OECD Green Growth Papers
2012-02

Green Growth and Environmental Governance in Eastern Europe, Caucasus, and Central Asia

July 2012

OECD GREEN GROWTH PAPERS

The OECD Green Growth Strategy, launched in May 2011, provides concrete recommendations and measurement tools to support countries' efforts to achieve economic growth and development, while at the same time ensure that natural assets continue to provide the ecosystems services on which our well-being relies. The strategy proposes a flexible policy framework that can be tailored to different country circumstances and stages of development.
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EAP TASK FORCE

The Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe (EAP Task Force) was established in 1993 at the "Environment for Europe" Ministerial Conference in Lucerne, Switzerland. Its Secretariat was established at the OECD. Since its creation, the EAP Task Force has proven to be a flexible and practical avenue for providing support to environmental policy reforms and institutional strengthening in the countries of the region. More detailed information about Task Force activities can be found on its website at: www.oecd.org/env/eap

This report is also available in Russian under the title:

«ЗЕЛЕНЫЙ» РОСТ И ПРИРОДООХРАННОЕ УПРАВЛЕНИЕ В СТРАНАХ ВОСТОЧНОЙ ЕВРОПЫ, КАВКАЗА И ЦЕНТРАЛЬНОЙ АЗИИ

Please cite this paper as

OECD (2012), "Green Growth and Environmental Governance in Eastern Europe, Caucasus, and Central Asia", *OECD Green Growth Papers,* No. 2012-02, OECD Publishing, Paris. doi: 10.1787/5k97gk42q86g-en

Foreword

The Organisation for Economic Co-operation and Development (OECD) has been facilitating reforms and monitoring trends in the process of economic and environmental policy integration in countries of Eastern Europe, Caucasus and Central Asia (EECCA) since the beginning of their transition to a market economy in the early 1990s. This has been done within the "Environment for Europe" process. Given the dynamic but also fragile economic, social and governance context in many EECCA countries, as well as the fluctuating political and popular support for environmental action, the progress monitoring by OECD was important to facilitate and support policy and institutional reforms in the region. In particular, the resulting assessment reports had a role in helping EECCA countries and OECD donors to define environmental policy and financing priorities. Their value added stemmed from evidence-based analysis and a complementary process of cross-country comparison and peer learning.

This report is a continuation of a series of assessments, with a specific focus on green growth needs, opportunities and progress in the region. This focus was driven by demand from the countries. The report has been developed within the framework of the Task Force for the Environmental Action Programme (EAP Task Force) for which OECD serves as the secretariat.

There are many examples of political interest in, and support to, green growth nationally, regionally, and globally, the most recent being the Rio+20 Summit. Several initiatives to facilitate progress on green growth are being implemented by international organisations such as the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the United Nations Environmental Programme (UNEP) and the World Bank, to name a few. Within the OECD framework, the green growth agenda was discussed at two annual OECD Council meetings at the ministerial level. In 2009, OECD ministers of economy and finance signed a Declaration on Green Growth. Two years later, at the 2011 OECD Ministerial Council Meeting, they discussed the analytical base for "green growth strategies", which was proposed by the OECD as part of the work that followed the endorsement of the Declaration.

This report is the result of a regional diagnostic exercise that proceeded from the OECD's analytical base. The report takes stock of the latest developments in the overall economic and social conditions in EECCA countries, market signals and environmental governance arrangements that may facilitate the shift towards green growth, and discusses possible barriers and measures to overcome them. At the same time, the report delineates the possible elements of a more coherent and effective reform agenda. In such a way the report aims to serve as background and a starting point for follow up development of green growth policies in EECCA without, however, being prescriptive. It is regarded as a "living document", which would need regular update as countries make progress on the path of green growth.

It has to be mentioned that the pace of economic and social development is uneven in EECCA countries. Nevertheless, there are factors beyond geographic proximity that unite them and make a region-wide analysis feasible. Most importantly, these factors include some shared governance traditions and economic structures, as well as the types of policy instruments and implementation arrangements used to address development and environmental challenges.

With this work, the OECD aims to provide a strong basis for regional and national-level policy dialogues on green growth. The report aims to be equally useful for governmental and non-governmental stakeholders. At the same time, to make a difference, the report's major conclusions and recommendations need to be communicated to policy makers beyond the environmental community and be disseminated among such stakeholders as governments' central offices, parliaments, presidential administrations, central planning ministries (*i.e.* ministries of finance and economy), and sectoral ministries.

A preliminary version of this report was issued prior to the Seventh "Environment for Europe" Ministerial Conference that took place on 21–23 September 2011 in Astana, Kazakhstan. The Conference participants called for a bold and ambitious approach to make possible a green transformation of economies. In their final Declaration, Ministers welcomed the work of the EAP Task Force and invited OECD to continue this work, including on various facets of green growth in EECCA, in cooperation with Regional Environmental Centres and other partners.

Following the invitation made by Ministers in Astana, OECD is engaged to help EECCA countries to devise a suite of policies that would enable a more rapid shift towards greener growth, with a particular focus on market-based incentives. This will be based on the OECD's long-standing experience in supporting EECCA governments to improve and implement policies benefiting both the environment and economic development. Future OECD activities in EECCA will continue to draw on relevant projects carried out within the OECD's core programme of work, including the recent work on green growth. Most importantly, future projects will focus on facilitating the identification and gradual phase-out of environmentally-harmful subsidies and further reforming economic instruments and strengthening their implementation. The OECD can help EECCA countries to leverage further changes in infrastructure development and corporate strategies and spur green investment by the private sector. In particular, activities may focus on promoting technological modernisation and competitiveness gains among small and medium-sized enterprises. Working with International Financing Institutions and local banks to enable private-sector green investments will also be important. Finally, the OECD could help EECCA countries to make more tangible progress in strengthening institutional frameworks and capacity that would enable transition to green growth. In particular, activities may focus on developing roadmaps for green growth transition, capacity development, and further strengthening the budget planning capacity in line with green growth principles.

The opinions expressed and arguments employed in this report do not necessarily reflect the official views of the Organisation or of the governments of its member states.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Boxes

ACKNOWLEDGEMENTS

The report was developed within the framework of the Task Force for the Environmental Action Programme (EAP Task Force) by Angela Bularga, with peer input and review from Nelly Petkova, Eugene Mazur, Alexander Martoussevitch, Xavier Leflaive, Tatiana Efimova, Ziga Zarnic and Dana Krechowicz. Irina Massovets provided support in data research, verification and visual presentation. The report was produced under the overall guidance and supervision of Brendan Gillespie.

The members of the EAP Task Force contributed to the report's production by discussing its outline, examples of country-level progress and policy messages at their annual meetings in 2010 (Almaty, Kazakhstan) and 2011 (Berlin, Germany and Chisinau, Moldova). In addition, the report takes account of the outcomes of the 2010 "Environment and Development" Ministerial Conference of the Asia and Pacific region, the Seventh "Environment for Europe" Ministerial Conference and debates on green growth within the European Union's Eastern Partnership.

Data used for analysis are mostly open-source official information, including from the national statistical offices of EECCA countries and international databases. In several instances, the availability of data has precluded a more in-depth analysis. The quality of information has also posed problems revealing a need for further improving the analytical basis for decision making on green growth policies in the region.

Results of several national and regional projects carried out under the EAP Task Force umbrella in 2007-2011, and respective products, were used to produce selected chapters or sections. First of all, the report draws from two recent publications: "Greening public budgets in EECCA" and "Ten years of water sector reform in EECCA". The chapter on natural resource management benefited from previous papers produced with expert input from Gunilla Ölund Wingqvist and Olof Drakenberg (University of Gothenburg), Alexios Antypas and Stephen Stec (Central European University), Robert Atkinson and Remo Savoia (Prospect C&S), and Nina Hajoyan. Equally, the report uses the outcomes from policy dialogues and projects carried out in Armenia, Georgia, and Moldova, which were implemented with input from many experts, namely Erik Grigorian, Karin Requia, Nino Kvernadze, Ellen Iakobidze, Natalia Zugravu-Soilita, and Andrei Isac.

The EAP Task Force secretariat thanks government representatives, NGOs, international organisations and other stakeholders who contributed, directly or indirectly, to the report's preparation.

The financial contribution from the governments of Norway and Switzerland in support to this project is gratefully acknowledged.

EXECUTIVE SUMMARY

What is this report about?

This report examines the framework for green transformation of economies in the countries of Eastern Europe, Caucasus and Central Asia (EECCA). To this end, it analyses economic and social conditions, market signals and environmental policies. The report is divided into eight chapters and is largely based on the OECD's analytical toolbox, including green growth indicators. Country profiles are available in an Annex.

Why is greening growth so important?

Worldwide, risks to development are rising as the current models of growth continue to erode the stocks of natural assets and undermine the integrity of ecosystem services. A lack of action to better manage natural capital will result in increasing costs of substituting it with other forms of productive capital. Moreover, policy needs to take account of evidence that changes in ecosystems, and their capacity to support growth, do not necessarily follow a smooth, foreseeable trajectory. New patterns of production and consumption, as well as new approaches for defining growth and measuring human progress, are required.

Green growth strategies aim to foster economic growth and social development while ensuring that natural assets continue to provide the material inputs and services on which our economies and well-being rely. The green transformation can bring many positive development outcomes, such as enhanced productivity and innovation, creation of new jobs and markets, and fiscal revenue generation. Furthermore, by emphasising climate change resilience, water and energy security, and adequate functioning of ecosystems, green growth strategies reduce the likelihood of abrupt changes that may trigger economic and social shocks. To enable greener growth, market signals and policies must catalyse investment and innovation into new ways of sustainably managing natural capital and extracting higher, long-term benefits from its use.

Within the current model of economic growth, many EECCA countries have intensively, and often unsustainably, exploited their natural capital. If Gross Domestic Product (GDP) in EECCA was adjusted for natural capital depletion, net GDP would be substantially lower. Continuing environmental degradation, high carbon emissions and pervasive energy inefficiency, obsolete and wasteful production technologies, increasing water scarcity and important water losses, particularly in agriculture, as well as costs associated with all these concerns, point to the need of acting more firmly on mainstreaming environmental goals into framework and sectoral policies. In addition, addressing problems related to climate change vulnerability, as well as water, food and energy security are critical in the EECCA region.

Where do EECCA countries stand on their path to green growth?

The need for further socio-economic improvements in EECCA countries provides a strong argument for implementing green growth policies. Over twenty years of transition, most EECCA countries have opened their economies. The competitiveness of these economies, however, still needs important improvement and orientation towards future rather than past growth models, which were often based on natural resource rents. The green growth agenda in this region can be closely aligned with some central development goals, such as economic diversification, increasing the efficiency of production and competitiveness in global markets, fully harnessing the export potential, avoiding job loss and contributing to fiscal revenue.

The transition period has led to structural changes, primarily a higher than average deindustrialisation, which has diminished some negative environmental impacts. Nevertheless, the structure of EECCA economies remains skewed towards low value added branches, such as agriculture or extractive industries, which are vulnerable to external shocks and demand fluctuation, and dependent on environmental conditions, underlining the need to find new ways of wealth generation beyond commodity exports.

A particularly low energy efficiency imposes substantial costs on EECCA economies each year. For instance, steelmaking in Ukraine requires four times more energy than in China. Central Asia's energy savings potential across all sectors through improved efficiency and conservation constitutes 35-40% of the current consumption. The efficiency of industrial boilers in the Russian Federation is 30% below the best international practice. Energy efficiency measures in the Russian Federation would result in savings that exceed 2% of the global consumption and would reduce greenhouse gas emissions by an amount equivalent to the annual emissions of the United Kingdom. Furthermore, if energy efficiency in the Russian Federation approaches OECD levels, development in this country can take place without any increase in energy supply over the next decades.

As warned by the International Energy Agency and the World Bank, unless EECCA countries take much bolder action on energy efficiency, the energy supply potential and the current infrastructure will not be able to satisfy rising domestic and export demand. While half of EECCA countries are net energy exporters, several of them are highly dependent on energy imports, with Moldova importing 97% of its energy. In these countries, the energy-related green growth agenda is intimately linked to energy security issues. In Central Asia, the energy and water nexus is very strong, sometimes leading to economic disruptions. Remote and rural areas, particularly exposed to poverty, have low and often decreasing access to water services and sometimes energy.

Market signals in favour of green growth have become more pronounced but yet insufficient to drive behaviour change, particularly against the background of imperfect institutional frameworks in EECCA countries. Despite comparatively low tariffs for energy, water and other environmental services, an increasing part of household budgets is dedicated to utility payments. At the same time, utility companies are not financially sustainable and require subsidies.

Subsidies in the region are high and sometimes are estimated to account for over 30% of the GDP. The wrongly targeted energy subsidies are a major impediment to progress in energy efficiency and renewable energy production.

Several other economic and social factors, such as, for instance, shadow economic activity, relatively low labour productivity, brain drain, prevent more robust, sustainable and inclusive growth, and make EECCA countries more vulnerable to the global economic crisis. Re-thinking the current development model, in addition to bringing environmental benefits, would increase longer-term economic competitiveness and resilience.

Examples exist of EECCA countries that have already implemented selected elements of a green economy. For example, alternative energy production is increasing in Georgia, Tajikistan and the Kyrgyz Republic. Photovoltaic installations have improved access to energy in remote areas of Uzbekistan. Organic farming brings an increased proportion of agriculture-related income in Armenia, Moldova and Ukraine. The Russian Federation and Kazakhstan have set energy efficiency targets. Energy efficiency is also improving in Belarus. Azerbaijan uses its sovereign wealth fund to finance green projects. Many of these actions are also contributing to poverty reduction.

In terms of environmental policies, EECCA countries have made noticeable progress, though the global economic and financial crisis has put some of these gains at risk. A vast toolbox of policy instruments, including market-based instruments, is available. Modern-style policy planning is now well rooted in the majority of countries. Environmental policies gained important ground in being integrated into development and sectoral policies. Following the introduction of government-wide Medium-Term Expenditure Frameworks in some EECCA countries, the links between policy and budget planning have been strengthened. The sophistication of systems to support problem analysis and decision making is rising, particularly in Belarus and the Russian Federation where environmental monitoring systems have been modernised. The regulatory coverage is widening due to new initiatives in such areas as resource efficiency or consumer policies. Environmental matters are also better incorporated in private sector strategies.

Progress towards greener growth in EECCA is, unfortunately, stymied by a range of market and policy failures and imperfections. These include, for instance, the limited financial viability of green growth projects because of very high lending interest rates, high reliance for growth on commodities export, a large informal economy, relatively low domestic prices for natural resources, inadequate or sometimes absent pollution pricing, failure to capture more and better investments because of poorly designed governance frameworks, etc.

Imperfections in both framework and environmental policies underpin these constraints. Framework conditions are still unsupportive of investment and innovation in general and of green investment and innovation in particular, although several countries, *e.g.* Georgia, Kyrgyzstan and Tajikistan, have put a lot of effort into improving the business environment. In turn, environmental policy incentives in EECCA are weak due to a lack of consideration of the value of natural assets, unreformed market-based instruments, insufficient implementation, underfunding, etc. The instability of government institutions, particularly of environmental authorities (undergoing frequent changes in organisation structures and political leadership) and low administrative capacity remain important problems. International drivers continue to play a prominent role in EECCA, with external support being critical for environmental policy reforms, even in richer countries, such as Kazakhstan and the Russian Federation.

Commonly, there are no powerful agents for the "green" transformation in EECCA. Even where top political leaders, such as presidents, clearly indicate the need to green countries' economies, the government's capacity to transpose this vision into action and manage reforms is limited. Popular support for environmental policy reform is weak as well, but environmental activism is strong at the local level in some countries.

How progress towards green growth could be accelerated in EECCA?

The role of governments will remain crucial in accelerating progress on green growth. While the green growth agenda in EECCA is not yet as prominent as in most OECD countries, green growth goals are already integrated, though to a varying extent, into national development objectives and respective strategies of EECCA countries.

Therefore, governments in EECCA should avoid engaging in yet another wave of strategic papers' development. In this region, green growth promotion needs a reinforced focus on implementation.

This could be done by focusing on the reform of specific policy instruments and their mixes, and conducting more in-depth sectoral work. In order to increase policy coherence between different sectors, mechanisms that help identify inconsistencies and address the problem of institutional and budget fragmentation need to be put in place or strengthened. Overcoming the relatively weak capacity of environmental ministries in the region and their institutional instability will be a major challenge in pursuing green growth in the region. At the same time, the success of green growth promotion will highly depend upon the support and involvement of the non-environmental community, including ministries of economy and finance, line ministries, NGOs and the private sector. Improving the overall governance framework, including public administration, is ,therefore, a prerequisite for the green transformation.

In order to accelerate the process of greening growth in EECCA, both framework and environmental policies need to be addressed within a clear strategy, accompanied by adequate measurement tools. While the sectoral level will be the one where most of the changes will happen, addressing the cross-cutting policies should also be pursued; if not, sectoral reforms will be hindered by unsupportive overall conditions, as it was the case in the past. The proposed cross-cutting policy actions in support of green growth in EECCA are summarised below. Certainly, countries will have to design their own national policies based on the specifics of their situation, and these are just general guidelines:

STRENGTHEN PRICE AND TAX INCENTIVES: As part of their shift to green growth, EECCA countries should price natural assets and environmental "bads" more adequately, and reduce public spending on environmentally harmful subsidies, simultaneously taking account of and addressing eventual negative impacts of these changes on the poor and vulnerable segments of the population.

In the absence of information on how environmental externalities affect personal well-being, compounded with weak liability regimes, price signals need to be corrected through, primarily, market-based instruments. Though in place since the early 1990s, such instruments are still ineffective in EECCA and require holistic reform. The pricing of both natural resources and pollution must be brought up to a level that is sufficient to promote environmental and resource efficiency and sustainable use of natural resources more generally. Existing data point to a strong presence of environmentally harmful subsidies (EHS). Six EECCA countries are leading the global ranking of states that subsidise fossil fuel consumption. This makes the EECCA region

particularly prone to wasteful resource consumption, budget pressures, and technological stagnation. Besides helping countries to overcome these problems, EHS identification and gradual removal in EECCA may have important global benefits. Further analysis in this area is necessary to better understand the extent of EHS and the social and economic effects of their removal. Simultaneously, consideration should be given to how existing environmentally-related taxes and charges could be reformed. This would provide a basis for considering additional market-based instruments, in particular the introduction of payments for ecosystem services. The ministries of environment need to closely monitor the evolution of framework conditions in order to identify "windows of opportunity" for introducing such instruments.

OPTIMISE NATURAL CAPITAL INVESTMENT AND RENTS USE: Given the huge economic and social significance of natural resources in EECCA, improving the institutional aspects of natural resource management is one the most pressing steps towards greening economic growth in this region.

Natural resource abundance in many EECCA countries has been and will continue to be, at least in the short and medium-term perspective, the basis for the creation of national wealth. Shifting towards environmentally-oriented growth can enhance the value derived from natural resources. At the same time, revenue from natural capital has to be managed very carefully and transformed into other forms of capital (foremost, human capital and productive capital). The issues of appropriation, distribution and sound use of natural resource rents need to be addressed. EECCA countries need to continue their efforts to enhance the transparency of how revenues from natural resources are collected and spent. Also in order to avoid the "natural resource curse", institutions need to be further improved through, for example, tenure arrangements, monopoly regulation, or the regulation of concession contracts. Better enforcement of natural resource rights and curbing illegal activities is crucial.

ADDRESS REGULATORY GAPS AND FAILURES THAT HINDER THE DEVELOPMENT OF GREEN ECONOMY: EECCA countries should further re-design their non-market policy instruments and their mixes in a way to both improve the existing models of production and consumption and stimulate the emergence of new business opportunities linked to a green economy.

In addition to improving the design and use of market-based instruments, further strengthening of non-market instruments is needed to unleash the potential for increasing efficiency. Environmental regulations that set performance and technology standards should be adjusted in line with green growth objectives. The small and medium-sized enterprise sector has particular needs, which should be carefully studied and addressed. In this context, countries may need to look at the potential offered by supply chain pressure and green procurement. Information-based instruments, such as eco-labels, may also be useful in influencing consumer behaviour. Reinforcing the use of Environmental Impact Assessment and permitting will help to address the environmental side-effects of policies and individual projects and climate change vulnerability. In addition, financial risks of non-compliance with regulatory requirements need to be increased through the reform of liability regimes and monetary penalties.

MODERNISE INFRASTRUCTURE AND REGIONAL DEVELOPMENT IN LINE WITH GREEN GROWTH OBJECTIVES AND OPPORTUNITIES: Greening growth in EECCA requires adequate, environmentally-sound infrastructure.

Shifting to a greener path of development requires special attention to infrastructure. Given the long life of infrastructure, it is crucial that infrastructure decisions not lock these countries into pollution- and resource-intensive technology. Adequate infrastructure plays an enabling role for other sectors' development and for reducing regional disparities in the level of development. In the context of climate change, the often oversized and obsolete infrastructure in the region is ill-suited to cope with extreme heat waves and floods. EECCA countries would need, therefore, to invest in its rehabilitation and build new infrastructure, where this is more cost-effective. This process should be accompanied by a careful analysis of the technical options for modernising infrastructure, the improvement of regulatory and institutional frameworks, sound financial planning, and facilitation of private sector participation. There is a need for continued support from development banks and donors. Since synergies between environmental and infrastructure policies are stronger at the regional and urban levels, a better integrated policymaking at these levels is instrumental for fully exploiting such synergies.

STIMULATE "GREEN" INNOVATION AND SKILLS DEVELOPMENT: Innovation policies, which are burgeoning in EECCA countries, should be further extended and implemented.

Innovation primarily needs an adequate overall framework, including supportive labour, trade, research and development, and investment policies. By recently developing innovation strategies, EECCA countries, *e.g.* Belarus, Kazakhstan and the Russian Federation, have launched the process of establishing such conditions. But "green" innovation is also influenced by environmental policy. In this respect, more supportive policies are needed in EECCA to combine tools that impose technology modernisation (such as permitting based on best available techniques) with measures to facilitate knowledge sharing and skills development.

ENSURE ADEQUATE ACCESS TO FINANCE: A crucial factor in EECCA is facilitating access to finance and making returns on environmental investments attractive for the private sector.

More adequate access to finance is a prerequisite for enabling green growth in EECCA. Public funding and official development assistance can play a major role in stimulating private sector investment. Policy barriers that hold back private investment, including foreign direct investment, need to be identified and removed. In addition, countries need to be more proactive in tapping into global climate-related funds. An important measure is to increase the transparency and accountability of public revenue and expenditure. Public funds have a critical role to play in leveraging private financial flows and investment, as well as attracting support from donors and International Financing Institutions. Greening the public budgets, sovereign wealth funds, government procurement, as well as banks' and micro-finance schemes' due diligence procedures are powerful instruments that remain largely unexploited in EECCA.

USE BETTER ANALYTICAL TOOLS TO CATALYSE AND MEASURE PROGRESS: EECCA countries should systematically review their framework and sectoral policies for consistency with green growth principles. In particular, the costs of natural capital degradation need to be fully taken into account.

In EECCA countries, as worldwide, the lack of solid evidence fully revealing the economic consequences of natural capital depletion and environmental degradation is often a barrier in promoting the environmental transformation of production and consumption. Environmental ministries in EECCA, in partnership with ministries of economy, can catalyse a further shift in development planning by adopting new analytical tools that would permit them to factor the costs of natural capital depletion into their decision-making. Besides the analysis of costs and benefits of environmental policies and laws, these can include the valuation of ecosystem services, and introducing green (natural capital) accounting more generally. Higher demand and enhanced analytical capacity for the use of these tools are needed. Strategic Environmental Assessment needs to be used systematically. The design of sectoral policies in EECCA can benefit from the "green growth lens" if the real sector of economy is to become more competitive in the global economy. Green growth indicators will need to be developed and adopted to measure progress. All these will have to be done bearing in mind that environmentally-related data collection and information management need to be further improved, and use of environmental information by decision-makers enhanced.

CONTINUE THE REFORM OF FRAMEWORK POLICIES: Framework conditions should be further improved in EECCA. Without addressing them, green growth will not take root.

Green growth is as much about growth, as about green. The soundness of framework policies constitutes a prerequisite for any further action to advance green growth strategies. In EECCA, setting the framework conditions right requires a critical review of investment and taxation policies, and very serious work to improve the governance conditions, in particular the quality of public administration.

More detailed policy recommendations are outlined at the end of each chapter.

Abbreviations

ADB	Asian Development Bank
CDM	Clean Development Mechanism
CEE	Central and Eastern Europe
CIS	Commonwealth of Independent States
EAP TF	Task Force for the Implementation of the Environmental Action Programme
EBRD	European Bank for reconstruction and Development
EC	European Commission
EEA	European Environment Agency
EECCA	Eastern Europe, Caucasus and Central Asia
EIA	Environmental impact assessment
EITI	Extractive Industries Transparency Initiative
EHS	Environmentally harmful subsidies
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GEF	the Global Environment Facility
GDP	Gross Domestic Product
GGFR	Global Gas Flaring Reduction Partnership
GNI	Gross National Income
IBRD	International Bank for Reconstruction and Development (the World Bank)
IEA	International Energy Agency
ILO	International Labour Organization
IMF	International Monetary Fund
JMP	Joint monitoring programme

MDGs	Millennium Development Goals
MTEF	Medium-term expenditure framework
NGO	Non-governmental organisation
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OSCE	Organization for Security and Cooperation in Europe
PES	Payment for ecosystem services
PM	Particulate matter
R&D	Research and development
SEEA	System of Environmental and Economic Accounting
SEA	Strategic Environmental Assessment
SMEs	Small and Medium-sized Enterprises
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
USAID	United States Agency for International Development
USD	United States Dollar
WHO	World Health Organization
WTO	World Trade Organization
WWF	World Wildlife Fund

Country codes

ARM	Armenia
AZE	Azerbaijan
BLR	Belarus
GEO	Georgia
KAZ	Kazakhstan
KGZ	Kyrgyz Republic
LIC	Low-income countries
LMC	Low and middle income countries
MDA	Republic of Moldova
RUS	Russian Federation
TJK	Tajikistan
TRM	Turkmenistan
UKR	Ukraine
UZB	Uzbekistan

CHAPTER 1:
INTRODUCTION TO GREEN GROWTH

This report is based, to the extent possible, on the analytical framework and indicators developed by the OECD as part of the organisation's work on green growth. Chapter 1 introduces the concept of green growth and presents the main elements of the OECD's toolbox that could support the development of green growth strategies at the national level.

Why did the green growth concept emerge?

The interest in adopting a greener, environmentally-oriented model of growth originates in concerns about the scarcity and increasing prices of natural resources, the costs of past patterns of development and ecosystem degradation, and aspirations for better quality of life beyond material well-being. Worldwide, the value of ecosystem services, for example, may be around USD 33 trillion, which is nearly twice the value of the global gross national product. The costs of natural disasters in the poorest countries can be as much as 13% of the gross domestic product (GDP). The costs of health impacts caused by air pollution can be as high as 4% of the GDP. In non-OECD countries, 1.7 million deaths are attributable to unsafe water supply and sanitation. Ninety percent of these deaths concern children under the age of five.

Lately, green growth has received high-level political support (at least in OECD countries) because of its potential to support short-term recovery from the global economic crisis while, simultaneously, laying the ground for low-carbon, resource-efficient and socially inclusive economies in the longer term. From an economic point of view, the pursuit of green growth requires structural changes to increase the share of "cleaner" industries, goods and services and to stimulate new job creation, as well as efforts to improve the environmental performance of "traditional" industries.

Definition of green growth

There are several relevant terms and definitions, in particular those that emerged from work implemented by the United Nations Environmental Programme (UNEP) and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). The OECD has proposed a definition that enjoys stakeholder acceptance within environmental, economic, and financial communities beyond OECD members.

The OECD defines "green growth" as a model that aims at fostering economic growth and development while avoiding unsustainable pressure on the quality and quantity of natural assets, thus ensuring that these assets continue to provide the resources and environmental services on which our well-being relies. Greening growth is necessary in order to overcome risks related to the "business as usual" scenario, which erodes natural capital at a pace that threatens development. Preserving this scenario would involve both human costs and constraints on economic and social development. The green growth concept does not replace the sustainable development concept. It is meant to be one of the practical mechanisms for realising the goals of sustainable development.

The catalyst role of policies and better governance

Price signals and the huge costs of inaction on environmental challenges provide strong incentives for initiating a large-scale green transformation of development patterns. However, a number of constraints, which will vary from country to country, can prevent or slow down this transformation. Such constraints limit investments to, and social and economic returns from, "green" investment and innovation. Broadly, such constraints can be divided into market and policy failures and imperfections.

Specific measures, which would form a "green growth strategy", are needed to address constraints to green growth. The overarching goal of any green growth strategy is to establish incentives or institutions that increase well-being by: (i) improving resource management and boosting productivity; (ii) encouraging economic activity to take place where it is of best advantage to society over the long term; (iii) leading to new ways of meeting these first two objectives through innovation. A green growth strategy does not mean yet another formal policy planning paper. Rather, it is a framework which provides a reference point for looking at growth and identifying mutually reinforcing aspects of economic and environmental policy. It recognises the full value of natural capital as a factor of production along with other commodities and services. It focuses on cost-effective ways of attenuating environmental pressures to achieve a transition towards new patterns of growth that will avoid crossing critical local, regional and global environmental thresholds.

A green growth strategy also recognises that focusing on GDP as a measure of economic progress generally overlooks the contribution of natural assets to wealth, health and well-being. It will, therefore, introduce new measures of progress, encompassing the quality and composition of growth, and the way it affects people's wealth and welfare.

Matching green growth policies and poverty reduction objectives will be important for adapting this framework to emerging and developing countries. There are important complementarities between green growth and poverty reduction, which can help to drive progress towards achieving the Millennium Development Goals (MDGs). These include providing more efficient water and transport infrastructure, alleviating poor health associated with environmental degradation, and introducing technologies that can reduce costs and increase productivity, while easing environmental pressure. By preserving natural assets, green growth policies can reduce vulnerability to environmental risks and increase the livelihood security of the poor.

Given their dual nature, green growth strategies involve two broad sets of policies:

- ***Framework policies***. These include, essentially, fiscal and regulatory settings, as well as competition, trade and innovation policies, which, if well designed and executed, maximise the efficient allocation of resources. In addition, education, labour, and social protection policies have the potential for facilitating the green growth transition;

- ***Sectoral, including environmental, policies.*** These policies would further incentivise the efficient use of natural resources and ecosystems and put the right price on pollution.

The development of green growth strategies has started in many OECD and some non-OECD countries (see Box 1.1). It includes multi-dimensional analysis of policies and governance arrangements.

Though green growth is relevant to all countries, the policies and approaches used to anchor this new model in everyday behaviour have to be tailored to specific regional and national circumstances and stages of development. The choice of such policies and approaches, and their mixes, may be influenced by a number of factors, for instance the weight put on environmental well-being, market conditions (*e.g.* the share of informal economy or the maturity of financial markets), or specific governance conditions (*e.g.* weak capacity in policy design or implementation).

Box 1.1. Green growth in action: Examples of government initiatives

China: six strategic pillars for green growth. The "Green Development" section of China's 12th Five Year Plan (FYP, 2011-2015) identified six strategic pillars: climate change, resource saving and management, circular economy, environmental protection, ecosystem protection and recovery, water conservation and natural disaster prevention. These pillars entail several new binding targets (*e.g.* carbon emission per unit of GDP to be reduced by 17% by 2015, NOx and nitrogen air emissions to be reduced by 10% by 2015), in addition to targets continued from the 11th FYP (*e.g.* energy intensity, SO_2 pollution and COD levels).

Germany: renewable energy pioneer. The National Strategy for Sustainable Development (2002) defined targets for 21 different sectors. In 2010, nearly 17% of electricity supply was generated from renewable sources, surpassing the target of 12.5%.

Japan: green innovation. Japan's National Strategic Projects Related to Green Innovation aim to achieve a JPY 50 trillion environment-related market and to create 1.4 million new environment-related jobs.

Korea: national green growth plans. Korea's National Strategy for Green Growth and the Five-Year Plan (2009-2013) provide a comprehensive policy framework for green growth. Under the plan, the government will spend about 2% of the GDP on green growth programmes and projects. To facilitate its realisation, a Presidential Commission on Green Growth was established in 2009 and a Framework Act on Low Carbon Green Growth was adopted in 2010.

Ireland: a comprehensive green expenditure framework. The National Development Plan of Ireland (2007-2013) sets out indicative financial allocations for investment priorities aimed at enhancing economic competitiveness and providing a better quality of life. It brings together different sectoral investment policies into one framework. Its environment chapter covers transport, waste management, climate change, environmental research, and sustainable energy.

New Zealand: brainstorming on ways to green the economy. The Ministers of Finance, Economic Development, and Environment jointly established a high-level advisory group to look at how to add value to the export industry, ensure smarter uses of technology and innovation and assist small and medium-sized enterprises to become more energy efficient.

European Nordic countries: using green procurement. Public procurement constitutes 16% of the gross national product in the Nordic countries and, for some product groups, the public sector is the most significant purchaser. All Nordic countries have recently issued national action plans and legislation on green (sustainable) public procurement.

United Kingdom: the Green Investment Bank. The Bank will be launched in 2012, with GBP 3 billion of public money to provide funding for low-carbon projects that would be too risky or whose returns are too long-term for the market to invest in.

Source: OECD (2011a).

Notwithstanding differences in national circumstances, putting a price on pollution and the natural resource use should be a central element of any policy mix to support green growth. The responsiveness of businesses and consumers to price signals can, in many situations, be further strengthened through better regulation and information-based measures (*i.e.* non-market policy instruments). Given the relative strengths and weaknesses of different policy instruments, their optimal choice will vary by environmental issue and depend on country-specific circumstances. Difficulties in monitoring environmental performance, collecting environmental taxes or setting up new markets may influence the choice of policy instruments in countries with large informal economies and where there is weak capacity for environmental policy design or implementation. Distributional effects may play an equally important role in policy development: politically successful measures will have to address equity concerns by correcting adverse social impacts.

Even though better pricing of natural resource use and pollution, and smarter regulation, can help provide incentives for such shifts, more than a change in environmental governance will be needed to overcome the inertia. Some other important ingredients of success include improving macroeconomic, investment and innovation policies, the quality of human capital (thus education and labour market policies), and establishing more effective institutions that would promote efficient investment, fair competition, sound innovation and private entrepreneurship while maintaining social protection and guaranteeing the rule of law. Also key to the success of the green model of growth are infrastructure modernisation and changing consumption norms and habits.

Governance structures need to be improved so that they can serve as a pivot for the development and implementation of green growth strategies. This will involve, first of all, enhanced efforts for procedural integration of environmental issues into national development planning processes. Secondly, establishing governance structures at the highest levels of government and ensuring co-ordination between different areas and levels of government will be needed. The goal should be to integrate green growth into policy processes rather than create stand-alone policy documents or agencies.

Green growth indicators

Policies that promote green growth need to be founded on sound analysis, embedded in a robust conceptual framework, capable of capturing and sending clear messages which speak to policy makers and the public at large. In line with this objective, the OECD has chosen indicators in the following four areas:

- ***The natural asset base,*** to characterise stocks of natural resources and the value of natural capital;
- ***Environmental and resource productivity,*** to measure environmental efficiency of natural resource use and identify shortcomings of production and consumption;
- ***The environmental dimension of human well-being,*** capturing the value of the environment for people's lives;
- ***Economic opportunities and policy responses,*** which can be used to determine the effectiveness of a policy in contributing to green growth.

Contextual analysis is needed to facilitate the interpretation of these indicators and the understanding of problems and opportunities more generally. Therefore, the above-listed four groups have to be complemented with indicators describing socio-economic conditions and market (price) evolution. For each of these groups, a list of indicators has been proposed in a recent OECD publication "Towards Green Growth: Monitoring progress - OECD Indicators" (OECD, 2011b). The Statistics Netherlands has already pioneered this set and issued an overview of the national-level progress on green growth in May 2011.While these indicators will be elaborated further, the current report reflects an attempt to use the proposed measurement framework for analysing the situation in Eastern Europe, Caucasus, and Central Asia.

Benefits from green growth

Green growth has the potential to address economic and environmental challenges and open up new sources of growth through several channels:

- ***Productivity:*** Greening growth can enhance productivity by reducing waste and energy consumption and making resources available for higher-value use. For example, the value of fuel savings from investment in low-carbon energy systems is estimated at USD 112 trillion between 2020 and 2050 (IEA, 2010);

- ***Innovation:*** Green growth, though better policies and framework conditions, provides opportunities for innovation;

- ***New jobs:*** Investing in green activities will create many jobs, and a number of governments have already stressed the sizeable job creation potential of some of their green stimulus packages and broader green growth strategies. There is a large, 20 million jobs worth, potential for job creation associated with the expansion of renewable energies (UN, 2008). But some other jobs will be at risk, so there is a need to facilitate the re-allocation of workers to expanding sectors and firms that engage in cleaner production alternatives or provide environmental services;

- ***New markets:*** The creation of new markets can be enhanced by stimulating demand for green technologies, goods and services, and creating new job opportunities. The value of potential commercial opportunities related to environmental sustainability in natural resource sectors alone is estimated at USD 2.1 to 6.3 trillion by 2050 (WBCSD, 2010);

- ***Confidence:*** Green growth targets and strategies can boost investor confidence through greater predictability and stability of how governments deal with major environmental and development issues;

- ***Stability***. Green growth leads to more balanced macroeconomic conditions, reduced resource price volatility and fiscal consolidation through, for instance, reviewing the composition and efficiency of public spending and increasing revenues through the pricing of pollution.

Green growth also reduces risks of negative economic and social shocks related to environmental factors. First among these factors are the depletion of natural resource stocks and reduction of ecosystem services which make production more costly and require investment into capital-intensive infrastructure. In some instances, the substitution of ecosystem services is quasi impossible. In this regard, the loss of natural capital can exceed the gains generated by economic activity, undermining the ability to sustain future growth. Natural resources also provide a safety net for the poor therefore their importance is higher than average in lower-income countries.

Secondly, imbalances in natural systems raise the risk of profound, abrupt, highly damaging and potentially irreversible impact: this has already happened with respect to some fish stocks and could affect many other species under unabated climate change. Attempts to identify potential irreversibility thresholds suggest that in some cases – climate change, global nitrogen cycles and biodiversity loss – these have already been exceeded.

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CHAPTER 2:
THE DEVELOPMENT CONTEXT FOR GREEN GROWTH IN EECCA

Over the last two decades, EECCA countries have been exposed to an extremely dynamic context, marked by intensive institution building, deep economic and social transformation, and rapid integration into the global economy. In order to better understand this context and related opportunities for adopting a greener path of development, Chapter 2 provides a brief overview of the major development trends in EECCA countries, taking account of the diversity that exists among these countries.

Since 1991, EECCA countries went through an economic transformation of an unprecedented magnitude (including different degrees of liberalisation and privatisation), accompanied by economic recession, re-structuring, recovery, and impact of two (in 1998 and 2008) international financial and economic crises. During the transition period, international trade, capital and labour integration rose in most of these countries. While the transformation of these economies has been dramatic, the transition effects and failures are still influencing the development patterns in EECCA.

Size and sectoral structure of economy

According to the size of their GDP, the EECCA countries range from very small (USD 5 billion) to relatively large (USD 1 700 billion) economies. Based on the GDP per capita values, two countries of the region are classified as low-income economies, six countries – as lower middle-income economies and four countries fall in the group of upper middle-income economies.

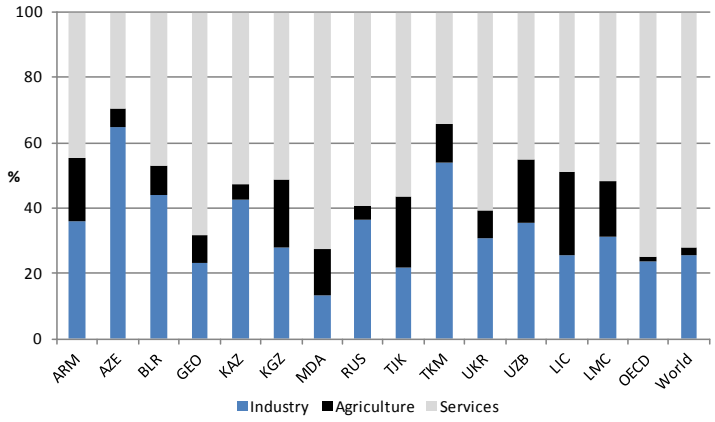
Table 2.1. Classification of EECCA countries according to income

Group	GDP per capita	Countries
Low-income economies	USD 1 005 or less	Kyrgyz Republic, Tajikistan
Lower middle-income economies	USD 1 006 to 3 975	Armenia, Georgia, Moldova, Turkmenistan, Ukraine, Uzbekistan
Upper middle-income economies	USD 3 976 to 12 275	Azerbaijan, Belarus, Kazakhstan, Russian Federation

Source: The World Bank (2011).

Although conserving their traditional, Soviet-period specialisation, most of the region's economies underwent important structural changes during the last two decades. From an initial very low base, the importance of the service sector (Figure 2.1 and Figure 2.2) has increased in a spectacular way in most EECCA countries.

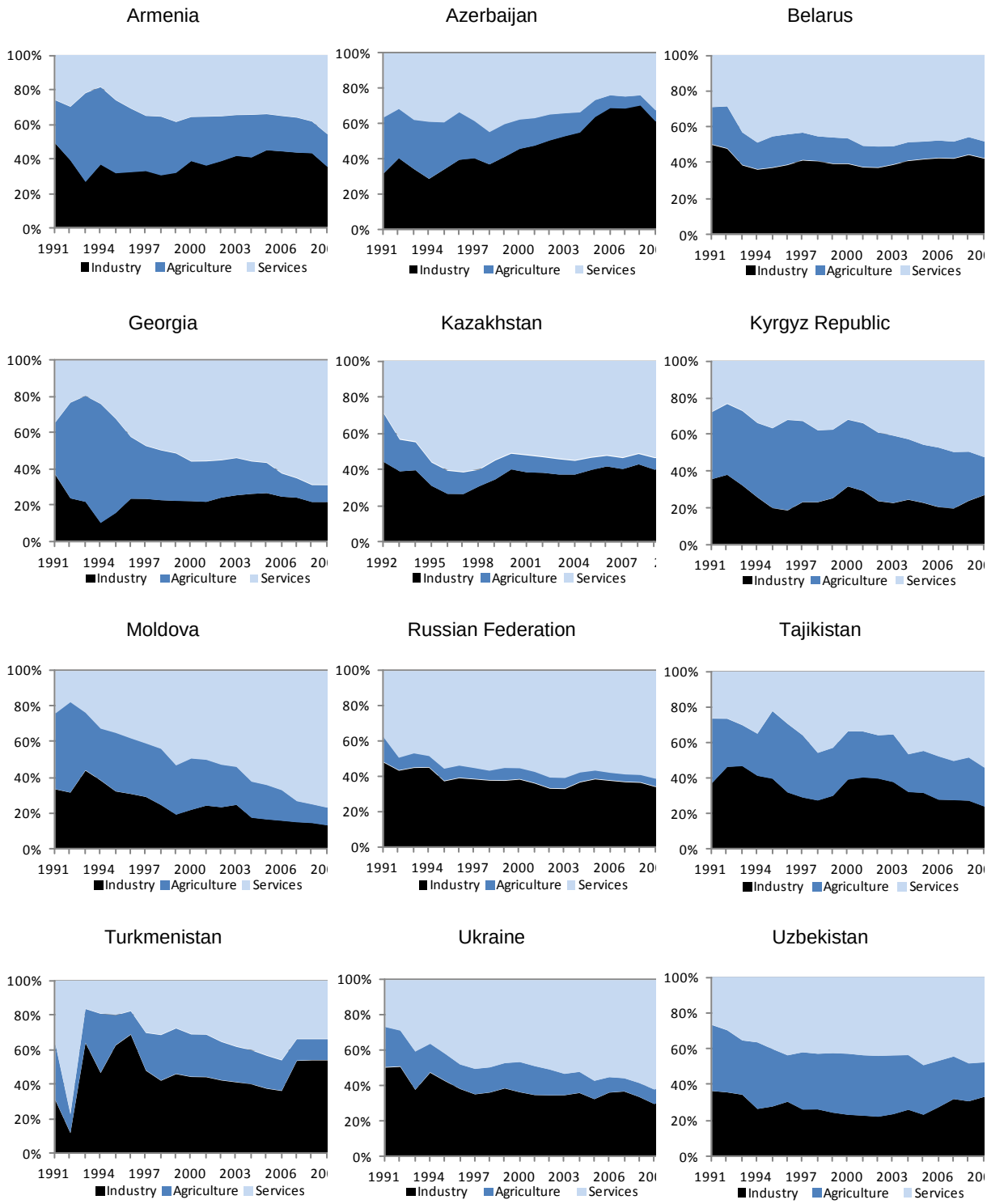
Figure 2.1. GDP structure in EECCA (2010), %



Note: For the OECD countries and the word latest data available are for 2009.

Source: The World Bank Development Indicators Database, last accessed in May 2012.

Figure 2.2. Evolution of GDP structure in EECCA (1991-2010), %



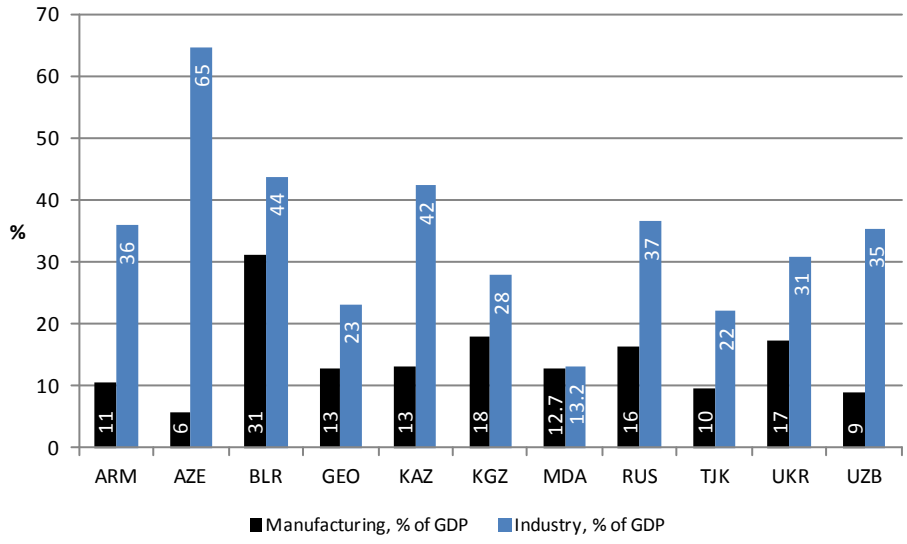
Note: For the OECD countries and the word latest data available are for 2009.

Source: The World Bank Development Indicators Database, last accessed in May 2012.

During the transition period, in several countries (notably, in Armenia, Kyrgyzstan, Moldova, and Tajikistan), a significant output contraction has been recorded in the industrial sector. Industry's contraction over the same period in the Russian Federation was smaller and comparable to OECD trends. Lately, industrial production has grown in absolute terms. Agriculture contracted in all EECCA countries, with greatest, over 20%, reductions in its share recorded in Georgia and Moldova. However, agriculture remained the largest job provider in several countries.

According to the World Bank data (Figure 2.3) and UNIDO statistics, where available, the share of manufacturing branches in industrial production is low, with Azerbaijan, Uzbekistan, Tajikistan and Armenia being particularly in need to move up the value chain. Most frequently, the dominant manufacturing industries include agricultural products processing (*e.g.* in Azerbaijan, Moldova, Georgia and Belarus), machinery production (*e.g.* in Belarus, Georgia and Ukraine) production of basic chemicals (*e.g.* in Belarus), and iron and steel (*e.g.* Georgia and Ukraine), as well as precious and non-ferrous metals (*e.g.* in Kyrgyzstan). Manufacturing can be very diversified/fragmented, with up to 60 different branches as in Georgia or Kyrgyzstan, or relatively specialised, with some 12-15 key branches, as in Belarus and Moldova.

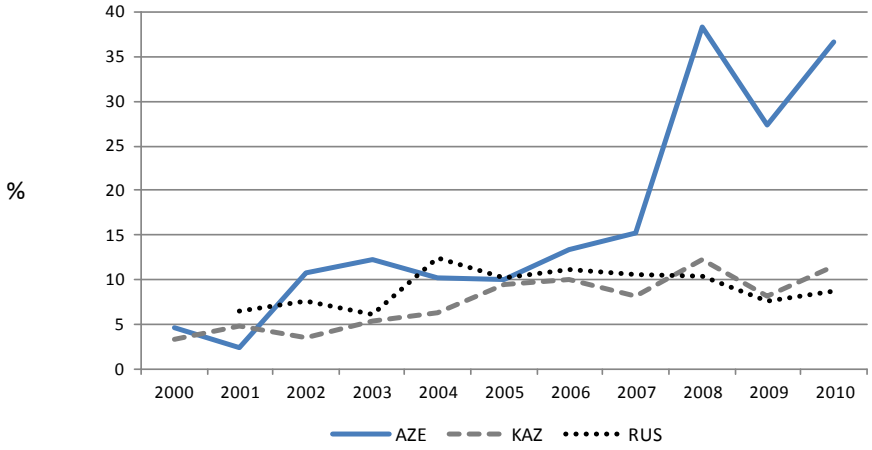
Figure 2.3. Share of manufacturing in industry, EECCA (2010), %



Source: The World Bank Development Indicators Database, last accessed in May 2012.

Overall, the share of low value-added sectors remains significant. The share of extractive industries is particularly high in several countries (Figure 2.4) that have conserved or even accentuated the Soviet-period economic model of a *rentier* state. Knowledge and technology-intensive branches have a very modest share in most EECCA countries. Similarly, branches linked to recycling constitute at best an insignificant 0.63% and 0.43% of total manufacturing, as in the Russian Federation and the Republic of Moldova respectively, most often being negligible, as in Georgia (0.04%), Azerbaijan (0.02%), or the Kyrgyz Republic (0.01%).

Figure 2.4. Oil and gas revenue as per cent of GDP in selected EECCA countries



Source: The World Bank (2011a).

Changes in the economic structure relieved some of the pressures on the environment, for instance reduced the level of point-source air pollution from industry, and contributed to the improvement of energy and carbon efficiency. At the same time, the economic downturn in the mid-1990s delayed the adoption of strong measures, similar to Central European policies, aimed at pollution abatement in the energy, mining and manufacturing sectors.

Further reforms are needed to make the economic structure of EECCA countries better adapted to the challenges that they face and more competitive (OECD, 2011a, b, c, d, e, and j). Structural reforms and diversification are high on the agenda of several if not all EECCA countries. The focus on structural reforms, at least at the political level, has strengthened recently, including in the countries highly exposed to the *rentier* model problem, such as Azerbaijan, Kazakhstan and the Russian Federation.

In many instances, structural reforms in EECCA can be linked with the promotion of "green energy" and higher-quality agricultural and forestry products. There are many opportunities for increasing the share of the renewable energy production sector. For example, Kazakhstan and Ukraine could exploit their bio-fuel potential: the country's potential in this area is estimated at some 100 thousand tonnes annually. Furthermore, due to abundant agricultural by-products Ukraine has an important potential for energy production based on biomass (OECD, 2012). Georgia is already exploiting its many rivers through hydropower plants and has succeeded to become self-sufficient in electricity, with a strong export potential. Armenia, Kyrgyzstan and Tajikistan could also further develop their hydropower production. The potential for renewable energy sector development is very strong in the Russian Federation (see Chapter 4). Some potential exists for eco-tourism and agricultural tourism, as well as sustainable forestry (EC, 2011). The construction sector will need to adopt new practices if the 2010 UNECE Action Plan for Energy-efficient Housing is to be implemented in the region. Similarly, countries will need to green their transport sector. Relevant incremental adjustments are possible within the current overall structure of economy. Organic agriculture is already rapidly developing in Armenia, Moldova, and Ukraine (see Chapter 5). In several countries, however, the diversification goal may be hindered by the "natural resource curse", as in Kazakhstan, for instance (Box 2.1). A further discussion of this problem is available from Chapter 3.

Box 2.1. Kazakhstan needs structural reforms to increase competitiveness

The Kazakh economy is narrowly based, with economic activity and investment concentrated in the hydrocarbon and mining sectors. Oil and fuel products account for 65% of the country's exports. The 2008-09 financial crisis, which led to falling demand for crude oil, highlighted the need to accelerate the diversification of the production base beyond these sectors.

Past reforms to enable structural changes. Institutional reforms have been adopted by the government in order to address structural challenges, often with some success. For instance, the government initiated the modernisation of the banking sector, trade liberalisation, the adoption of an inflation target policy and the reduction of the external debt. New laws and regulations to improve the business environment have been enacted. Regional development programmes have also been put in place to pursue such objectives as reducing regional disparities in living standards and stimulating economic development of the *akimats* (regions). In addition, to address the challenge of diversification, a number of development agencies and research centres, as well as technology and science parks, have been established to support the diversification of higher value-added industries. In the same vein, in 2005 the government launched an initiative to design and develop innovation clusters in tourism, textiles, agriculture and processed foods, minerals, and oil and gas. Key diversification priorities will be achieved within the "Government programme for accelerated industrial innovative development for 2010-14".

The impact of the "natural resource curse". Diversification efforts can be challenging for an economy like Kazakhstan's for several reasons, among them the so-called "natural resource curse". Abundant natural resources may indeed lead to the appreciation of the country's real exchange rate, thereby making manufactured goods less competitive than those of other nations, and so increasing imports and decreasing exports (a process of de-industrialising would then ensue). While some resource-rich economies (*e.g.* Norway, Botswana and Malaysia) have successfully tackled diversification challenges, these cases are rare.

Country's competitive advantages. Kazakhstan sectors are competing with high-growth emerging and transition economies such as Russia, India and China to capture a share of global FDI flows, which are becoming scarce. Kazakhstan can rely on several clear competitive advantages to meet this challenge: its cost of labour in services is half that of Poland or Hungary – countries that are attracting a new wave of investment – and slightly lower than that of Russia. In agriculture, the country can rely on ample grassland to breed cattle and vast arable land for crop production. Currently, up to 3.5 million hectares of reserve arable land is unused, representing about 15% of the country's total arable land. Low production costs (*e.g.* half those of France for wheat, and approximately 60% of those of Ukraine and Russia) put it in a good position to compete on the international market.

A strategy to enhance competitiveness. In order to determine which strategy could best use these advantages to enhance competitiveness and diversify sources of FDI for Kazakhstan, OECD has worked with the Kazakh government to identify opportunities for diversification. Several initial priority sectors for foreign direct investment were singled out for Kazakhstan: the agribusiness value chain, including the wheat, beef and dairy sectors, the agrochemicals sector and the logistics sector for agribusiness, and the information technology (IT) and business services sector. These sectors were selected on the basis of market attractiveness (which incorporates the competitive advantage and potential growth of a sector in a country, and FDI attractiveness) and country benefits, for example through a transfer of skills and technology and higher employment.

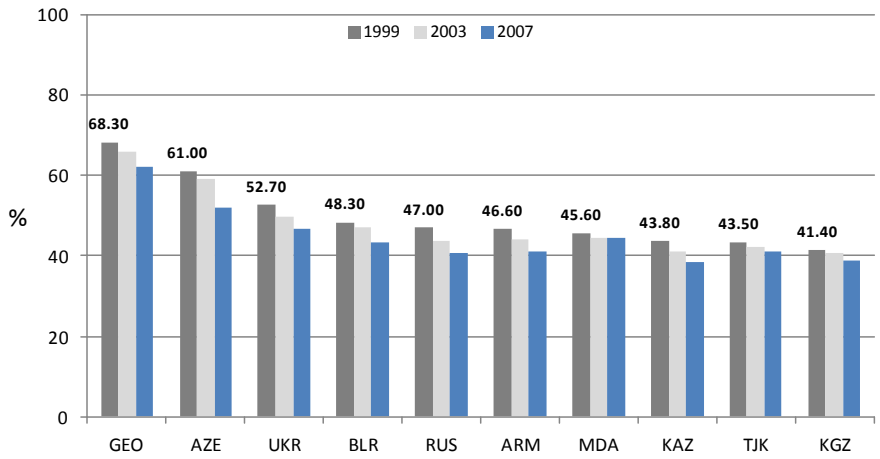
Source: OECD (2011d).

The size of informal economy

The size of shadow (informal) economy is substantial in EECCA (Figure 2.5). According to estimates by Schneider (2002), in 1999/2000, Georgia had the largest informal economy in EECCA and the entire world with unaccounted 67.3% of the official GDP produced through informal activities, followed by Azerbaijan with 60.6% and Ukraine with 52.2% (OECD non-weighted average was estimated at 16.8%). The same author's estimates (Schneider, 2010) show steady (though marginal) improvements in all EECCA countries, but the crisis may have had a negative impact and may have pushed these figures up by 10% or more. In 1999-2007, Kyrgyzstan, Moldova and Tajikistan achieved the least progress among EECCA countries in reducing the share of shadow economy, though in absolute terms they are all under the EECCA average for 1999-2007. The latter value is higher than the 40.6% average for Sub-Saharan Africa, making the EECCA region a world leader in this area.

Albeit imperfect, these estimates point to the fact that much has to be done in EECCA for enhancing the quality of government's interventions. Most notably, taxation and regulation have to be improved, since their deficient design is viewed as a major reason for people's engagement in shadow economic activities. Environmental regulation and taxation are no exception in this regard, though their contribution to the informal economy may be less important than that of framework conditions. From a green growth perspective, this underlines the importance of establishing policies that reach out to private households, in addition to the enterprise sector.

Figure 2.5. Estimated size of the shadow economies in EECCA, % of GDP



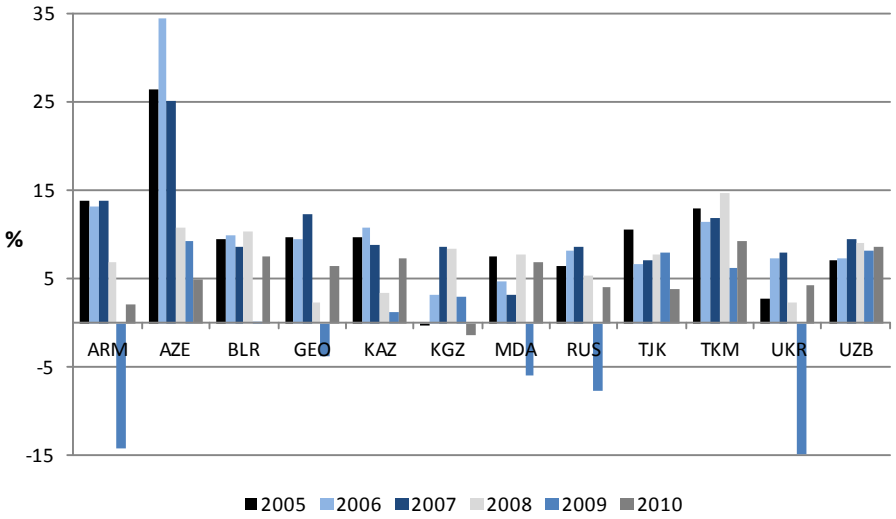
Source: Schneider, F. et al. (2010).

Besides being a product of rational behaviour of entrepreneurs that desire to escape state regulations, the informal sector may well reflect "coping behaviour" by individuals in economies where earning opportunities are scarce. As noted by Becker (2004), a vast majority of the informal economy may provide goods and services whose production and distribution are perfectly legal, and the informal economy should not be confused with the criminal economy. The informal economies in EECCA countries have probably played the role of a safety net for people during the transition period, when the formal social safety nets were disrupted or poorly functioning. Possibly, there is an informal "green economy" in place, *e.g.* in the field of waste recycling. This issue needs further research and policy attention in the region.

Pace of economic growth

In terms of growth, the situation in EECCA has been mixed over the last decade. The early transition economic decline was such that the region as a whole did not recover to the 1990 level of real output until 2004. Between 2005 and 2007, EECCA countries generally enjoyed stable growth, with most spectacular results achieved in Azerbaijan, where the economy grew at an average rate of 28.6%, followed by Armenia with an average rate of 13.6%. However, the majority of EECCA countries were badly hit by the 2008 global economic and financial crisis (Figure 2.6).

Figure 2.6. Real GDP growth in EECCA countries (2005-2010)



Source: The World Bank Development Indicators Database, last accessed in May 2012.

The shock resulting from the global crisis was such that the average GDP growth in the East European and Caucasus sub-group of countries collapsed from 8.3% in 2008 to -8.0% in 2009, a remarkable 16.3% change in one year. The downturn in 2009 resulted in this group of countries suffering the most severe economic decline in the world, with a contraction of a whole order of magnitude greater than the global one (the global GDP fell in 2009 by an estimated -0.8%). Remittances, which have an important contribution to the GDP in some countries, declined in 2009. The Central Asian countries were less exposed to the global financial and economic turmoil, possibly because of a lower degree of integration into the global economy.

