bodies, such as ECE, UNEP and the European Commission, as well as with civil society organizations.

The Fifth Ministerial Conference on Environment and Health took place in Parma, Italy in 2010. Countries adopted a new environment and health vision oriented towards health in all policies and made an explicit goal of using environment and health policies as a mean to prevent non-communicable diseases by addressing their environmental determinants.

The implementation of the Commitment to Act in the Parma Declaration (WHO/EURO, 2010d) will be essential to better link health and sustainable development. In particular, in protecting children's health, it sets out the following environment and health priority goals:

- Ensuring public health by improving access to safe water and sanitation.
- Addressing obesity and injuries through safe environments, physical activity and healthy diet.
- Preventing disease through improved outdoor and indoor air quality.
- Preventing disease arising from chemical, biological and physical environments.

It also seeks to ensure health protection from climate change through:

- Integrating health issues in all climate-change mitigation and adaptation measures, policies and strategies;
- Strengthening health, social welfare and environmental systems and services to improve their response to the impacts of climate change in a timely manner;
- Developing early warning surveillance and preparedness systems for extreme weather events and disease outbreaks.
- Developing educational and public awareness programmes;
- Increasing the health sector's contribution to reducing GHG emissions;
- Research and development.

2. Strengthening a health-in-all-policies approach, and environmental benefits of health policies

Stronger health governance will help to implement the Parma Commitment to Act. High-level ministerial support is important to the success of intersectoral planning for health and equity in any development, but progress towards shared goals requires technical and scientific know-how and the engagement of civil society. This requires that political, technical and scientific leadership is coordinated in a mutually reinforcing manner, seeking achievable goals, evaluating interventions, assigning clear roles and responsibilities, and putting processes in place that are designed for appropriate capacity-building across societies. Further, institutional structures and accountability mechanisms need to be built or strengthened to create incentives for joint work, and to ensure that public-sector action has shared targets that address priority issues.

A variety of governance tools, such as the health-in-all-policies approach, foster coherence and evaluate and sustain policy coherence, collaboration and partnership. These approaches support policymakers in including the consideration of health, well-being and equity in the development, implementation and evaluation of policies, programmes and services. Numerous examples are available today. Those examples have illustrated the usefulness and importance of such tools and illustrated their applicability in other countries and throughout a variety of sectors (see box 5.10).

Box 5.10 Examples of Government-driven health-in-all-policies approaches

Norway's programme promotes follow-up by incorporating a common reporting system for all ministries/ sectors involved, with overall management responsibility assigned to the Directorate of Health. The Directorate published the first Norwegian public health policy report for 2009 and will be reporting annually, incorporating information from multiple sectors.

In **Estonia**, the National Health Plan 2009–2020 gives the Ministry of Social Affairs a leading role in the coordination of intersectoral collaboration. All ministries provide annual plans of health-related actions, report on their implementation and impact and belong to the steering panel, where overall priorities for all ministries in regard to health are set.

In **Kyrgyzstan**, the Ministry of Health in 2006 elaborated an intersectoral action plan for promoting the health of the population within the framework of the national health-care reform process, "Manas Taalimi". The aim was to better coordinate actions and resources for health with other government sectors, in order to improve daily living conditions such as water supply and housing, improve health behaviours and access to primary health-care services; and also to coordinate the support of United Nations agencies and international donors around common objectives for improving health at the community level.

In **Slovakia**, regional governments have increased autonomy in relation to social and economic decisions and investments, many of which affect health and health equity and their determinants. Regional parliaments formally adopted a health chapter into regional development plans and related investment objectives and funding flows. Cross-sectoral and interdisciplinary planning teams were established, using regional planning cycles and mechanisms to include health equity considerations in priorities and investment plans. Goals related to the health of the most vulnerable groups (e.g., elderly persons, the Roma, rural communities, homeless or migrant populations, and the unemployed) were integrated into regional cross-sectoral priorities and actions, backed up by resources and financial investments.

Source: (WHO Regional Office for Europe, 2011b).

Priority health governance needs, in addition to the Parma commitments, are:

- The reduction of consumption known to create a heavy burden of disease, such as overconsumption of calories, trans-fats and salt, as well as the promotion of healthy diets and a reduction in the harmful use of alcohol and tobacco;
- The promotion of those policies that have a triple or quadruple gain, including health and equity benefits, in other sectors such as transport, energy, agriculture, water and education;
- The promotion of health sector governance in environmental and strategic impact assessments;
- The application of environmental and strategic impact assessments to health policies, measures and strategies, to contribute to ameliorating health sector sustainability. This is very important for those countries in the eastern part of the region that seek donor funding for health projects.

3. Research, technology and knowledge sharing: understanding the health opportunities of green and inclusive growth

There are many specific research needs on how green development can benefit health and equity. Eight areas of development and research are of particular importance:

- Guidance, tools and standardized methodologies for health impact assessment in other sectors and environmental impact assessment in the health sector (including protocols, standards and evidence);
- Research on the health effects of new technologies and innovation (e.g., nanotechnologies, adaptation measures, etc.);
- Benchmarking and standard setting of behavioural change to promote the health and health equity benefits of GHG reduction;
- The health and equity benefits of green and inclusive growth policies in other sectors;
- The benefits for social, environment and economic development of health sector action;
- Specific research and demonstration projects to improve understanding of the benefits of sustainability in the health sector;
- Small- and large-scale opportunities of green growth for a green health sector and health development;
- Climate change adaptation effectiveness in the health sector.

A significant number of well-trained personnel is further required to ensure information exchange and learning support to enable action of the size and scale necessary for the desired impact. Communication of opportunities for innovation to the health sector and across sectors is further required to ensure a sustainable health sector.

4. Ensure funding, resource flows, investment, and innovation, to promote health and health equities

Social protection is needed, as well as further health financing, as the region's people remain vulnerable to sudden crises and financial uncertainty and environmental change exacerbates these risks. This requires the following priority key actions:

- Recognition that social protection has benefits both in terms of the economy (as an automatic stabilizer) and in terms of health outcomes;
- Linking different types of protection (crop insurance, old age pensions, remittance transfers), resources that enable access to basic services (such as health and education) and financing for the provision of those services;

- Strengthening provision of funds for public health and its services, as an investment in the long-term health and well-being of the population as a whole;
- Enhancing participation and responsiveness of citizens, as part of the fundamental values that underpin modern health systems and vital to achieving health-promotion and health-system objectives.

5. Measuring progress

Health outcomes can be measured and can generate public and political interest. Sustainable development and health are closely linked, and demonstrating this relationship can provide a powerful argument to support climate-change mitigation and adaptation, as well as sustainable development. Health indicators alone cannot show progress in development but, as both a contributor to and beneficiary of sustainable development, health will be a critical component in how the progress and impact of sustainable development are tracked after Rio+20. For example, at the Fifth Ministerial Conference on Environment and Health, health and environment ministries agreed to a number of non-legally binding targets (WHO/EURO, 2011d). The Rio+20 Conference will provide an opportunity to agree on a new approach to development based on the integration of economic, environmental and social-policy concerns. For any new approach to have real traction, however, new measures will be needed to assess progress. These may take the form of sustainable development goals or a new MDG framework.

The following initiatives are important for further development and implementation:

- Opinion surveys of the general public and climate negotiators;
- Economic valuation of the health effects of climate-change mitigation and adaptation measures, arguing for a much stronger role for health in climate and related development processes;
- Indicators to measure progress on environment and health in the pan-European region (WHO/EURO, 2010), such as
  - Improving access to safe water and sanitation;
  - Reducing obesity and injuries through ensuring safe environments, physical activity and healthy diets;
  - Preventing disease through improved outdoor and indoor air quality and greater chemical, biological and physical safety; and
  - Action to protect health and the environment from climate change.
- WHO tools and indicators to assess the impact of policies in different sectors and their potential impact on people's health.
- Health measurements in the new MDG framework.