The funding sources for anti-crisis programmes were quite different in different countries. Oil and gas rich countries (including Azerbaijan, Kazakhstan, Russia, Turkmenistan and Uzbekistan) used surpluses accumulated from hydrocarbon exports to reduce the impact of the crisis and finance stimulus packages. The most significant packages of this type were put in place in Kazakhstan and the Russian Federation. Kazakhstan's package amounted to 9.5% of the GDP, mainly to support industry and invest in infrastructure. The Russian package (5% of the GDP, excluding support to the banking sector) provided support to local governments for social benefits, but also for subsidies to industry. Several other countries, including Armenia, Moldova and Ukraine had to strongly tighten fiscal discipline and make recourse to IMF support. Georgia relied on massive international aid to stimulate economic recovery. Some funding made available through anti-crisis programmes went to finance "green" projects (see Chapter 7).

Government revenue and expenditure[1]

Government expenditure and revenue (Table 2.2.) have both been rising as a share of GDP over the pre-crisis years. As a result of the crisis and contracted economies, the fiscal position of EECCA governments has weakened by the generally low share of government tax revenue in the GDP which has also substantially declined in 2008. Armenia, Georgia, Moldova, Tajikistan and particularly Ukraine experienced significant government deficits in 2008 and 2009. This limits the public expenditure capacity at all levels of government and pushes the objective of revenue generation up the list of government priorities, which may exacerbate the focus on the fiscal objectives of environmental policies. More generally, EECCA governments conduct prudent fiscal policies and very solid economic arguments will need to be employed to convince them to spend more to promote the green growth objective. Tax collection rates are improving, although tax evasion remains a significant constraint in all the countries.

Table 2.2. Key indicators of governments' fiscal position, % of GDP

Country	General government revenue, % of GDP					General government total expenditure, % of GDP					General government gross debt, % of GDP				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
ARM	20	21	21	22	21	22	29	26	24	24	15	34	33	35	38
AZE	51	42	47	46	44	31	35	32	33	33	7	12	11	10	11
BLR	51	46	42	42	39	47	46	43	38	39	22	35	41	50	37
GEO	31	29	28	28	27	33	36	33	29	29	28	37	39	34	33
KAZ	28	22	24	29	28	27	23	22	23	24	7	10	11	11	10
KGZ	30	32	31	33	33	29	33	36	38	39	48	58	60	52	51
MDA	41	39	38	37	38	42	45	41	39	39	19	29	27	23	23
RUS	39	35	35	38	39	34	41	39	37	38	8	11	12	10	8
TAJ	22	23	23	25	26	27	29	26	27	29	30	36	36	35	35
TKM	21	22	18	20	19	11	15	16	17	15	3	3	12	15	20
UKR	44	42	43	42	41	47	49	48	45	44	21	35	40	37	36
UZB	41	37	37	40	39	31	34	34	33	35	13	11	10	9	9

Note: General government revenue consists of taxes, social contributions, grants receivable, and other revenue. Total expenditure consists of total expense and the net acquisition of nonfinancial assets. Gross debt consists of all liabilities that require payment or payments of interest and/or principal by the debtor to the creditor at a date or dates in the future. Data for 2012 represent an estimation by IMF. For Georgia, Turkmenistan and Ukraine, the 2011 data represent an estimation by IMF.

Source: International Monetary Fund, World Economic Outlook Database (last accessed in April 2012).

EECCA governments are important consumers at levels comparable with some OECD members, *e.g.* the European Nordic countries. Public procurement in nine EECCA countries (excluding the Kyrgyz Republic, Turkmenistan and Uzbekistan) constitutes some 19% of the GDP on average, the highest one (24.1%) being in Moldova. This "purchasing power" can be used to promote green products, services and production processes such as construction works, information technology products, cleaning agents, transport services and vehicles. In some countries, for example in Georgia and Ukraine, the governments have already taken specific steps to green their procurement practices. The Georgian government plans to procure some

[1] See also Chapter 8.

4 000 electric cars over the next few years (EC, 2011). In Ukraine, government offices are gradually being equipped with energy-efficient bulbs.

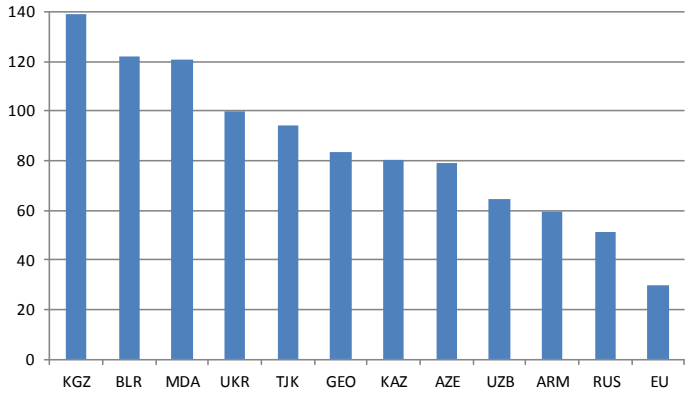
Performance-based contracts, applied in several sectors of economy, such as water supply and sanitation (OECD, 2011e), oil and gas extraction (WWF, 2010), or forestry may become an important vehicle for the real-life application of sustainable public procurement practices. To this end, their content should be carefully scrutinised through a green growth lens.

Given the level of trade integration exhibited by most EECCA countries (see the next section) and their orientation towards higher convergence with the European Union's environmental policies, the greening of public procurement needs to take account of international trends and development to avoid market distortions. Having a common set of criteria for each specific product or service would considerably reduce the administrative burden for tendering companies and public administrations implementing green public procurement.

Trade integration

Trade integration is high in a vast majority of EECCA countries (Figure 2.7). Due to international demand and prices for commodities such as steel and oil, rapid export growth has occurred in resource-rich countries. In countries with a high inflow of remittances, trade was skewed towards imports. While trade integration normally shows high exposure to international competition, in the EECCA region this indicator has to be interpreted with care because of the qualitative characteristics of trade flows and a limited number of trade partners.

Figure 2.7. Trade to GDP ratio, EECCA (2008-2010)



Source: World Trade Organisation database, last accessed in May 2012.

Until very recently, the EECCA region had mostly been a Russia-centred trade block. As of 2009, according to the World Trade Organization's (WTO) data, the European Union has become both the main destination and origin of merchandise trade involving Armenia, Azerbaijan, Georgia, Moldova, the Russian Federation and Ukraine, as well as the main export destination from Belarus and Kazakhstan (Tables 2.3 and 2.4). Other important trade partners for EECCA countries include the Russian Federation, China, United States, Israel and Switzerland. In addition, sub-regional trade is active, particularly in Central Asia.

Table 2.3. Breakdown in economy's total exports, EECCA countries

Country	Share in world total exports (%)	By main commodity group (%)			By main destination (%)	
		Agricultural products	Fuels and mining products	Manufactures		
ARM	0.01	16.4	47.8	31.0	1. European Union	49.5
					2. Russian Federation	15.8
					3. United States	8.1
					4. Georgia	4.8
					5. Iran	3.9
AZE	0.17	2.3	95.7	2.0	1. European Union	47.5
					2. Israel	8.2
					3. United States	8.0
					4. Ukraine	4.2
					5. Croatia	3.7
BLR	0.17	14.7	28.8	52.9	1. Russian Federation	38.5
					2. European Union	30.0
					3. Ukraine	10.1
					4. Brazil	2.8
					5. China	1.9
GEO	0.01	20.3	20.6	53.4	1. European Union	18.5
					2. Azerbaijan	15.4
					3. Turkey	13.6
					4. United States	11.4
					5. Armenia	10.1
KAZ	0.39	3.5	82.9	12.1	1. European Union	53.8
					2. China	17.7
					3. Russian Federation	5.3
					4. Canada	4.3
					5. Israel	2.2
KGZ	0.01	12.8	8.2	15.8	1. Switzerland	26.1
					2. United Arab Emirates	20.3
					3. Russian Federation	17.3
					4. Kazakhstan	12.2
					5. United States	6.1
MDA	0.01	49.5	3.2	47.3	1. European Union	47.3
					2. Russian Federation	26.2
					3. Ukraine	5.9
					4. Belarus	5.2
					5. Turkey	4.4
RUS	2.63	5.2	70.4	20.2	1. European Union	52.2
					2. Ukraine	5.8
					3. Turkey	5.1
					4. China	5.1
					5. Belarus	4.5
TJK	0.01	..	..	..	..	..
TKM	0.04	..	..	..	..	..
UKR	0.34	20.3	15.2	63.6	1. Russian Federation	26.1
					2. European Union	25.4
					3. Turkey	5.9
					4. Belarus	3.7
					5. India	2.8
UZB	0.08	..	..	..	..	..

Source: World Trade Organisation's Database, last accessed in May 2012.

Table 2.4. Breakdown in economy's total imports, EECCA countries

Country	Share in world total imports (%)	By main commodity group (%)			By main destination (%)	
		Agricultural products	Fuels and mining products	Manufactures		
ARM	0.02	18.4	20.8	55.5	1. European Union	25.4
					2. Russian Federation	21.9
					3. China	10.6
					4. Ukraine	6.1
					5. Iran	5.8
AZE	0.04	19.8	2.7	74.6	1. European Union	25.3
					2. Russian Federation	17.4
					3. Turkey	11.7
					4. China	8.9
					5. Ukraine	7.1
BLR	0.23	9.4	37.9	47.5	1. Russian Federation	51.3
					2. European Union (27)	21.5
					3. Ukraine	5.4
					4. China	4.7
					5. Venezuela, Bolivarian Rep. of	3.3
GEO	0.03	18.9	20.5	60.2	1. European Union	28.2
					2. Turkey	17.3
					3. Ukraine	10.9
					4. Azerbaijan	9.1
					5. China	6.5
KAZ	0.20	10.2	16.2	73.4	1. European Union	30.1
					2. Russian Federation	22.8
					3. China	16.5
					4. Ukraine	5.7
					5. United States	5.5
KGZ	0.02	18.1	27.4	53.9	1. Russian Federation	33.6
					2. China	20.7
					3. Kazakhstan	12.0
					4. European Union	9.2
					5. United States	5.9
MDA	0.02	16.3	13.6	62.3	1. European Union	44.2
					2. Russian Federation	15.2
					3. Ukraine	13.7
					4. China	8.3
					5. Turkey	5.3
RUS	1.61	14.8	5.3	75.7	1. European Union	38.3
					2. China	15.7
					3. Ukraine	5.6
					4. United States	4.5
					5. Japan	4.1
TJK	0.02	..	..	..	..	..
TKM	0.04	..	..	..	..	..
UKR	0.39	10.3	35.7	52.8	1. Russian Federation	36.5
					2. European Union	31.4
					3. China	7.7
					4. Belarus	4.2
					5. United States	2.9
UZB	0.06	..	..	..	..	..

Source: World Trade Organisation's Database, last accessed in May 2012.

Trade integration is an important factor driving the process of approximation with the European Union's environmental legislation. A Free Trade Agreement is now being negotiated between the EU and Ukraine (Box 2.2) , aiming at a very ambitious regulatory alignment, including in the environmental field. A similar regulatory impact would have association agreements, which are being negotiated between the EU and Armenia, Azerbaijan, Georgia, and Moldova.

Box 2.2. EU-Ukraine Free Trade Agreement

Negotiating an EU-Ukraine free trade agreement (FTA) is part of the EU's policy of creating a stable and prosperous European neighbourhood. The EU is Ukraine's largest trading partner and closer economic ties offer major benefits for both parties. The ambition is for a deep and comprehensive FTA, going far beyond WTO rules, which would not only include significant reductions in tariffs but also a high degree of regulatory approximation. The removal of non-tariff barriers through regulatory alignment, including effective enforcement, is the most important way in which the two markets can be integrated.

Source: The European Commission's web site.

The gradual trade integration with countries outside the EECCA region imposes a need to monitor the evolution of policies and regulatory frameworks, including environmental ones, in the partner countries. This is necessary in order to make sure that the country's export potential is not affected by changes in those policies and regulations. Consumer preferences may also need some attention.

Five EECCA countries are WTO members: Armenia (since 2003), Georgia (since 2000), the Kyrgyz Republic (since 1998), Moldova (since 2001), Ukraine (since 2008), and the Russian Federation (since late 2011). Respectively, their trade policies satisfy the WTO requirements. Several other countries, including Azerbaijan, Belarus, and Kazakhstan are seeking WTO membership. In this regard, successful completion of multilateral trade talks could play an important role in greening growth, especially to the extent that ambitious outcomes are achieved in environmental goods and services trade, and commitments are made to reduce harmful subsidies.

Many EECCA countries are parties to regional or sub-regional trade agreements, with Belarus, Kazakhstan and the Russian Federation having recently put in place a Customs Union. Such regional trade arrangements may need to be examined from the green growth perspective so that they become a way to lower barriers to trade in environmental goods and services and to improve policy coordination and capacity building.

Financial integration and capital flows

Today, all EECCA countries have open economies, though the extent to which they are integrated into global capital markets varies. According to the International Monetary Fund (IMF), in some of these countries the inflow of capital in the pre-crisis years was double in comparison, for instance, with Latin America (IMF, 2010). The transition period was marked by remarkable growth of credit to the private sector, enabled in some countries by large external inflows. The fastest credit growth rates between 2000 and 2008 were in Kazakhstan, the Russian Federation and Ukraine (World Bank, 2010). This growth of credit was, to a very large extent, the result of a fast consumption catch-up by households aspiring to improve their living standards and, on the supply side, by historically high global liquidity in 2003-2006. Increased capital inflows in EECCA were due to both foreign direct investment and remittances (OECD, 2008).

There is a clear need to make governments' environmental and investment policy goals mutually supportive. In this vein, the OECD-hosted Freedom of Investment (FOI) Roundtable recently issued a communication on "Harnessing Freedom of Investment for Green Growth". Governments are encouraged to continue to monitor their investment treaty practices with regard to environmental goals. It is also important that new environmental measures observe key international law principles such as non-discrimination (creating a level playing field for domestic and international investors). This process is most effective and efficient if it is integrated into policy design at an early stage. International investment arbitration is assuming a growing role in resolving disputes involving environmental issues, placing special responsibility on the investment policy community to ensure the integrity and competence of arbitral tribunals and to improve their transparency. The FOI Roundtable communication also addresses the concern, expressed by some countries, that investment could be affected if the green growth policy agenda were captured by protectionist interests.

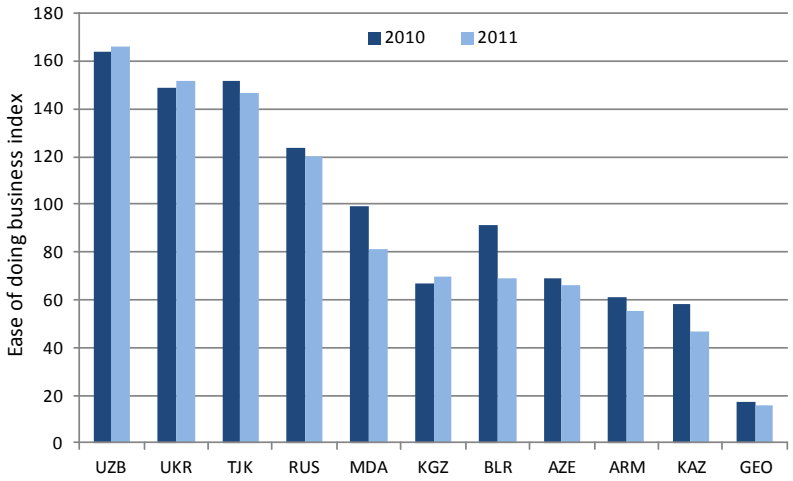
Certainly, these recommendations are relevant for EECCA governments, though the opposite is true as well: investment needs and policies should not be used to disregard environmental concerns.

Business climate

All EECCA countries have made efforts to improve their business climate, which, by international standards, is still unsupportive in the majority of countries (Figure 2.8). Reforms have been carried out in several countries, sometimes with positive outcomes, for instance in Azerbaijan, Kazakhstan, Kyrgyz Republic, and Tajikistan. The most profound and spectacular reforms in the business environment were realised by Georgia (World Bank, 2011b).

Figure 2.8. Ease of doing business index in EECCA countries

(183=most difficult to 1=easiest)



Source: The World Bank Development Indicators Database, last accessed in May 2012.

Several positive developments can be mentioned. Georgia and Ukraine worked to improve their national competition policies. Various tax reforms have been implemented in Armenia, Moldova and Ukraine. Kazakhstan and Tajikistan have strengthened investor protection by requiring greater corporate disclosure in company annual reports, and Armenia and Kazakhstan have modernised their customs procedures. Still, much remains to be done to fully align the practices in EECCA with international benchmarks as well as to make the improvements sustainable.

As noted in a recent working paper by the European Commission (2011), the main beneficiaries of an improved business climate are new entrepreneurs, because many countries have made it easier to set up a new company. This implies clear benefits for developing new "green" business as well. However, even where the ease of doing business has improved significantly by means of deregulation, including substantial relaxation of environmental safeguards, this improvement of the business climate was not always accompanied by increased attractiveness for investors, as was the case in Georgia (Box 2.3). In part, this may be due to the fact that investors look for harmonised and clear regulatory frameworks, considering the absence of regulation as an investment risk. On the other hand, scrapping regulations that are not enforceable or are not enforced because of foreseeable long-term capacity constraints within the government may be seen as an act of "regulatory honesty". In order to be sensible, this step should be balanced by encouraging the civil society's activism in protecting environmental rights of citizens through adequate access to information and justice and in expressing consumer choices.

Box 2.3. Doing business in Georgia is simple but unattractive for investors

In 2005-2009, the Georgian government initiated radical reforms in several key sectors of the economy. Reforms were long overdue: sheer inefficiencies in governance almost granted Georgia the status of a failed state. The main aim of reforms was to stimulate economic growth and prosperity *via* easing the burden on business and investments. Georgia has gained praise as a "systematic reformer" and was "catapulted" to the 11th (out of 183) rank in the World Bank's "doing business" ranking. However, the analysis by the World Economic Forum (WEF) shows the limited nature of the gains. Georgia occupies only the 90th place among 134 nations when ranked for competitiveness – the ultimate gauge of a country's attractiveness for potential investors. The unsettling conclusion is that doing business in Georgia is simple but unattractive. A primary driver for Georgia's reforms were narrowly defined economic needs. This approach has led to the removal of many social and environmental safeguards, which were perceived as "barriers" to growth, a view that disregarded the complexity of development strategies.

Source: Lomtadze, Z. (2009).

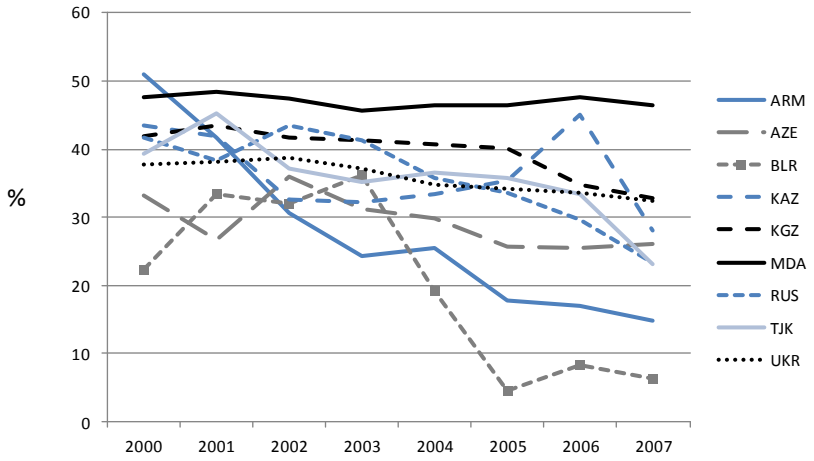
The tax and regulatory systems in EECCA need to become more predictable in order to increase investor confidence. Clear environmental targets and regulations supporting their achievement, need to be part of any green growth strategy in EECCA. In this regard, further reforms of environmental standards and permitting are needed.

Private sector development and competitiveness

The private sector represents the largest part of economy, particularly in the Eastern European and Caucasus countries (providing a 60-70% contribution to the GDP and more than a 90% contribution to employment). The sector emerged after the large privatisation campaigns since the break-up of the Soviet Union. Such campaigns involved a lot of dissatisfaction, as illustrated by the results of a recent survey in the Russian Federation, showing that 53% of the population would be in favour of re-nationalising the privatised enterprises (Denisova *et al.*, 2007). Such kind of dissatisfaction is not unique to EECCA, being rooted in negative distributional effects against poorly developed and enforced regulatory frameworks. According to the same survey, only 0.5% of Russian people feel that their welfare strongly improved over the transition period, while almost 50% consider that their life worsened.

Governments regarded privatisation as a way to improve the efficiency of production and receive additional revenue. As these goals were (partly) achieved, the financial sustainability of enterprises also improved: country data show that the share of unprofitable enterprises has been declining since 2000 (Figure 2.9), though the degree of the decline differs from country to country. A high share of unprofitable enterprises may be a surrogate indicator of tax evasion in EECCA (companies not being interested to show profits), which is commonly linked to unsupportive business climate, imperfect tax systems and government incapacity to enforce taxes. At the same time, the high level of unprofitability may also be a reflection of low energy and material efficiency of production.

Figure 2.9. Share of unprofitable enterprises in their total number, %



Source: Interstate Statistical Committee of the CIS (2010).

Environmental concerns were rarely taken into account during the first wave of privatisation resulting in areas of unclear responsibility for past pollution. In many countries, liability regimes are now being reformed (see Chapter 7) in order to strengthen the financial responsibility for environmental damage thus providing additional signals for greening private sector's strategies. The environmental liability reform would also reduce burdens imposed on public budgets by large-scale pollution remediation works (required in such countries as Azerbaijan and Kazakhstan).

Private sector businesses are concentrated in main cities. Over 90% of registered companies are small and medium-sized enterprises (SMEs). Their share in the GDP varies from 16% in Ukraine to nearly 50% in Armenia; they also provide the largest share of employment. Due to a large informal economy, these figures may underestimate the real contribution of SMEs and individual entrepreneurs to employment and growth.

In all the countries, better framework conditions for private sector development, and SME development in particular, are required in order to increase competitiveness (OECD, 2011e). Reforming framework policies in line with green growth principles will have the benefit of enabling higher efficiency and diversifying the economy. A focus on SMEs is needed to turn this huge and diverse part of the private sector into a key driver of growth and innovation in the region.

Research and innovation

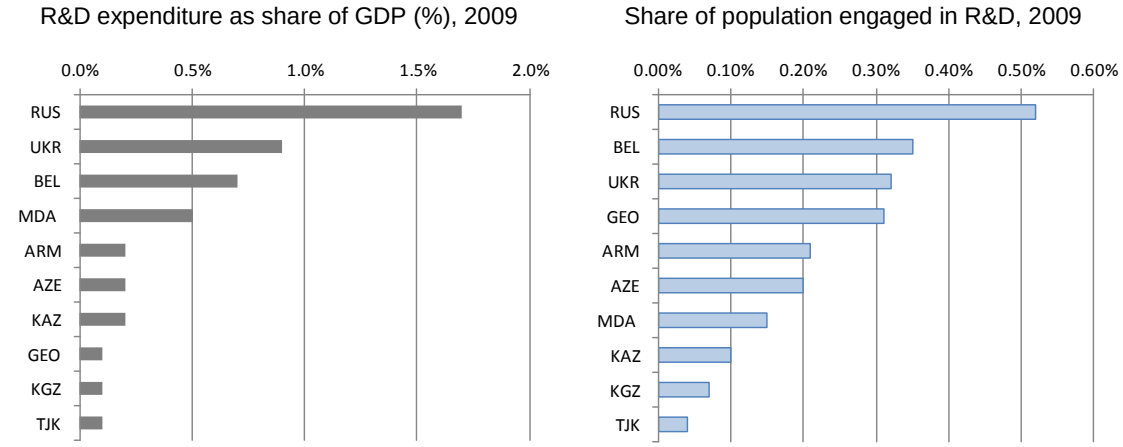
Governments play an important role in fostering innovation in general and green innovation in particular. In addition to using environmental policies that address the demand side, they can lend support by improving framework conditions, *e.g.* by developing innovation policies, establishing adequate institutions, encouraging the diversification of actors involved in innovation, and funding relevant research and development activities.

In many EECCA countries, substantial scientific and technological capabilities were in place during the Soviet period, although they were exclusively concentrated in the public sector and mostly geared to military innovation rather than innovation to support well-being. During the transition period, much of the human capital and funds were siphoned out of public research and development (R&D), although the basic institutional framework and a certain level of activities were preserved within the public sector in some EECCA countries (Figure 2.10). Public resources dedicated to R&D are considerably lower in comparison with the OECD average of 2.33% of the GDP in 2008 (or 4.68% of the GDP in Israel in 2008) (OECD 2011d). Overall, there is limited understanding of current capabilities in the field of R&D in EECCA.

At the same time, there is evidence that promising changes are happening in the research and innovation landscape in EECCA, although from a low starting point. Armenia and Moldova have increased their public spending on science and technology (Figure 2.11). Many countries, for example, Azerbaijan, Belarus, Kazakhstan, Kyrgyz Republic, the Russian Federation and Ukraine have developed relevant legislation and strategies. Larger countries, such as Kazakhstan and the Russian Federation, are putting efforts into the development of research and innovation through so-called “innovation incubators” or other approaches. Research institutes that specialise in the environmental field exist, for example, in Azerbaijan, Moldova, Kazakhstan, Kyrgyz Republic, the Russian Federation and Ukraine. Most of them appeared in the early 1990s or even earlier.

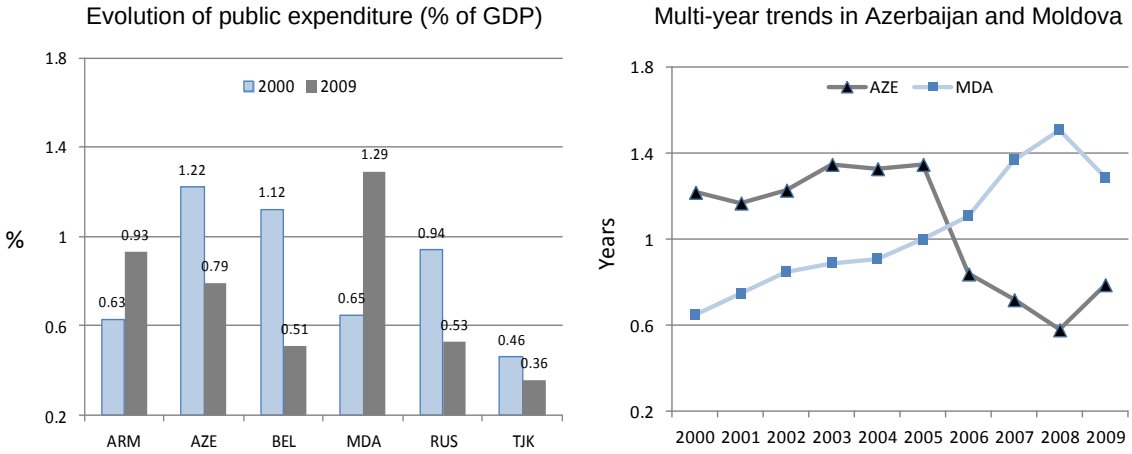
The transition involved the diversification of the original institutional landscape, which now includes private firms in addition to traditional state-run research institutes and universities. However, actors supporting research and development are still insufficiently coordinated and often lack a critical mass of resources. Publicly owned branch research institutes and design bureaus are still the central players in the current innovation system. Although the number of personnel employed fell sharply in this sector during the 1990s, many institutes managed to survive, often at a level of basic subsistence, due to public funding, donor grants and, occasionally, contracts with the private sector.

Figure 2.10. Resources dedicated to research and development (R&D) activities in EECCA



Source: Interstate Statistical Committee of the CIS (2010).

Figure 2.11. Public expenditure on science in selected EECCA countries



Source: Interstate Statistical Committee of the CIS (2010).

The inadequacy of the predominant role of the public sector in innovation was already well documented in the late Soviet period: weak knowledge flows and lack of interaction between technology developers and technology producers/users are a major problem. Re-focusing the current system on production-oriented firms as the central players will involve more than simply re-organising the former branch institutes.

The performance of the innovation system continues to be undermined by several other factors, such as very low levels of research and development and innovation activities in firms, weak framework conditions for innovation (particularly, the lack of rule of law, corruption and administrative burden; insufficiently competitive product markets; relatively underdeveloped financial markets; and insufficient protection of intellectual property rights). Based on the Russian Federation's example (OECD, 2011h), one can say that policy efforts at reform are often frustrated by active resistance from established groups and/or institutional inertia.

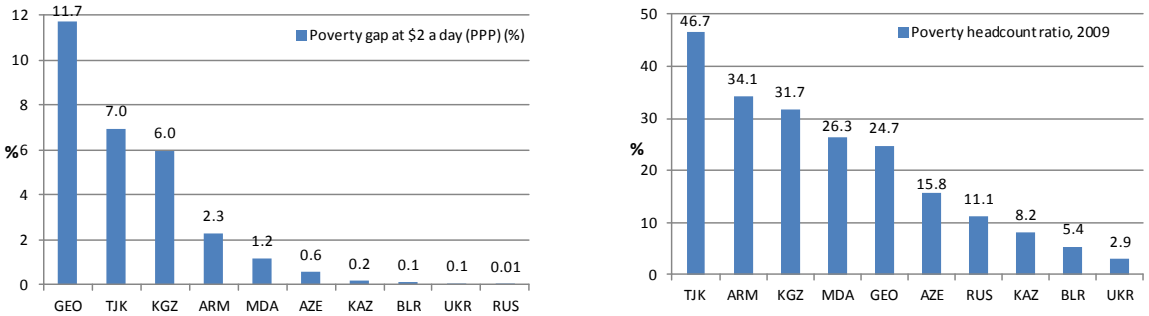
Crucially, innovation performance depends on firms developing the interests and capabilities to carry out R&D. More favourable framework conditions for innovation, combined with an appropriate mix of financial incentives and other policy measures, will play an important role. Over the past few years, the political leadership in several countries, chiefly Kazakhstan and the Russian Federation, has made innovation a national priority. Future developments will show whether political will was strong enough to drive real changes.

Finally, the international cooperation arrangements, especially with the European Union, are becoming more supportive. A relatively new development is the establishment of two networks involving EU and EECCA countries' research communities – the IncoNet EECA (Science and Technology International Cooperation Network for Eastern European and Central Asian Countries) and the IncoNet CA/SC (Science and Technology International Cooperation Network for Central Asian and South Caucasus Countries). Armenia and the Russian Federation are members of the "Enterprise Europe Network" that delivers support to business and innovation companies. The United Nations Economic Commission for Europe has launched an international dialogue on issues specific to green innovation.

Income and growth inequality

The GDP per capita has increased in all EECCA countries, but national income alone fails to capture the full extent of changes in well-being during the transition period, which was associated with increased inequality and the emergence of widespread poverty. Progress in poverty reduction was achieved in the pre-crisis years, particularly in the most populous middle-income countries (Kazakhstan, the Russian Federation and Ukraine). Low-income EECCA countries, however, still have extremely high levels of poverty (Figure 2.12). Countries with a high share of rural population continue to be particularly exposed to poverty. Kyrgyzstan and Tajikistan are amongst the poorest countries in the world. Certain "encapsulation" of growth around capital cities or in natural resource-rich regions contributes to high poverty rates in rural areas and leads to important inequalities within the country. More generally, the inequality level is high (Table 2.4), and trends across EECCA are not uniform, with some countries achieving progress in poverty reduction.

Figure 2.12. Poverty gap at $2 a day and poverty headcount ratio at national poverty line, 2009 (% of population)



Note: Data are for 2009 or the latest available; data for Turkmenistan and Uzbekistan are missing.

Source: The World Bank Development Indicators Database, accessed May 2012.

Table 2.4. The Gini index levels in EECCA (last year available), %

Country	Year	Gini Index, %
ARM	2008	30.9
AZE	2008	33.7
BLR	2008	27.2
GEO	2008	41.3
KAZ	2009	29
KGZ	2009	36.2
MDA	2010	33
RUS	2009	40.1
TJK	2009	30.8
TKM	1998	40.8
UKR	2009	26.4
UZB	2003	36.7

Note: The **Gini index** is a measure of inequality between 0 (everyone has the same income) and 100 (richest person has all the income).

Source: The World Bank Development Indicators Database, last accessed in May 2012.

High inequalities mean that accounting for the distributional impacts of green growth policies will be crucial for their acceptance by the public. Unless such impacts are addressed, the acceptability of some key policies may be called into question.

Labour force evolution

Greening growth will see new jobs created, including skilled jobs in emerging innovative green activities. But some jobs will be at risk, so there is a need to facilitate the re-allocation of workers from contracting to expanding sectors and firms such as those that replace polluting activities with cleaner alternatives or provide environmental services. Labour market and training policies can play an important role within the overall policy framework for achieving green growth. This section looks at the context for adjusting such policies in EECCA.

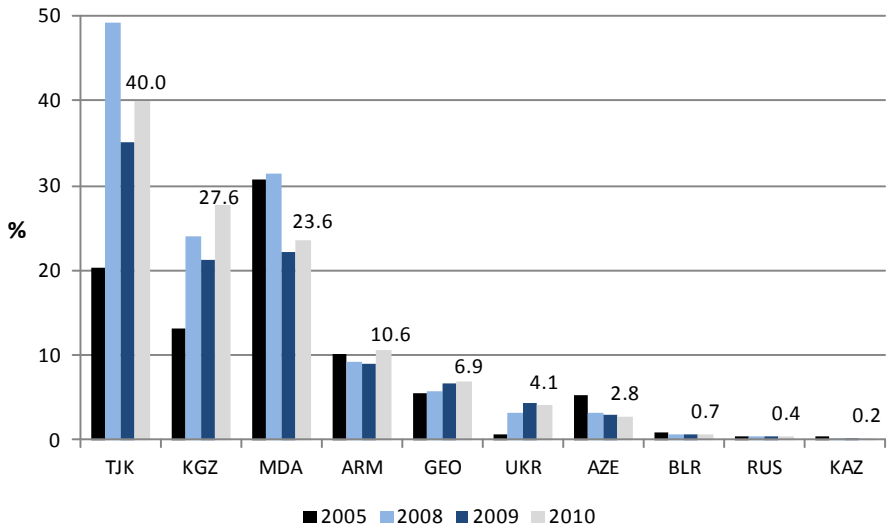
Most EECCA countries face acute demographic problems. These include ageing population, negative population growth (in Belarus, Georgia, Moldova, but most remarkably in the Russian Federation and Ukraine), and even decline in the number of economically active population, as in Moldova. Judging by the age dependency ratio and population structure, EECCA countries will face two challenges: creating jobs for the next generation and supporting the large numbers of elderly as the current working age population retire (OECD, 2008). The ageing population will increase the challenge of improving the already deteriorated social safety net in this region. In addition, this will require that infrastructure and urban development more generally be adapted to the new demographic structure. With likely improvements in life expectancy, supporting the elderly population will become a priority policy area.

The EECCA region enjoys a well educated workforce, literacy being quasi-universal in all the countries. Furthermore, the share of population enrolled in tertiary education is relatively important, particularly in higher-income countries, reaching almost 7% in the Russian Federation, and exceeding 6% in Belarus and Ukraine. These factors could enable a smooth transition to environmentally oriented sectors requiring a more skilled workforce.

Many EECCA countries see human capital development as a driver of growth in its own right. The public spending on education was on the rise in EECCA (with the exception of the Kyrgyz Republic) over the last few years, attaining almost 10% of public budgets in Moldova. Besides enabling smooth adaptation of new environmentally friendly production processes, a higher level of education can also induce changes in values and behaviour leading to a change in consumption.

High levels of labour migration (Figure 2.13) can be noted in some EECCA countries. This development has been induced by domestic unemployment, which was particularly high in the late 1990s (Figure 2.14). According to the International Labour Organisation's Decent Work Country Programme for Moldova, a quarter of the economically active population of this country works abroad. Most often, the migrant workers are employed in precarious jobs. While decreasing over time, the unemployment rates (Figure 2.14) still reach 28.60% in Armenia and over 16.5% in Georgia according to 2008 data. While other countries (in particular Azerbaijan and Kazakhstan) showed lower rates of unemployment before 2008,the crisis has generally led to increased unemployment (ILO, 2011).

Figure 2.13. Levels of labour migration: Share of remittances in GDP, %



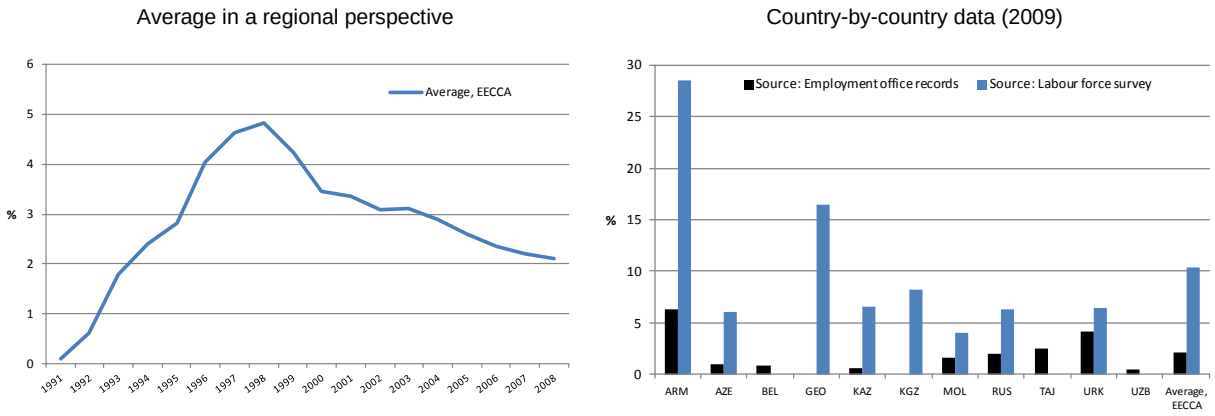
Source: The World Bank Development Indicators Database, accessed May 2012.

As noted by the World Bank (2008), the job creation in EECCA since the turn of the century was mostly due to the emergence of new private companies. In privatised and state-owned enterprises, downsizing has reduced the number of jobs, though the degree of downsizing was lower than in South and Eastern Europe. Further competitiveness gains in these enterprises may result in layoffs, which will require the establishment of re-training programmes and a social safety net to reduce the social costs of displacement.

More generally, the Europe and Central Asia region (though not fully corresponding to EECCA) is the world's largest region of emigration (OECD, 2008). At the beginning of the transition, the migration flows in EECCA were driven by political and cultural factors. Since the late 1990s they have been dominated by the search of temporary employment. In addition to international labour migration, there is internal migration, fuelled by unemployment in rural

areas. Where data are available, difference in unemployment rates by gender could be noticed: in Kazakhstan and Kyrgyzstan unemployment is higher among women, in Georgia and Moldova – among men, while in Russia and Ukraine the difference is insignificant.

Figure 2.14. Unemployment rates in EECCA



Note : Latest available data is for 2008. Armenia: no data from the employment office, official estimates used. No data for Kyrgyzstan. Tajikistan: latest data available is for 2007.

Source: International Labour Organization database: http://laborsta.ilo.org/, last accessed in May 2012.

As noted by the World Bank (2008), the job creation in EECCA since the turn of the century was mostly due to the emergence of new private companies. In privatised and state-owned enterprises, downsizing has reduced the number of jobs, though the degree of downsizing was lower than in South and Eastern Europe. Further competitiveness gains in these enterprises may result in layoffs, which will require the establishment of re-training programmes and a social safety net to reduce the social costs of displacement.

Though steadily growing over the transition period, labour productivity is relatively low in EECCA (ILO, 2011). As mentioned above, the transition period was characterised by relative de-industrialisation in EECCA and a corresponding labour re-structuring, with an influx of labour into low-productivity ("backyard") agriculture, which played the role of a social safety net – in the low-income EECCA countries, and into the services sector (where productivity was lower than in industry) in other countries (World Bank, 2008). In addition, a large part of the population is employed in the informal economy.

The particularities of EECCA's labour market and labour productivity may limit the potential for creating new "green" jobs, but green growth should be an important source of preserving jobs. The expansion of the renewable energy market may be particularly beneficial for green job creation. In this context, skills development policies can make an important contribution to both limiting unemployment and promoting greener growth. By minimising skill bottlenecks, these policies can make the transition to green growth quicker and more beneficial. Helping workers (likely to represent a small portion of the total workforce) to move from contracting to expanding sectors facilitates the economic adjustment that accompanies the transition to green growth.

Conclusions and ways forward

EECCA countries have gradually opened their economies, integrating with the rest of the world in terms of trade, capital and labour flows. Most of them, however, continue to suffer from a daunting mix of problems, either inherited from the Soviet period or related to the economic transition. The degree of the EECCA countries' exposure to the global financial and economic crisis has underscored the need to promote self-sustaining, investment- and innovation-led economic growth. This involves boosting productivity and competitiveness and diversifying economies in order to make them less vulnerable to economic shocks.

Greening growth offers an important opportunity for economic development in EECCA: it can ***provide a framework for economic restructuring to increase the countries' competitiveness.*** In the global market, the competitive potential of EECCA countries beyond commodity exporters has yet to be realised. Further restructuring of these economies will offer the benefit of overcoming the dependence on volatile commodity prices and increasing income from higher-value products.

This requires overcoming a number of ***barriers***. Such barriers include, among others, poor business climate, brain drain due to emigration, a large informal sector, and relatively low labour productivity. The extent to which such barriers influence development varies across countries.

At the same time, EECCA countries have ***competitive advantages*** that need to be preserved. These include, first of all, a high human capital and a significant natural asset endowment (see Chapter 3). The countries' proximity to European and Asian markets can also play a positive role.

The politically-backed demand for further economic restructuring and modernisation conducted along the lines of a green economy could become part of the solution to the development problems in the EECCA region. In order to facilitate this change, EECCA governments, depending upon the specific country context, should:

- ***Identify country-specific economic factors in support of greener growth:*** EECCA countries are quite heterogeneous; therefore, an in-depth analysis is necessary in order to understand the full potential for green growth and identify synergies between its objectives and higher competitiveness. Economic criteria such as revenue generation, job creation and export potential, import substitution and competitiveness could be used for such analysis. An additional criterion, however, may be the economic costs of environmental impacts originating in the current production patterns and benefits of reducing such impacts. Quantifying economic benefits of green growth will help identify optimal economic solutions and accelerate the transformation process;

- ***Continue the reform of framework policies:*** Without a supportive overall framework, green growth will not be possible. In this vein, EECCA countries need to continue improving their policies and regulations as a prerequisite for modernising their development models. Framework policies in areas such as taxation and investment may need to be further adjusted to enable economic diversification and a shift to higher value-added products and services;

- ***Regularly and consistently apply green growth criteria to framework and sectoral policies:*** The development of framework and sectoral policies needs to be aligned with green growth principles. To this end, strategic environmental assessment should be

systematically applied to policies, strategies, legal acts and public expenditure programmes;

- ***Analyse the green economy and trade nexus:*** EECCA countries need to monitor the evolution of consumer demand and preferences in countries that are their major trade partners. This may be useful for shaping up policies in support to the increase of exports;

- ***Make careful use of green public procurement to foster markets for new products and services:*** Green public procurement is a potentially useful instrument if designed with full consideration of possible market distortion. Regional-level work in this area, involving EECCA countries and their major trade partners, in particular the European Union, seems to be the most effective way of promoting sustainable procurement policies that are open and non-discriminatory;

- ***Support SME development in a way that they contribute to green growth:*** SMEs will have to receive more attention, particularly due to their limited resources but important job-creation and innovation potential. To green the SME sector, adjustments in the regulatory frameworks are necessary to make regulatory requirements proportional to environmental risks and the capacities of SMEs. Opening (green) public procurement to SMEs may also help in strengthening green innovation in such firms. In addition, a closer look at supply chains, which are a major avenue for SME greening, is required;

- ***Reform the institutional framework for innovation:*** Further efforts are needed to establish the enabling conditions for green innovation. This includes such measures as strengthening the rule of law, and protection of intellectual property rights. Maintaining a sound macroeconomic climate, including the sustainability of public finances, is also an important condition for boosting private and public investment in innovation. Closer links should be established between the scientific research community and firms. Environmental policy instruments should provide incentives for innovation through the use of such tools as environmentally related taxes and performance-based permitting;

- ***Develop skills to fully reap the green job creation potential:*** Labour policies should facilitate the transition of workers from declining to new, green emerging sectors by providing them with necessary training. Policies that increase the adaptive capacity of labour markets need to be combined with flanking measures, such as unemployment insurance and in-work benefits, which assure that dynamism is not achieved at the cost of excessive insecurity of workers and their families. The environment should be integrated into policies for higher education;

- ***Carefully monitor income distribution patterns and prevent negative impacts of green growth policies on income distribution:*** An important transition lesson is the need to account for distributional impacts in order to secure the population's well-being and support for a new development model. Therefore, prior to embarking on any green growth policies, the governments need to study their distributional impacts, develop and implement specific measures to address the negative impacts on lower-income groups.

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CHAPTER 3:
ECONOMIC SIGNIFICANCE AND VALUE OF THE NATURAL CAPITAL

Chapter 3 addresses the current situation and future challenges at the interface between economic development and natural resources use in EECCA. Given the huge economic and social significance of natural resources in the region, making their use sustainable is one of the most urgent steps towards preserving and greening their economic growth.

In order to promote the adoption of a greener model of growth, the natural capital's value should be fully accounted for in both the short and long-term perspectives. The contribution of this type of capital to well-being is, however, in great part overlooked. Certainly, the economic significance of raw materials is evident: in many countries, which are at the beginning of supply chains, the extraction of natural resources as such is a very prominent (and sometimes dominant) economic activity. At the same time, sectors related to natural resources provide many jobs, particularly in low-income countries. The natural environment also acts as an important "service provider" to the economy (*e.g.* as concerns water purification or crop pollination) and as a sink for pollution. The current chapter makes an attempt to discuss the extent to which these, in great part economic, functions of natural assets contribute to, or stifle, growth in EECCA.

Revenue related to the use of natural resources

The prominent role of natural resources in the EECCA economies is a consequence of the region's rich endowment (see examples in Box 3.1), though it also shows structural problems in these countries. Extractive industries, primarily oil and gas, constitute the lion's share of income in several countries, including, most importantly, Azerbaijan, Kazakhstan, the Russian Federation and Turkmenistan. For example, hydrocarbons accounted for 30% of Russia's GDP in 2008. In 2008, mineral fuels, mining and quarrying comprised 52.5% of the GDP in Azerbaijan, with oil and gas making up almost all of that. In the same year, the extractive industries accounted for 57% of industrial production in Kazakhstan, and over 18% of the country's GDP. In these countries, the recent rebound of oil prices (and an increase in commodity prices more generally) constitutes a positive development for current accounts, though price volatility remains a risk factor for growth. In other countries, income from mineral extraction is less impressive but high, while agriculture often provides an important contribution to their GDP (see also country profiles).

Box 3.1. Endowment with natural resources: Examples from EECCA countries

The **Russian Federation** holds the world's largest reserves of natural gas, and the 8th largest reserves of oil. Siberia contains approximately 20% of the world's forests, and Russia is so richly endowed with mineral deposits that it is nearly self-sufficient in industrially important minerals. The Kursk Magnetic Anomaly alone contains up to one sixth of the world's known iron-ore deposits.

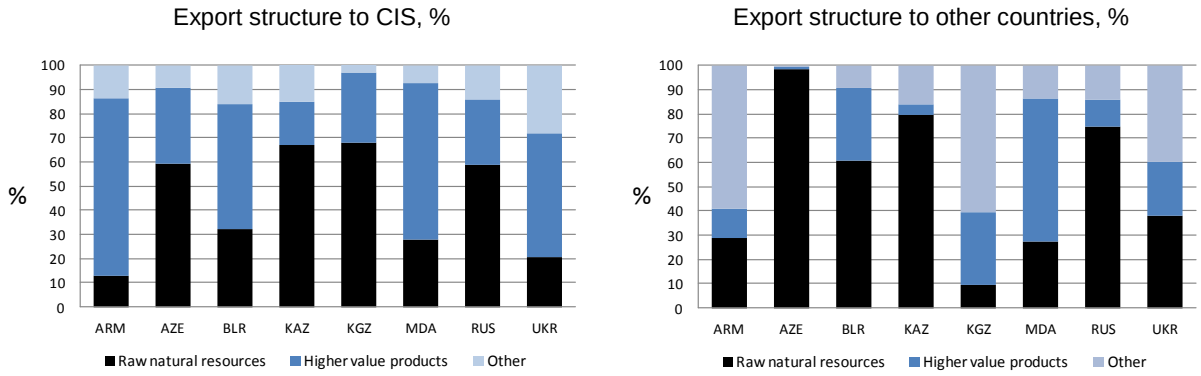
Central Asian countries have significant oil, gas and coal reserves. The vast majority of the oil and coal reserves are located in Kazakhstan, while Turkmenistan leads in gas reserves, trailed not far behind by Kazakhstan and Uzbekistan. The Caspian Sea has estimated oil reserves of 75 billion barrels, nearly as much as currently estimated Russian oil reserves, and 6.9 trillion cubic meters of natural gas. Kazakhstan is a major global producer of many minerals, including copper, gold, iron, lead, manganese, zinc and rare-earth elements. Kyrgyzstan has important mineral resources. Turkmenistan is the fourth largest producer of natural gas in the world, with vast untapped reserves. Uzbekistan is the world's fourth largest producer of cotton, and it also produces a range of minerals and metals, of which gold and uranium are globally significant. Uzbekistan has important gas reserves, as well as reserves of copper, zinc, lead, and uranium.

In the **Caucasus region**, Azerbaijan holds the most economically valuable natural resources. Azerbaijan produces metals and minerals but its primary resource is oil and gas. Since independence the focus of the mineral fuels industry has been to develop fields in the Caspian Sea. Armenia is the sixth largest producer of molybdenum in the world. It possesses significant deposits of copper, gold, iron, lead, molybdenum, rhenium and zinc, as well as raw construction materials. In addition to currently produced minerals, Armenia has the potential to produce uranium. Georgia produced many minerals during the Soviet period, including arsenic, copper, lead, manganese, and zinc. While production dropped dramatically after independence, investment is intended to revive production. At the same time, the Georgia's current role is to serve as a transport route, with three major oil and gas pipelines running across its territory.

Sources: Levine and Wallace (2009); World Bank (2008).

In all EECCA countries, exports are dominated by natural resources (Figure 3.1), principally by non-renewable mineral products or products of natural resource-related sectors such as agriculture, fisheries or forestry. For instance, oil, gas and, to a lesser extent, other minerals made up 73% of Kazakh exports in 2008, with metals accounting for another 15%. Oil and gas also make up over 80% of export earnings in Turkmenistan. Gold may account for 20% of export earnings in Uzbekistan, though cotton remains the most important export commodity. The export of renewable resources (*e.g.* wood or derived products) is quite low and, except for Georgia and Moldova, agricultural products are mostly traded within the Commonwealth of Independent States (CIS).

Figure 3.1. Export structure in selected EECCA countries (2009), %



Source: Interstate Statistical Committee of the CIS (2010), data grouping and calculations by OECD Secretariat.

These data show that several EECCA countries have largely preserved the model of a *rentier* state that emerged during the Soviet period. The literature discussing this model's repercussions on the development of the Russian Federation is abundant. Among others, this model means high dependence upon the fluctuations of the world commodity markets and demands of foreign consumers. Today, these markets and demand are on the rise. However, their evolution in the future is not certain. A shift towards a more diversified and higher value-added economic structure is, therefore, necessary.

Box 3.2. The natural resource curse – Symptoms and origins

The term "natural resource curse" has been introduced to depict the phenomenon where abundance of resources is associated with poor development outcomes. Its manifestations include rent-seeking and corruption, crowding out of manufacturing and underinvestment in human capital, rising exchange rates and consequent underperformance of other sectors, unsustainability of non-renewable resource extraction (depletion of natural capital), and boom and bust cycles. Poor economic performance in many natural resource-rich economies may have been caused by weak resource management institutions, structures of ownership and control, notably state-owned or state-controlled monopolies. An important detail is that natural resource extraction concessions are usually issued by governments that control or own the resources. Such concessions are usually given to large enterprises, whether governmental or private. The necessarily large size of enterprises operating in this sector reduces or eliminates competition for concessions, and companies often end up in monopolistic or cartel positions. Once installed in these positions, they seek to protect these positions and rents, which may involve bribery of governmental officials. This leads to a situation where rent seeking and corruption are more likely than in manufacturing or service sectors where market competition is typically fierce.

Source: OECD (2008).

Several countries, most importantly Kazakhstan and Russia, have already set a respective long-term objective at the highest political level. Institutional frameworks need to be improved to support such a shift, which is a very difficult task, while the role of institutions is decisive in successfully curbing the resource curse (*e.g.* as demonstrated by Norway and Canada). More generally, when examining the dominance of the natural resources sector in certain economies, existing studies are divided on whether resource abundance translates into faster or slower economic growth (WTO, 2010). Some stress the risks of over-specialisation in the resource sector, including de-industrialisation, problems associated with excessive price volatility, economic instability and civil conflict. Others, however, point to examples of economies (such as Norway and Chile, for example) that have successfully harnessed resource specialisation for economic growth, and conclude that other factors, besides a resource endowment, are key predictors of economic success or failure.

Albeit slowly, adherence to the principle of transparency of revenues related to natural resources, especially oil rents, is increasing throughout the region. An important role in this process is being played by the Extractive Industries Transparency Initiative (EITI). Several EECCA countries have joined EITI. Azerbaijan was the first country to be considered as compliant by the EITI Board in 2009. Kyrgyzstan is now also part of the list of 11 compliant countries. Kazakhstan is among the 24 candidate countries, and Ukraine is working to acquire the latter status, which is awarded only upon meeting four sign-up criteria. EITI requires regular publication of reports on revenues from natural resources, subject to external audits according to international standards and a validation process.

At the same time, there is still much to be done to ensure accountability and transparency in natural resource-related sectors, particularly because of their susceptibility to corruption and illegal activities. Knowing that implementation is very weak in the EECCA region, full adherence to principles may mean very little in reality.

Finally, there is a widespread perception among policy-makers and citizens that the natural resource richness, at least in a few EECCA countries, is unlimited. Though most of these counties are indeed richly endowed with natural resources, according to some sources, their "economic" depletion (*i.e.* extraction at competitive prices) is not a matter of remote future. In the least obvious example of Russia's mineral resources (Table 3.1), with the costs of their extraction increasing, the Russian business is looking to gain access to strategic minerals in regions where costs are lower, in particular in Sub-Saharan (Southern) Africa. This is mostly done by company acquisitions, which sometimes have a poor environmental record (Gerasimchuk I., 2009).

Table 3.1. Depletion of economically profitable mineral reserves in the Russian Federation

Mineral	Year in which Russia will deplete		Mineral	Year in which Russia will deplete	
	Economically productive reserves	All reserves		Economically productive reserves	All reserves
Lead	2007	Beyond 2025	Tungsten	2016	Beyond 2025
Manganese ores	2008	Idem	Platinum-group metals	2018	Idem
Zinc	2011	Idem	Graphite	2018	Idem
Chromium	2013	Idem	Coal	Beyond 2025	Idem
Diamonds	2013	Idem	Phosphate	Idem	Idem

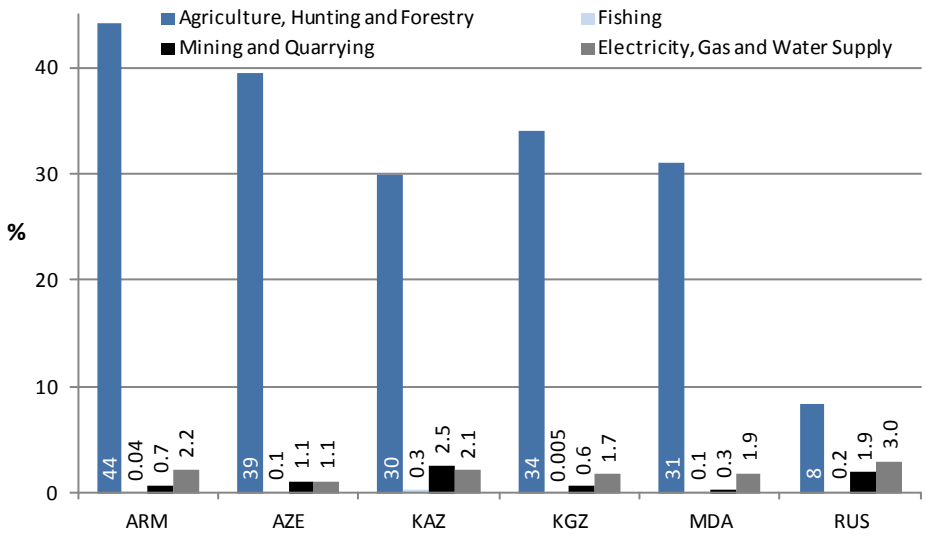
Mineral	Year in which Russia will deplete		Mineral	Year in which Russia will deplete	
	Economically productive reserves	All reserves		Economically productive reserves	All reserves
Quartz	2013	2013	Potash	Idem	Idem
Tin	2015	Beyond 2025	Bauxite	Idem	Idem
Uranium	2015	Idem	Iron ores	Idem	Idem
Gold	2015	Idem	Natural gas	Idem	Idem
Oil	2015	Idem	Vanadium	Idem	Idem
Copper	2016	Idem	Fluorspar	Idem	Idem
Nickel	2016	Idem	Salt	Idem	Idem

Source: Gerasimchuk, I. (2009).

Natural resources and employment

The share of employment in sectors that are related to natural resources (such as agriculture, hunting and forestry, fishing, and mining and quarrying) oscillates between some 10% in Belarus and over 60% and Tajikistan (Figure 3.2). Agriculture is the top job provider in most EECCA countries. In Georgia, where revenue related to natural resources has been steadily declining and does not exceed 15% of the GDP, the role of agricultural employment remains high. In several countries, *e.g.* Armenia, Azerbaijan, Kazakhstan, the Kyrgyz Republic and Moldova, the number of people employed in the mining sector has been increasing lately, though the share of employment in this sector is one of the lowest in the economy.

Figure 3.2. Share of population employed in sectors directly related to natural resources in EECCA countries (2008), % of total employment



Note: Data are not available for Belarus, Georgia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. The latest year available is 2008.

Source: International Labour Organisation database: http://laborsta.ilo.org, last accessed in May 2012.

Turning these sectors "greener" will not erode jobs: on the contrary, opportunities for new jobs emerge, *e.g.* with the development of organic farming or more responsible mining. Globally, green jobs in agriculture are on the increase, with studies showing that organic farms provide more jobs per unit of production and sales than conventional farms. Sustainable, organic agriculture requires smaller-scale farms and less reliance on machines, and, therefore, generates more employment. While the prospects for job growth in the forestry sector are more mixed, forestry provides steady employment. Aforestation initiatives linked to increasing demands for wood fibre as well as carbon sequestration to mitigate climate change will provide additional jobs in the coming decades.

Economic consequences of unsustainable use of natural resources

Unsustainable use of natural resources is often accompanied by important losses in revenues, markets or jobs. The facets of this phenomenon are multiple, including, most importantly, inefficient or illegal extraction, though natural "economic" depletion happens as well, as already mentioned.

One of the most vulnerable resources is water (see the next Chapter that, among others, discusses water use efficiency in EECCA). Another example of unsustainable resource management with important economic repercussions is fisheries. In 2007, the European Environmental Agency (EEA) reports that marine resources in EECCA countries are in a poor state, with overfishing, poaching, eutrophication and industrial effluent, including oil spills, as the main causes of marine damage. In the Black Sea, the fish stocks of most valuable species have collapsed by the late 1960s already, mainly due to unregulated fishing. One of the most telling examples of marine mismanagement in the region is the Caspian Sea. Catches of sturgeon, its key resource, have fallen dramatically over the past years (from 13 300 tonnes in 1990 to 800 tonnes in 2005), which has resulted in significant economic consequences for the region. Poaching activity in the Volga-Caspian basin was estimated at 10-12 times the legal catch (WWF, 2002). In recent years, overfishing has threatened the sturgeon population in the Caspian to the point that sturgeon fishing had to be banned completely by the riparian states[2] until the population recovers. Without appropriate enforcement actions, the continuing illegal caviar harvesting will further endanger the fish stocks.

Deforestation in countries as different as Armenia and Russia is another example of stock depletion. Although the Food and Agriculture Organization (FAO) statistics show that since the start of the transition period, most EECCA countries have maintained or even increased their forest cover, one particular challenge is illegal logging. Illegal logging, which often results in the loss of high-value species and soil erosion, accounts for more than 10% of all logging in Armenia, Azerbaijan and Tajikistan.