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Chapter V, part B

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Chapter VI.

Institutional arrangements supporting the shift towards sustainable development

Chapter VI. Institutional arrangements supporting the shift towards sustainable development

Introduction

The purpose of this chapter is to deepen understanding of governance approaches, notably the instruments, tools, approaches and institutional arrangements at the national, subregional and pan-European levels, which have assisted in the integration of sustainable development in all spheres of decision-making.

The chapter is divided into three substantive sections, each pertaining to a different scale of governance (i.e., national, subregional and pan-European). Each section describes the primary governance approaches that have been developed and assesses their overall effectiveness. Recommendations are also included.

It should be emphasized that the overall starting point for this chapter is the national level. Tremendous advances have been made on the part of all States in the region in the development of sustainable development governance. However, as reflected in the first section on national governance, there are significant challenges remaining in all of the subregions in Europe.

The subsequent subsections on subregional and pan-European governance highlight only those approaches that address all three pillars of sustainable development, as opposed to those that are strictly focused on environment concerns. The examples have also been chosen in terms of the extent to which they support national Governments in their concrete efforts to transition to sustainable development.

Strengthening the institutional framework for sustainable development is one of the two main themes of the forthcoming United Nations Conference on Sustainable Development. At the second Preparatory Committee, which was convened in New York in March 2011, United Nations Member States agreed that:

> *The achievement of an effective and efficient institutional framework for sustainable development at all levels is key to the full implementation of Agenda 21, the follow-up to the outcomes of the World Summit on Sustainable Development and meeting emerging sustainable development challenges.* (United Nations, 2011).

At this point in the preparatory process, the focus of the governance deliberations has been directed primarily to the global level of the institutional framework for sustainable development. This chapter does not cover this level: it focuses on the national, subregional and regional levels of sustainable governance which are also expected to be addressed at a later stage in the Rio+20 preparatory process.

A. Sustainable development governance at the national level

In this section, national-level sustainable development governance approaches are examined in terms of new institutions, policies and strategies and legislation, as called for by chapter XI of the Plan of Implementation of the World Summit on Sustainable Development, also called the Johannesburg Plan of Implementation.

In view of the geographical scope and diversity of the region, this section evaluates the effectiveness of these national approaches by groups of countries corresponding to the subregional groupings as delineated previously in the report.

The overarching challenges of sustainability policy integration

There have been considerable governance innovations over the last decade, and these are highlighted throughout this chapter. However, it is equally clear that the horizontal and vertical policy integration of sustainable development continues to be problematic throughout the region for several concrete reasons.

First and foremost, despite efforts to "green" stimulus spending, in many cases, the global economic downturn has exacerbated the tensions between short-term considerations about GDP growth and economic stabilization and the long-term imperative of sustainable development (OECD, 2002).

Second, in many cases, the difficulties and obstacles in integrating the three pillars of sustainable development and mainstreaming them into key policy domains often result from the inability of policymakers to understand and realize the mutual benefits that can accrue from harmonizing environment, social and economic considerations (ibid.).

A third underlying factor that has impeded the integration of sustainability into key spheres of decision-making relates to the lack of effective coordination between sectors and across various levels of government (ibid.). Of course, where States have functioning national commissions for sustainable development, the problem is less acute. But for those countries where institutional development has been slow, efforts at deepening inter-ministerial coordination continue to be underdeveloped (see box 6.1).

Box 6.1 "Ministries of the Impossible": Inter-ministerial coordination is at the heart of sustainable development

Despite growing awareness of sustainable development, responsibility for this area still often remains under the purview of ministries of environment. Famously called "Ministries of the Impossible" by former French Prime Minister Lionel Jospin, environmental ministries often have limited influence in economic decision-making. UNDP recently commissioned a survey to assess institutional capacities for low-carbon and climate-resilient development in a number of EECCA and SEE economies (Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Kazakhstan, the Republic of Moldova, Montenegro, Serbia, the former Yugoslav Republic of Macedonia and Turkey). The survey demonstrates that weak inter-ministerial coordination and the pitfall of "silo thinking" — i.e., that each ministry stands alone, not interacting with others — stands in the way of the integrated policymaking necessary to advance sustainable development (full results are available online). The study shows that several integrative bodies responsible for sustainable development do exist, but in many countries these bodies are hosted by ministries of environment and enjoy limited ownership among essential partner ministries, such as finance and economy, energy, transport, social protection and health. In addition to the coordination problem, the study shows that most countries also have a capacity gap: they often lack the appropriate institutional and human capacities to develop and implement cross-sectoral climate change policies, rely on coordinating committees which are not systematically supported, and are insufficiently prepared for climate-change negotiations. Progress is under way to address these gaps. A number of countries are developing Low Emissions Climate Resilient Development Strategies in partnership with UNDP, which provide a mix of integrative policies and adequate financing mechanisms to pave the way towards sustainable development. As an added incentive, countries with such strategies also became eligible to access the much-awaited Green Climate Fund after the 2011 Durban Climate Change Conference of the Parties to the UNFCCC.

Source: ***UNDP (2011).***

Achieving greater policy coherence demands sustained efforts to improve the integration of sustainable development into sectoral policies, to ensure policy integration across levels of government, and to ensure consistency in the choices made by various stakeholders, especially the private sector. However, the success of these efforts depends on the existence of fundamental framework conditions as well as the right mix of institutional arrangements, policy and legislative frameworks. All of these are summarized in box 6.2 below.

Box 6.2 "The "tool box" for sustainability integration

- Constitutional mandates for sustainable development.
- Clearly articulated strategic sustainability frameworks with time-bound goals and specific, results-oriented indicators and benchmarks.
- Mechanisms for monitoring, assessment, feedback and revision of national sustainability strategies.
- Political leadership in order to demonstrate the importance and value of integrating sustainable development into all spheres of decision-making.
- Inter-ministerial body to coordinate sustainable development policy between all relevant ministries.
- Structural incentives to encourage government departments to integrate sustainability considerations into decision-making. These include results-based reporting, budgeting and accountability processes.
- Ongoing process of review of laws and regulations to ensure conformity with sustainable development.
- Tools to ensure that sustainability priorities are duly reflected in long-term budgeting.
- Clear frameworks for assessing performance of government bodies.
- Support for stakeholder involvement in sustainability decision-making.

Source: ***UNDP (2011).***

Sustainable development governance challenges in Western Europe

At the 2009 European Sustainable Development Network Conference on the future of the EU Sustainable Development Strategy, a number of important lessons were highlighted regarding the implementation of national strategies for sustainable development (which are required by the EU Sustainable Development Strategy) (ESDN, 2009).

These include the following:

- Inter-ministerial committees and national sustainable development councils are important institutional structures for fostering horizontal integration, which is one of the most decisive issues for sustainable development implementation;
- Each ministry should be aware of the sustainable development strategy and should contribute to its effective implementation;
- The inclusion of the capacities of stakeholders (particularly in the strategy development) and the cooperation with societal actors in the strategy implementation are important factors in the sustainable development strategy process;
- Cooperation among the different political levels is essential for successful implementation of strategy objectives;
- Sustainable development action plans are important to define concrete actions and measures for the strategy's objectives across ministries and sub-national authorities;
- Concrete mid-term targets of the National Sustainable Development Strategies helped to better communicate sustainable development and increase the understanding of sustainability in the society at large;
- A strong political commitment for sustainability on all political levels would enhance the chance to implement the objectives of the future EU Sustainable Development Strategy and National Sustainable Development Strategies;

- Better coordination and coherence on key challenges and objectives (with related targets and actions) between the future EU Sustainable Development Strategy and the National Sustainable Development Strategies of the member States is necessary;
- Strong monitoring mechanisms and indicators are needed to ensure implementation and coordination of the EU Sustainable Development Strategy and the National Sustainable Development Strategies processes.

The following box provides an overview of important horizontal integration mechanisms that have been implemented by countries of Western Europe and Canada.

Box 6.3 Overview of horizontal integration mechanisms

AUSTRIA: In Austria, horizontal coordination on the federal level is fostered by the Committee for a Sustainable Austria that consists of representatives of all federal ministries, social partners and the chairs of the Expert Conference of National and Regional Sustainable Development Coordinators. Moreover, a Sustainable Development Steering Group was established on the national level to coordinate sustainable development activities among the different ministries. As of 2010, the Committee is co-chaired by the Federal Chancellery and the Federal Ministry of Agriculture, Forestry, Environment and Water Management. (ESDN, 2011e)

NORWAY: According to the National Sustainable Development Strategy, a "Green Cabinet", chaired by the State Secretary of the Ministry of Finance and composed of state secretaries from other ministries and the Office of the Prime Minister, is responsible for ensuring policy coherence. Following increased need for coordination of the climate change issue, the mandate of the Cabinet on Sustainable Development was expanded in 2008 to cover more specifically policies related to climate change. (ESDN, 2011d)

SWEDEN: Between 2003 and 2007 Sweden had a Coordination Unit for Sustainable Development. Its task was to coordinate sustainable development within the Government Offices, function as a think-tank and promote the further development of the National Sustainable Development Strategy. The revised National Sustainable Development Strategy was prepared by the Coordination Unit for Sustainable Development in cooperation with a cross-departmental working group. Generally, all ministries are involved in the implementation of the National Sustainable Development Strategy. Within the Swedish Government offices, the coordination responsibilities for the Sustainable Development Strategy are shared between several ministries. The EU Sustainable Development Strategy is coordinated by the Prime Ministers Office, while the Ministry of Foreign Affairs is responsible for coordination of the global sustainable development work. (ESDN, 2011c)

SWITZERLAND: The coordination function for sustainable development within the Swiss Government is undertaken by the Interdepartmental Sustainable Development Committee, in which more than 30 federal agencies are involved and which is headed by the Federal Office for Spatial Development.

The tasks of the Committee include:

- Coordination of Confederation policy as it relates to sustainable development;
- Inter-departmental and inter-agency coordination of Confederation activities which are of significance to sustainable development;
- Joint development of strategies and action plans for Switzerland's implementation of Agenda 21;
- Coordination of the position taken by Switzerland in international processes, and reporting to international bodies such as the United Nations; and
- Fostering relationships within the federal administration as well as with the private sector and civil society. (ESDN, 2011b)

Box 6.3 Overview of horizontal integration mechanisms *(continued)*

FINLAND: The aim of the Finnish National Commission on Sustainable Development is to promote strategic sustainable development goals in national and administrative policies, and also to enhance the dialogue between different societal actors. The promotion and concretizing of implementation processes fosters cohesion between sectoral policies and administration. The Prime Minister chairs the meetings of the Commission, which has ensured a much higher level of political visibility. (ESDN, 2011a)

CANADA: Since 1995, designated departments and agencies have been required by law to prepare sustainable development strategies, then update them and present them to Parliament every three years. The Commissioner of the Environment and Sustainable Development assesses the quality of departmental sustainable development strategies and whether the plans set out in the strategies have been implemented. The results are presented in various reports of the Office of the Auditor General of Canada, including the Commissioner's reports to the House of Commons. (ibid.)

UNITED KINGDOM: There are several coordination mechanisms that facilitate horizontal integration in the United Kingdom: first, a new Cabinet committee structure was announced in July 2007. In this committee structure, the main committee relevant to sustainable development is the Environment and Energy Subcommittee of the Economic Development Committee. Its remit is to consider international and domestic policy on environment and energy issues, and to report as necessary to the Committee on Economic Development and the Committee on National Security, International Relations and Development. The second coordination mechanism is the Sustainable Development Task Forces, established by the State Secretary for Environment in 2002. Government Task Forces are set up in order to bring together officials, and often ministers from across Government, in order to generate action on a particular issue of sustainable development. (ibid.)

GERMANY: The Committee of State Secretaries for Sustainable Development is predominantly responsible for developing and implementing the German National Strategy for Sustainable Development. All Government ministries are represented on the Committee. The Head of the Federal Chancellery chairs the committee on which all ministries are represented. Moreover, the Committee's importance in sustainability policymaking is guaranteed by its institutional position right below the Cabinet of Ministers and the fact that only the State Secretaries can participate. (Germany, 2009).

Sustainable development governance challenges in South-Eastern Europe

The institutional challenge

Many countries in SEE have made considerable efforts in developing the new institutions that will be needed to implement EU and international commitments.

In addition, following on the recommendations of the 2002 World Summit for Sustainable Development, several countries have established National Councils for Sustainable Development to provide for forums for inter-ministerial coordination and stakeholder consultation on issues related to the environment and sustainable development. The national councils are usually entrusted with the preparation of the national strategy for sustainable development and the coordination of Government ministries in their respective sustainability policymaking.

As with other subregions throughout the ECE region, despite good intentions, the national councils have not been properly equipped with the resources to effectively carry out their mandates. In many cases, they lack permanent secretariats and are not sufficiently elevated in the political hierarchy to have any real effect.

Some countries have made efforts to address these problems by elevating the profile of the councils by placing the chairmanship within the Deputy Prime Minister's office.

Box 6.4 Examples of sustainable development governance

The Serbian National Council for Sustainable Development was established in 2003 to ensure horizontal coordination and to prepare the National Strategy for Sustainable Development. At first, in 2003, the National Council was placed under the responsibility of the Ministry of Natural Resources and Environmental Protection, which undermined its overall effectiveness. Following a restructuring in 2005, it is now chaired by the Deputy Prime Minister and includes six ministers and is serviced by a permanent secretariat.

In Croatia, the Sustainable Development and Environmental Protection Council was established by the Government for the purpose of achieving coordinated and harmonized economic development in the context of environmental protection and ensuring conditions for sustainable development.

Sustainability policy integration

Throughout SEE, the integration of sustainability considerations into other sectoral policies is still at an early stage. This stems in part from the aforementioned weaknesses with the national councils for sustainable development, the lack of structures in place to ensure coordination and cooperation between the environment ministries and other line ministries, and the fact that some ministries continue to include simultaneous competencies for resource protection and exploitation.

The challenges with national strategies for sustainable development

Over the years, the most important contribution to the policy framework has been the establishment of national strategies for sustainable development. Called for by the World Summit for Sustainable Development, they enshrine fundamental sustainability principles, define priorities for legislation and the integration of environmental policy into economic and other sectoral policies and define priorities for strengthening institutional capacities. However, not all countries in the subregion have been able to mobilize the political will needed to establish national strategies. And, where they are indeed missing, policy integration is being addressed in a fragmented manner with limited progress in developing concrete initiatives for sectoral integration.

Box 6.5 Montenegro's National Strategy for Sustainable Development

The National Council for Sustainable Development of Montenegro is composed of key ministries and scientific institutions, and brings together the business sector and NGOs. The National Council is responsible for the implementation of the National Sustainable Development, the main aims of which are to develop sustainable tourism, a programme of forestry policy and a programme on organic agriculture.