The main cause of illegal logging is its high profitability (Box 3.3). In Armenia, related illegal earnings are estimated at USD 140 million annually. According to the World Bank, if logging continues at the current rate the forest will be completely destroyed in Armenia within 20-30 years. The World Wildlife Fund (WWF) estimates that illegal logging in Russia is at least 20%, reaching 50% in its far eastern regions. In those regions, it is China's wood market that fuels illegal logging. According to WWF, more than a third of Russian logs are smuggled into China from Siberia, home to the world's largest forest and arguably the most threatened.

[2] In 2006, the Convention on International Trade in Endangered Species (CITES) prohibited international trade of caviar products due to the fact that sturgeon was on the verge of extinction.

Globally, it is estimated that illegal logging in public lands alone causes losses in assets and revenue in excess of USD 10 billion annually.

Box 3.3. Illegal logging in Armenia and the Russian Federation

Armenia. Forests cover approximately 10% of Armenia's land area; primary forest accounts for 0.5% of the land area. The rate of deforestation has risen in recent years and is now around 1.4% per year. Nine percent of households use wood for heating and cooking, and wood is demanded by the construction sector. Research suggests that 630,000 cubic metres of timber are illegally logged in Armenia annually, earning over USD 140 million for wood processing companies. Companies are using approximately 10 times the amount permitted by government. It is hoped that, as more of the population gets access to gas supply, at least the demand for fuel wood will fall. Because of limited timber supply, Armenia has traditionally been a net importer of wood; however, the recent tax legislation created zero tariffs for exporting and 20% tariffs for importing. According to NGOs, this has created a further incentive for illegal timber extraction. The government has recognised the seriousness of the problem, but has yet to produce concrete policies to tackle the situation.

Russia. Russia has the largest forest area in the world. These forests not only have an important role to play for people in the area and irreplaceable indigenous biodiversity, but also a major impact on the global climate system. Forty percent of Russia's vast forest resource remains inaccessible for logging due to the mountainous landscape and the lack of infrastructure. Where forests are accessible, areas are logged heavily and often apparently illegally. This is particularly evident around railroads and population centres and in Siberia and the Russian Far East. Many areas that have been clear-cut and particularly those located on the fragile permafrost have become virtual deserts. Vast amounts of timber are exported from the Russian Far East and Siberia annually. While it is difficult to gather exact export numbers, a clear trend is apparent: the export of raw logs to the Asia-Pacific countries has increased, while the export of sawn wood and wood chips has decreased.

Source: Chatham House's web site.

Consumer countries sometimes contribute to the problem of illegal logging by importing smuggled timber and wood products. Over the last few years, however, some of them have taken a series of measures to try to ensure that they exclude illegal timber products from their markets. The bilateral voluntary partnership agreements negotiated between the European Union and timber-producing countries, which will establish a licensing scheme for legal timber, offer potentially effective controls coupled with support to tackle underlying governance failure. However, these licensing schemes will take time to be set up and will not cover the entire trade. The extension of the Lacey Act[3] to timber in 2008 provided the United States with an effective means of encouraging sustainable practices in the timber industry. The EU's 2010 timber regulation (entering into force in 2013) is expected to have a similar impact, combining a prohibition against placement of illegally harvested timber on the market with specification of due diligence requirements to minimise the risk of such placement. Procurement policies requiring government bodies to purchase only legal (and, usually, sustainable) timber can prove very effective in excluding illegal timber from segments of a consumer country's market. All these developments will encourage the spread of voluntary certification and legality verification schemes, but are also likely to expose them to fraud-related pressures.

At the same time, the international context of natural resource consumption is changing, especially with many emerging economies now becoming major importers of natural resources. This increased demand for natural resources makes improved domestic resources management even more urgent (but also difficult) for countries in transition where the features of imperfectly

[3] The US Lacey Act makes it illegal to handle fish or wildlife produced illegally outside the US. An amendment to the Lacey Act to extend it to timber products was agreed by the US Congress in June 2008. The Lacey Act was introduced in 1900 to prevent transportation of illegally captured wildlife across state lines.

or unevenly developed legislation and governance may be compounded by economic pressures to draw on natural resources unsustainably.

In some cases, current losses can be transformed into revenue. An illustrative case is gas flaring during oil extraction. Through gas flaring, countries of the region waste energy at the point of production and contribute significantly to greenhouse gas emissions. In 2006, Russia, Kazakhstan, Azerbaijan, Uzbekistan and Turkmenistan flared 63 billion cubic metres of natural gas, according to a recent survey on gas flaring using satellite data. This is equivalent to about 1.5 times France's annual consumption of natural gas. Russia is the largest gas-flaring nation in the world and Kazakhstan is the fifth worldwide. Besides lost opportunities, oil extracting companies have to pay fines if they exceed limits of allowable flaring. These fines are too small to force a rapid switch in behaviour even though government authorities, *e.g.* in Kazakhstan and Russia, apply such fines systematically. Savings from reduced flaring may be quite important (Box 3.4) if incentives are put in place by governments. The region's flared and vented gas could provide feedstock to 70 Giga Watts of combined cycle gas turbine plants, or about 2.3 times the installed capacity in Poland. Azerbaijan, Kazakhstan, Russian Federation, Turkmenistan and Uzbekistan are all members of the public-private Global Gas Flaring Reduction Partnership (GGFR), which is facilitated by the World Bank's International Finance Corporation (IFC). GGFR partners have established a collaborative "Global Standard" for gas flaring reduction.

Box 3.4. Gains from reduced gas flaring and venting in EECCA

Most flaring occurs when oil production produces associated gas. Some flaring and venting is needed to ensure safe operation, but most associated gas is flared and vented because there is no infrastructure or market to use the gas. Flaring and venting-associated gas wastes potentially valuable energy. At a price of natural gas of USD150–300 per thousand cubic meters, the annual value of the region's flared and vented gas is on the order of USD10–20 billion. In 2007, the Global Gas Flaring Reduction study on gas flaring in Russia showed that associated gas is a substantial short-term gas resource that can be developed at a relatively low risk and cost – if the government puts in place the necessary regulatory and economic incentives.

Source: The World Bank (2010).

Value of natural capital and the wealth structure

Methodological imperfections and a widespread lack of policy-useable information on the value of natural capital (and its depletion) has been a major factor impeding decision-makers to see future growth constraints related to the natural resource use. Traditionally, Gross Domestic Product (GDP) has been applied to measure economic progress. This measure, however, fails to grasp the evolution in the value of a nation's assets and to reveal the decline in its natural or social capital, which are indispensable for the sustainability of growth. Internationally, an intensive search and testing of alternative measures is underway, involving a large array of governmental and non-governmental stakeholders. One of the possible approaches, which could complement the monitoring of GDP evolution, is to measure total wealth and its structure.

The wealth accounting approach, as suggested by the World Bank (World Bank, 2005) and further developed by UNEP (UNEP et al., 2012), presumes that development can be treated as a process of "…building and managing a portfolio of assets. The challenge of development is to manage not just the total volume of assets – how much to save versus how much to consume – but also the composition of asset portfolio, that is, how much to invest in different types of capital, including the institutions and governance that constitute social [intangible] capital" (World Bank, 2011). Natural capital is one of the major components that contribute to wealth.

Though the wealth accounting approaches are still under development and have a number of flaws (*e.g.* the World Bank's approach fails to incorporate the cost of fisheries, value of renewable energy resources, water resources and ecosystem services, or exposure to commodity price volatility), they can be a helpful for moving the discussion on the value of natural capital forward. This is particularly true against the background of very limited progress with adopting more integrated Systems of Environmental and Economic Accounting (SEEA)[4] and advancing the design of issue-specific SEEAs (*e.g.* for water). Though environmental-economic statistics have tended to improve, with national statistics offices in most EECCA countries issuing data on a small set of indicators annually, many information gaps still persist, chiefly in the areas of material balances and resource accounting more generally. There is little progress in establishing natural resource inventories.

According to World Bank calculations[5], people in EECCA are less wealthy (in absolute terms) compared to an "average" world citizen (see Table 3.1), including in terms of their possession of natural capital (except for Azerbaijan, Russia, and Uzbekistan). Natural capital, however, is particularly important in the total wealth structure in EECCA: it oscillates between 11% of total wealth in Armenia and 76% in Azerbaijan, compared to only 2 % on average in OECD countries.

Table 3.2. Total wealth and wealth per capita in EECCA in 2000 and 2005

Country	Total wealth (billion USD)		Wealth per capita (thousand USD)		Natural capital (2005)	
	2000	2005	2000	2005	Thousand USD per capita	Share of total
ARM	58	88	18.7	29.2	3.1	11%
AZB	89	128	11.0	15.3	11.7	76%
BLR	346	467	34.6	47.8	6.0	12%
GEO	84	119	17.9	26.6	3.3	13%
KGZ	36	54	7.2	10.6	3.0	28%
MDA	46	68	11.1	17.4	4.1	24%
RUS	7 638	10 471	52.2	73.2	31.3	43%
TJK	27	44	4.4	6.7	1.8	26%
UKR	968	1 380	19.7	29.3	6.9	24%
UZB	152	139	6.2	5.3	7.7	…

Note: Data for Kazakhstan and Turkmenistan are not available. Calculations for Uzbekistan are not shown since they are strongly biased because of a significant erosion of intangible capital. The **wealth accounting methodology** is based on a theoretical estimation of total wealth. **Produced capital** comprises machinery, fixed assets, and equipment. **Natural capital** comprises agricultural land, protected areas, forests, minerals, and energy (and does not include fisheries, water, and ecosystem services). **Intangible capital** is measured as a residual, the difference between total wealth and produced and natural capital. It implicitly includes measures of human, social and institutional capital that contribute to an efficient economy.

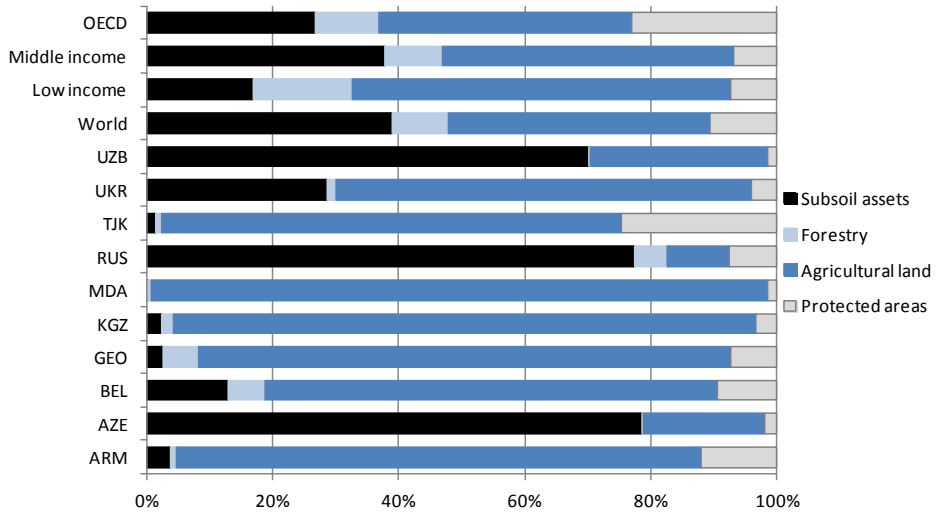
Source: The World Bank (2011).

[4] An international statistical standard on SEEA was adopted in 2012 by the Statistical Commission of the United Nations at its 43rd session. Within a SEEA, the trade-offs of development decisions that affect natural resources and associated services are made explicit. See more at unstats.un.org/unsd/envaccounting

[5] The World Bank data are used in this report because of their wider geographic scope. UNEP *et al.* (2012) calculations of "inclusive wealth" have covered only the Russian Federation.

Worldwide, land resources (including crop land, pasture land, and protected areas) constitute the highest share of the natural capital: 52% of the total. Subsoil assets account for 39%, and timber and non-timber forest resources account for the remaining 9% of the natural capital. The situation in EECCA is different and, at the same time, very diverse (Figure 3.3.). In Azerbaijan, Russia and Uzbekistan (and presumably Kazakhstan and Turkmenistan), the "primary" assets are non-renewable mineral resources. Agricultural land has a dominant position in the rest of EECCA, particularly in Moldova and the Kyrgyz Republic where it constitutes 98% and 92% of the natural capital, respectively. Forest resources and protected areas have a very small share of natural capital in all the countries. Countries where the natural capital structure is balanced are rare, only Georgia and Belarus exhibiting some sort of balance. What policy conclusions can emerge from the knowledge of wealth structure? How can they inform the decision-making on economic growth? Below are some examples that could inspire EECCA countries in this respect.

Figure 3.3. Natural capital structure in EECCA in comparison with world average and other groups of countries (2005)



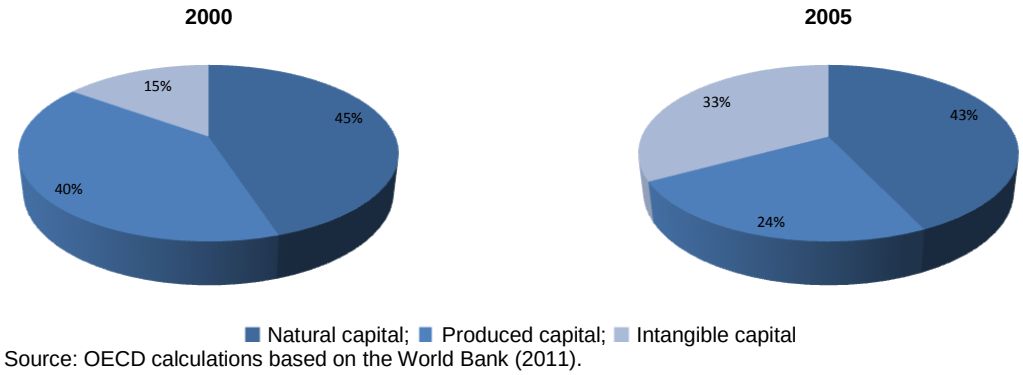
Note: Data for Kazakhstan and Turkmenistan are not available though one can assume that subsoil assets are likely to be predominant in their natural capital structure.

Source: OECD calculations based on the World Bank (2011).

The predominant position of non-renewable resources in the wealth structure in five EECCA countries means that besides rationally managing their natural resources these countries need to be very careful how they invest the income from resource extraction and whether natural capital is transformed into other forms of wealth[6]. The only available data set that can shed light on the actual situation with re-investment of the natural capital in this group of countries refers to the Russian Federation (Figure 3.4). It shows that in 2000-2005 the country has increased its intangible capital from 15 to 33%. At the same time, the physical depletion of mineral resources stocks was compensated by an important rise in market prices, thus keeping the total value of the natural capital almost unchanged.

[6] Non-renewable resources can only be depleted, as they do not regenerate themselves over humanly meaningful time spans. The revenue generated from non-renewable resource depletion should be measured as a loss of capital rather than as income comparable to that derived from renewable resources.

Figure 3.4. Evolution of the wealth structure in the Russian Federation (2000 and 2005), %



Source: OECD calculations based on the World Bank (2011).

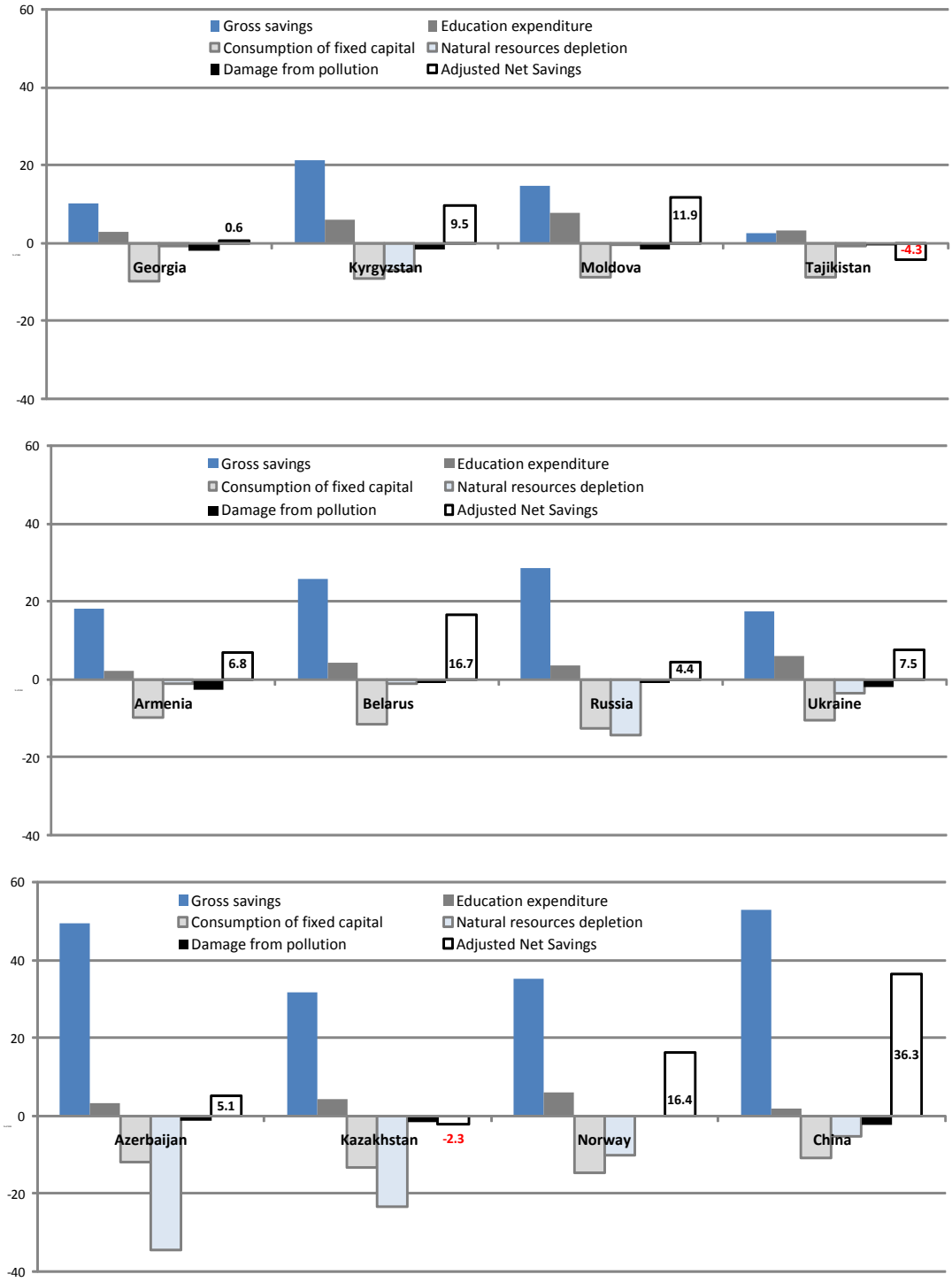
For EECCA countries that are dependent mostly on renewable resources, such as Georgia, Kyrgyzstan or Moldova, their sustainable management is essential in order to enjoy long-term revenue flows. Certainly, it has to be combined with a careful investment of revenue from these natural resources. Following a better understanding of costs of ecosystem services, some countries may want to make adjustments in the structure of their "renewable" natural capital, *e.g.* by increasing the share of capital derived from forestry or protected areas. Due to global carbon financing and the need for carbon sequestration, this path may become more attractive for those EECCA countries that derive a large part of their natural capital from agricultural land, which could be re-converted into forests. Ecotourism development can go hand-in-hand with the expansion of protected areas.

The total wealth accounting, however, does not yet correlate sufficiently well with current systems of national accounts. In a longer term, this methodology could be improved and used by countries to measure their wealth.

A complementary indicator, the "adjusted net savings" (also known as genuine saving), has been developed by the World Bank. Adjusted net savings measures the true rate of savings in an economy after taking into account investment in human capital, depletion of natural resources and damage caused by pollution. It is derived from standard national accounting measures of gross national savings. Judging by this indicator, the situation in EECCA is not very optimistic (Figure 3.5).

In several countries, the depletion of natural resources equals a very high share of Gross National Income, with historical peaks at over 60%. This leads to adjusted net savings that are very low or sometimes negative in comparison with data that do not take account of environmental factors and investment in human capital. This means that countries are either losing their chance to accumulate wealth from natural resources or accumulating it at a pace that is much lower than if their policies were more supportive of the formation and preservation of the human and natural capital. In some EECCA countries, this fact is highly contradictory to the traditionally assessed pace of growth, which was very high since the turn of the century.

Figure 3.5. The value of adjusted net savings in EECCA in comparison with Norway and China, % of GNI



Note: The calculations are based on data for the last year available.

Source: World Bank (2012), The Little Green Data Book 2012.

Very few decision-makers and even experts in EECCA are acquainted with this kind of information, which is a problem that could be addressed in a relatively short term. More difficult is to address the lack of sound data which enable calculations of adjusted net savings and their integration into national accounts. This picture, which may seem rather abstract, needs to be complemented by some information that is easier to understand for the general public. In this context, traditionally collected and disclosed information, such as the rate of deforestation, evolution of protected areas, or number of threatened species remains useful. Data on deforestation, for instance, are quite encouraging, showing that this phenomenon was stopped in all but two EECCA countries (Armenia and Kazakhstan).

A helpful measure would be to make project-specific data on how revenues from the depletion of non-renewable resources are spent publicly accessible. Azerbaijan could serve as an example where international organisations report progress in the transparency of revenue use (see Chapter 8). Collecting and publicly disclosing such data in a regular manner would offer a real management tool to decision-makers and would constitute an important factor driving economic re-structuring. Unfortunately, even where the amounts dedicated to specific projects are known, the effectiveness of those projects is not assessed, at least judging by a total absence of such information.

Limits to natural capital substitution

There are limits to the degree to which natural capital can be substituted by other types of capital, such as physical and human capital. Beyond a certain point, the maintenance of remaining natural capital becomes critical. This happens when life-supporting ecosystem services provided by natural capital are irreplaceable or can only be replaced at a very high cost. In many such cases, the value of alternate land use is actually low or zero. For example, a forest in a steeply-sloping terrain is likely to be the optimal use of this particular piece of land, given that it cannot readily be converted to agriculture. It may be possible to combine production of the goods provided by the forest (*e.g.* timber extracted in a sustainable way) as well as non-marketed services such as watershed protection. Conversely, exploiting this forest to exhaustion would entail its irreversible loss, with few, if any, compensating benefits.

This has given rise to the concept of "critical natural capital" beyond which there should be no further substitution. These irreplaceable resources include the world's major rainforests, biodiversity, freshwater supply, and climate regulation. Some countries had to devote significant resources to restoring critical natural capital at a cost much higher than preventing its degradation. Payments for ecosystem services (PES) are a relatively new instrument for addressing the issue of "critical natural capital".

Despite resource-intensity and relatively high transaction costs, PES schemes are increasing in number around the world, including in EECCA, sometimes with strategic support from the NGO and international communities. For instance, WWF has worked in Moldova, Romania and Ukraine to identify land uses and environmental services that could trigger payments from the European Union and national agencies, thereby supporting rural residents and protecting the environment (WWF 2006). Based on WWF's initiative, the Global Environment Facility has continued funding work in the Lower Danube Basin to mainstream PES schemes in the integrated river basin management context. The first PES project in Central Asia was launched in 2008 by the Central Asia Regional Environmental Centre in Kyrgyzstan in cooperation with the Swiss government, the US Forest Service and the Global Environment Facility, working with local stakeholders, including national and local authorities, water user and pasture user associations, local experts and the local population. The project aims to improve the ecological

health of alpine and sub-alpine ecosystems by making grazing practices more sustainable. The ecosystem services to be paid for are water supplies to the watershed, water quality, biodiversity and forest conservation, with upstream grazing farmers and national forest districts identified as sellers and irrigated agriculture farmers and tourists identified as buyers. Although this PES scheme has run into obstacles in the form of low ability and willingness to pay for the environmental services and a limited understanding of the relationship between upstream grazing practices and downstream water quality, the project is providing a unique learning environment and is serving as a springboard for further PES schemes in the region.

At the same time, reformers in EECCA need to realise that PES schemes are not particularly easy to design and implement and require a substantial amount of initial effort. Baselines for ecosystem services must be established in order to determine if PES provide additional value. PES schemes also depend upon social capital embodied in the trust between buyers and sellers and may require an intermediary such as an NGO. Moreover, transaction costs may be high. Therefore, incorporating a PES scheme into the policy mix necessitates careful weighing of the costs and benefits of such a scheme in comparison with other policy instruments. The environmental and cost-effectiveness of PES depend crucially on programme design and implementation. OECD (2010) identifies twelve criteria meeting which are essential for enhancing PES effectiveness.

Valuation of ecosystem services is an important challenge facing EECCA countries. For most ecosystem services, methods to assign value are just being developed. There is a clear lack of data and knowledge associated with the use of such methods in EECCA, as well as potentially high transaction costs of quantifying the services and their value. For instance, in an attempt to approximate the costs of ecosystem services in Georgia, the OECD/EAP Secretariat faced the problem to collect data as simple as land use structure.

Conclusions and ways forward

While designing their development strategies, EECCA governments may want to take account of the following considerations:

- ***Natural resource abundance in EECCA has been and will continue to be, at least in the short and medium-term perspectives, the basis for the creation of national wealth.*** Revenue from natural capital has to be managed very carefully and transformed into other forms of capital. Sustaining revenue flows from renewable resources requires their sustainable management, with due attention to the issue of "critical capital". Revenues from natural resources should be managed in a transparent way, including expenditure of those revenues.

- ***Shifting towards environmentally-oriented growth can enhance the value, job creation potential and revenue derived from natural resources.*** There are many opportunities in this sense, and countries need to look at such opportunities from the perspective of their specific needs and constraints. There are green growth-related branches, such as organic agriculture, with a potential that could be exploited in the short to medium term. Going green, however, should be part of economic restructuring and diversification that is necessary to overcome the current *rentier* model of economic growth in EECCA. Improving natural resources management is necessary in order to maintain the export potential given that in many countries a positive balance of trade is maintained due to the export of natural resources or derivative (but still low value added) products. Some of this trade may be affected by environmental requirements in

importing countries. The wider use of labelling for forestry products is just one example.

- ***Strengthening natural resource management institutions is a matter of priority for EECCA countries***. Improved institutions have a crucial role in avoiding the natural resource curse. To this end, EECCA countries may want to further reform the system of natural resource tenure, with a particular focus on environmental conditions of natural resources use and the transparency of rights allocation, *e.g.* as part of concession contracts negotiation. Enforcement of these rights and curbing illegal activities is also crucial. From an economic point of view, improved natural resource management is necessary in order to maintain the export potential. As shown in this Chapter, in many EECCA countries a positive balance of trade is maintained due to the export of natural resources or derivative (but still low value added) products. Some of this trade may be affected by environmental requirements in importing countries. The wider use of forestry products certification is just one example.

- ***Developing and putting environmental economic accounts into place*** is another important task for EECCA countries that want to invest wisely their natural capital. The efforts made by the international community to move towards a standardised methodology are building momentum for mainstreaming environmental accounting. Today some countries, like Canada, but also developing countries in Southern Africa, are using environmental accounting extensively. It is essential that countries participate in efforts to promote environmental economic accounting systems in line with the recently adopted international standard (EC et al., 2012).

- ***Promoting ecosystem valuation and piloting PES schemes*****:** Environmental ministries, particularly in partnership with ministries of economy, can catalyse a policy shift by demonstrating the costs of policy inaction on key environmental challenges, as well as the savings and revenue generation potential of improved production and consumer policies and infrastructure modernisation. Besides the traditional valuation of costs and benefits of environmental policies and laws, which is done sporadically in EECCA, this can include the valuation of ecosystem services, including their valuation under different management scenarios. Research and demonstration projects are needed to understand the various facets of ecosystem valuation in the region and launch of PES schemes. The OECD criteria for PES effectiveness could be applied to assess the feasibility of such schemes;

- ***Use environmental policies to enable the shift from the current reliance on exporting primary commodities to producing processed and manufactured goods.*** Export of raw materials supports manufacturing in other countries, but deprives exporting countries of much of the economic benefit of their resources. On their path to economic diversification and restructuring, EECCA countries may want to develop green businesses in order to stay competitive in tomorrow's markets (as China started to do by massively investing in alternative energy). As concerns the development of "traditional" manufacturing, environmental conditions of production will need to be reinforced and systematically applied in order to avoid another curse of old technologies. At the same time, environmental authorities in EECCA need to be careful with any regulatory initiatives so that additional administrative burden is not created, particularly on small businesses that are recognised as drivers of green innovation. While not under the control of environmental authorities, key framework conditions for developing processing and manufacturing capacity will need improvement. These

include: (i) sound macro-economic and industrial policies; (ii) appropriate levels of credit, including micro-credit for small, local entrepreneurs; (iii) policies aimed at supporting small and medium-sized enterprises; (iv) policies aimed at supporting research, development and innovation; (v) supporting innovation by SMEs, research partnerships, etc.; (vi) an appropriate education and skills base for workers and commensurate investments in education and skills training.

- ***Strategies for avoiding the resources curse will not work if EECCA countries do not embrace the principles of good governance.*** The recent economic and financial crises have demonstrated that EECCA countries are part of the global marketplace. To stay competitive in this marketplace, mature market conditions are necessary. Shifting "from government to governance" is one of them, perfectly applicable to natural resource management, where policy and management problems often resist swift or easy solution. Traditional policies and management practices that place decisions in the hands of narrow groups of technical experts, industry and decision makers have proven insufficient in the context of declining resource bases, competing demands by multiple stakeholders, and increasing knowledge of the complexity of natural systems and their interaction with human systems. Designing new governance arrangements for natural resources is a time-consuming process in which principles of good natural resources governance play a central organising role. It is, therefore, necessary to start now to receive dividends tomorrow.

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CHAPTER 4:
ENVIRONMENTAL AND RESOURCE PRODUCTIVITY

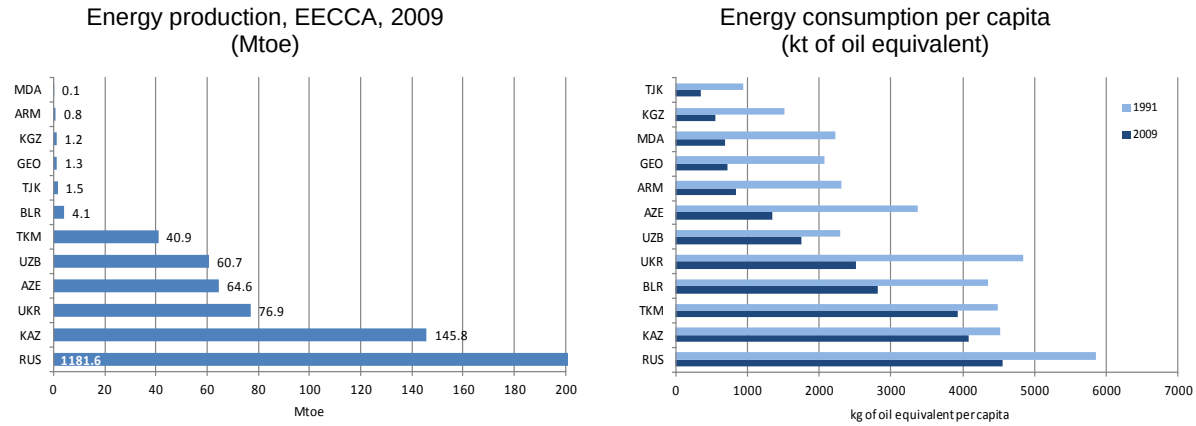
A central element of green growth is environmental and resource efficiency of production and consumption and its evolution over time and space and across sectors. Understanding this evolution and the factors that drive it is an essential ingredient of developing green growth policies. The main issues of importance to green growth include energy and carbon productivity as well as resource productivity. Other issues of importance include consumer behaviour and household and government consumption patterns. Given the scarcity of data on resource efficiency in EECCA, Chapter 4 addresses mainly the issues of energy, carbon and water productivity in the region.

Energy and carbon efficiency

Environmental impacts from energy production, transport and use are many and significant. They range from land and water contamination to fossil fuel extraction and transport, and from emission of local air pollutants and greenhouse gases (GHG) from fuel combustion to radiation from inadequate disposal of nuclear waste. Local environmental impacts may be considered more pressing issues for EECCA policy-makers (OECD, 2007), but the EECCA region generates nearly 10% of global GHG emissions (UNFCCC, 2007).

While reliable and affordable energy supply is a precondition for economic growth, ensuring access to energy, including access to affordable energy at the household level, is becoming a significant issue for EECCA countries. Besides factors related to energy prices and household income, this is partly due to infrastructure deterioration (World Bank, 2010), lack of sufficient domestic energy production in some countries, as well as wasteful energy consumption. Over the last two decades, several EECCA countries increased their total energy production (including Armenia, Azerbaijan, Belarus, Kazakhstan and Uzbekistan. Except for Uzbekistan and Turkmenistan, energy consumption in absolute terms has decreased, with several countries reducing it in a spectacular manner to levels twice and more lower than at the beginning of the transition period. All EECCA countries have seen a decrease of energy consumption per capita (Figure 4.1). More generally, access to energy services is not a major concern in the region, as EECCA countries have high connection rates to electricity and heat supply networks. But quality and affordability of services are a problem.

Figure 4.1. Energy production and consumption in EECCA



Source: International Energy Agency Database and the World Bank Development Indicators Database, last accessed in May 2012.

Energy supply (Table 4.1) is mostly based on non-renewable energy sources and inefficient technologies of energy production, as well as a highly intensive supply pattern. In some countries, *e.g.* Georgia, Kyrgyzstan and Tajikistan, the share of renewable energy sources, in particular hydropower energy, is relatively high. The use of biofuels and waste as energy sources is noticeable in Belarus, Russia and Ukraine. Still, the often abundant agricultural and forestry waste is not used as an asset by EECCA countries, *e.g.* Ukraine (OECD, 2012). The reliance on nuclear power is high in Armenia, which poses risks because of the country's location in a seismic zone. In several countries, for example in Kazakhstan and Kyrgyzstan (UNECE, 2007 and 2008), a continuous use of heavy oil and low-quality coal still poses health and environmental problems.

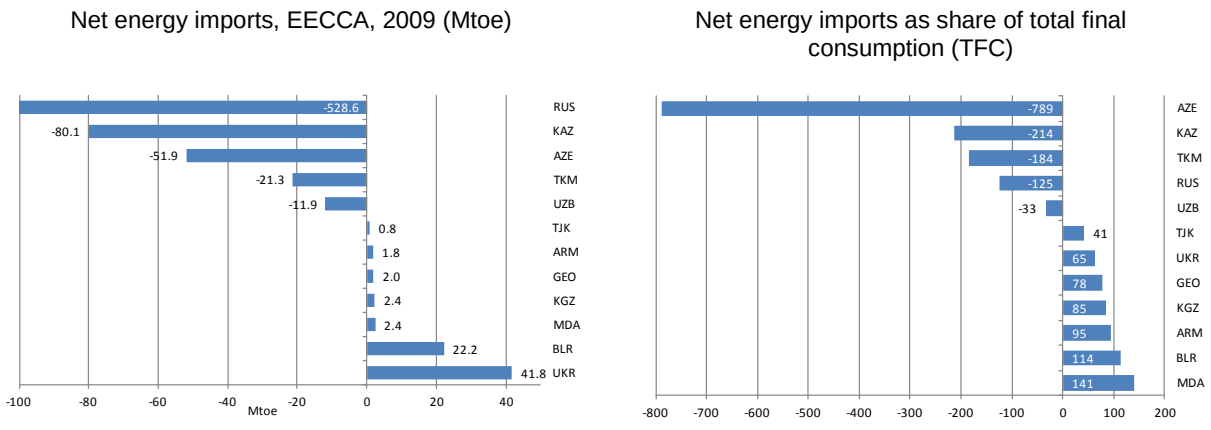
Table 4.1. Total primary energy supply structure, EECCA, 2009 (ktoe)

	Coal and peat	Crude oil	Oil products	Natural gas	Nuclear	Hydro	Geo-thermal, solar, etc	Bio-fuels and waste	Elec-tricity	Heat	Total
ARM	0	0	371	1409	650	174	0	1	-4	0	2601
AZE	0	6234	-2706	8225	0	199	0	0	-23	40	11968
BLR	513	21767	-12202	14688	0	4	0	1605	385	0	26760
GEO	205	15	861	1086	0	637	44	382	-42	0	3189
KAZ	31557	18655	-4260	19192	0	592	0	157	-58	0	65835
KGZ	433	75	1123	550	0	852	0	4	-28	0	3011
MDA	81	17	658	1481	0	5	0	82	126	0	2449
RUS	95271	243658	-105734	350295	42959	14980	399	6367	-1278	0	646915
TJK	92	22	478	363	0	1359	0	0	5	0	2318
TKM	0	7831	-3182	15070	0	0	0	0	-135	0	19584
UKR	35582	11654	1365	43810	21682	1019	4	878	-522	0	115472
UZB	1345	4808	-281	42141	0	802	0	0	-7	0	48809

Source: International Energy Agency Database, last accessed in May 2012.

Concerns about energy security exist in energy importing countries of EECCA, some of with a heavily dependent on imported energy (see Figure 4.2). An increased use of renewable sources of energy may address such concerns, at least partly. Georgia has made important progress on this path by increasing the share of hydro-power though there are serious concerns *vis-à-vis* the environmental sustainability of a rapid construction of multiple hydro-power stations in Georgia.

Figure 4.2. Net energy imports, EECCA (2009)

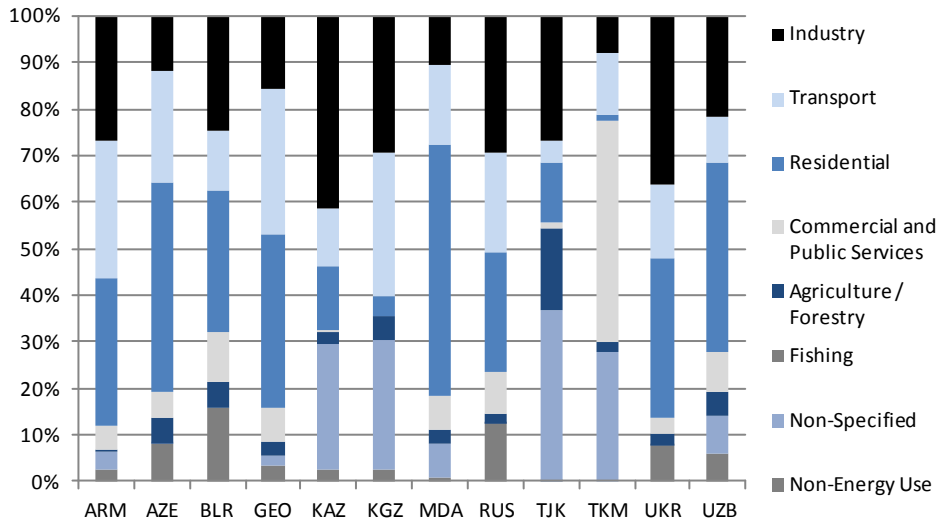


Source: International Energy Agency's Database, last accessed in May 2012.

The structure of energy consumption (Figure 4.3) is different across the EECCA region given that the structure of their economies differs. Many countries have high residential consumption, linked to an often inefficient housing infrastructure. Industrialised countries, such

as Kazakhstan, Russia and Ukraine, largely base their manufacturing activity on industries that are energy intensive, such as steel production.

Figure 4.3. Total final consumption structure in EECCA (2009), % of total



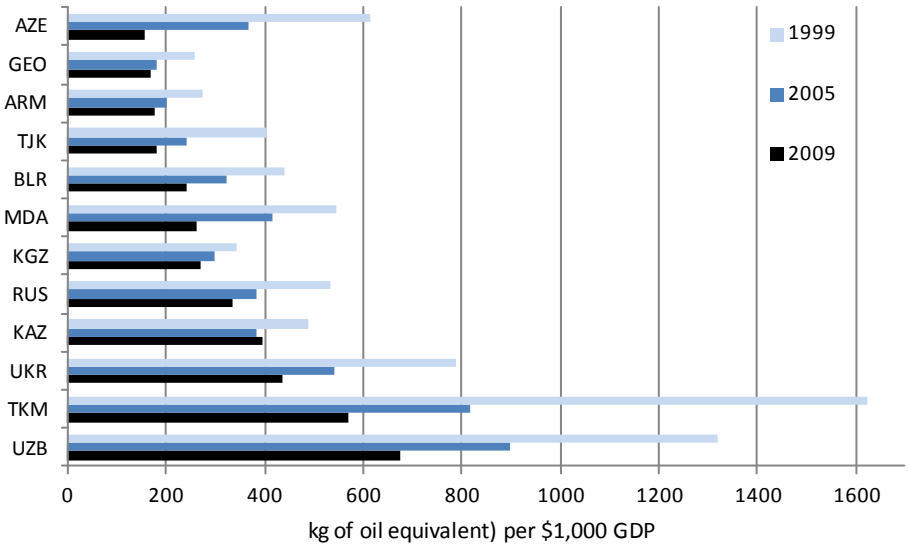
Source: International Energy Agency Database, last accessed in May 2012.

Despite improvements, often rooted in higher energy prices (EBRD, 2011), energy efficiency remains low in the entire region, and carbon emissions per unit of GDP in the region are among the highest in the world (Figure 4.4). Among EECCA countries, only Georgia approaches the OECD benchmarks. This reflects the region's reliance on abundant domestic coal, but also an outdated technology. In absolute terms, the region's largest emitters of CO_2 are Russia, Ukraine, Kazakhstan, and Uzbekistan, Russia being the third largest CO_2 emitter in the world, after the United States and China. The energy sector is the largest contributor to carbon emissions.

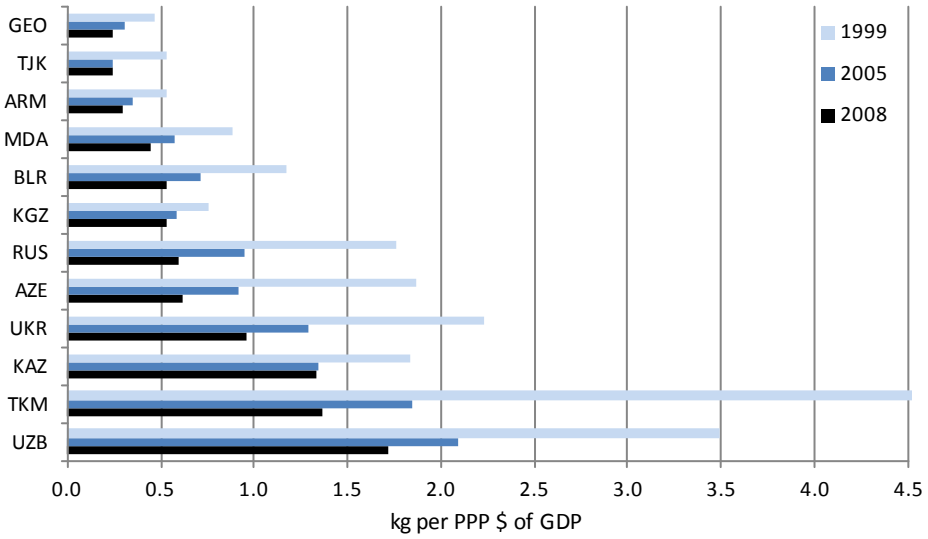
Natural factors, such as continental climate in many EECCA countries, can explain the comparative inefficiency of the energy sector in the region, but only partly. Sometimes, as in Kazakhstan and the Russian Federation, physical factors come into play. The huge distances at which energy is transported in these countries (and sometimes the state of energy networks) add energy costs. The high energy intensity of the economy is also determined by its structure where energy-intense sectors, including raw materials production and primary processing, dominate. However, the key reasons for the high energy intensity are outdated and inefficient technologies that remain in use across the entire region. This is the case, for example, in Ukraine, where smelting one tonne of steel in obsolete open-heart furnaces consumes almost four times more energy than in the European Union Countries or China (OECD, 2011). In the Russian Federation, the efficiency of industrial boilers is 30 % below the best international practice; district heating is extremely inefficient, with high losses in heat transportation and poor operation controls.

Figure 4.4. Carbon and energy efficiency in EECCA (1999-2009)

Energy use (kg of oil equivalent) per $1,000 GDP (constant 2005 PPP), 1999, 2000 and 2009



Carbon efficiency in EECCA: CO2 emissions 1999, 2000 and 2008 (kg per PPP $ of GDP)



Source: The World Bank Development Indicators Database, last accessed in May 2012.

Since the turn of the century, and more generally during the transition period, energy intensity has declined relatively sharply in many EECCA countries (EBRD, 2011). Besides a very low base, the reasons are changes in the economic structure (determined by an increasing share of services and de-industrialisation, as shown in Chapter 2), recovering production loads of industrial facilities (though not yet fully at the designed capacity) and high prices of raw materials and fuel. According to expert opinion, the potential positive impact of these factors has been practically exhausted, at least in the Russian Federation, and policy measures are needed to

ensure further improvements. In the absence of such measures, many EECCA countries are likely to face energy supply deficits (World Bank, 2010) that will strongly jeopardise growth.

The technical potential for improving energy efficiency using current technology is thought to be much greater in the EECCA region than in the rest of the world. The potential for reducing the amount of energy used for district heating is particularly large. In all EECCA countries, district heating accounts for a significant share of energy used in buildings. In many cases, heat is produced, distributed and consumed very inefficiently. Thus, modernising district heating plants and rehabilitating or replacing inefficient combined heat and power plants could reduce overall primary energy consumption in EECCA by an estimated 17% by 2030. Further energy savings could be realised by reducing heat distribution losses, by insulating buildings and by installing metering and thermostats in buildings to discourage waste.

The technical potential for energy efficiency in the Russian Federation alone is immense. According to Kokorin A. *et al*., the direct effect of modernising fixed assets can save more than 40% of the 2005 energy consumption. The same authors mention that this exceeds 2% of the global energy consumption and would result in a greenhouse gas emission reduction exceeding the annual emissions of Great Britain. Furthermore, if the efficiency of Russian production technologies and equipment approaches those of advanced industrialised countries, economic development over the next decades can take place without any increase in primary energy supply. Significant energy saving potential exists in all sectors of the Russian economy.

Based on year 2008 energy intensities, the International Energy Agency (IEA) estimated that, were the Caucasus and Central Asia sub-regions to use energy as efficiently as OECD countries, consumption of primary energy could be cut by 50%, or more than 80 million tonnes oil equivalent (Mtoe). This estimate is broadly in line with the results of other recent studies. For example, a 2008 UN study estimated the energy savings potential across all sectors through improved efficiency and conservation in Central Asia at 35-40% of the current consumption (UNESCAP, 2008). An earlier study put the potential even higher, at around one-half, some 60% of it in industry (including energy production), up to a quarter in housing, 7-8% in transport and 6-7% in agriculture (SPECA, 2007). The energy savings potential in both absolute and percentage terms is the greatest in Kazakhstan, where the energy use could in principle be lowered by more than one-half in the industrial, residential and commercial sectors. The savings potential is also very large in Turkmenistan – especially in the services and residential sectors, as well as in distribution systems – and in Uzbekistan, where about half of the over-consumption is related to inefficient industrial energy use. By contrast, the IEA appreciates that much of the potential that existed until recently in Azerbaijan has now been exploited, thanks in large part to pricing reforms.

In sum, energy savings potential is a very important and cost-effective source of additional energy "supply" in EECCA. The IEA (2010) notes that the pace of progress on energy saving will be largely driven by government policies. Evidence from the region suggests that the policy formula for success comprises three major elements: (i) a move towards market-based energy pricing, reliably regulated, as a means of triggering the investments needed to replace obsolete and inefficient technologies; (ii) metering of energy so that consumption can be attributed to individual consumers; (iii) a governance structure that can ensure that energy is regularly and fully paid for, as well as to provide targeted incentives and support for vulnerable social groups (to replace broad subsidies). Sufficient financing of energy investments and awareness among the private sector players about benefits of energy saving and returns on investment to raise energy efficiency are also important.

Where governments have managed to take action in all these areas, there has been a significant impact. Partial or erratic implementation of policies has not produced the same gains (Box 4.1). While the combination of pricing, metering and better sector governance can reduce waste, these are best seen as one-time gains related to the manifold inefficiencies inherited from the Soviet period. They are not a medium-term substitute for more sophisticated efficiency policies and measures, such as the development of new building codes or appliance standards, or the design of energy efficiency strategies and institutions. But they are an essential first step.

Box 4.1. Examples of successes and failures in energy efficiency in EECCA

In ***Azerbaijan***, price rises in 2007 were accompanied by a metering programme and efforts to improve collection rates, with the result that electricity consumption fell from almost 21 TWh in 2006 to around 17 TWh in 2007 and 2008, at a time when Azerbaijan's economy enjoyed double-digit growth.

In ***Georgia***, reform of the electricity sector since the late 1990s and the resulting reduction in commercial and technical losses meant that, for the period of 1999-2008, electricity consumption increased by only 10% while the economy nearly quadrupled in size.

In the ***Kyrgyz Republic***, events in early 2010 increased the perception of political risk associated with electricity market reform in Central Asia. The government tried to make up for postponing previous tariff increases with a precipitous jump in electricity prices. This step was widely seen as contributing to the unrest that brought down the government later in the spring.

The ***Russian Federation*** adopted in November 2009 the "Federal Law on Energy Conservation and Increasing Energy Efficiency". It requires, among others, the introduction of energy efficiency labelling for technologies and consumer products, energy efficiency standards for buildings as well as for products and services procured by the government, energy conservation measures in residential buildings, and energy audits for industrial and commercial facilities. However, implementing regulations under this law have yet to be promulgated.

In ***Uzbekistan***, there has been a major drive to install electricity and gas meters and promote payment discipline, but tariff increases have not been sufficient to have a large impact on consumer behaviour. As a result, the link between energy demand growth and GDP remains broadly intact.

Source: IEA (2010).

Experience from Belarus (Box 4.2) demonstrates the importance of adequate institutional frameworks and finance. In an effort to reduce its dependence on imported energy, the government of Belarus has placed high priority on increasing energy efficiency. According to the World Bank (2010), its role in designing and enforcing a comprehensive policy on energy efficiency is one of the main reasons behind the remarkable reduction in the amount of energy consumed per unit of production.

According to UNECE (2011), private sector investors are not yet active in the energy efficiency area. Among reasons for this is a lack of dedicated sources of financing and insufficient local knowledge and experience on how to select and formulate energy efficiency investment projects. In order to address these obstacles, capacity development and advisory work in the region is conducted by the European Bank for Reconstruction and Development, UNDP, UNECE, and other organisations.

Box 4.2. Improving energy efficiency in Belarus: A success story

Between 1996 and 2008, energy intensity in Belarus decreased by almost 50%. The main elements of this success story are:

Sustaining political commitment on the part of the government. The first national energy efficiency programme —the National Programme for Energy Savings to Year 2000 — was approved in 1996. It was followed by the second national energy efficiency programme, for 2001–2006, and the third, for 2006–2010. The Law on Energy Savings was adopted in 1998.

Establishing energy efficiency institutions with a clear mandate. A Committee for Energy Efficiency was established in 1993. This committee evolved into the Energy Efficiency Department of the Committee of Standardisation.

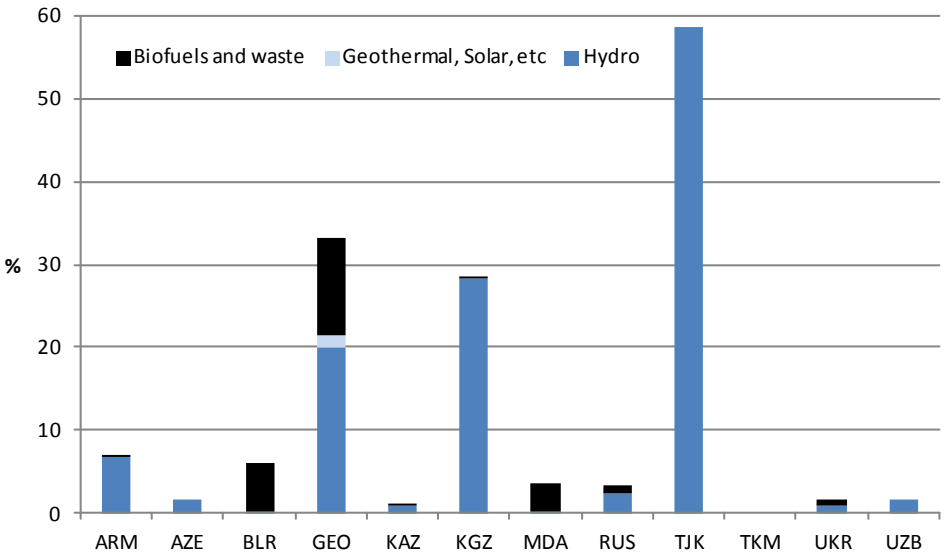
Allocating adequate financial resources to implement energy efficiency measures. The financing of energy efficiency measures increased from USD 47.7 million in 1996 to USD 1,213.9 million in 2008. Over this period, total investments in energy efficiency amounted to about USD 4.2 billion.

Source: The World Bank (2010).

Renewable energy use

Except for hydropower, electricity produced from renewable resources does not play an important role in EECCA despite its large potential. As Figure 4.5 shows, in several nuclear-free countries, including Georgia, the Kyrgyz Republic and Tajikistan, the use of alternative (mostly hydropower) energy has increased tremendously over the last two decades. As mentioned in Chapter 2, in Georgia this has contributed towards achieving higher self-sufficiency in terms of energy supply.

Figure 4.5. Share of alternative energy in TPES structure in EECCA (2009)



Source: International Energy Agency Database, last accessed in May 2012.

The installed wind power capacity is almost negligible, though it does exist, for example, in Ukraine. The production of solar or biomass-based energy has just started, notably in Moldova, Ukraine, and Uzbekistan. In the Russian Federation, the share of renewables in the overall primary energy supply is less than 1% (excluding large hydropower plants), while the technical potential of renewable energy sources is approximately 4.5 times the country's current volume of fuel and energy consumption. Renewable energy could successfully replace diesel- and other oil fuel-fired installations in distant settlements (Box 4.3). There are examples of existing positive experience, *e.g.* in Uzbekistan where solar energy was brought to poor communities in Karapakalstan and substituted 1.5 M kWh of thermal energy.

Box 4.3. Prospects for the use of biomass renewable energy in the Russian Federation

Market size. The current market size for renewable energy production from biomass is considerable and can resolve, first of all, the energy supply problems of remote locations. Such areas, normally situated in distant northern parts of the country with a harsh climate, are inhabited by approximately 10 million people. In addition, there are hundreds of places where current generation capacities have exceeded their lifetime and it makes no sense to repair them. In these locations, it is worthwhile to produce heat and electricity by small bio fuel-fired boilers (modern block mini-heat and power plants). Small villages, summer cottage communities, as well as one-family cottages and residencies owned and used by a major part of Russia's population are another large and socially important market for small-size independent renewable energy installations.

Co-benefits. Improving efficiency of forestry operations can be a co-benefit of renewable energy production. During wood harvesting, only 70% of biomass leaves the harvest area as round timber, and 30% (branch wood, forest residue, etc.) is lost and not even included in the statistics. According to the estimates of the Russian Federation's Forestry Agency, the losses amount to more than 150 million cubic metres that may theoretically be used to produce nearly 500 GWh of heat and energy, leading to nearly 270 Mt of CO_2 emission reduction per annum. Apart from addressing energy problems, this amounts to more than 10% of Russia's overall GHG emissions. The regions having the largest potential are Arkhangelskaya Oblast, Karelia and Komi Republics, Krasnoyarsky Krai and Novosibirskaya Oblast.

Feasibility of production. Importantly, the technologies are available and feasible. The problem is financing: the required amount is considerable but not unfeasible to raise. A modern module plant costs EUR 600 000, whereas the cost of renovating an existing boiler house is approximately EUR 400 000.

Source: Kokorin A.O., Garnak A, Gritsevich I.G., Safonov G.V. (2008).

Barriers to the implementation of renewable energy projects include the high costs of, and poor access to, loans (see Chapter 8), persistent subsidies for fossil fuels and energy (see Chapter 6) and the availability of considerable fossil fuel resources in many EECCA countries, creating an illusion of overall energy abundance. It is commonly recognised that in the renewable energy area, unlike in energy saving, the economic feasibility of projects depends to a large extent on the regulatory framework and innovation. Because of current cost differences between traditional and renewable sources of energy, progress in renewable energy will depend upon the availability of state support schemes based on transparent and predictable regulations.

In order to enable the development of supportive policy measures in the Russian Federation, a Presidential Decree has set a target for a 4.5% share of renewable energy in electricity generation by 2020, a goal confirmed in the Energy Strategy. The International Finance Corporation (IFC), part of the World Bank group, is providing advisory services through a new initiative, the Russia Renewable Energy Program (RREP). Supported by the Global Environment Facility, RREP was launched in December 2010, and the IFC hopes that it will create a platform that can support at least the beginnings of a significant share for renewable energy in the Russian Federation.

More generally, the promotion of renewable energy is a priority in at least half of EECCA countries. Moldova's government programme "European Integration: Freedom, Democracy and Welfare" for 2009-13 calls for increased investment in renewable energy production to implement the "Law on Renewable Energy" (adopted already in 2007). The Georgian government in its programme "Georgia without Poverty" for 2008-12 declares its goal to generate most of the country's electricity by means of hydropower. Armenia, in a similar programme, particularly emphasises hydropower as a source of rural energy supply.

Among different government support schemes for electricity produced from renewable resources, feed-in tariffs are commonly perceived as the most effective approach that has been deployed in several European countries. In EECCA, this type of tariffs is pioneered by Ukraine (Box 4.4). Kazakhstan is studying the experience and feasibility of introducing such tariffs based on support from the European Bank for Reconstruction and Development (EBRD).

Box 4.4. The overall design of feed-in tariffs in Ukraine

Definition. The mechanism of feed-in tariffs consists in guaranteeing a (priority) grid access for the providers of renewable energy and the purchase at a fixed price of their deliveries, which may vary depending on production technologies (*e.g.* wind, solar, biomass, etc.). Prices are set in such a way that they compensate for higher production costs of renewable energy.

Main elements of policy reform in Ukraine. Ukraine first introduced "green" feed-in tariffs in 2008 and then made some important modifications in April 2009. The green tariff law fixes the tariff path until 2029 at a level that is linked to conventional energy prices with an additional guarantee against exchange rate fluctuations. The rates differ depending on the technology and the size of the operation. Ukraine's level of feed-in tariffs can be considered fairly generous and allowing for the development of renewable electricity production from the currently negligible level.

Problems related to feed-in tariffs introduction. The business community has raised some issues related to the application of feed-in tariff regulations, notably the costs of connecting renewable energy facilities to the grid and the lack of clarity of certain provisions in the green tariff law. It considers in particular that the investment risk of renewable projects could be mitigated if access to green tariffs is guaranteed already at the stage of issuing relevant building permits and not only after the plants start producing electricity. However, such modifications would probably increase the risks considerably for the state and the grid operators given frequent delays in the finalisation of renewable energy projects.

Additional tax reduction measures. In addition to feed-in tariffs, the Tax Code sets up a range of tax benefits in favour of renewable energy production, including the reduction of taxes on land used for construction of renewable energy facilities and the exemption from corporate tax on sales of power generated by renewable sources (available until January 2021). Imports of equipment and components used for energy savings are exempt from import duties and VAT if they are not produced in Ukraine. The 2011 budget foresees the allocation of public funds and support for cheaper loans to finance energy savings projects.

Source: OECD (2011).

Water use efficiency

The unsustainable use of water can create shortages or additional costs (*e.g.* for treatment or transport). Such costs are detrimental for economic growth, in particular in sectors that depend on secure supply of water of adequate quality (agriculture, selected industries and services such as tourism).

In EECCA, water resource withdrawal is relatively stable, but its consumption continues to be wasteful (Figure 4.6 and 4.7). In 2005-2008, water losses were 6-7% in Belarus and Moldova and 32-33% in Armenia and Azerbaijan. Since 2005, water losses have remained stable or increased, at least in countries for which data are available.

Agriculture is a major water user in several countries (Figure 4.8). In 2008, water consumption for agricultural needs (mostly irrigation) accounted for 88% of the total water consumption in Armenia, 84% in Kyrgyzstan, 69% in Azerbaijan and 55% in Kazakhstan. In Uzbekistan, the average rate of water use for irrigation was 90.2% in 2002-2006.

In Central Asia, irrigation-based crop production is responsible for one of the most notorious environmental disasters on the planet – the shrinking of the Aral Sea that caused a collapse of the local economy and livelihoods and severely affected human health. This has occurred due to the fact that competing uses of water resources were not taken into account and integrated in a strategic management framework.

Since 2007, several countries have been working with donors, in particular the United States' Millennium Challenges Corporation, to reduce agricultural water consumption by rehabilitating and modernising irrigation networks. Such work is now underway in Armenia (Box 4.5), Moldova and the Kyrgyz Republic.