The positive impact of EU approximation

Many countries in the subregion have advanced considerably in the development of their national legal frameworks for sustainable development. In many cases, the elaboration of new environmental legislation has resulted from efforts to approximate the EU environmental *acquis*, especially in the areas of environmental impact assessment, strategic impact assessment, integrated pollution prevention and control. However, there are significant challenges remaining, such as the slow pace in enacting necessary secondary implementing legislation and the degree of complication and fragmentation, as well as weak monitoring and enforcement.

Box 6.6 Right to a healthy environment in Serbia

In 2006, Serbia adopted its Constitution, which proclaims that every citizen has the right to a healthy environment and the right to timely and full information about the state of the environment.

The role of public participation

One important trend in the development of environmental legislation has been the improvement of public participation in environmental law-making. Many countries now regularly hold public hearings concerning draft laws, and NGOs often participate in the preparation of draft laws. Indeed the Aarhus Convention has been an important catalyst in stimulating the democratic process of public participation in environmental decision-making throughout the subregion.

Sustainable development governance challenges in Eastern Europe

The institutional challenges

One of the central institutional challenges in Eastern Europe has been the lack of robust national commissions for sustainable development. Where they have been created, in the case of Ukraine, for example, they have been weak in both form and function. The participation of key stakeholders has been limited and the bodies have lacked the resources and tools needed to develop innovative sustainability policies, to support implementation and to evaluate progress.

Integration efforts

The most significant contribution to the policy framework for sustainable development has been the efforts to integrate the environment into other sectoral issues such as transportation, agriculture and industry, although this has not been very successful in energy and land-use planning. Many national Governments in Eastern Europe have begun to use economic instruments, often employing the "polluter pays" principle, in order to achieve environmental goals. Nevertheless, these instruments have only been used to a very limited extent and, even where they are used, environmental enforcement and monitoring mechanisms are underdeveloped and significant exemptions exist which, combined, undermine the effectiveness of these instruments.

Low level of political support

While several countries have developed national environmental policies, notably related to sustainable development, they have not been fully implemented or integrated throughout the national and subnational environmental institutions. National Governments do not place a high priority on environmental issues, and funding for this sector is minimal in Eastern Europe. Furthermore, long-term environmental strategies are still lacking in many States of the subregion. These factors severely limit the effectiveness of national environmental policies.

Box 6.7 Belarus' National Strategy for Sustainable Development

The Ministry of Natural Resources and Environmental Protection introduced the National Strategy for Sustainable Development as a policy and legal framework. The National Strategy sets the transition towards sustainable development in two stages: first, to further improve living standards based on more efficient use of resources and a competitive economy; and, second, to lay the groundwork for a new post-industrial information age, with an emphasis on technology designed to bring about a smooth transition to resource-saving production.

Progress with the development of environmental law

Despite some degree of legislative progress, environmental concerns continue to rank low on the political hierarchy in Eastern European national Governments. Furthermore, the impact of environmental legislation is often minimal because monitoring and enforcement mechanisms are underdeveloped. In addition, efforts to implement legislation are often poorly coordinated and rarely integrated into the overall environmental policy framework.

Sustainable development governance challenges in the Caucasus and Central Asia

The influence of the Environmental Performance Reviews and political transition processes

There have been significant changes in the institutional framework of countries in the Caucasus and Central Asia over the past 10 years. In large part, these changes have been influenced by political independence processes and recommendations of the first Environmental Performance Reviews (EPRs), undertaken as part of the ECE EPR Programme. However, in other cases, political transition processes have impeded the development of sustainability institutions because of the predominant focus on economic growth.

Box 6.8 Environmental authorities in Azerbaijan

In Azerbaijan environmental authorities have been considerably strengthened since the first EPR, both institutionally and in terms of funding. As a result, since its establishment in 2001, the Ministry of Ecology and Natural Resources has succeeded in promoting sectoral integration by developing environmental programmes and action plans, and by contributing to the development of programmes on sustainable development in cooperation with other ministries and State agencies.

The institutional challenges

As with other subregions throughout the pan-European region, despite good intentions, few national sustainable development councils have been put in place in the Caucasus and Central Asia. Where they do exist, they have not been properly equipped with the resources and capacity to ensure implementation of national sustainable development strategies.

Challenges also remain in terms of ensuring coherence in the division of responsibilities among the relevant institutions and strengthening coordination and cooperation in order to avoid gaps, overlaps and inefficiencies that continue to undermine the realization of sustainability goals. Many countries have now created environment ministries, however drastic cuts and frequent restructuring impede continuity and capacity.

Box 6.9 Kazakhstan's National Council for Sustainable Development

The National Council for Sustainable Development of Kazakhstan is responsible for the implementation of the national sustainability strategy. It endeavours to balance economic and environmental objectives, without endangering the competitiveness and future growth of the country. The strategy harmonizes resource efficiency and human development alongside economic competitiveness.

National strategies for sustainable development

National strategies for sustainable development have only been implemented in a few countries in the subregion. For those countries that have implemented such strategies, few have been properly reviewed or assessed, as with National Environmental Action Plans. In some cases, the national strategies for sustainable development have been discontinued or replaced by even less effective approaches that have led to further policy fragmentation.

Box 6.10

Uzbekistan's 1997 National Sustainable Development Strategy continues to serve as the overarching framework for sustainable development and functions as the basic reference document for all strategies and legislation. It requires that all policies and laws must be consistent with the National Strategy.

The integration gap

Throughout the countries of the Caucasus and Central Asia, the integration of environmental policy with economic and other sectoral policies is still undeveloped. This stems in part from the aforementioned weaknesses with the national councils for sustainable development, the lack of structures in place to ensure coordination and cooperation between the environment ministries and other line ministries, and the fact that some ministries continue to include simultaneous, contesting competencies for resource protection and exploitation.

Challenges in the development of environmental law

Many environmental laws and regulations were adopted following the first cycle of EPRs throughout this subregion. This has contributed to number of legislative advances. However, democratic deficits, lack of internal consistencies, and unclear division of responsibilities, which has created deeper gaps and duplication, in turn, have undermined implementation of and compliance with these laws.

Box 6.11 Draft law on environmental security in Uzbekistan

In Uzbekistan a draft law on environmental security is currently at the early stages of consideration. The purpose of the law is to identify and prevent the development of environmental threats, address emergency environmental situations and rehabilitate environmental disaster zones, and establish the legal basis for protection against hazardous environmental impacts.

Conclusions and recommendations for strengthening sustainable development governance at the national level.

Challenges related to the policy framework and the institutional set up

In terms of the overarching policy framework challenges faced by States of the region, the common factor relates to lack of political support for the development of national strategies for sustainable development. However, there are variations in this respect and, for example, EU member States have benefitted enormously from the EU Sustainable Development Strategy, which provides clear guidance for the development of national sustainability strategies.

In order to ensure the effective integration of the three pillars of sustainable development into policymaking, there is a need to strengthen national institutional frameworks for sustainable development across multiple levels of governance. This requires a whole-of-government approach, fostering inter-ministerial and local-national level cooperation. Such an approach would lead to the integration of sustainability considerations into all levels and sectors of government planning and decision-making.

For this purpose, it is necessary to strengthen relevant bodies, such as national councils for sustainable development, and to establish offices within the executive office to undertake overall responsibility for the development of national sustainability strategies. In addition, ensuring an oversight of national strategies by a parliamentary committee is needed to send clear messages to bureaucracies that their performance in achieving sustainability goals will be monitored at the highest level.

Governments should also establish sustainability audits, with baseline measures against which progress can be measured. They further need to ensure that key stakeholders are involved in the sustainability audit, by supporting them with the resources needed to conduct a shadow audit.

Equally important is the need for related instruments to support effective integration of sustainable development considerations into sectoral policies and specific tools and mechanisms (i.e., sustainability impact assessments, environmental impact assessments, environmental management systems, national environment and health action plans, market-based tools, comprehensive labour market information, etc.) integrating environmental requirements into transport, energy, agriculture and other key sectors.

The overall weakness of environment ministries needs also to be addressed by increasing resources and expertise with a view to promoting and supporting both the implementation of environmental legislation and the integration of environmental considerations into other line ministry decision-making.

The legislative challenges

Despite the positive impact of EU approximation — or, the transposition of EU environmental legislation into national legal systems of States aspiring to membership in the EU — for many States in the region, there are significant challenges which remain concerning the slow pace in enacting necessary secondary implementing legislation, the degree of complication and fragmentation, as well as weak monitoring and enforcement. Therefore Governments should strengthen the legal capacity and expertise of key ministries to accelerate the approximation process.

The ineffectiveness of compliance and enforcement mechanisms is generally connected with an incomplete legal basis and insufficient institutional capacity. Governments must therefore continue to address democratic deficits, lack of consistency within and between ministries and capacity issues, as well as the unclear division of responsibilities that underpin monitoring and enforcement.

The ratification and implementation of the Aarhus Convention has significantly stimulated the democratic process of public participation in environmental decision-making and sustainable development throughout the pan-European region. Aarhus principles should be extended to other policy domains.

B. Sustainable development governance at the subregional level

Introduction

Against the backdrop of national-level sustainable development governance challenges, it is clear that subregional and pan-European organizations have a key role to play to support States in improving their integration efforts.

Indeed, this section reveals that considerable advances are indeed being made in this regard.

Normative instruments, including both legally binding conventions and soft law approaches have been developed for almost all of the subregions. The Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention), the International Convention for the Protection of the Alps (Alpine Convention), and the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) have all addressed the three pillars of sustainability in an integrated manner in their efforts to balance environmental protection with economic and human development (Fall, 2006). Another important development in this regard is the ongoing process for a possible convention on the sustainable development of the Dinaric Arc.

Soft law approaches, such as the Mediterranean Strategy for Sustainable Development, the Council of the Baltic Sea States Strategy on Sustainable Development 2010–2015 and the Strategy and Action Plan for the Barents Region until 2010, also demonstrate that governance approaches at the subregional scale are proving effective in addressing the integrated sustainability challenges. In many cases, there is a more distinct "community of interest" from which robust and innovative solutions can be developed with greater ease than at the international level.

Particular attention is focused in this section on the EU SDS. The EU SDS has gone through several rigorous review processes. The most recent revision, although far from perfect, ensures a greater recognition of the need for integrated approaches to policymaking to ensure policy synergies and to reduce trade-offs between economic, social and environmental challenges.

Breakthroughs and accomplishments

Legally binding instruments

Administered by UNEP Vienna, the Carpathian Convention promotes the protection and sustainable economic development of the Carpathian mountain region. Its cross-sectoral and integrated approach has been an important source of policy guidance for States in the Carpathian region — especially in terms of the challenges of balancing environmental protection with economic development in the region (Fall, 2006).

The Convention has also motivated the EU to ensure better coordination of existing EU programmes in the region. In terms of implementation, EU member States continue to have difficulties, especially in terms of their continuing need for financial, technical, and personnel assistance. On the transnational level, greater efforts are needed to strengthen the institutional arrangements under the Convention, to develop the "Carpathian Space" under the convention, and to enhance transnational coordination (UNEP, 2011).

One of the key sources of inspiration for the Carpathian Convention was the 1991 Alpine Convention, which was the first regional agreement for sustainable development of mountains. Like the Carpathian Convention, the Alpine Convention has been instrumental in helping the Parties to promote jointly the integration of the ecological, economic and social dimensions of this common ecosystem. The Convention commits States Parties to pursue conservation policies and to intensify cooperation on key thematic areas, such as population and culture, land use, air quality, soil protection, water, nature protection and landscape tending, mountain farming, mountain forests, tourism, transport, energy and waste.

Mention should also be made of the ongoing efforts to launch a legally binding convention on the sustainable development of the Dinaric Arc. At the 2011 Conference for the Protection and Sustainable Development of the Dinaric Arc Region, States of the subregion agreed on the need for an integrated approach to ensure sustainable development and for a balanced relationship between people and nature. The integrated approach will address the linkages between spatial planning, nature conservation, environmental protection, water management, agriculture and rural development, cultural identity, energy, mountain forestry, tourism, sports and transport (Sandei, 2008).

Soft law approaches

At the subregional level there are a number of important strategic frameworks that have addressed the integrated challenges of sustainable development.

One of the earliest examples is the Baltic 21, the regional expression of Agenda 21. The Baltic Sea Region was the first region in the world to develop a regional sustainability strategy. In fact, no other region in the world has such a strong track record when it comes to sustainable development in both principle and practice (Baltic 21, 2006).

Initiated in 1996 by the Prime Ministers of the countries around the Baltic Sea, the objective of the strategy was to contribute actively towards advancing sustainable development in the Baltic Sea Region by addressing the linkages between environmental, including health, and spatial planning aspects of sustainable development in the region.

In the 10 years since the Prime Ministers of the Baltic Sea States initiated the Baltic 21 process, the Baltic Sea Region's commitment to sustainable development has been intensified through numerous high-level political declarations and agreements. For the 2010–2015 period, the Baltic 21 Strategy will focus on climate change, sustainable urban and rural development, sustainable consumption and production and innovations and education for sustainable development (CBSS, 2011).

Despite the Baltic Sea Region's clear commitment to sustainable development, it has been difficult to mobilize the financing and the resources needed for implementation. More focused efforts are needed both to halt and reverse regional unsustainable trends, such as the excessive use of and demand for energy, as well as the immoderate depletion of natural resources (Baltic 21, 2006).

Adopted in 2005, the Mediterranean Strategy for Sustainable Development was the result of an extensive consultation process. The Mediterranean Strategy for Sustainable Development framework provides guidance for national sustainable development strategies and implements international agreements in the regional context. Because the environment provides the basis for economic development in the Mediterranean, the Strategy addresses the challenges in redirecting development to meet economic and social needs, without exacerbating environmental degradation. The Strategy focuses on integrating environmental concerns into key economic development sectors (UNEP, 2005).

More recently, the Strategy and Action Plan for the Barents Region until 2010 is an excellent example of the balancing of economic growth and social development, alongside the sustainable use and management of the region's natural resources. Key achievements of the Strategy include its impact in forging collaboration between stakeholders and ensuring the participation of indigenous peoples. Further, it has been designed to provide guidance and support to countries in the development of their own sustainability strategies.

EU Sustainable Development Strategy

With the EU Sustainable Development Strategy (Council of the EU, 2006), the EU has been increasingly proactive in building political support among member States and key constituencies. The Strategy was first adopted in 2001 to provide the EU with an overarching sustainability policy framework. The framework provided policy guidance for EU member States in the development of their national strategies for sustainable development.

Five years later, in 2006, the European Council adopted an ambitious, comprehensive and renewed Sustainable Development Strategy in order to respond to the new sustainability challenges that were generated by an important wave of expansion in recent years. As a result, the Strategy was revised to ensure greater recognition of the need for integrated approaches to policymaking to facilitate policy synergies and to reduce trade-offs between economic, social and environmental challenges.

Other equally important additions to the revised EU Strategy included: consideration of the challenges of integrating sustainable development considerations into external policies of the EU; mechanisms for improving the coordination with other stakeholders and levels of Governments; the launch of a new process for voluntary peer review of national sustainable development strategies; and increased emphasis on unsustainable consumption and production.