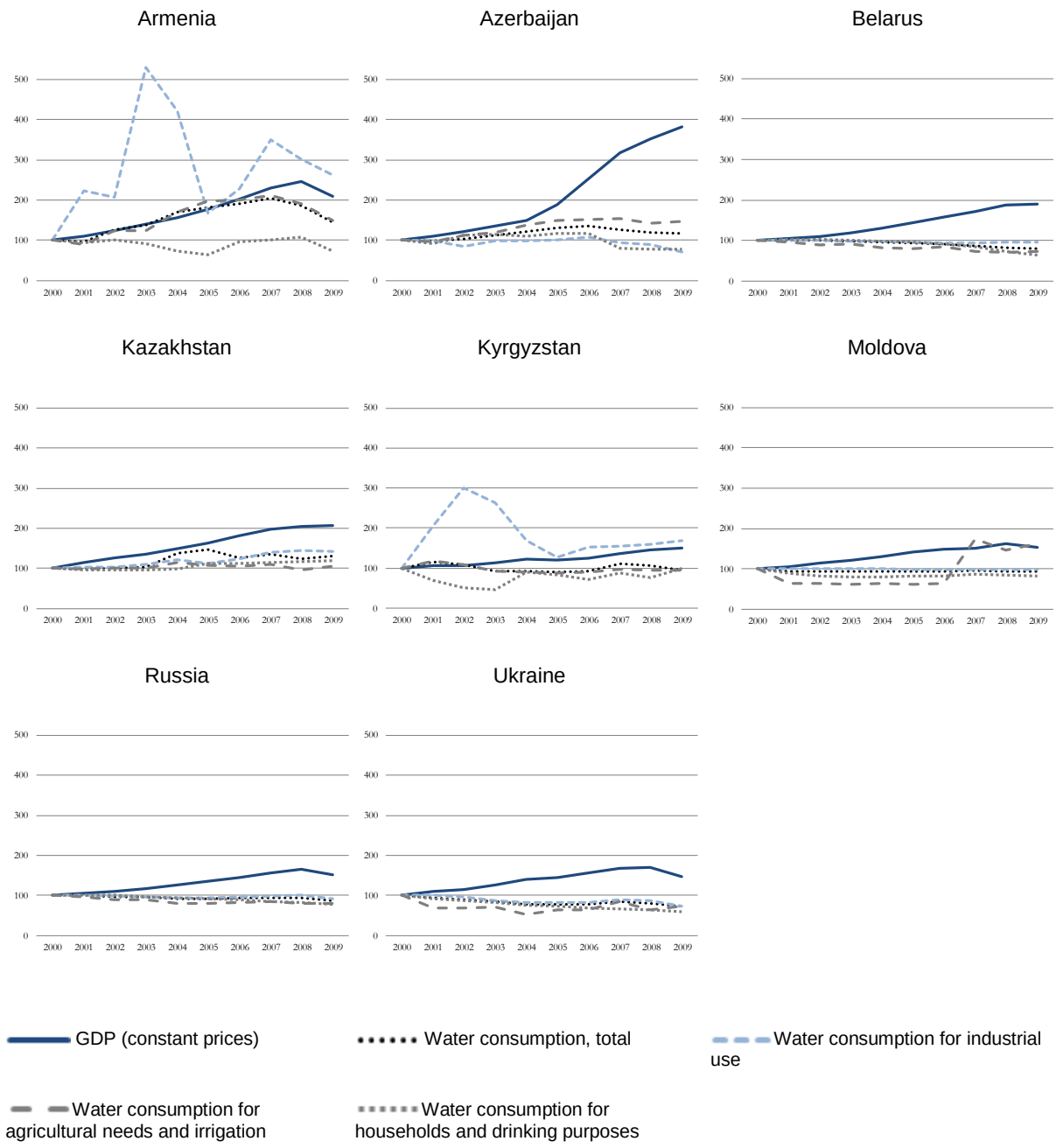
Box 4.5. Efforts to increase agricultural water use efficiency in Armenia

The Irrigation Rehabilitation Emergency Project in Armenia, effective since October 2009, supports investments in irrigation systems to enhance agricultural productivity, reduce production volatility and stimulate short-term employment. The project has been designed to improve water use efficiency by rehabilitating 83 km of irrigation canals to reduce water losses while fostering immediate rural employment. Since October 2009, 50 km of canals have already been rehabilitated and water losses have been reduced by 12%; a further 20% reduction is expected by the end of the project. As a result, the increase in the irrigated area is expected to be about 7,000 ha by June 2011.

Source: World Bank (2011).

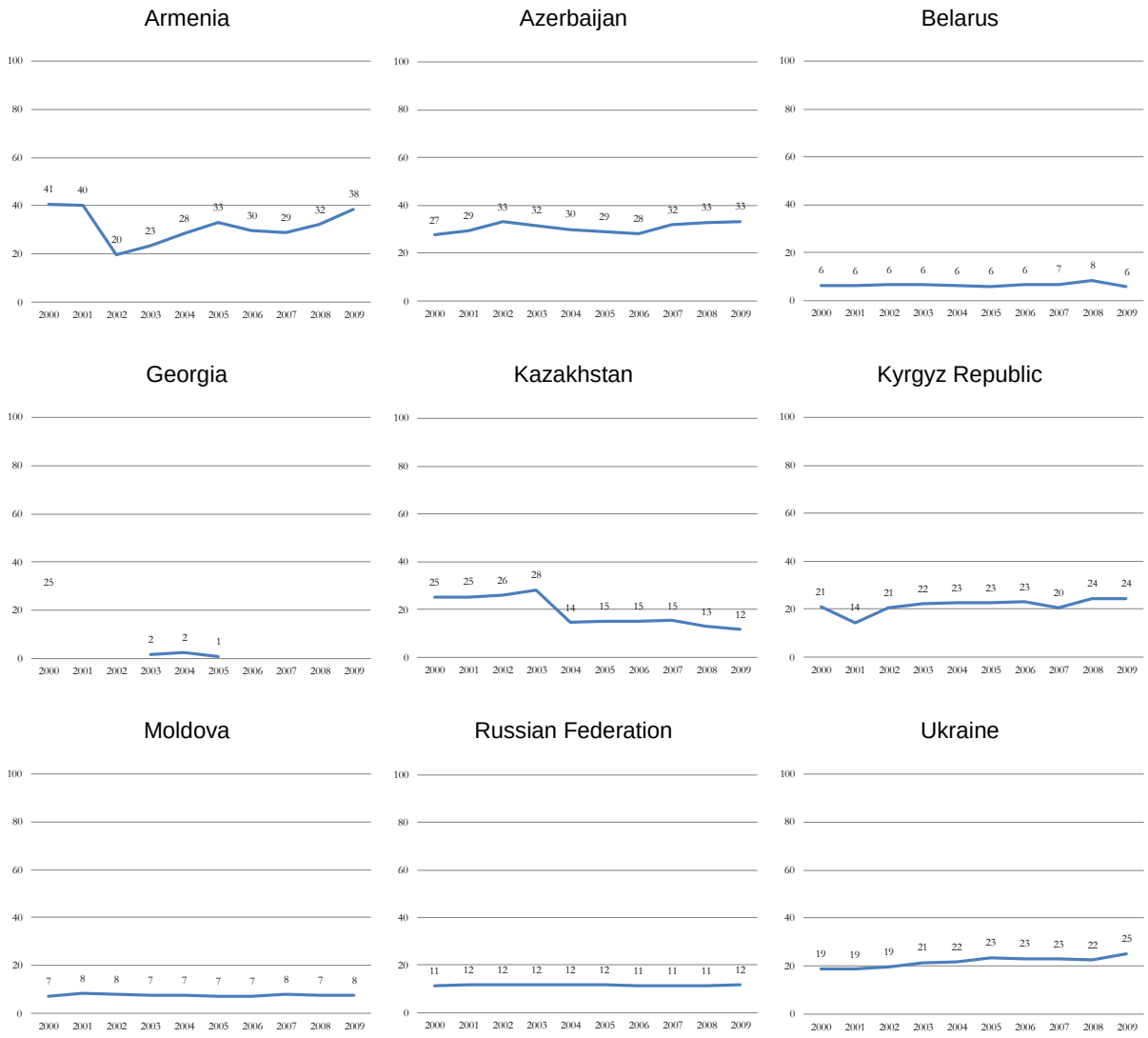
In conjunction with this, water user associations have been created to improve the overall management of water resources. Simultaneously, many governments reflect on economic instruments for water resource management in agriculture.

Figure 4.6. Changes in water consumption in EECCA
(Index, 2000 = 100)



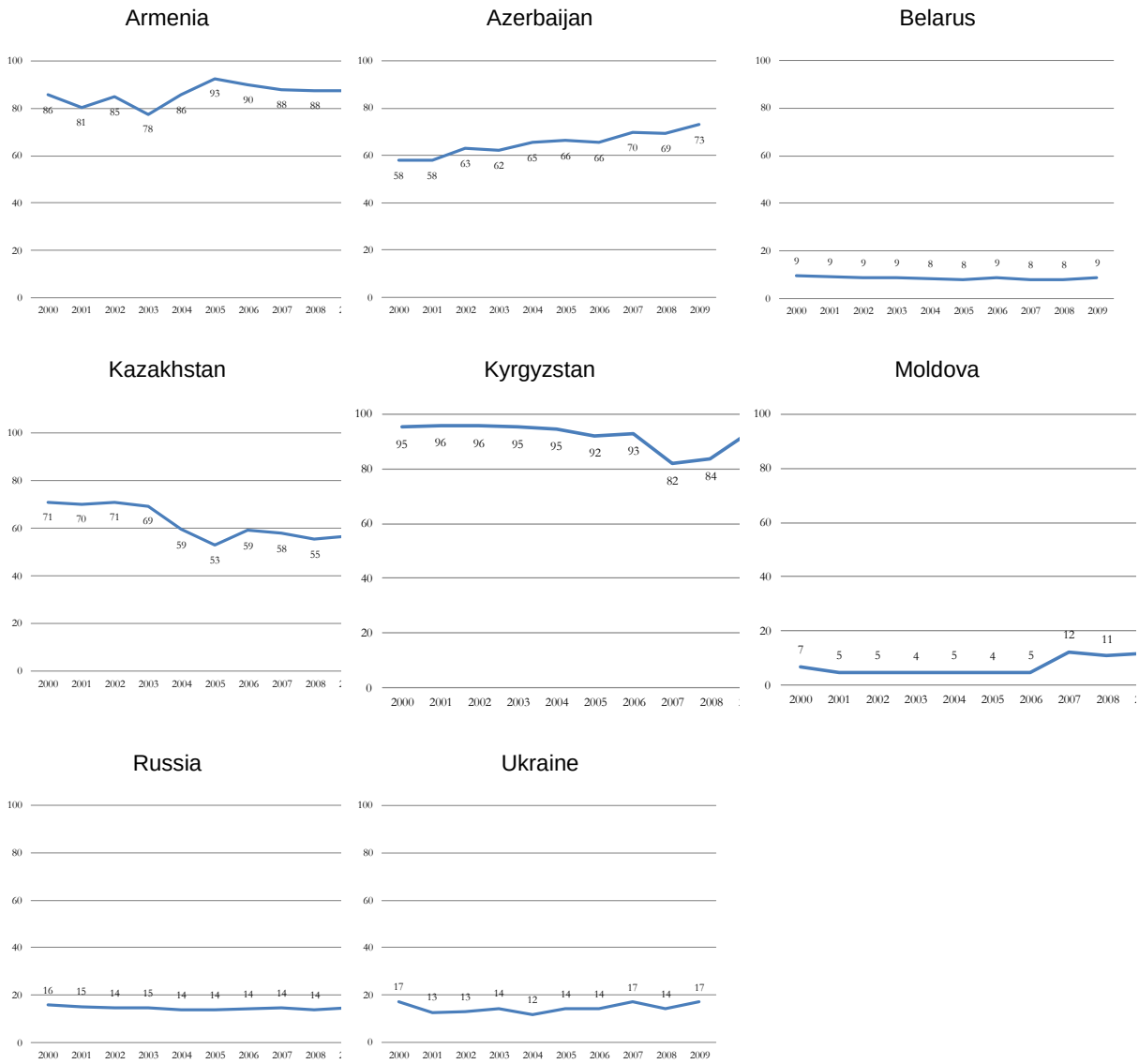
Source: CIS STAT (2010), *Commonwealth of Independent States in 2009*, Statistical yearbook, Moscow, Russia.

Figure 4.7. Water losses in EECCA, all uses, %



Source: CIS STAT (2010), *Commonwealth of Independent States in 2009*, Statistical yearbook, Moscow, Russia.

Figure 4.8. Evolution of water consumption for agricultural needs in EECCA, % of total



Source: CIS STAT (2010), *Commonwealth of Independent States in 2009*, Statistical yearbook, Moscow, Russia.

Soil degradation and pollution, and green growth solutions

Some of the main consequences of unsustainable irrigation in EECCA are related to increased soil erosion and salinity (OECD, 2007). As a result, soil fertility has declined and agricultural output production decreased. The share of irrigated agriculture affected by moderate to severe soil salinity, for example, ranges from around 20% in Azerbaijan and Uzbekistan to 30% in Kazakhstan, the Russian Federation and Ukraine, to over 90% in Turkmenistan. These trends have important economic implications, as agricultural output accounts for up to 18% of the GDP in these countries, compared to 2.2% on average in OECD countries. More importantly, the impacts of soil erosion are cumulative: initial damages from soil erosion may be small, but after 10-20 years the cumulative effect can be significant.

Due to the relative significance of agriculture, the environmental sustainability of agro-food systems is, therefore, at the centre of green growth considerations in many EECCA countries. Main concerns relate to food security (where the water nexus is important), soil degradation, excessive flows of nutrients (nitrogen, phosphorus) from fertiliser use and intensive livestock farming, and (to a lesser extent) pesticide residues that may leach into surface and groundwater and enter the food chain. Most EECCA countries that are traditionally important agricultural producers, such as Armenia, Georgia, Kazakhstan, Moldova and Ukraine, have relatively low levels of fertilizer and pesticide use for crop production. Some countries inherited important stocks of obsolete pesticides, a problem which is discussed in the next chapter.

Because of low affordability, a dramatic drop in these levels has happened in the mid-1990s, without any spectacular rebound happening more recently. This creates opportunities for developing a new segment of the market – organic farming. Efforts to promote organic agriculture are particularly visible, and sometimes having effect, in Armenia, Belarus, Moldova and Ukraine. In Ukraine, areas under organic agriculture reached some 270 000 hectares in 2010, making Ukraine the country with the 20th biggest organic farming sector in the word (EC, 2011). Georgia is now also studying the potential for organic agriculture. However, despite the fact that government programmes in all EECCA countries call for a further increase in the effectiveness of the agricultural sector, only few of them (Box 4.6) have carried out specific actions in respect to sustainable agriculture. Several other countries intend to align their product policies in the agricultural sector with the requirements and demands on the European Union's market.

Box 4.6. Organic farming in Armenia and Moldova

Armenia. In Armenia, the law "On Organic Agriculture" was adopted on 8 April 2008. Following its enactment, an internationally-agreed mechanism of organic product certification was put in place. A local company was recognized as organic certification body compliant with ISO Guide 65 and EN 45011. By May 2011, certificates for 33 Armenian agricultural companies have been issued, mostly for primary agricultural production.

Moldova. Organic agriculture has been identified as a new field for development in Moldova. Following the adoption of the 2005 Law on Organic Agriculture and Food Products, a thematic programme was developed in 2010 to facilitate the implementation of this Law. The programme foresees an important increase of the share of organic agriculture for export and the domestic market. In Moldova, policies supportive of market demand resulted in a notable increase of land under organic agriculture from 168 ha in 2003 to 32 102 ha in 2009. In 2009, the organic farming products accounted for 11% of the total agricultural export value.

Source: EC (2011), OECD (2010).

At the same time, another source of nutrient pollution – livestock production – has started to recover in many EECCA countries, for example, in Armenia, Moldova and Ukraine. In this domain, intensive farming can have important repercussions on water quality, as it was the case in Moldova. To avoid the livestock's negative impact, the application of both technical and policy solutions is needed. The experience of such OECD countries as the Netherlands and Denmark can provide a good basis for identifying such measures.

Materials use by industry

The low material productivity of industry has been a matter of policy debate and action for at least a decade. To address this problem, reforms of regulatory instruments, primarily the introduction of integrated permitting based on best available techniques, were launched in Armenia, Belarus, Georgia, Moldova, Kyrgyzstan, Kazakhstan, the Russian Federation and Ukraine. Complementary instruments, such as environmental management and audit systems, or industry's environmental performance rating (OECD, 2007) have been put in place. Substantial international help has been provided in this area, including for advisory services. Under the umbrella of a joint initiative by the United Nations Industrial Development Organisation and the United Nations Environmental Programme, national cleaner production centres have been established in Armenia, Moldova, the Russian Federation, Ukraine and Uzbekistan. The bulk of projects, however, were sponsored by the European Commission. These initiatives have helped to reduce energy and raw material wastage.

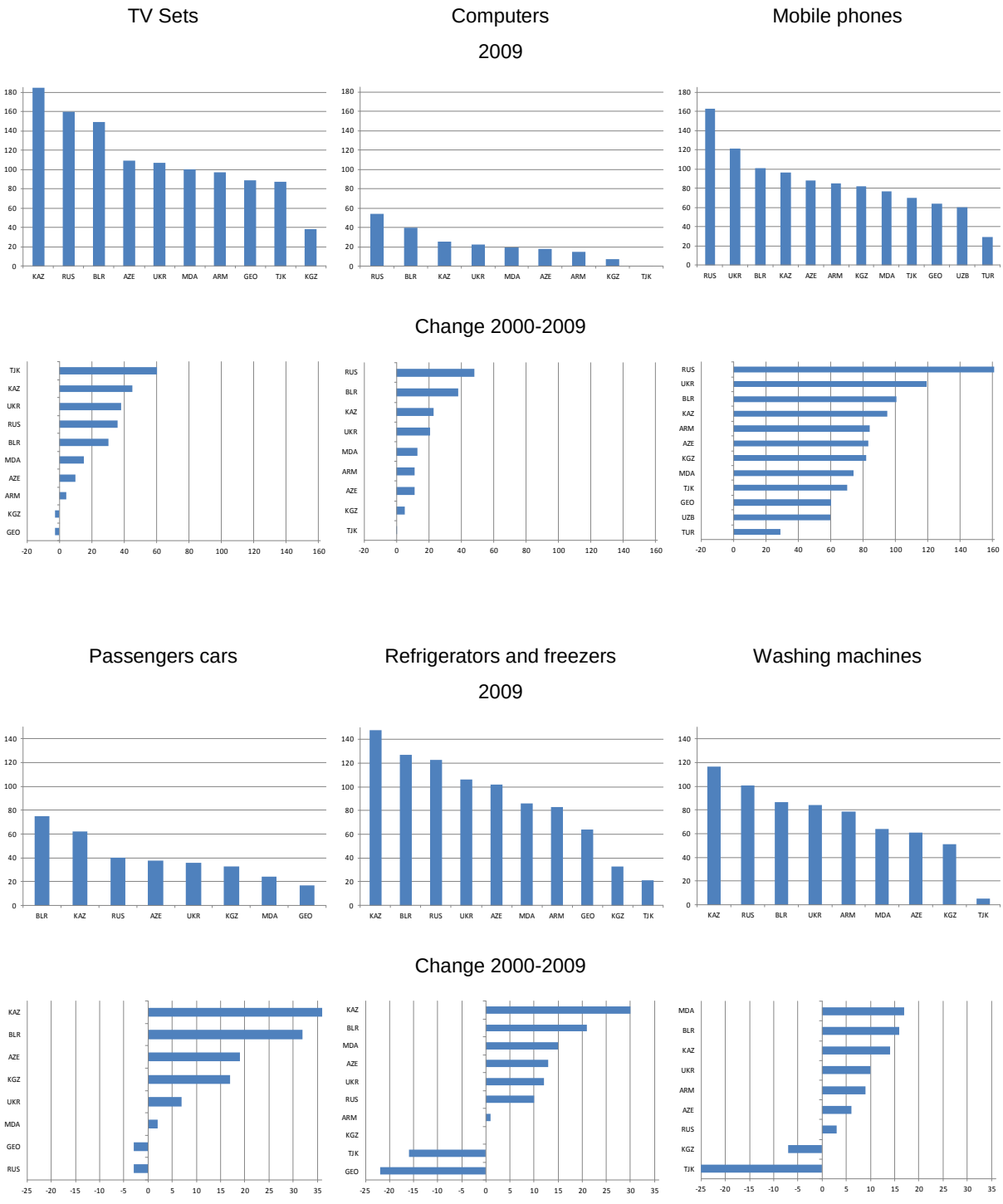
Nevertheless, the extent and nature of challenges posed by industrial waste and by-products in EECCA countries are still not fully known, and many problems remain unaddressed, even if they have been well studied. The mining sector continues to generate high volumes of tailings, especially in Armenia, Kazakhstan, the Kyrgyz Republic, the Russian Federation and Uzbekistan (OECD, 2007). There are mining by-products, such as sulphur, that are difficult to market because of a relatively low demand that does not match the high supply. Kazakhstan in particular is exposed to this problem. If stored in open air for a long time, this by-product is believed to have a negative impact on the environment, particularly given the enormous amounts of sulphur available in Kazakhstan because of its oil reserves particularities. The overall situation with the current wasteful mining and industrial production is aggravated by the historic pollution with nuclear, military and industrial waste (see, for instance, OECD 1998 and 2007).

Household consumption patterns

Together with increasing household income, consumption levels are growing in EECCA countries, catching up, though rarely, with the OECD levels (Figure 4.9). Car ownership numbers have been increasing, particularly in Azerbaijan and Kazakhstan against the background of poor regulation of vehicles' environmental performance and the declining public transport. Some countries banned the import of old cars, with yet unclear effects on the air quality. Given the rising use of computers and mobile phones, it is likely that EECCA countries will soon face the problem of electronic waste.

More than 90% of municipal waste in EECCA is disposed in municipal landfills, which rarely not meet sanitary norms. Illegal dumping and inadequate disposal sites are widespread. The absence of proper waste management infrastructure and practices remains a serious concern in all the countries.

Figure 4.9. Examples of consumption trends in EECCA



Source: CIS STAT (2010), *Commonwealth of Independent States in 2009*, Statistical yearbook, Moscow, Russia.

Since 2007, waste management has become a top priority in Moldova and Kazakhstan where important policy development and institutional building initiatives are underway. Several landfill gas capture projects, with a clear green growth element, are being implemented or prepared in Armenia and Moldova. However, the implementation of such projects seems to be very slow.

Instruments targeted at consumers are being gradually introduced. Eco-labelling is making its way, for example in Belarus (EC, 2011). Product taxes are used in several countries, including Armenia, Moldova and the Russian Federation. The introduction of fuel taxes in Armenia and Moldova (OECD, 2006) has brought both environmental and fiscal dividends. There are also punctual failures, like the introduction of packaging taxes in Moldova in 2009-2010, which resulted in trade disputes with Ukraine and had to be re-designed after a very short period of time following its introduction.

Conclusions and ways forward

The combination of inefficient production and rising unsustainable consumption is dangerous to economic development of countries in the region. Even resource-abundant EECCA countries are likely to be confronted with eventual scarcities resulting from this pattern of growth. Policies to adjust prices, which are discussed in Chapter 6, constitute, in principle, the best cure for unsustainable production and consumption. Among others, they stimulate technological change. However, a sharp change in pricing policies can give rise to strong opposition in EECCA countries where affordability concerns are high, where people have the memory of low resource prices and where the liberal model of development finds resentments, including among politicians.

Therefore, while preparing the ground for price adjustments, EECCA governments may want to use more actively other policy tools to further encourage energy and resource productivity that are more politically feasible in the short term. Doing this in sectors where there are opportunities to pick the "low-hanging fruit" is the best start. Careful identification of sectors and actions with such a potential is necessary, and there is sufficient evidence and good international practice to inform this process.

In this vein, EECCA countries should:

- ***Further re-orient industrial regulation on performance:*** The imposition of performance standards can prove to be a good complement to price-based instruments, provided that compliance with these standards can be reliably verified and enforced. In this regard, EECCA countries that are introducing integrated permitting for large industry, *e.g.* Belarus, Kazakhstan, Russia and Ukraine, need to further invest into capacity development within their regulatory and enforcement agencies. The application of general binding rules needs to be enhanced, particularly where it constitutes a less costly and more effective alternative to performance standards;

- ***Modernise waste management policies:*** Improving resource productivity and ensuring sustainable materials management requires waste, materials and product policies based on integrated life-cycle analysis, such as initiative on "circular economy" or 3R (reduce, reuse, and recycle). It also implies internalising the costs of waste management into prices of consumer goods and of waste management services;

- ***Increase the use of environmental performance rating and eco-labelling*** that will usefully supplement regulatory instruments, provided that collecting and disclosing such information to consumers is not too costly for the government or firms and that labelling can change the consumer behaviour. Given high rates of public consumption in EECCA, greener public purchasing could be used, although analysis is needed to understand if conditions for the use of this policy instrument are favourable in the region.

- ***Take advantage of the benefits associated with the private sector's voluntary initiatives*** that have expanded due to a strong drive from the UN's Global Compacts or the Global Reporting Initiative. The promotion of ISO 14 000 series certification and support for cleaner production centres may play a continuously positive role in fostering voluntary initiatives.

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CHAPTER 5:
ENVIRONMENTAL QUALITY OF LIFE

Environmental outcomes are important determinants of health status and well-being. They provide an example where production and income growth may not be accompanied by a rise in overall well-being. Environmental conditions affect the quality of life of people in various ways. They affect human health through air and water pollution, exposure to hazardous substances and noise, as well as through indirect effects of climate change, transformations in the water cycles, biodiversity loss and natural disasters. People also benefit from environmental services, such as access to clean water and nature, and their choices are influenced by environmental amenities. The main aspects of importance to green growth include: (i) human exposure to environmental pollution and environmental risks, associated effects on human health and quality of life, and related health costs and impacts on human capital; and (ii) public access to environmental services and amenities such as clean water, sanitation, green space, or public transport.

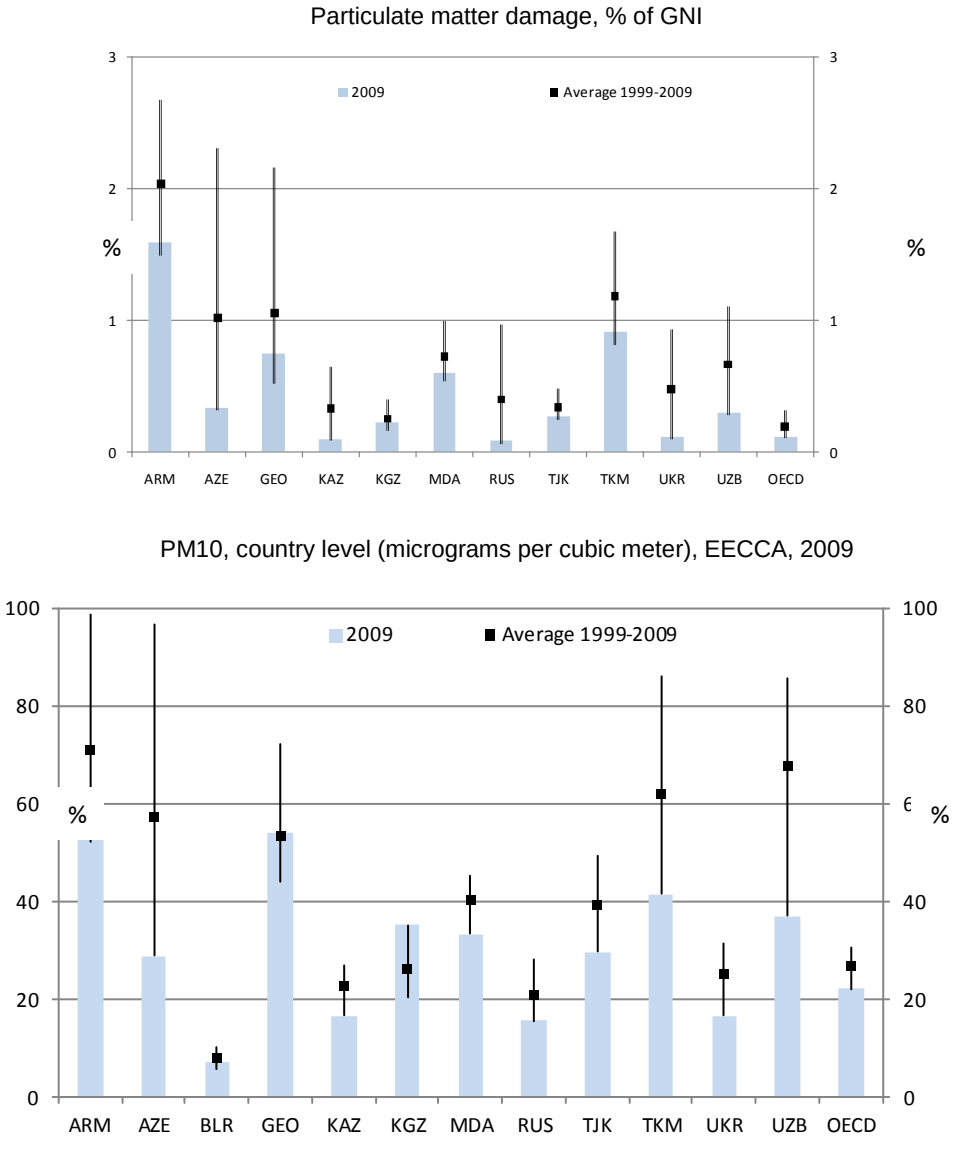
Chapter 5 addresses some priority aspects of the environmental quality of life in EECCA.

The legacy of the Soviet period continues to affect the region's environmental track record. Although the magnitude of industrial pollution has been reduced, all the countries are still faced with past and current pollution problems. At the same time, EECCA countries are highly vulnerable to the impacts of climate change.

Costs of policy inaction on environmental challenges

Though the costs of policy inaction on environmental challenges are still poorly quantified in EECCA, such costs may be remarkable. Rough estimates by the World Bank show that damage to health from particulate matter alone can reach over 2% in some EECCA countries (Figure 5.1).

Figure 5.1. Economic costs of particulate matter damage in EECCA



Source: The World Bank Development Indicators Database, last accessed in May 2012.

A recent in-depth study by the World Bank in Tajikistan (2008) suggests that the costs of environmental damages in this country accounted for 9.5% of its GDP in 2006. The highest damage is from land degradation, the cost of which accounts for 3.7% of the GDP, followed by natural disasters (1.6% of the GDP) and inadequate water supply, sanitation and hygiene (1.5% of the GDP). The costs of indoor air pollution and associated health risks are about 1% of the GDP. Other costs are related to rangeland degradation, urban outdoor air pollution, lead poisoning and deforestation. A valuation study conducted by the World Bank in the mid-1990s in Moldova (Box 5.1) resulted in estimated costs of environmental damages of a similar order of magnitude.

Box 5.1. Economic costs of environmental degradation in Moldova

Water and air pollution is a source of significant health costs in Moldova. The latest effort to quantify health impacts of water and air pollution dates back to 1995. Polluted drinking water emerged as the major environmental health problem in Moldova. Estimated average annual costs resulting from water pollution were USD 60-115 million due to premature deaths and USD 6-12 million due to illness. Premature death and illness associated with exposure to air pollution were estimated to cost the economy USD18-33 million, of which USD 17-30 million were attributable to particulates and USD 1.5-3 million attributable to lead. Overall, the costs of inaction on environmental challenges considerably exceed public environmental expenditure, which constitute on average 0.1-0.2% of the GDP. The latter figure, though, may not include public expenditure on water and other infrastructure, soil protection and forest rehabilitation and, therefore, has to be considered with care. The magnitude of private sector environmental expenditure is also unclear.

Source: *National Environmental Action Plan*, World Bank and Government of Moldova (1995).

Poor water quality imposes high economic costs in terms of impacts on human health and production losses. These costs have not been sufficiently recognised in decision-making in EECCA countries. Analysis of such costs in other regions suggests that economic returns for investment in the water sector can be 7 to 1. Failure to adequately value the costs of poor water policy and the potential benefits of investment in the water sector is one of the reasons why water has generally not received a sufficiently high priority in EECCA countries. One consequence has been that the water sector received a declining share of domestic public funding in most EECCA countries over the last decade.

Environmentally related health risks

EECCA countries have a particularly bad ***human health*** record linked to environmental problems. Outdoor air pollution, smoke from solid fuel used in homes, exposure to lead and unsafe water and sanitation are considered among the most threatening environmental factors to people's health in the region. Table 5.1 shows the share of deaths attributed to environmental causes in several geographical regions.

Central Asia region has, by far, the worst indicators. For example, according to the WHO, the contribution of indoor smoke, estimated for the countries in this region, can range from 1.6% to 5.2% of all deaths in different areas in Central Asia (Table 5.1).

Table 5.1. Share of deaths attributed to various environmental causes in different regions

Country group	Outdoor air pollution	Indoor smoke from solid fuel	Exposure to lead	Unsafe water and sanitation
Southeast Europe	0.6 to 2.1	0.7 to 1.3	1.1 to 1.3	-
Central Asia	1.1. to 2.6	1.6 to 5.2	1.3 to 1.5	3.2 to 3.3
Other EECCA	1.2 to 1.4	1.3	1.1 to 1.2	-
Germany and UK	0.6	0	0	0

Note: "-" – No data available.

Source: World Health Organization (2005).

EECCA economies have started the transition period with high industrial emissions and relatively low ***air emissions*** from mobile sources due to fewer vehicles. The decline of industrial production, due to industry's proximity to densely populated areas, resulted in substantial improvements in urban air quality and a certain decoupling of growth and air pollution (Figure 5.2). Such improvements, however, were limited because of increased emissions from transport. Air pollution in urban areas continues to routinely exceed the legally established norms. Emissions from transport now constitute over 70% of the total amount of air emissions in several countries (including Armenia, Belarus, Moldova and Tajikistan). Emissions from industrial and power generation sources continue to decline but remain significant, particularly in Kazakhstan, Russian Federation and Ukraine.

The problems of outdoor air pollution are particularly acute in satellite cities of large industrial plants, for example, in Ukraine and the Russian Federation. The result is a high number of premature deaths. For example, Russia's 2002 data on concentrations of total suspended particulates in urban locations from 98 cities with a combined population of 45 million indicated the levels several times above the WHO Air Quality Guidelines.

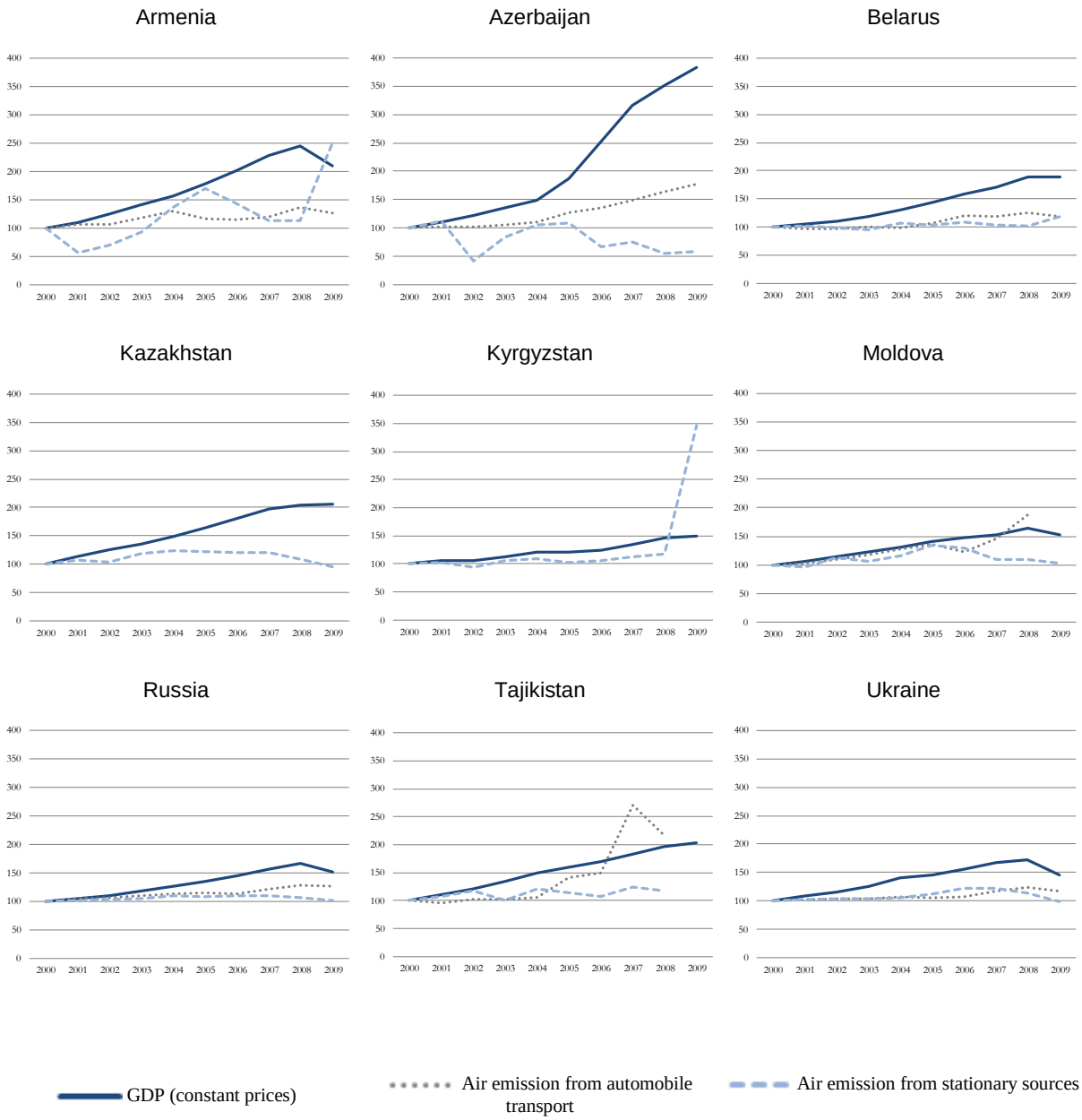
Indoor air pollution is characteristic for poor rural areas that are not connected to gas networks and where people lack clean fuel. Adopting some of the green growth solutions, for example micro-hydropower, may address air–related health problems in such areas (Box 5.2).

Box 5.2. Greener growth solution to air-related health problems in EECCA

Many low-income rural households across the region also lack access to clean fuels for cooking and heating. In Azerbaijan, over 20% of rural households rely on straw, wood or coal, with many of them cooking over an open fire. Three quarters of rural households in Armenia rely on wood for cooking and heating. Poverty in rural areas of Tajikistan forces households to use traditional biomass for cooking and heating, thus leading to degradation of local resources and less food for livestock. In some cases, decentralised deployment of renewable energy technologies could be a way forward; for example, micro-hydropower has a lot of potential in isolated mountainous communities in Tajikistan and the Kyrgyz Republic.

Source: IEA (2010).

Figure 5.2. Decoupling indicators in EECCA: Air emissions
(Index, 2000 = 100)



Source: CIS STAT (2010), *Commonwealth of Independent States in 2009*, Statistical yearbook, Moscow, Russia.

The environmental quality of life is further reduced by diverse ***water quality*** problems that EECCA countries continue to face. Discharges of untreated wastewater and deterioration in drinking water pipes are seen as primary factors of water contamination in the region. In several countries, including Armenia, Azerbaijan and Kyrgyzstan, the rate of untreated, or insufficiently treated, wastewater reaches 90% or even 100%. Besides municipal effluents, surface water is also polluted by heavy metals from mining and industry, and by nutrients originating from poor agricultural practices. There are several particularly well-known hot spots related to water quality degradation. For example, in Armenia, the lake Sevan is heavily contaminated by persistent organic pollutants.

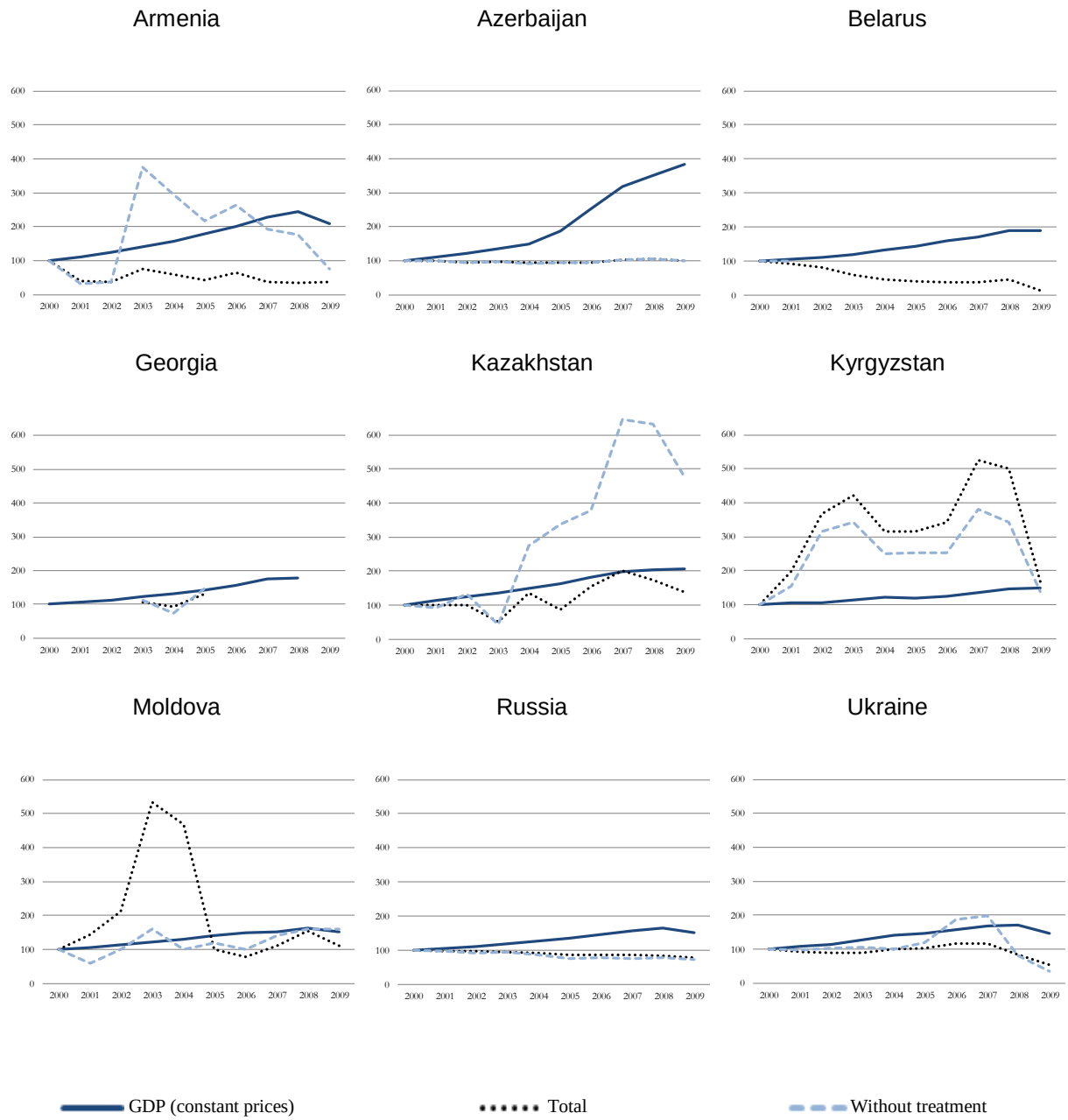
Large rivers, including shared ones, are heavily polluted. In turn, this leads to the degradation of water quality and marine ecosystems. Up to 90% of nitrogen and phosphorus discharges into the Black and Caspian Seas originate from polluted rivers. Although water abstraction and wastewater discharges have declined due to less intensive economic activity, water-efficient or pollution control technologies have not been massively introduced.

Several indicators (Figures 5.3 and 5.4) show that (very modest) decoupling has been attained with respect to water pollution. However, they have to be considered with care as data are based on self-reporting and estimates in conditions when under-reporting is very likely.

Despite the remaining environmental concerns, the ***general indicators of human health*** are improving. Life expectancy at birth has been growing in 2000-2009 in all EECCA countries, except the Kyrgyz Republic. In all the countries, infant mortality rates have been decreasing over the same period, though compared to OECD countries, they remain extremely high in the Caucasus and Central Asia, with a maximum of 51.8 deaths per 1 000 live births in Tajikistan (2009 data, down from 75.3 in 2000). The infant mortality rates are by far higher than in OECD countries, where they ranged in 2008 from 1-3 deaths per 1 000 live births in the Czech Republic, Greece and Slovenia to over 15 deaths per 1 000 live births in Mexico and Turkey. Environmental factors, in addition to social and economic ones, may have played a role in maintaining this very alarming situation in EECCA.

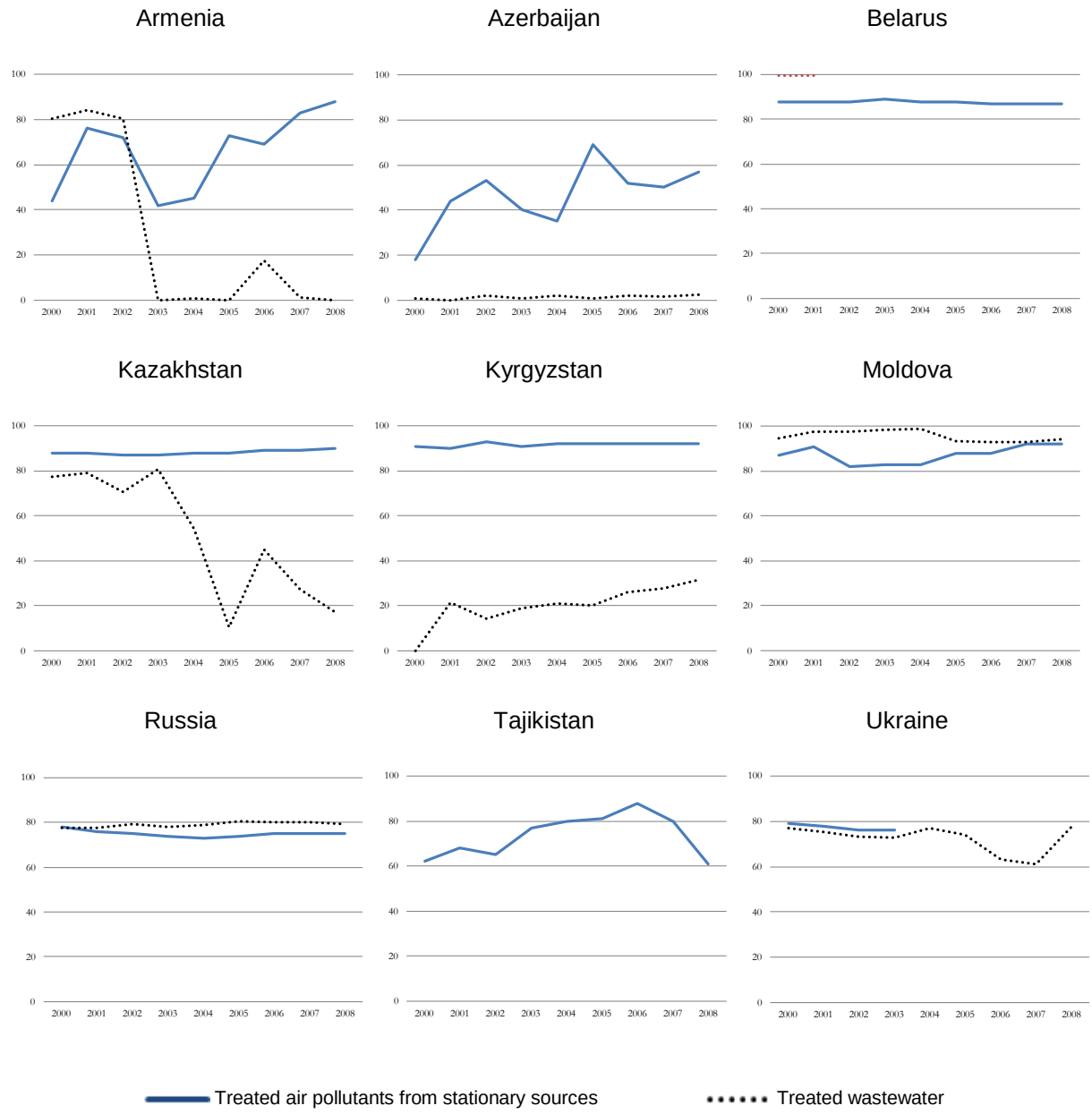
The EECCA situation with respect to ***hazardous waste***, including radioactive waste and waste from mining and oil extraction and refining, is critical. The legacy of the Chernobyl disaster in Belarus and Ukraine is well documented. There have been recent studies of the significant challenges posed by chemicals in EECCA countries, particularly in relation to multilateral environmental agreements, such as the Stockholm Convention on Persistent Organic Pollutants (POPs). Most EECCA countries have signed and ratified the Stockholm Convention (Table 5.2). Since 2007, many of them (*e.g.* Kazakhstan and Moldova) have submitted National Implementation Plans and took specific actions to translate those plans into practice. Inventories of obsolete POPs stocks and the quantification of their health impacts have been undertaken in several countries. The revealed impacts are large, resulting in increased cancer morbidity, particularly that of breast cancer.

Figure 5.3. Decoupling indicators in EECCA: Wastewater discharges
(Index, 2000 = 100)



Source: CIS STAT (2010), *Commonwealth of Independent States in 2009*, Statistical yearbook, Moscow, Russia.

Figure 5.4. Share of air emissions and wastewater discharges subject to treatment, % of total



Source: CIS STAT (2010), *Commonwealth of Independent States in 2009*, Statistical yearbook, Moscow, Russia.

Table 5.2. Status of Stockholm Convention implementation in EECCA countries

Participant	Signature, Succession to Signature (d)	Ratification, Acceptance (A), Approval (AA), Accession (a)	Date of National Implementation Plan transmission
Armenia	23/05/2001	26/11/2003	April 2006
Azerbaijan		13/01/2004 (a)	January 2010
Belarus		03/02/2004 (a)	January 2007
Georgia	23/05/2001	04/10/2006	Transmission pending
Kazakhstan	23/05/2001	09/11/2007	December 2009
Kyrgyzstan	16/05/2002	12/12/2006	April 2009
Moldova	23/05/2001	07/04/2004	August 2005
Russian Federation	22/05/2002	Ratification pending	N/A
Tajikistan	21/05/2002	08/02/2007	November 2007
Ukraine	23/05/2001	25/09/2007	Transmission pending

Source: Stockholm Convention's web site, last accessed in August 2011.

Climate change impacts and adaptation needs of urban areas and infrastructure

Contrary to a popular perception, the World Bank (2009) reports that EECCA countries are significantly threatened by climate change. Climate change is causing floods, droughts, melting of permafrost and glaciers, and is affecting hydrology. Risks from sea level rise, storms and other extremes, severe water shortages and desertification are increasing. The level of the Caspian Sea is expected to drop by six meters by the end of the 21st century, affecting fish stocks and coastal infrastructure. On the other hand, a sea level rise in the Black Sea basin is already threatening coastal zones in Georgia, the Russian Federation and Ukraine. Threats to biodiversity and ecosystems such as grasslands, forests and mountain ecosystems are significant as well.

At the same time, the World Bank concludes that the EECCA region suffers from a serious adaptation deficit. The most vulnerable countries are Moldova and Tajikistan. The potential economic loss from natural disasters is particularly severe in the Caucasus and parts of Central Asia (in Tajikistan, it would exceed 70% of the GDP (Pusch, 2004)). The 2000-2001 drought was estimated to have cost Georgia and Tajikistan 6% and 5% of their respective GDPs (World Bank, 2006). Climate impacts will likely exacerbate the persistent problem of rural poverty in these and other EECCA countries.

Socio-economic factors and the Soviet legacy of chronic environmental mismanagement have increased the region's vulnerability to even modest global warming. The poorly constructed and maintained Soviet-era infrastructure is ill-suited to cope with or protect people from extremes like heat waves and floods. Even countries and sectors that stand to benefit from climate change are poorly positioned to do so. In EECCA, for instance, many believe that a warmer climate and abundant precipitation will open up new agricultural frontiers even though the current gap between potential and actual yields in EECCA is much higher than any gains climate change can bring. While still insufficient in EECCA, public knowledge of climate change will be a powerful determinant of climate change policy adoption and implementation (EBRD, 2011). According to EBRD, information asymmetries in many transition economies, particularly in disseminating information about the threat of climate change, are caused partly by the predominant role of extractive sectors and carbon-intensive industries.

The next decade offers a window of opportunity to make development more resilient to climate change while reaping co-benefits. As the impacts of climate change increase, so will the need for appropriate adaptation measures in various sectors in addition to mitigation efforts. In particular, infrastructure concerns need to be addressed, including water and energy infrastructure, buildings, and transport. Urban areas in EECCA may need particular attention: they are acutely vulnerable to climate variability and extremes.

The share of urban population is important in many EECCA countries, with most of this population living in apartment blocks constructed in the 1960-70s and designed to last some 30 years. Some of these poorly maintained buildings continue to be liveable in summer time only thanks to extensive urban green areas. Transport systems, energy infrastructure and water utilities are similarly vulnerable. These challenges call for green solutions for urban areas in EECCA (Box 5.3).

Box 5.3. Green solutions for urban areas in EECCA

As cities move to develop adaptation plans, city managers and planners could promote new, sustainable site planning and zoning policies that reflect climate change risks. For example, by limiting development in areas affected by flooding, high precipitation or other weather-related events, or by preserving green spaces and waterways, government policies can enhance the hydrological environment's natural ability to adapt. Site planning must extend to consider industrial areas, mining operations and brownfield sites to address the risks that these areas pose to people and settlements when floods occur. In addition, new building codes and energy conservation ordinances should be aligned with principles of green design.

Operating from a planning paradigm that incorporates climate change will require new processes and new capacities. Municipal governments and government agencies must have the capacity to plan for and implement adaptation measures. Capacity in this case refers to technology, expertise, financial resources, staffing and inter-agency coordination. Given the nature of climate change, there should also be mechanisms to solicit input about changes from local communities so that officials can respond. Local communities must be part of the decision-making process.

Source: World Bank, 2009.

Climate change will affect every single aspect of energy production and transport. In addition to policies that would change the patterns of energy production, as discussed in the previous chapter, energy infrastructure needs to be made more efficient and compatible with the next generation of energy production technologies. This could be achieved through a cluster of innovations collectively known as the "smart grid".

Other solutions to improving network efficiency include increased integration of networks across regions or countries. In EECCA, as in Western Europe, the efficiency of energy supply could be improved through enhanced regional interconnection. In this area, international cooperation has clear benefits (Box 5.4). There have been multiple initiatives to promote regional co-operation to modernise energy grids, particularly in Central Asia: this is a priority for many international organisations and donors working in the region. The results so far have been more declaratory than tangible (IEA, 2010). There are new regional structures that may become influential in this regard, for example the Shanghai Cooperation Organisation, a regional political and security forum which includes the Russian Federation and all Central Asian countries except Turkmenistan.

Box 5.4. Regional concept of rational energy use in the Caspian Sea Basin

There is significant potential to increase cross-border electricity trade in the Caspian Sea Basin, but there are few signs of any real commitment from national authorities to a regional approach to energy rationalisation and security. The tendency in recent years has been towards the autonomous and, where possible, self-sufficient operation of national electricity systems, along with specific bilateral arrangements. In the past, regional electricity grids used to operate both in Central Asia and in the South Caucasus. The unified South Caucasus grid ceased to operate soon after 1991. A Central Asian energy grid has functioned until the present day, although at a very low capacity.

The development, over time, of a regional concept of rational energy use and energy security would avoid the current very large loss of economic efficiency associated with unnecessary investments in new generation and transmission capacity and inefficiencies in operating the existing capacity. The electricity generation mix in the South Caucasus, for example, offers scope for exploiting the synergies between Azerbaijan's gas-fired power generation, Georgia's hydropower and Armenia's nuclear capacity. On an even larger scale, there is huge scope in Central Asia for more co-ordinated seasonal exchanges of energy and water between the two mountainous countries with hydropower potential, Tajikistan and the Kyrgyz Republic, and their hydrocarbon-rich neighbours.

Source: IEA (2010)

The energy and water nexus

Climate change will strengthen the energy and water nexus, which is particularly evident in the Caucasus and Central Asia, where multiple energy and water relationships exist and where energy and water sharing arrangements were established in the 1960s.

Table 5.3. Main energy and water relationships in the Caspian region

	Provides	Relies on
Azerbaijan	Oil/gas to Georgia Transit services to Kazakhstan	Georgia for oil/gas transit
Armenia		Russia for oil/gas/nuclear fuel supply
Georgia	Transit services to Azerbaijan / Kazakhstan	Azerbaijan for oil/gas supply
Kazakhstan	Gas, electricity to Russia Coal, gas to Kyrgyz Republic Transit services to Turkmenistan, Uzbekistan	Russia, (Azerbaijan, Georgia) for oil transit Uzbekistan for gas/electricity supply (to south) Kyrgyz Republic for water services
Kyrgyz Republic	Water services to Kazakhstan	Uzbekistan, Kazakhstan for fossil fuels
Tajikistan	Water services to Uzbekistan	Uzbekistan for gas
Turkmenistan	Gas to Russia	Russia, Uzbekistan, Kazakhstan for gas transit Tajikistan for water services
Uzbekistan	Gas to Russia, Kazakhstan, Tajikistan, Kyrgyz Republic Transit services to Turkmenistan	Tajikistan for water services

Source: IEA (2010).

More recently, it has proved extremely difficult to resurrect a stable overall framework for cross-border energy and water transfers, and co-operation mechanisms between upstream and downstream countries remain inadequate. A prolonged failure to find sustainable bilateral or regional solutions to cross-border energy and water issues will hold back economic and social development and pose threats to the environment.

Box 5.5. Energy and water nexus in Central Asia: Past and present situation

A connection between energy and water use along the Amu Darya and Syr Darya rivers was established in the 1960s, when hydropower facilities built in the mountainous republics of Tajikistan and Kyrgyzstan released water in the summer months in order to satisfy the water needs of downstream Kazakhstan and Uzbekistan, mainly for irrigation of the cotton crop. In return, Tajikistan and Kyrgyzstan received fossil fuels to run their thermal power plants during the winter months, during which time (even though electricity demand was high) the upriver countries would cut back hydropower generation.

These regional arrangements no longer operate effectively. A key reason for this is the continued existence of subsidised power prices in Tajikistan and the Kyrgyz Republic, which now have to pay market prices for their fossil-fuels imports.

Power price subsidies have constrained the possibility for thermal power plants in these countries to generate electricity and heat competitively during the winter months. As a consequence, the operation of the key reservoirs — Nurek in Tajikistan and Toktogul in the Kyrgyz Republic — switched away from summer irrigation and gave priority instead to generating electricity in the winter months. This change in operation has had a significant impact on regional energy supply and on water distribution along the entire river system. For downstream countries this has often meant water shortages in the summer months, affecting agricultural production, and flooding in the winter. For Tajikistan and the Kyrgyz Republic, it has resulted in regular shortages of power, most severe in Tajikistan in the winter of 2007-2008. These shortages have fuelled social unrest in the Kyrgyz Republic and Tajikistan.