The most recent review of the EU Sustainable Development Strategy, carried out in 2009, concluded that, despite considerable progress with the Strategy in mainstreaming sustainable development in other EU policies, unsustainable trends persist, "ranging from climate change to the ageing of societies in developed countries and a widening gap between the rich and the poor in the world." (European Commission, 2009)

The most important challenge now is to ensure that the EU Strategy can influence EU short- and medium-term policies, such as the EU 2020 strategy, which is the new EU green-growth strategy. EU 2020 has three mutually reinforcing priorities, namely to help the EU become a smart, sustainable and inclusive economy. Important lessons must be learned from the difficulties the EU has faced in harmonizing its Sustainable Development Strategy with the EU 2020 precursor — the so-called Lisbon Strategy. For years, there has been a divide between the two policy domains, notwithstanding the clear linkages between economic growth and competitiveness, job creation and environmental sustainability and social cohesion (Stevens, 2009).

Subregional cooperation in Eastern Europe, the Caucasus and Central Asia

An outstanding example of transforming environmental and security risks into subregional cooperation is provided by ENVSEC, a partnership of six international organizations — ECE, OSCE, the Regional Environment Centre for Central and Eastern Europe, UNDP, UNEP, and the North Atlantic Treaty Organization (NATO) as an associated partner — with specialized mandates and expertise, providing an integrated response to environment and security challenges.

ENVSEC tries to address environmental and security concerns through prevention, international dialogue and neighbourly cooperation. The mission of ENVSEC is to contribute to the reduction of environment and security risks through strengthened cooperation among and within countries in four regions: Central Asia, Eastern Europe, Southern Caucasus and SEE.

As examples of the practical results this programme achieves, ENVSEC work in Central Asia has led to important multi-country projects, such as "In-depth assessment of environment and security linkages and impact in the Amu Darya River Basin", "Capacity-building for cooperation on dam safety in Central Asia", "Strengthening coordination of project formulation and mobilization of resources for sustainable radioactive waste management in Central Asia" and a comprehensive study on glacial melting in Central Asia.

By providing a platform for countries to analyse cross-border climate phenomena, ENVSEC takes a human-centred approach to environmental issues, builds ties among experts and regional leaders, and increases capacity for managing environmental risk in the region.

Policy recommendations

- To trigger the political engagement of States in a subregional context, it is important to promote transboundary agreements as instruments for political cooperation and peacebuilding. Wherever new policy initiatives will be needed at the subregional level, experience has shown clearly that there is a greater chance of compliance if Governments

can be convinced of their potential for securing political stability, stabilizing economies and improving living conditions. These overarching goals must always provide the context for policymaking.

- Draw on examples of the Carpathian Convention, the Alpine Convention and Barcelona Convention, which have all addressed the three pillars of sustainability in an integrated manner. This is essential to ensure that policy making balances environmental protection with economic and human development.
- New subregional policy initiatives should therefore be embedded in a true sustainability framework, which ensures that all three pillars are properly integrated.
- When developing legally binding instruments or strategies at the subregional level, ensure that they provide for the necessary tools for implementation since the lack thereof is a common factor that has impeded success so far.
- In those cases where subregional cooperation is limited by lack of capacity, assistance from donors and relevant international organizations needs to be provided in order to ensure the systematic flow of financial, technical and policy support.
- Civil society and the private sector are important stakeholders in many subregional cooperation initiatives and their effective involvement needs therefore to be facilitated by the countries which are parties to these initiatives.

C. Sustainable development governance at the pan-European level

Breakthroughs and achievements

Many important breakthroughs have been made at the pan-European level in terms of new governance approaches that integrate the three pillars of sustainable development. These have not only enhanced regional coordination and cooperation, but have also supported deeper integration of sustainability into decision-making at all levels.

Indeed, to a very large extent, United Nations bodies as well as some non-United Nations pan-European organizations (e.g., the Council of Europe, OSCE) have played an important role in shaping regional strategies, policy frameworks and legal instruments under which national Governments have succeeded in developing their own policy and legal framework. Furthermore, these organizations provide advisory services and concrete capacity-building support in order to enhance the ability of Governments to translate these regional processes and tools into national governance mechanisms.

Pan-European strategies and policy frameworks

The *Pan-European Biodiversity and Landscape Diversity Strategy,* which is jointly administered by UNEP and the Council of Europe, is a particularly innovative approach to biodiversity conservation. It integrates biological and landscape diversity considerations into social and economic sectors. It also provides a framework to ensure coherence between national and regional actions to implement the Convention on Biological Diversity.

The *Transport, Health and Environment Pan-European Programme* is another important sustainability strategic framework. Established in 2002 under the joint auspices of ECE and WHO/EURO, it provides a framework for integrating transport, health and environment policies at the national and local levels. Furthermore, it has facilitated cooperation between ministries of transport and environment throughout the region, as well as the exchange of good practices in promoting sustainable transport systems (ECE/WHO, 2008).

The *Strategy for Education for Sustainable Development,* managed by ECE, was adopted on the basis of a participatory process involving Governments, UNESCO, NGOs and other stakeholders. The Strategy aims to incorporate key themes of sustainable development in all education systems in the region. These themes include a wide range of issues: poverty

alleviation, peace, ethics, democracy, justice, security, human rights, health, social equity, cultural diversity, economy, environmental protection and natural resource management.

Political processes

The *"Environment for Europe" (EfE) process* is regarded as an essential high-level political process which provides for a coordinated approach in environmental policy for the entire ECE region. It involves 56 countries — spreading from the EU to the Balkans, to Central Asia and North America — as well as a large number of civil society organizations from the region. Serviced by ECE, this process benefits also from the active involvement of United Nations organizations, in particular UNEP, and other regional organizations such as the European Environmental Agency, OECD, OSCE and the Council of Europe. Not only has the EfE been critical to the development of regional conventions and harmonized norms, it has served to bridge important gaps and facilitate the exchange of experience between State and non-State actors, which has in turn proved essential to policy, law-making and institution-building at the domestic level (ECE, 2011). The Seventh EfE Ministerial Conference, held in Astana in September 2011, focused on two main themes: sustainable management of water and water-related ecosystems; and greening the economy: mainstreaming the environment into economic development. The Ministerial Declaration that was adopted at the Conference reaffirmed the value of the EfE process and, through the themes addressed, created the opportunity to expand its scope from environmental protection to sustainable development (IISD, Reporting Services Division, 2011).

The *Ministerial Conference on Environment and Health* is another high-level political process. Managed by WHO/EURO in close cooperation with UNEP and ECE, it aims at eliminating the most significant environmental threats to human health. The Fifth Ministerial Conference on Environment and Health (Parma, Italy, March 2010) is the latest milestone in this process, now in its twentieth year. Focused on protecting children's health in a changing environment, the Conference set Europe's agenda on emerging environmental health challenges for the years to come. The Parma Declaration is the first time-bound outcome of process. The 53 member States of the WHO/EURO region set clear targets to reduce the harm to health from environmental threats in the next decade, particularly those related to climate change (WHO, 2012).

Environmental Performance Reviews

Among the principal pan-European operational tools, the Environmental Performance Reviews have helped enormously to improve the evaluation of environmental performance relative to the national goals and the international obligations of the reviewed countries. The reviews are led by OECD for countries of Western Europe and by ECE for countries of Eastern Europe, with the support of UNDP and UNEP. States that have been reviewed under the first and second cycle of EPRs regard the process as essential in the following ways: identifying their environmental problems; defining further policy and legislative actions; improving their environmental governance; sharing experience; monitoring progress; assessing their involvement in regional and global processes; and identifying the next steps for further progress.[50] The third cycle of EPRs will address broader sustainability challenges in the countries under review.

Advisory services and capacity-building activities

The UNDP regional office for Europe and Central Asia (RBEC) undertakes a wide range of advisory and capacity-building activities to support efforts of Governments and other national stakeholders in promoting human development in its three interrelated environmental economic and social dimensions (Drexhage and Murphy, 2010). The capacity of UNDP to foster human development governance in countries of Eastern Europe, the Caucasus and Central Asia is reflected by a portfolio of over 250 active projects, with a $68 million budget for 2010 (Kuzmin, 2009).

[50] See the EPR webpage on the ECE website: http://www.unece.org/env/epr/welcome.html.

The UNEP Regional Office for Europe provides policy advice to national Governments in the area of environment, assisting in particular with the development of ecosystem-based approaches to biodiversity conservation. Mention should also be made of the UNEP Green Economy Initiative, which constitutes a solid basis for providing advisory services to Governments in support of their green economy transition efforts.

The ILO Green Jobs programme provides country assessments of the potential of green jobs, as well as training for ILO constituents in the region on green jobs and climate change (www.ilo.org/greenjobs). With demand for ILO assistance and interest in these issues growing in the region, the ILO stands ready to support countries through technical cooperation, policy advice and capacity-building, the objective being to promote best practice and raise the interest of decision makers in this area.

Policy recommendations

The key policy recommendations that apply across the board to all of the above-mentioned soft law norms, strategies and policy frameworks include the following:

- Continue to engage States of the region and other key stakeholders in the norm-creation/policymaking processes engaged at the regional level;
- Provide necessary capacity-building support to ensure the full engagement of States in these processes. Direct special efforts to ensure the engagement of those States that have played less prominent roles in previous policymaking processes;
- Prioritize the development of policy frameworks that help to deepen and strengthen the integration of the three sustainability pillars;
- Ensure that the priorities of the regional policy frameworks are reflected in the formulation of national strategies and that national priorities are better reflected in regional frameworks;
- For countries with limited institutional capacity that are involved in regional sustainable development processes, provide support in order to deepen their understanding of the cross-sectoral linkages and the tools for integrated policymaking. This is particularly important with tools such as sustainability impact assessment;
- For this purpose, encourage continued inter-ministerial cooperation and collaboration. Demonstrate the benefits of "joined-up" thinking;
- Direct greater efforts in distilling lessons learned throughout the region and feeding best practices into policymaking.

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Statistical annex

Annex Table 1
Energy use (kg oil equivalent) per $1,000 GDP (Constant 2005 PPP $)

Country	1990	1995	2000	2005	2009 [a]
Eastern Europe, Caucasus and Central Asia					
Armenia	740	297	284	199	174
Azerbaijan	759	895	571	354	190
Belarus	684	570	418	322	250
Georgia	411	447	259	180	151
Kazakhstan	628	730	501	426	432
Kyrgyzstan	676	424	325	299	265
Republic of Moldova	582	646	472	416	319
Russian Federation	470	547	491	384	328
Tajikistan	327	360	347	243	207
Turkmenistan	1427	1621	1388	731	605
Ukraine	602	816	736	543	438
Uzbekistan	1129	1278	1261	897	753
South-Eastern Europe					
Albania	207	117	120	121	91
Bosnia and Herzegovina	..	281	235	214	213
Croatia	141	152	142	131	118
Serbia	218	308	270	237	213
The former Yugoslav Republic of Macedonia	156	199	184	186	173
Turkey	120	120	122	108	112
EU 27					
Austria	125	122	112	124	112
Belgium	193	199	188	174	160
Bulgaria	435	402	321	262	216
Cyprus	130	133	135	120	124
Czech Republic	288	254	232	215	187
Denmark	133	132	110	105	100
Estonia	605	451	315	232	214
Finland	246	259	227	212	201
France	158	158	146	145	133
Germany	172	148	134	131	121
Greece	121	120	121	111	97

Annex Table 1 (continued)

Energy use (kg oil equivalent) per $1,000 GDP (Constant 2005 PPP $)

Hungary	225	229	180	161	147
Ireland	161	137	111	90	87
Italy	109	111	109	111	102
Latvia	292	299	184	147	127
Lithuania	349	326	214	178	156
Luxembourg	209	159	125	135	114
Malta	143	112	84	102	88
Netherlands	167	161	136	138	128
Poland	331	286	197	176	147
Portugal	104	115	114	118	105
Romania	342	283	236	189	155
Slovakia	324	314	259	216	164
Slovenia	174	191	163	155	141
Spain	117	122	121	119	103
Sweden	224	231	184	175	145
United Kingdom	152	147	128	113	99
Other high income countries					
Canada	279	283	252	241	214
Iceland	320	340	369	336	509
Israel	138	136	125	125	117
Norway	154	143	132	122	115
Switzerland	107	106	99	97	94
United States	240	229	204	184	169

Source: MDG Database of the UN Statistics Division

Note: Energy use per GDP (Constant 2005 PPP $) is the kilogram of oil equivalent of energy use per gross domestic product converted to 2005 constant international dollars using purchasing power parity rates. Energy use refers to use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport.

Gross Domestic Product (GDP) is the sum of gross value added by all resident producers in the economy plus any product taxes (less subsidies) not included in the valuation of output. Value added is the net output of an industry after adding up all outputs and subtracting intermediate inputs. The purchasing power parity (PPP) conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as the United States (U.S.) dollar would buy in the United States. An international dollar has the same purchasing power over GDP as a U.S. dollar has in the United States.»

Annex Table 2

Carbon dioxide emissions, kg per $1 GDP (PPP)

Country	1995	2000	2005	2008
Eastern Europe, Caucasus and Central Asia				
Armenia	0.64	0.49	0.35	0.32
Azerbaijan	2.36	1.52	0.91	0.67
Belarus	1.43	0.91	0.71	0.56
Georgia	0.28	0.41	0.30	0.26
Kazakhstan	2.34	1.59	1.35	1.44
Kyrgyzstan	0.80	0.61	0.58	0.58
Republic of Moldova	1.65	0.58	0.58	0.48
Russian Federation	1.35	1.17	0.90	0.77
Tajikistan	0.40	0.36	0.24	0.26
Turkmenistan	4.04	3.41	1.85	1.54
Ukraine	2.22	1.76	1.29	1.04
Uzbekistan	3.03	2.98	2.09	1.86
South-Eastern Europe				
Albania	0.18	0.21	0.24	0.18
Bosnia and Herzegovina	0.65	1.26	1.09	1.11
Croatia	0.38	0.36	0.34	0.30
Montenegro			0.40	0.29
Serbia			0.74	0.66
The former Yugoslav Republic of Macedonia	0.86	0.83	0.72	0.66
Turkey	0.34	0.35	0.30	0.32
EU 27				
Austria	0.29	0.26	0.29	0.24
Belgium	0.46	0.40	0.37	0.33
Bulgaria	1.14	0.87	0.72	0.61
Cyprus	0.44	0.43	0.41	0.41
Czech Republic	0.82	0.73	0.60	0.50
Denmark	0.42	0.33	0.29	0.28
Estonia	1.63	1.03	0.75	0.69
Finland	0.52	0.40	0.35	0.33
France	0.26	0.24	0.23	0.20
Germany	0.41	0.36	0.33	0.30
Greece	0.46	0.46	0.41	0.36
Hungary	0.54	0.42	0.36	0.31
Ireland	0.45	0.36	0.30	0.27
Italy	0.31	0.29	0.30	0.28
Latvia	0.59	0.35	0.26	0.23

Annex Table 2 (continued)
Carbon dioxide emissions, kg per $1 GDP (PPP)