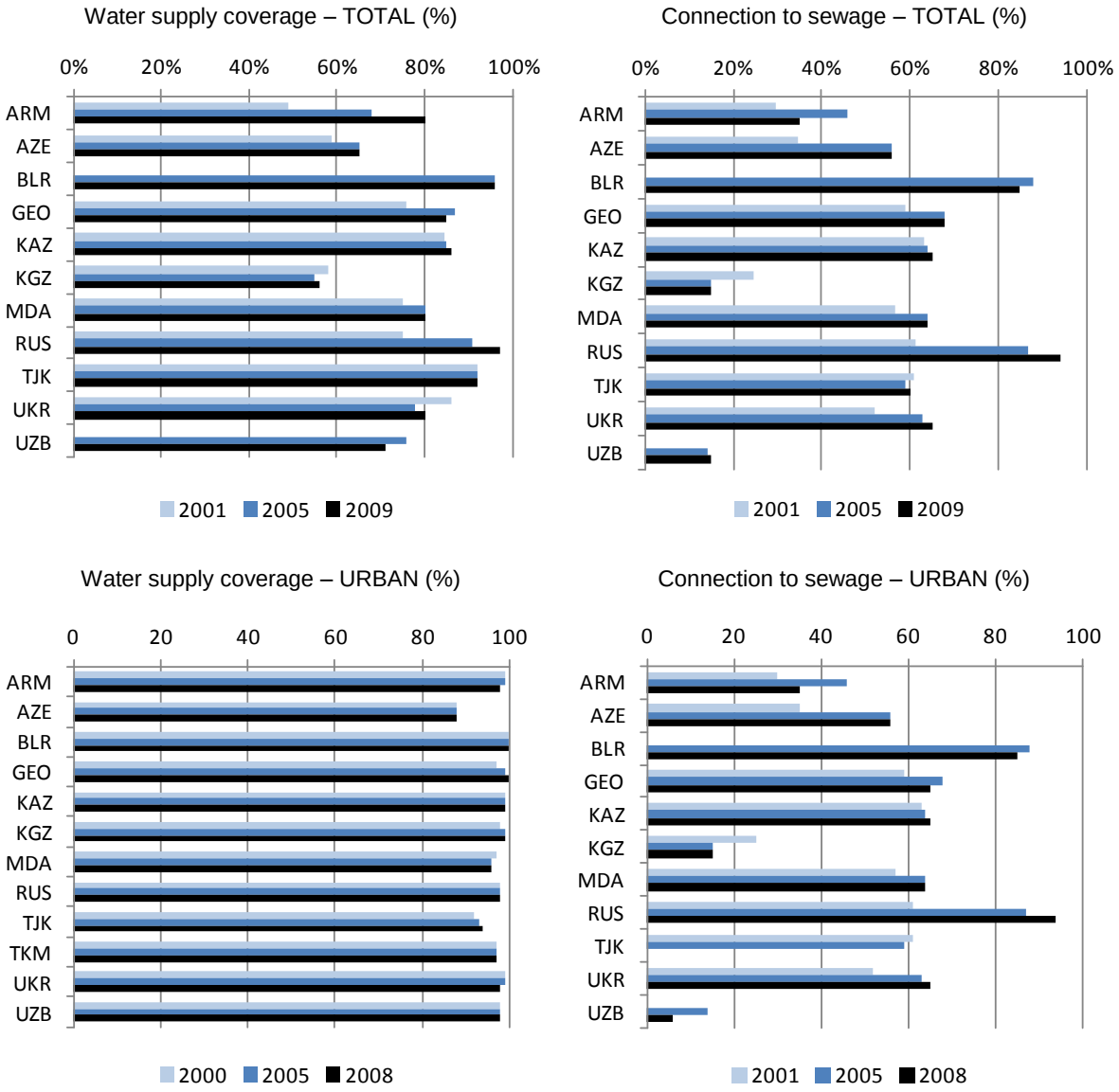
The Kyrgyz Republic and Tajikistan both intend to complete large new hydropower plants that could improve the reliability of electricity supply and bring revenue from exports, but these projects — in particular the huge 3.6 gigawatt Rogun dam project in Tajikistan — are extremely capital-intensive, face opposition from downstream countries and will take many years to complete. In the near term, alongside continued disagreement about these projects, there is likely to be continued tension about the seasonal patterns of operation of the existing hydro plants, about the pricing of internationally traded hydrocarbons and, more controversially, whether and how to compensate for water services provided by the hydro-rich countries.

Source: IEA (2010).

Access to environmental services and amenities: focus on water

The UNICEF/WHO Joint Monitoring Programme (JMP) for the Millennium Development Goals presents a positive picture of how EECCA countries have improved access to water and sanitation services. However, due to the methodology and baseline used, this is a partial and potentially misleading picture. Reviewing a broader range of indicators provides a different perspective on the situation of the water sector in EECCA.

Figure 5.5. Access to improved water supply and sanitation in EECCA countries



Source: OECD (2011a).

Data collected by the OECD/EAP Task Force secretariat (OECD, 2011) concur with the JMP view that access to water supply in urban areas has remained high. However, with notable exceptions, service quality and the condition of water infrastructure have continued to decline. Only four countries (Belarus, Kazakhstan, the Kyrgyz Republic and the Russian Federation) have uninterrupted water supply 24 hours a day. Per capita water consumption, the energy required to pump water, the volume of unaccounted for water and staffing levels in water utilities are high compared to OECD countries. Access to water services is particularly limited in poorer countries and in rural areas. Some evidence suggests that corruption plays a role in the operations of the water sector in some countries, which also increases costs. Addressing these issues provides opportunities for relatively low-cost efficiency gains.

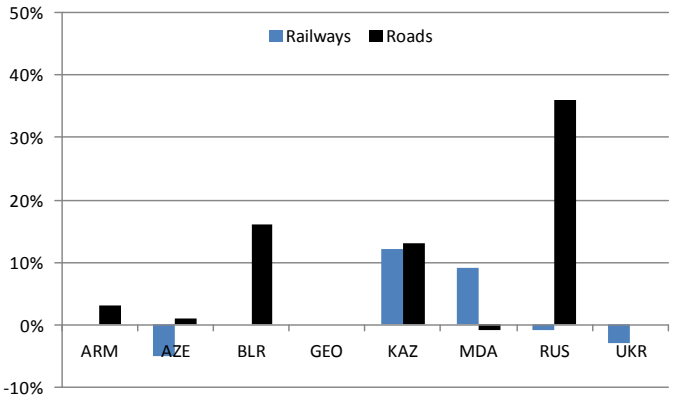
Sanitation is the area of greatest concern in EECCA countries. Sewage coverage is low. In many EECCA countries, even where wastewater is collected, it generally is not treated because wastewater treatment plants are not functioning. As a result, most wastewater is discharged directly into water bodies without treatment. Municipal water utilities have become the main polluters of surface waters in many EECCA countries.

Access to water and sanitation services in rural areas is much worse than in large urban areas, with smaller urban areas somewhere in-between. Access to water services in poorer countries is particularly acute. Rural dwellers rely on low-cost groundwater sources, protected streams, and, sometimes, surface water intakes. The most commonly used form of sanitation is pit latrines. Wastewater is not treated, even in the case of simple sewage systems. Inadequate treatment of wastewater has resulted in the deterioration of water quality and levels of waterborne diseases that are significantly higher than in the EU. These trends are likely to continue in the absence of improved provision of water services and better hygiene. At the same time, addressing these issues provides opportunities for relatively low-cost efficiency gains.

Transport and green growth

Adequate transport infrastructure and management systems are needed to support economic growth and development. The transport systems' infrastructure has been in decline for a while, although it has restarted to expand in some countries (Figure 5.6). Public transport is, however, affected by low cost-recovery of offered services that has led to its degradation. The degree of transport congestion is rising, resulting in substantial costs for the economy and human health alike. Transport policies and management systems are improving too slowly to facilitate better economic and environmental performance of transport systems in the short term.

Figure 5.6. Changes in the length of railways and roads in EECCA (2000-2009), %



Source: OECD calculations based on CIS STAT (2010), Commonwealth of Independent States in 2009, Statistical Yearbook, Moscow, Russia.

Green growth presents several opportunities and challenges in relation to transport systems. For example, investment in high-speed rail networks can promote growth and yield environmental benefits, but only under the right conditions; evaluating when these conditions are met is critical. Another example relates to the deployment of infrastructure in support of new, potentially low-carbon transport technologies such as electric vehicles.

Decreasing transport's environmental footprint while increasing its accessibility requires robust cost-benefit analysis of investments into transport systems. Network infrastructure investment appraisal needs to be made on a life-cycle basis, cover maintenance as well as investment costs, network resilience and facility robustness to a changing climate, as well as costs of post-incident recovery.

No doubt, transport will need to shift away from reliance on fossil energy to a broader range of fuel types and energy carriers. Electrification is likely to be a part of the shift (ITF, 2010). Many authorities have started, or are planning to, subsidise consumer purchase of electric vehicles, charging infrastructure and smart-grid electricity distribution networks. Large-scale deployment of electric vehicles will require considerable public support until electric vehicle, battery and charging infrastructure efficiency gains are realised. Such subsidies should be carefully considered, as there is a risk that public intervention in new energy distribution networks and technology may be costly either because it is premature or because it backs a technology that fails to win market support (OECD, 2011b).

Conclusions and ways forward

Human exposure to water and air pollution is high in EECCA, particularly in areas where economic activities are concentrated. While a certain level of decoupling has been achieved, the challenges are to sustain this trend and further reduce the absolute volume of emissions of air and water pollutants and the resulting impact on people's health. This implies continued improvement and implementation of policies promoting pollution control, technological innovation, energy savings and environmentally sustainable transport.

In order to improve the environmental quality of life, EECCA countries need to accelerate progress on the following lines of action:

- ***Put in place a realistic and effective incentive framework for cleaner production.*** This would imply continued reform of environmental quality standards, shifting the focus from procedural regulation to performance regulation, and establishing more effective economic instruments. The policy packages need to contain information-based instruments (such as Pollutant Release and Transfer Registers) and awareness raising activities. Better inspection and enforcement are needed to promote compliance with regulatory requirements by industry.

- ***Rehabilitate existing, particularly water, and build new environmentally-related infrastructure.*** The infrastructure problems in EECCA negatively affect the quality of life, have important economic costs and lead to a loss of opportunities for local economic development. Adequate infrastructure is important for other sectors' development and for reducing development disparities across regions. While EECCA countries have a relatively extensive water infrastructure, compared to their level of income, many of them fail to provide safe drinking water and effective sanitation because the poor state of this infrastructure. Indoor air pollution is characteristic to poor rural households lacking access to the gas network. The waste management infrastructure is very often rudimentary, and transport infrastructure is degrading. In the context of climate change, the existing infrastructure is ill-suited to cope with extremes like heat waves and floods. Clearly, shifting to a greener path of development requires special attention to these problems. EECCA countries would need, therefore, to rehabilitate the existing and build new infrastructure. Given the long life of infrastructure, it is crucial that decisions on its development consider environmental

aspects, such as resource intensity. Adopting some of the green growth solutions, for example micro-hydropower or solar energy production, may address both health problems related to indoor air pollution and access to energy more generally. The investment efforts should be accompanied by careful analysis of technical options to favour flexible and less costly ones, improvement of regulatory and institutional frameworks, sound financial planning and public co-funding where necessary to address the public good aspects, as well as a better facilitation of private sector participation. The use of performance-based contracts with private operators should become a regular practice. In order to enable the necessary investments, continued support from development banks and donors is necessary. Synergies between environmental and infrastructure policies should be fully exploited at the regional and urban levels. Inter-municipal cooperation should be considered in all areas in order to take advantage of economies of scale.

- ***Target transport-related air emissions.*** This would require further work to develop regulations (fuel standards, exhaust gas emission standards) to combat air pollution from mobile sources, enforcement measures (vehicle inspection programmes) and economic incentives (such as taxes on imported vehicles). In conjunctions with it, transport infrastructure needs attention, particularly the infrastructure servicing environmentally-friendly municipal transportation.

- ***Enable cities to grow green.*** While cities concentrate environmental challenges and climate vulnerabilities, they are critical drivers of national growth and have an important potential to exploit synergies between environmental and economic goals. The implementation of green growth at the local level can address social issues in a more direct way than at the national level. Furthermore, greener growth can increase cities attractiveness for firms and skilled workers. Better policy frameworks are needed to advance urban green growth in EECCA. This would include, for example, an improved vertical governance and removing systemic barriers to local action (such as national policies that conflict with each other or prevent local action); establishing adequate price signals on carbon and natural resources; providing technical assistance, funding and knowledge sharing; and providing coherent and accessible financing mechanisms. There is also a need for developing more effective tools for measuring progress towards greener growth in cities. Finally, partnership platforms involving cities along with other public, private and intergovernmental organisations need to be extended. In this regard, EECCA cities need to increase their participation in the European Covenant of Mayors and other similar initiatives.

- ***Continue addressing the problem of chemical hazards.*** National policies for the management of chemicals and hazardous waste need further improvement and implementation. Contaminated sites lacking clear ownership will require continuous attention and funding from public authorities.

- ***Maintain the international dialogue and extend analysis related to the environment and health agenda.*** In this respect, the European Environment and Health process will have an important role to play. Within this process, areas of joint action include policy reform, the evidence base, international commitments and emerging issues related to: energy and health, inequalities, climate change, water and sanitation, etc.

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CHAPTER 6:
PRICE SIGNALS, ECONOMIC INSTRUMENTS AND MONETARY INCENTIVES FOR GREEN GROWTH

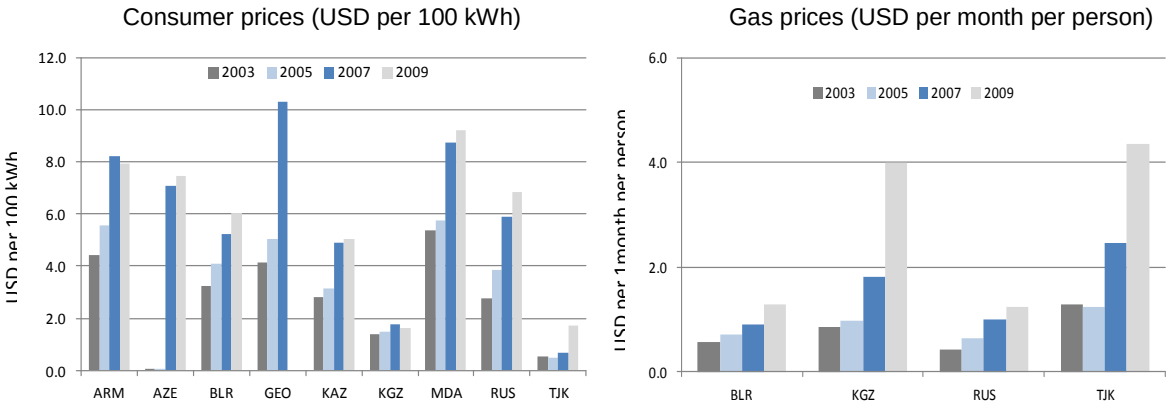
Households and businesses alike largely follow price signals to adjust their behaviour. The main strength of price signals (whether they are created by the market or influenced by government policies) is that they can set the right incentives for broad-based actions that reduce environmental damage with the least economic cost and also promote and guide "green" innovation. The current chapter discusses the relevance of some price and other monetary signals in EECCA for promoting green growth in the region. However, available data on carbon pricing, price differences between households and industry and agriculture, level of basic rates for environmental taxes and natural resource use payments in the EECCA region has been limited.

Energy and fuel pricing

The upward trends in energy pricing, observed a few years ago (OECD, 2007) have continued (Figure 6.1), although energy tariffs, and the pace of their change, vary widely across EECCA. Armenia, Georgia and Moldova have the highest ***electricity tariffs*** in the region (over some 0.08 USD /kWh), which are quite close to those in Bulgaria, the country with the lowest tariffs in the European Union. The tariffs in Kazakhstan, the Russian Federation and Belarus have increased and exceed now some 5 usc/kWh. Tajikistan has more than tripled its tariffs. In Turkmenistan, the 100% subsidisation of electricity delivered to households remains in place (IEA, 2011).

Household ***gas tariffs*** have fluctuated, often reflecting their link to oil prices (*e.g.* in Moldova and Ukraine). In comparison with 2007, gas tariffs have doubled in the Kyrgyz Republic and Tajikistan and continued to rise even in oil and gas-rich countries such as Kazakhstan and the Russian Federation. As is the case with electricity, gas is free for households in Turkmenistan.

Figure 6.1. The evolution of electricity tariffs and gas prices for households in selected EECCA countries



Source: CIS Statistical Yearbook 2009.

Disputes around gas tariffs and payments have stalled bilateral relations between the Russian Federation and Ukraine and disrupted supplies to the European Union, provoking a new reflection in many EU countries on energy security and the diversification of energy supply, primarily through an increase of renewable energy production. Gas price increases have also led to tensions between Russia and Belarus and financial difficulties in Belarus's energy sector because of the government's reluctance to increase consumer prices (Box 6.1).

The greatest increase of ***heating tariffs*** in EECCA happened prior to 2007, though they continue to rise (given their link, in some cases, with gas prices). Nevertheless, in the majority of EECCA countries they remain below the levels that would enable cost recovery by district heating companies (IEA, 2010; World Bank, 2010). Given that in comparison to income the existing tariffs provide sufficiently strong signals, it is likely that the way of imposing these tariffs – fixed per dwelling, or variable depending upon the size of apartment, irrespective of the used amount of heat – may be the factor that encourages a wasteful use of heat. In addition to not being equipped with meters, the household heating distribution infrastructure does not allow individual users to adjust the heat supply; where such adjustments are technically possible, they usually do not influence the heating bill.

Box 6.1. Gas import prices and the energy sector's financial viability in Belarus

The cost recovery challenge. Belarus is heavily reliant on natural gas imports from Russia which it obtains at below-market prices. Belarus generates about 97% of its electricity from natural gas-based thermal power plants, and 87% of its heat generation is based on natural gas. While import prices for natural gas and oil continue to be below European market prices, import prices of natural gas have more than tripled over the past 5 years, presenting the sector with significant challenges. The reluctance to pass on increases in production costs to residential consumers has led to a decline of cost recovery levels on electricity, gas and heat supplied to residential consumers and has undermined the financial viability of the sector. Energy tariffs for residential consumers have remained flat in real terms since 2005, keeping household expenditures on utility services in Belarus below 10% of household income, much lower than in most countries in the region. Operating losses incurred by utility companies grew to 1.7% of the GDP in 2009. They are compensated for these losses through a complex, non-transparent system of subsidies accounting for 0.3% of the GDP and, to a larger extent, cross-subsidisation between commercial and residential consumers, accounting for 2% of the GDP in 2009. Persistent under-pricing has deprived energy suppliers of the financing needed to carry out routine maintenance activities and investments, thereby reducing the efficiency and reliability of the energy supply. The low energy prices also distort price signals to households, leading to energy-inefficient consumption patterns, while cross-subsidies between commercial and residential consumers impose an implicit tax on the business sector, adding to an already large tax burden.

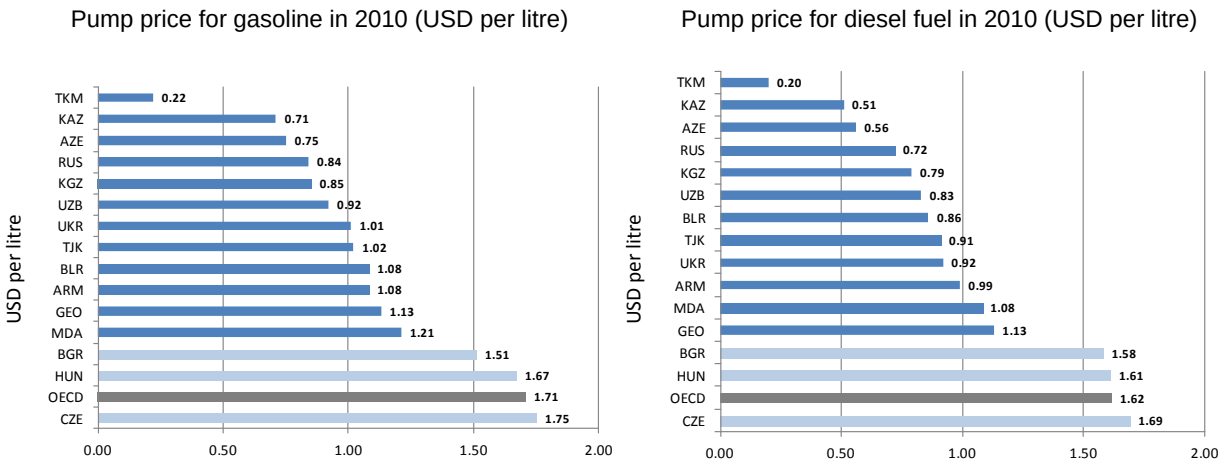
Proposed tariff reforms. Responding to growing fiscal pressures, the government has begun to address these challenges. With energy costs expected to rise, the importance of higher energy prices has been well recognised in Belarus. To restore the financial viability of the sector, the State Programme for the Development of the Belarusian Energy System (2011-2015) in August 2010 called for a comprehensive tariff reform and gradual elimination of cross-subsidisation in the natural gas supply by 2013, and in the electricity and heat supply by 2014. If implemented as planned, these reforms will generate significant fiscal savings, but they will require steep increases in tariffs that will hurt poorer households, necessitating compensatory increases in the coverage and adequacy of targeted social assistance.

Source: World Bank (2011).

There are examples of changing practices to reduce heating bills, *e.g.* in Moldova where meters have been installed in apartments blocks, also allowing variations of heat supply in connection with weather conditions. Such changes have clear benefits for consumers and the environment though their cost-effectiveness in the absence of donor support still needs to be verified.

In some EECCA countries, gasoline and diesel prices (Figure 6.2) approach the OECD levels, while in others they remain relatively low. The gasoline/diesel differential (that has traditionally existed in EECCA countries but has now been eliminated in Georgia) may encourage the consumption of diesel, a more polluting fuel than gasoline. Price differentiation between various types of gasoline may have a similar effect. It has to be noted that in 2012, diesel engine exhaust gases were classified as carcinogenic to humans (from "probably carcinogenic") by the International Agency for Research on Cancer (IARC), which is part of the World Health Organization (WHO),

Figure 6.2. Fuel prices in the EECCA region as compared to other countries



Source: The World Bank Development Indicators Database.

Several EECCA countries, including the Russian Federation (Box 6.2), are moving quite strongly in reforming pricing policies for gas and electricity. Through price liberalisation, Russia aims to increase the competitiveness of its energy sector. In line with the same objective, further energy tariff increases are planned in Tajikistan, Ukraine and Uzbekistan (World Bank, 2011). In Uzbekistan, there is a new 2011-2015 government programme aimed at the power sector modernisation. These policies will need to take account of the fact that even the currently applied tariffs create difficulties for consumers, resulting in increased non-payment for electricity: collection rates dropped to 74% in the Kyrgyz Republic and only 54% in Uzbekistan in 2006 (ADB, 2009). In order to address the problem of non-payments, Ukraine introduced non-payment fines. While all these actions are not strongly linked with environmental concerns, they could have a major impact on greening the development in the region, particularly if pricing is complemented with some other policy measures (such as carefully designed metering and information provision).

Box 6.2. Liberalisation of energy prices in the Russian Federation: Policy objectives

The Russian Energy Strategy to 2020, approved in 2003, gave priority to improving energy sector competitiveness in domestic and export markets. One important feature was a commitment to the gradual liberalisation of domestic prices for energy. In line with the strategy, Russia has steadily increased natural gas tariffs for industry, with a view toward convergence with export prices by 2014. The electricity market reform is now well advanced, with liberalisation of wholesale electricity market scheduled for completion in 2011. These target dates have been subject to revision due to economic circumstances or other factors. In 2007, the government adopted the goal of achieving equal profitability from gas sales to domestic and export markets by 2011. Following the surge in oil prices during 2008 and the subsequent economic downturn, this target date was extended to 2014. Gradual price hikes have nonetheless narrowed the gap between the domestic and European prices. Recent market developments, such as the shale gas boom and increasing liquefied natural gas availability, are contributing to this convergence by lowering the European prices. Another notable result of the Russian government's resolve to continue to increase the domestic gas prices was that Gazprom recorded its first-ever profit from domestic sales in 2009. The Russian government has also taken steps to liberalise the electricity sector in order to create more competition and attract needed investment.

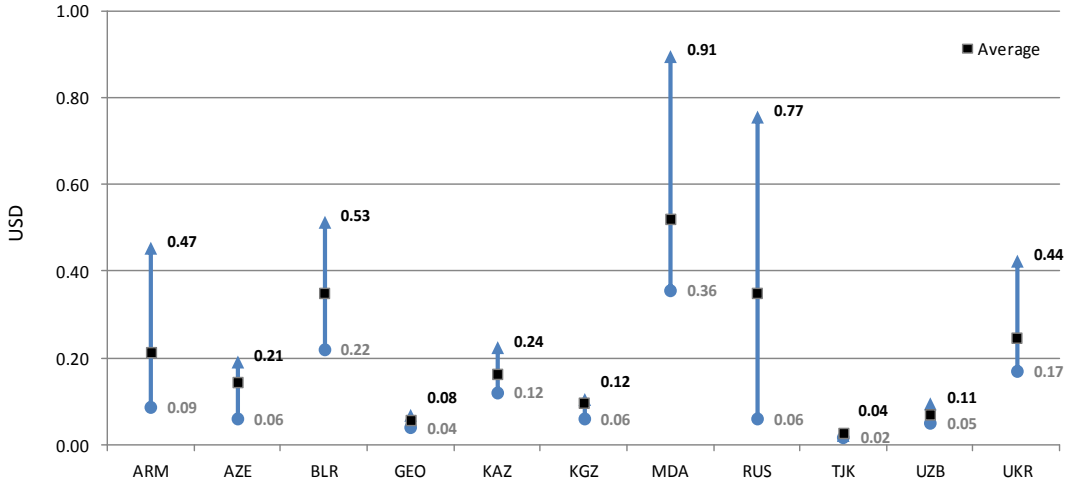
Source: IEA (2010).

Water pricing

Similarly to the energy sector, water tariffs (Figure 6.3) do not produce sufficient cash revenues to allow sustainable cost recovery in most EECCA countries. Revenues from water remain very low in the region, with tariffs standing at or below 0.4 USD/m^3 in seven out of twelve countries. In fact, none of the water companies is currently able to generate any significant cash flow from operations to finance capital expenditures. A major factor leading to this inability to cover costs is that water tariffs for the majority of EECCA water companies have increased slower than some operating costs. In this context, the water sector is challenged to set tariffs at levels that provide incentives for economic use of water and improve the efficiency of water and wastewater utilities while remaining affordable, fair and equitable.

Figure 6.3. Evolution of water tariffs in EECCA in 2000-2008, USD

(maximum, average and minimum per each country)



Note: The graph shows the minimum, average and maximum levels of tariffs observed in 2000-2008. For some countries, the maximum shows the last year available.

Source: EAP Task Force Water Utility Performance Indicator Database, June 2011.

A number of countries have made significant efforts to improve their tariff-setting policies (Box 6.3) to reflect the economic realities and to insulate tariff-setting from excessive political interference. Not all these efforts have been successful, however, as the example from Ukraine shows. In many cases, the reforms resulted in higher tariffs. In addition, the tariff differentiation practices have been changing. Traditionally, the deficit generated by low household tariffs used to be partly covered by higher tariffs for industrial customers. A survey conducted by the OECD in 2011 shows that tariff differentiation by user has become less prevalent in the Russian Federation, where most regions now apply uniform tariffs. At the same time, in Ukraine, industrial users are charged higher average tariffs than domestic customers. In Moldova, the average industrial tariffs are roughly three times higher than the average household tariffs. This aspect of water pricing needs further analysis and reform, leading to a tariff structure that balances the cost recovery goal and the affordability constraints that may exist for certain groups of customers.

Box 6.3. Examples of water tariffs reform in EECCA

In ***Azerbaijan***, Azersu is the main provider in the country, and tariffs are set nationally for different types of consumers. The tariffs were last increased by approximately 50% in February 2011 (from USD 0.23 to USD 0.36 per cubic meter for domestic users and from USD 0.8 to 1.2 for other users), demonstrating a willingness to increase revenues. Metering rates also increased during the period, with 8.3% of connections to water supply networks metered by 2005, going up to 12.5% by 2009.

Kazakhstan took action to better regulate tariffs for utilities that belong to natural monopolies. Amendments to the law "*On Natural Monopolies and Regulated Markets*" were adopted, envisaging an "investment tariff" and the setting of a maximum tariff level by an authorised body. Tariffs are to be based on the rate of return on regulated assets. The introduction of a stable mid-term tariff can attract investors: it sets a range within which natural monopolies can operate, provided that the utility implements an approved mid-term investment programme. However, the criteria for approval of a five-year tariff are so stringent that not every company can meet them.

In ***Ukraine***, the resolution of the Cabinet of Ministers "On Approval of the Procedure for Tariff-Setting for Public Water Supply and Sanitation Services" was adopted to define the procedure and method of tariff calculation for water supply and sanitation services. However, this method does not allow to cover costs of upgrading the infrastructure and does not provide incentives for energy saving.

Source: OECD (2011a).

Commonly, pricing policies are strengthened by the introduction of metering. Current water metering rates are relatively low in the region, but they have been growing over the last years and reached over 90% in Moldova, more than 70% in Armenia and Belarus, and 40% in Kazakhstan and Uzbekistan. Some EECCA countries, for instance, Armenia, Azerbaijan and Moldova, implemented special metering programmes for households, but their results are mixed in some cases (Box 6.4).

Box 6.4. Introduction of water metering in EECCA

Armenia has implemented a water use metering strategy to reduce water consumption, water leaks, production costs, and to increase the collection rate. In Yerevan, a metering programme reached more than 80% of connections. This has significantly driven down consumption, which is now in line with Western Europe averages. Yet the problem of how to accurately meter water use in multifamily houses or apartment blocks persists. While the attention focused on metering domestic (indoor) water use, water losses in supply lines leading to apartment blocks has grown.

In ***Azerbaijan***, a state-funded programme for meter installation has been implemented since 2006. The plan has been delayed: although the installation was expected to be completed by 2007 in Baku and 2008 nationwide, about 50% of users were metered as of mid-2009.

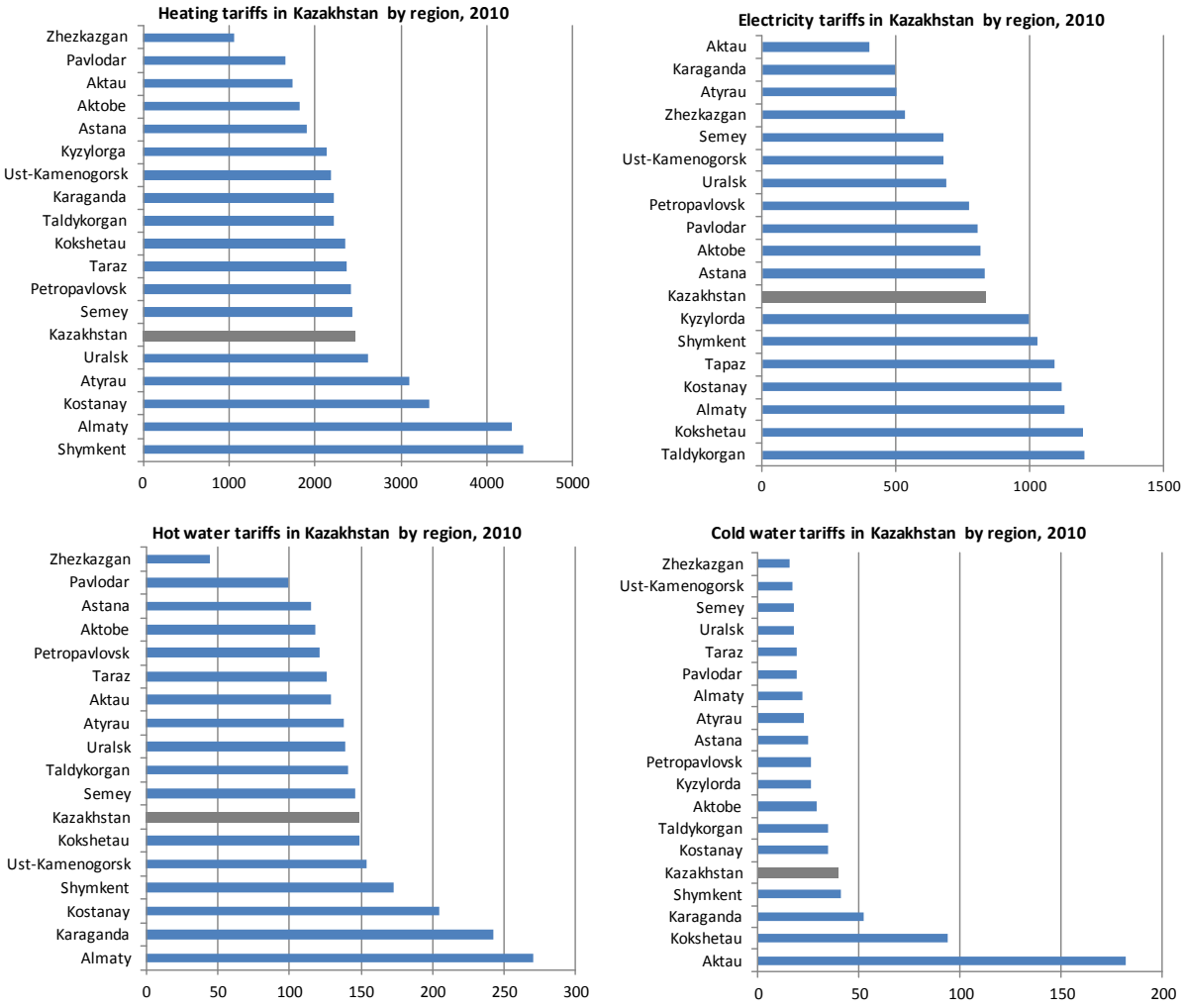
Moldova has been among the first to use water meters. The nationwide installation of water meters has led to a significant reduction in user charge revenues because of the differences between total consumption (including transportation losses) and the volume of water billed based on meter readings. This generated a difficult financial situation for WSS utilities. Besides, cross-subsidising domestic water tariffs at the expense of commercial and industrial users prompted many such users to drill their own boreholes instead of using water supply services. This has also reduced revenues from user charges for water utilities.

Source: OECD (2011a).

Regional disparities

The average figures presented for energy and water tariffs sometimes mask huge regional disparities within countries that stem from a number of factors, most importantly, the differences in population income levels, the quality of services and unit costs for water utilities. Figure 6.4 below provides evidences of such disparities from Kazakhstan.

Figure 6.4. Tariffs for major utility services in Kazakhstan, by region (2010), Tenge



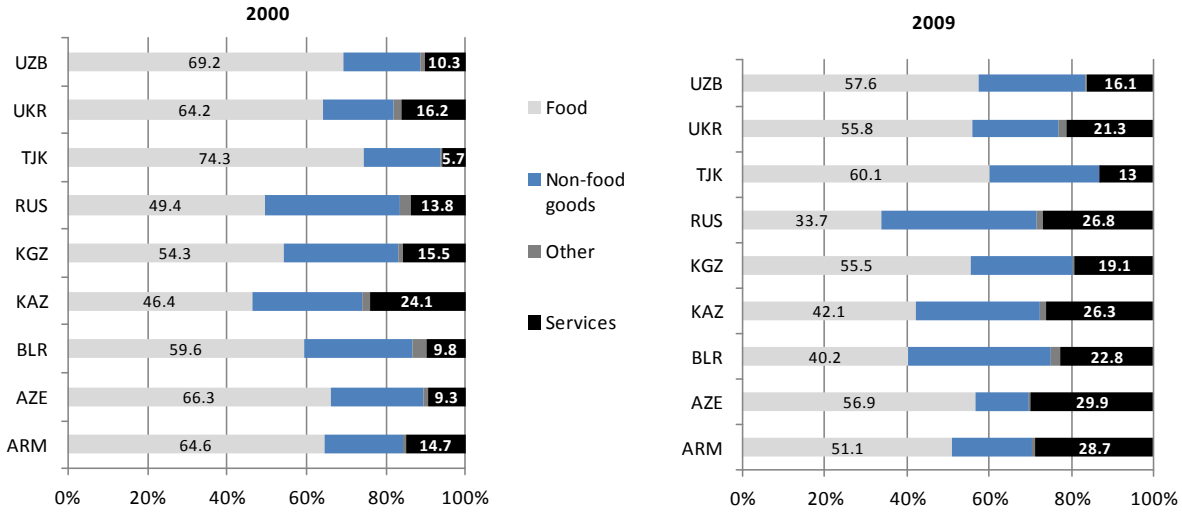
Source: National statistics office.

Natural characteristics (such as climate or topography) are additional factors that influence regional disparities. For instance, topography in some EECCA countries can vary greatly, which means that serving people in different geographical areas can generate very different costs. Some service areas can be served with gravity systems (as is frequently the case in Armenia, Georgia and the Kyrgyz Republic), while others require significant amounts of electricity for pumping water. The bargaining power between the public sector and operators, when water services are privatised or delivered through public-private partnerships, may also influence such disparities.

Affordability concerns

While the average nominal incomes in EECCA countries have increased substantially, many households can still be qualified as poor (OECD, 2011a). This is illustrated by the share of disposable income spent on food (it is commonly agreed that poor households spend more than half of their income for food). At the same time, a uniform trend towards the increased share of services in the household expenditure structure is observed across the entire region (Figure 6.5).

Figure 6.5. Structure of household expenditure in EECCA countries in 2000 and 2009



Source: CIS in 2009: Statistical Yearbook" (Inter-State Statistical Committee of CIS, 2010, CIS in 2009: Statistical Yearbook).

In spite of nominal tariff increases, prices (*e.g.* for water supply and sanitation), calculated as a percentage of household income, have not grown significantly since the year 2000. This thesis is supported by the data in Table 6.1. Detailed analyses in selected countries have shown that water bills remain below the affordability thresholds agreed in the country. These thresholds vary, and, for example, are fixed at 5% of the income in Moldova, 3.5% in Georgia, and 2.5% in Armenia and Kyrgyzstan, respectively.

It is difficult to judge whether this information suggests that there is still room for further tariff increases. First of all, affordability should be looked at comprehensively, covering all services. Furthermore, the analyses of water price affordability in EECCA countries were conducted before 2008, and it is possible that the economic and financial crisis has since eroded some of the opportunities for tariff increases. Although economic growth resumed relatively strongly in the region, it remains to be seen whether it results in growing incomes and affordability.

Table 6.1. Multi-year trends in the average monthly bill for water supply and sanitation services in selected EECCA countries (% of average household income)

Country	2001	2002	2003	2004	2005	2006	2007	2008
ARM	0.6%	0.6%	0.5%	0.8%	0.9%	1.0%	0.9%	0.8%
BLR	0.5%	0.5%	0.6%	0.5%	0.7%	0.6%	0.5%	0.5%
KAZ	0.9%	1.0%	0.9%	0.7%	0.6%	0.6%	0.5%	0.4%
KGZ	2.0%	2.0%	1.6%	1.4%	1.3%	1.3%	1.2%	1.2%
MDA	3.4%	3.1%	2.3%	2.6%	1.9%	2.1%	2.0%	2.2%
RUS	1.0%	1.3%	1.4%	1.4%	1.5%	1.5%	1.4%	1.3%
TJK	0.7%	0.6%	0.7%	0.9%	0.8%	0.7%	0.8%	n.d.

Source: Calculated based on data presented in the "CIS in 2008: Statistical yearbook" (Inter-State Statistical Committee of CIS, 2009), CIS in 2008: Statistical yearbook.

More generally, the social dimension of pricing policies, be these policies related to energy or water, remains critical for EECCA countries. It implies that affordability checks should always be included in the determination of tariffs and that establishing or improving social safety net systems targeted at the poor should always be considered. Addressing distributional effects can make it possible to increase average tariffs towards cost-recovery levels whilst not affecting poor customers negatively.

It has to be noted, however, that price controls are immensely popular, and targeted subsidies may not be accepted easily by the target group. Evidence from Moldova shows that a transport tariff increase has led to protests by retired people who lost free travel against a scheme, which aimed to compensate their transport expenses. Communication campaigns are, therefore, a necessary element of both pricing policies and targeted aid for the poor in the EECCA region, where the mentality of a merely free public service has not dissipated totally over the transition period.

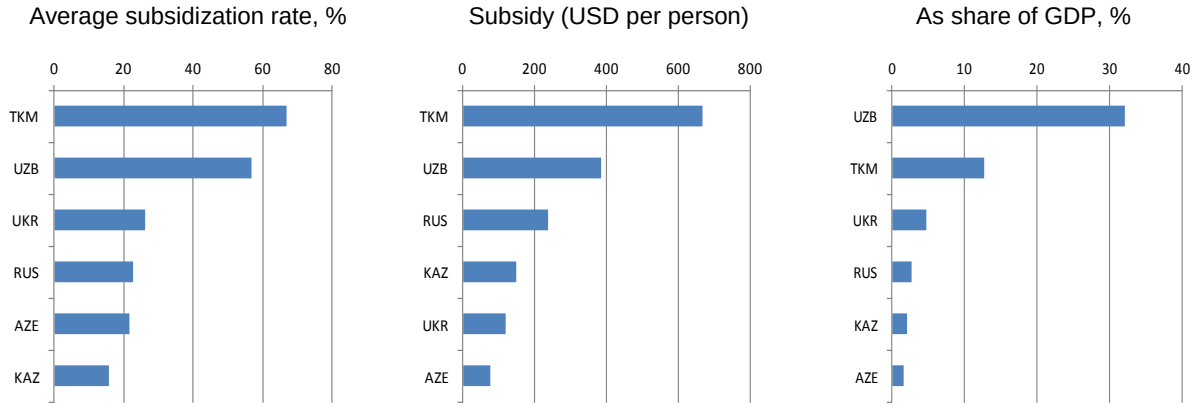
Subsidies

Subsidies are a commonly used tool for shaping incentives. They can be an effective policy option when pricing instruments are too difficult or costly to enforce. Used in a targeted manner, they can help shift the balance of incentives towards more environmentally sound products and practices or support new and immature technologies. Subsidies have also been common in the area of energy efficiency to enable low-income groups to gain from the economic benefits of conservation. These programmes typically lower the up-front capital cost of investing in energy efficiency improvements by offering grants, tax credits or low-interest loans. However, subsidies involve complications around finding and targeting limited public funds. The demands that they place on governments in terms of administrative capacity and information requirements are considerable. Governments should also be able to resist lobbying from the affected sectors. Subsidies require careful consideration in the context of green growth: those that contradict green growth objectives need to be eliminated.

Information and analysis on EECCA countries' exposure to environmentally harmful subsidies and the consequences of such exposure are very scarce. Most of the information refers to fossil fuel subsidies. In many instances, such subsidies favour unsustainable production practices by heavily polluting industries.

Most EECCA countries subsidise at least one form of energy, in some cases extremely heavily. As already mentioned, in Turkmenistan there is no charge to residential users for electricity and gas supply (up to a certain threshold). Available data show that fuel subsidies may consume up to one third of the GDP in Uzbekistan, with other five EECCA countries possibly spending high shares of their GDP on such subsidies (see Figure 6.6). Energy subsidies are also present in other EECCA countries. The World Bank reports that in Belarus, subsidies for heating provided from local budgets amounted to an average of 0.25% of the GDP in 2007-2010. Until recently, compensations for energy expenditures were 0.5% of the GDP in Moldova; in 2011, they reached a total of 0.85% of the GDP (World Bank, 2011).

Figure 6.6. Estimates of fossil fuel subsidies in selected EECCA countries



Source: IEA (2010).

In absolute terms, the Russian Federation is leading EECCA on fossil fuel subsidies. The IEA estimates that the cost of these subsidies in 2009 was almost USD 34 billion (Table 6.2), down from USD 53.8 billion in 2008. Subsidies for natural gas were the highest, estimated at almost USD 19 billion. The under-pricing of electricity resulted in subsidies of just under USD 15 billion. It is difficult to judge the accuracy of these estimates without doing country-level analysis and making more precise calculations.

Table 6.2. Fossil-fuel consumption subsidies in Russia (2007-2009)

		Unit	2007	2008	2009
Total	Estimated subsidies	USD billion	33.3	53.8	33.6
	per capita	USD	235	380	238
	as a share of GDP (MER)	%	2.6	3.2	2.7
	rate of subsidisation	%	23	25	23
By fuel	Natural gas	USD billion	18.4	30.7	18.7
	rate of subsidisation	%	50	54	50
	Electricity	USD billion	14.9	23.2	14.9
	rate of subsidisation	%	29	32	27

Source: IEA (2010).

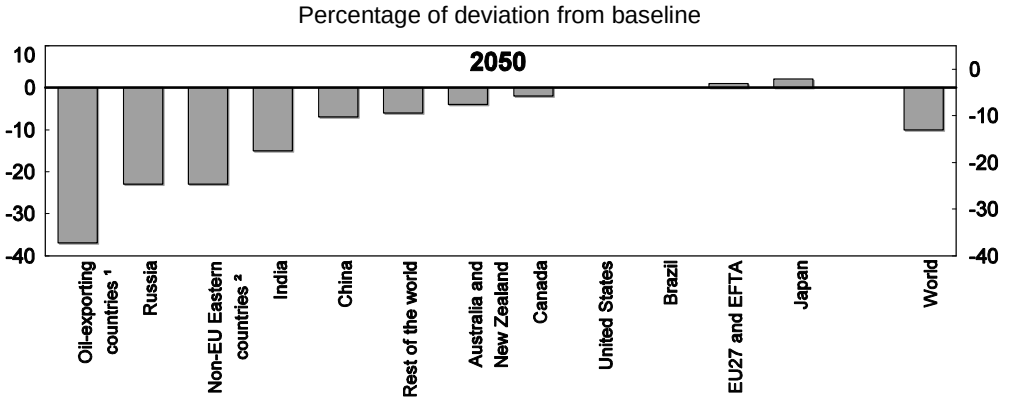
While imposing a rising fiscal cost, energy subsidies seem to be mostly untargeted and largely inequitable. In Belarus, for instance, they benefit the higher income population that has higher per capita consumption of energy (World Bank, 2011). Forty-five percent of the total

energy subsidies for utilities flows to the top 30% of households in the income distribution, compared to 15% of the subsidies for the poorest 30% of households. Households in relatively richer urban areas receive 82% of the subsidy. The issue of cross-subsidisation requires a closer assessment in EECCA. Available data point to different approaches in different countries, *e.g.* electricity prices may be higher for households than for industry, as in the Russian Federation, or vice-versa, as in Moldova. Furthermore, the impact of such practices on behaviour is not clear.

Data on subsidies in other sectors are even scarcer and may be quite outdated. According to a recent World Trade Organization report (2010), the latest data on fisheries subsidies in non-OECD countries are for 2003. They show that in Georgia such subsidies amounted to USD 1 million, while in the Russian Federation they were USD 1.6 billion. There are scattered examples of agricultural subsidies in EECCA, though their environmental impacts have never been studied. Agriculture subsidies constitute some USD 9 billion annually in the Russian Federation. Public support to agriculture amounts to some USD 17-25 million in Moldova, where a special Agency for Agricultural Interventions and Payments was created in 2010 to manage these subsidies. Agricultural subsidies in Kazakhstan compensate 2-3% of the costs per hectare, though there are plans to eliminate the current system of crop subsidies as of 2012. In Belarus, the share of agricultural spending in the national budget is extremely high (8% versus 1-2% in the majority of other countries).

Gradually phasing out subsidies can help to free up public funds while providing stronger incentives for changes in the environmental behaviour. A range of subsidy programmes need to be reviewed in this regard, *e.g.* subsidies for fossil fuels, water use, or agricultural production. The decision on priority sectors needs to be made at the country level. Their removal can also, according to modelling results (Figure 6.7), play an important role in the reduction of greenhouse gases (GHG). It has to be mentioned that five out of twenty most GHG-intensive economies in the world are EECCA countries, with the following ranks: Uzbekistan – 2; Kazakhstan – 8; Ukraine – 11, Turkmenistan – 12, and Russia – 15. OECD estimates show that by 2050 the EECCA region could reduce more than 20% of GHG emissions as a result of fossil fuel subsidies removal.

Figure 6.7. Greenhouse gas emissions with fossil fuel subsidy removals



1. The region includes the Middle East, Algeria-Libya-Egypt, Indonesia and Venezuela.
2. This region includes Armenia, Azerbaijan, Belarus, Croatia, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.
Source: OECD ENV-Linkages model based on subsidies data from IEA.

Carbon markets

Carbon price signals can be provided through two major groups of instruments: subsidies and carbon taxes, on the one hand, and caps on emission quantities (also called "carbon markets"), on the other. These instruments produce the most efficient and cost-effective solutions and create incentives to ensure that emissions are reduced first where it is the cheapest to do so. There are pros and cons to each type of price instrument, which vary according to sectors where they are applied. In general, however, these mechanisms help provide a price incentive to invest in low-carbon technologies. Given the generally high burden of utility tariffs in EECCA and the fact that most EECCA countries do not face the strict reduction targets, a carbon tax may not be the most appropriate policy option.

The potential advantages of carbon markets were recognised in the Kyoto Protocol which established the range of market instruments, often referred to as flexible mechanisms. The Kyoto agreement recognises three mechanisms: Joint Implementation (JI), Clean Development Mechanism (CDM) and Assigned Amount Units (AAUs). JI is a mechanism that covers all countries under the Kyoto protocol that have an emissions cap (including the Russian Federation and Ukraine), whereas CDM covers those countries without a cap (developing countries, including the other 10 EECCA economies). In both cases, projects that reduce emissions, relative to a notional baseline, are granted credits that can be sold in the carbon market. Under AAUs, on the other hand, each country with a cap under the Kyoto Protocol was given an assigned amount of tradable units equivalent to the country's annual allowed emissions. Australia, Canada, Japan, Italy, New Zealand and Spain are among those expected to purchase AAUs from Central and Eastern Europe (and particularly the Russian Federation and Ukraine) who have large surpluses that resulted from industry restructuring as part of the economic transition. The CDM market was established in 2000, and it is estimated (UNEP, 2008) that by 2012 about 1.5 billion credits will have been issued. The market for JI credits, on the other hand, was established in 2008 and is currently small.

Most EECCA countries are eligible for the CDM. A recent UNEP study (2008) shows that between 2001, the first year CDM projects could be registered, and 2012, the end of the Kyoto commitment period, the CDM is expected to produce some 1.5 billion tonnes of carbon dioxide equivalent (CO_2e) in emission reductions, much through renewable energy, energy efficiency and fuel switching. This could raise USD 15 billion to USD 24 billion in direct carbon revenues for developing countries and economies in transition, depending on the price of carbon. The same study shows that EECCA countries have benefited only marginally from this mechanism.

Of all world regions, the revenue that is expected to be generated through CDM projects for the region of Europe and Central Asia by 2012 is negligible, only USD 119 million. For the sake of comparison, the total value of CDM projects in East Asia and the Pacific is USD 10.4 billion, USD 2.7 billion in Latin America and the Caribbean and USD 3 billion in South Asia.

The CDM is the main source of income for the UNFCCC Adaptation Fund, which was established in 2007 to finance concrete adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol. In addition, the CDM is subject to a 2% levy, which could raise between USD 300 million and USD 600 million over the 2008-12 period. The actual amount raised will depend on the carbon price.

Pollution and product charges

All EECCA countries have put a price on pollution by imposing pollution charges and damage remediation and compensation requirements. Georgia abolished the Soviet system of pollution charges in 2005, judging its use inefficient because of low rates and revenue collection problems. Several previous OECD papers discussed in detail the use of pollution charges in EECCA (see References). Their main conclusion, which is still valid, is that pollution charges have been too poorly designed to provide real incentives for environmental improvements and essentially have a revenue-raising nature (the key OECD recommendations for reforming pollution charges in EECCA are summarised in Box 6.6).

Box 6.6. OECD recommendations for reforming pollution charges in EECCA

A number of actions need to be undertaken to eliminate the most obvious flaws in the present pollution charge system and increase its incentive impact. The first step would be to significantly simplify the system through a drastic reduction in the number of pollutants on which charges are levied. The charge base should constitute major and priority pollutants that can be monitored at reasonable costs. The following are key recommendations for the reform of pollution charge systems in EECCA:

Elimination of Pollution Charges on Waste. The limits for industrial waste generation are based on actual technologies and practices, so the charges (as low as they are) do not provide any incentive for waste minimisation. The revenues from pollution charges on waste generation are not conveyed to operators of industrial landfills for the development of waste management facilities but are distributed to the environmental funds or go directly to the general budget. This results in inadequate investment in waste management facilities and inappropriate disposal practices. EECCA countries should consider eliminating or phasing out pollution charges for industrial hazardous and solid waste and allow providers of waste collection, transport, storage, treatment, and disposal services to charge enterprises *directly* for these services in order to recover the full costs of safe management of the wastes.

Exclusion of hazardous air and water pollutants from the charge system. Toxic substances such as heavy metals, phenols, etc. should be strictly regulated through permits based on technology considerations and regularly monitored. Pollution charges for hazardous pollutants play virtually no incentive role that would complement command-and-control regulation and, due to the large number of such pollutants, overly complicate the administration of the system.

Targeted use of pollution charges. The determination of pollutants that would continue to be charged should be guided by an analysis of main environmental problems. In order to have an incentive impact, pollution charges must be targeted at a few key pollutants (that represent priorities of the government's environmental management programme) that are discharged mainly by a number of big stationary point sources. For example, a sulphur dioxide pollution problem, when the major polluters are power plants and a few industrial facilities, can be effectively addressed by a pollution charge. The process of reducing the charge base should be tied together with the revision of charge rates.

Charge rates need to be increased to a level that would provide significant incentives to reduce pollution. Environmental authorities should conduct studies to determine typical charge burdens and pollution abatement costs for enterprises by sector and size and estimate the degree to which the charge rates can be increased (at the same time as the number of pollutants subject to charge is drastically reduced), so as to enhance their incentive impact while maintaining the charges' economic feasibility and political acceptability. The incentive impact of the reformed system of pollution charges would need to be assessed after several years of operation to determine the need for further improvements.

Improving Collection of Pollution Charges. An effort to increase the collection rates will also enhance the overall credibility of the pollution charge system. Without enforcement, pollution charges, as well as other economic instruments become meaningless.

Source: OECD (2003).

Charges and taxes on environmentally harmful products are being applied in several countries, most importantly in Armenia, Moldova and Ukraine, but in the majority of cases they do not seem to have any incentive impact due to the low charge rates and lack (or higher price) of alternative, less harmful products on the market (OECD, 2004 a, b).

Revenues from environmental and natural resource use taxes and charges are relatively small in EECCA and have been declining (Table 6.3). The basic rates of these taxes and charges are set, most often, in the countries' fiscal legislation. New tax codes were recently adopted in several EECCA countries, *e.g.* in Kyrgyzstan (2009), Belarus (2010) and Ukraine (2011), or amended, as in Azerbaijan. This update of fiscal legislation has often led to an increase in basic rates and the enactment of provisions for their adjustment for inflation.

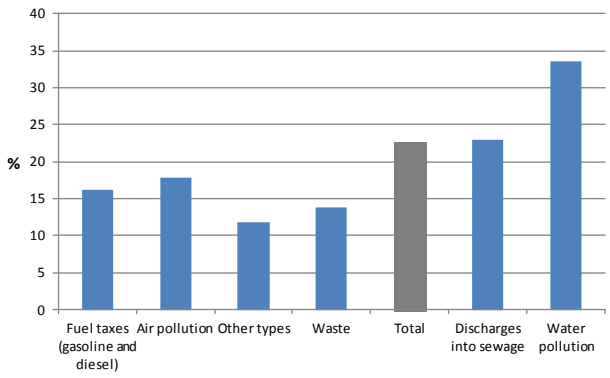
Table 6.3. Revenue from some environmental and natural resource taxes and charges in selected EECCA countries as share of GDP, %

Country	Type of tax	2004	2005	2006	2007	2008
Armenia	Total, environmental pollution and resource abstraction			0.25	0.29	0.28
Azerbaijan	Mining tax	1.150	0.428	0.535	0.435	0.368
	Land tax	0.165	0.122	0.100	0.096	0.077
Belarus	Total, environmental pollution and resource abstraction			0.66	0.57	0.37
Georgia	Licence auctioning	-	0.0002	0.0004	0.0014	0.0010
Moldova	Total, environmental pollution and resource abstraction			0.02	0.02	0.01
Uzbekistan	Sub-soil tax	0.46	2.33	2.35	2.18	2.39
	Land tax	0.59	0.58	0.54	0.56	0.50
	Water tax	0.09	0.09	0.09	0.10	0.10

Source: UNECE EPRs (Azerbaijan; Georgia; Uzbekistan); National statistics (Armenia; Belarus; Moldova).

The rate of un-collected taxes and charges can be quite high (Figure 6.8). The highest pollution charge payment evasion of 97% was recorded in Georgia in 2003 (OECD, 2007). It is likely that this exceptional administrative inefficiency resulted in the total elimination of pollution taxation in Georgia in 2005. Such governance-related weaknesses are clear barriers to green growth strategies as well.

Figure 6.8 The ratio between uncollected revenue and imposed charges in Moldova (2005-2009)



Source: OECD calculations based on national statistics.

Financial risks of non-compliance: Administrative fines

Monetary penalties (fines) are the most widespread instrument in EECCA as well as internationally, intended to providing signals of financial risks on non-compliance. In the absence of such signals many policy instruments, including taxes, are likely to lose their effectiveness. In order for fines to send a strong signal, the level of fines should account for the economic benefits of non-compliance to which a gravity component is added. The amount of fine can be fixed in the legislation or variable. Variable fines are most common, due to their flexibility, with their size determined by a government authority according to a number of factors.

The minimum and maximum limits for administrative fines are fixed for different types of violations in each country's Code of Administrative Offences (CAO) and vary across the EECCA region (Box 6.7), often reflecting the level of income. Fines in EECCA are often expressed as multiples of the minimum wage set in the law (*e.g.* in Armenia, Tajikistan and Uzbekistan) in order to facilitate their adjustment to inflation. For the same reason, Moldova, Belarus, Kazakhstan and Kyrgyzstan use "conventional units" whose monetary value is regularly revised. Russia and Georgia have recently moved to the monetary denomination of administrative fines. Fines are generally higher for officials than for regular citizens, and in those countries that have fines for legal entities those may be up to an order of magnitude higher than those for individuals. Kazakhstan even distinguishes the rates between small and medium-sized enterprises and large businesses. There are no formal requirements to relate the size of a monetary penalty to the economic benefit to the offender from the violation (especially considering the fact that only a few EECCA countries have administrative penalties for enterprises), to the violator's intent, or the violator's ability to pay the penalty.

Box 6.7. Variations of maximum limits of fines in EECCA

The maximum limits vary dramatically across the region, both in relative values of multiples of the minimum monthly wage (MMW) and in monetary terms. For example, whereas in Armenia the maximum fine for officials is 150 MMW, in Tajikistan it is 20 MMW. In Moldova the maximum fine is about 450 €, while in Kazakhstan it is around 10,000 €. In a unique case in the EECCA region, Kazakhstan has a provision in the CAO setting administrative fines for violation of (air) emission limit values by large enterprises at ten times the pollution charge rate applicable to the exceedance amount. For wastewater discharge and waste management violations by large businesses, Kazakhstan's CAO makes the fine equal to the monetary value of the damage inflicted by the violation.

Source: OECD (2009).

EECCA countries diverge with respect to the scope of application of administrative enforcement. Administrative liability may cover only individuals (physical persons), with important differentiation between regular citizens and 'officials' (managers of legal entities or individuals with decision-making power), as is the case in Ukraine, Moldova, Armenia, Kyrgyzstan, etc. Several EECCA countries (*e.g.* Russia, Kazakhstan, Belarus, and Georgia) have, in addition, established administrative penalties for legal entities (juridical persons). Those countries that do not have provisions for administrative fines against companies rely on pollution charges and damage compensation claims to make businesses pay for violating environmental requirements. The limited scope of application of administrative fines (excluding legal entities) in most EECCA countries and the lack of systematic consideration of many, particularly economic, factors of non-compliance in determining the penalties indicate a need for improvement based on best international practices.

The collection rates of administrative fines in EECCA are quite low. Depending on the year, they can be as low as 31-32% (*e.g.* in Georgia in 2005 and in Moldova in 2006) but are generally between 60% and 80%. Tajikistan, however, reports collection rates exceeding 90%. The revenues in most EECCA countries (*e.g.* Russia, Armenia, Kyrgyzstan) go to the general budget, while a few others (*e.g.* Moldova and Uzbekistan) channel them to special Environmental Funds. The fines are practically used as a revenue raising instrument, and sometimes there are even fiscal plans for the assessment and collection of environmental fines.

Financial responsibility for environmental damage

Industrial and commercial activities generating environmental pollution are often associated with the risk of degrading the natural capital. Through environmental liability regimes the financial responsibility for damage to natural resources is imposed on those who cause the damage. It is one of the means of making polluters pay for preventing, remediating or compensating environmental damage they cause. In economic terms, this means imposing internalisation of pollution externalities. A well-designed environmental liability regime is also a significant deterrent against non-compliance with regulatory requirements. Financial security mechanisms such as insurance are increasingly used to protect potentially responsible parties and, ultimately, the public (in case of absence or insolvency of responsible parties) from the heavy burden of damage remediation or compensation costs.

The notion of environmental damage had not been clearly defined in EECCA countries until very recently. Russia's draft Federal Law "On amendments to certain legal acts of the Russian Federation (in relation to the regulation of liquidation of environmental damage, including that caused by past economic activity)" defines environmental damage as monetary value of the harm to the environment. Potentially creating an important legal precedent, reparation of the harm is defined as *restoration* of impaired environmental conditions through remediation measures or monetary compensation.

Environmental liability systems remain underdeveloped in EECCA where they are focused on collecting monetary compensations for the damage rather than on correcting the damage, limiting its impacts, and preventing further damage. The new draft Russian law on environmental damage marks a significant change in this approach by emphasising remediation.

Box 6.8. The new draft Russian law on environmental damage: focus on remediation

According to the new draft Russian law on environmental damage, the government authority at the administrative level (federal, sub-national or municipal) corresponding to the ownership of the site would approve remediation projects submitted by the operator responsible for the damage or, if the responsible party cannot be identified or is insolvent, would directly manage appropriate remediation activities. The completion of a remediation project should be certified by the competent government authority that initially approved it. Furthermore, the draft law recognises the "technical impossibility" of remediating environmental damage from air pollution, contamination of surface water (if pollutants cannot be removed) and groundwater, as well as irreversible destruction of animals, plants or ecosystems. In those cases, the competent government authority would obtain monetary compensation from the responsible party and use it to conduct "equivalent environmental protection measures".

Source: OECD (2012).

For assessing the level of compensations to be paid, competent authorities often rely on methodologies that are largely abstract in nature and poorly defendable in courts. While recent regulatory documents declare the principles of damage assessment based on actual remediation costs, there is a complete disconnect between these declarations and the methods used in practice. There are very few, if any, standards for site risk and impact assessment, technique

selection, and definition of clean-up levels. In addition, there is limited capacity and expertise in the region to undertake damage assessment: the circle of regional experts remains small while international consultants are too expensive to be relied upon routinely.

Box 6.9. Damage assessment methodologies in EECCA

The Soviet-era "Temporary Methodology on… Assessing Environmental Damage Incurred by the Economy and Caused by Environmental Pollution" (1983) was the first one to address the issue of environmental damage. It enacted an approach that uses fixed cost parameters as surrogates of actual remediation costs to calculate a certain value accepted as damage. Thereby the calculation of damage is extremely simplified and does not involve economic justification. The official approval of the respective methodologies facilitates their acceptance by courts. However, practice demonstrates that they result in significant underestimation of the damage. Many damage calculation methodologies in EECCA countries make the value of the damage a function of current pollution charge rates. The link to pollution charge rates is most often present in methodologies related to air pollution (*e.g.* in Moldova), which is not accidental.

In recent years, most EECCA countries have introduced legislative provisions for *optional* damage assessment based on actual remediation costs. This was done in the Russian Federation and Kazakhstan. Kazakhstan's Environmental Code (2007) defines economic value of environmental damage as the cost of environmental remediation, to be assessed directly or indirectly. The direct method of assessment is to determine the expenditure (in market prices) necessary to restore natural resources and living organisms through "most effective engineering, management and technological measures" in accordance with a time-specific project. The Environmental Code gives "priority" for the remediation to be undertaken by the party responsible for the damage. It also provides for the engagement of independent experts whose fee must be paid by the responsible party. The indirect method (using fixed parameters and formulas) may be used only if a direct assessment cannot be performed. There have been attempts to improve damage calculation methodologies by combining fixed statutory damage values with some real costs. Several environmental damage-related implementing regulations in EECCA also make specific references to remediation costs.

Source: OECD (2012).

The legislation in EECCA countries establishes the primacy of monetary compensation of the harm to "in-kind" environmental remediation by the responsible party. Most often, such monetary compensation goes to the state budget without any guarantee that it will be spent on environmental remediation. In Moldova, the responsible party can conduct environmental measures for the amount equal to the value of the damage, not necessarily related to remediating the inflicted damage. Moreover, state-owned enterprises in Uzbekistan are exempted from monetary compensation of environmental damage.

In EECCA countries' legal systems, environmental liability is predominantly fault-based although some EECCA countries, such as Kazakhstan, have imposed strict liability for hazardous industrial activities. These strict liability provisions are rarely implemented in practice. Past damage is often treated as an independent issue in EECCA, largely due to the legacy of heavy pollution from state-owned enterprises during the Soviet era and the liability challenges that emerged in connection with their bankruptcy or privatisation. Essentially, however, the questions to be resolved are those of identification of liable parties and financial responsibility.

The draft Russian law on environmental damage defines "environmental damage related to past economic activity" as harm to the environment inflicted on state or municipal-owned land not currently used for economic activity, where the responsible party cannot be identified or taken to justice. It places the ultimate remediation and financial responsibility upon the appropriate government authority. On the other hand, in Kazakhstan, if the responsible party cannot be identified, liability is imposed on the current owner or user of the natural resource.

Environmental liability may also cover transboundary damage to natural resources, mostly from air and water pollution. For example, the UNECE Protocol "On civil liability and compensation for damage caused by the transboundary effects of industrial accidents on transboundary waters" (2003 Kiev Liability Protocol to the 1992 Water Convention) addresses the issue of financial responsibility for actually taken or planned measures of 'reinstatement' of impaired transboundary watercourses. This Protocol has been signed by Georgia, Moldova and Ukraine, but no EECCA country has ratified it.

Historically, the lack of a viable financial guarantee system in EECCA resulted in a situation where all significant environmental remediation projects in the region were almost fully financed using budgetary resources. To address this problem, several EECCA countries started to develop environmental insurance schemes in the late 1990s. They were introduced to cover civil liability of owners of potentially environmentally hazardous facilities with respect to traditional (health and property) and environmental damage caused by industrial accidents. The existing insurance schemes are not working mainly because of the lack of large damage remediation claims that would create a real need for financial security. The lack of independent assessment of an operator's environmental risks also impedes the development of an environmental insurance market. In a functioning environmental liability system, the vast majority of insurance companies in EECCA countries would be unable to compensate potential damages. One reason for this is the inadequate assessment of insurance companies' assets and financial strength prior to issuing them a licence to offer environmental insurance.

Conclusions and ways forward

One of the main conclusions is that as part of their shift to green growth, EECCA countries need to provide more adequate price signals, taking account of how price changes could negatively impact vulnerable groups of population. The precise magnitude of subsidies, be it with a positive or a negative effect, is unclear in the region, though estimates point to a strong presence of environmentally-harmful subsidies (particularly fossil fuel subsidies). The actual benefits of subsidies to a green economy and the poor are unclear. While reforming subsidies and removing environmentally harmful subsidies (EHS) may be highly beneficial, the implementation of such reforms can be quite challenging in the region.

In this context, EECCA governments should:

- ***Carefully identify and gradually remove subsidies:*** Existing data point to a strong presence of EHS in some EECCA countries, leading to such phenomena as wasteful resource consumption, budget pressures and technological stagnation. The current level of subsidies requires further evaluation by country: going beyond price-gap estimates may be necessary to understand the true extent of environmentally harmful subsidies and potential social effects of their removal in the region. EHS identification and gradual phase-out may have important global-level benefits. . EHS removal should be carefully planned to overcome opposition from powerful lobby groups and to avoid adverse impacts on competitiveness and welfare of the poor. Simultaneously, it will be important to consider most effective ways to redistribute savings from EHS removal.

- ***Continue tariff reforms in conjunction with work to improve institutions that govern tariffs:*** While there are many legitima***te concerns over the affordability of tariffs for some groups of pop***ulation, tariff reforms need to continue, along with related institutional improvements, in order to increase the financial sustainability of utilities.

- ***Curb environmental "tax evasion":*** Enforcement of economic instruments in EECCA is challenging, with historically very high rates of environmental tax evasion. This problem needs to be studied in more detail, and better mechanisms of enforcement put in place, particularly given the existence of internationally recognised efficient practices.

- ***Reform existing market-based instruments of environmental policy:*** In the absence of information on how environmental externalities affect personal well-being, compounded with weak liability regimes, price signals need to be corrected through market-based instruments. Though in place since the early 1990s, such instruments are still ineffective in EECCA and require holistic reform. The pricing of both natural resources and pollution must be brought up to a level that is sufficient to promote resource efficiency. Product tax incentives, *e.g.* car or fuel taxation, need to be improved or introduced where absent.

- ***Introduce new market-based instruments:*** The introduction of additional instruments, such as payments for ecosystem services, may need careful consideration of the overall framework, particularly when the maturity of markets and trust between market players is crucial, such as in the case of payments for ecosystem services (discussed in Chapter 3). The ministries of environment need to closely monitor the evolution of framework conditions in order to identify "windows of opportunity" for introducing such instruments. The use of carbon pricing mechanisms in EECCA needs to be better studied and gradually implemented where feasible;

- ***Make the use of various instruments mutually supportive:*** There may be cases where not all emission sources could be covered by an economic instrument, or the instrument could not provide the right incentives for all actions. In these cases, approaches like voluntary and information-based instruments such as energy efficiency ratings and eco-labelling can prove important in influencing the market. For example, eco-labels can be effective in strengthening the responsiveness of agents to price signals by raising consumer and producer awareness on the environmental damage caused by specific activities as well as on the availability of cleaner alternatives. Voluntary approaches can also help to reveal information about abatement costs and environmental damage.

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CHAPTER 7:
INSTITUTIONAL ASPECTS OF GREEN GROWTH – ACTORS, PLANNING FRAMEWORKS, AND CAPACITY DEVELOPMENT

Green growth needs improved institutional arrangements to, first of all, overcome the institutional inertia and silos that exist around economic and environmental decision-making. For many countries, this will involve significant capacity building for integrating environmental issues into national development planning processes. Governance structures will need to be established at the highest levels of government and on ensuring co-ordination between different areas and levels of government. This Chapter addresses these main elements of institutional frameworks for green growth in EECCA.

Overall governance context

EECCA countries had to build their institutions following the disintegration of the Soviet Union. This process happened against the background of a deep economic crisis and encroached Soviet administrative traditions of silo thinking, opaque decision-making, and low government accountability for social and economic results of its activity. The change in governance systems was difficult to promote, and the quality of governance still remains problematic after twenty years of transition. The World Bank Governance Indicators (see country profiles) show both progress and regress, with many governance dimensions being poorly addressed. Over the last few years, unfortunately, commitment to reform the governance systems in EECCA in line with good international practice has mostly eroded, though the international community welcomed some of the positive governance changes in Georgia, the Kyrgyz Republic and Moldova, particularly as concerns their efforts to fight corruption. But even the best EECCA performers were not able to ensure progress across all major dimensions of good governance.

Many countries achieved improvements in the quality of economic governance that resulted in better international ranking of their business environment (see Chapter 2), though the private sector development is still constrained by many regulatory barriers and political and regulatory instability, and a lack of the rule of law and judiciary independence. In terms of multi-level governance, centralisation trends seem to gain spin due to both economic and political reasons.

Policy planning in many EECCA countries has entered the phase of sector consolidation and cross-sectoral integration after a period of proliferation of narrowly-focused strategies that resulted in both overly fragmented policy objectives and dispersed public budgets. The latest improvements of intra-government planning, including the use of medium-term expenditure frameworks (MTEF) and performance objectives for budgetary planning, contribute to a higher policy coherence and a better link between planning and financing in EECCA.

Organisational mechanisms, such as inter-ministerial committees and working groups have also helped to make government action more coordinated. Albeit slowly, the pluralism of decision making is improving in EECCA even though in some cases the local stakeholders face a declarative, formalistic approach to their involvement. Consultations on regulatory reforms remain the key entry point for major stakeholder groups to be involved in decision-making. To increase their impact, the private sector actors increasingly speak with one voice through industry associations. In the pursuit of the same objective, NGOs have strengthened their coalitions locally, nationally, and internationally.

Green measures in national strategies and recovery programmes

Green growth promotion requires a clear vision and priority setting at different levels of planning, including national, sectoral and local planning. Three elements of green growth enjoy ***longer-term government priority*** in many EECCA countries: energy efficiency, renewable energy and sustainable agriculture. Investments in environmental infrastructure, particularly in water supply and sanitation, are also considered to be a crucial element of economic development. Waste management is mentioned among priorities in Moldova, Kazakhstan and Uzbekistan. Public transport is hardly a matter of priority, though its environmental impact is on the rise. Other green growth-related aspects are rarely considered in EECCA government strategies. Knowing that only one EECCA country (Armenia) has ratified the Kiev Protocol on Strategic Environmental Assessment (SEA), the relatively wide presence of green growth issues in development strategies is a rather encouraging result. However, a continuous absence and underuse of a tool such as SEA, maintains the danger of slide backs, as it happened in the case of

the "Moldova 2020 Development Strategy: Seven Solutions for the Republic of Moldova" (adopted in 2012), which does not see greener growth as one of the seven solutions for development problems in the country. Nor the latter document looks into the environment-related risks of economic and social development, *e.g.* its vulnerability to climate change and the need for adaptation measures.

Back in 2008-2009, a majority of EECCA countries developed high-profile government programmes that are either directly dedicated to ***anti-crisis measures*** or contain development strategies in the context of economic recovery. These programmes particularly emphasise structural changes in the economy with an increasing support for SMEs, infrastructure development (where roads are a priority) and innovation. In some countries, agriculture and industry also received support as part of the recovery packages.

The financing of anti-crisis programmes relied on various sources. Oil- and gas-rich countries used significant fiscal and external surpluses accumulated from hydrocarbon exports. Georgia received massive international aid to stimulate economic recovery. Because of a very narrow fiscal space, several other countries, including Armenia, Belarus, Moldova and Ukraine had to strongly tighten fiscal discipline and appeal for support from the International Monetary Fund and other development partners.

Many recovery programmes include elements related to green growth (Table 7.1), although none present comprehensive or coherent strategies for the greening of the countries' economies. The most prominent green growth-related aspect is energy efficiency. Other sectors that are addressed include renewable energy, water supply and sanitation, sustainable agriculture, cleaner production and waste management.

Table 7.1. Presence of green growth aspects in anti-crisis programmes in EECCA countries

	Energy efficiency	Renewable energy	Transport infrastructure	Sustainable agriculture	Water supply and sanitation	Waste management	Cleaner production
ARM	Yes	Yes	Yes	Not explicitly	Yes	..	..
AZE	..	..	..	Not explicitly	..	..	..
BLR	Yes	..	Yes	Yes	..	..	Yes
GEO	..	Yes	Yes	Yes	..	..	..
KAZ	Yes	Yes	..	Not explicitly	Not clear	Yes	..
KGZ	Yes	..	Yes	Yes	Yes	Yes	Yes
MDA	Yes	Yes	Yes	Yes	Yes	..	Yes
RUS	Yes	..	Yes	Not explicitly	..	..	Yes
TJK	..	..	..	Not explicitly	..	..	..
URK	Yes	Yes	..	Not explicitly	..	..	..
UZB	Yes	Yes	Yes	Not explicitly	Yes	Yes	Yes

Source: National recovery programmes (see References).

Energy efficiency is listed among government priorities in Armenia, Kazakhstan, Belarus, Kyrgyzstan, Moldova, Russia, Ukraine and Uzbekistan. For example, the "Programme of Anti-crisis Measures of the Government of Russian Federation for 2009" lists resource and energy efficiency among the top five policy priorities and stipulates the implementation of energy efficiency programmes and projects at the regional and local levels. The "Programme for Stabilisation and Recovery of the Republic of Moldova for 2009-2011" envisages energy audits of office and residential buildings as a starting point of a large programme to cut energy losses.

At the same time, recovery programmes include projects with a potentially high environmental impact, such as building road infrastructure. In some countries, *e.g.* in Azerbaijan, subsidies to agricultural producers are envisaged. In this regard, a careful environmental assessment at the project and programme levels, as well as analysis of environmental implications of subsidies should be carried out.

The information on specific initiatives to develop ***strategies for low-carbon economies*** is scarce. However, at least two countries have launched the development of such strategies: Kazakhstan (in January 2010) and Moldova (in July 2010). In both countries, this work is part of their commitments under the United Nations Framework Convention on Climate Change (UNFCCC)[7] and is facilitated by the UNDP. These two and possibly other strategies of the same type may help countries to better understand the dynamics of stakeholder interaction and to consider the necessary policy analysis and scenarios of policy implementation.

In 2011, Kazakhstan has launched the development of a National Green Growth Strategy with support from international partners. Its development was preceded by the abolishment of the country's Sustainable Development Strategy, a step that contradicts the exhibited political will to strongly move on the green growth path. While the outcomes of the new Strategy development should not be pre-judged, the now common focus on proliferating strategy papers clearly puts in danger the advancement of green growth in EECCA.

Several other countries in EECCA embarked in the development of their green growth package of policies. Such countries include, for instance, Kyrgyzstan and Uzbekistan. National level policy dialogues on green growth have been launched, though are not yet well structured, in Armenia, Georgia, and Moldova, to name a few.

Unfortunately, many EECCA countries rely on donor assistance for the development and implementation of their green growth policies. More evidence needs to be collected on implementation aspects to make sure that important developments are not overlooked.

[7] In the Bali Action Plan (2007), the developing countries agreed to design and implement Nationally Appropriate Mitigation Actions (NAMAs). The preparation of a Low Emission Development Strategy (LEDS) is part of the implementation process. The UNDP's regional project titled "Supporting countries transition to low-emission development" facilitates this work in several countries of the region. As part of this initiative, a "How-to Guide: Development of Low-emission Development Concept, Nationally Appropriate Mitigation Actions, Low-emission development Strategy in Eastern Europe and Commonwealth of Independent States" was developed and has served as a methodological tool for drafting LEDS in Moldova and Kazakhstan.

Environmental governance structures and main environmental authorities

The role of public authorities, in particular of the environmental authorities, will remain central for promoting green growth in the EECCA context. Are the current environmental governance structures in EECCA sufficiently mature and effective to play this role?

The overall governance landscape of the environmental sector in EECCA is quite diverse and comprises a large number of governmental and non-governmental actors. Among those, public environmental authorities may not always be the major driving and convening force in EECCA. While ministries of environment (or equivalent bodies) have the main responsibility for environmental policy and regulation, sectoral ministries dealing with specific issues, such as water, energy, agriculture or forestry, often share policy planning function and are commonly charged with policy implementation (Table 7.2). Ministries of economy and finance play an increasingly prominent role in conjunction with the green growth agenda. Thus, the Georgian Government has entrusted the green growth portfolio to the Ministry of Economy and Sustainable Development, which established in 2010. Similarly, the Kyrgyz Ministry of Economy and Antimonopoly Policy has received the mandate to lead the government efforts on green growth planning and implementation in the country.

Table 7.2. Examples of policy areas covered by some EECCA environmental ministries

Country	Pollution and chemicals control	Water resources management	Management of mineral resources	Land management	Fisheries management	Biodiversity/ protected areas	Ecotourism	Renewable energy	Forest resources
Armenia	●	●	shared	●	Absent	●	shared	shared	other
Azerbaijan	●	●	●	shared	●	●	shared	other	●
Belarus	●	●	●	other	Other	shared	other	●	other
Georgia	●	●	●	●	●	●	●	●	●
Kazakhstan	●	other	other	other	other	other	other	shared	other
Kyrgyzstan	●	other	other	other	other	●	absent	other	●
Moldova	●	●	●	other	●	●	other	other	other
Russia	●	●	●	other	other	●	other	other	shared
Ukraine	●	other	●	other	other	absent	other	other	other
Uzbekistan	●	other	●	other	other	shared	absent	absent	other

Source: Responses from EECCA countries (data as of 2009).

Environmental authorities in EECCA are sometimes facing contradictory signals and may not be sufficiently motivated to promote green growth. In particular, Azerbaijan, Belarus, the Russian Federation and Ukraine all have ministries that combine responsibilities for managing the use of natural resources and environmental protection. This combination of economic and regulatory functions makes some of their decisions to be driven by the need to extract short-term dividends from the country's natural capital. In consequence, the goal of long-term sustainable use of natural capital is often overshadowed by immediate needs of economic growth, often pursued along the "develop now, clean up later" approach. To avoid such perverse institutional incentives, several countries (including Armenia, Georgia and Kazakhstan) have separated the environmental and natural resources management arms of the government after long periods of their joint functioning within a single ministry.

In order to lead green growth promotion, environmental authorities need to have a certain political bargaining power, which is often weak in EECCA. Commonly, the profile of environmental ministries in the government structure is relatively low. In the Kyrgyz Republic and Uzbekistan there are no ministries of environment at all, their functions being performed by agency-level authorities.

While the green growth agenda may contributed towards raising the profile of environmental authorities in EECCA countries, this process will take time, and will require forming new, stronger alliances with both governmental and non-governmental partners. Better informing potential supporters of green growth, particularly those who have a strong impact on national and corporate decision-making, will therefore be crucial. Strong evidence in support to benefits of green growth will help environmental authorities to win supporters and balance diverging interests. It has to be noted that the overall international context and many international partners of EECCA countries are supportive to the green growth agenda and may well positively influence the policy environment in individual countries.

The nature of organisational structures within the environmental sector will also have a role to play. Today, among the major characteristics of environmental ministries in EECCA countries are their horizontal and vertical complexity and organisational instability. Against the background of weak internal information sharing and coordination, most of the environmental ministries in EECCA have multiple autonomous of quasi-autonomous agencies that are subordinated to them. Vertically, there are both branches of central governmental authorities and independent units of local authorities that operate at the sub-national level, with functions and jurisdictions that are often overlapping or unclear.

This highly complex nature of the environmental sector (which is not endemic to the EECCA region though) significantly complicates the communication within and across institutions and the implementation of national environmental policies and laws. For this reason, co-ordination is critical for success.

However, even where coordination mechanisms were put in place in EECCA, such as Commissions for Sustainable Development, their impact on co-ordination and environmental policy integration has been marginal. The cross-sectoral nature of environmental and natural resource management also complicates the definition of targets and performance measures, as many actors contribute to a given output or environmental outcome.

Frequent reorganisation in the ministries of environment have often resulted in long transition periods of institutional uncertainty and inaction, as well as the loss of qualified staff and institutional memory. In some cases (such as in the Kyrgyz Republic and more recently in Georgia), the restructuring process limited the influence of environmental authorities over government policies.

The budgetary resources allocated to environmental ministries remain modest (see Chapter 8). The continuous shortage of financial resources sustains a fear of reduced revenues if the present system of environmental management changed, and sometimes encourages corruption.

Staff capacity constraints are also frequent in environmental authorities of EECCA. Key skill shortages include risk and economic analysis, working across policy areas (both within the environmental domain and across public policies) and understanding of decision-making by businesses.

Environmental policy planning and its link to budget planning

A modern-style policy and budget planning process is now well anchored in the majority of legal systems in EECCA countries though their application in practice is often at an incipient phase. Most recent reforms include the adoption of performance-oriented budget planning, often linked to MTEFs – medium-term expenditure frameworks (OECD, 2011). The latter reforms, implemented over the last 5-6 years, have linked policy planning with budget planning. As already mentioned, most environmental authorities in EECCA countries have contributed to strategic papers that underpin MTEFs.

In addition, EECCA environmental authorities develop their own strategies and concepts where they define national environmental priorities, instruments for achieving these priorities and resources to finance policy implementation. These policy documents often serve as a legal basis for proposing and developing specific multiyear environmental programmes. Armenia, Georgia, Tajikistan and Ukraine have recently completed or are completing new National Environmental Action Plans (NEAPs). Moldova has launched its third cycle of NEAP development. The development of such plans still remains difficult because of a blend of factors, including organisational instability or sometimes discontent among the civil society, as experience from Georgia shows (Box 7.1).

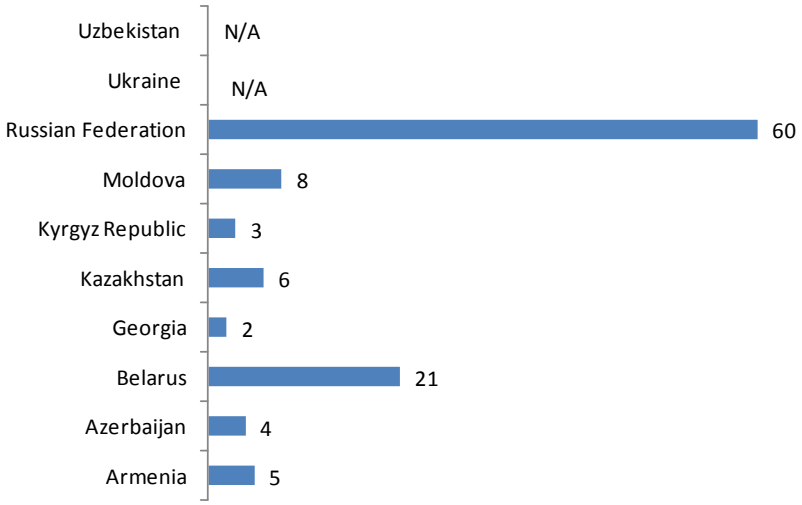
Box 7.1. The Second National Environmental Action Plan (NEAP-2) in Georgia

Georgia's Environmental Protection Law requires the government to develop a National Environmental Action Plan every five years. In line with this requirement, the Ministry of Environment prepared a draft NEAP-2 for 2011-2015, which had to be approved in 2010 by the Council of Ministers but is still under discussion at the time of writing because of re-organisations within the government. A previous attempt to enact the NEAP-2 for 2008-2012 failed because of civil society's discontent with its draft, developed in 2006-2007 within a project funded by the UNDP. NEAP-1 was adopted in May 2000 by a Presidential Decree, after five years of development financed by the World Bank. NEAP-2 includes long-term goals (up to 2030), short-term targets and activities for eleven themes. Each thematic chapter describes theme-specific problems and their causes, stakeholders, past actions, and latest international developments. Each chapter concludes with a table of activities, responsible parties and estimated implementation costs. Potential financing sources and indicators of success are also listed.

Source: OECD/EAP Task Force Secretariat.

The proliferation of issue-specific strategic documents, prepared by the ministries of environment, has continued (Figure 7.1). For example, between 2004 and 2008, the Ministry of Environment of Belarus has prepared 21 strategic and policy papers. It is difficult to judge the impact of so many strategic documents on the implementation of national environmental policies, but without a clear unifying framework this high number of papers may lead to fragmentation and incoherence of policy objectives and dispersion of human and budgetary resources.

Figure 7.1. Number of new strategies and policy documents prepared by ministries of environment, 2004-08



Note: Uzbekistan and Ukraine did produce strategic and policy documents over the period but the number of these documents was not specified in the survey responses.

Source: OECD (2011).

In some EECCA countries, such strategies have been prepared mainly as a result of the push by donors and the international community where aid receiving countries hope that the mere production of such documents will bring about much needed external funds, as it was the case with the preparation of Poverty Reduction Strategy papers (PRSPs). Such approach does not create a sense of ownership and is counterproductive. It can also lead to frustration and cynicism both in EECCA administrations and donors.

The mere existence of such policy documents does not guarantee, however, their effective implementation. Problems start at the stage of their translation into specific programmes, due to a lack of clear priorities for public financing. When asked, within an OECD survey (OECD, 2011), to quote their three most important environmental priorities within the budget process, some EECCA countries indicated such priorities quite broadly (Table 7.3). This lack of clear priorities within the budget process points to very weak orientation of environmental planning towards the intra-government audience, such as ministries of finance, and the continued reliance on external support for tackling environmental problems.

Table 7.3. Environmental priorities in EECCA countries

Country	First environmental priority	Second environmental priority	Third environmental priority
Armenia	Programmes and measures according to the comprehensive programme on the Lake Sevan	Preservation of protected areas (national parks, state reserves, etc.)	Other nature conservation measures
Azerbaijan	Preservation of biodiversity, restoration of natural resources	Measures on combating desertification, mostly on restoration of pastures	Harmonisation of environmental legislation with the EU legislation
Belarus	Protection, rational use, reproduction of natural resources as necessary conditions for providing favourable environment and ecological safety	Reduction of harmful impacts of economic and other activities on the environment by using technologies that meet environmental requirements	
Georgia	Enhancing environmental protection systems	Sustainable use of mineral resources	Enhancing monitoring and forecasting systems
Kazakhstan	Stabilisation and improvement of environmental quality	Creation of appropriate mechanisms for sustainable development	Modernisation and introduction of hydrometeorological and environmental monitoring
Kyrgyz Republic	Protection, rational use , reproduction of natural resources, including forest ecosystems, as an element of good environmental conditions and environmental safety	Special protected areas (state protected areas, national parks)	Other environmental measures
Moldova	Development of policy and management in the field of environmental protection	Improved control of persistent organic pollutants and other chemical substances	Environmental safety and environmental quality control
Russian Federation	Creation of conditions for increasing the effective use of natural resources	Ensuring the reproduction of natural resources	The environment and health interface
Ukraine	Implementation of environmental quality standards, approaching those of the European Union	Dynamic creation of an environmental network of parks and reserves	Development of regulatory basis for the effective implementation of the Kyoto Protocol
Uzbekistan	Ensuring good quality water to the population	Rational use of natural resources	Environmental protection and ensuring environmental safety

Source: OECD (2011).

As mentioned above, the EECCA countries have introduced a number of important reforms in their budgetary systems, including medium-term expenditure frameworks (MTEFs). One of the main goals of an MTEF is to make the budget process more policy-oriented and link policy, medium-term financial plans and annual budgets in a coherent manner. Despite the fact that in many of the countries MTEFs have been central to these reforms, they seem to be an exercise of little practical value, as can be seen from their implementation in the environmental sector in most EECCA countries (see Chapter 8 and OECD, 2011 for further details). In the Republic of Moldova, the introduction of Institutional Development Plans to accompany MTEFs, offered the additional benefit of conducting capacity self-assessments by all ministries (Box 7.2).

Box 7.2. Capacity self-assessment within national systems: the case of Moldova

In the Republic of Moldova, sector-specific medium-term plans were introduced to link strategic planning with budget allocation. Such plans, called "Institutional Development Plans" (IDP), should cover all functions carried out by the respective Ministry, be fully harmonised with the Medium-Term Expenditure Framework (MTEF), identify priorities, including for capacity building, and specific performance targets. IDPs oblige ministries to adjust their level of ambition to the capacity level. The timeframe of the IDPs corresponds to the MTEF timeframe: both have a "rolling" character, being updated annually. Because of conflicting deadlines, the first round of IDP development in 2008 was done in parallel with MTEF drafting thus achieving some, but not a full degree of harmonisation. Staff participation in IDP drafting was very weak, the task being largely outsourced to consultants. The quality control of IDP papers by the government could not be ensured.

Similarly to other ministries, the Ministry of Ecology and Natural Resources (MENR) of Moldova went through a capacity assessment exercise as part of the IDP drafting. This assessment consisted of a questionnaire-based survey and analysis of collected data. The survey covered only 33 people working in the MENR central body (other 816 people being employed in MENR sub-divisions with autonomous status). The assessment did not use quantitative benchmarks for comparison; in many instances, this made data interpretation very difficult if not impossible. As part of the assessment, staff members were asked to rank on a 5-grade scale (from unsatisfactory to highly satisfactory) their own capacity to undertake some functions. No topic-specific assessment was made thus it remained unclear what was the level of knowledge and skills in new areas of environmental management that are appearing on the agenda or are likely to appear together with European integration.

Apart from an underdeveloped methodology, there were other barriers that prevented the production of a more solid report:

Firstly, the level of cooperation shown by the MENR staff was minimal due to the absence of incentives to embark in open discussions and admit capacity problems. Respondents suspicious that their answers might be turned against them during the individual performance reviews.

Secondly, people perceived the exercise as being very abstract, with no clear impact at the individual or organizational level.

Thirdly, deadlines were too tough and did not allow for a more inclusive process that would start with methodology discussion (including the structure of the questionnaire) and its full acceptance by the staff. It is not clear whether results of assessment were reported back to people involved in the exercise. Consultations with non-governmental stakeholders were not conducted.

As a result, the assessment report's recommendations grasped only partially the organisational development needs and were very scarce in advice on individual capacity development and improvement of instruments and procedures specific to environmental and natural resources management. The report did not suggest any sequencing for capacity development or provide data on costs related to capacity development.

The capacity assessment process carried out within the MENR offers important lessons for future initiatives of this type, whether conducted in Moldova or in any other country. As a pilot exercise, it showed well the limitations of self-assessments and the need for clear incentives to conduct such assessments but also for a clear framework of assessment that produces objective results. The IDP-related capacity assessment did not use any benchmarks and was solely based on judgments affected by perverse incentives to over-state the capacity level. It is not clear why an exercise that had little sector-specific elements, had to be carried out in all ministries separately. Overall, the incentive framework for Ministries to produce high quality IDPs (or even embark in this process) was very weak. The process of IDP production, however, has to be maintained as a very useful framework to reconcile development targets, institutional capacity, and budget planning through an iterative mechanism of capacity assessment and planning.

Source: OECD (2010), Capacity development for environmental management in Moldova: Drivers, links to planning and methods of assessment.

Role of sectoral ministries and local authorities

In roughly half of the EECCA countries, the sectoral ministries have set up specialised environmental units (OECD, 2007) that have the mission of promoting the integration of environmental issues into sectoral planning and action. Regional and country-level (*e.g.* in Armenia and Moldova) policy dialogue with sectoral ministries and economic and finance ministries shows that there is genuine interest to adhere to green growth despite a poor understanding of opportunities for green growth.

To unveil such opportunities, for instance, sector-specific analysis has been underway in Georgia with support from UNDP and input from other development partners. In Armenia, national policy dialogue involving line ministries and senior staff from the Ministry of Nature Protection has resulted in a list of very specific proposals on a better integration of economic, sectoral and environmental policies (Box 7.3).

Box 7.3. Learning from sectoral partners in Armenia

In 2009, the OECD/EAP Task Force Secretariat has facilitated a structured reflection on national needs related to environmental policy integration, which involved a very wide spectrum of governmental and non-governmental actors, including all line ministries. This reflection resulted in the following recommendations on how to promote a better integration of economic and environmental policies:

- Facilitate information sharing among sectors to enable early planning of environmental assessments either at the programme or project level and ensure *ex post* analysis of compliance with conclusions from Strategic Environmental Assessments (SEA);
- Apply SEA to IFI structural adjustment loans and other sector-wide financial mechanisms;
- Conduct the analysis of alternatives for territorial development strategies;
- Maintain positive dynamics in the functioning of the national sustainable development centres after their creation by allocating sufficient resources for their operation and requiring that members of such councils conduct regular meetings and provide support to the local councils for sustainable development;
- Ensure a proportional representation of all stakeholders, including business representatives, and gender balance within the framework of inter-sectoral working groups;
- Conduct regular review of policy coherence across all sectors, as well as identify areas of responsibility duplications and of "nobody's" mandate;
- Analyse mechanisms that may increase environmental performance within the supply chain.

Source: OECD/EAP Task Force Secretariat.

The green activism of local-level authorities in EECCA, cities in particular, is increasing. As of May 2012, over 40 municipalities from Armenia, Belarus, Georgia, Kyrgyzstan, Moldova and Ukraine are members of the European Covenant of Mayors, including the capital cities of Georgia, Moldova and Ukraine. Established in 2008, the Covenant is a mechanism to support the efforts deployed by local authorities in the implementation of sustainable energy policies. There is a vivid interest in other EECCA countries to join this initiative. Besides energy efficiency, the environment-related infrastructure development seems to be one of the main preoccupations at the local level (Box 7.4). Its improvement is seen as an enabling factor for local development, and a factor that raises attractiveness for investors and skilled workforce.

Box 7.4. Demand for green growth from local authorities in Moldova

A policy dialogue on green growth in Moldova, carried out in 2010, has revealed a high demand for better environment-related infrastructure from local-level actors. Mayors from across the country have repeatedly pointed to the fact that foreign investment into local economic development is often precluded because of lacking water and waste management infrastructure. While there is some progress on water supply and sanitation in Moldova, the municipal waste infrastructure is embryonic and due to limited local budgets cannot be established without a mechanism that would allow joining the resources. Furthermore, capacity to design infrastructure projects is very limited at the local level and local authorities can hardly afford the costs of feasibility studies.

Source: OECD/EAP Task Force Secretariat.

Many local authorities have learned the importance of fiscal strength to respond to infrastructure needs. In this context, the role of inter-municipal cooperation and strong involvement and support from regional governments, such as oblasts in Russia, as well as from the national level, is crucial.

Involvement of the private sector actors

Support for green growth is increasing within private sectors actors in EECCA countries. This interest has been spelled out though a progressive greening of corporate strategies, driven by a blend of regulatory and economic considerations. Voluntary corporate initiatives and international partnerships have played an important role in promoting the greening of decision-making.

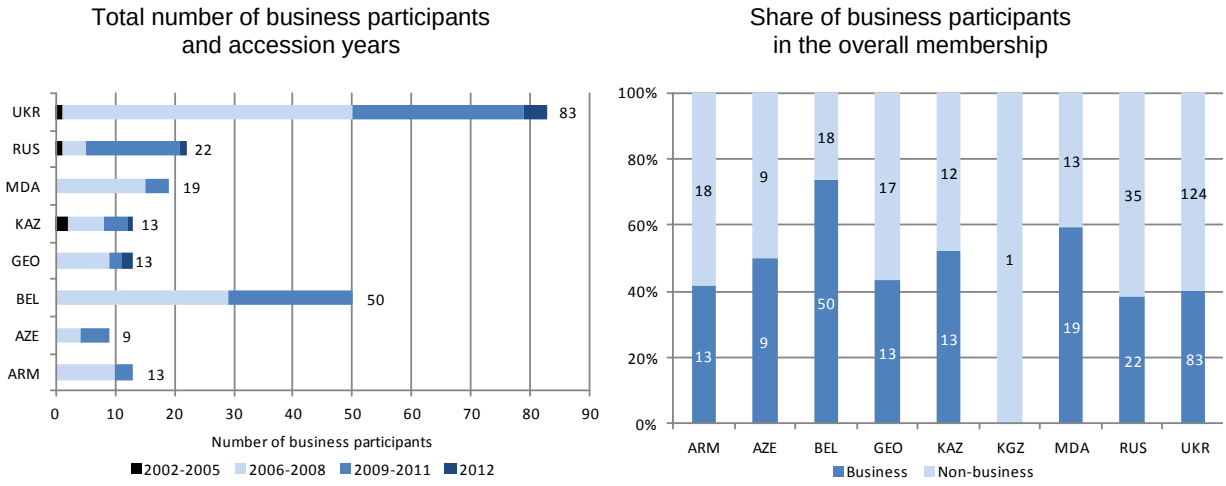
Nationally, many business associations and chambers of commerce have working groups or less structures mechanisms to address environmental matters, primarily in order to address concerns related to regulatory development. Sometimes they serve as a platform for experience exchange, *e.g.* on corporate environmental reporting, and diffusion of good practices. Such a role, for example, is played by the Kazakh Business Association for Sustainable Development.

Information-based instruments have contributed to the greening of the private sector in EECCA, particularly in the largest industrialized countries with a wealthier population. The Russian Rating Agency NERA, in cooperation with Greenpeace Russia, has launched and maintained a public register of corporate environmental reports issued by Russian companies. Apparently, a vast majority of large companies in the Russian Federation have been issuing environmental corporate reports for at least 2-3 years, doing it on the annual basis. The same Agency have conducted environmental ratings of companies in Russia and Kazakhstan and widely disclosed the result of the rating. A similar initiative, launched with OECD/EAP Task Force support in Ukraine, has been operational for over four years within the Lviv *oblast* local environmental authority.

Internationally, the United Nations Global Compact has gained traction in EECCA. Launched in 2000, the Global Compact is both a policy platform and a practical framework for companies that are committed to sustainability and responsible business practices. As a multi-stakeholder leadership initiative, it seeks to align business operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption enforcement and to catalyse actions in line with broader UN goals. It is the world's largest voluntary corporate citizenship initiative, with over 6 500 signatories based in more than 130 countries.

Since 2006, UNDP-facilitated local networks have been established in several EECCA countries, most of them having environmental sustainability among priority objectives. The overall participation of EECCA countries in the Global Compact varies from one member from Kyrgyzstan to 207 members from Ukraine. Ukraine detains the leadership as concerns the number of business participants (see Figure 7.2) among EECCA countries, although the share of business participants in total members is one of the lowest (40 %) unlike in Belarus (74 %), Moldova (59 %) and Kazakhstan (52 %). There are no members at all from Tajikistan, Turkmenistan and Uzbekistan. EECCA companies generally started joining UN global compact after 2005, with the financial sector showing the highest level of participation (11.7 %).

Figure 7.2 EECCA business participants in the UN Global Compact (2002-2012)



Source: UN global compact web site: http://www.unglobalcompact.org/participants/search

The private sector actors, involved in the "Environment for Europe" process, expect to play a role in green growth promotion at both the policy and market level. They highlighted the important role of businesses working together through value- and supply- chains to speed up and amplify progress on green growth. A critical question for the private sector is the interaction between global markets, regulatory frameworks, and specific country conditions. There is demand for incentives that would spur private sector action, including through public-private partnerships.

NGO contribution

The environmental NGO community in the majority of EECCA countries is sufficiently mature and strong to influence policy development and implementation. Dialogue with NGOs has been on-going on various issues, including green growth promotion. While there are cases when this dialogue is reduced to a so-called "isoform mimicry" of public participation in decision-making, in countries as different as Georgia and Russia. Examples, nevertheless, abound of real impact of NGOs on final decisions. In countries with weak environmental ministries, NGOs may be and often are strong allies to promote environmental mainstreaming and make the voice of environmental authorities heard.

Both regionally and nationally, EECCA NGOs are influential due to alliances, such as, for instance, the European Eco-Forum, the WWF or the International Socio-Ecological Union. All these organisations have been supportive of green growth, voicing the need to change current lifestyles in recognition to the social and biophysical limits to the economic growth. They demand a fair distribution of resources, and a change in values, norms and behaviour patterns.

Major multilateral partnerships relevant to green growth in EECCA

Directly or indirectly, green growth issues are subjects of multiple global and multilateral initiatives involving EECCA countries. Reviewing all of them is a challenging task; this section makes an overview of just the key ones. Table 7.3 provides a summary of country involvement in various formal and *ad hoc* intergovernmental co-operation initiatives that have elements of green growth promotion in their work programmes[8].

Table 7.4. Membership of some multilateral/regional partnerships involving EECCA countries

	ARM	AZE	BLR	GEO	KAZ	KGZ	MDA	RUS	TJK	TKM	UKR	UZB
UNECE's EfE work, the Action Plan for Energy-efficient Housing and the Task Force on Environment and Energy	●	●	●	●	●	●	●	●	●	●	●	●
EAP Task Force	●	●	●	●	●	●	●	●	●	●	●	●
Eastern Partnership	●	●	●	●			●				●	
EU Water Initiative	●	●	●	●	●	●	●	●	●	●	●	●
Black Sea Synergy	●	●		●			●	●			●	
Danube-Black Sea Task Force				●			●	●			●	
BSEC WGEP	●	●		●			●	●			●	
UNESCAP Seoul Initiative	●	●		●	●	●			●	●		●
EU Strategy for Central Asia					●	●			●	●		●
Caspian Environment Programme		●			●			●		●		
Interstate Commission for Water Coordination of Central Asia					●	●			●	●		●

Source: Internet pages of the respective organisations/partnerships.

The ***United Nations Environmental Programme (UNEP)*** carries out activities relevant to green growth, in particular within the sustainable consumption and transport project. Globally, the ***UNEP's Green Economy Initiative*** (GEI) includes providing advisory services to countries interested in greening their economies, producing research products (such as the Green Economy Report, the Economics of Ecosystems and Biodiversity series of reports, and the Green Jobs Report) and engaging partners to effectively promote and implement green economy strategies. The degree of EECCA countries' involvement in this initiative is not clear.

The ***UNDP's environment and energy work*** in Europe and the Commonwealth of Independent States (CIS) has four pillars: (i) mainstreaming environment and energy into national and local development policies and plans; (ii) mobilising environmental finance; (iii) promoting adaptation to climate change – mainstreaming climate change risk management into

[8] The EECCA Regional Environmental Centres participate in several of these initiatives.

national development strategies; and (iv) expanding access to environment and energy services for the poor. Activities under these pillars are implemented mostly through country-level projects.

Beyond the work done by the ***UNECE***'s Committee on Environmental Policy within the "Environment for Europe" process, there are several older and more recent UNECE-led initiatives relevant to green growth, including: (i) a Task Force on Environment and Energy with a mandate to develop non-binding guidelines for decision-makers on reforming energy prices to support sustainable energy development; (ii) the Ad Hoc Group of Experts on Energy Efficiency and Renewable Energy Investments for Climate Change Mitigation; (iii) the Action Plan for Energy-efficient Housing in the UNECE Region. In 2010, the UNECE secretariat was invited to provide support to the Assessment of Assessments (AoA) initiative within the "Environment for Europe" process. The main purpose of the AoA was be to provide a critical review and analysis of existing environmental assessments that are of relevance to the region and the two selected topics for the Astana "Environment for Europe" Conference, to identify gaps that need to be covered and priorities that should be addressed for conducting assessments to keep the pan-European environment under continuous review.

The Caucasus and Central Asian countries are involved in the ***UNESCAP-facilitated Seoul Initiative on Green Growth***. This initiative aims to address major policy issues for green growth as identified in 2005 at the fifth Ministerial Conference on Environment and Development in Asia and the Pacific.

All countries, though to a different extent, are involved in country-level and regional activities carried out by the United Nation's ***Food and Agriculture Organization*** (FAO). FAO provides assistance to modernise and improve agriculture, forestry and fisheries practices, with a special focus on rural development. Currently, FAO works with Central Asian and Caucasus countries to establish a regional fisheries and aquaculture organisation (Moldova is also part of this initiative), as well as to raise their capacity for agricultural innovation. One of the recent regional projects aims at helping countries to map and design policies related to climate change adaptation. At the country level, FAO supports afforestation projects, the development of forest management policies and legislation, small-scale organic agriculture projects, development of fish farming for poor rural families, sustainable pasture management, etc.

Important drivers for green growth are partnerships involving EECCA countries and the European Union (EU). For instance, through ***European Neighbourhood Policy*** (ENP) Action Plans, the EU aims to promote strengthened implementation of multilateral environment agreements and processes. In 2009, the Eastern Partnership (EaP) covering Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine was established as, among other things, a forum for dialogue and co-operation on the environment and climate. A dedicated flagship initiative focused on strengthening environmental governance has been launched in the context of the EaP.

In Central Asia, cooperation with EU members is structured around two strategies: the EU-Central Asia Strategy approved by EU Heads of State and Government in June 2007 and the European Commission's Regional Strategy Paper. EU Members States and the European Commission have committed to collaborate closely in the seven thematic blocks. A clear focus is put on three main areas of policy dialogue and enhanced co-operation, including environmental sustainability and water.

Several thematic partnerships may have a role in promoting green growth. The EECCA component of the EU Water Initiative, which is a regional component of the EU Water Initiative

agreed at the 2002 World Summit on Sustainable Development, involves all countries in the region. The aim of the initiative is to promote improved water governance and coordination between stakeholders. Furthermore, there are many initiatives launched around common seas or rivers, including the Black Sea Environmental Partnership (launched in March 2010), the Working Group on Environment Protection, established within the Organization of the Black Sea Economic Cooperation (BSEC), the Caspian Environment Programme; the Aral Sea programme[9], the Danube-Black Sea Task Force (DABLAS), etc.

Following the interest to become global or regional drivers, some of countries are active players in the green growth promotion internationally. Kazakhstan, for instance, has launched an inter-regional Eurasian Green Bridge Programme, which was welcomed at several international forums, including the Rio+20 Summit. The Green Bridge Initiative suggests a link between the European and Asian regions with the aim to develop joint activities to support green growth in countries in transition and developing countries. At the 2012 Summit of BRICS, the Russian Federation proposed to develop a long-term development strategy for this group of countries, with "green growth" being suggested as one of the Strategy's substantive areas.

Conclusions and ways forward

A modern-style policy planning, which is one of the major enabling factors for green growth promotion nationally, is increasingly used by some EECCA countries. Following the introduction of government-wide Medium Term Expenditure Frameworks, the policy and budget planning are better linked. Over the last decade, environmental goals gained ground in development and sectoral policies, *e.g.* in Armenia, Azerbaijan, and Kazakhstan. Environmental matters are better incorporated in the private sector strategies.

Given the recent progress on building better institutions, the primary task of the EECCA governments is to ***incorporate the green growth concept and instruments into existing policies and institutions and put more effort into implementation***. Above all, EECCA countries need to avoid engaging in yet another wave of strategic papers development. This could be done by focusing on the reform of specific instruments, sectoral work, as well as on improving policy implementation. Without due ownership on the side of non-environmental communities, green growth will become a lost opportunity. In order to increase policy coherence between different sectors, mechanisms that permit to unveil policy inconsistencies, but also to address the problem of institutional and budget fragmentation need to be put in place or strengthened.

National action on green growth must have broad-based ownership. Creating such ownership requires analytical evidence that resonates with both environmental and non-environmental communities. To generate such evidence, ministries of environment may need to invest in skills development and start using tools in support to economic and social analysis of environmental policies. The opposite is true as well: tools of environmental assessment may need promotion within non-environmental communities. The most obvious action is assisting a government-wide adoption of Strategic Environmental Assessment, and extending its use to budgetary programmes.

Creating ownership also requires the broadest possible ***review of constraints and proposed action by various actors, vertically and horizontally*** – a so-called "360-degree feedback" – including both the governmental and non-governmental sector. Domestic business actors and

[9] An International Fund for Saving the Aral Sea (IFAS) was created in 1993 to finance cooperation programmes aiming at saving the Aral Sea.

their associations in particular need to be involved in this type of review: their power and influence in EECCA has evolved significantly since the beginning of transition. More generally, the balance of powers needs to be considered. The green growth agenda will have to be very strongly linked to top-priority immediate development objectives such as increased productivity and competitiveness, upgrading municipal services, maintaining or extending export potential, diversification of the economic structure, energy security, job creation, etc. Many countries may be interested in the positive impact of environmental fiscal reform and the removal environmentally harmful subsidies on the state of public finances.

Policy dialogues involving all relevant stakeholders, and using sound analysis as background for debates, may be used to identify the key constraints to green growth and constructing policy packages to overcome such constraints. Such policy dialogues can accompany the development of framework or sectoral policies, drafting of new laws, or similar "routine" processes. Tools may need to be developed to facilitate such dialogues. International benchmarking and exchange of experience can be useful tools for designing reforms and for a more rapid diffusion of good practices.

Governments need to treat the green growth challenges as ones that go to the core of their development strategies. This implies a leading role for finance and economy ministries or another influential unit (depending upon the country, though in many EECCA countries presidential administration has a particularly strong influence) with a supportive role to be played by ministries of environment. Medium-Term Expenditure Frameworks (MTEFs) have been introduced in almost all EECCA countries. They added to the planning process a much required element of financial realism. Thus, the overall mechanism for cross-sectoral planning has been established in EECCA. This creates a good basis to address, in a coherent way, cross-cutting policies and environmental policies as part of a wider "green growth strategy".

An adequate governance structure will need to be established for ensuring the participation and effective coordination of different players, both governmental and non-governmental. Intra-government coordination will have to address both horizontal and vertical relations. Mechanisms created in support of sustainable development promotion may need to be re-designed in conformity with lessons learned from their past activity and impact (or its absence). Among other things, governments need to avoid the situation when green growth rhetoric simply leads to the annihilation of sustainable development strategies without bringing any palpable changes.

Simultaneously, the weakening of capacity and extreme institutional instability of EECCA environmental ministries need to be contained, and professional staff retain in these ministries.To be able to support national initiatives on green growth, EECCA ministries of environment need to have a stronger presence in the policy debate in their countries. Preparing and proposing economically justified programmes which merit the attention of the rest of the government is the best way to promote environmental objectives. A minimum level of institutional stability and a clarification of responsibilities at the national and sub-national levels are required for reform intentions and actions to be followed through,. Environmental institutions need to develop more effective and efficient institutional development plans to achieve their priorities, and remove the perverse incentives that impede a results-oriented approach to staff performance. Environmental policy development and implementation need to be underpinned by more robust and policy-relevant information systems.

Environmental authorities need to maintain partnerships that were built to support environmental reforms. NGOs should remain their natural allies, both as environmental

watchdogs and agents of action at the local level. Understanding industry concerns and looking for common ground should become priorities. More attention should also be given to how mass-media could raise awareness and promote good environmental behaviour.

As donors move away from sectoral to general budget support, it will be all the more important for environment ministries in EECCA to demonstrate the importance of environmental issues, as well as their ability to use resources effectively and efficiently (see also the following chapter). At the same time, donors could consider carrying on policy dialogue, regionally and nationally, to promote and enable the green transition. Their support is badly needed, in particular to make environmental policy integration possible (OECD, 2007). In building their capacities, EECCA countries could take advantage of international processes and establish more opportunities for regional learning.

Finally, without government action to ***ensure good governance***, the entire green growth construction, no matter how soundly designed, will fail. Bad governance erodes confidence among market players in EECCA and makes them focus on short-term high-return projects. A better incentive framework is needed for individuals within the public service to adhere to good governance principles.

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CHAPTER 8:
FINANCIAL ASPECTS OF GREEN GROWTH STRATEGIES

Drawing on the complementary work of the OECD/EAP Task Force, this chapter discusses trends in the mobilisation and management of environmental finance in Eastern Europe, Caucasus, and Central Asia (EECCA). Traditionally, environmental expenditure in EECCA has been relatively low (though there are nuances, with important variations among countries and sectors), and both national and local-level environmental programmes have faced chronic underfunding during the entire transition period. The chapter addresses the question whether access to domestic, but also foreign (including donor), financing has improved or worsened and what factors determined the latest developments in this area.

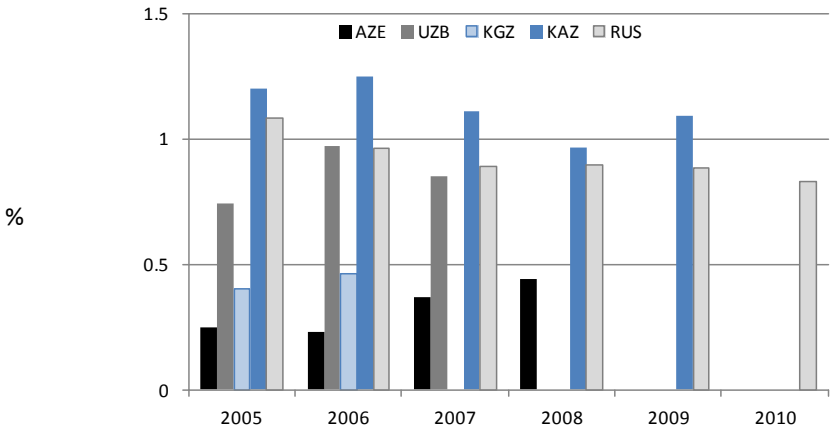
Adequate access to finance and scaling up "green" investment is an important pre-requisite and driver for green growth. Much of this investment is expected to come from private sources. Public funding and official development assistance (ODA) can play a major role in stimulating private sector investment. There are some other sources of finance that may be potentially useful in terms of green growth financing.

While this Chapter attempts to define whether access to "green" finance is adequate in EECCA, it has to be recognised that the scope of analysis may be very large. Given that precise definitions in the area of "green" finance do not exist, the discussion in the report is limited to environment-oriented financing in its quality of an indirect indicator of green growth financing. Even here it has to be noted that quantitative analysis continues to be impaired by the availability of data and, where information is available, by methodological flaws related to data gathering and aggregation.

Total environmental expenditure

The available time series reveal the heterogeneity and fluctuation of total environmental expenditures in EECCA (Figure 8.1). This indicator can vary between 0.4% of the GDP (as in Kyrgyzstan) and 1.3% of the GDP (in Kazakhstan). There is no unique trend for the entire region, each country being characterised by its own evolution of the total environmental expenditure. Similarly, there are no region-wide patters of expenditure for specific media, this being the consequence of different environmental priorities, although a large share of water-related expenditures is noticeable in all countries. The current expenditures often eclipse capital investments in all countries.

Figure 8.1. Total environmental expenditure in selected EECCA countries (2005-2010), % of GDP



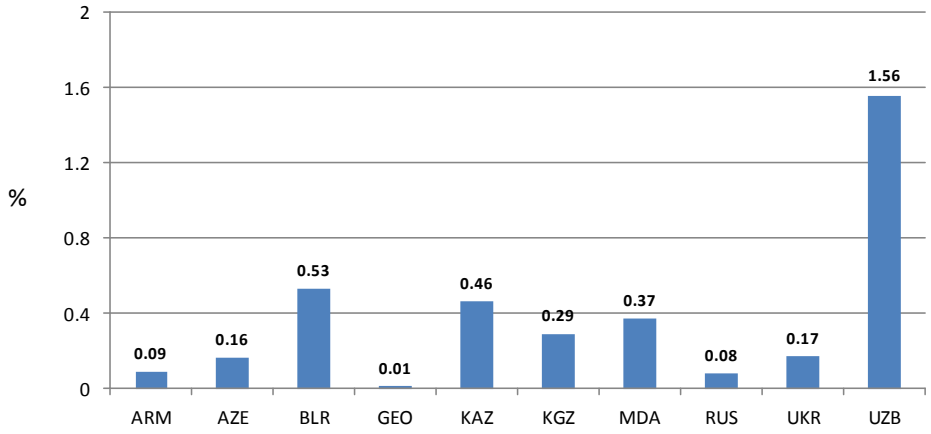
Source: UNECE, 2009 (Kyrgyz Republic); UNECE, 2010b (Uzbekistan), UNECE, 2011 (Azerbaijan), National Statistics Offices (Kazakhstan, Russian Federation).

From an international perspective, these figures correspond to levels of expenditure in OECD countries where the bulk of "traditional" (pollution control) environmental problems have already been solved, which is by no means the case in EECCA. The levels of expenditure are relatively low compared to the averages of Central European countries at the peak of their efforts to address their legacy of environmental problems. For instance, the Czech Republic invested on average 2.2% of the GDP in environmental projects in the mid-1990s.

Public environmental spending

In absolute terms, public environmental expenditure in most EECCA countries has increased over the 2006-2009 period. However, as a share of GDP and on a per capita basis they are very low and, in many cases, stagnant or decreasing. In 2009, the total domestic public environmental expenditure ranged from about USD 1-1.5 million in Georgia to more than USD 2 billion in the Russian Federation. The share of reported public environmentally-related expenditure in the GDP varies across the countries, from 0.01% in Georgia to 1.56% in Uzbekistan in 2009 (Figure 8.2). On the contrary, as a share of total government budgets, environmental authorities' budget in 2009 was the highest (0.78%) in Georgia and the lowest (0.11%) in Uzbekistan.

Figure 8.2. Domestic public environmental expenditure as a share of GDP (2009), %

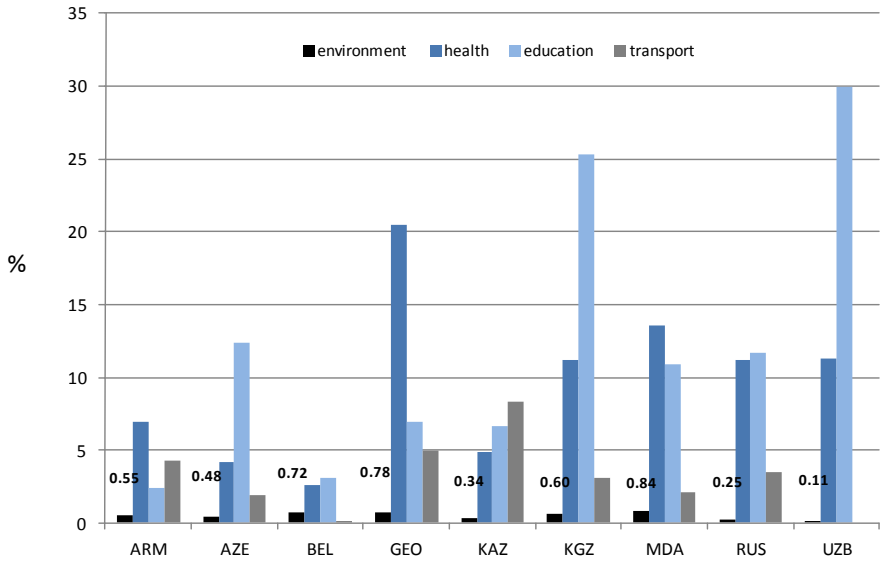


Source: OECD/EAP Task Force Secretariat's own calculations based on data from countries.

When compared to budgets of other social sectors, "green" budgets are almost negligible (Figure 8.3). Per capita public environmental expenditure in EECCA countries is also low and in 2009 ranged from less than USD 1 in Georgia to about 70 USD in Belarus. Where available, *e.g.* in the Russian Federation, long-term projections of public budgets' evolution do not foresee any increase. Most public resources go to nature protection and conservation, water resource and waste management.

Current expenditure is the dominant component of public spending and most EECCA countries hardly make any investments in the environmental sector. Apart from Kazakhstan, where the government has been allocating considerably more money for investments than for current expenditure, and Armenia in certain years, in almost all other countries current expenditure dominated in the review period. Investment levels in most countries decreased in 2009 in comparison with the pre-crisis years.

Figure 8.3. Government allocation to the environment ministry budget as compared to other sectors, percentage of government budget (average for 2005-2009)



Source: OECD/EAP Task Force Secretariat's own calculations based on data from countries.

Where revenue earmarking through specialised funds exists, most environmental revenue is used to support current expenditure rather than investments. In 2006-2009, of the four countries that had earmarked environmental funds (Belarus, the Kyrgyz Republic, Moldova and Uzbekistan), only Belarus provided more support for investments from their environmental funds than for current expenditure. More generally, the existence of such funds often leads to a decrease of regular budget allocation to the environmental sector and reduces the incentives to prepare solid budget proposals. If the earmarked environmental funds will continue to function in line with current patterns, their utility for green growth would be minimal.

This picture may be more nuanced, however, since environmentally-related spending is commonly spread over a large number of sectors, while green growth goes well beyond the traditional definition of environmental action as pollution abatement. In addition, environmental expenditure data provided by the countries are very patchy and inconsistent. Therefore, it is often difficult to obtain a precise snapshot of the situation with public environmental financing in EECCA. This lack of reliable information needs special attention since it does not allow policy makers to take informed decisions. Further analysis involving relevant line ministries may shed more light on the real picture of environmentally-related expenditure.