Lithuania	0.59	0.37	0.30	0.26
Luxembourg	0.47	0.33	0.39	0.32
Malta	0.43	0.26	0.32	0.27
Netherlands	0.39	0.32	0.31	0.28
Poland	1.05	0.71	0.61	0.52
Portugal	0.30	0.30	0.30	0.26
Romania	0.79	0.62	0.52	0.42
Slovakia	0.79	0.60	0.48	0.36
Slovenia	0.47	0.39	0.35	0.33
Spain	0.31	0.30	0.31	0.26
Sweden	0.27	0.21	0.18	0.16
United Kingdom	0.38	0.32	0.28	0.26
Other high income countries				
Canada	0.60	0.56	0.50	0.48
Iceland	0.35	0.33	0.28	0.31
Israel	0.48	0.43	0.37	0.20
Norway	0.23	0.21	0.20	0.19
Switzerland	0.19	0.18	0.17	0.16
United States	0.60	0.53	0.48	0.45

Source: MDG Database of the UN Statistics Division
Note: Carbon emissions are measured as the total amount of carbon dioxide emitted by the country as a consequence of all relevant human (production and consumption) activities. Total CO_2 emissions is divided by the total value of the gross domestic product (GDP) expressed in purchasing power parity (PPPs).

Annex Table 3

Change in annual levels of CO_2 emissions, 1990-2008

Country	Territorial emissions million tonnes	Territorial emissions per cent	Consumption emissions million tonnes	Consumption emissions per cent
Eastern Europe, Caucasus and Central Asia				
Armenia	-1.1	-20.4	2.0	63.5
Azerbaijan	-21.3	-40.3	1.0	3.6
Belarus	-37.5	-35.9	5.0	8.2
Georgia	-2.9	-34.7	4.0	74.3
Kazakhstan	-51.2	-19.1	-73.0	-29.4
Kyrgyzstan	-3.5	-38.7	3.0	46.5
Russian Federation	-850.4	-34.8	-361.0	-21.5
Ukraine	-262.1	-45.8	-146.0	-36.4
Subtotal	-1230.1	-35.5	-565.0	-23.3
South-Eastern Europe				
Albania	-3.2	-42.3	-1.4	-20.7
Croatia	-2.0	-6.0	4.4	16.7
Turkey	147.0	100.6	117.1	55.6
Subtotal	141.8	79.6	120.1	49.3
New EU Member States				
Bulgaria	-26.9	-35.0	-42.8	-45.0
Cyprus	3.2	68.0	1.3	13.7
Czech Republic	-50.6	-30.9	-61.6	-37.7
Estonia	-11.1	-38.7	4.2	24.8
Hungary	-5.7	-9.1	4.2	5.6
Latvia	-5.4	-41.9	7.2	100.8
Lithuania	-8.8	-37.2	-18.3	-48.3
Malta	0.3	13.2	3.5	126.9
Poland	-17.6	-5.1	-64.1	-18.4
Romania	-69.4	-43.7	-74.5	-43.0
Slovakia	-16.2	-29.9	-10.1	-18.6
Slovenia	-2.1	-12.0	1.0	5.5
Subtotal	-210.2	-22.1	-250.0	-24.9
EU-15				
Austria	11.1	18.3	-4.1	-4.0
Belgium	7.4	6.8	65.3	38.6
Denmark	-4.0	-7.9	1.6	2.8
Finland	5.4	10.6	-14.6	-15.4
France	-17.3	-4.4	-29.0	-5.1
Germany	-241.8	-23.9	-257.0	-20.5
Greece	26.5	36.5	36.8	43.0

Annex Table 3 (continued)
Change in annual levels of CO_2 emissions, 1990-2008

Ireland	11.7	37.8	30.7	75.0
Italy	33.3	7.8	4.9	0.8
Luxembourg	1.4	14.6	6.6	66.9
Netherlands	2.0	1.2	11.6	5.7
Portugal	12.8	28.8	53.6	94.0
Spain	117.2	51.2	160.2	57.1
Sweden	-3.7	-7.2	-11.6	-12.7
United Kingdom	-28.1	-4.9	101.6	16.8
Subtotal	-66.0	-2.0	156.5	3.7
Other high income countries				
Canada	113.4	25.2	145.4	31.9
Norway	8.7	27.7	2.5	3.7
Switzerland	-2.1	-5.0	8.0	8.0
United States	809.4	16.6	1215.1	24.6
Subtotal	929.3	17.2	1371.0	24.6
ECE region	-434.3	-3.3	832.5	6.2

Source: UNECE calculations based on G. Peters at al (2010).

Annex Table 4
National targets on energy efficiency

Country	Name of the programme/law	Nature of target	Target value
Bulgaria	National Long Term Energy Efficiency Programme, 2005–2015	Energy intensity reduction	-8%
Bulgaria	National Long Term Energy Efficiency Programme, 2005–2016	Energy intensity reduction	-17%
Bulgaria	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Croatia	National Energy Efficiency Action Plan	Energy savings (rate)	14%
Czech Republic	State Energy Policy	Energy intensity reduction	-3.22% / year
Czech Republic	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Estonia	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Hungary	Energy Saving and Energy Efficiency Action Programme 1999- 2010	Energy intensity reduction	-3.5% / year
Hungary	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Latvia	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Lithuania	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Lithuania	National Energy Strategy	Energy intensity reduction	EU average intensity
Poland	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Poland	Obligation of energy savings for energy companies (white certificates)	Energy savings (value)	na
Romania	National Strategy for Energy Efficiency (2004–2015)	Energy intensity reduction	-40%
Romania	National Energy Efficiency Action Plan	Energy savings (rate)	14%
Russian Federation	Energy Strategy of the Russian Federation (2009)	Energy intensity reduction	-40%
Russian Federation	Federal Law on Energy Saving and Energy Efficiency Improvement (2009)	Energy savings (rate)	15%
Russian Federation	Federal programme on Energy Efficient Economy (project)	Energy savings (rate)	na
Serbia	Energy Strategy Implementation Programme	Energy savings (rate)	15%
Slovakia	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Slovenia	National Energy Efficiency Action Plan	Energy savings (rate)	9%
Slovenia	Energy Act	na	na
Turkey	Energy Efficiency Law 2007 Draft Energy Efficiency Strategy	na Energy intensity reduction	-20% between 2011–2023

Source: Adapted from World Energy Council (2009)

Annex Table 5

Summary of energy policies applied in selected countries of the region

Type of policy instruments for energy efficiency, technology development and diffusion										
	Regulatory		Market-based: Financial incentives			Other market-based		Knowledge and Information based		
Countries	Obligations	Standards	Subsidies	Tax incentives	Loan facilities	Pricing	Cap & trade	R&D	Training	Capacity-building
EU 25	x						x	x		x
France	x		x	x	x		x		x	x
Germany	x	x	x	x	x	x	x	x	x	x
Netherlands		x	x	x	x		x	x	x	x
UK	x		x	x	x		x	x	x	x
Russian Fed.	x	x			x			x		x
Ukraine	x				x					
Armenia	x	x	x	x	x			x	x	x
Bulgaria	x		x		x				x	x
Croatia	x		x				x		x	x
Czech Rep.	x		x				x		x	x
Estonia	x		x	x			x		x	x
Hungary	x		x		x		x		x	x
Latvia	x		x	x			x		x	x
Poland	x		x		x		x		x	x
Romania	x		x		x				x	x
Slovakia	x		x				x		x	x
Slovenia	x		x	x	x		x		x	x

Source: UNIDO, International Energy Agency (IEA) Policy Database http://www.iea.org/textbase/pm/index_effi.asp

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