In order to integrate policy, activity planning and annual budgets, seven countries in the region – Armenia, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Moldova and the Russian Federation – have already introduced medium-term expenditure frameworks (MTEFs). In several countries multi-year planning is accompanied by the introduction of sectoral programmes, which may be oriented to achieve certain performance of public services. However, the adoption of MTEFs has often been driven by external financing and has hardly changed the essence of budgetary processes. Though MTEFs are regularly developed by governments, the relevant macroeconomic projections, programme outlays and performance objectives are rarely used by legislative bodies in budget-related debates.

The number of environmental programmes included in the MTEF/annual budget can be high. In 2008, the Russian Federation had 56 active programmes, followed by Armenia (38 programmes) and Kazakhstan (14 programmes). In other countries where such programmes were developed, their number did not exceed ten. Given a very low level of environmental expenditure, the number of budget programmes marks excessive fragmentation of budgets, particularly in relatively small countries. This fragmentation raises concerns about the effort needed to develop and implement budget programmes and their eventual quality. Most recently, Armenia's Ministry of Finance tried to address this problem by drastically reducing the number of programmes per government agency.

Private environmental expenditure

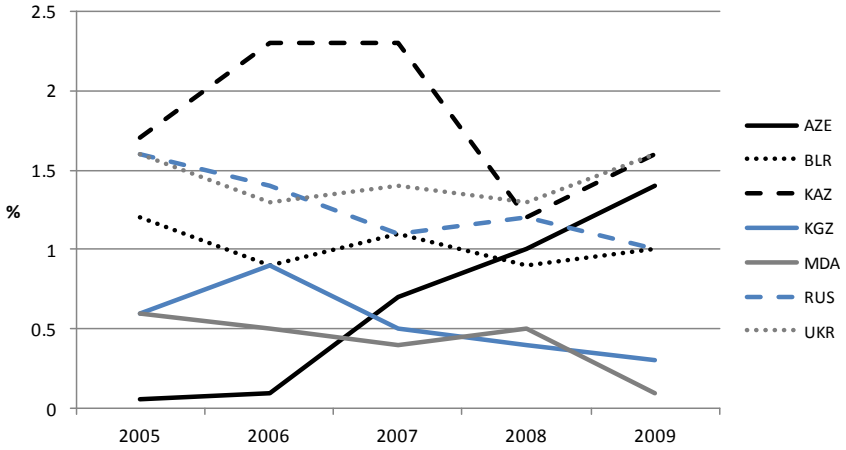
The public sector should not be the only source of environmental investments: the implementation of the Polluter Pays and User Pays Principles suggests that business and consumers should have an important role. The extent to which private investment contributes to environmental goals is difficult to quantify in EECCA: information is patchy and contradictory. In many cases, data collected by OECD (2007) seem to be the most up-to-date, though there are some relevant figures available from more recent Environmental Performance Reviews (EPRs) conducted by the United Nations Commission for Europe (UNECE).

The situation with private environmental expenditure varies across countries. In the Kyrgyz Republic, it is estimated at 10% of the total environmental expenditure (UNECE, 2009), while in neighbouring Uzbekistan the State Committee for Nature Protection reports the fluctuation of this indicator between 69% and 84% in 1994-2007 (UNECE, 2010b). In Kazakhstan, the enterprise sector accounted for 87% of the total investment expenditures in environmental protection in 2006 (UNECE, 2008).

The latter indicator does not indicate the share of private environmental expenditure in the total: for instance, in 2009, investment expenditures by the private sector in Russia were only 18% of total environmental expenditures while accounting for some 74% of investment expenditures. Data for the Russian Federation also shows that the role of private environmental expenditure was steadily growing after 2000. The distribution of private spending between air and water-related expenditure was relatively balanced and uniform during the 2005-2009 period.

Assuming that the total capital investment indicator can serve, at least partly, as an indirect measure of trends in total investment by the private sector, one could say that there have been no spectacular developments in EECCA over the last years, except in Azerbaijan (Figure 8.4). In the poorest countries, this indicator has been showing a decrease, while in the middle-income countries it was relatively constant. As data on the private sector environmental investments are not available in a disaggregated form, information on capital investments (combining private and public spending) may serve as an indirect indicator of the private sector's effort, given that reported public spending is much lower that the values of this indicator.

Figure 8.4. Capital investment in the environmental sector in EECCA (2005-2009), % of GDP



Source: Interstate Statistical Committee of the CIS (2010).

Sovereign wealth funds

Sovereign wealth funds (SWFs) can become an important source of green financing. Such funds have proliferated around the world, most often in response to the recognition that the depletion of finite resources exposes countries to experience potentially severe drops in income in the absence of new income sources. SWFs are government-owned investment funds, set up for a variety of macroeconomic purposes. SWFs are not new, and some of the longer-established funds—for example those of Kuwait, Abu Dhabi and Singapore—have existed for decades. Lately, the number and size of SWFs has been rising fast, and their presence in international capital markets is becoming more prominent. In addition to using receipts from non-renewable resource extraction to invest in human capital and economic diversification, SWFs are established to invest a portion of resource-generated income for the benefit of future generations and to act as a buffer against commodity price drops. In EECCA, such funds have been established in Azerbaijan, Kazakhstan and the Russian Federation (Box 8.1). The oldest of them, the State Oil Fund of Azerbaijan, was established in 1999.

Box 8.1. Russian Federation Stabilisation Fund and its evolution

The government established the Stabilisation Fund of the Russian Federation in 2004. Managed by the Ministry of Finance and taking in revenues from oil export duties and taxes on oil operations, the Fund was designed to help the government balance its budget in cases where the price of oil would fall below USD27 a barrel. In addition to acting as a hedge against volatile oil prices, the Fund was intended to take up excess liquidity, thereby reducing inflationary pressure. In 2008, the Fund was divided into two: the Reserve Fund and the National Welfare (or Future Generations) Fund. The Reserve Fund is invested abroad in low-yielding government bonds and can be used to help balance the national budget when oil and gas revenues fall. The National Welfare Fund is invested in higher-risk, higher-yield corporate bonds, investment funds and Russian banks. The Reserve and Welfare Funds now also take revenues from natural gas as well as oil operations. The National Welfare Fund is intended to guarantee the pensions of Russian citizens and can be used to balance the budget of the Pension Fund.

Source: Sovereign Wealth Fund Institute; Ministry of Finance of the Russian Federation.

Key issues in the effective management of such funds are oversight and transparency. Traditional legislative oversight can be complemented by other oversight bodies, especially ones that bring in civil society actors. According to global rankings, the most transparent among SWFs in EECCA is the Azerbaijani Fund (see Table 8.1). The oversight board for this fund has members representing the legislature, the central bank, the government and the national academy of sciences.

Table 8.1. Sovereign wealth funds of Azerbaijan, Kazakhstan and the Russian Federation compared to other funds and their transparency ranking

Country	Fund Name	Assets USD Billion	Inception	Origin	*Transparency Index*
UAE – Abu Dhabi	Abu Dhabi Investment Authority	627	1976	Oil	3
Norway	Government Pension Fund – Global	571.5	1990	Oil	10
China	SAFE Investment Company	567.9**	1997	Non-Commodity	2
…					
Russia	National Welfare Fund	142.5*	2008	Oil	5
….					
Kazakhstan	Kazakhstan National Fund	38.6	2000	Oil	8
….					
Azerbaijan	State Oil Fund	30.2	1999	Oil	10
….					
Total Oil and Gas Related		2,628.7			
Total Other		2,102.5			
TOTAL		4,731.2			

Notes: (*)This includes the oil stabilization fund of Russia; (**)This number is a best guess estimation. (***)All figures quoted are from official sources, or, where the institutions concerned do not issue statistics of their assets, from other publicly available sources. Some of these figures are best estimates as market values change day to day. Updated July 2011.

The Linaburg-Maduell Transparency Index was developed at the Sovereign Wealth Fund Institute and is based on ten criteria/principles, **each adding one point of transparency to the index rating.**

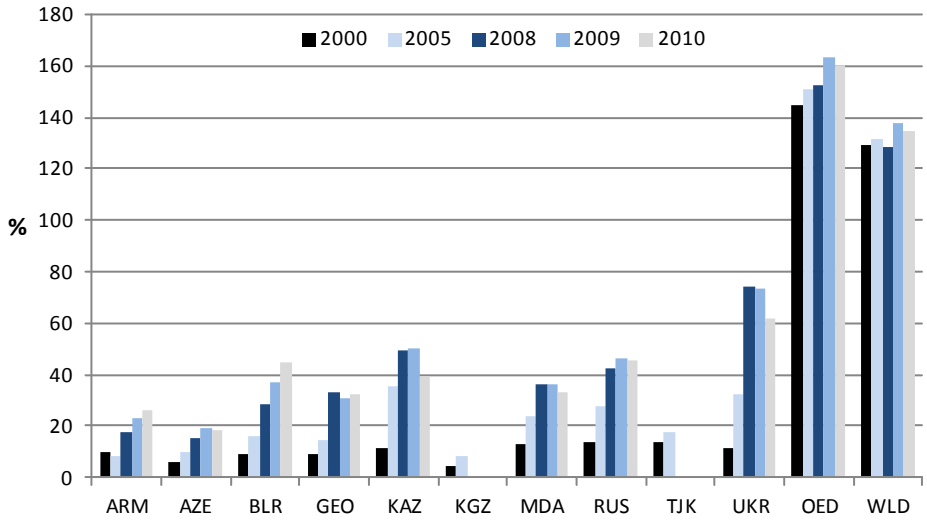
Source: Sovereign Wealth Fund Institute web site.

While projects financed by the SWFs may contribute to the promotion of green growth, this role is not yet played by the EECCA funds. Only some of the current projects of the Azerbaijani SWF may be relevant: for instance, this fund has allocated 749.4 million manats (some USD 950 million) for the construction of the Oguz-Qabala-Baku water supply system and supports projects in the area of education. Funds in Kazakhstan and the Russian Federation operate largely through the state budget, thus are exposed to intra-government competition for financial resources. Greening public budgets is thus a prerequisite of greening SWFs. Another line of action would be to include promotion of green growth as a criterion for finance allocation to individual projects or programmes.

Role of the domestic banking sector

In comparison with OECD and Central and Eastern European (CEE) countries, the banking sector in EECCA countries constitutes a small part of their economies. The volume of banking credit, as a share of the GDP (Figure 8.5), is still much lower than in some countries of CEE (in 2009, in Bulgaria it was 69.4% of the GDP, in Poland – 61.5%, in Estonia – 106.2%) and several times smaller than in the "old" members of the European Union (*e.g.* in France – 128.4%, in the UK – 228.9%). Only in Ukraine was the 2009 level of domestic credit on par with the levels in some CEE countries. However, the rapid credit growth expansion in Ukraine could have possibly contributed to the subsequent liquidity problems in the sector. The financial crisis highlighted serious weaknesses in the banking systems in many EECCA countries. These include, for instance, reliance on foreign funding, fast credit growth with a great number of nonperforming loans.

Figure 8.5 Domestic credit to the private sector, % of GDP



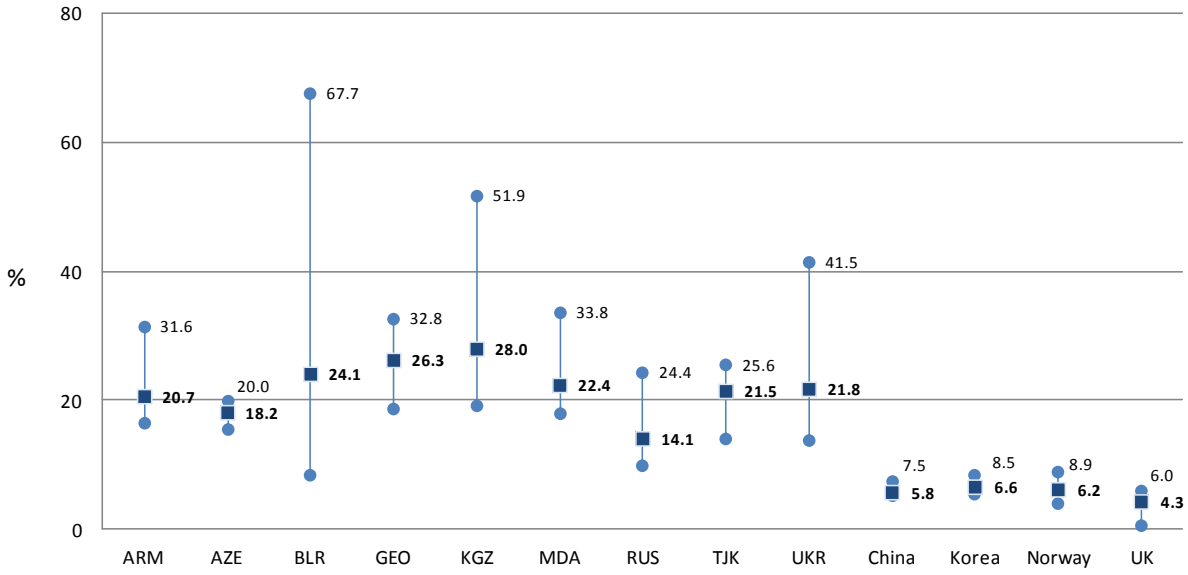
Note: Data not available for Turkmenistan and Uzbekistan.

Source: The World Bank Development Indicators Database, accessed May 2012.

The domestic lending interest rates for the private sector are very high in EECCA: for the period of 2000-2009, the average of this indicator is above 20% in the majority of EECCA countries (Figure 8.6), as compared to 4-6% rates in such green economy-oriented countries as Korea, Norway and the UK, as well as in China. They remain at similar levels to those in Haiti, Malawi and Nigeria and considerably exceed the average lending interest rates in other emerging (except for Brazil) and developing countries.

Figure 8.6 Cost of finance for the private sector in EECCA

Lending interest rates (%): Average, minimum and maximum for 2000-2009



Source: International Monetary Fund, International Financial Statistics and Data, calculations by OECD.

The level of interest rates in EECCA reflects a continuously fragile credit market and important lending risks, be these linked to loan's non-performance (that may be as high as 40%) or diverse other risks, such as political instability. In addition, the year-by-year fluctuations of lending interest rates are significant, as in Belarus, the Kyrgyz Republic and Ukraine, and collateral requirements may be as high as 149%. All these limit the private's sector access to finance and interest in projects with long-term payback periods, thus translating into under-investment and encouraging a persistent short-termism.

It is worth noting that some green growth projects may be profitable even against such extremely elevated costs of borrowing as in EECCA. For instance, according to McKinsey & Co. (2009) estimates (Table 8.2), a list of some 60 energy efficiency measures can have an average internal rate of return (IRR) of 30% and more. The same source mentions that implementing such measures in the Russian Federation would require some EUR 150 billion worth of investment in the period of 2011-2030, but the savings and profits would exceed the amount of investment by some EUR 190 billion. The most promising sectors are buildings and construction, energy and heating, and industry and transport.

Table 8.2. Profitability of green growth projects in the Russian Federation, billion Euros

Energy efficiency projects with IRR>30%	2011-15	2016-20	2021-25	2026-30	Total
Investments,	-20	-29	-49	-54	152
Savings	26	60	103	155	344

Source: McKinsey (2009).

As reported by WWF (2010), there is a wide gap between opportunities to finance greener development and trends in domestic capital markets, where financial institutions are reluctant to switch from financing "business as usual" carbon-intensive activities to providing funding to eco-friendly projects aimed, first of all, at energy saving and renewable energy sources. Moreover, financial institutions in EECCA pay limited attention to carbon and environmental profiles of projects they provide loans to.

Environmental safeguards that have long been used by development banks provide strong incentives for the EECCA financial sector as well. For example, the Russian Federation's *Vnesheconombank* (VEB) signed in 2008 a Memorandum of Understanding with the IBRD and the IFC to devise joint programmes in line with the goal of environmentally sustainable development and climate change mitigation. Furthermore, co-financing by development banks encourages the VEB to implement greener projects in its client EECCA countries: a syndicated loan was provided by the VEB (EUR 22.5 million) and the EBRD (up to EUR 42 million) to the electricity distribution company Electric Networks of Armenia to promote energy efficiency throughout the Caucasus. According to WWF Russia, other Russian state-owned banks, in particular Sberbank, have begun considering the incorporation of social, environmental and climate change-related factors into their decision-making precisely because of the expansion of their international activities.

The international community supports capacity building in EECCA domestic banks. For example, the Sustainable Finance Programme of WWF Russia, supported by the International Climate Initiative of the German Ministry for the Environment , aims to facilitate the integration of Russia's national climate-related targets into investment practices of Russia's financial sector (Box 8.2). The programme supports the development of individual and joint action plans for major Russian state-owned banks (Vnesheconombank, VTB, Sberbank, Eurasian Development Bank, Russian Agricultural Bank and Gazprombank) as well as commercial banks and other financial institutions (insurance and asset management companies, pension funds). This leads to a gradual greening of commercial banks.

Box 8.2. Examples of "greener" commercial banks in the Russian Federation

Center-Invest Bank, a commercial bank founded in 1992 and focused on serving corporations and SMEs in southern Russia. It was the first bank in Russia to offer specialised financing for energy efficiency projects. Since 2005, under a programme developed together with the IFC, Center-Invest has provided loans for the procurement of more efficient industrial, agricultural and food processing equipment. The programme has enabled companies not only to reduce production costs, but also to significantly reduce CO_2 emissions, on average by 30-50% in 2008.

MDM Bank, one of the leading independent providers of banking services in Russia, has signed with the IFC and the EBRD credit agreements that contain a number of covenants related to the environmental appraisal of projects. Accordingly, MDM Bank defined a list of activities that it will not credit, including activities harmful to the environment and those banned by the national or international legislation. The Bank regularly verifies environmental risks of projects to which it provides financing and tracks serious technological accidents, suspensions of production as a result of environmental non-compliance, social protest actions, etc. A special MDM Bank credit line aims at increasing the energy efficiency of small enterprises. Possible projects within this programme included modernising light systems, heating and water supply systems, etc. Under the programme, entrepreneurs could receive a loan of RUR 3-60 million for up to seven years.

Source: WWF, 2010.

There might be specific regulatory failures that impede the greening of domestic banks in EECCA. WWF identifies the absence of environmental risks in the classification of borrowing risks as one such regulatory failure: this is the case in Russia, where the Central Bank only

considers default risk, operating risk, legal risk, risk of reputational losses, and strategic risks. Given the high costs of borrowing, the role of governments in financing green growth projects will likely be high in EECCA. However, green projects will have to compete with projects in other social sectors that are related to high development priorities, *e.g.* education and health.

Microfinance institutions

Microfinance institutions (MFIs) include a broad range of organisations such as banks, non-bank financial institutions, financial cooperatives and credit unions, finance companies and NGOs specialising in serving clients who lack access to traditional financial services. In 2008, they served 40 million poor people in over 65 countries. With time, MFIs have gone from being purely a poverty-alleviation tool to financing economic development. They have done so through their proximity to local entrepreneurs. Their successful uptake is due to a flexible formula offered to small entrepreneurs, bypassing stringent regulatory and collateral requirements.

Today, MFIs in EECCA are at least a decade-old phenomenon (Table 8.3). According to the Microfinance Information Exchange (2008-2011), their number, portfolios and financial performance have been steadily increasing in the pre-crisis years, followed by an important cut-back of 10-15% in 2009. While there is some evidence of micro-finance contribution to MDGs achievement (UNESCAP, 2010), the role of MFIs in promoting environmental sustainability and greening growth needs to be better defined. MFIs could be a useful tool for providing better access to finance for SMEs and to households, as their behaviour starts changing in EECCA.

Table 8.3. The microfinance sector in EECCA: key statistics

	Number of institutions		Retail portfolio (USD million)		Retail deposits (USD million)	
	2008	2009	2008	2009	2008	2009
Armenia	32	16	577.0	294.0	118.7	106.2
Azerbaijan	74	77	481.0	465.0	31.6	63.8
Belarus	20	21	65.3	68.1	0.2	585.8
Georgia	31	13	478.5	210.0	191.5	170.3
Kazakhstan	682	831	1449.7	1323.3	0	0
Kyrgyzstan	544	601	326.3	302.2	0.5	7.7
Moldova	447	433	200.7	155.6	23.4	18.1
Russia	2770	2769	2732.3	2103.8	470.8	472.0
Tajikistan	104	128	228.4	166.2	168.3	22.8
Turkmenistan	-	-	-	-	-	-
Ukraine	837	735	1532.6	597.0	825.4	599.0
Uzbekistan	682	138	1449.7	226.8	0	125.1

Source: MIX and CGAP (2011); MIX and CGAP (2010).

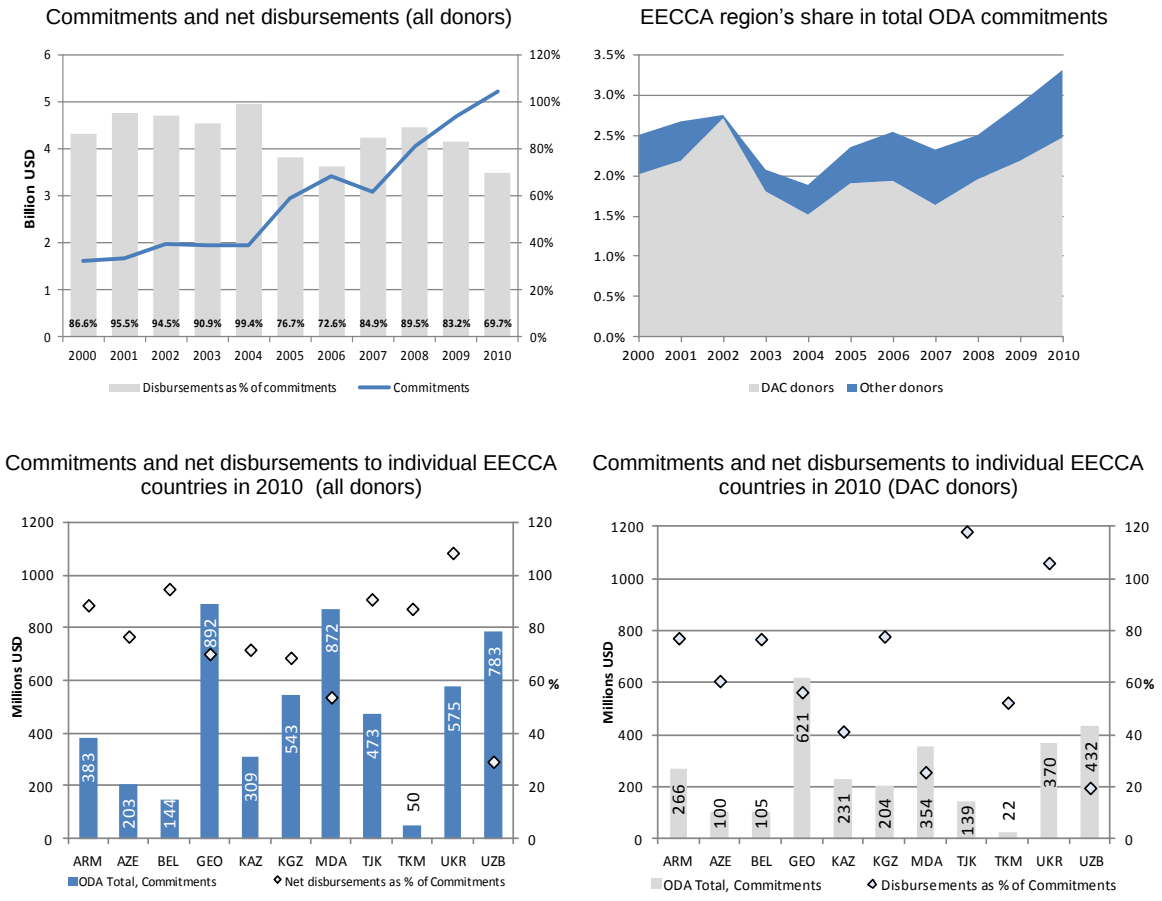
Since 2007, development banks such as the IBRD and the European Bank for Reconstruction and Development have established dedicated facilities that target the private sector in encouraging green growth projects, *e.g.* on energy efficiency. Examples of such facilities are presented in the next section. Very often these facilities operate through local banks, some of which are associated with microfinance schemes.

Role of Official Development Assistance and International Financing Institutions

ODA size and thematic coverage

Official Development Assistance (ODA) can play an important role in helping countries to establish supportive conditions for green growth and facilitate green investments. According to data collected by the OECD's Development Assistance Committee (DAC), EECCA[10] countries have received an increasing amount of ODA over the last decade (Figure 8.7). The disbursed ODA reached USD 3.6 billion in 2010 as compared to USD 2.3 billion in 2007 and 1.4 billion in 2000. At the same time, the annual disbursement rates were clearly affected by the financial and economic crisis, showing a historically low value of 69.7% in 2010. The EECCA countries share has lately seen an increase from some 1.5% of the total ODA in 2004 to 2.5% in 2010 though it did not reach the decennial peak of 2.7% reached in 2002. Thus, donors were able to maintain their support to EECCA even in the crisis conditions.

Figure 8.7. Evolution of ODA commitments and net disbursements to EECCA (2000-2010)



Note: Disbursements represent the actual international transfer of financial resources. They may be recorded gross (the actual amounts disbursed) or net (*i.e.* less repayments of principal in respect of earlier loans).

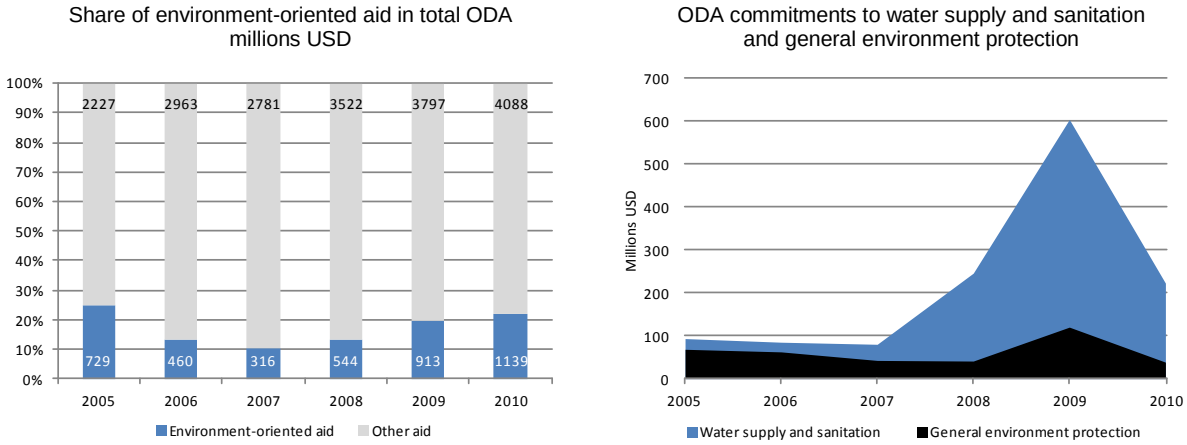
Source: OECD/EAP Task Force calculations based on data extracted from OECD DAC database.

[10] Russia is not included in the DAC database, so for these purposes EECCA comprises 11 countries. There is no separate "EECCA" group of countries in the DAC database.

There are several priority countries that receive the bulk of ODA allocated to EECCA. In 2010, for example, some 50% of aid was provided to three out of twelve EECCA countries: Georgia (USD 892 million), Moldova (USD 872 million), and Uzbekistan (USD 783 million).

Against the upward trends in total ODA, the environment-oriented[11] ODA to EECCA has also seen a spectacular re-bound after an important drop in 2006-2007 (see Figure 8.8). In 2010, it accounted for about USD 1.1 billion (21.8% of total commitments) as compared to 0.3 billion (10.2% of the total) in 2007. In particular, the water-related ODA[12] has increased substantially since 2007. The reliance on donor assistance in the water sector may be very high: for example, 88% from total investment in water supply and sanitation in Armenia in 2009 came from IFIs and donors (OECD, 2011a). It has to be noted that aid provided within regional programmes of cooperation is not recorded thus difficult to describe in quantitative terms.

Figure 8.8. Evolution of environment-oriented aid to EECCA (2005-2010), all donors commitments



Source: OECD/EAP Task Force calculations based on data provided by the OECD's Development Cooperation Directorate and data extracted from the Creditor Reporting System (stats.oecd.org).

From a national perspective, though, the environment-oriented ODA has been rather volatile from one year to another. Even the largest donors were not able to ensure a stable flow of aid to the region. The ODA volatility in the environmental sector is further aggravated by the volatility of respective public budgets (OECD, 2011b).

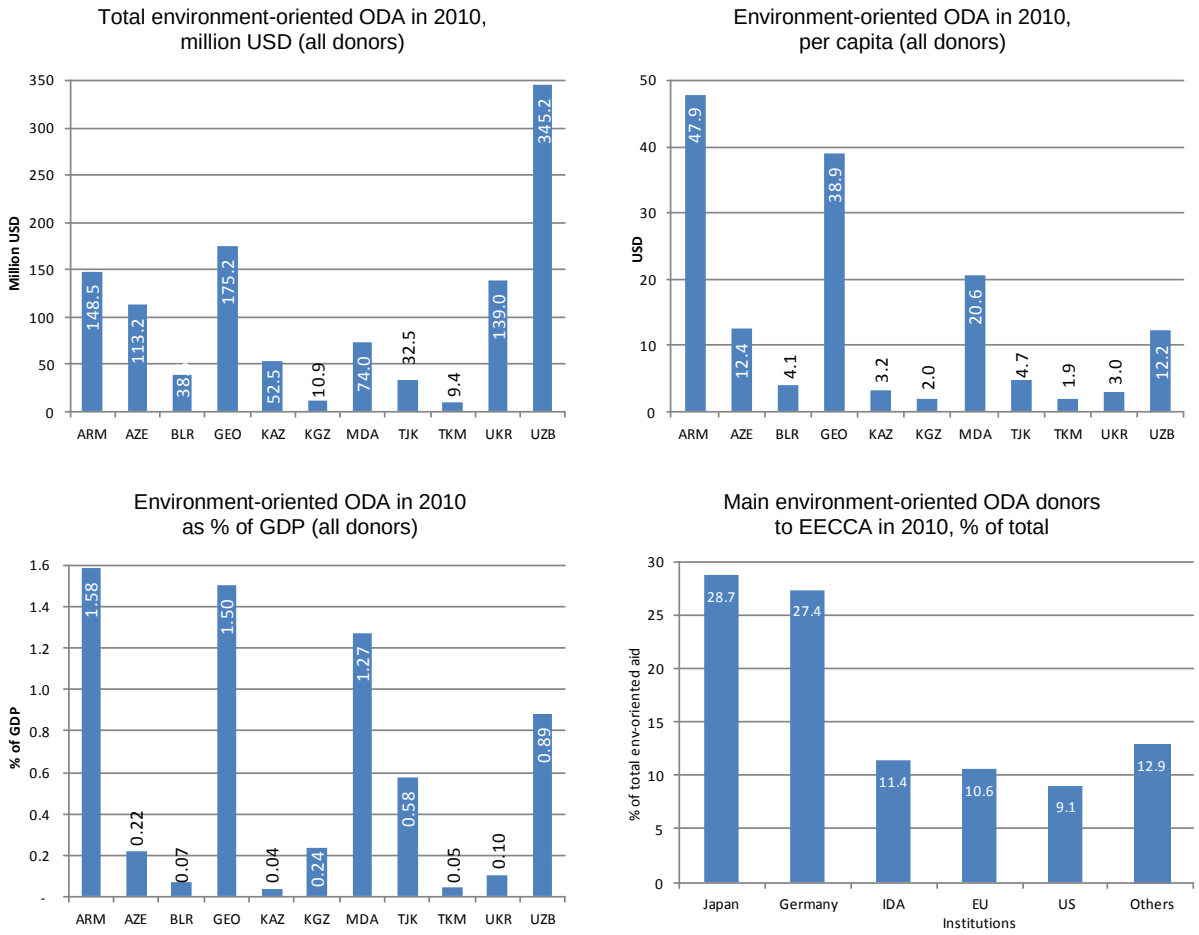
[11] In the DAC database, an activity is classified as **environment-oriented** if: a) It is intended to produce an improvement, or something that is diagnosed as an improvement, in the physical and/or biological environment of the recipient country, area or target group concerned; or b) It includes specific action to integrate environmental concerns with a range of development objectives through institution building and/or capacity development. DAC monitors environment-oriented aid using the so called "environment markers". Source: http://www.oecd.org/dataoecd/4/6/38025362.pdf

[12] In more detail, aid provided to the water supply and sanitation sector in EECCA is discussed in another recent OECD publication (OECD, 2011).

According to 2010 data, the main recipients of the environment-oriented ODA were Armenia, Georgia, Ukraine and Uzbekistan, with quite modest amounts being allocated to Kyrgyzstan and Turkmenistan (see Figure 8.9). On a per capita basis, and as a share of GDP, Armenia was the leader in 2010, followed by Georgia, Moldova, and Uzbekistan. Once again, Kyrgyzstan and Turkmenistan receive least ODA per capita. On a per unit of GDP basis, ODA is highest in Armenia (1.58% of GDP in 2010) and almost negligible in Belarus, Kazakhstan and Turkmenistan (0.04-0.07% of the GDP).

The most important bilateral donors include Japan, Germany, and the United States. Among multi-lateral donors, the key role is played by the International Development Agency and the EU institutions. ODA flows related to capital investment projects outweigh technical assistance projects. Funding received through multilateral development banks is the predominant source of investments (see also Section 4.3).

Figure 8.9. Environment-oriented ODA commitments to EECCA in 2010



Source: OECD/EAP Task Force calculations based on data provided by the OECD's Development Cooperation Directorate and data extracted from the World Bank Development Indicators database.

The lion's share of environment aid (65.5 %) goes to areas covered by the three Rio global environmental conventions[13], particularly to activities related to the energy sector. Energy production from biomass was supported in Armenia, Belarus, Kyrgyzstan, Moldova and Ukraine since the late 1990s but with amounts that are almost negligible (*e.g.* the total support for biomass in EECCA was just USD 0.2 million in 2010). Aid to solar energy production was first provided in 2010, amounting some USD 11 million per total with three countries (Georgia, Kazakhstan and Turkmenistan) receiving such aid. Given the very modest share of support related to renewable energy, the important contribution of the energy sector to the environment-oriented aid might come from projects addressing local air pollution, *e.g.* aid to produce energy from gas-fired power stations. More generally, projects that are receiving the "Rio markers" are quite diverse, often being outside of the traditional "environmental protection" category of aid. For instance, such markers can be assigned to projects as different as hydropower generation, food crop production and biodiversity protection. This makes them usable as an indirect measure to assess aid to green growth projects.

The size of aid targeting Rio Conventions (Table 8.4) is quite variable in different EECCA countries: from 1% in Azerbaijan to 98% in Uzbekistan (based on 2010 data). In 2010, Japan and Germany provided more than 80% of aid targeting the Rio Conventions (44% and 38% respectively, see Table 8.5), with important funds also being provided by the EU, IDA, and the Global Environmental Facility (GEF). As concerns non-DAC countries, only the United Arab Emirates contribute with relatively modest amounts to environmental protection though with a wide geographic scope covering Azerbaijan, Moldova, Kazakhstan, Tajikistan, Ukraine and Uzbekistan.

Table 8.4. ODA commitments that have one or more of the Rio markers: by recipient country (2005-2010), current millions USD

Recipient country	2005	2006	2007	2008	2009	2010	Share in total (2010), %
Armenia	147.7	5.3	2.6	38.5	0.7	134.1	*90*
Azerbaijan	275.0	35.9	0.7	1.0	355.7	1.3	*1*
Belarus	0.001	..	..	11.9	2.5	8.0	*21*
Georgia	60.8	5.2	1.3	5.1	5.7	143.9	*82*
Kazakhstan	5.6	4.5	60.0	8.4	2.3	22.0	*42*
Kyrgyzstan	13.7	0.7	33.3	5.3	10.8	2.9	*26*
Moldova	0.04	0.2	0.5	14.8	10.4	31.7	*43*
Tajikistan	18.0	15.0	1.8	38.9	17.4	9.0	*28*
Turkmenistan		4.4		2.1	0.2	6.9	*74*
Ukraine	13.8	3.1	4.1	111.0	10.3	47.2	*34*
Uzbekistan	9.1	0.4	0.3	3.7	26.0	338.7	*98*
EECCA, total	543.8	74.7	104.7	240.8	442.0	745.6	*65*

Source: Data provided by the OECD's Development Cooperation Directorate.

[13] Since 1998 the DAC has monitored aid targeting the objectives of the Rio Conventions through its "Creditor Reporting System" (CRS) using the so called "Rio markers". Every aid activity reported to the CRS should be screened and marked as either (i) targeting the Conventions as a 'principal objective' or a 'significant objective', or (ii) not targeting the objective.

Table 8.5. ODA commitments that have one or more of the Rio markers: by donor (2005-2010), current millions USD

Donor country	2005	2006	2007	2008	2009	2010
Austria	0.2	0.3	0.1	1.5	0	2.7
Belgium	0.4	0.4	0.0	0.0	0.04	0.0
Canada	0.01	2.2	0	0	0.003	0.2
Denmark	0	0	1.2	0	0	1.2
EU institutions	17.4	20.1	0	108.2	0	17.2
Finland	0	0	0	2.6	4.7	3.6
France	9.4	0	0	36.6	21.4	0.5
GEF	0	0	0	0	0	33.5
Germany	77.3	44.1	92.5	64.0	7.1	282.5
Greece	0.7	0.2	0.6	0.1	0.7	0
IDA	26.0	5.0	0	14.0	10.0	50.0
Ireland	0	0	1.6	0.4	0	0
Italy	0	0	0.1	1.8	0.5	0.03
Japan	410.7	0.3	0.7	1.7	376.1	325.5
Korea	0	0	0	0.02	5.9	1.5
Netherlands	0	0	0	0	0	0.1
New Zealand	0.1	0	0	0	0	0
Norway	1.1	1.3	6.4	8.4	7.5	1.8
Sweden	0	0	0	0	5.5	19.6
Switzerland	0	0.5	0.7	1.0	0.1	3.5
UNDP	0	0	0.1	0	0	0
United Arab Emirates	0	0	0	0	0	0.1
United Kingdom	0	0	0.03	0.4	1.2	1.0
United States	0.4	0.3	0.6	0.03	1.2	1.1

Source: Data provided by the OECD's Development Cooperation Directorate.

Assistance by multilateral donors and International Financing Institutions (IFIs) covers many elements of green growth in all EECCA countries, with a varying scope and scale. The two most significant elements covered by multilateral aid in all the countries are energy efficiency and water supply/wastewater treatment initiatives. These are the areas where relatively more money and effort are invested in the region. According to the planned and agreed development assistance, these areas will remain in focus for the several years to come. They are followed by renewable energy (mostly in hydropower, with some in wind and biomass) and sustainable agriculture/land management[14]. Waste management (apart from Azerbaijan with its large hazardous waste clean-up projects) and improvements in public transportation do not get much attention of multilateral donors. Table 8.6 provides a summary of the relative size (high, medium, low)[15] of assistance targeting each of the green growth aspects in individual EECCA countries.

[14] In addition to country-specific projects, there are several regional sustainable agriculture and land management initiatives in Central Asia and the Caucasus.

[15] The number and amount of thematic projects were used as criteria for this classification.

Table 8.6. Green growth aspects in multilateral development projects in EECCA countries

	Energy efficiency	Renewable energy	Public transport	Sustainable agriculture	Water supply and sanitation	Waste management
ARM	**High**	**High**		Low	**High**	Low
AZE		Medium		Low	**High**	**High**
BLR	Medium			Low	Low	
GEO	Low	Medium	Medium	Low	**High**	Low
KAZ	Medium	Low	Low	Medium	Medium	Low
KGZ	Low	Low		Low	Medium	Low
MDA	Medium	Low		Medium	**High**	Low
RUS	**High**	Low			Low	
TJK	Low	Low	Low	Low	Medium	
TKM	Low	Low		Low		
UKR	**High**	Low			Low	
UZB	Medium	Low		**High**	**High**	

Source: Donor agencies' websites.

The sectoral distribution of development assistance relevant to green growth generally corresponds to EECCA countries' declared strategic priorities. This is particularly true in Armenia, Russia and Uzbekistan. It is very difficult to identify cross-sectoral green growth-related issues (environmental fiscal reform, product policies or eco-technologies and innovation) in the assistance projects. However, it seems that very few projects address these issues explicitly.

The environment-oriented assistance is still largely provided through projects, though budgetary and sector support is being increasingly allocated to Armenia, Georgia, Kyrgyzstan, Moldova, Tajikistan and Ukraine. As of 2010, Georgia and Moldova enjoyed sector support for water supply and sanitation. In 2010-2011, there were intensive discussions involving the European Union about providing environment sector support to Ukraine. The debt-for-environment swap mechanism was not yet used in EECCA despite some preparatory work done in Georgia and Kyrgyzstan (OECD, 2007).

Aid effectiveness related to environment-oriented actions is difficult to judge without additional research. It has to be noted that only four recipient countries from EECCA have adhered to the 2005 Paris Declaration on Aid Effectiveness (Armenia, Moldova, Tajikistan and Ukraine). A recent survey of progress on aid effectiveness (OECD, 2011c) shows that these countries (except Ukraine) made important efforts to improve their performance through better planning and budget management, and reduction of parallel project implementation units, with less progress being recorded on the side of donor countries who, for instance, still fail to improve coordination of their country-level analytical work and missions. Following recent improvements in the country systems, some 70% of aid to Moldova now goes through such systems, with 43% in Armenia, 31% in Tajikistan and 27% in Ukraine. Hopefully, other EECCA countries will join the Paris Declaration, which may speed up positive change and enable regular progress monitoring. At the same time, additional analysis of the aid effectiveness in the context of green growth promotion would be needed in the future.

The role of International Financing Institutions

Three major multilateral development banks are active in the region: the European Bank for Reconstruction and Development (EBRD), the International Bank for Reconstruction and Development (IBRD), and the Asian Development Bank (ADB). The European Investment Bank has recently received a mandate to operate in the region as well. Several other IFIs or bilateral financing mechanisms operate in the region, including the support fund of the Northern Dimension's Environmental Partnership, the Nordic Environmental Finance Corporation, the Black Sea Trade and Development Bank, to name just a few. Many IFIs work through local banks, often by establishing micro-finance facilities. Although all these institutions have a role to play, this section focuses on the major players.

The ***European Bank for Reconstruction and Development*** is today the largest financial investor in the EECCA region. In particular, the EBRD has a leadership position on climate change and energy efficiency financing. These issues have been a focal point for the EBRD since 2006, when the Bank launched the ***Sustainable Energy Initiative*** (SEI). Under SEI Phase 1 (2006-2008), the EBRD invested EUR 4 billion in energy efficiency in industrial, power and municipal infrastructure as well as the renewable energy sector and carbon market development. As of 2008, areas of new activity include energy efficiency in buildings and climate change adaptation.

EBRD's ***Sustainable energy financing facilities*** (SEFFs) with local financial institutions are specifically dedicated to small and medium-scale investment projects. Financing is based on extending credit lines to local banks that provide commercial loans, at their own risk, to borrowers with eligible investment opportunities. Loan amounts vary depending on the facility and the investment opportunity, but the average is roughly EUR 500 000 for loans to companies, while loans to households are typically below EUR 1 500. The SEFF model works in Kazakhstan, Russia and Ukraine. In 2009, the EBRD launched a new EUR 3.5 million technical cooperation facility – the ***Regional Energy Efficiency Programme for the Corporate Sector*** – to provide energy audit support for the manufacturing, agribusiness and natural resource sectors.

Another relevant EBRD activity is the management of two carbon funds, the EUR 23 million Netherlands ***Emissions Reduction Cooperation Fund*** (NERCoF) and the EUR 208.5 million ***Multilateral Carbon Credit Fund*** (MCCF). EBRD's carbon finance activities increased in 2009 with the signing of five carbon credit transactions, bringing the aggregated carbon credit portfolio under MCCF and NERCoF to 10.1 million carbon credits. The carbon credits originate from emission reduction projects in power generation, renewable energy, oil and gas, and industrial energy efficiency and are located in Azerbaijan, Armenia, Georgia, Russia and Ukraine. In 2010, the MCCF expects to sign a number of additional carbon credit transactions. The focus will be on Ukraine and Russia. Using the MCCF, the EBRD is also active in the development of ***Green Investment Schemes*** (GIS), whereby an eligible country of operations sells surplus Assigned Amount Units to a buyer, and the proceeds are used to co-finance greenhouse gas emission reduction projects. GIS development opportunities are being explored in Russia and Ukraine. In the case of Ukraine, the Bank provides specific technical assistance, funded by Spain, to develop a suitable GIS. In 2009, emphasis was put on developing tools such as the Green Investment Scheme Manual and Model Agreement, development of which was funded by the Netherlands.

Box 8.3. Green Investment Scheme: Experience in Ukraine

A Green Investment Scheme (GIS) is an innovative mechanism to facilitate (mostly) government-to-government trade in carbon credits, whereby the selling country uses the revenue from such trade to support investments in climate-friendly projects.

Ukraine's potential for carbon credit generation. Under the Kyoto Protocol (Annex B), industrialised countries (including the Russian Federation and Ukraine) have committed to country-specific targets that collectively reduce their greenhouse gas (GHG) emissions by at least 5.2% below 1990 levels on average during the first commitment period, 2008–12. Emission reduction commitments are defined as a cap on the volume of GHGs that can be emitted and are quantified by Assigned Amount Units (AAUs) allocated to each participating country. One AAU represents the right to emit one metric ton of carbon dioxide equivalent.

Countries that are below their Kyoto target can sell their emissions surplus to countries that have a shortage of emission rights under Kyoto Protocol Article 17. These surplus emissions are a result of the economic transition from energy-intensive planned economies toward market economies since the early 1990s. Ukraine is a net AAU seller and has the second largest AAU surplus after the Russian Federation. Ukraine's surplus AAUs are estimated to be around 2 billion for the period 2008–12.

By mid-2011, Ukraine has concluded three AAU deals – two with Japan, in March 2009 (with the Japanese government) and in May 2009 (with a group of private Japanese firms) and one deal with Spain, which altogether amounted to 47 mln AAUs sold (44 mln to Japan and 3 mln to Spain). As part of these deals, Ukraine managed to raise a total of Euro 319.9 mln in that year. With three transactions, Ukraine became a leading seller in 2009.

Management of the proceeds from the AAUs sales

To manage the proceeds from the AAU sales, the Ukrainian government established a GIS as a targeted budget programme under the Ukrainian budget law. The proceeds from the AAU sales are held by the Ministry of Finance, in a special foreign currency account. The State Budget Law postulates that the revenue from such transactions be used only for projects directly leading to GHG emission reductions.

In 2008, the Ukrainian government assigned to the now called State Environmental Investment Agency (SEIA) (established under the Ministry of Environment) the responsibility to manage GIS, including negotiations with buyers as well as the approval and implementation of projects that will be financed from the revenue from the AAU sales. However, so far, there is no GIS specific law and no overall GIS architecture in Ukraine. A generic draft GHG emissions trading law passed first reading in parliament in 2010, but has seen little progress since. All sales require Cabinet of Ministers' approval with sales revenues disbursed to projects mostly in the form of grants.

Specific details of projects are reached in bilateral consultations on each GIS deal with the buyer country. Details about monitoring, reporting and verification (MRV) are also included in the contracts with buyers, but these contracts are not publicly available. Performance reports on individual projects are envisaged to undergo checks by an independent accredited verifier but according to the current Ukrainian GIS regulations, Ukraine is not obliged to provide this information to a buying country.

GIS implementation issues

Despite the potentially high amount of AAUs that Ukraine can sell, until recently, only very few projects, suitable for finance under GIS were identified. These projects however were not enough to fulfil the country's obligations under the signed contracts with Japan and Spain. In addition, and despite existing legislation, most of the revenue from the sales was diverted and not used for environmental investments. Coupled with a lengthy process of tendering and contracting the projects, all this led to significant delays in implementing the agreements and in spending the resources in an effective and efficient manner. As a result of this misuse of resources, the buyer countries requested the government to demonstrate the accountability and transparency of the AAU transactions.

Recently, the Ukrainian government has announced plans to honour its contractual obligations and finance relevant projects. In January 2011, Ukraine and Japan negotiated and agreed on 127, mostly energy efficiency, projects which will be financed with Japanese AAU proceeds and which are estimated to result in a reduction of 1.74 million tons of carbon dioxide equivalent a year. However, it is not yet clear when the projects will start and when the expected emission cuts will take effect. The Ukrainian government is taking similar actions with regard to the money paid by Spain under this scheme. In this way Ukraine hopes to rebuild its tarnished credibility and reputation and launch new deals with other interested buyer countries.

The experience of Ukraine with designing and implementing a GIS shows the importance of and the need for transparent and accountable rules and procedures for identifying and selecting GHG abatement or other environmental projects to be financed from AAU sale revenues. It also shows that the existence of a sound pipeline of projects for a GIS that can be implemented relatively quickly is critical.

When a country decides to establish a GIS, a more detailed sector assessment should be performed in order to identify high priority and quick to implement projects to include in the GIS pipeline. Both the World Bank and the EBRD have created facilities to assist countries in this regard. EBRD published a template and guidance manual for GIS transactions on its website (see below) in an attempt to contribute to the development of GIS and its financial and environmental robustness.

More generally, the track record with GIS implementation in various countries so far is rather mixed. However, it is worth noting that some elements of the GIS could be particularly useful in planning and implementing Nationally Appropriate Mitigation Actions (NAMAs) in developing countries and economies in transition. GIS experience could also provide insight into the development of new policy-based instruments to reduce GHG emissions in these countries. Conceptually, NAMAs emerged as part of the 2007 UNFCCC Bali Action Plan. The concept recognises that different countries may take different nationally appropriate policy actions on the basis of equity and in accordance with common but differentiated responsibilities and respective capabilities. The concept, which is being operationalised, also emphasises financial assistance from developed countries to developing countries to reduce emissions in a voluntary but responsible way.

Source: Adapted from:

Tuerk, A. et al. (April 2010), Working Paper: Green Investment Schemes: First experience and lessons learnt, Center for Climate Change and Sustainable Energy Policy, Central European University, Budapest.

World Bank (2011), State and trends of the carbon market 2011, Washington DC.

World Bank (2006), Ukraine - Options for designing a Green Investment Scheme under the Kyoto Protocol, Report No. 37949, Washington DC.

Point Carbon web-site: www.pointcarbon.com, Ukraine publishes 125 projects financed under GIS, 24 January 2011.

EBRD website: http://www.ebrd.com/pages/sector/energyefficiency/sei/carbon/markets.shtml

The ***World Bank*** has a substantial programme to improve energy efficiency in EECCA. Projects to improve energy efficiency in public buildings, schools and hospitals (as well as to achieve educational and health outcomes) have been successfully implemented in Armenia and Moldova. In Belarus, a USD 125 million project will help improve heating and power generation is selected towns, leading to a reduction of about 165 000 tonnes of carbon dioxide annually. Many of these projects utilise a range of financing instruments and grants. The World Bank is also helping a number of countries, including Ukraine and the Russian Federation, to implement national energy efficiency strategies.

Box 8.4. Climate Investment Funds (CIFs), World Bank

CIFs can finance carbon reduction activities. They are multi-donor trust funds, launched at the 2008 G8 summit. CIF resources (of USD 6.3 billion) are available through multilateral development banks to support efforts to mitigate or strengthen resilience to the impacts of climate change. CIFs create an opportunity to blend funding from multilateral development banks and national and private sector development resources, thereby leveraging substantial additional funds. The two CIFs are the Clean Technology Fund (CTF) which finances demonstration, deployment and transfer of low-carbon technologies for significant greenhouse gas reductions as part of country investment plans, and the Strategic Climate Fund (SCF), which finances targeted programmes in developing countries to pilot new climate or sectoral approaches with scaling-up potential. Two CTF programmes have been initiated in the region: in Kazakhstan and Ukraine.

Source: UNESCAP (2010).

The GEF's ***Investment Fund for Nutrient Reductions***, managed by the World Bank, was established to catalyse investments and accelerate action by other stakeholders interested in the protection and revival of the Black Sea. It aimed to leverage USD 210 million to complement USD 70 million of GEF grant funds for investments in nutrient reduction in agriculture, municipal and industrial wastewater treatment, as well as for wetland restoration.

The ***Forest Law Enforcement and Governance*** (FLEG) partnership is a multi-donor trust fund established at the World Bank in 2004 to support regional FLEG ministerial processes. In EECCA, such a process was initiated in 2004 by the Russian Federation. The aim of FLEG initiatives is, among others, to reduce the loss of government revenue from uncollected fees/taxes and support the establishment of a level playing field for legitimate forest operators.

Unlike the EBRD and the World Bank, the ***Asian Development Bank*** operates only in the Caucasus and Central Asia. These countries joined the ADB between 1994 and 2007, Georgia being the latest newcomer. ADB assistance to this group of countries targets regional transport networks, energy security and efficiency, urban services, and finance sector and government reforms. More generally, the ADB focuses its support on three distinct, but complementary, development agendas in the region: inclusive economic growth, environmentally sustainable growth, and regional integration. In its "Strategy 2020", the ADB declares that it will help borrowing countries to move their economies onto low-carbon growth paths, reduce the carbon footprint of Asia's cities, and mainstream environmental considerations into national policies and investment programmes. It also emphasised the strengthening of legal, regulatory and enforcement capacities of public institutions involved in environmental management.

In 2009, as part of the Central Asia Regional Economic Cooperation (CAREC) programme[16], the five Central Asian republics (CARs) endorsed a ***regional action plan for the energy sector***. This plan aims at improving the use of energy resources across the region in the context of climate change through the use of renewable energy resources and energy efficiency. It also looks at energy–water linkages, and the role hydropower may play in Central Asia despite the region's complex transboundary water management. The plan calls for a strong analytical base to ensure the coordinated management of energy and water resources in the region.

[16] CAREC has eight member countries: Afghanistan, Azerbaijan, the People's Republic of China, Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan and Uzbekistan. In addition, six multilateral institutions are involved in this partnership.

With support from the ADB, the CARs established the ***Central Asian Countries Initiative for Land Management*** (CACILM). The goal of this 10-year programme is to combat land degradation and improve rural livelihood through climate adaptation-oriented measures related to biodiversity conservation, integrated water resource management and food security. The current target is to mobilise about USD 1.4 billion to support projects approved under the CACILM framework, with the ADB as the largest contributor and the GEF providing USD 100 million over 10 years in grant co-financing.

At the country level, the ADB provides loans or grants/technical assistance for project in water supply and sanitation natural resource management. Azerbaijan, Uzbekistan and Kazakhstan are the largest receivers of assistance to improve water supply and sanitation infrastructure, including in small towns and rural areas. For instance, in 2009 the ADB approved a multi-tranche financing facility of USD 600 million in Azerbaijan and a similar USD 300 million facility in Uzbekistan.

Conclusions and ways forward

The access to finance for environmental investments is limited in EECCA. Domestic capital and financial markets are still weak, and the rate of non-performing loans is high, making private sector borrowing expensive. Hence, the role of the private sector in green investments is not likely to be prominent at least in a short-term perspective, unless mechanisms are put in place to improve the lending conditions. Public support, including from extra-budgetary environmental funds (where these exist) and donor aid, remains significant as a source of finance for environmental investments in some, though not all, EECCA countries. At the same time, the financial sustainability of the environmental sector is eroding further, and public environmental expenditure remains extremely opaque and fragmented. Carbon finance, for both mitigation and adaptation, is a potentially important new source of finance that EECCA countries need to exploit more consistently.

More adequate access to finance and investment are important prerequisites for the greening of business and infrastructure in the EECCA region. The scale of change required to shift the development path is such that public funds can only provide a small proportion of the investments needed to enable this change.

Governments should focus on using improved policies to leverage private sector investment. Some of these policies involve:

- ***Further improving the public environmental expenditure management:*** An important step towards improving the financial sustainability of the environmental sector in EECCA is raising the transparency of public environmental finance. A particular aspect of this action is the need to continue efforts to enhance the transparency of revenues from pollution and product charges and natural resources payments, as well of their allocation and use, building on past achievements. As mentioned in Chapter 3, the issues of more effective appropriation, distribution and use of natural resource rents and public environmental expenditure more generally need to be addressed. Costing models and sound, internationally-recognised approaches to finance needs assessment are required in order to increase effective spending on green growth projects;

- ***Enhancing the application of such tools as Strategic Environmental Assessment (SEA):*** Using SEA, regular assessments of medium-term expenditure frameworks and budget laws could be conducted thus better aligning public spending with green growth

objectives. A recent analysis of the European Commission's Common Strategic Framework for 2014-2020 (IEEP, 2012) could provide an example of how expenditure planning could be assessed in terms of how public expenditure plays its role for unlocking green growth initiatives;

- ***Creating incentives for private banks to support environmental investments:*** Most financing for investments in green growth, particularly in wealthier EECCA countries will have to come from private sources. There are examples in EECCA of successful partnerships between development and local banks to provide access to finance in line with green growth objectives. IFIs, such as the World Bank and the EBRD, are already supporting the region with earmarked credit lines, for example, to improve energy efficiency and promote the use of renewable sources of energy. Such credit lines are disbursed through domestic banks. The sustainability of these financing schemes may, however, dissipate following the eventual disengagement of development banks. Establishing incentives for the local banking sector is therefore crucial for scaling up low carbon investments in the enterprise, residential and municipal sectors. In addition, reforming investment policy frameworks can help countries to channel foreign direct investment to green growth projects;

- ***Increasing ODA transparency and effectiveness:*** Most of EECCA countries receive important donor support to help them achieve development goals. A greater transparency and effectiveness of its use is necessary since most of this support is still channelled through projects. At the same time, together with a wider application of new modalities of aid such as general budget and sector support, a better mainstreaming of green growth objectives into national policies and budgets will be necessary;

- ***Strengthening capacity to access climate-related and other international financing:*** Carbon finance for climate change mitigation and adaptation is a potentially important new source of finance for environmental expenditure that EECCA countries need to exploit more consistently. Though to a limited extent, EECCA countries have managed to tap into global climate-related funds. Carbon financing is part of bilateral aid. Some international organisations that are active in EECCA, including the EBRD, the UNDP and the World Bank, help countries to access new sources of environmental finance in the implementation of climate mitigation and adaptation projects through several environmental finance facilities. However, access to global finance is limited because of, among other things, capacity constraints within governments and the private sector, including capacity to formulate and cost priority programmes and projects. EECCA countries face a complex international and domestic funding architecture and need better strategies, as well as "monitoring and navigation tools" in order to profit from climate finance. In the post-2012 global climate regime, donors and IFIs will be investing significant resources in climate change adaptation measures. Future carbon finance mechanisms are likely to rely to a great extent on country-based systems for programme and project identification and implementation. Those countries that develop the necessary skills to prepare sound public expenditure programmes and identify cost-effective projects will be more competitive and will stand better chances of benefiting from international support. In order to be successful, such programmes also need to be integrated into the national development strategies and medium-term budgetary processes (such as medium-term expenditure frameworks, MTEF). Therefore, strengthening the capacity of EECCA environmental administrations in this area is key to accessing international carbon finance as well as obtaining adequate

financing from the regular budget, both of which are critical for the countries' economic and social development;

- ***Re-assessing the potential benefits and implementing debt-for-environment swap (DFES) schemes, as appropriate***: The potential benefits of DFES for low-income countries are manifold. At the same time, DFES initiatives should always be carefully considered, as if managed in an inappropriate way, this can affect the country's credit rating and increase costs of sovereign borrowing. In the past, OECD has helped Kyrgyzstan and Georgia to analyse the feasibility of DFES schemes. Such studies would need to be replicated in countries that are potentially interested to use such schemes, since the context has evolved and past analysis might not be sufficiently adapted to new conditions. Whenever opportunities for a DFES arise, ministries of environment should stand prepared with convincing expenditure programmes[17];

- ***"Greening" the national stabilisation (wealth) funds and other institutional investors:*** Institutional investors, such as, for instance, sovereign wealth funds and pension funds can be a source of long-term capital due to the long-term nature of their liabilities. Such long-term investing can contribute to green investments. Policy makers and regulators need to re-examine the investment and funding regulations relevant to these investors to ensure that they are not inadvertently encouraging a short-term approach. Experience from environmental funds management in EECCA might be useful in this regard.

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ANNEX:
COUNTRY PROFILES

ARMENIA

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	4900	11662	8648	9371
GDP (million constant 2000 USD)	3400	4680	4018	4102
Annual GDP growth (%)	14	7	-14	2
GDP per capita, current USD	1598	3787	2803	3031
GDP per capita (constant 2000 USD)	1109	1520	1302	1327
GDP per capita growth, annual %	14	7	-14	2
Poverty rate (% of population below USD 2/day)	5.2	2.3	..	..
Demography and health				
Population (million inhabitants)	3.1	3.1	3.1	3.1
Population growth (%)	0.1	0.2	0.2	0.2
Urban population (%)	64	64	64	64
Mortality rate, under 5 (per 1000)	26	22	21	20
Life expectancy at birth, years	73	73	74	74
Economic structure (as % of GDP)				
Agriculture	21	18	19	20
Industry	45	44	36	36
Services	34	38	45	44
Financial flows				
FDI (inward flows as % of GDP)	5	8	9	6
Net ODA (% of GNI)	3	2	6	3
Workers' remittances and compensation of employees, received (% of GDP)	10	9	9	11
Adjusted net savings (% of GNI)	17	19	9	9

Source: (2012) The World Bank Development Indicators database.

Welfare structure

	2005			*2000*	
	Bln,$	%	$ per capita		Trend
Total Wealth	**88.0**	**100**	**29190**	**18677**	↗
Produced Capital	12.6	14.3	4185	3617	↗
Natural Capital	9.5	10.8	3139	3703	↘
Intangible capital	67.4	76.6	22355	11971	↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	6.4
Number of subscribers of mobile cellular networks	81
Persons engaged in scientific research and development	0.2

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-0.58 (±0.16)	-0.72 (±0.13)	-0.82 (±0.12)	↘
Political stability and absence of violence	-0.2 (±0.26)	-0.07 (±0.24)	0.09 (±0.24)	↗
Government effectiveness	-0.05 (±0.17)	-0.03 (±0.19)	0.069 (±0.19)	↗
Regulatory quality	0.156 (±0.18)	0.379 (±0.17)	0.034 (±0.16)	↗↘
Rule of law	-0.34 (±0.17)	-0.28 (±0.14)	-0.4 (±0.14)	↗↘
Control of corruption	-0.57 (±0.14)	-0.54 (±0.14)	-0.59 (±0.14)	↗↘
Rank				
Voice and accountability	30	28	26	↘
Political stability and absence of violence	40	40	48	↗
Government effectiveness	55	51	57	↘↗
Regulatory quality	58	62	60	↗
Rule of law	43	46	43	↗↘
Control of corruption	36	34	34	↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	12.4
Agriculture land	71.3
Water basin area	1
Other	15.3

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	..	..	..
Forest rents	0.01	0.01	-
Mineral rents	0.9	1.7	↗
Natural gas rents	0	0	-
Oil rents	0	0	-
Total natural resources rents	0.9	1.7	↗

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Drought	June 2000	100 000	5.2
Earthquake	18 July 1997	33 333	2.0
Flood	22 June 1997	8 000	0.5
Flood	30 May1998	120	0.01

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	861	825	↘
Energy use (kt of oil equivalent)	2505	2601	↗
Energy imports, net (% of energy use)	66	68	↗
Alternative and nuclear energy (% of total use)	34	32	↘
Energy related emissions (% of total)	51	..	..

Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) targets	2005	2010	Trend
Proportion of land covered by forest, %	10	9.3	↘
Carbon dioxide emissions (CO2), metric tons per capita (CDIAC)	1.4	1.8*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	199	174	↘
Consumption of ozone-depleting substances	87	24.9*	↘
Terrestrial and marine area protected, % of total	8.0	8.0	-
Proportion of total water resources used, %	36.4	..	..
Proportion of population with sustainable access to an improved water source, total	95	96*	↗
Proportion of population with sustainable access to improved sanitation, total	89	90*	↗

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for selected MDG (7) targets	
Forest cover	↓
Protected area	•
CO2 emissions	↓
ODP substance consumption	•
Water, total	•
Sanitation, total	Δ

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: *Achieving the MDGs in an Era of Global Uncertainty,* Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	195.4	148.5
Aid targeting the objectives of the Rio Conventions	147.7	134.1
General environmental protection	13.0	0.5
Environmental policy and administrative management	10.3	0.5
Environmental education and training	..	..
Environmental research	0.002	0.031

Source: (2012) OECD database: http://stats.oecd.org/qwids/

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1999
UNFCCC (climate change)	1993
UNCLOS (law of the sea)	2002
UNCCD (desertification treaty)	1997
Ramsar Convention (wetlands)	1993
Kyoto Protocol (climate change)	2003
Convention on Biological Diversity	1993
CMS (migratory species treaty)	..
CITES (species trade treaty)	2008
Stockholm Convention (POPs)	2003
Montreal Protocol (ozone)	1999
Convention on Long-range Transboundary Air Pollution	1997
Convention on Environmental Impact Assessment in a Transboundary Context	1997
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	..
Convention on the Transboundary Effects of Industrial Accidents	1997
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2001

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); and UNECE.

AZERBAIJAN

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	13245	48852	44291	51774
GDP (million constant 2000 USD)	9927	18499	20220	21231
Annual GDP growth (%)	26	11	9	5
GDP per capita, current USD	1578	5575	4950	5718
GDP per capita (constant 2000 USD)	1183	2111	2260	2345
GDP per capita growth, annual %	25	8	7	4
Poverty rate (% of population below USD 2/day)	..	0.6	..	..
Demography and health				
Population (million inhabitants)	8.4	8.8	8.9	9.1
Population growth (%)	1.0	2.1	2.1	1.2
Urban population (%)	52	52	52	52
Mortality rate, under 5 (per 1000)	56	50	48	46
Life expectancy at birth, years	69	70	70	71
Economic structure (as % of GDP)				
Agriculture	10	6	7	6
Industry	64	70	61	65
Services	27	24	32	30
Financial flows				
FDI (inward flows as % of GDP)	13	0	1	1
Net ODA (% of GNI)	2	1	1	0.3
Workers' remittances and compensation of employees, received (% of GDP)	5	3	3	3
Adjusted net savings (% of GNI)	-8	7	10	6

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005		*2000*	
	Bln,$	%	$ per capita	Trend
Total Wealth	128.3	100	11035	15298 ↗
Produced Capital	38.0	29.6	2534	4535 ↗
Natural Capital	98.0	76.4	5539	11684 ↗
Intangible capital	1.6	1.2	3686	195 ↘

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	41.5
Number of subscribers of mobile cellular networks	87
Persons engaged in scientific research and development	0.2

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-1.03 (±0.14)	-1.25 (±0.12)	-1.2 (±0.12)	↘↗
Political stability and absence of violence	-1.29 (±0.24)	-0.39 (±0.24)	-0.39 (±0.22)	↗
Government effectiveness	-0.68 (±0.16)	-0.71 (±0.19)	-0.63 (±0.18)	↘↗
Regulatory quality	-0.5 (±0.17)	-0.35 (±0.18)	-0.28 (±0.16)	↗
Rule of law	-0.72 (±0.14)	-0.73 (±0.14)	-0.81 (±0.13)	↘
Control of corruption	-1.03 (±0.13)	-1.03 (±0.14)	-1.1 (±0.14)	↘
Rank				
Voice and accountability	18	13	13	↘
Political stability and absence of violence	12	31	32	↗
Government effectiveness	29	28	33	↘↗
Regulatory quality	33	42	44	↗
Rule of law	30	25	22	↘
Control of corruption	16	13	13	↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	12.0
Agriculture land	80.6
Water basin area	1.7
Other	5.7

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	..	..	..
Forest rents	0.001	0.0003	↘
Mineral rents	0	0.02	↗
Natural gas rents	9.4	3.9	↘
Oil rents	55.7	42.6	↘
Total natural resources rents	65.0	46.5	↘

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Drought	Oct., 2000	100 000	1.9
Flood	16 April 2003	55 000	0.8
Flood	5 June 1997	25 000	0.6
Earthquake	25 Nov. 2000	10 000	0.2
Flood	15 Jun. 1995	6 700	0.2

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	27229	64559	↗
Energy use (kt of oil equivalent)	13871	11968	↘
Energy imports, net (% of energy use)	-96	-439	↘
Alternative and nuclear energy (% of total use)	2	2	-
Energy related emissions (% of total)	82	..	..

Note: A negative value indicates that the country is a net exporter.
Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) targets	2005	2010	Trend
Proportion of land covered by forest, %	11.3	11.3	-
Carbon dioxide emissions (CO2), metric tons per capita	4.1	5.4*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	354	190*	↘
Consumption of ozone-depleting substances	21.9	3.5*	↘
Terrestrial and marine area protected, % of total	7.2	7.2	-
Proportion of total water resources used, %	35.2	..	..
Proportion of population with sustainable access to an improved water source, total	77	80*	↗
Proportion of population with sustainable access to improved sanitation, total	74	45*	↘

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for selected MDG (7) targets	
Forest cover	↑
Protected area	•
CO2 emissions	↓
ODP substance consumption	•
Water, total	Δ
Sanitation, total	↓

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: *Achieving the MDGs in an Era of Global Uncertainty,* Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	279.2	113.2
Aid targeting the objectives of the Rio Conventions	275.0	1.3
General environmental protection	6.3	0.7
Environmental policy and administrative management	6.3	0.4
Environmental education and training	..	..
Environmental research	..	..

Source: OECD DAC database.

International commitments

Convention/Protocol/Treaty	Year Ratified
Vienna Convention (ozone)	1996 (Accession)
UNFCCC (climate change)	1995
UNCLOS (law of the sea)	..
UNCCD (desertification treaty)	1998 (Accession)
Ramsar Convention (wetlands)	2001
Kyoto Protocol (climate change)	2000
Convention on Biological Diversity	2000 (Approval)
CMS (migratory species treaty)	..
CITES (species trade treaty)	1998 (Accession)
Stockholm Convention (POPs)	2004 (Accession)
Montreal Protocol (ozone)	1996 (Accesion)
Convention on Long-range Transboundary Air Pollution	2002 (Accession)
Convention on Environmental Impact Assessment in a Transboundary Context	1999 (Accession)
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	2000 (Accession)
Convention on the Transboundary Effects of Industrial Accidents	2004
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2000 (Accession)

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

BELARUS

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	30210	60763	49271	54713
GDP (million constant 2000 USD)	18294	24104	24143	25980
Annual GDP growth (%)	9	10	0	8
GDP per capita, current USD	3090	6328	5183	5765
GDP per capita (constant 2000 USD)	1871	2510	2540	2738
GDP per capita growth, annual %	10	11	1	8
Poverty rate (% of population below USD 2/day)	0.2	0.1	..	..
Demography and health				
Population (million inhabitants)	9.8	9.6	9.5	9.5
Population growth (%)	-0.5	-1.0	-1.0	-0.2
Urban population (%)	72	73	74	74
Mortality rate, under 5 (per 1000)	9	7	7	6
Life expectancy at birth, years	69	70	70	70
Economic structure (as % of GDP)				
Agriculture	10	10	9	9
Industry	42	44	42	44
Services	48	46	48	47
Financial flows				
FDI (inward flows as % of GDP)	1	4	4	3
Net ODA (% of GNI)	0.2	0.2	0.2	0.3
Workers' remittances and compensation of employees, received (% of GDP)	1	1	1	1
Adjusted net savings (% of GNI)	22	20	16	17

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005			*2000*	
	Bln,$	%	$ per capita		Trend
Total Wealth	467.2	100	34576	47788	↗
Produced Capital	95.9	20.5	8712	9812	↗
Natural Capital	58.4	12.5	10015	5972	↘
Intangible capital	316.9	67.8	16251	32420	↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	46.7
Number of subscribers of mobile cellular networks	102
Persons engaged in scientific research and development	0.4

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-1.71 (±0.18)	-1.61 (±0.14)	-1.54 (±0.14)	↗
Political stability and absence of violence	0.13 (±0.27)	0.368 (±0.25)	0.366 (±0.25)	↗↘
Government effectiveness	-1.11 (±0.2)	-1.14 (±0.21)	-1.1 (±0.21)	↘
Regulatory quality	-1.47 (±0.19)	-1.35 (±0.19)	-1.23 (±0.18)	↗
Rule of law	-1.01 (±0.18)	-0.97 (±0.15)	-0.94 (±0.15)	↗
Control of corruption	-0.89 (±0.15)	-0.76 (±0.15)	-0.78 (±0.15)	↗↘
Rank				
Voice and accountability	4	7	7	↗
Political stability and absence of violence	52	58	57	↗↘
Government effectiveness	12	12	13	↗
Regulatory quality	6	8	9	↗
Rule of law	15	19	19	↗
Control of corruption	19	24	23	↗↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Natural resource reserves

	% of land area
Forest area	45
Agriculture land	45
Water basin area	2
Other	8

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	..	..	..
Forest rents	0.6	0.5	↘
Mineral rents	0	0	-
Natural gas rents	0.2	0.04	↘
Oil rents	2.0	1.3	↘
Total natural resources rents	2.8	1.9	↘

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Flood	25 July 1993	100 000	0.6
Storm	23 Jun. 1997	33 000	0.2
Extreme temperature	May 2000	30 300	0.2
Storm	19 Jan. 2007	10 000	0.02
Flood	7 Mar. 1999	4 380	0.04

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	3813	4045	↗
Energy use (kt of oil equivalent)	26873	26760	↘
Energy imports, net (% of energy use)	86	85	↘
Alternative and nuclear energy (% of total use)	0.01	0.01	–
Energy related emissions (% of total)	8	..	..

Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) targets	2005	2010	Trend
Proportion of land covered by forest, %	40.7	41.6	↗
Carbon dioxide emissions (CO2), metric tons per capita	6	6.5*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	322	250*	↘
Consumption of ozone-depleting substances	0.6	10.4*	↗
Terrestrial and marine area protected, % of total	7.2	7.2	-
Proportion of total water resources used, %	7.5*	..	..
Proportion of population with sustainable access to an improved water source, total	100	100*	-
Proportion of population with sustainable access to improved sanitation, total	93	93*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for selected MDG (7) targets	
Forest cover	n.d.
Protected area	n.d.
CO2 emissions	n.d.
ODP substance consumption	n.d.
Water, total	n.d.
Sanitation, total	n.d.

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: *Achieving the MDGs in an Era of Global Uncertainty,* Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	3.0	38.6
Aid targeting the objectives of the Rio Conventions	0.001	8.0
General environmental protection	2.9	5.7
Environmental policy and administrative management	2.9	5.7
Environmental education and training	..	..
Environmental research	..	..

Source: OECD DAC database.

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1986 (Acceptance)
UNFCCC (climate change)	2000
UNCLOS (law of the sea)	2006
UNCCD (desertification treaty)	2001 (Accession)
Ramsar Convention (wetlands)	1991
Kyoto Protocol (climate change)	2005
Convention on Biological Diversity	1993
CMS (migratory species treaty)	2003
CITES (species trade treaty)	1995 (Accession)
Stockholm Convention (POPs)	2004 (Accession)
Montreal Protocol (ozone)	1988 (Acceptance)
Convention on Long-range Transboundary Air Pollution	1980
Convention on Environmental Impact Assessment in a Transboundary Context	2005 (Acceptance)
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	2003 (Accession)
Convention on the Transboundary Effects of Industrial Accidents	2003
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2000 (Approval)

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

GEORGIA

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	6411	12795	10767	11667
GDP (million constant 2000 USD)	4355	5475	5269	5604
Annual GDP growth (%)	10	2	-4	6
GDP per capita, current USD	1470	2919	2441	2621
GDP per capita (constant 2000 USD)	999	1249	1194	1259
GDP per capita growth, annual %	9	2	-4	5
Poverty rate (% of population below USD 2/day)	12.3	11.7	..	..
Demography and health				
Population (million inhabitants)	4.3	4.4	4.4	4.5
Population growth (%)	1.0	-0.1	0.6	0.9
Urban population (%)	53	53	53	53
Mortality rate, under 5 (per 1000)	27	24	23	22
Life expectancy at birth, years	73	73	73	73
Economic structure (as % of GDP)				
Agriculture	17	9	9	8
Industry	27	22	22	23
Services	56	69	69	68
Financial flows				
FDI (inward flows as % of GDP)	7	12	6	7
Net ODA (% of GNI)	5	7	9	5
Workers' remittances and compensation of employees, received (% of GDP)	5	6	7	7
Adjusted net savings (% of GNI)	14	-4	-6	2

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005		*2000*	
	Bln,$	%	$ per capita	Trend
Total Wealth	119.1	100	17860	26607 ↗
Produced Capital	22.9	19.2	4878	5128 ↗
Natural Capital	14.9	12.5	3310	3334 ↗
Intangible capital	85.4	71.7	10287	19076 ↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	8.9
Number of subscribers of mobile cellular networks	63
Persons engaged in scientific research and development	0.3

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-0.16 (±0.16)	-0.24 (±0.13)	-0.18 (±0.12)	↘↗
Political stability and absence of violence	-0.63 (±0.27)	-0.88 (±0.25)	-0.99 (±0.25)	↘
Government effectiveness	-0.37 (±0.18)	0.253 (±0.19)	0.224 (±0.2)	↗
Regulatory quality	-0.54 (±0.19)	0.559 (±0.17)	0.6 (±0.17)	↗
Rule of law	-0.63 (±0.17)	-0.23 (±0.14)	-0.17 (±0.14)	↗
Control of corruption	-0.33 (±0.14)	-0.2 (±0.14)	-0.23 (±0.14)	↗↘
Rank				
Voice and accountability	46	40	43	↘↗
Political stability and absence of violence	26	18	17	↘
Government effectiveness	41	62	62	↗
Regulatory quality	31	69	70	↗
Rule of law	33	48	50	↗
Control of corruption	47	52	52	↗

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	37.2
Agriculture land	39.7
Water basin area	2.6
Other	20.5

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	0.002	0.1	↗
Forest rents	0.1	0.1	-
Mineral rents	0.4	0.6	↗
Natural gas rents	0.1	0.01	↘
Oil rents	0.3	0.2	↘
Total natural resources rents	0.9	0.8	↘

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Earthquake	25 April 2002	350 000	10.3
Drought	August 2000	200 000	6.5
Flood	1 Jan. 1997	19 500	0.6
Flood	26 Apr.1997	10 000	0.3
Flood	1 July 1995	2 200	0.1
Flood	15 Jul. 2004	2 156	0.04

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	981	1258	↗
Energy use (kt of oil equivalent)	2841	3189	↗
Energy imports, net (% of energy use)	65	61	↘
Alternative and nuclear energy (% of total use)	19	21	↗
Energy related emissions (% of total)	36	..	..

Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) targets	2005	2010	Trend
Proportion of land covered by forest, %	39.6	39.5	↘
Carbon dioxide emissions (CO2), metric tons per capita	1.1	1.2*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	180	151*	↘
Consumption of ozone-depleting substances	34.4	4.6*	↘
Terrestrial and marine area protected, % of total	3.4	3.4	-
Proportion of total water resources used, %	2.6	..	..
Proportion of population with sustainable access to an improved water source, total	96	98*	↗
Proportion of population with sustainable access to improved sanitation, total	95	95*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for selected MDG (7) targets	
Forest cover	↑
Protected area	•
CO2 emissions	↓
ODP substance consumption	•
Water, total	•
Sanitation, total	↓

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: *Achieving the MDGs in an Era of Global Uncertainty,* Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	89.0	175.2
Aid targeting the objectives of the Rio Conventions	60.8	143.9
General environmental protection	1.3	3.1
Environmental policy and administrative management	0.5	0.7
Environmental education and training	0.02	0.003
Environmental research	..	..

Source: OECD DAC database.

International commitments

International commitments	Year Ratified
Vienna Convention (ozone)	1996 (Accession)
UNFCCC (climate change)	1994
UNCLOS (law of the sea)	1996 (Accession)
UNCCD (desertification treaty)	1999
Ramsar Convention (wetlands)	1997
Kyoto Protocol (climate change)	1999
Convention on Biological Diversity	1994 (Accession)
CMS (migratory species treaty)	2000
CITES (species trade treaty)	1996 (Accession)
Stockholm Convention (POPs)	2006
Montreal Protocol (ozone)	1996 (Accession)
Convention on Long-range Transboundary Air Pollution	1999 (Accession)
Convention on Environmental Impact Assessment in a Transboundary Context	..
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	..
Convention on the Transboundary Effects of Industrial Accidents	..
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2000

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

KAZAKHSTAN

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	57124	133442	115306	149059
GDP (million constant 2000 USD)	29957	37305	37753	40509
Annual GDP growth (%)	10	3	1	7
GDP per capita, current USD	3771	8514	7165	9132
GDP per capita (constant 2000 USD)	1978	2380	2346	2482
GDP per capita growth, annual %	9	2	-1	6
Poverty rate (% of population below USD 2/day)	..	0.2	0.2	..
Demography and health				
Population (million inhabitants)	15.1	15.7	16.1	16.3
Population growth (%)	0.9	1.2	2.6	1.4
Urban population (%)	57	58	58	59
Mortality rate, under 5 (per 1000)	38	35	34	33
Life expectancy at birth, years	66	67	68	68
Economic structure (as % of GDP)				
Agriculture	7	6	6	5
Industry	40	43	40	42
Services	53	51	53	53
Financial flows				
FDI (inward flows as % of GDP)	3	11	11	7
Net ODA (% of GNI)	0.4	0.3	0.3	0.2
Workers' remittances and compensation of employees, received (% of GDP)	0.3	0.1	0.2	0.2
Adjusted net savings (% of GNI)	-14	-8	-6	-2

Source: (2012) The World Bank Development Indicators Database.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	4.7	5.5	↗
Forest rents	0.03	0.004	↘
Mineral rents	2.1	2.5	↗
Natural gas rents	7.9	2.7	↘
Oil rents	31.0	22.4	↘
Total natural resources rents	**41.1**	**27.6**	↘

Source: (2012) The World Bank Development Indicators Database.

Technological development

	% of population
Number of Internet users	11.0
Number of subscribers of mobile cellular networks	96
Persons engaged in scientific research and development	0.1

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-0.94 (±0.14)	-1.02 (±0.12)	-1.04 (±0.12)	↘
Political stability and absence of violence	0.127 (±0.24)	0.538 (±0.23)	0.642 (±0.21)	↗
Government effectiveness	-0.53 (±0.16)	-0.47 (±0.19)	-0.19 (±0.18)	↗
Regulatory quality	-0.45 (±0.17)	-0.41 (±0.18)	-0.37 (±0.16)	↗
Rule of law	-0.76 (±0.15)	-0.74 (±0.14)	-0.56 (±0.13)	↗
Control of corruption	-0.98 (±0.14)	-1.01 (±0.13)	-0.91 (±0.13)	↘↗
Rank				
Voice and accountability	22	18	18	↘
Political stability and absence of violence	51	66	70	↗
Government effectiveness	35	39	48	↗
Regulatory quality	37	38	39	↗
Rule of law	29	25	35	↘↗
Control of corruption	18	15	19	↘↗

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	8.5
Agriculture land	32
Water basin area	1.5
Other	58

Source: (2010) CIS STAT.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Flood	20 Feb. 2008	130 000	0.1
Flood	26 May 1993	36 532	0.2
Flood	Feb. 2010	34 576	0.02
Flood	24 Feb. 2005	7 662	0.01
Storm	20 Dec. 1995	3 000	0.01

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	117365	145814	↗
Energy use (kt of oil equivalent)	50739	65835	↗
Energy imports, net (% of energy use)	-131	-121	↘
Alternative and nuclear energy (% of total use)	1.3	0.9	↘
Energy related emissions (% of total)	66	..	..

Source: (2012) The World Bank Development Indicators Database.
Note: A negative value indicates that the country is a net exporter.

Progress toward achieving the MDGs

Performance on selected MGD (7) targets	2005	2010	Trend
Proportion of land covered by forest, %	1.2	1.2	-
Carbon dioxide emissions (CO2), metric tons per capita	11.7	15.3*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	426	432*	↗
Consumption of ozone-depleting substances	40	130.2*	↗
Terrestrial and marine area protected, % of total	2.5	2.5	-
Proportion of total water resources used, %	28.9*	..	..
Proportion of population with sustainable access to an improved water source, total	96	95*	↘
Proportion of population with sustainable access to improved sanitation, total	97	97*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for selected MDG (7) targets	
Forest cover	↓
Protected area	•
CO2 emissions	↓
ODP substance consumption	•
Water, total	Δ
Sanitation, total	↓

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: *Achieving the MDGs in an Era of Global Uncertainty,* Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	5.0	52.5
Aid targeting the objectives of the Rio Conventions	5.6	22.0
General environmental protection	9.8	11.9
Environmental policy and administrative management	9.6	1.0
Environmental education and training	0.01	0.06
Environmental research	...	..

Source: OECD DAC database.

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1998 (Accession)
UNFCCC (climate change)	1995
UNCLOS (law of the sea)	..
UNCCD (desertification treaty)	1997
Ramsar Convention (wetlands)	2007
Kyoto Protocol (climate change)	2009
Convention on Biological Diversity	1994
CMS (migratory species treaty)	2006
CITES (species trade treaty)	2000 (Accession)
Stockholm Convention (POPs)	2007
Montreal Protocol (ozone)	1998 (Accession)
Convention on Long-range Transboundary Air Pollution	2001 (Accession)
Convention on Environmental Impact Assessment in a Transboundary Context	2001 (Accession)
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	2001 (Accession)
Convention on the Transboundary Effects of Industrial Accidents	2001
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2001

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

KYRGYZSTAN

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	2460	5140	4690	4616
GDP (million constant 2000 USD)	1649	2000	2059	2031
Annual GDP growth (%)	0	8	3	-1
GDP per capita, current USD	476	966	871	847
GDP per capita (constant 2000 USD)	319	376	382	373
GDP per capita growth, annual %	-1	7	2	-3
Poverty rate (% of population below USD 2/day)	17.1	5.9	6.0	..
Demography and health				
Population (million inhabitants)	5.2	5.3	5.4	5.4
Population growth (%)	1.1	1.0	1.2	1.2
Urban population (%)	36	36	36	37
Mortality rate, under 5 (per 1000)	44	40	39	38
Life expectancy at birth, years	68	68	69	69
Economic structure (as % of GDP)				
Agriculture	32	27	21	21
Industry	22	24	27	28
Services	46	49	52	51
Financial flows				
FDI (inward flows as % of GDP)	2	7	4	9
Net ODA (% of GNI)	11	7	7	9
Workers' remittances and compensation of employees, received (% of GDP)	13	24	21	28
Adjusted net savings (% of GNI)	2	4	15	10

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005		*2000*		
	Bln,$	%	$ per capita		Trend
Total Wealth	54.3	100	7254	10563	↗
Produced Capital	6.2	11.4	1307	1210	↘
Natural Capital	15.4	28.4	3586	2992	↘
Intangible capital	34.4	63.4	2916	6696	↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	41.6
Number of subscribers of mobile cellular networks	85
Persons engaged in scientific research and development	0.1

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-0.8 (±0.17)	-0.8 (±0.13)	-0.96 (±0.12)	↗
Political stability and absence of violence	-1.2 (±0.27)	-0.62 (±0.25)	-0.54 (±0.25)	↗
Government effectiveness	-0.94 (±0.17)	-0.81 (±0.19)	-0.98 (±0.2)	↗↘
Regulatory quality	-0.75 (±0.19)	-0.37 (±0.17)	-0.36 (±0.17)	↗
Rule of law	-1.08 (±0.17)	-1.29 (±0.14)	-1.29 (±0.14)	↘
Control of corruption	-1.18 (±0.15)	-1.07 (±0.14)	-1.22 (0.14)	↗↘
Rank				
Voice and accountability	24	25	22	↗↘
Political stability and absence of violence	13	24	26	↗
Government effectiveness	19	22	17	↗↘
Regulatory quality	23	40	40	↗
Rule of law	14	8	7	↘
Control of corruption	12	12	7	↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	13.4
Agriculture land	28.6
Water basin area	3.8
Other	54.2

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	0.2	0.4	↗
Forest rents	0.02	0.01	↘
Mineral rents	3.2	8.5	↗
Natural gas rents	0.2	0.04	↘
Oil rents	1.0	0.7	↘
Total natural resources rents	**4.5**	**9.2**	↗

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Earthquake	19 Aug. 1992	130 000	5.6
Mass movement	14 Apr. 1994	36 000	2.1
Earthquake	22 May 1992	31 000	1.3
Flood	10 Jun. 2005	2 660	0.1
Flood	18 May 1998	2 400	0.1

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	1447	1161	↘
Energy use (kt of oil equivalent)	2658	3011	↗
Energy imports, net (% of energy use)	46	61	↗
Alternative and nuclear energy (% of total use)	46	28	↘
Energy related emissions (% of total)	7	..	..

Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) targets	2005	2010	Trend
Proportion of land covered by forest, %	4.5	5	↗
Carbon dioxide emissions (CO2), metric tons per capita	1.0	1.1*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	299	265*	↘
Consumption of ozone-depleting substances	16.4	7.7*	↘
Terrestrial and marine area protected, % of total	6.9	6.9	-
Proportion of total water resources used, %	43.7*	..	..
Proportion of population with sustainable access to an improved water source, total	87	90*	↗
Proportion of population with sustainable access to improved sanitation, total	93	93*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for selected MDG (7) targets	
Forest cover	↑
Protected area	•
CO2 emissions	↓
ODP substance consumption	•
Water, total	•
Sanitation, total	Δ

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: *Achieving the MDGs in an Era of Global Uncertainty,* Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	31.1	10.9
Aid targeting the objectives of the Rio Conventions	13.7	2.9
General environmental protection	2.4	0.9
Environmental policy and administrative management	2.4	0.6
Environmental education and training	..	..
Environmental research	..	..

Source: OECD DAC database.

International commitments

Convention/Protocol/Treaty	Year Ratified
Vienna Convention (ozone)	2000 (Accession)
UNFCCC (climate change)	2000
UNCLOS (law of the sea)	..
UNCCD (desertification treaty)	1997 (Accession)
Ramsar Convention (wetlands)	2003
Kyoto Protocol (climate change)	2003
Convention on Biological Diversity	1996 (Accession)
CMS (migratory species treaty)	..
CITES (species trade treaty)	2007 (Accession)
Stockholm Convention (POPs)	2006
Montreal Protocol (ozone)	2000 (Accession)
Convention on Long-range Transboundary Air Pollution	2000 (Accession)
Convention on Environmental Impact Assessment in a Transboundary Context	2001 (Accession)
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	..
Convention on the Transboundary Effects of Industrial Accidents	..
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2001 (Accession)

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

MOLDOVA

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	2988	6055	5439	5809
GDP (million constant 2000 USD)	1814	2111	1985	2123
Annual GDP growth (%)	8	8	-6	7
GDP per capita, current USD	831	1696	1526	1631
GDP per capita (constant 2000 USD)	505	591	557	596
GDP per capita growth, annual %	8	8	-6	7
Poverty rate (% of population below USD 2/day)	10.7	1.4	1.2	0.7
Demography and health				
Population (million inhabitants)	3.6	3.6	3.6	3.6
Population growth (%)	-0.2	-0.2	-0.1	-0.1
Urban population (%)	43	42	41	41
Mortality rate, under 5 (per 1000)	22	20	20	19
Life expectancy at birth, years	68	68	69	69
Economic structure (as % of GDP)				
Agriculture	20	11	10	14
Industry	16	14	13	13
Services	64	75	77	73
Financial flows				
FDI (inward flows as % of GDP)	6	12	3	3
Net ODA (% of GNI)	5	4	4	7
Workers' remittances and compensation of employees, received (% of GDP)	31	31	22	24
Adjusted net savings (% of GNI)	16	18	13	13

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005		*2000*	
	Bln,$	%	$ per capita	Trend
Total Wealth	67.5	100	11053	17421 ↗
Produced Capital	14.7	21.8	4163	3794 ↘
Natural Capital	16.1	23.9	5467	4148 ↘
Intangible capital	38.5	57.0	1999	9919 ↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	36.3
Number of subscribers of mobile cellular networks	78
Persons engaged in scientific research and development	0.2

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-0.59 (±0.16)	-0.33 (±0.14)	-0.31 (±0.14)	↗
Political stability and absence of violence	-0.6 (±0.26)	-0.33 (±0.24)	-0.5 (±0.25)	↗↘
Government effectiveness	-0.73 (±0.16)	-0.72 (±0.19)	-0.56 (±0.21)	↗
Regulatory quality	-0.46 (±0.17)	-0.14 (±0.18)	-0.15 (±0.17)	↗↘
Rule of law	-0.45 (±0.15)	-0.41 (±0.14)	-0.45 (±0.15)	↗↘
Control of corruption	-0.68 (±0.13)	-0.61 (±0.14)	-0.74 (±0.15)	↗↘
Rank				
Voice and accountability	29	36	39	↗
Political stability and absence of violence	28	33	28	↗↘
Government effectiveness	27	27	36	↗
Regulatory quality	36	50	48	↗↘
Rule of law	40	42	39	↗↘
Control of corruption	31	33	26	↗↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	13.2
Agriculture land	58.6
Water basin area	2.5
Other	25.7

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	..	..	..
Forest rents	0.2	0.1	↘
Mineral rents	0	0	-
Natural gas rents	0	0	-
Oil rents	0.1	0.1	-
Total natural resources rents	0.2	0.2	-

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Drought	2007	406 000	9.2
Flood	24 Aug. 1994	300 000	17.6
Flood	6 Jul. 1997	50 000	2.6
Storm	26 Nov. 2000	31 600	2.5
Flood	18 Aug. 2005	7 752	0.3

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	88	104	↗
Energy use (kt of oil equivalent)	3536	2449	↘
Energy imports, net (% of energy use)	97	96	↘
Alternative and nuclear energy (% of total use)	0.2	0.2	-
Energy related emissions (% of total)	45	..	..

Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) indicators	2005	2010	Trend
Proportion of land covered by forest, %	11	11.7	↗
Carbon dioxide emissions (CO2), metric tons per capita	1.3	1.3*	-
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	416	319*	↘
Consumption of ozone-depleting substances	15.3	1.2*	↘
Proportion of total water resources used, %	1.4	1.4	-
Terrestrial and marine area protected, % of total	16.4*	..	..
Proportion of population with sustainable access to an improved water source, total	90	90*	-
Proportion of population with sustainable access to improved sanitation, total	79	79*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	18.4	74.0
Aid targeting the objectives of the Rio Conventions	0.04	31.7
General environmental protection	11.2	1.0
Environmental policy and administrative management	11.2	1.0
Environmental education and training	..	0.01
Environmental research	..	0.01

Source: OECD DAC database.

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1996 (Accession)
UNFCCC (climate change)	1995
UNCLOS (law of the sea)	2007 (Accession)
UNCCD (desertification treaty)	1999 (Accession)
Ramsar Convention (wetlands)	2000
Kyoto Protocol (climate change)	2003
Convention on Biological Diversity	1995
CMS (migratory species treaty)	2001
CITES (species trade treaty)	2001 (Accession)
Stockholm Convention (POPs)	2004
Montreal Protocol (ozone)	1996 (Accession)
Convention on Long-range Transboundary Air Pollution	1995 (Accession)
Convention on Environmental Impact Assessment in a Transboundary Context	1994 (Accession)
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	1994 (Accession)
Convention on the Transboundary Effects of Industrial Accidents	1994
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	1999

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

RUSSIAN FEDERATION

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (billion current USD)	764	1661	1222	1480
GDP (billion constant 2000 USD)	350	432	398	414
Annual GDP growth (%)	6	5	-8	4
GDP per capita, current USD	5337	11700	8615	10440
GDP per capita (constant 2000 USD)	2443	3044	2808	2923
GDP per capita growth, annual %	7	5	-8	4
Poverty rate (% of population below USD 2/day)	0.3	0.01	0.01	..
Demography and health				
Population (million inhabitants)	143.2	142.0	141.9	141.8
Population growth (%)	-0.5	-0.1	-0.1	-0.1
Urban population (%)	73	73	73	73
Mortality rate, under 5 (per 1000)	17	13	13	12
Life expectancy at birth, years	65	68	69	69
Economic structure (as % of GDP)				
Agriculture	5	4	5	4
Industry	38	36	34	37
Services	57	59	62	59
Financial flows				
FDI (inward flows as % of GDP)	2	5	3	3
Net ODA (% of GNI)	..	..	..	..
Workers' remittances and compensation of employees, received (% of GDP)	0.4	0.4	0.4	0.4
Adjusted net savings (% of GNI)	3	10	7	5

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005			*2000*	
	Bln,$	%	$ per capita		Trend
Total Wealth	10471.1	100	52207	73166	↗
Produced Capital	2534.8	24.2	18614	17712	↘
Natural Capital	4481.9	42.8	28515	31317	↗
Intangible capital	3486.9	33.3	4450	24364	↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	42.1
Number of subscribers of mobile cellular networks	162
Persons engaged in scientific research and development	0.5

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-0.65 (±0.14)	-0.91 (±0.12)	-0.95 (±0.12)	↘
Political stability and absence of violence	-0.89 (±0.23)	-0.61 (±0.22)	-0.72 (±0.21)	↗↘
Government effectiveness	-0.36 (±0.16)	-0.26 (±0.18)	-0.28 (±0.18)	↗↘
Regulatory quality	-0.26 (±0.17)	-0.48 (±0.17)	-0.46 (±0.16)	↘↗
Rule of law	-0.84 (±0.14)	-0.92 (±0.13)	-0.77 (±0.13)	↘↗
Control of corruption	-0.75 (±0.13)	-1.02 (±0.12)	-1.12 (±0.13)	↘
Rank				
Voice and accountability	28	22	23	↘↗
Political stability and absence of violence	20	25	22	↗↘
Government effectiveness	42	45	45	↗
Regulatory quality	46	35	35	↘
Rule of law	23	20	24	↘↗
Control of corruption	27	14	11	↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	64.7
Agriculture land	23.5
Water basin area	1.6
Other	10.2

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	0.9	1.4	↗
Forest rents	0.5	0.3	↘
Mineral rents	1.0	1.7	↗
Natural gas rents	17.0	3.6	↘
Oil rents	18.9	14.2	↘
Total natural resources rents	37.5	19.9	↘

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Wildfire	July 2010	1 800 000	0.1
Drought	April 2010	1 400 000	0.1
Extreme temperature	Jan. 2006	1 000 000	0.1
Flood	8 Aug. 2002	500 000	0.1
Flood	19 Jun. 2002	443 000	0.1

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent), thousands	1203	1182	↘
Energy use (kt of oil equivalent) , thousands	652	647	↘
Energy imports, net (% of energy use)	-85	-83	↗
Alternative and nuclear energy (% of total use)	8	9	-
Energy related emissions (% of total)	79	..	..

Note: A negative value indicates that the country is a net exporter.
Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) indicators	2005	2010	Trend
Proportion of land covered by forest, %	49.4	49.4	-
Carbon dioxide emissions (CO2), metric tons per capita	11.3	12.1*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	384	328*	↘
Consumption of ozone-depleting substances	776	1200*	↗
Terrestrial and marine area protected, % of total	9.2	9.2	-
Proportion of total water resources used, %	1.5*	..	..
Proportion of population with sustainable access to an improved water source, total	96	96*	-
Proportion of population with sustainable access to improved sanitation, total	87	87*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for MDG (7) targets	
Forest cover	↑
Protected area	•
CO2 emissions	↓
ODP substance consumption	↓
Water, total	•
Sanitation, total	↓

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: Achieving the MDGs in an Era of Global Uncertainty, Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1986 (Acceptance)
UNFCCC (climate change)	1994
UNCLOS (law of the sea)	1997
UNCCD (desertification treaty)	2003 (Accession)
Ramsar Convention (wetlands)	1977
Kyoto Protocol (climate change)	2004
Convention on Biological Diversity	1995
CMS (migratory species treaty)	..
CITES (species trade treaty)	1992 (Continuation)
Stockholm Convention (POPs)	2002 (signature)
Montreal Protocol (ozone)	1988 (Acceptance)
Convention on Long-range Transboundary Air Pollution	1980
Convention on Environmental Impact Assessment in a Transboundary Context	1991 (signature)
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	1993 (Acceptance)
Convention on the Transboundary Effects of Industrial Accidents	1994
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	..

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

TAJIKISTAN

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	2312	5161	4978	5640
GDP (million constant 2000 USD)	1393	1715	1850	1920
Annual GDP growth (%)	10	8	8	4
GDP per capita, current USD	358	771	734	820
GDP per capita (constant 2000 USD)	216	256	273	279
GDP per capita growth, annual %	9	6	6	2
Poverty rate (% of population below USD 2/day)	..	..	7	..
Demography and health				
Population (million inhabitants)	6.5	6.7	6.8	6.9
Population growth (%)	1.0	1.3	1.4	1.4
Urban population (%)	26	26	26	27
Mortality rate, under 5 (per 1000)	76	67	65	63
Life expectancy at birth, years	66	67	67	67
Economic structure (as % of GDP)				
Agriculture	24	25	22	21
Industry	31	27	24	22
Services	45	48	54	57
Financial flows				
FDI (inward flows as % of GDP)	2	7	0.3	0.3
Net ODA (% of GNI)	11	6	8	8
Workers' remittances and compensation of employees, received (% of GDP)	20	49	35	40
Adjusted net savings (% of GNI)	-17	7	6	-4

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005		*2000*	
	Bln,$	%	$ per capita	Trend
Total Wealth	43.8	100	4388	6687 ↗
Produced Capital	7.2	16.4	1441	1093 ↘
Natural Capital	11.5	26.3	2030	1762 ↘
Intangible capital	26.5	60.5	1214	4052 ↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	9.5
Number of subscribers of mobile cellular networks	66
Persons engaged in scientific research and development	0.04

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-1.16 (±0.17)	-1.35 (±0.13)	-1.33 (±0.13)	↘↗
Political stability and absence of violence	-1.41 (±0.27)	-0.84 (±0.25)	-1 (±0.25)	↗↘
Government effectiveness	-1.15 (±0.17)	-1.05 (±0.19)	-1.11 (±0.2)	↗↘
Regulatory quality	-1.03 (±0.19)	-1.02 (±0.17)	-1.08 (±0.17)	↗↘
Rule of law	-0.99 (±0.17)	-1.23 (±0.14)	-1.22 (±0.14)	↘↗
Control of corruption	-1.12 (±0.15)	-1 (±0.14)	-1.11 (±0.14)	↗↘
Rank				
Voice and accountability	15	10	10	↘
Political stability and absence of violence	9	19	16	↗↘
Government effectiveness	12	14	12	↗↘
Regulatory quality	15	15	13	↘
Rule of law	17	9	11	↘↗
Control of corruption	13	16	12	↗↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	26.5
Agriculture land	50.5
Water basin area	0.3
Other	22.7

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	0.1	0.3	↗
Forest rents	0.05	0.02	↘
Mineral rents	0.4	0.6	↗
Natural gas rents	0.3	0.1	↘
Oil rents	0.3	0.2	↘
Total natural resources rents	**1.0**	**0.9**	**↘**

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Extreme temperature	Jan. 2008	840 000	16.3
Flood	25 May 1992	300 000	15.7
Flood	6 May 2010	204 000	3.6
Mass movement	7 May 1993	149 000	9.0
Flood	24 Apr. 1998	66 000	5.0

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	1546	1502	↘
Energy use (kt of oil equivalent)	2350	2318	↘
Energy imports, net (% of energy use)	34	35	↗
Alternative and nuclear energy (% of total use)	62	59	↘
Energy related emissions (% of total)	13	..	..

Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) indicators	2005	2010	Trend
Proportion of land covered by forest, %	2.9	2.9	-
Carbon dioxide emissions (CO2), metric tons per capita	0.4	0.5*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	243	207*	↘
Consumption of ozone-depleting substances	3.5	2.6*	↘
Terrestrial and marine area protected, % of total	4.1	4.1	-
Proportion of total water resources used, %	74.8*	..	..
Proportion of population with sustainable access to an improved water source, total	67	70*	↗
Proportion of population with sustainable access to improved sanitation, total	93	94*	↗

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off track for MDG (7) targets	
Forest cover	↑
Protected area	•
CO2 emissions	↓
ODP substance consumption	•
Water, total	Δ
Sanitation, total	•

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: Achieving the MDGs in an Era of Global Uncertainty, Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	51.5	32.5
Aid targeting the objectives of the Rio Conventions	18.0	9.0
General environmental protection	2.3	1.9
Environmental policy and administrative management	2.1	0.4
Environmental education and training	..	..
Environmental research	..	..

Source: OECD DAC database.

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1996 (Accession)
UNFCCC (climate change)	1998
UNCLOS (law of the sea)	..
UNCCD (desertification treaty)	1997 (Accession)
Ramsar Convention (wetlands)	2001
Kyoto Protocol (climate change)	2008
Convention on Biological Diversity	1997 (Accession)
CMS (migratory species treaty)	2001
CITES (species trade treaty)	..
Stockholm Convention (POPs)	2007
Montreal Protocol (ozone)	1998 (Accession)
Convention on Long-range Transboundary Air Pollution	..
Convention on Environmental Impact Assessment in a Transboundary Context	..
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	..
Convention on the Transboundary Effects of Industrial Accidents	..
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	2001 (Accession)

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

TURKMENISTAN

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	8104	19272	18651	20001
GDP (million constant 2000 USD)	6282	8974	9521	10397
Annual GDP growth (%)	13	15	6	9
GDP per capita, current USD	1707	3918	3745	3967
GDP per capita (constant 2000 USD)	1323	1825	1912	2062
GDP per capita growth, annual %	12	13	5	8
Poverty rate (% of population below USD 2/day)	..	..	..	..
Demography and health				
Population (million inhabitants)	4.7	4.9	5.0	5.0
Population growth (%)	1.1	1.2	1.2	1.2
Urban population (%)	47	49	49	50
Mortality rate, under 5 (per 1000)	64	59	57	56
Life expectancy at birth, years	64	65	65	65
Economic structure (as % of GDP)				
Agriculture	19	12	12	12
Industry	38	54	54	54
Services	44	34	34	34
Financial flows				
FDI (inward flows as % of GDP)	5	7	21	10
Net ODA (% of GNI)	0.4	0.1	0.2	0.2
Workers' remittances and compensation of employees, received (% of GDP)	..	..	..	..
Adjusted net savings (% of GNI)	..	..	..	..

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	Bln,$	%	$ per capita		Trend
Total Wealth	*2005*			*2000*	
Produced Capital					
Natural Capital					
Intangible capital					

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	
Number of subscribers of mobile cellular networks	
Persons engaged in scientific research and development	

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-1.99 (±0.19)	-2.09 (±0.15)	-2.06 (±0.15)	↘↗
Political stability and absence of violence	-0.23 (±0.26)	0.252 (±0.26)	0.181 (±0.26)	↗↘
Government effectiveness	-1.62 (±0.19)	-1.36 (±0.22)	-1.34 (±0.23)	↗
Regulatory quality	-2.08 (±0.19)	-2.09 (±0.2)	-2.07 (±0.19)	↘↗
Rule of law	-1.52 (±0.16)	-1.35 (±0.16)	-1.37 (±0.15)	↗↘
Control of corruption	-1.48 (±0.15)	-1.38 (±0.16)	-1.43 (±0.16)	↗↘
Rank				
Voice and accountability	1	1	1	–
Political stability and absence of violence	38	54	51	↗↘
Government effectiveness	2	7	7	↗
Regulatory quality	2	2	2	–
Rule of law	4	7	5	↗↘
Control of corruption	3	4	2	↗↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Reserve and forest area	25
Agriculture land	69
Water basin area	
Other	6

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	..	..	..
Forest rents	..	..	..
Mineral rents	0	0	-
Natural gas rents	169	24.2	↘
Oil rents	37.5	19.7	↘
Total natural resources rents	206.5	43.9	↘

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Flood	Jan. 1993	99 870	3.1

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	61137	40904	↘
Energy use (kt of oil equivalent)	18511	19584	↗
Energy imports, net (% of energy use)	-230	-109	↗
Alternative and nuclear energy (% of total use)	0.001	0.001	–
Energy related emissions (% of total)	75	..	..

Note: A negative value indicates that the country is a net exporter.
Source: (2012) The World Bank Development Indicators Database.

Progress towards achieving the MDGs

Performance on selected MGD (7) indicators	2005	2010	Trend
Proportion of land covered by forest, %	8.8	8.8	-
Carbon dioxide emissions (CO2), metric tons per capita	8.6	9.5*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	731	605*	↘
Consumption of ozone-depleting substances	27.3	13.1*	↘
Terrestrial and marine area protected, % of total	3.0	3.0	-
Proportion of total water resources used, %	100.8*	..	..
Proportion of population with sustainable access to an improved water source, total	84	..	..
Proportion of population with sustainable access to improved sanitation, total	98	98*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off the track for MDG (7) targets	
Forest cover	↑
Protected area	↑
CO2 emissions	↓
ODP substance consumption	↓
Water, total	n.d.
Sanitation, total	n.d.

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: Achieving the MDGs in an Era of Global Uncertainty, Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	2.1	9.4
Aid targeting the objectives of the Rio Conventions	..	6.9
General environmental protection	1.6	0.7
Environmental policy and administrative management	1.6	0.3
Environmental education and training	..	..
Environmental research	..	..

Source: OECD DAC base.

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1993 (Accession)
UNFCCC (climate change)	1995
UNCLOS (law of the sea)	..
UNCCD (desertification treaty)	1996
Ramsar Convention (wetlands)	2009
Kyoto Protocol (climate change)	1999
Convention on Biological Diversity	1996 (Accession)
CMS (migratory species treaty)	..
CITES (species trade treaty)	..
Stockholm Convention (POPs)	..
Montreal Protocol (ozone)	1993 (Accession)
Convention on Long-range Transboundary Air Pollution	..
Convention on Environmental Impact Assessment in a Transboundary Context	..
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	..
Convention on the Transboundary Effects of Industrial Accidents	..
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	1999 (Accession)

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

UKRAINE

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	86142	179992	117228	137929
GDP (million constant 2000 USD)	45232	53572	45643	47560
Annual GDP growth (%)	3	2	-15	4
GDP per capita, current USD	1829	3891	2545	3007
GDP per capita (constant 2000 USD)	960	1158	991	1037
GDP per capita growth, annual %	3	3	-14	5
Poverty rate (% of population below USD 2/day)	0.1	0.04	0.1	..
Demography and health				
Population (million inhabitants)	47.1	46.3	46.1	45.9
Population growth (%)	-0.7	-0.5	-0.4	-0.4
Urban population (%)	68	68	68	68
Mortality rate, under 5 (per 1000)	15	14	14	13
Life expectancy at birth, years	68	68	69	70
Economic structure (as % of GDP)				
Agriculture	10	8	8	8
Industry	32	34	30	31
Services	57	58	62	61
Financial flows				
FDI (inward flows as % of GDP)	9	6	4	5
Net ODA (% of GNI)	0.5	0.3	0.6	0.5
Workers' remittances and compensation of employees, received (% of GDP)	1	3	4	4
Adjusted net savings (% of GNI)	11	11	4	8

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005		*2000*	
	Bln,$	%	$ per capita	Trend
Total Wealth	1380.3	100	19693	29322 ↗
Produced Capital	341.3	24.7	7877	7250 ↘
Natural Capital	324.8	23.5	7235	6899 ↘
Intangible capital	728.9	52.8	5097	15485 ↗

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Technological development

	% of population
Number of Internet users	33.3
Number of subscribers of mobile cellular networks	120
Persons engaged in scientific research and development	0.3

Source: (2010) CIS STAT.

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-0.42 (±0.15)	-0.02 (±0.12)	-0.06 (±0.12)	↗↘
Political stability and absence of violence	-0.24 (±0.24)	-0.092 (±0.22)	-0.27 (±0.21)	↗↘
Government effectiveness	-0.46 (±0.16)	-0.69 (±0.18)	-0.77 (±0.18)	↘
Regulatory quality	-0.41 (±0.17)	-0.47 (±0.17)	-0.54 (±0.16)	↘
Rule of law	-0.73 (±0.15)	-0.66 (±0.13)	-0.73 (±0.13)	↗↘
Control of corruption	-0.65 (±0.13)	-0.73 (±0.12)	-0.9 (±0.13)	↘
Rank				
Voice and accountability	35	47	47	↗
Political stability and absence of violence	38	47	34	↗↘
Government effectiveness	37	29	24	↘
Regulatory quality	40	36	31	↘
Rule of law	30	29	26	↘
Control of corruption	32	27	20	↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	17.5
Agriculture land	71.0
Water basin area	4.0
Other	7.5

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	2.2	3.1	↗
Forest rents	0.3	0.3	-
Mineral rents	0.1	0.1	-
Natural gas rents	5.4	1.7	↘
Oil rents	1.2	0.9	↘
Total natural resources rents	7.0	2.9	↘

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Flood	26 Jul. 2008	1 000 000	0.6
Flood	20 Dec.1993	159 000	0.2
Storm	27 Nov. 2000	120 000	0.4
Storm	17 Jan. 2007	100 000	0.1
Extreme temperature	1 May 2000	85 000	0.3

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	80969	76914	↘
Energy use (kt of oil equivalent)	142886	115472	↘
Energy imports, net (% of energy use)	43	33	↘
Alternative and nuclear energy (% of total use)	17	20	↗
Energy related emissions (% of total)	62	..	..

Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) indicators	2005	2010	Trend
Proportion of land covered by forest, %	16.5	16.8	↗
Carbon dioxide emissions (CO2), metric tons per capita	7.2	7.0*	↘
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	543	438*	↘
Consumption of ozone-depleting substances	133.5	63.5*	↘
Terrestrial and marine area protected, % of total	3.6	3.6	-
Proportion of total water resources used, %	27.6*	..	..
Proportion of population with sustainable access to an improved water source, total	98	98*	-
Proportion of population with sustainable access to improved sanitation, total	95	95*	-

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off the track for MDG (7) targets	
Forest cover	n.d.
Protected area	n.d.
CO2 emissions	n.d.
ODP substance consumption	n.d.
Water, total	n.d.
Sanitation, total	n.d.

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	28.7	139.0
Aid targeting the objectives of the Rio Conventions	13.8	47.2
General environmental protection	12.0	9.6
Environmental policy and administrative management	12.0	8.9
Environmental education and training	..	0.03
Environmental research	0.01	..

Source: OECD DAC base.

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1986 (Acceptance)
UNFCCC (climate change)	1997
UNCLOS (law of the sea)	1999
UNCCD (desertification treaty)	2002 (Accession)
Ramsar Convention (wetlands)	1991
Kyoto Protocol (climate change)	2004
Convention on Biological Diversity	1995
CMS (migratory species treaty)	1999
CITES (species trade treaty)	1999 (Accession)
Stockholm Convention (POPs)	2007
Montreal Protocol (ozone)	1988 (Acceptance)
Convention on Long-range Transboundary Air Pollution	1980
Convention on Environmental Impact Assessment in a Transboundary Context	1999
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	1999 (Accession)
Convention on the Transboundary Effects of Industrial Accidents	..
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	1999

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE.

UZBEKISTAN

Socio-economic indicators

	2005	2008	2009	2010
Income and poverty				
GDP (million current USD)	14308	27918	32817	38982
GDP (million constant 2000 USD)	17905	22932	24789	26896
Annual GDP growth (%)	7	9	8	9
GDP per capita, current USD	547	1023	1182	1381
GDP per capita (constant 2000 USD)	684	840	893	953
GDP per capita growth, annual %	6	7	6	7
Poverty rate (% of population below USD 2/day)	..	..	..	..
Demography and health				
Population (million inhabitants)	26.2	27.3	27.8	28.2
Population growth (%)	1.2	1.6	1.7	1.6
Urban population (%)	37	37	37	37
Mortality rate, under 5 (per 1000)	57	54	52	52
Life expectancy at birth, years	67	68	68	68
Economic structure (as % of GDP)				
Agriculture	28	21	20	20
Industry	23	31	33	35
Services	49	48	47	45
Financial flows				
FDI (inward flows as % of GDP)	1	3	2	2
Net ODA (% of GNI)	1	1	1	1
Workers' remittances and compensation of employees, received (% of GDP)	..	..	..	..
Adjusted net savings (% of GNI)	..	..	..	..

Source: (2012) The World Bank Development Indicators Database.

Welfare structure

	2005			*2000*	
	Bln,$	%	$ per capita		Trend
Total Wealth	139.1	100	6161	5316	↘
Produced Capital	40.4	29.0	1491	1514	↘
Natural Capital	200.2	143.9	3231	7652	↗
Intangible capital	-101.7	-73.1	1538	-3887	↘

Source: (2010) The Changing Wealth of Nations, The World Bank: http://data.worldbank.org/data-catalog/wealth-of-nations

Governance quality

	2005	2008	2009	Trend
Estimate value (± standard error)				
Voice and accountability	-1.83 (±0.15)	-1.95 (±0.13)	-1.93 (±0.12)	↘↗
Political stability and absence of violence	-1.94 (±0.26)	-1.13 (±0.24)	-0.91 (±0.23)	↗
Government effectiveness	-1.29 (±0.18)	-0.8 (±0.21)	-0.72 (±0.21)	↗
Regulatory quality	-1.69 (±0.19)	-1.44 (±0.18)	-1.55 (±0.17)	↗↘
Rule of law	-1.42 (±0.16)	-1.13 (±0.15)	-1.22 (±0.14)	↗↘
Control of corruption	-1.42 (±0.16)	-1.13 (±0.15)	-1.22 (±0.14)	↗↘
Rank				
Voice and accountability	3	2	2	↘
Political stability and absence of violence	3	13	18	↗
Government effectiveness	9	23	27	↗
Regulatory quality	3	5	6	↗
Rule of law	7	12	11	↗↘
Control of corruption	11	13	6	↗↘

Notes: These six indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Source: (2012) The World Bank.

Major land uses

	% of land area
Forest area	3.1
Agriculture land	59.5
Water basin area	1.8
Other	35.6

Source: (2010) CIS STAT.

Natural resource rents

% of GDP	2005	2010	Trend
Coal rents	0.2	0.2	-
Forest rents	0.003	0.001	↘
Mineral rents	4.8	8.1	↗
Natural gas rents	91.4	18.1	↘
Oil rents	9.6	3.3	↘
Total natural resources rents	105.7	29.4	↘

Source: (2012) The World Bank Development Indicators Database.

Natural disasters: economic costs, 1990-2011

Disaster	Date	Damage	
		Thousand USD	% of GDP
Drought	August 2000	50 000	0.4

Source: EM-DAT, International Disaster Database.

Energy and environment

Energy production and consumption	2005	2009	Trend
Energy production (kt of oil equivalent)	56396	60694	↗
Energy use (kt of oil equivalent)	46951	48809	↗
Energy imports, net (% of energy use)	-20	-24	↘
Alternative and nuclear energy (% of total use)	1.6	1.6	-
Energy related emissions (% of total)	57	..	..

Note: A negative value indicates that the country is a net exporter.
Source: (2012) The World Bank Development Indicators Database.

Progress toward achieving the MDGs

Performance on selected MGD (7) indicators	2005	2010	Trend
Proportion of land covered by forest, %	7.7	7.7	-
Carbon dioxide emissions (CO2), metric tons per capita	4.2	4.6*	↗
Energy use (kg oil equivalent) per $1 GDP (constant 2005 PPP $)	897	753*	↘
Consumption of ozone-depleting substances	3.5	1.8*	↘
Terrestrial and marine area protected, % of total	2.3	2.3	-
Proportion of total water resources used, %	118.3*	..	..
Proportion of population with sustainable access to an improved water source, total	88	87*	↘
Proportion of population with sustainable access to improved sanitation, total	97	100*	↗

Note: * - latest data available.

Source: (2012) UN Database: unstats.un.org/unsd/mdg/Data.aspx

On and off the track for MDG (7) targets	
Forest cover	•
Protected area	•
CO2 emissions	•
ODP substance consumption	•
Water, total	↓
Sanitation, total	↑

Notes: • early achiever; ↑ on track ; Δ slow; ↓ regressing/no progress
Source: Achieving the MDGs in an Era of Global Uncertainty, Asia-Pacific Regional Report (2009/10): p. 29, http://www.mdgasiapacific.org

International assistance for environment

	2005	2010
Environment-oriented aid, million USD (current prices)		
Total environment-oriented aid	25.9	345.2
Aid targeting the objectives of the Rio Conventions	9.1	338.7
General environmental protection	4.4	2.3
Environmental policy and administrative management	4.3	1.9
Environmental education and training	..	..
Environmental research	..	..

Source: OECD DAC base.

International commitments

Convention/protocol/treaty	Year Ratified
Vienna Convention (ozone)	1993 (Accession)
UNFCCC (climate change)	1993
UNCLOS (law of the sea)	..
UNCCD (desertification treaty)	1995
Ramsar Convention (wetlands)	2002
Kyoto Protocol (climate change)	1999
Convention on Biological Diversity	1995 (Accession)
CMS (migratory species treaty)	1998
CITES (species trade treaty)	1997 (Accession)
Stockholm Convention (POPs)	..
Montreal Protocol (ozone)	1993 (Accession)
Convention on Long-range Transboundary Air Pollution	..
Convention on Environmental Impact Assessment in a Transboundary Context	..
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	2007 (Accession)
Convention on the Transboundary Effects of Industrial Accidents	..
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	..

Notes: Ramsar Convention: data for entry into force; Convention on Biological Diversity: data for party. CMS: data for entry into force.

Source: Web sites of UNEP, Ozone Secretariat; UNFCCC; UN, Division for Ocean Affairs and the Law of the Sea; UNCCD; The Ramsar Convention of Wetlands; Convention on Migratory Species; CITES; Stockholm Convention (POP); UNECE

www.oecd.org/greengrowth